Phoenix-Mesa Gateway Airport

Airport Master Plan

Mead & Hunt

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AIRPORT MASTER PLAN

for

Phoenix-Mesa Gateway Airport

Mesa, Arizona

Phoenix-Mesa Gateway Airport Project Number: 929

Federal Aviation Administration

Airport Improvement Program Grant Number: 3-04-0078-041-2018

Arizona Department of Transportation – Aeronautics Division Grant Number: E9M1C

Prepared for the

Phoenix-Mesa Gateway Airport Authority

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Phoenix-Mesa Gateway Airport Authority Board of Directors

June 16, 2020

Resolution Number: 20-19

"The preparation of this document may have been supported, in part, with financial assistance from the Federal Aviation Administration through the Airport Improvement Program. The contents 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 herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public law."

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INTRODUCTION
AIRPORT MASTER PLAN

Study Introduction

The Phoenix-Mesa Gateway Airport Authority (PMGAA) initiated an update to the Airport Master Plan (Master Plan or Plan) to assess the facilities and service needs of the Phoenix-Mesa Gateway Airport (IWA or Airport) throughout the next 20 years (planning period). The Plan serves as a roadmap for bringing future projects, people, and funding together in a coordinated manner and provides strategic direction for future airport development in the form of a 20-year capital development plan that considers investment of resources.

The Plan is conducted in accordance with Federal Aviation Administration (FAA) guidance, as prescribed by grant assurances and mandated by regulatory standards. Conformance with FAA standards enables the PMGAA to apply for federal and state funding for the support of maintenance, expansion, and upgrade of airport facilities as demand warrants and when funding is available.

Airport Background

The Airport is owned and operated by the PMGAA. These entities comprise the PMGAA:

- ✓ City of Mesa
- ✓ City of Phoenix
- ✓ Gila River Indian Community
- ✓ Town of Gilbert
- ✓ Town of Queen Creek
- ✓ City of Apache Junction

Located in one of the fastest growing areas in the United States, IWA has become a significant economic engine in the Phoenix-Mesa-Chandler Metropolitan Statistical Area's diversifying economy. In 2013, IWA had a $1.3 billion annual economic impact and supported more than 10,000 jobs in the region. Additionally, the population in the local area has increased almost 200 percent over the past ten years.

The Airport is home to more than 40 businesses and has been designated as a Foreign Trade Zone #221, as well as a Military Reuse Zone, offering aviation businesses a competitive advantage in the marketplace.

IWA has marked several recent milestones since the February 2009 Airport Master Plan, including a modified passenger terminal, initiation of passenger service by domestic and international commercial air

carriers, investments by local colleges, and the addition of tenants such as Cessna and Embraer. This Master Plan will build upon the Airport's continuing success and deliver a plan to guide development at IWA for the next 20 years.

What is an Airport Master Plan?

An airport master plan is a comprehensive study of an airport that focuses on short-, medium-, and long-term development plans to meet future aviation demand. The vitality of air transportation as a community industry makes it important that requirements for new, improved, or expanded airport facilities be anticipated in planning. The scope of an airport master plan focuses on identifying the development and facilities needed to support an FAA-approved forecast.

Many elements of airport operations and management are outside of the scope of this Plan, such as staff organization, marketing, and general repair and maintenance. This Plan focuses on facilities that serve passengers, air cargo, aircraft owners, pilots, and airport tenants, and provides guidance on how the facilities need to be updated and changed to maintain a high level of service to the flying public into the future.

What the Plan "is"

- ✓ A flexible long-term development plan for the Airport over the next 20 years
- ✓ A detailed and comprehensive record of the data analysis of existing conditions and future trends
- ✓ A Plan with a focus on long-term facility development and land use
- ✓ A document assembled through extensive community outreach

What the Plan "is not"

- ✓ An engineering level document
- ✓ A rigid "blueprint" for future development
- ✓ A program to move the Airport to another location
- ✓ A business, strategic, or marketing plan
- ✓ An environmental permitting document

The Plan is one of several documents that the PMGAA produces to guide airport operations. The Plan development considers the other documents already in place and refers to these documents as appropriate.

Master Plan Elements

The Plan is organized into six core elements that translate into comprehensive chapters as the plan is developed. Each element is a building block that will result in the final Plan document and compliance

with FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*. The purpose behind each element is described below.

- ✓ **Inventory:** This element answers the question "What do we have?" This element describes facilities and levels of activity currently existing at the Airport, and how they have changed over time. The inventory is the foundation of subsequent Plan elements.
- ✓ **Aviation Forecasts**: This element answers the question "How much demand do we expect?" Understanding future demand is a critical part in the decision-making process that occurs during Plan development and during the execution of the ensuing capital improvement plan. The forecasts look at the volume of passengers and cargo, the number of based aircraft, and the movements of aircraft to describe how the use of the Airport will change over time. Aviation forecasts are pivotal in justifying future improvements and helping the FAA determine funding priority. For these reasons, the FAA must approve the aviation forecasts. This is one of only two Plan elements that the FAA formally approves.
- ✓ **Facility Requirements and Demand / Capacity Analysis**: This element answers the question "Are our existing facilities sufficient to meet future demand?" This element can be thought of as a gap analysis between the facilities that the Airport has (inventory) and the facilities it will need (based on the forecasts). This element will yield recommendations about which facilities need improvement, expansion, replacement, and removal and will provide an idea of the scale of facility changes needed to meet future demand. This element will also cover the potential for Airport modernization to address evolving technologies and preferences.
- ✓ **Airport Alternatives and Environmental Considerations**: This element answers the question "How will we meet future demand?" This element builds on the recommendations in the Facility Requirements and Demand / Capacity Analysis element and assesses a variety of alternatives to meet future needs. Alternatives are evaluated based on cost, environmental impact, construction feasibility, and operational integration with the existing airfield and facilities. A preferred alternative for each facility type is recommended based on the analysis and is carried forward in the Plan.
- ✓ **Financial Feasibility Analysis and Facilities Implementation Plan**: This element answers the following questions: (1) When do we need financially to fulfill alternatives; (2) How will we pay for the improvements selected in the alternatives; and (3) What is the affordability and the impact of potential rates and charges on airline costs servicing IWA? The preferred alternatives are plotted on a timeline of when they are expected to be needed, based on the forecasts. A financial plan is prepared that addresses up-front capital costs and ongoing operations. Maintenance costs are identified, and the financial impact and feasibility are evaluated. The outcome of this element is a phased capital improvement plan that will guide the PMGAA through the facility development process and aid the Airport during the Airport Improvement Program process with FAA and Arizona Department of Transportation - Aeronautics Division (ADOT).

- ✓ **Airport Layout Plan Set**: This element is the graphical depiction of the existing airfield and preferred improvements identified in the Plan. This document shows how the airfield will look once the improvements have occurred and illustrates the conceptual ultimate plan. This is the second part of the Plan that must be formally approved by the FAA. Only improvement projects depicted on an approved Airport Layout Plan are eligible for FAA funding.

Plan Participation

As a strategic visioning process, the Plan is structured to be responsive to airport needs while being inclusive of broader community considerations. This approach builds stakeholder support for Plan recommendations and facilitates acceptance. The Plan's public involvement program is targeted to engage key personnel that are representative of the Airport and community (elected officials, community leaders, on- and off-airport stakeholders), address comments, and actively encourage public participation.

Agency Coordination

The FAA Phoenix Airports District Office (ADO) is the primary external reviewing agency for this Plan. A representative from the Phoenix ADO received Plan deliverables and attended Stakeholder Working Group (SWG), Technical Advisory Committee (TAC), and public meetings.

ADOT was a key stakeholder in the Plan. The Consultant and the Airport kept ADOT updated on Plan progress through routine communication, including scheduled teleconferences, and transmittal of Plan chapters.

Stakeholder Working Group (SWG)

The SWG consists of aeronautical and non-aeronautical constituents selected to provide their individual perspectives at key project milestones in the Plan. The SWG served in an advisory capacity to collectively review Plan recommendations and provide feedback to the Airport and Consultant. SWG input guided Plan developments. The SWG consisted of invited members representing the following interests:

- ✓ City of Mesa (City Representative)
- ✓ City of Mesa (Resident)
- ✓ Town of Gilbert (Town Representative)
- ✓ Town of Gilbert (Resident)
- ✓ City of Phoenix - Sky Harbor Airport
- ✓ Gila River Indian Community
- ✓ Arizona State University
- ✓ Chandler - Gilbert Community College East Valley Partnership
- ✓ Town of Queen Creek (Town Representative)
- ✓ Town of Queen Creek (Resident)
- ✓ City of Apache Junction
- ✓ Aircraft Owners and Pilots Association
- ✓ Chandler Airport (CHD)
- ✓ Mesa Falcon Field (FFZ)
- ✓ East Valley Chambers of Commerce Alliance
- ✓ National Association of Industrial and Office Properties
- ✓ Home Builders Association of Central Arizona

Technical Advisory Committee (TAC)

A TAC consisting of airport stakeholders provides a technical perspective on key Plan elements. Similar to the SWG, the TAC provided their individual perspectives at key milestones. The TAC provided more detailed feedback on operational Plan elements due to the members' familiarity with the Airport. The TAC consisted of invited members representing the following interests:

- ✓ Worldwide Flight Services
- ✓ University of North Dakota
- ✓ ATP Flight School
- ✓ Able Engineering
- ✓ Cessna
- ✓ Embraer
- ✓ Constant Aviation
- ✓ Native Air (Air Methods)
- ✓ International Air Response
- ✓ Intel - Air Shuttle
- ✓ US Forest Service
- ✓ Allegiant
- ✓ WestJet
- ✓ Federal Aviation Administration
- ✓ Serco
- ✓ Boeing
- ✓ Arizona Department of Transportation
- ✓ Skybridge Arizona
- ✓ Arizona Air National Guard
- ✓ Arizona Army Air National Guard
- ✓ Transportation Security Administration – Homeland Security

Public Outreach

A public involvement process informs, educates, and solicits feedback from the public regarding the Plan process, major findings, and conclusions. Conducting public outreach meetings in an open house format

provided the public the opportunity to interact with the Airport and Consultant, ask questions, communicate concerns, and provide feedback.

Two public meetings occurred at these Plan milestones:

- ✓ Aviation Demand Forecasts and Facility Requirements
- ✓ Airport Development Alternatives

As part of the public outreach methods, online surveys were conducted to provide the Airport and Consultant with additional feedback to support the cultivation of the Plan and encourage community participation/input.

Master Plan Goals & Objectives

The mission of this Master Plan Update was to expand upon the past successes of the Airport and to make positive plans for the future resulting in a 20-year Capital Improvement Program. On April 24, 2018, the Master Plan consulting team conducted a workshop to gather a comprehensive understanding of development issues the Airport has been experiencing. This understanding led to the development of a list of improvement goals that were used in the development and analysis of the Master Plan's improvement alternatives. The developed goals of the Master Plan include recommendations that:

- ✓ Maximize the safety and efficiency for the use of the aircraft operational areas and achieve compliance with FAA guidance.
- ✓ Consider the significant amount of marketable airport developable property and potential demands. The Master Plan identifies a development program that makes efficient use of airport land for aviation, aviation/airport support, and non-aeronautical facilities, which will maximize the potential for revenue generation.
- ✓ Consider the layout of the airfield based on the demands related to existing and all potential future aircraft types that could regularly operate at the Airport. This includes consideration of all safety and object clearing standards and current FAA configuration guidance.
- ✓ Consider passenger terminal improvements that are scalable and flexible in the Airport's ability to accommodate potential demands. Recommendations are tied to trigger points at specific passenger activity levels appropriate to implement improvements.
- ✓ Consider comprehensive improvements for landside facilities (e.g., Air Traffic Control Tower, Aircraft Rescue and Firefighting Facilities, fuel storage and delivery, storage hangars, maintenance hangars, air cargo facilities, etc.).
- ✓ Continue to work with the surrounding communities to promote land use compatibility initiatives that minimize the potential for negative impacts, while not being restrictive of potential airport improvements and increased activity.
- ✓ Promote a Capital Improvement Plan that provides financial sustainability, anticipates reasonable levels of expense and income, and balances facility improvements and infrastructure recommendations with revenues and funding sources.

- ✓ Consider the additional passenger transportation modes (i.e., Lyft, Rideshare, other transportation network companies) in the development of the future terminal improvement program.
- ✓ Recognize environmental development constraints and appropriately consider them in improvement recommendations.

CHAPTER 1
INVENTORY OF EXISTING CONDITIONS

Airport Inventory

This Inventory Chapter documents 2018 conditions at the Phoenix-Mesa Gateway Airport (IWA or the Airport) and provides a foundation for the overall planning analysis in the subsequent chapters of the IWA Master Plan. This chapter includes an overview of environmental conditions and land uses at and surrounding the Airport as a basis for evaluating planned improvements.

Introduction to the Inventory

This section summarizes the purpose and organization of this chapter and defines the key elements of the inventory.

Chapter Purpose and Organization

The Inventory Chapter looks at the physical layout of the Airport and documents 2018 conditions in terms of airfield design standards and aviation activity. The airport activity and design standards will be used in later plan chapters to address the need for improvements, to identify improvements that may be recommended, and to provide a basis for design alternatives. The Master Plan does not address management policies and procedures, staffing, or operational rules and regulations, because these topics are addressed in other airport documents.

This chapter begins with an overview of the Airport that covers location, history, role in the local community and aviation networks, and the components of airport operation. The Airport is a complex operation with three major facility areas: airside, landside, and the terminal building. This chapter documents the use, design, and condition of each of these areas.

- ✓ Airside facilities are restricted from public access – sometimes called "inside the fence." This includes runways and taxiways, facilities for general aviation (GA) parking and maintenance, air cargo, support and other private business facilities with direct access to the runway, airport safety, and maintenance facilities.
- ✓ Landside facilities support airport activities without direct access to the airfield. They include internal roadways, parking areas, and non-aeronautical development areas.
- ✓ The terminal building provides a transition between the airside and landside areas for commercial airline passengers and provides spaces for the traveling public, airline and airport administration, and the Transportation Security Administration (TSA).

The chapter looks beyond the boundaries of the Airport to consider surrounding land uses that are subject to aircraft overflight and the catchment area from where the Airport draws its passengers and users.

The Airport serves these businesses and residents:

- ✓ City of Mesa
- ✓ Town of Gilbert
- ✓ Town of Queen Creek
- ✓ Gila River Indian Community
- ✓ City of Apache Junction
- ✓ City of Phoenix
- ✓ Maricopa and Pinal counties

The community around the Airport drives the demand for commercial air service, GA, and air cargo. Other airports serving the region are documented as they impact demand at the Airport.

The consultant team inventories environmental factors because they influence aircraft flight. Weather factors, such as temperature and wind direction, impact aircraft performance and drive facility design considerations. The consultant team documents environmental conditions such as air quality and aircraft noise to provide a basis for evaluating future development in terms of potential environmental impacts.

Information was collected by the consultant in several ways, including a site visit to the Airport in April 2018; review of documents and records provided by the Airport, the City of Mesa, Town of Gilbert, Town of Queen Creek, the Federal Aviation Administration (FAA), and other public agencies; and reference to the FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*.

Results are presented in the following sections:

- ✓ Background
- ✓ Airport Facilities
- ✓ Wind Analysis
- ✓ Airport Environs
- ✓ Environmental Review
- ✓ Issues Summary

Background

IWA is in Maricopa County, Mesa, Arizona, approximately 30 miles southeast of downtown Phoenix as seen in ***Figure 1-1: Location Map***. The City of Mesa's population is predominately located north and east of the Airport. The Airport is bounded by the Town of Queen Creek to the south and the Town of Gilbert to the west (see ***Figure 1-2: Vicinity Map***). Pinal County, the state's third most populous County, is east and south of the Airport.

Prior to its inception as IWA, the Airport served as a former United States Air Force (USAF) base known as Williams Air Force Base (AFB). Construction of the base began July 16, 1941, by the U.S. Army Air Corps for its Advanced Flight School. The US Army Air Corps trained fighter and bomber pilots at the facility for World War II combat. Initially the base was coined Williams Field in 1942, after an Arizona-native pilot Charles Linton Williams, later becoming Williams AFB in January of 1948.

The Base Realignment and Closure Commission recommended the base for closure in 1991, and the base closed in September 1993. Over 26,000 men and women became pilots while training at the Williams AFB. The closure[1] caused the loss of 3,800 jobs and $300 million in economic activity. To remedy the issue, the governor created an Economic Reuse Advisory Board that developed a plan to reuse the base. The board decided the best use for the closed base would be to repurpose it as a civilian airport to serve the public and serve as a reliever airport for Phoenix Sky Harbor Airport. In 1992, an Intergovernmental Agreement (IGA) entered by the following entities also established a plan dedicated to the many reuses of the Williams AFB:

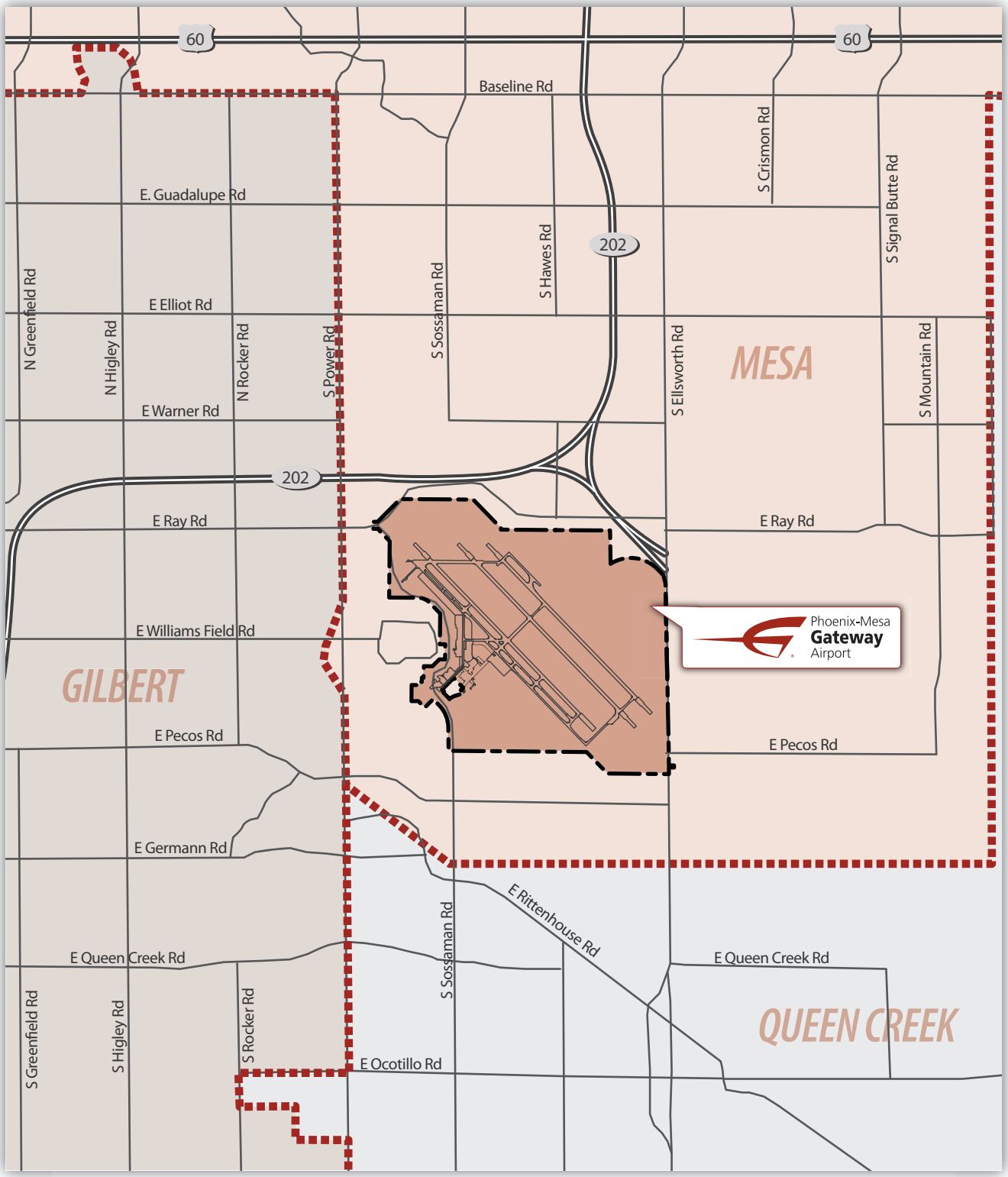
- ✓ Maricopa County
- ✓ City of Apache Junction
- ✓ City of Chandler
- ✓ Town of Gilbert
- ✓ City of Mesa
- ✓ Town of Queen Creek

This plan also provided land for educational and flight training facilities. Williams AFB was converted to civilian use in March 1994 and was named Williams Gateway Airport. Of the former base, 734 acres is now the Williams Educational Research and Training Campus. The Williams campus houses Arizona State University Polytechnic Campus, Chandler Gilbert Community College Williams Campus, and Embry-Riddle Phoenix-Mesa Campus.

[1] U.S. Air Force Civil Engineer Center. "Williams Today." *U.S. Air Force Civil Engineer Center*, www.afcec.af.mil/Home/BRAC/Williams/Williams-Today/.

Source: *Google Maps, 2018*

Figure 1-1: **Location Map**



Source: *Google Maps, 2018*

Figure 1-2: **Vicinity Map**

The Williams Gateway Airport Authority (WGAA) was created in May of 1994 with the responsibility to manage the Airport and did so under a lease agreement until April 14, 1998, when the United States of America, acting by and through its Secretary of the Air Force, transferred to WGAA the deed to airport property. The WGAA, now known as the Phoenix-Mesa Gateway Airport Authority (PMGAA), consists of mayors from the cities and towns of Mesa, Gilbert, Apache Junction, Queen Creek, the vice mayor of Phoenix, and the lieutenant governor of the Gila River Indian Community. The PMGAA continues to own and operate the Airport.

In 2008, the Airport was renamed Phoenix-Mesa Gateway Airport. Consisting of 3,020 acres and located at an elevation of 1,384 feet above mean sea level, IWA offers facilities that accommodate local and transient aircraft of all sizes including Airbus aircraft flown by Allegiant Air, the Airport's primary commercial service provider. Several aviation related businesses including Cessna, Embraer, and Able Aerospace are located at the Airport. In addition to the 3,020 acres, IWA owns two avigation easements that extend beyond South Ellsworth Road for the protection of Runway 30's Runway Protection Zone (RPZ) and as part of the critical area for above-ground bunkers located on the northeast portion of the airfield.

Airport Role

The FAA and state agencies have developed categories that designate an airport's role. The role of an airport translates to the services it provides and how an airport performs within a national and state airport system. The FAA's National Plan of Integrated Airport Systems (NPIAS) consists of 3,400 airports considered significant to national air transportation. As part of the NPIAS, IWA is classified as a primary small-hub commercial service airport. The Arizona Department of Transportation (ADOT) airport system consists of 83 airports. ADOT categorizes airports as primary or secondary and has sub-classification categories that mirror the NPIAS. Within the ADOT system, IWA is considered a primary commercial service airport based on size and activities.

Military, GA, and commercial service operations are conducted at IWA year-round. Both Allegiant Air and WestJet Airlines currently provide the Airport with commercial service. Allegiant Air offers nonstop service to 23 states while WestJet Airlines offers seasonal flights to multiple destinations in Canada. Flight training is offered by multiple businesses at the Airport and accounts for a high percentage of operations conducted at IWA.

The Airport is within a Military Reuse Zone (MRZ), which the Arizona State Legislature created in 1992 to lessen the negative economic impact of military base closures. The program offers tax incentives to businesses providing aviation or aerospace services or engaged in manufacturing, assembling, or fabricating aviation or aerospace products.

There are three primary benefits to developing businesses within the MRZ[2]:

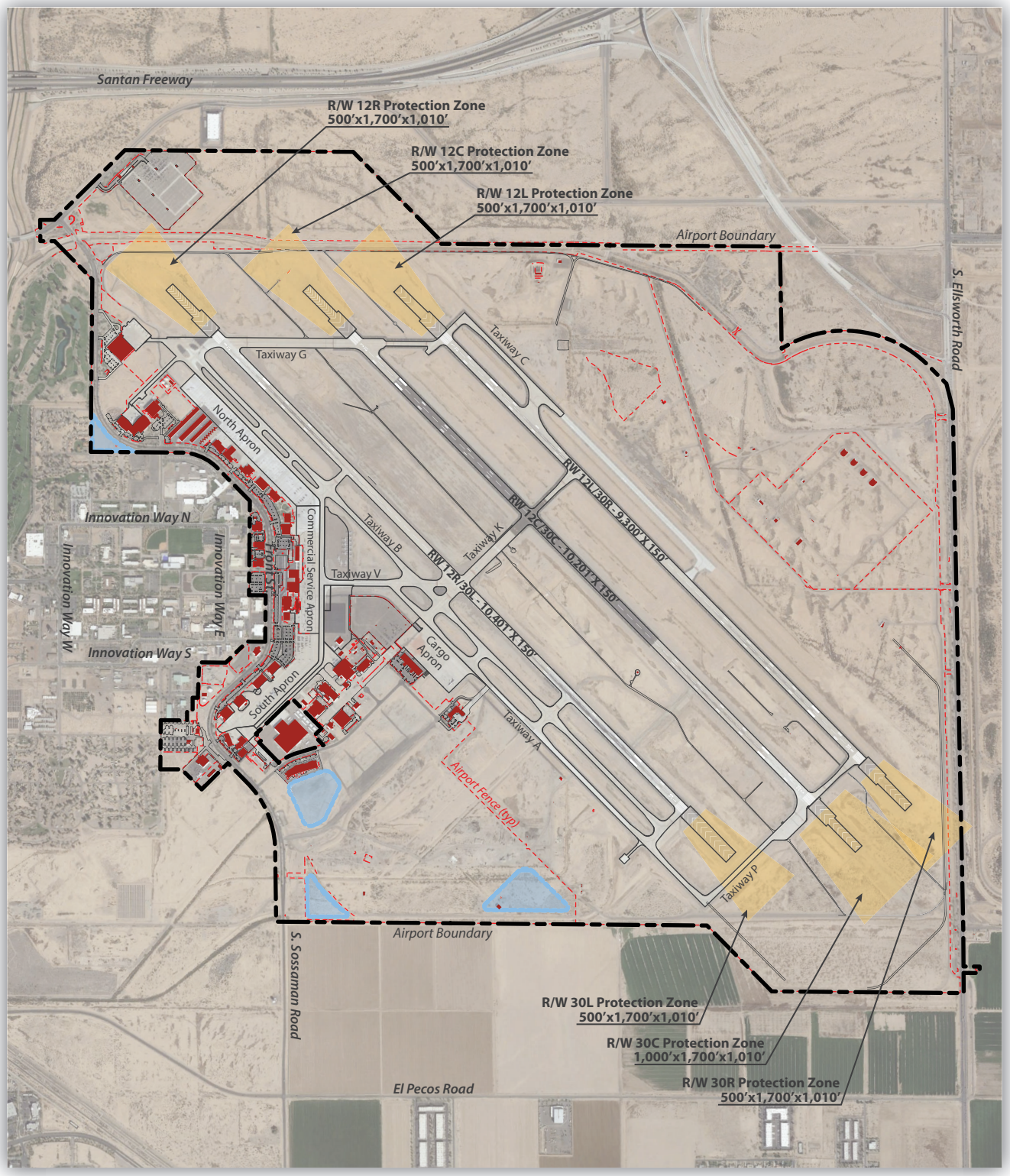
- ✓ Transaction Privilege Tax Exemptions: Exemption from transaction privilege tax on contracts for certain types of construction;
- ✓ Tax Credits: Arizona income/premium tax credits for up to five years for each net new job created, totaling up to $7,500 per non-dislocated employee and up to $10,000 per dislocated employee; and
- ✓ Property Reclassifications: Both real and personal property can be reclassified from class one (25 percent assessment ratio) to class six (5 percent assessment ratio), which may result in property tax savings of up to 80 percent for a period of five years.

The Airport is also within the City of Mesa's Foreign Trade Zone (FTZ) Number 221, meaning merchandise may be brought into the United States and onto the Airport duty-free for purposes of storage, repacking, display, assembly or manufacturing. FTZs are designated areas intended to promote international trade and offer companies and importers a way to gain a financial edge in the global marketplace through reduction, deferral, or elimination of U.S. Customs duties.

Airport Facilities Inventory

An airport facilities inventory details the airside and landside facilities present at an airport. Airside facilities directly relate to aircraft movement and parking, while landside facilities provide aircraft and airport support services. ***Figure 1-3: Airport Facilities*** illustrates the airport facilities at IWA.

[2] Jacobs, *Final Technical Report Northeast Area Development Plan Phoenix-Mesa Gateway Airport*, June 2012.



Source: *Phoenix-Mesa Gateway Existing Airport Layout Plan, 2015*

Figure 1-3: **Airport Facilities**

Airside Facilities

Runway System

Phoenix-Mesa Gateway Airport has three northwest-southeast oriented parallel runways:

- ✓ Runway 12R/30L
- ✓ Runway 12C/30C
- ✓ Runway 12L/30R

According to a recent pavement condition inspection, all runways are in fair or better condition based on the rating classification system established in AC 150/5380-7B, *Airport Pavement Management Program*. Runway signs designating taxiway exit locations and distance remaining for aircraft takeoffs and landings are present on all runways.

Runway 12R/30L

Runway 12R/30L, the longest runway at IWA, is 10,401 feet long and 150 feet wide. It is intended primarily for GA training and has a right-hand traffic pattern for Runway 12R and a left-hand traffic pattern for Runway 30L. Runway 12R/30L is constructed of concrete, paved with precision instrument markings, and has a pavement strength of 55,000 pounds single-wheel, 95,000 pounds dual-wheel, 185,000 pounds dual-tandem-wheel, and 550,000 pounds double-dual-tandem-wheel main landing gear configuration.

The runway has medium intensity runway lights to identify runway edges at night or during adverse weather conditions. Additionally, the runway has 35-foot-wide paved shoulders. Four-light precision approach path indicators (PAPIs), color coded lights providing visual indication of an aircraft's approach relative to the designated glideslope, are on the left side of each runway end. Both runway ends have 1,000-foot overruns.

Runway 12C/30C

Runway 12C/30C is 10,201 feet long and 150 feet wide. Located between Runway 12R/30L and Runway 12L/30R, Runway 12C/30C is primarily intended for instrument procedure operations. Runway 12C/30C has left-hand traffic patterns designated for both runway ends. Precision instrument runway markings and 1,000-foot overruns are provided at each runway end.

The center portion of the runway, approximately 5,700 feet, is asphalt with the remainder constructed of concrete. Pavement strength for this runway is identical to that of Runway 12R/30L: 55,000 pounds single-wheel, 95,000 pounds dual-wheel, 185,000 pounds dual-tandem-wheel, and 550,000 pounds double-dual-tandem-wheel main landing gear configuration. There are 35-foot paved shoulders at the runway edges. Runway 12C/30C has High Intensity Runway Lights (HIRLs), and four-light PAPIs are on the left of each runway end.

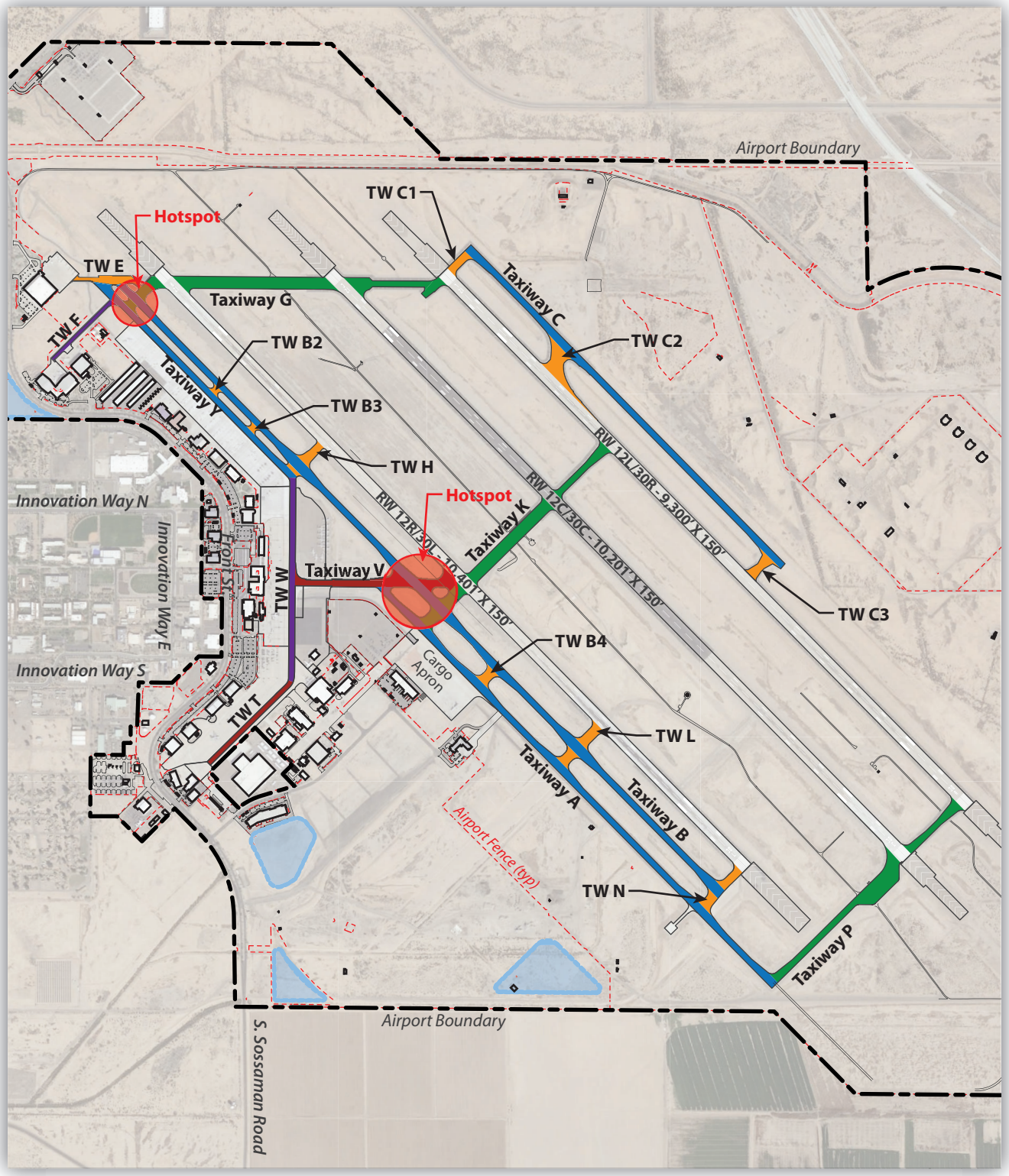
Runway 12L/30R

Runway 12L/30R is 9,300 feet long and 150 feet wide. Though Runway 12L/30R is the shortest runway in length at the Airport, it has a strength capacity of: 75,000 pounds single-wheel, 210,000 pounds dual-wheel, 590,000 pounds dual-tandem-wheel, and 850,000 pounds double-dual-tandem-wheel main landing gear configuration. As a result, Runway 12L/30R is intended to serve as the heavy aircraft runway. Runway 12L has a left-hand traffic pattern; Runway 30R has a right-hand traffic pattern. Precision instrument runway markings and 400-foot overruns are at each runway end. Runway 12L/30R is constructed completely of concrete and equipped with 35-foot-wide paved runway shoulders.

Runway 12L/30R has HIRLs, and four-light PAPIs are on the left side of each runway end. Runway end identifier lights (REILs) and threshold lights are also positioned at each runway end. REILS aid aircraft in distinguishing runway ends during reduced visibility or when a runway is close to an array of airfield lighting not relative to the active runway. Threshold lights denote the beginning of the portion of runway available for landing.

Taxiway System

The IWA taxiway system provides adequate access between the runways and landside facilities. ***Figure 1-4: Existing Taxiway System*** outlines the taxiway system at IWA for better clarity. Runway 12R/30L is served by one full parallel taxiway, Taxiway B, and two partial parallel taxiways, Taxiway Y and A. Taxiway B serves Runway 12R/30L, partial parallel Taxiway Y dually serves Runway 12R, and Taxiway A dually serves Runway 30L. Taxiway B has three connectors (B2, B3, B4). From Taxiway B, B2 and B3 provide access to partial parallel Taxiway Y, and B4 provides access to partial parallel Taxiway A.



Source: *Phoenix-Mesa Gateway Existing Airport Layout Plan, 2015*

Figure 1-4: **Existing Taxiway System**

Taxiways Y and B extend from Taxiway G. Taxiway G extends to and intersects Runway 12R/30L. It then extends from Runway 12R/30L to Runway 12C/30C. Taxiway G intersects Runway 12C/30C and extends to the hold-short position at Runway 12L/30R where Taxiway G ends. Taxiway G provides aircraft access from Runways 12L, 12C, and 12R to the rest of the airfield via Taxiways Y, and B and Taxilanes E and F. Taxilane E leads to the Cessna Citation Service Center, and Taxilane F leads to the Southwest Jet Center and Embraer Executive Jet services.

Taxiway Y provides access from Taxiway G to the intersection with Taxiway H. From Runway 12R/30L, Taxiway H provides access to the GA apron via Taxiway Y and the commercial service apron via Taxiway W. Access to Taxiway W, located at the edge of the commercial service apron, is provided by Taxiways Y, H, V, and T. Taxiway T is located south of Taxiway W. Aircraft with wingspans exceeding 135 feet are not permitted to operate on the Taxiway W portion between Taxiways H and V.

As seen in ***Figure 1-4: Existing Taxiway System***, Taxiways V, B, K, and A form a complex intersection. Taxiway V extends from Runway 12R/30L at an acute angle, intersecting Taxiway B, to the commercial service apron. Taxiway V, between Taxiways A and B, is closed to aircraft exceeding 300,000 pounds. Taxiway K extends from Taxiway A, intersects Taxiway B, and provides access to Runway 12R/30L, Runway 12C/30C, and Runway 12L/30R, allowing aircraft the ability to taxi from the approximate midpoint of all three runways. Aircraft exceeding 41,000 pounds may not operate on the Taxiway K portion between Taxiway A and Taxiway B. As mentioned previously, Taxiway A is a partial parallel taxiway that serves Runway 30L. It begins as an extension from Taxiway V to a length beyond Runway 30L where it becomes Taxiway P, which serves Runways 30C and 30R. Taxiway A offers direct access to the cargo apron and can be immediately accessed from Runway 12R/30L via Taxiways L and N, southeast of the Taxiways V, B, K, and A intersection. Taxiway Connector B4 provides access to Taxiway A and the cargo apron from Taxiway B.

Runway 12L/30R is served by a partial parallel taxiway, Taxiway C, that has three connectors (C1, C2, and C3). Connector C2 is considered a high-speed exit taxiway. This type of taxiway does not require pilots to execute a 90-degree turn to exit the runway and increases airport capacity by affording aircraft the ability to exit the runway at faster speeds. Connector C1 serves Runway 12L from which Taxiway G can be accessed. During the planning period, Taxiway C will undergo construction to become a full parallel taxiway with additional taxiway connectors.

All taxiways are constructed of concrete and are equipped with medium intensity taxiway lights. Taxiway location and directional signage is in place for all taxiways and their connectors. ***Table 1-1: Phoenix-Mesa Gateway Airport Taxiway System*** provides additional information.

Table 1-1: Phoenix-Mesa Gateway Airport Taxiway System

Taxiway	Type	Width	Condition
Taxiway B	Full parallel	75 feet	Good
Taxiway B2	Connector/Exit	96 feet	Good
Taxiway B3	Connector/Exit	95 feet	Good
Taxiway B4	Connector/Exit	130 feet	Good
Taxiway Y	Partial Parallel	76 feet	Good
Taxiway A	Partial Parallel	75 feet	Good[3]
Taxiway G (between Runways 12R and 12C)	Connector/Exit	150 feet	The pavement is in fair condition.
Taxiway G (between Runways 12C and 12L)	Connector/Exit	75 feet	The pavement is primarily in good condition. Small portions are in fair condition.
Taxiway E	Connector	50 feet	The pavement is primarily in fair to good condition. However, a small portion is considered poor.
Taxiway F	Connector	50 feet	Good
Taxiway H	Connector/Exit	104 feet	The pavement condition is primarily considered poor. However, a portion of the pavement is considered good.
Taxiway W	Connector	75 feet	The pavement condition ranges from fair to poor.
Taxiway V	Connector	100 feet	Pavement condition is primarily good but has poor pavement ratings in small portions.
Taxiway T	Connector	60 feet	Good
Taxiway K (between Runway 12L/30R and Runway 12C/30C)	Connector	75 feet	Good
Taxiway K (between Runway 12C/30C and Runway 12R/30L)	Connector	150 feet	The pavement ranges from poor to good condition.
Taxiway K (between Runway 12R/30L and Cargo Apron)	Connector	150 feet	The pavement is primarily in good condition. A portion of the taxiway is in poor condition.
Taxiway L	Connector	130 feet	Good
Taxiway N	Connector	100 feet	Excellent
Taxiway P	Connector/Exit	75 feet	Excellent
Taxiway C	Partial Parallel	75 feet	Excellent
Taxiway C1	Connector/Exit	103 feet	Excellent
Taxiway C2	Connector/Exit	325 feet	Excellent
Taxiway C3	Connector/Exit	90 feet	Excellent

[3] Pavement was replaced in 2017.

Hot Spots

A hot spot, as defined by the FAA, is "a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary."[4] The typical causes of hot spot-related runway incursions or incidents can be attributed to airfield layout, traffic flow, airport marking/signage/lighting, situational awareness, and training. Due to the complexity of the Taxiway V, B, and K intersection, the FAA has designated this as a complex intersection and as Hot Spot-1.[5] The FAA has also designated the intersection of Taxiways B, G, and Y as Hot Spot-2 due to pilots becoming confused at the intersection.[6] Although the Airport recently addressed Hot Spot-2 by re-engineering taxiway intersections B, G, and Y to eliminate pilot confusion, the FAA continues to declare the area as a hot spot.

Aprons

The five primary aprons located on the airfield fit into four categories:

- ✓ Commercial service apron
- ✓ GA aprons
- ✓ Cargo apron
- ✓ Holding apron

The apron system at IWA supports landside facilities and activities including:

- ✓ Fueling
- ✓ Loading and unloading of passengers
- ✓ Loading and unloading of freight, mail, and baggage
- ✓ Minor maintenance

All aprons are constructed of concrete and are detailed in the following text.

Commercial Service Apron

Located west of Taxiway V, the commercial service apron is approximately 626,949 square feet and restricted to air carrier operations. There are 10 aircraft parking positions on the apron for air carriers of varying lengths and widths. Due to the absence of terminal loading bridges, passengers board and deplane aircraft using mobile stairs and ramps onto the apron. Mobile stairs and ramps are owned, maintained, and provided by the Airport.

[4] FAA. (2016, May). Runway Safety Hot Spots List. Retrieved June, 2018, from https://www.faa.gov/airports/runway_safety/hotspots/hotspots_list/
[5] Ibid.
[6] FAA. (2018, May). Hot Spots. Retrieved June, 2018, from http://aeronav.faa.gov/afd/24May2018/SW_hotspot.pdf

Southeast of the commercial service apron are four air carrier parking positions for air carriers to store aircraft not in use until needed for operations. This area is known as the remain over-night (RON) area or remote parking and is approximately 148,207 square feet.

GA Aprons. GA can be loosely defined as all civil flight operations excluding scheduled air service and military operations. Using this definition, two GA aprons have been designated at IWA. The primary GA apron, referred to as the north apron, is located northwest of the commercial service apron and primarily accommodates transient and based aircraft not stored in hangars. Over 130 aircraft parking positions are available on this apron. The north apron is 881,086 square feet.

The second GA apron, referred to as the south apron, is located south of the commercial service apron and provides parking positions for all aircraft types. The south apron primarily serves the corporate and business community at the Airport. The south apron is 490,819 square feet.

Cargo Apron. The cargo apron is adjacent to Taxiway A and provides aircraft parking and movement space primarily for aerial firefighting and charter operators. Swift Air uses the apron for lease with Classic Air Charter for U.S. Government flights. The U.S. Forest Service leases the remainder of space for aerial firefighting staff and equipment. The cargo apron is 578,716 square feet.

Holding Apron. Often referred to as run-up and warm-up areas, holding aprons are typically located near runway ends. They allow for pilots to conduct final flight checks, wait for takeoff clearance, and use the provided area as a bypass space. Aircraft may experience mechanical issues or delay in departure due to weather or other unforeseen circumstances. A holding apron provides space for aircraft experiencing these issues to wait and to allow for aircraft not experiencing issues to bypass them. A holding apron is available at runway end 30C on Taxiway P. Runway end 12R is also served by a holding apron formed by Taxiway E.

Landside Facilities

Terminal Facilities

A building constructed in 1968 for Williams AFB was renovated and repurposed as a terminal in 1998. Since then, the terminal facility has undergone renovation, remodeling, and additions. Open every day for 24 hours, the Charles L Williams Terminal is centrally located on airport property adjacent to the commercial service apron. As illustrated in ***Figure 1-5: Existing Terminal Complex***, four separate single-story buildings and two outdoor courtyard areas comprise the terminal. Ten gate positions serve air carrier passengers boarding and deplaning. The terminal buildings are as follows:

- ✓ Ticketing terminal
- ✓ West Terminal A
- ✓ West Terminal B
- ✓ Terminal annex

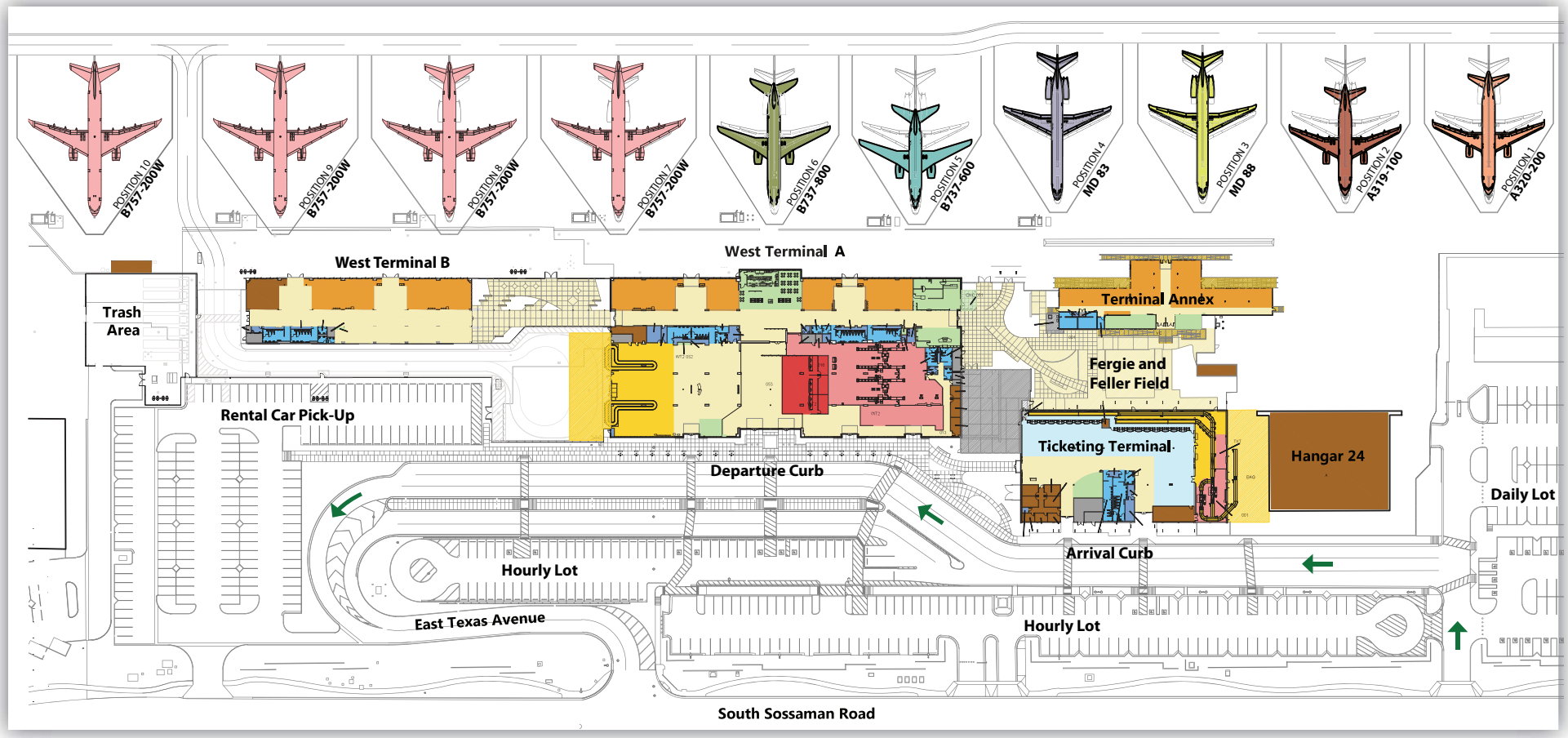


Figure 1-5: **Existing Terminal Complex**

Ticketing Terminal

The original 1968 single building is now the ticketing terminal of the Charles L Williams Terminal. The ticketing terminal is a pre-secure area that comprises 23,258 square feet primarily dedicated to check-in services and passenger circulation. Located inside are 32 ticket counters currently utilized by Allegiant Air and WestJet**.** Allegiant Air tickets can be purchased at ticket counters from 12:00 p.m. – 2:00 p.m. on Sundays and Mondays. A baggage belt is behind the air carrier ticket counters to transport passenger baggage and belongings through a security screening checkpoint to a baggage handler area.

Air carrier offices are located opposite the ticketing counters. Adjacent to the air carrier offices is a parking pay station.

West Terminals (A and B)

Located north of the ticketing terminal is West Terminal A that consists of secure and non-secure areas. West Terminal A is 54,716 square feet. On the non-secure side, located on the northern portion of the building, is a baggage claim area consisting of two baggage carousels and an additional parking pay station. Both carrousels are supported by an external baggage drop off area where bags are transported to and from air carriers. Three rental car service counters occupied by Hertz, Enterprise, and Alamo/National are across from the baggage claim carrousels. Circulation space provides a place for both passengers waiting to claim baggage and rental car customers. TSA screens passengers at the security checkpoint located on the southern, non-secure portion of West Terminal A. During peak hours, TSA Pre(check) is offered allowing for expedited screening of pre(check) approved passengers. Four linear screening stations are within this area.

West Terminal A secure area is located on the eastern portion of the facility. Within this area are four gates (Gate 5, 6, 7, 8) and four air carrier service counters. Holding areas with seating for departing passengers are provided for each gate.

West Terminal B is approximately 15,000 square feet and can be accessed via an outside courtyard leading from the secure area of West Terminal A. Two gates (Gates 9 and 10) and two air carrier service counters are located within the terminal. Holding areas with seating for departing passengers are provided for each gate.

Terminal Annex and South Courtyard

Constructed in 2008 to alleviate West Terminal congestion, the terminal annex is a separate 9,557-square-foot building located south of the West Terminals and east of the ticketing terminal. The terminal annex and South Courtyard are secure areas that can only be accessed by exiting the secure area of West Terminal A. The terminal annex consists of four gates (Gates 1, 2, 3, 4) and four air carrier service counters. Two holding areas with seating for departing passengers predominantly comprise the facility. Minimal circulation space is available.

The South Courtyard is located outside between the ticketing terminal and terminal annex. The courtyard is considered a transitional space decorated with landscaped gardened areas for passengers awaiting their flights.

Concessions

Concessions include vending machines, restaurants, and gift shops available throughout the terminal facilities. Vending machines are provided in the ticketing terminal. Located in the non-secure area of West Terminal A is Paradise Bakery and Café. The Phoenix store, Copper Plate Bar and Grill, and an additional Paradise Bakery and Café are in the secure areas of West Terminal A. An AZ Highways Kiosk is in West Terminal B, and an AZ Highways Gift Shop is in the terminal annex. The Airport will be examining new opportunities in the near future for a potential 2020 opening.

Terminal Amenities

Restrooms are in every terminal facility in both the secure and non-secure areas. Mother rooms, provided by MomDoc Charities, offer privacy for maternal activities between mothers and their children. Two mother rooms are provided in the secure area of West Terminal A. For pet assisted travelers, a service animal/pet relief area, in compliance with Americans with Disabilities Act, is located in the South Courtyard.

GA Facilities/Fixed Base Operator (FBO) Facilities

GA facilities are primarily west and south of the runway system as shown in ***Figure 1-6: Terminal Facilities Map***. The GA facilities are represented by a combination of commercial and corporate hangars and facilities. The following businesses and their corresponding facilities described herein are impactful to services and operations.

The primary GA facility, Gateway Aviation Center, is 22,700 square feet located north of the terminal and adjacent to the north apron. Within the Gateway Aviation Center are several businesses including Gateway Aviation Services, the sole FBO at IWA operational 24 hours a day, seven days a week. Services and amenities provided by the FBO to transient and local military, commercial, and GA aircraft include:

- ✓ Fueling
- ✓ Aircraft parking
- ✓ Overnight and long-term hangar rental
- ✓ Courtesy cars
- ✓ Ground power units
- ✓ Flight planning rooms and pilot lounge

Rental car service offered by Pegasus Car Rental and Enterprise is available in the Gateway Aviation Center. A restaurant and award-winning brewery, Barrio Brewing Company, and the U.S. Customs and Border Protection are also located within the center. Other businesses within include: Phoenix Mesa Gateway Traffic Survival School, Denise Riden Family Law, and Factory Direct Models.

Hangar 24. Located immediately south of the ticketing terminal, Hangar 24 is 12,256 square feet and was constructed as part of the Williams AFB. Hangar 24 serves as the air carrier operations, maintenance, and provisions storage area.

T-Hangars

Three T-Hangar buildings are located west of Taxiway Y. Individual T-Hangar spaces are leased by tenants. Approximately 48 aircraft are based in the T-Hangar facilities.

Cessna Citation Service Center

The Cessna Citation Service Center is west of Runway 12R. The center is equipped with 65,000 square feet of open hangar space and 29,000 square feet for office space, warehousing, and maintenance activities. The apron area that services the hangar is 127,980 square feet.

Southwest Jet Center

The Southwest Jet Center is northwest of the T-Hangars. The facility comprises office space and two bay hangars. N1, LLC. uses the west hangar and office facilities comprising approximately 32,820 square feet, while Constant Aviation uses the east hangar and office facilities comprising approximately 41,666 square feet. The apron area that services both hangars is 52,669 square feet.

Embraer Executive Jet Services

Adjacent to the Southwest Jet Center, the Embraer Executive Jet Services facility has office and hangar space equivalent to 50,027 square feet, of which 28,000 square feet is used for hangar space. The apron area that services the hangar is approximately 36,000 square feet.

Embraer also uses infield space between Taxiway W and Taxiway B. This infield area is currently used for aircraft storage for periodically based aircraft. The additional Embraer lease area is 362,019 square feet.

Air Methods

As identified on ***Figure 1-6: Terminal Facilities Map***, Air Methods offers aerial ambulance service to the state of Arizona, and its IWA location is a primary maintenance base for air ambulance rotorcraft. Air Methods bases a Pilatus PC-12 within a 27,158 square foot hangar, Hangar 31, served by the south apron.

The following establishments offer aviation education and flight training at IWA:

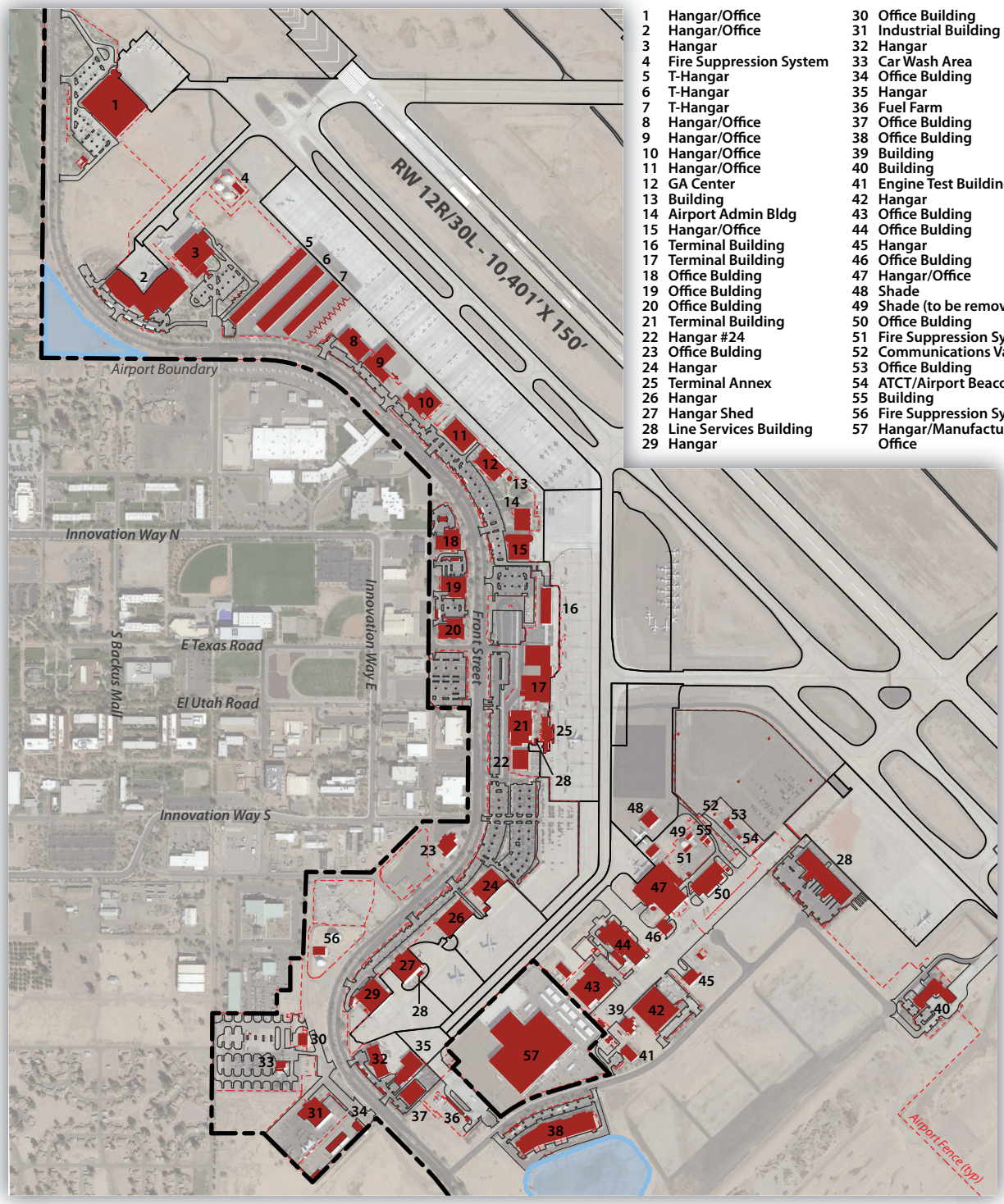
- ✓ **Arizona State University Polytechnic Campus (ASU)/Airline Transport Professionals (ATP) Flight School**. The ASU and ATP facility is located south of the T-hangars and comprises 19,000 square feet, of which 10,000 square feet is dedicated to maintenance. ASU offers Bachelor of Science Degrees in aviation management with focus in air traffic management, air transportation management, and unmanned aerial systems. ASU also offers a Bachelor of Science degree with a focus of professional flight in partnership with ATP. ASU students receive their flight training from ATP, who also offers transitional flight training to students around the U.S. (not enrolled at ASU). Students studying with ATP may pursue an airline or corporate pilot career track. They may also receive specific aircraft type training and ratings. Twenty-one Cessna 172s and seven Piper PA-44-180 Seminoles are based on the north apron immediately east of the facility.
- ✓ **Chandler-Gilbert Community College (CGCC)/University of North Dakota Aerospace (UND).** The CGCC/UND hangar located north of the terminal, as identified on Figure 1-6: Terminal Facilities Map, is 23,472 square feet. CGCC, in partnership with UND, offers flight training at IWA. Students may receive a two-year degree from CGCC using UND aircraft based at the Airport and can continue their flight training with UND to obtain a four-year degree. Twenty Cessna 172s and four Piper PA-44-180 Seminoles are based at the Airport.
- ✓ **Aviation Performance Solutions (APS).** APS shares hangar space with CGCC/UND. APS provides upset training courses that enhance pilot recognition, avoidance, and recovery capabilities during flight. The APS located at IWA is the company's corporate facility and largest training facility in their network. Six Extra 300s and two Aermacchis are based at the Airport.
- ✓ **Top Aces.** Top Aces provides Canadian Armed Forces with combat airborne training services. Top Aces uses the hangar facility identified in Figure 1-6: Terminal Facilities Map, which is approximately 16,500 square feet. Two TA-4Js are based in their hangar.

Cargo Facility

Adjacent to the cargo apron, the cargo facility is currently used by Immigration and Customs Enforcement (ICE). The facility is 44,396 square feet.

BUILDING LEGEND

1 Hangar/Office
2 Hangar/Office
3 Hangar
4 Fire Suppression System
5 T-Hangar
6 T-Hangar
7 T-Hangar
8 Hangar/Office
9 Hangar/Office
10 Hangar/Office
11 Hangar/Office
12 GA Center
13 Building
14 Airport Admin Bldg
15 Hangar/Office
16 Terminal Building
17 Terminal Building
18 Office Bulding
19 Office Bulding
20 Office Bulding
21 Terminal Building
22 Hangar #24
23 Office Bulding
24 Hangar
25 Terminal Annex
26 Hangar
27 Hangar Shed
28 Line Services Building
29 Hangar
30 Office Building
31 Industrial Building
32 Hangar
33 Car Wash Area
34 Office Bulding
35 Hangar
36 Fuel Farm
37 Office Bulding
38 Office Bulding
39 Building
40 Building
41 Engine Test Building
42 Hangar
43 Office Bulding
44 Office Bulding
45 Hangar
46 Office Bulding
47 Hangar/Office
48 Shade
49 Shade (to be removed)
50 Office Bulding
51 Fire Suppression System
52 Communications Vault
53 Office Bulding
54 ATCT/Airport Beacon
55 Building
56 Fire Suppression System
57 Hangar/Manufacturing/ Office



0 500 1000 1500
Graphic Scale in Feet

Source: *Phoenix-Mesa Gateway Existing Airport Layout Plan, 2015*

Figure 1-6: **Terminal Facilities**

Federal Inspection Services

U.S. Customs and Border Protection (USCBP) controls the entry and clearance of international aircraft arriving in the United States. Federal Inspection Services (FIS), provided by USCBP, is required at all airports receiving international passengers and or cargo and includes:

- ✓ Crew, passport, baggage, and cargo inspection
- ✓ Passenger processing and inspection
- ✓ Collection of duties for certain items

USCBP is available weekdays from 11:00 a.m. – 7:00 p.m. in the Gateway Aviation Center and can accommodate 20 international passengers per aircraft. After hour FIS are available upon appointment.

Airport Support Facilities

Fuel Storage Facilities

Located south of the South Apron, the IWA fuel farm is encompassed by a 7-foot-tall wall. It does not allow pilots to self-service their aircraft and can only be accessed by FBO and authorized airport personnel. The fuel farm comprises two aboveground 50,000-gallon jet A fuel tanks, six aboveground 25,000-gallon jet A fuel tanks, and one aboveground 12,000-gallon AvGas fuel tank.

The Airport owns eight fuel trucks operated by FBO staff for fueling operations. Of the eight, one is a 1,500-gallon and one is a 2,200-gallon AvGas fuel truck. The remaining six are jet A fuel trucks. Of the six, one has a 5,000-gallon capacity, two have a 7,000-gallon capacity, and three have a 10,000-gallon capacity.

Aircraft Rescue and Firefighting (ARFF)

Part 139 certificated airports are required to provide ARFF services according to the ARFF index achieved by the Airport. An ARFF index is determined by two components: 1) the length of the air carrier aircraft and 2) average daily departures of air carrier aircraft. IWA maintains ARFF Index C, which is required at airports with five or more daily departures by air carrier aircraft at least 126 feet but less than 159 feet long. Adjacent to the cargo ramp, Mesa Fire Station 215 provides ARFF personnel and equipment to the Airport through an IGA. In accordance with Part 139, IWA owns the following ARFF equipment necessary for the existing type and number of air carrier aircraft:

- ✓ **"Foam 21":** 2018 Oshkosh Striker with a capacity to carry 1,500 gallons of water, 400 gallons of aqueous foam forming film (AFFF), and 450 pounds of potassium based dry chemical (expected delivery October 2018).
- ✓ **"Foam 22":** 2009 Oshkosh Striker 3000 with a capacity to carry 3,000 gallons of water, 400 gallons of AFFF, and 500 pounds of potassium-based dry chemical.
- ✓ **On Reserve:** 2000 Oshkosh T-1500 4x4 with a capacity to carry 1,500 gallons of water, 200 gallons of AFFF, and 450 pounds of potassium based dry chemical.

Airport Security

IWA has established an airport security program with the goal to offer and maintain a safe environment for all who use the Airport. IWA maintains an Airport Security Plan (ASP), approved by TSA to comply with 49 CFR 1542, *Airport Security*. The ASP includes a security inventory, applicable procedures, and contingency plans. The City of Mesa Police Department (MPD) provides an officer for 24-hour coverage and response, per an IGA, to support airport operations. The City of Mesa also maintains an on-site police sub-station for additional airport and community protection. Police personnel responsible for airport duties complete specified training. The Airport works closely with FAA, TSA, MPD, and additional agencies, such as MPD explosive and canine units, Phoenix Sky Harbor assigned police, and the local Federal Bureau of Investigation, in support for the ASP.

Airport property is encompassed by an 8-foot-tall fence mounted with 45-degree-outward-angled barbed wire. All perimeter fences, gates, and doors are secured by locks and or access control devices. Daily inspections of the airport fence are performed by airport operations personnel.

Airfield Perimeter Roads

Along the perimeter fencing are service roads located on airport property. Airport vehicles use these roads to access the airfield and airport facilities or equipment. The perimeter roads' location along the perimeter fence allows for security monitoring and monitoring of wildlife. Maintenance staff also use the roads to access the fence should any structural problems arise. These service roads create a transportation system for airport vehicles that reduces their use of taxiways and runways unless for daily inspections. There is also a mid-field road with several crossover points. Vehicle access routes are designated on the aprons at IWA for transportation of airport and fuel vehicles within the non-movement area.

Airport Maintenance Facilities

Maintenance vehicles and equipment are stored in several buildings throughout the Airport. The PMGAA Maintenance and Operations building is 23,500 square feet and consists of offices, a repair shop, and storage space. It is located at 6263 South Taxiway Circle.

Transportation Facilities

Ease of vehicular accessibility is vital for all who use an airport and its many facilities. The surrounding ground transportation system should accommodate a combination of daily local and airport traffic as congestion can cause missed flights and other unforeseen circumstances. Parking availability is not only crucial for passengers, but for airport employees, rental car services, and revenue generation. The existing system of ground transportation and ground facilities supporting the Airport is described in the following paragraphs.

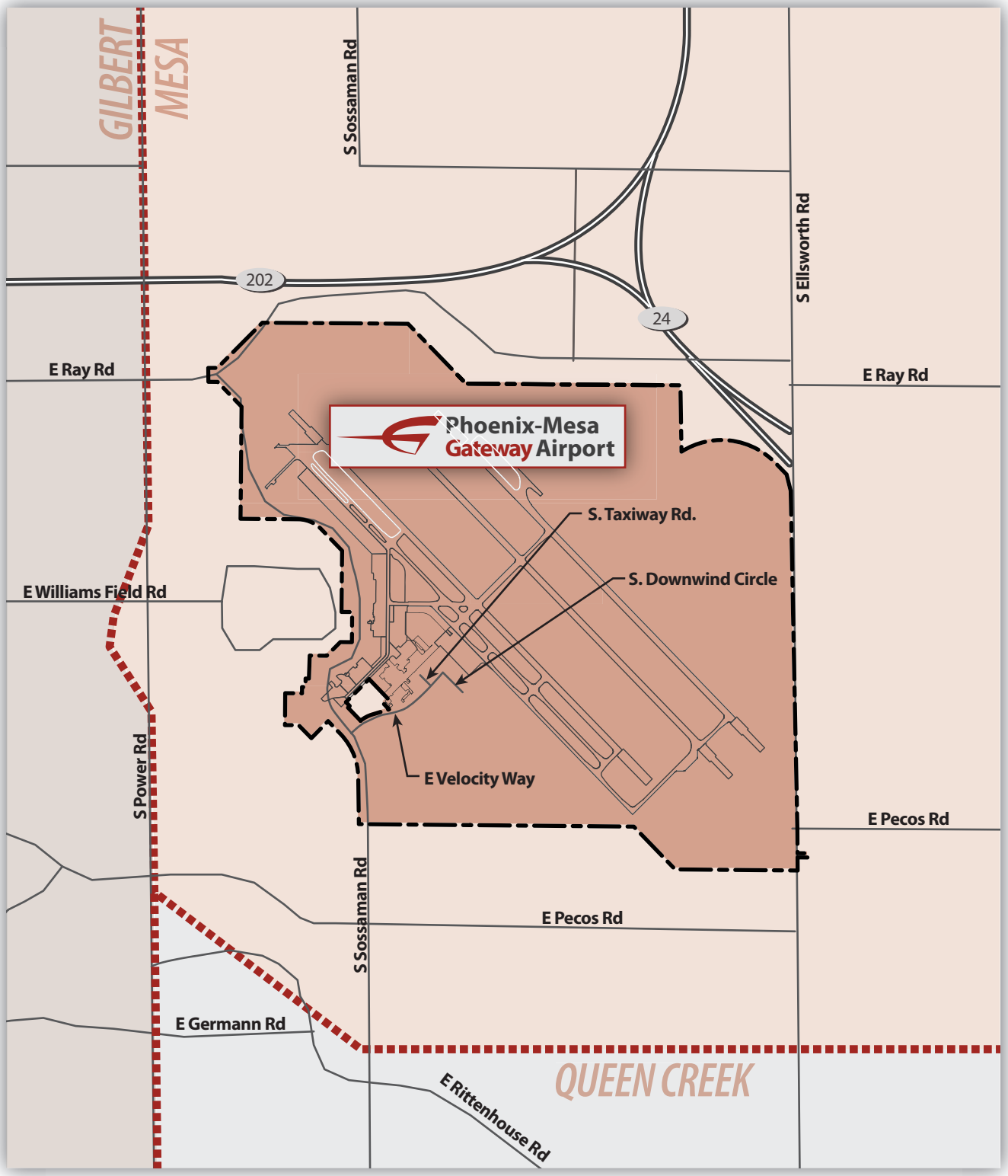
Vehicle Access

IWA is bordered by East Ray Road to the north, South Ellsworth Road to the east, East Pecos Road to the south, and South Sossaman Road to the west as illustrated in ***Figure 1-7: Local Area Roadway Network***. Airport and Arizona locals use South Sossaman Road, an arterial road with two lanes in each direction, connecting East Ray Road, where long-term airport parking is located, to East Pecos Road. Adjacent to East Ray Road is Santan Freeway 202, which has ramp intersections providing access to South Ellsworth Road, South Hawes Road, and South Power Road. South Power Road is close to the Airport and provides access to East Pecos Road in addition to other arterial roads from which the Airport can be accessed. The newly constructed State Route 24 provides access to the Airport's east side east side along Ellsworth Road with plans to extend the freeway further east of IWA.

The Commercial Service Terminal, GA facilities located on the western and southwestern portion of the airfield, and parking west and south of the terminal are provided access by South Sossaman Road. Access is provided to the Commercial Service Terminal, hourly parking, and daily parking via a left-turning lane. During peak hours the left-turning lane becomes congested due to its configuration and length, and vehicles desiring to use the left-turning lane are forced into lanes for through traffic. As a result, traffic congestion extends from the airport entrance. Improvements to the road system are currently underway that will result in four lanes serving as South Sossaman Road.

Currently, three lanes are situated in front of the terminal area. They provide access to the departure curb located outside of the ticketing terminal, arrival curb located outside of West Terminal A, commercial curb, and the hourly parking lot. The three lanes providing access to the arrival and departure curbs extend to a length of the adjacent median, located west of the lanes, and later merge into one lane that loops around the hourly parking lot to permit access back to South Sossaman Road.

The commercial curb is served by two lanes and consists of a waiting area that also serves as the median separating the commercial area from the arrival and departure area. The two lanes serving the commercial curb extend to a length of the median. Once the median ends, both lanes merge into one and loop around the hourly parking lot located adjacent to the commercial curb lane(s). The single lane then becomes collocated with the single lane serving those leaving the arrival and departure area and provides access to South Sossaman Road.



Source: *Google Maps, 2018*

Figure 1-7: **Local Road Network**

The commercial curb provides an area for third party commercial transportation services, which does not include ride sharing companies/transportation network companies. To conduct transportation operations at IWA, ride sharing companies/transportation network companies must enter into an agreement with the Airport. At this time, Lyft is the only ride share operator at the Airport.

The hourly parking lot is adjacent to the two lanes serving the commercial curb and can be accessed by a one lane entrance. During peak hours, cars entering the hourly parking lot generate a queue that blocks the free flow of traffic.

Businesses and other facilities located on the southern portion of the airfield can be accessed by East Velocity Way, which extends east from South Sossaman Road. South Taxiway Circle and South Downwind Circle also provide access to southern facilities. Both roads extend from East Velocity Way.

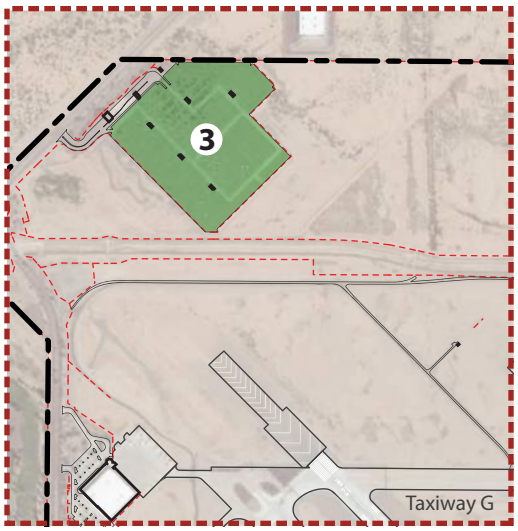
Automobile Parking

Airport parking is in various locations in the immediate vicinity. ***Figure 1-8: Passenger Parking Facilities*** illustrates parking availability for IWA passengers. The Hourly Lot, Daily Lot, and the Ray Road Economy Airport Parking facility are owned and operated by the Airport. Within these areas, those who choose to park here must pay. A cell phone lot located south of the terminal is also available for airport parking. The no-charge cell phone lot allows waiting space for ride sharing companies and taxicab staging areas. From Ray Road Economy Airport Parking located 1.8 miles north, shuttle service to and from the terminal is provided by the Airport. Space availability for all lots including space for rental car services is listed in ***Table 1-2: Phoenix-Mesa Gateway Airport Passenger and Rental Car Service Parking Availability***.

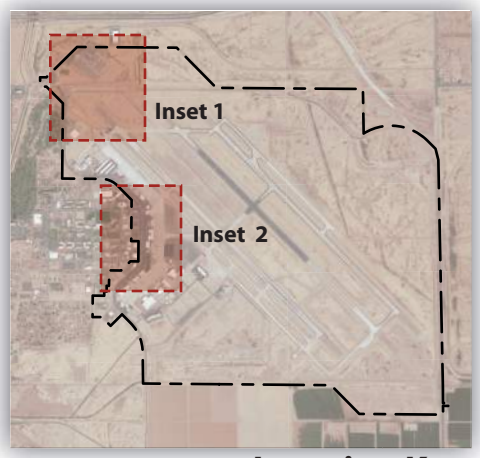
Table 1-2: Phoenix-Mesa Gateway Airport Passenger and Rental Car Service Parking Availability

Parking Lot	Space Count
Hourly Lot	186
Daily Lot	840
Rental Car Pick-Up[7]	159
Rental Return[8]	250
Cell Phone Lot[9]	180
Ray Road Economy Airport Parking	2,809

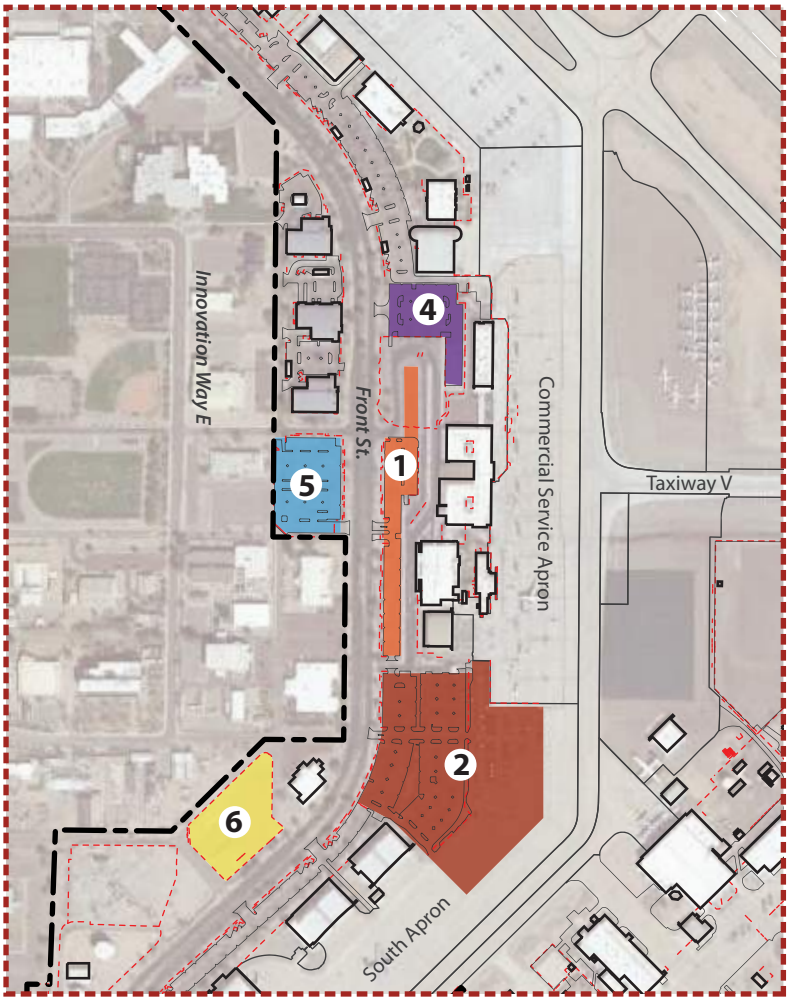
[7] A selection of rental cars for Pegasus are readily available for airport users. They are located off airport property. When a reservation has been made, or when contacted, a car is delivered to the Airport. Rental cars may be dropped off at the Airport in the parking lot adjacent to the General Aviation Center.
[8] Spaces for rental car return are in a linear fashion. Approximate space availability is subject to car size. An estimation of 250 spaces has been made.
[9] Parking spaces have not been paved within the cell phone lot. An estimation of 180 spots has been made.



Inset 1
Scale 1" = 800'



Location Key



Inset 2
Scale 1" = 400'

Legend

1. **Hourly Lot**
2. **Daily Lot**
3. **Ray Road Economy Airport Parking**
4. **Rental Car Pick-Up**
5. **Rental Car Return**
6. **Cellphone Parking Lot**

Source: *Phoenix-Mesa Gateway Existing Airport Layout Plan, 2015*

Figure 1-8: **Passenger Parking Facilities**

Airspace System and Navigational Aids

There are two primary classifications of airspace within the National Airspace System (NAS): controlled and uncontrolled airspace. Controlled airspace is where air traffic control service is provided for aircraft operating under visual or instrument flight rules (VFR or IFR). It consists of Class A, B, C, D, and E airspace. Uncontrolled airspace consists of Class G airspace. The airspace system comprises navigational aids (NAVAIDs) and is of great importance. IWA, as with all airports, functions within the NAS. The following paragraphs briefly detail the role of IWA within the NAS and the NAVAIDs that service the Airport.

Air Traffic Service Areas and Aviation Communications

Air Route Traffic Control Centers (ARTCC) are responsible for providing navigational assistance to en route aircraft along airways and other portions of airspace. ARTCCs cover a specific geographic area and primarily assist aircraft operating under IFR. Of the 22 ARTCCs, IWA is within the Albuquerque coverage area. Airports in parts of Arizona, New Mexico, Texas, Oklahoma, and Colorado are also under the Albuquerque ARTCC jurisdiction.

Aviation communications facilities associated with the Airport include the Air Traffic Control Tower (ATCT) with frequencies 120.6 for common traffic advisory, 128.25 for ground control, and 124.9 for approach and departure control. Contact with the FBO can be made on the 129.875 frequency.

Air Traffic Control Tower (ATCT)

Primary responsibilities of air traffic controllers include maintaining separation between arriving and departing aircraft and assuring an orderly flow of traffic. The ATCT at IWA is 127 feet tall and located northwest of the cargo apron. Visibility of all runways and taxiways is clear; however, due to the location of hangar facilities, visibility of apron areas is obstructed. An ATCT siting study was completed in 2015 for the potential relocation of the tower. A new site recommendation and height were chosen, and an initial new tower design was completed in 2019. The tower is owned by the PMGAA and is contracted for operation by Serco, Inc. as part of the FAA Contract Tower Program. Serco operates the tower from 5:00 a.m. – 12:00 a.m. and provides instruction and separation of inbound traffic, approach clearance, departure clearance, and ground control.

Weather Monitoring Equipment

An automated terminal information system (ATIS) broadcasts continuous weather information including:

- ✓ Time of the report issued
- ✓ Wind speed and direction
- ✓ Visibility
- ✓ Notice to Airmen (NOTAM) Information
- ✓ Temperature
- ✓ Dew point

Other information includes the ATIS report such as traffic patterns, altimeter setting, runway and/or taxiway closures, NAVAIDs out of service, instrument information, and more. Weather information is retrieved from the automated weather observing system (AWOS). ATIS and weather information are verbally recorded by air traffic controllers and reported on the 133.35 frequency. The transfer of AWOS information to ATIS is not automated at this time. The ATIS is operational during tower hours.

AWOS information can be accessed on the 133.5 frequency after the operational hours of the tower and 24 hours a day by calling 480-988-9428. The AWOS is located adjacent to the glideslope on the south end between Runways 30R and 30C.

Airspace

IWA is within Class D airspace that extends from the surface elevation of the airfield to 3,900 feet mean sea level. It is 5 nautical miles (NM) wide and prior to entering, aircraft must be equipped with a two-way radio and contact the ATCT. IWA Airspace is illustrated in ***Figure 1-9: Sectional Chart***. All airspace overlying airports is individually tailored to the availability of the tower and types of instrument procedures. The Class D airspace overlying IWA is functional while the ATCT for the Airport is operational. During non-operational hours, the Class D airspace reverts to Class G and extends from the surface elevation of the airfield to 700 feet mean sea level. Class G airspace is uncontrolled and typically does not require any equipment or radio communication. However, due to the overlying airspace above 700 feet mean sea level, both are required.

Source: *FAA.gov - Phoenix Sectional Aeronautical Chart*

Figure 1-9: **Sectional Chart**

Phoenix Sky Harbor International Airport (PHX) is one of the nation's busiest airports for aircraft operations and passenger enplanements. Because of this, Class B airspace and a Mode C transponder veil 30 NM wide is enforced over the PHX and its instrument procedures. This Class B has multiple layers that extend and cover nearly 30 NM in certain areas. Though the base elevations of the Class B layers differ, the ceiling elevation of 9,000 feet mean sea level is constant. Four Class B layers overlay the Class D airspace for IWA. The Class B layer that lies over the majority of IWA is located north with a base elevation of 5,000 feet mean sea level. The 1,100 feet of airspace between the Class D ceiling of 3,900 feet and Class B base elevation of 5,000 feet is Class E transitional airspace. Class E airspace encompasses PHX, IWA, and several other nearby airports. It begins at 700 feet mean sea level and extends to 18,000 feet. Any form of Class E airspace requires two-way radio communication. The Class B layer with the lowest base elevation of 4,000 feet mean sea level is west of IWA, while the remaining two layers are south and southwest with base elevations of 7,000 feet and 6,000 feet, respectively. The gap airspace between the three levels and Class D ceiling are also Class E transitional airspace.

Military Operating Areas (MOAs), Restricted Areas, and Alert Areas are considered Special Use Airspace. East of the IWA are three MOAs: Outlaw MOA, Jackal MOA, and Jackal Low MOA. These areas have been established due to extensive military training activity. Southeast of the Airport are Restricted Areas R-2310A, B, and C. Restricted areas contain activities that may be hazardous to aircraft, necessitating restriction of flight operations during certain hours. Alert Area A-231, 39 NM west of IWA, has been established due to concentrated jet transition training associated with the Luke Air Force Base. Flight within this area is not prohibited; however, aircraft flying within this airspace should exercise extreme caution.

FAR Part 77 Surfaces

Part 77 imaginary surfaces are established within Federal Aviation Regulations (FAR) Part 77: *Safe, Efficient Use, and Preservation of the Navigable Airspace* for the protection of navigable airspace at and surrounding the Airport.[10] The criteria contained in Part 77 apply to existing and proposed manmade objects and/or objects of natural growth and terrain. These surfaces should be kept free of obstructions. The dimensions of the Part 77 surface depend on various factors such as type of runway, runway surface, and type of instrument approach available to a runway's end. IWA Part 77 surfaces are as follows:[11]

[10] Federal Aviation Regulations (FAR) Part 77: Safe, Efficient Use, and Preservation of the Navigable *Airspace.*
[11] Ibid.

Primary Surface

- ✓ The primary surface is centered along the centerline of a runway at an elevation of the highest point on the nearest runway centerline. The primary surface for all runways at IWA extends 200 feet beyond the runway end.
- ✓ **Runway 12R/30L:** Runway 12R/30L is served by non-precision approaches and is equipped for aircraft weight over 12,500 pounds; therefore, the primary surface width is 500 feet.
- ✓ **Runway 12C/30C:** Though runway end 12C is served by non-precision approaches with visibility minimums of 1 mile, runway end 30C is served by an instrument approach with a visibility minimum of ¾ mile. The more demanding primary surface is considered; therefore, the width of the primary surface for Runway 12C/30C is 1,000 feet.
- ✓ **Runway 12L/30R:** Due to Runway 12L/30R only accommodating visual approaches, the primary surface is 500 feet wide.

Approach Surface

- ✓ **Approach Surface:** An Approach Surface is critical due to its representation and protection of the airspace used for aircraft's approach to land. All approach surfaces are centered along the extended runway centerline and begin at the end of the primary surface. The inner edge of the approach surface is equivalent to the width of the primary surface. It then extends outward and upward.
- ✓ **Runway 12R/30L:** The approach surface for both runway ends expand to a width of 2,000 feet and extend 10,000 feet long at a slope of 34:1.
- ✓ **Runway 12C/30C:** The approach surface for runway end 12C extends 10,000 feet horizontally at a slope of 34:1 and expands uniformly to a width of 3,500 feet. Runway end 30C is serviced by an approach surface that expands 16,000 feet wide to a horizontal length of 10,000 feet at a slope of 50:1. The approach then extends an additional 40,000 feet at a slope of 40:1.
- ✓ **Runway 12L/30R:** The approach surface for both runway ends extend 5,000 feet long at a 20:1 slope and expand to a width of 1,500 feet.

Transitional Surface

- ✓ The transitional surface extends outward and upward from the sides of the primary surface and approach surfaces at a slope of 7:1 up to the horizontal surface. No objects or buildings on airport property should penetrate this surface.

Horizontal Surface

- ✓ FAR Part 77 defines a horizontal surface as "a horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of a specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs."[12]
- ✓ Runway 12R/30L and 12C/30C have a radius of arc of 10,000 feet. The radius of arc for Runway 12L/30R is 5,000 feet.

Conical Surface

- ✓ The conical surface extends outward and upward for a horizontal distance of 4,000 feet from the outer limits of the horizontal surface at a slope of 20:1.

NAVAIDs

NAVAIDs are essential as they provide aerial navigation assistance to aircraft en route and aircraft on approach to land. Most NAVAIDs are ground-based equipment located both on and off airport property; however, some are satellite based. The following NAVAIDS are available to IWA.

Airport Beacon

The airport beacon is located above the ATCT and operates from sunset to sunrise. It emits a white then green light every 180 degrees to indicate the location of the Airport. The white-green light notifies aircraft that IWA is a civilian land airport.

Wind Cones and Segmented Circles

Normal flight operations require aircraft to take off and land into the wind. Wind cones visually indicate prevailing wind direction and speed, aiding a pilot in choosing what runway to use for takeoff and landing operations. Segmented circles are typically positioned around wind cones and are sometimes assisted by land direction indicators that indicate the traffic pattern for a runway. There are seven wind cones in total, of which six are lit. Three are accompanied by segmented circles. Two of the segmented circles provide land direction indicators. All wind cones and segmented circles except one are located left of every runway end near the 1,000-foot precision pavement markers. Wind cones with segmented circles are left of Runways 30C, 30R, and 12R. The remaining wind cone is located directly south of Taxiway V.

Compass Rose

Compass roses are painted on the airfield, so that aircraft may calibrate the magnetic compass within the cockpit. The compass rose is located west of Taxiway A and Runway 30L. It is approximately 12,500 square feet of concrete.

[12] Ibid.

Very High Frequency Omnidirectional Range (VOR)/Distance Measuring Equipment (DME)

VORs are the most common ground-based NAVAID. Aircraft may use VORs for en route aerial navigation and non-precision instrument approaches to land. VORs transmit very high frequency (VHF) signals to aircraft instruments that then determine the location from the station. VORs are often combined with DME enabling the system to provide distance and direction. When VORs are combined with DME and with a Tactical Air Navigation System (TACAN) beacon, they are then considered a VORTAC. TACANs provide the same distance measuring capability as DME and are primarily used by military aircraft. A VOR and TACAN approach is available to Runway 30c with a visibility minimum of 1 mile. The VORTAC is located on the airfield west of Runway 12C/30C and south of Taxiway K.

Instrument Landing System (ILS)

An ILS transmits radio signals that establish a straight approach to a runway at a specific angle and comprises two components: localizer and glide slope. The localizer is positioned beyond the runway end and transmits a radio signal that provides an aircraft with lateral guidance. It signals an aircraft if it has deviated to the left or right of the course to the runway. The glide slope transmits a radio signal that guides aircraft vertically at a specified degree angle towards the runway. Runway 30C is equipped with an ILS approach with a visibility minimum of ¾ mile. Runway 12C is served by a non-precision approach.

Area Navigation (RNAV)/Global Positioning System (GPS)

Rather than using VOR navigation by flying point to point, RNAV permits equipped aircraft the ability to triangulate signals broadcast by the ground-based stations and fly directly to their destination on any desired flight path. GPS are satellite-based navigation systems that transmit location, distance, altitude, direction of travel, and speed to aircraft. GPS affords equipped aircraft the ability to conduct non-precision approaches to runways not equipped with ground-based equipment. RNAV (GPS) instrument approaches are available to Runways 12R/30L and 12C/30C with 1-mile visibility minimums.

Airport Surveillance Radar (ASR)

An ASR is designed to provide relatively short-range coverage near an airport to assist in handling terminal area traffic through observations of precise locations on a radarscope. ASR provides azimuth information, with a coverage area of up to 60 miles, but does not provide elevation data. The ASR at IWA is located east of Taxiway C adjacent to the paved access road.

Utilities[13]

Utilities are significant elements in the immediate and long-range planning of the Airport. They provide the necessary foundation for development projects; without widely available and reliable electrical, water, telecommunications/fiber optics, natural gas, wastewater, and drainage, it is extremely difficult to expand or develop facilities. Significant planning is required to ensure that sufficient capacity and infrastructure is in place to serve existing infrastructure and future development projects. ***Figure 1-10: Comprehensive Utilities Map*** identifies the various utility locations surrounding the Airport.

Electrical

The Salt River Project (SRP) provides electrical service to the Airport. SRP facilities include generation plants, substations, and transmission and distribution lines. Electrical power is generated at the recently expanded 1,200 megawatt (MW) Santan Generating Station, located south of Warner Road on Val Vista Road in Gilbert. Power is transmitted via the Browning Power Receiving Station north of Elliott and Signal Butte Roads, with scheduled additions of the Dinosaur substation on Germann Road at the Central Arizona Project (CAP) canal and Moody substation south of Pecos and Recker Roads. SRP has the capability of expanding facilities to accommodate future growth in and around the Airport, but will need to understand the location, nature, and timing of development so that appropriate facilities can be provided. All electrical utility lines serving the Airport are identified in ***Figure 1-11: Electrical Utilities Map.***

The Airport also has back-up diesel and natural gas generators that support critical electrical systems and does not intend on establishing redundant feeds.

Water

The City of Mesa is the designated municipal water service provider for the Airport within the Falcon Field Pressure Zone. There is an existing 16-inch water line running north-south along Sossaman Road that supplies the airport with two 12-inch lines. Newly installed 20-inch and 24-inch water lines are along the north boundary of the Airport. All water utility lines serving the Airport are identified in ***Figure 1-12: Water Utilities Map.***

[13] Jacobs, *Final Technical Report Northeast Area Development Plan Phoenix-Mesa Gateway Airport*, June 2012.

Telecommunications/Fiber Optics

The Airport and adjacent commercial and light industrial parks are well served through local telecommunications and fiber optic providers Cox Communications, CenturyLink, and Xentras Communications. The City of Mesa has also constructed the E-streets East Mesa Loop, a professionally engineered carrier class conduit and vault system for commercial and government uses. The backbone consists of over 36 miles of 12 two-inch conduits with access points at every major street crossing, and 100 percent of the system is buried. Although no fiber has been placed by the City of Mesa, private companies such as Cox Communications and CenturyLink purchase conduits and deploy fiber optic connectivity for commercial needs. All telecommunications/fiber optic lines serving the Airport are identified *in* ***Figure 1-13: Telecommunications/Fiber Optics Map*****.**

Natural Gas

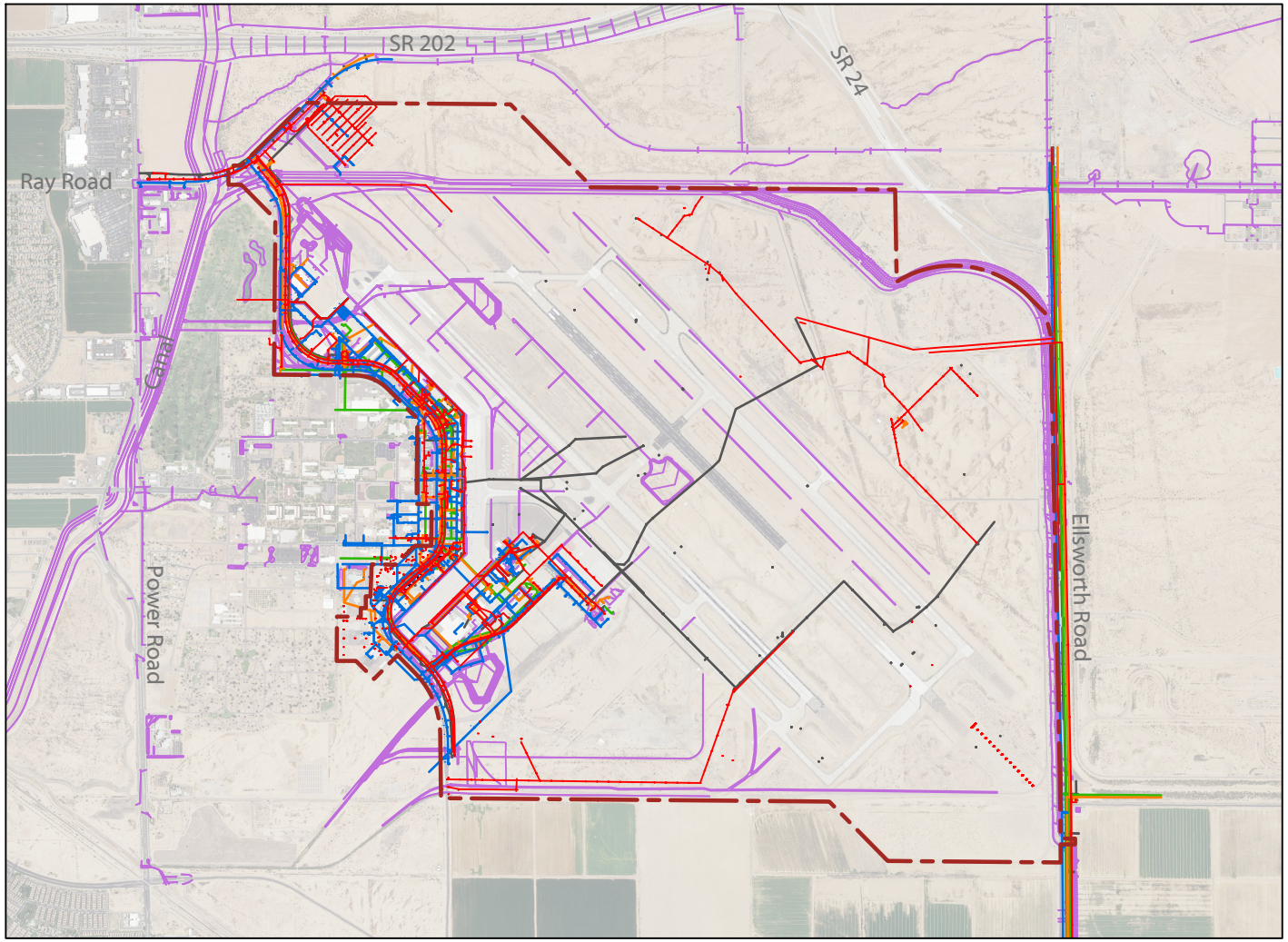
Southwest Gas is the natural gas provider for the Airport. A high-pressure line runs along Signal Butte Road and turns west on Elliot Road. At Ellsworth Road, the line runs from Guadalupe on the east to Germann Road and continues east and west along Germann Road outside of the Airport. An additional high-pressure line also runs along Pecos Road from Ellsworth Road east of Signal Butte Road. Southwest Gas has the capability to accommodate future development needs without any interruptions to service. All natural gas utility lines serving the Airport are identified in ***Figure 1-14: Natural Gas Utilities Map*****.**

Wastewater

The City of Mesa is the provider for wastewater collection and treatment for the incorporated areas of the city, which includes the Airport. The Greenfield Water Reclamation Plant is jointly owned by the City of Mesa and the Towns of Gilbert and Queen Creek and serves the Airport. The Airport is served by a 12-inch line in Sossaman Road that flows north near the new Ray Road Alignment where it connects to the new 30-inch line, then south in a 54-inch line along Power Road and ultimately to the Greenfield Water Reclamation Plant. All wastewater utility lines serving the Airport are identified in ***Figure 1-15: Wastewater*****.**

Airport Drainage

The City of Mesa and the Flood Control District of Maricopa County partner to address drainage and flood control issues at the Airport. Water generally flows from the southeast to northwest and a system of channels and basins are used to capture, store, and convey flows. The Airport has a Master Drainage Plan in addition to a Stormwater Pollution Prevention Plan. Airport drainage is identified in ***Figure 1-16: Airport Drainage Map*****.**



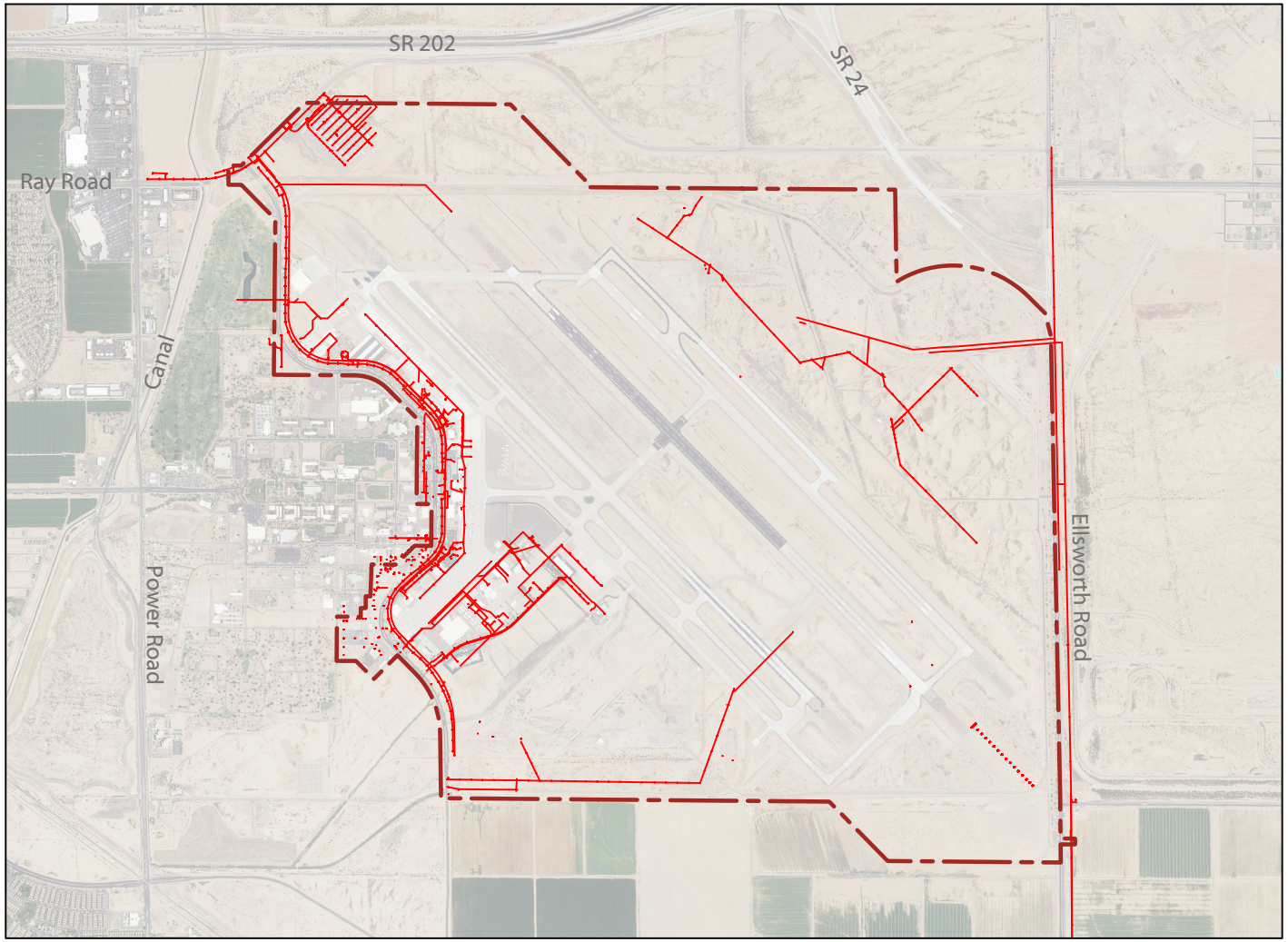
Legend

- Property Line
- Electrical
- Water Utilities
- Telecommunications/ Fiber Optics Lines
- Natural Gas
- Sewer
- Drainage

0 1,500' 3,000' 4,500'

Graphic Scale in Feet

SOURCE: City of Mesa.



Legend

Property Line

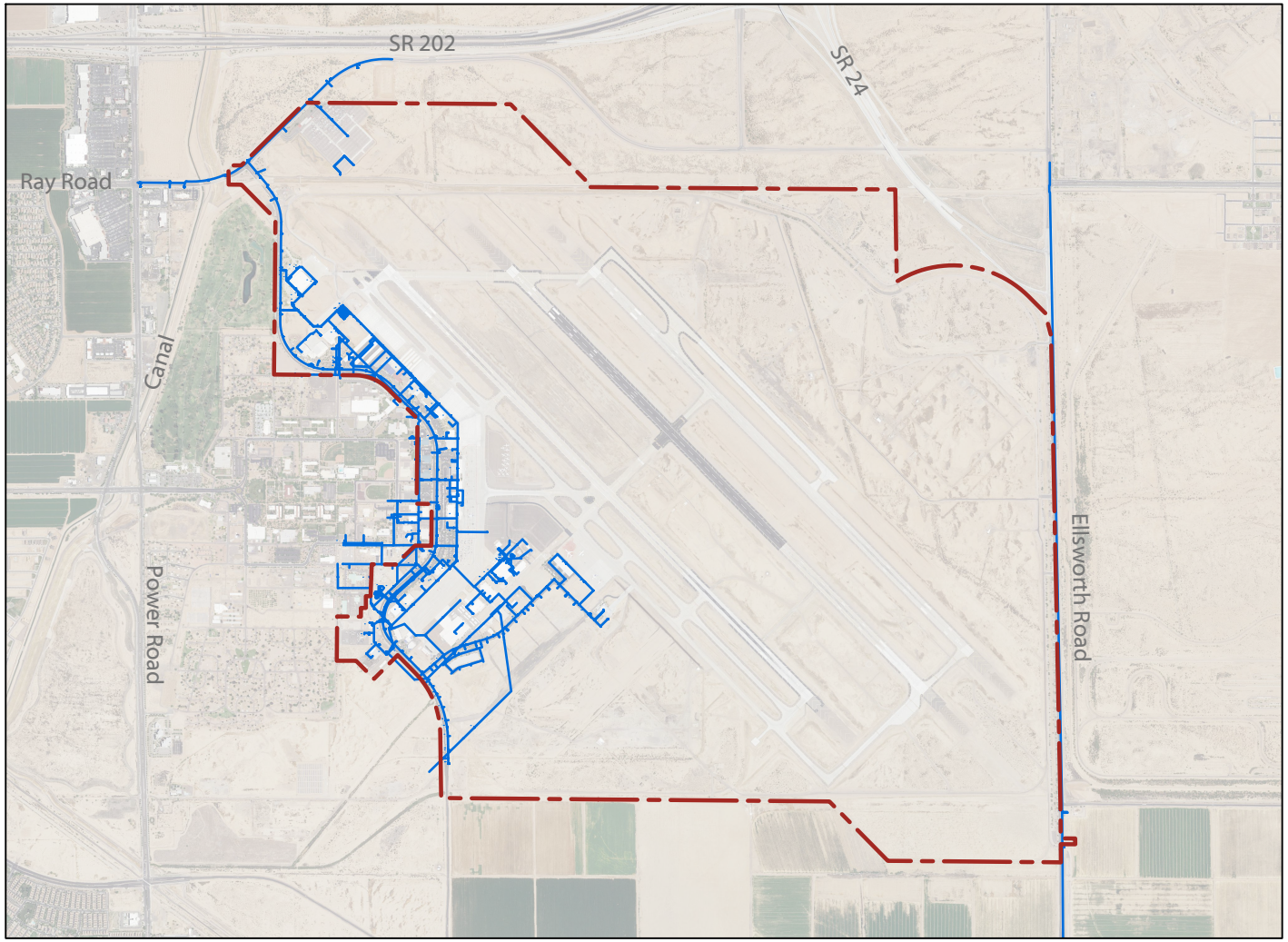
Electrical

0 1,500' 3,000' 4,500'

Graphic Scale in Feet

SOURCE: City of Mesa.

Figure 1-11: Electrical Utilities Map



Legend

Property Line

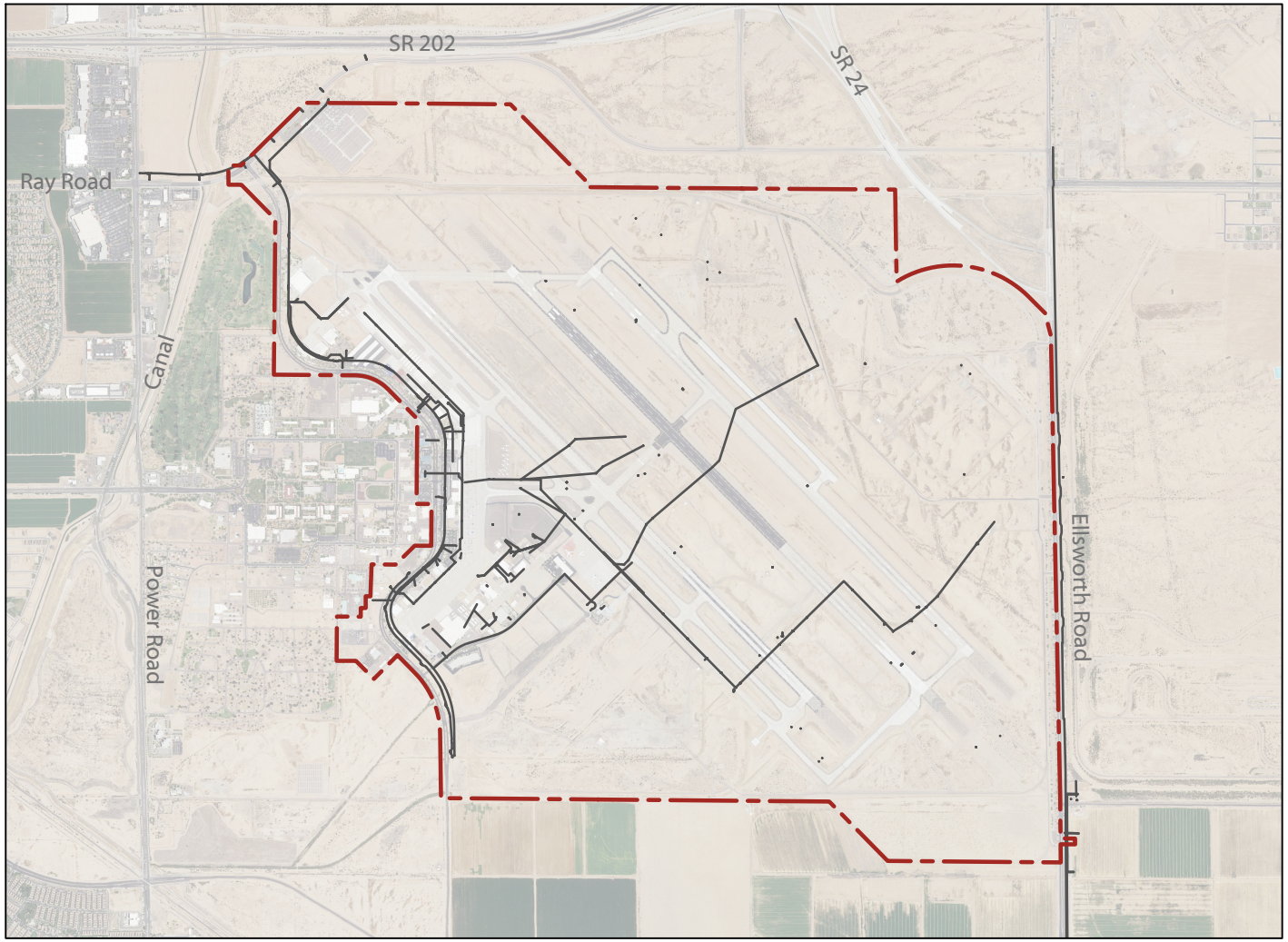
Water Utilities

0 1,500' 3,000' 4,500'

Graphic Scale in Feet

SOURCE: City of Mesa.

Figure 1-12: Water Utilities Map



Legend

Property Line

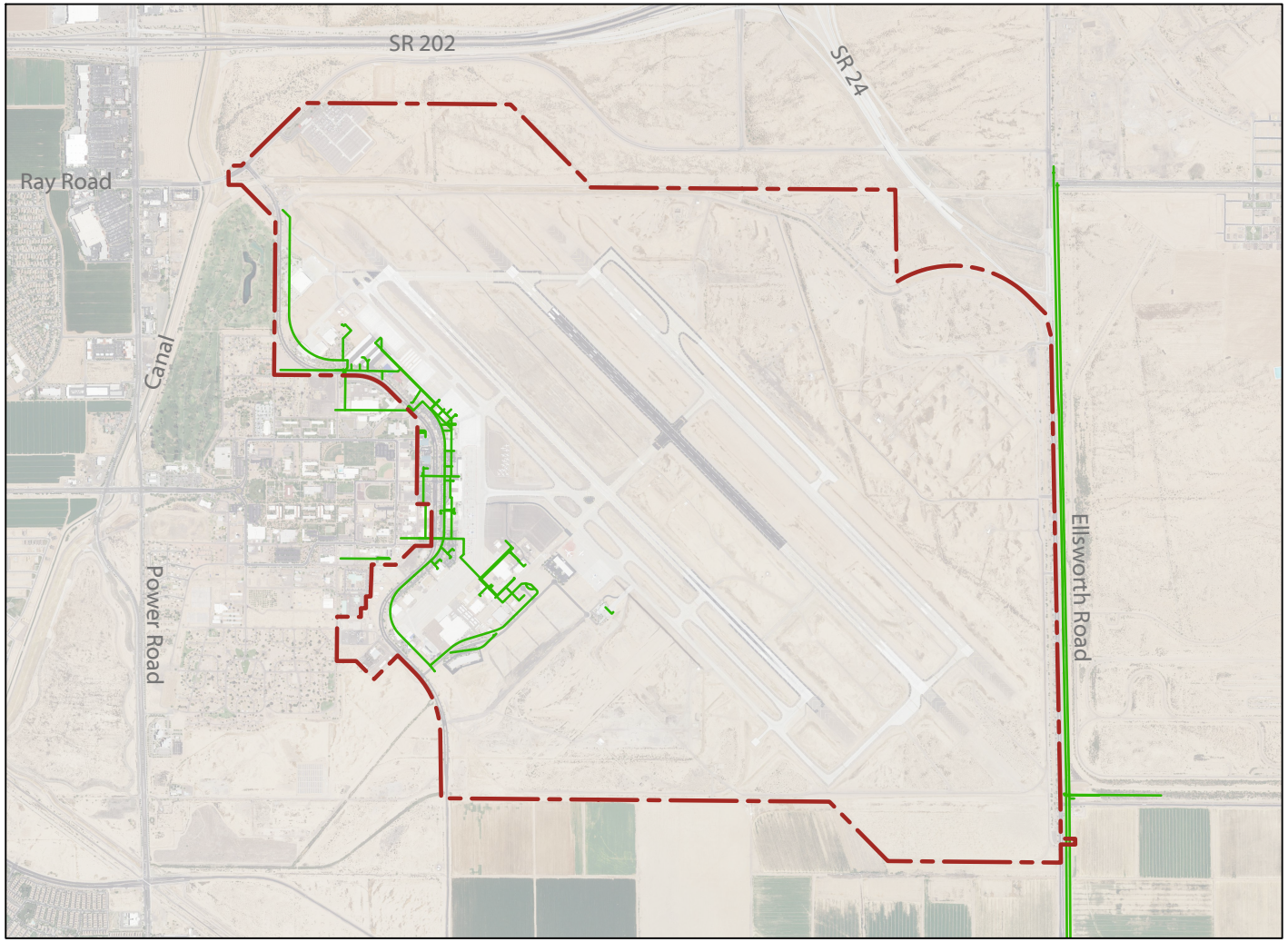
Telecommunications/
Fiber Optics Lines

0 1,500' 3,000' 4,500'

Graphic Scale in Feet

SOURCE: City of Mesa.

Figure 1-13: Telecommunications/Fiber Optics Map



Legend

Property Line

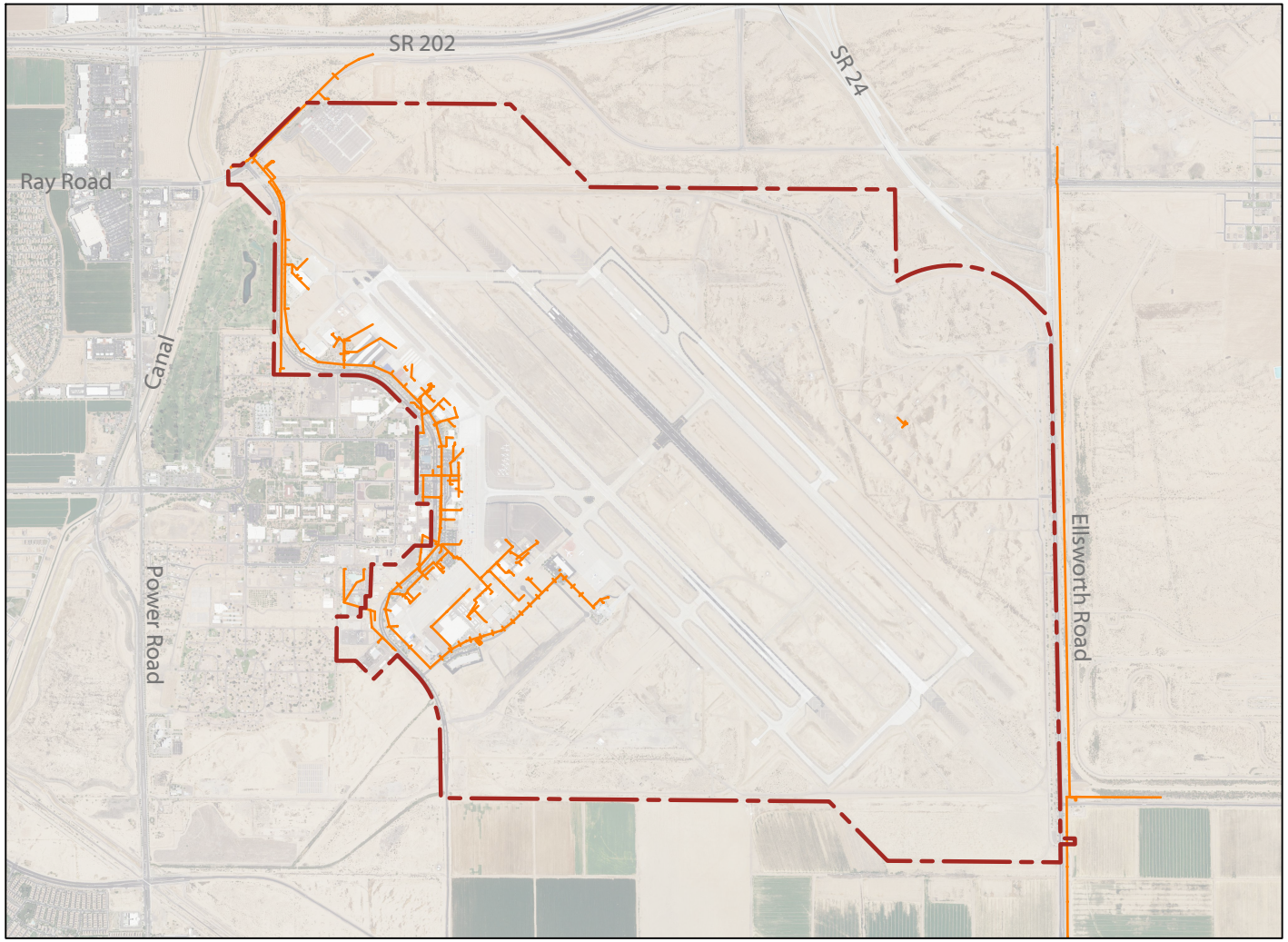
Natural Gas

0 1,500' 3,000' 4,500'

Graphic Scale in Feet

SOURCE: City of Mesa.

Figure 1-14: Natural Gas Utilities Map



Legend

Property Line

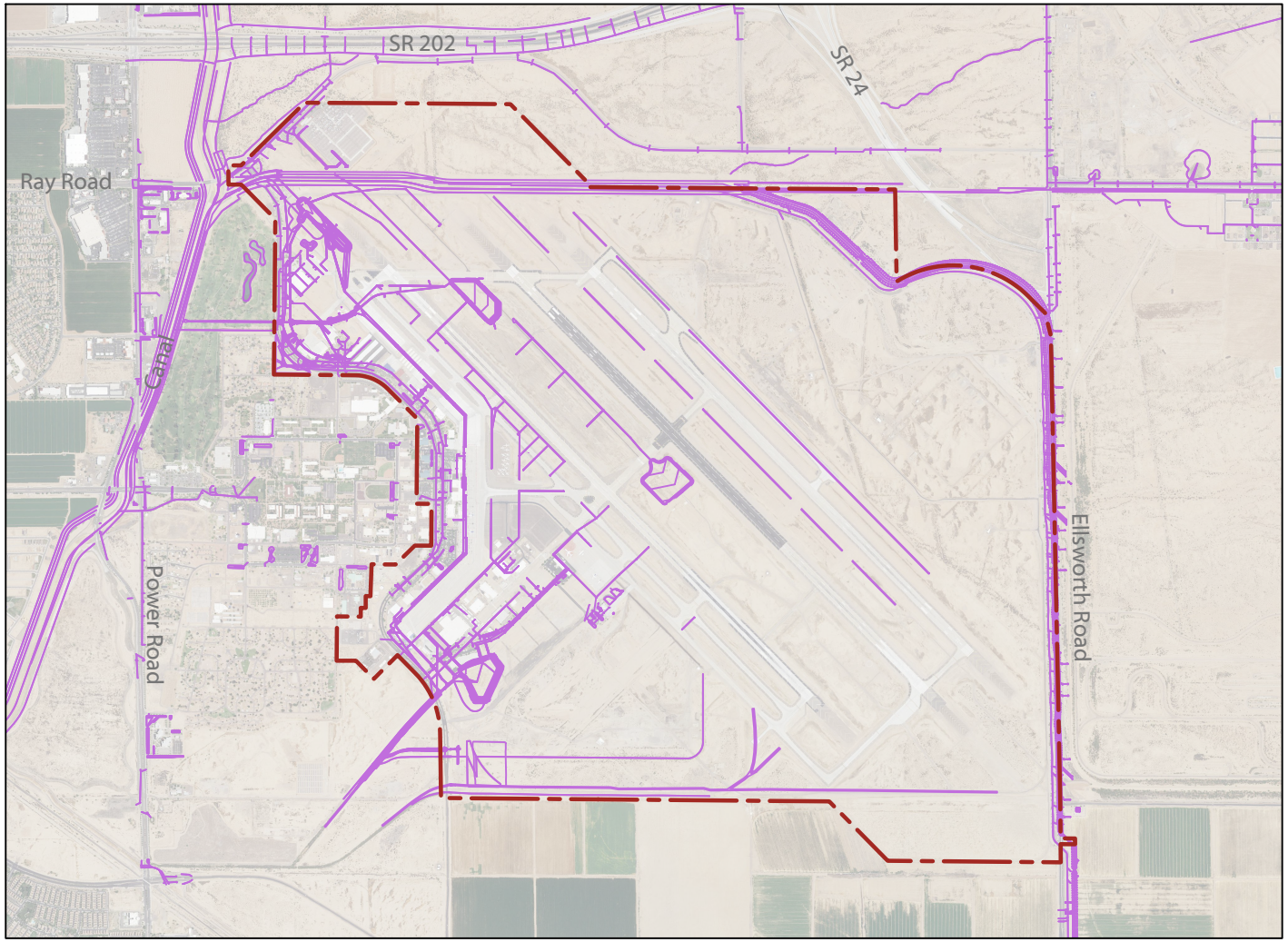
Sewer

0 1,500' 3,000' 4,500'

Graphic Scale in Feet

SOURCE: City of Mesa.

Figure 1-15: Wastewater Utilities Map



Legend

Property Line

Drainage

0 1,500' 3,000' 4,500'

Graphic Scale in Feet

SOURCE: City of Mesa.

Figure 1-16: Drainage Map

Wind Analysis

Wind is a key factor in runway orientation as optimal utility of an airport is provided when runway orientation is relative to prevailing winds in that area. The FAA guidance recommends an airport runway system offer 95 percent wind coverage for the allowable crosswind component, which is dependent on the runway design code (RDC). This means that the runway orientation should be developed so that the maximum crosswind component is not exceeded more than 5 percent of the time. If the primary runway does not offer 95 percent wind coverage, a crosswind runway should be considered so that together they provide 95 percent wind coverage. RDC is assigned to each individual runway. In the event of multiple runways, the RDC depends on the aircraft that will primarily use that runway. The RDC for all runways at IWA is D-V, which allows for a crosswind component of 20 knots. The runways at IWA are not only used by D-V aircraft, but by aircraft of smaller and larger RDC with lower allowable crosswind components. Crosswind components for all RDCs are listed in ***Table 1-3: Allowable Crosswind Component per Runway Design Code (RDC).***

Table 1-3: Allowable Crosswind Component per Runway Design Code (RDC)

RDC	Crosswind Component
A-I and B-I	10.5 Knots
A-II and B-II	13 Knots
A-III, B-III, C-I through C-III, D-I through D-III	16 knots
A-IV and B-IV, C-IV through C-VI, D-IV through D-VI, E-I through E-VI	20 Knots

Source: FAA AC 150/5300 13A, Airport Design, Change 1. Table 3-1

A wind analysis is conducted for two primary reasons: 1) To determine the best runway orientation for an airport and 2) to analyze how the current runway orientation accommodates wind conditions. A wind analysis considers both wind direction and speed in VFR, IFR, and all-weather conditions. The wind analysis conducted for IWA used data from a 10-year period, 2008-2017. There were approximately 141,148 observations during this time. Due to the identical runway orientations at IWA, wind analysis data is sufficient for all three runways.

Table 1-4: All-Weather quantifies the wind coverage provided by the existing runway system including the coverage provided by each runway end. Based on the all-weather wind analysis for IWA, using the Wind Rose File Generator and Wind Analysis Tool on the FAA Airports GIS Program website, the existing runway configuration provides the following all-weather wind coverage. ***Figure 1-17: All Weather Wind Rose*** depicts the all-weather wind rose for the runway system at IWA.

Table 1-4: All-Weather

Runway	10.5 Knot	13 Knots	16 Knots	20 Knots
Runways 12	89.74%	90.33%	90.98%	91.22%
Runways 30	73.66%	74.46%	75.24%	75.52%
Runways 12/30	97.66%	98.6%	99.51%	99.84%

Source: National Oceanic and Atmospheric Administration, National Climatic Data Center, Station 722786, Williams Gateway Airport, Mesa, AZ. Period of Reporting 2008-2017; 141,148 Total Observations, and tailwind component of five knots for unidirectional runways and sixty knots for bidirectional runways.

Figure 1-17: All Weather Wind Rose

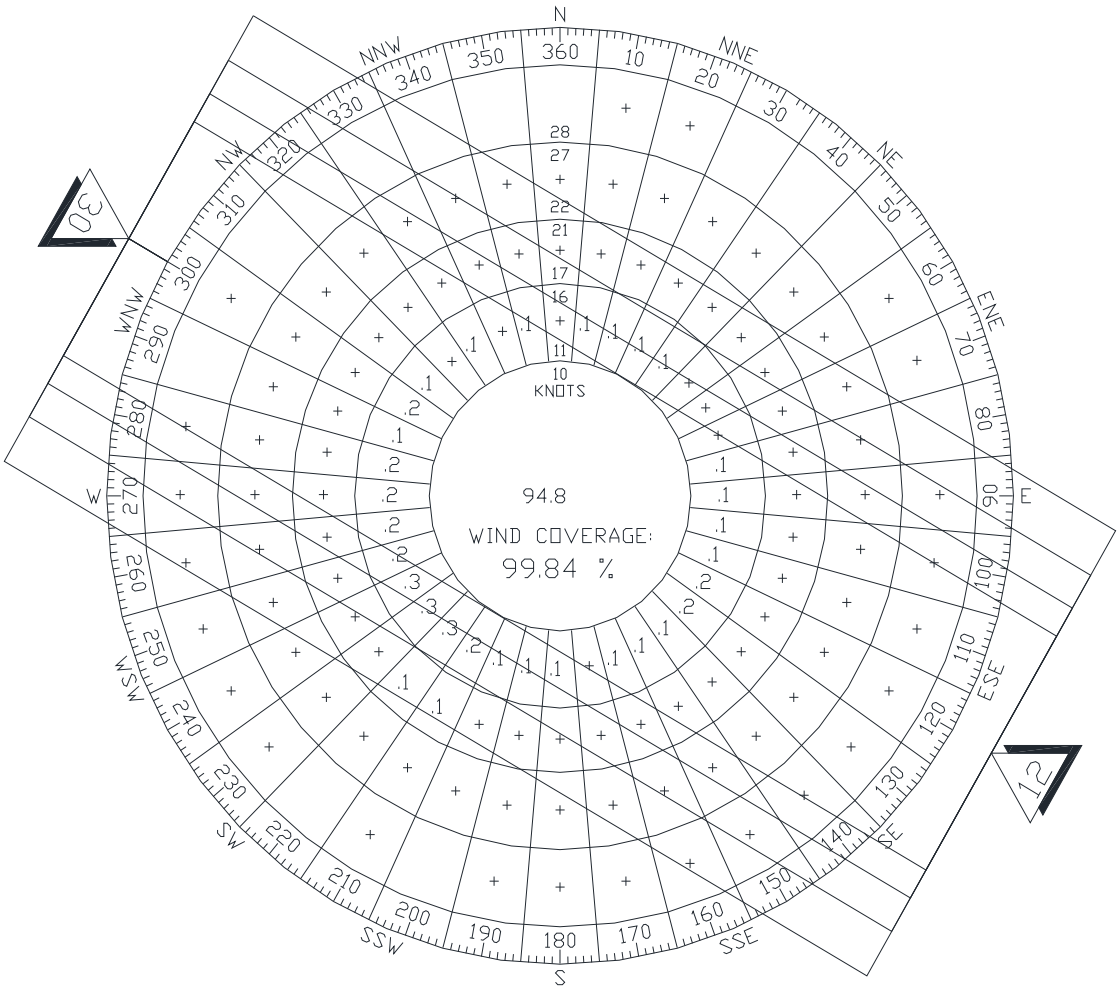


Table 1-5: Visual Flight Rules (VFR) Weather and ***Table 1-6: Instrument Flight Rules (IFR) Weather*** present the wind coverage offered by the current runway system during VFR and IFR conditions. VFR conditions exist when the cloud ceiling is at least 1,000 feet above the ground level, and the visibility is a minimum of 3 statute miles. IFR conditions exist when the reported cloud ceiling is less than 1,000 feet, and visibility is less than 3 miles. ***Figure 1-18: IFR Wind Rose*** presents the IFR wind rose for the runway system at IWA. As seen in the tables, wind conditions favor Runways 12R, 12C, and 12L. The existing runway configuration meets and exceeds the standard 95 percent wind coverage.

Table 1-5: Visual Flight Rules (VFR) Weather

Runway	10.5 Knot	13 Knots	16 Knots	20 Knots
Runways 12	89.84%	90.41%	91.04%	91.27%
Runways 30	73.71%	74.5%	75.28%	75.55%
Runways 12/30	97.75%	98.68%	99.56%	98.86%

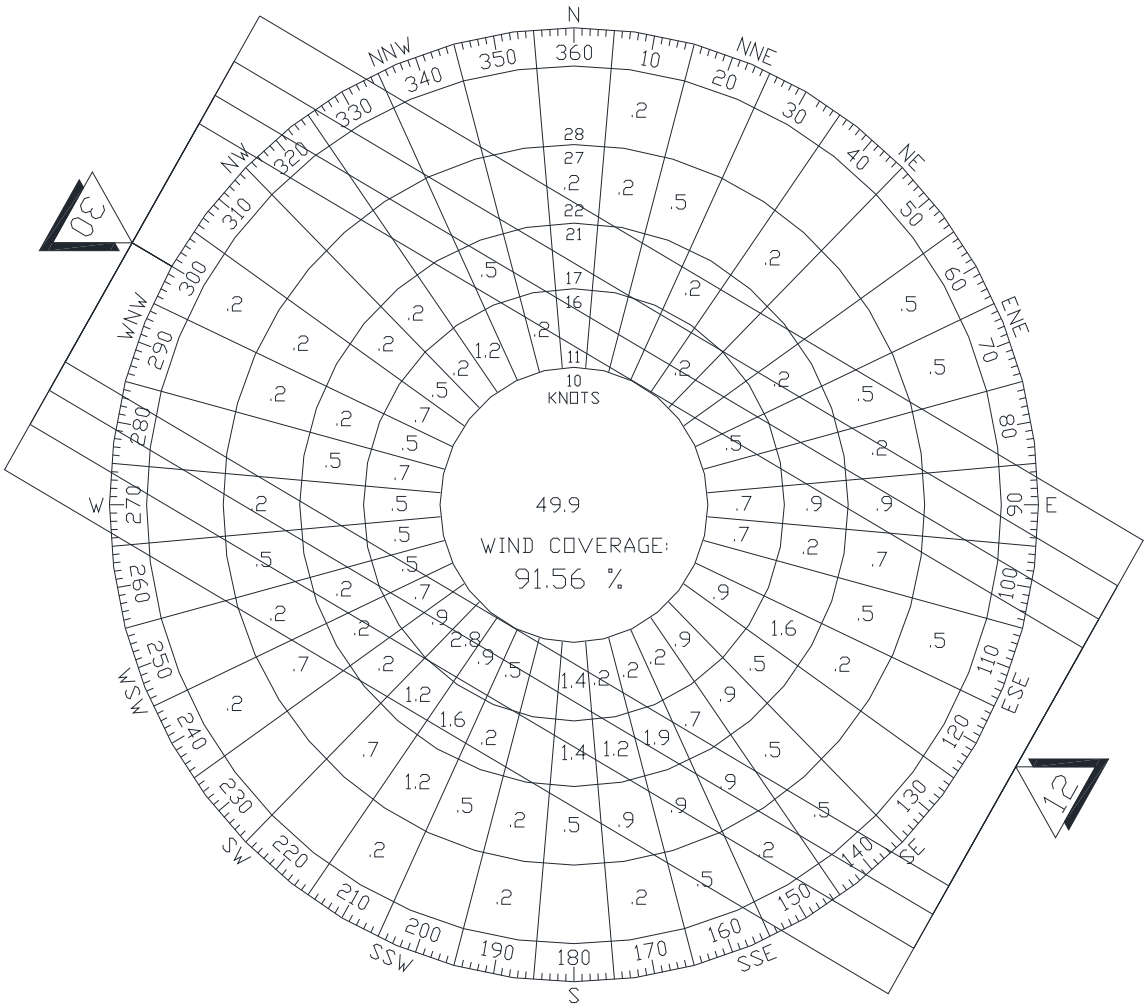
Source: National Oceanic and Atmospheric Administration, National Climatic Data Center, Station 722786, Williams Gateway Airport, Mesa, AZ. Period of Reporting 2008-2017; 139,974 Total Observations, and tailwind component of five knots for unidirectional runways and sixty knots for bidirectional runways.

Table 1-6: Instrument Flight Rules (IFR) Weather

Runway	10.5 Knot	13 Knots	16 Knots	20 Knots
Runways 12	56.03%	62.23%	68.96%	74.86%
Runways 30	46.74%	49.97%	53.83%	57.37%
Runways 12/30	69.26%	76.74%	84.66%	91.56%

Source: National Oceanic and Atmospheric Administration, National Climatic Data Center, Station 722786, Williams Gateway Airport, Mesa, AZ. Period of Reporting 2008-2017; 429 Total Observations, and tailwind component of five knots for unidirectional runways and sixty knots for bidirectional runways.

Figure 1-18: IFR Wind Rose



Airport Environs

Airport environs are considered zoning and land use on and neighboring an airport. They must be considered to combat land uses and activities deemed incompatible due to their possible effect on aircraft operation or aircraft operation impact to environs and their inhabitants. Understanding the environs surrounding an airport and within the airspace serving the airport provides airport management the opportunity to make informed decisions on how to mitigate impact to operations, future airport development, and the public.

Zoning is enforced law within every municipality. Zoning ordinances appoint permitted uses of land and establish standards for such. Arizona State Statute and Requirement 9-461.05 requires each planning agency to prepare a long-term general plan that must be adopted by the governing body. General plans have been created and adopted by the City of Mesa, the Town of Gilbert, and the Town of Queen Creek that document current land use. General plans also serve as a platform for future land use designation. Airport environs surrounding IWA are discussed in the following paragraphs.

Airport Overlay Zoning

An Airfield Overlay District comprising the RPZs and three Airport Overflight Areas (AOAs) (AOA 1, AOA 2, and AOA 3) have been created within the Mesa Zoning Ordinance. Similar overlays have also been adopted in Gilbert and Queen Creek. Unincorporated areas of Maricopa County in the vicinity of the Airport also include Airport Overlay zoning protection. This district was created to "promote the public health and safety in the vicinity of aircraft operation areas.[14]" Land use regulations within the RPZs and AOAs are established to minimize the potential of aircraft accidents or incidents and risk to the public. No buildings may be located in the RPZs at each runway end. The zoning ordinance permits vehicle parking, landscaping, stormwater retention, and yard setbacks within the RPZs given they do not penetrate the slope of an RPZ or another airport surface. Interference with aircraft operations or movement or creation of a wildlife hazard is prohibited. No uses within the district may interfere, obstruct, or impair:

- ✓ Navigable airspace or signals
- ✓ Radio communications
- ✓ Visibility in the vicinity of the Airport

AOA dimensions were updated in the Airport Land Use Compatibility Plan (ALUCP) that was approved in February 2017 by the Airport Authority and adopted by the City of Mesa, the Town of Gilbert, and is pending in the Town of Queen Creek. AOAs 1 and 2 indicate areas with high levels of noise exposure due to aircraft operations at IWA. Noise is measured using day-night sound level (DNL) methodology, which is a 24-hour time-weighted average noise level based on the "A" weighted decibel ("A" weighted refers to the sound scale pertaining to the human ear). The DNL is a measure of the overall aircraft noise

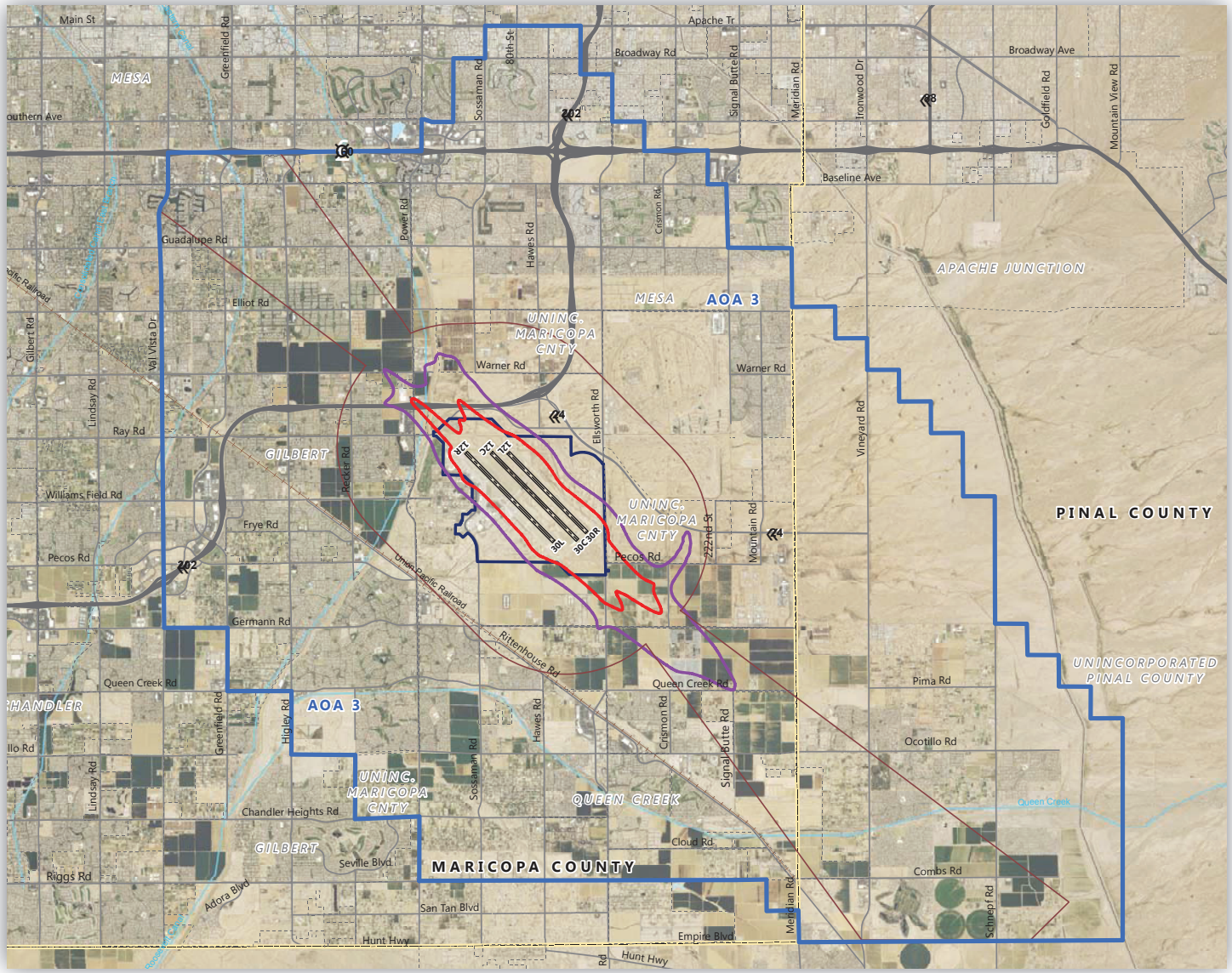
[14] Mesa Zoning Ordinance, Chapter 19 (2018)

experienced during an entire day. Aircraft noise occurring between 10:00 p.m. and 7:00 a.m. is penalized or weighted by ten decibels, which accounts for the higher sensitivity to noise during nighttime hours and the expected decrease in background noise levels. DNL noise levels are depicted as noise contours drawn to connect all points of similar level. The AOAs as defined in the ALUCP and mirrored in the Airfield Overlay District are as follows:

- ✓ AOA 1 – Area exposed to long-term future noise of DNL 65 and higher (65 DNL).
- ✓ AOA 2 – Area exposed to long-term future noise of DNL 60 to DNL 65 (60 DNL).
- ✓ AOA 3 – Generally corresponding to the area covered by dense, low-altitude flight tracks, the outer edges of the traffic pattern area, a majority of noise complaint locations, and the FAA-defined wildlife attractant separation area. (The boundaries are squared off to follow established geographic boundaries.) This area is located outside of the 60 DNL contour and represents the balance of the AOA.[15]
    - o The AOA 3 boundary is also the airport influence area according to Arizona Revised Statutes §28-8485, Airport influence area.

AOA 1 and 2 represent the 65 and 60 DNL contours for IWA. Permitted and non-permitted land use regulations within these AOAs are established for zoning districts in Mesa and Gilbert. Zoning code adoption of the updated AOA and ALUCP recommendations are pending in Queen Creek. Zoning Ordinances can be referenced online via the communities' websites. The Airfield Overlay District and noise contours are illustrated in ***Figure 1-19: Airport Overlay District & Airport Noise Contours*.**

[15] Ricondo and Associates. (2017). *Airport Land Use Compatibility Plan Update* (Rep.).



Source: *Phoenix-Mesa Gateway Airport Land Use Compatibility Plan Update, January 2017.*

Figure 1-19: **Airport Overlay District & Noise Contours**

Existing Zoning

A review of the City of Mesa Interactive Planning and Zoning Map revealed that airport property is solely zoned as Light Industrial, which is an Employment District. Land within the Employment District is zoned to permit industrial land use and promote environments to create employment opportunities. The Mesa Zoning Ordinance passed August 28, 2017, by the City of Mesa details the light industrial subdistrict as providing areas for:

- ✓ Limited manufacturing and processing
- ✓ Wholesaling
- ✓ Researching
- ✓ Warehousing
- ✓ Distribution activities that take place within enclosed buildings with restricted accessory outdoor storage as needed to support the primary uses
- ✓ Full range of commercial activities. [16]

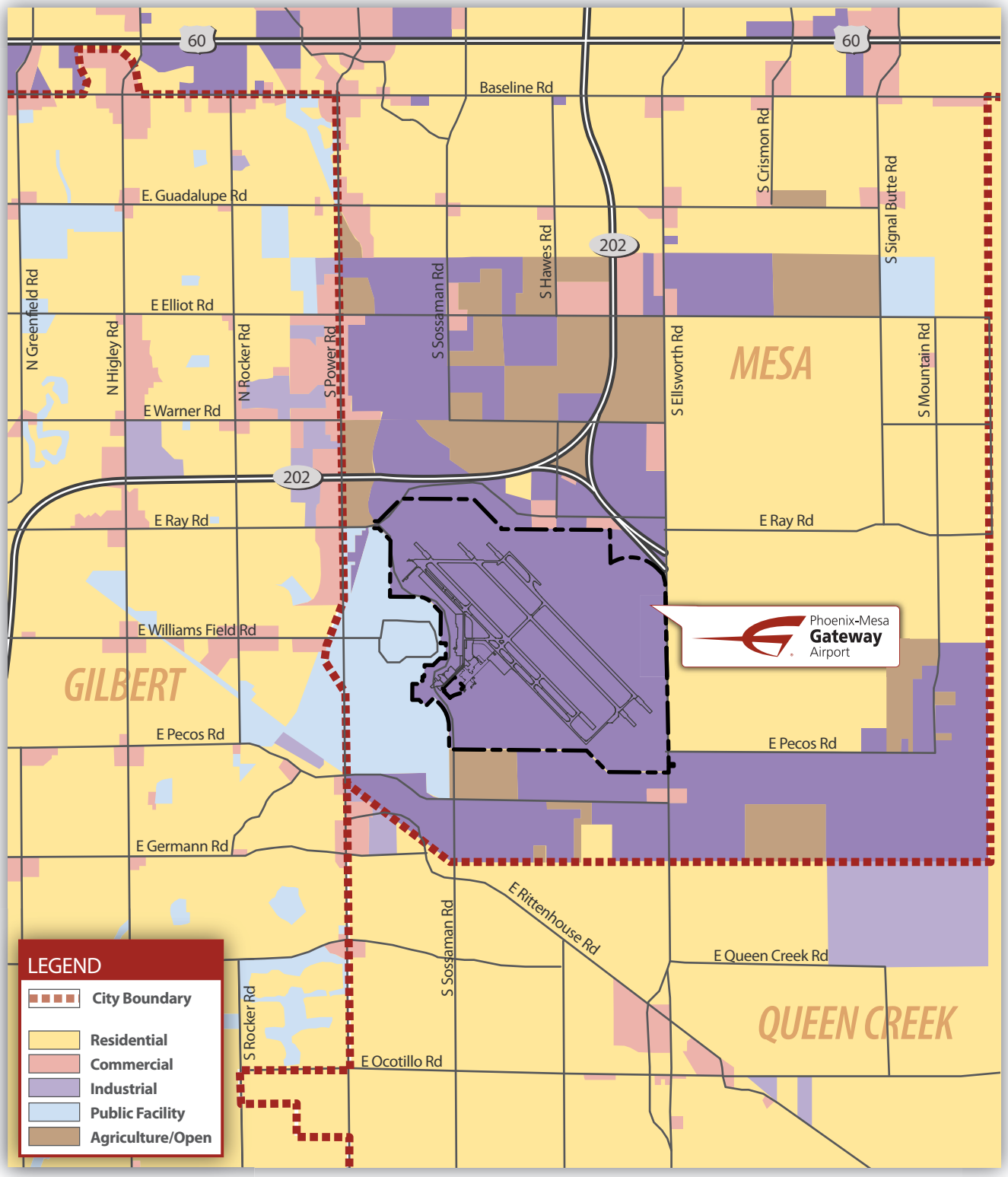
Figure 1-20: Generalized Existing Zoning illustrates the Generalized Existing Zoning of the Airport and surrounding area.

Land uses permitted within the light industrial zoning subdistrict encompass a range of industrial and employment activities. Airport land uses such as aircraft refueling stations, aircraft light maintenance, and airport related long-term parking lots are permitted. Heliports are allowed on a Special Use Permit basis. Light Industrial is also located north, northwest, and south of IWA.

Land west of the Airport is zoned as Public and Semi-Public. This zoning district accommodates and provides land for public utility, government, education, and recreational facilities and activities.[17] Land uses that generate congregations of people, including hospitals, schools, universities, and research facilities, are permitted given they are not within the RPZs or Airport Overflight Areas 1 or 2. Embry-Riddle Aeronautical University Phoenix-Mesa Campus, ASU, and CGCC are located immediately west of IWA and were established prior to the initiation of the Airfield Overlay District.

Located north of the Airport is a mixture of Agricultural, Limited Commercial, and Planned Employment Park Districts. A combination of Agricultural, General Industrial, Office Commercial, Neighborhood Commercial, and Residential Dwelling (43) Districts are located South of the Airport. East of the Airport, land is zoned as Planned Community. ***Table 1-7: Zoning in Mesa, Arizona*** details the surrounding districts. Many land uses within these areas are allowed given they are not located within RPZs or AOAs 1 or 2. Permitted uses of land within each district are listed in their respective chapter of the Mesa Zoning Ordinance. Certain uses are permitted regardless of their location and are mentioned within ***Table 1-7***.

[16] Mesa Zoning Ordinance, Chapter 7 (2018)
[17] Mesa Zoning Ordinance, Chapter 10 (2018)



Source: *Google Maps, 2018 Zoning Maps from the cities of Mesa, Gilbert & Queen Creek*

Figure 1-20 **Generalized Existing Zoning**

Table 1-7: Zoning in Mesa, Arizona

District	Purpose	Permitted Uses Despite Being in AOA 1 or AOA 2
Agricultural (AG)	To protect agricultural land and activities for local food sourcing and from urban encroachment/development.	Public parks and recreation facilities Minor utilities Community gardens Animal keeping
Limited Commercial (LC)	The LC district is a Commercial and Mixed-Use district with a purpose to provide for indoor retail, entertainment, and service-oriented businesses. LC districts, according to the zoning ordinance are designed to serve residential neighborhoods within a 10-mile radius.	Transportation passenger terminals Minor utilities Clubs and lodges Community centers Government and business offices Public parks and recreation facilities Financial institutions Restaurants with no outside eating areas General market Hotel and motels
Planned Employment Park (PEP)	As an Employment District, the purpose of the PEP District is to provide areas for professional, research, light manufacturing, and data processing shared areas accompanied by restaurants, retail, and other supportive establishments.	Government and business offices Public safety and maintenance facilities Financial Institutions Restaurants with no outside eating areas Labs Hotels and motels General retail stores Indoor warehousing and storage Transportation Passenger Terminals **Prohibited: Aircraft refueling stations, aircraft light maintenance, airport transit station, and airport related long-term parking lots**
General Industrial (GI)	The GI district is an Employment District with a purpose to provide space from residential areas for industrial businesses and activities including processing, assembly, research, storage.	Government offices Public safety and maintenance facilities Animal Sales and Services Labs Handicraft/Custom Manufacturing Small indoor collection facilities Warehousing and storage Research and development Outdoor storage Freight/truck terminals and warehouses **Prohibited: Aircraft refueling stations, aircraft light maintenance, airport transit station, and airport related long-term parking lots**

Office Commercial (OC)	As a Commercial and Mixed-Use District, the OC District is designed to accommodate small professional and medical offices that service the community.	Community gardens Government, medical, and dental offices Parks and recreation facilities Public safety facilities Financial Institutions Banquet and conference centers Business services Transportation passenger terminals Minor utilities
Neighborhood Commercial (NC)	As a Commercial and Mixed-Use district, the NC district is designed to provide areas for local retail and service use the surrounding residential area.	Community center Community gardens Public parks and recreation facilities Public safety facilities Banquet and conference center Business services and offices Restaurant with no designated outside eating area Transportation passenger terminals
Residential Dwelling 43 (RS-43)	RS-43 is a single residence residential district. According to the zoning ordinance, the purpose of the single residence zoning is to "provide areas for detached single residence housing at densities up to 7 units per net acre."[18] The 43 represents minimum lot size in thousands of square feet. Areas within this district are not solely for residential living.	Manufactures home subdivisions Community gardens Public parks and recreation facilities Minor utilities Accessory Uses and dwelling units
Planned Community (PC)	Property within the Planned Community district is zoned based on the Community Plan for that particular area while considering the purposes of the Planned Community District. The general purpose of the district is to provide for innovative and sustainable planned development.	

Source: Mesa Zoning Ordinance (2018)

Land west of the Airport in the Town of Gilbert adjacent to the city limits is primarily zoned as Commercial and Public/Quasi-Public. The Commercial district of Gilbert permits development of medium to large scale retail, commercial, recreation and entertainment use. The purpose of the Public Facility/Institutional district (a Public/Quasi-Public District) is to provide areas for utilities and public uses including libraries, golf courses, parks, hospitals, and schools. The Gateway District, an overlay district, is imposed over land adjacent to Mesa city limits. Within this overlay district, land is intended for high density residential, governmental, institutional, employment, and mass transit use. Land south of the Airport within the Town of Queen Creek is predominately zoned as residential districts of varying densities. Queen Creek also enforces a Phoenix-Mesa Gateway Airport Overlay District that establishes land use regulations within the AOAs. No portion of Queen Creek is within AOA 1 (65 DNL); however, the town does experience a considerable amount of overflight.

[18] Mesa Zoning Ordinance, Chapter 5 (2018)

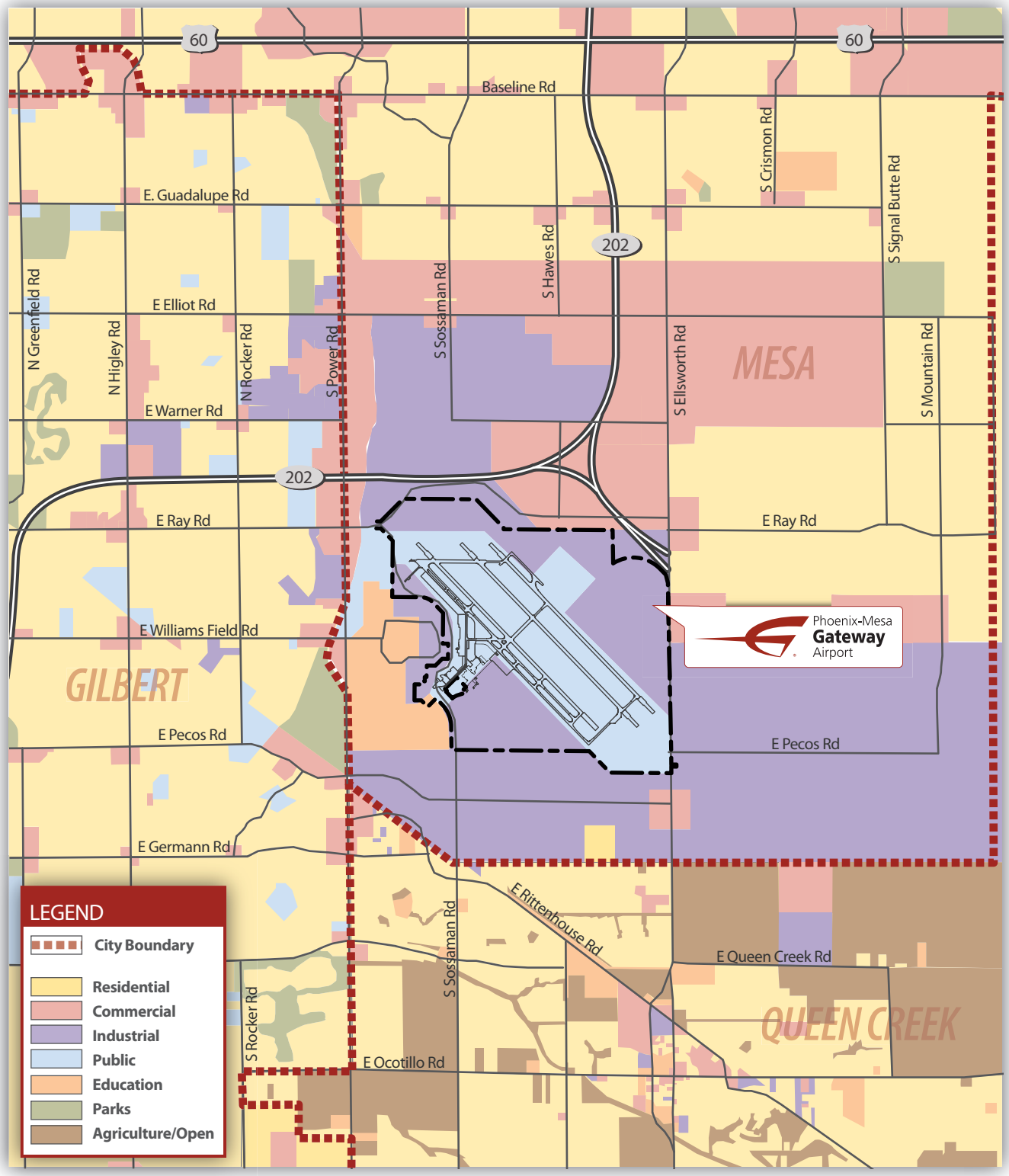
Existing Land Use and Future Land Use

Figure 1-21: Generalized Existing Land Use illustrates the generalized land use of airport property and the surrounding area. Land use and appertaining classifications are detailed in the following paragraphs.

City of Mesa

Residential and vacant land use account for the highest percentage of land in Mesa. The Airport is predominantly classified as transportation land use. Small sections of land located on the north and southeast portion of airport property are classified as vacant. The Airport is surrounded by vacant land use north, northwest, and northeast. A review of Google Maps revealed land six miles northeast of the Airport is characterized by a small cluster of residences surrounded by unoccupied land. Dairy farms, warehouses, airport parking, and a shopping plaza characterize the designated vacant land use area northwest of the Airport. South of the Airport is land designated as open space. West of the Airport is land classified as employment and open space. This area is primarily populated by college campuses. At this time, the City of Mesa and PMGAA are working together on a sub-area plan that will guide future land use in the surrounding area up to approximately 6 square miles.

Moving forward, rather than designating specific land uses per parcel, the Mesa 2040 General Plan strives to develop a sense of place easily recognized by citizens because of the activity, infrastructure, and character of and within an area. Nine character types have been established, including the Specialty District character type. The Airport is designated as a Specialty District, a classification for large areas with single use. Airports are a subtype of the Specialty District character type. Character types surrounding the Airport are Mixed Use Community to the east, Mixed Use Activity/Employment to the north, a sliver of Mixed-Use Activity to the west, and Employment east and south.



Source: *Google Maps, 2018 Land Use Maps from the cities of Mesa, Gilbert & Queen Creek*

Figure 1-21: **Generalized Existing Land Use**

Towns of Gilbert and Queen Creek

Land use in the towns of Gilbert and Queen Creek primarily follow the zoning in place. Land west of the Airport within the Town of Gilbert is classified as:

- ✓ Business park
- ✓ Residential (with high density)
- ✓ Shopping center
- ✓ Parks and recreation
- ✓ Village center

Located within these areas are residences, storage facilities, shopping centers, a hospital, an elementary and high school, and open areas. As in Mesa, Gilbert has established Character Areas that denote areas with unique characteristics or areas with the potential to evolve into such.

Current land use south of the Airport in Queen Creek is primarily Agriculture and Open Space and Residential. Throughout these areas are few scattered businesses, restaurants, and churches on land classified as Employment and Industrial Commercial. Future land use aims to use the open space and populate the area with increased residential use and industrial use.

Environmental Review

Environmental conditions must be considered during airport planning and the formulation of development alternatives to avoid or minimize potential environmental impacts. The following discussion briefly describes the environmental resources and potential impacts that are pertinent to IWA.

Noise

Noise is generally defined as unwanted sound. In 2000, IWA conducted a Code of Federal Regulations (CFR) Part 150 Study to determine land use compatibility and noise exposure in the Airport vicinity. CFR Part 150 identifies the 65 DNL noise contour as the threshold for determining land use compatibility. Schools, residences, churches, public health facilities, and concert facilities are sensitive to aircraft noise exposure and are considered incompatible land uses within the 65 or greater DNL contours. As part of the ALUCP, Ricondo and Associates[19] conducted a noise exposure analysis in July 2016 using the Aviation Environmental Design Tool, Version 2c, an FAA-approved noise model, to update the planning scenario noise contours. As presented earlier in ***Figure 1-19: Airport Overlay District & Airport Noise Contours,*** the noise contours are based on an annual service volume of 498,000 annual operations and were used for noise analysis in the master plan.

[19] In association with PM2

The 65 DNL contour is predominantly on airport property, partially expanding northwest and southeast of the Airport. No noise-sensitive land uses are located within the 65 DNL contour. The ALUCP categorizes land use in the AOAs as compatible, conditionally compatible, marginally compatible, or incompatible. For example, a residence, restaurant, and university can be classified as incompatible, conditionally compatible,[20] or marginally compatible[21] within the AOA. This ALUCP classification system applies only to new land uses or existing land uses undergoing maintenance, reconstruction or discontinuance. Noise attenuation requirements by the Mesa Zoning Ordinance are more restrictive, as follows[22]:

> A building permit shall not be issued for any structure requiring a Certificate of Occupancy or designed for habitation, within the Airfield Overlay District, until the plans and specifications accompanying the application for the building permit have been certified by a registered Professional Engineer or registered Professional Architect in the State of Arizona as demonstrating that indoor noise levels attributable to airport operations shall not exceed 45db for all portions of a structure where the public is received, office areas, public assembly rooms, sleeping areas, noise-sensitive areas and other areas where the ambient noise level is expected to be low. Plazas, courtyards, outside displays, covered/partially enclosed work areas, storage areas, loading bays, and similar areas are excluded.

ALUCP policies, as adopted by the communities, can also require fair disclosure agreements to home buyers or renters and avigation agreements, which have also been established in the Airfield Overlay District. A Public Airport Disclosure Map and Avigation Notice of airport activity have been recorded in Maricopa and Pinal Counties and are published on the Arizona Department of Real Estate's website in accordance with Arizona Revised Statutes.[23]

Air Quality

As required by the Clean Air Act, the Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants considered harmful to public health and the environment: Carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM; both 10 micron and 2.5 micron), and sulfur dioxide (SO_2). An attainment area is one in which air pollutants do not exceed the NAAQS. Nonattainment areas are those in which a pollutant exceeds the NAAQS. A maintenance area is defined as an area in which a prior exceedance occurred, but the area now achieves the standards. Maricopa County has an Air Monitoring Division that operates air quality monitoring sites and a mobile air monitoring program to measure all criteria pollutants. The county is designated as a non-attainment area for PM_{10} and 8-hour O_3, and as a maintenance area for CO.

[20] The ALUCP defines a conditionally compatible land use as one that should be allowed subject to stated conditions.
[21] The ALUCP defines a marginally compatible land use as one that should be allowed subject to the stated outdoor-to-indoor noise level reduction and other conditions.
[22] Mesa Zoning Ordinance, Chapter 19 (2018)
[23] Territory in the Vicinity of a Public Airport, § 28-8486 (1999).

Future projects at airports in non-attainment areas may need to be accounted for in the State Implementation Plan and/or be shown not to exceed the applicable de minimis levels as defined by General Conformity. Conformity requirements are addressed in Section 176(c)(1) of the Clean Air Act. These requirements are intended to ensure that the federal government does not take, approve, or support actions that are inconsistent with a state's plan to attain and maintain NAAQS. All construction and operational projects will adhere to state and federal law and all contractors will be required to obtain all required air quality permits to mitigate against any adverse air quality issues from heavy equipment pollutant emissions, fugitive dust resulting from the movement of earth for cut and fill, any open burning that may occur on the Airport, and the operation of concrete batch plants. Contractors would be required to comply with all local, state, and federal air quality regulations, especially the procedures contained in the FAA's AC 150/5370-10A, *Standards for Specifying Construction of Airports*, which contains the FAA's guidance to airport sponsors concerning protection of the environment during construction projects. PMGAA has a Non-Title V Air Quality Permit to Operate and/or Construct (Permit # 020111).

Water Quality

Airport activities such as airport development, aircraft washing, deicing, fueling, and maintenance can affect water quality. During a storm, water can pick up residual materials associated with these activities from runways, taxiways, aprons, parking lots, fuel storage facilities, and access roads. The residual material can be carried through drainage channels and off airport property to affect surface water, ground water, and local lakes, ponds, or streams. As part of the Clean Water Act (CWA), state and federal laws and regulations have been established to prevent extensive stormwater pollution. Water pollution is regulated by the National Pollutant Discharge Elimination System (NPDES) permit program by controlling sources that discharge into waters of the United States.

IWA is located in the Gila/Queen Creek subwatershed of the Middle Gila watershed. The Gila/Queen Creek subwatershed covers 1,307 square miles in Maricopa County, including the Airport, and part of Pinal County. North and northwest of the Airport are the Powerline Floodway and East Maricopa Floodway. Drainage from the detention basins at the Airport is directed to the Powerline Floodway and Rittenhouse Channels. Both are considered receiving waters and drain to the East Maricopa Floodway, which then drains to the Gila River. Surface water is primarily collected by an underground drainage system. There are no impaired waters within the immediate vicinity of the Airport. A sewer line in Sossaman Road transports the Airport wastewater to a treatment facility at the Southeast Water Reclamation Plant.

The Airport is equipped with a Multi Sector General Permit (MSGP), S-Sector, for Air Transportation Facilities, and a Stormwater Pollution Prevention Plan (SWPPP) that was finalized in May 2011, and was recently updated in 2019. All tenants are required to adhere to the Stormwater Control Measures within the SWPPP. According the SWPPP, stormwater at the Airport can accumulate anywhere, but primarily accumulates within the stormwater basins located in the northeastern and southeastern section of airfield property. Stormwater drains from the Airport through several sewers and outfalls to the Powerline and East Maricopa Floodway. The East Maricopa Powerline is typically dry except during periods of

stormwater runoff. The Airport is responsible for containing and/or diverting any oil discharge from airport operations into navigable waters and performs a visual inspection to monitor conditions. All water that flows into the areas surrounding the fuel farm drains to a 4,000-gallon oil/water separator.

Historical, Architectural, and Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the impacts of their undertakings on historic property, which includes archeological sites, buildings, structures, objects, and districts. The NHPA also requires federal agencies to allow the Advisory Council of Historic Preservation the opportunity to comment on the undertaking. The National Park Service (NPS) maintains the National Register of Historic Places (NRHP), which lists all historic sites that meet identified criteria.

The NRHP identifies one historic property at the airport: the Demountable Hangar (S-46) is located on the northern side of the airfield adjacent to the Gateway Aviation Center. The hangar was constructed at Williams Air Force Base in 1942 by the Del E. Webb Construction Company and designed by the Army Corps of Engineers. The Demountable Hangar (S-46) was added to the NRHP in June of 1995. In May of 2018, the *Nineteenth Annual Report of Historic Properties at the Phoenix-Mesa Gateway Airport* was published detailing the management of historic properties at the Airport by the PMGAA from October 1, 2016, to September 30, 2017. In the report, four hangars on airport property (Hangars S-24, S-31, S-32, and T-37) were determined eligible for the NRHP.[24] They are not identified on the NRHP. Hangars S-24 and T-37 were approved for demolition by the State Historic Preservation Office (SHPO) but have not been demolished and are intact. The SHPO is responsible for the Arizona database of historic places and cultural resources.[25]

Two archaeological sites were identified on Airport property as eligible for the NRHP: Midvale Archeology Site and Archeological Site No. AZ U:10:25 (ASU). Two areas of the Midvale Archeology Site that have been heavily disturbed extend onto airport property. Testing of the sites proved no archaeological features were present below the surface. Upon testing of the Archeological Site No. AZ U:10:25 (ASU) in 1994, three sets of human remains and a cremation pit were found. According to the *Nineteenth Annual Report of Historic Properties at the Phoenix-Mesa Gateway Airport*, "all disturbed human remains were returned to the cremation pit" inside a trench the pit was found in and was backfilled. Later, according to the *Nineteenth Annual Report of Historic Properties at the Phoenix-Mesa Gateway Airport*, "two inhumation burials were discovered, excavated, and repatriated to the Gila River Indian Community."[26]

[24] Phoenix-Mesa Gateway Airport Authority, SWCA Environmental Consultants. (2018). *Nineteenth Annual Report of Historic Properties at the Phoenix-Mesa Gateway Airport*.
[25] Ibid.
[26] Ibid.

Seven NRHP-listed historic structures are located within approximately 2 miles of the Airport. All are of local significance and were constructed by Del E Webb Construction Company in the year span of 1941-1942. The seven historic structures identified as historic resources of former Williams Air Force Base are listed below:

- ✓ Flagpole (S-100) 1.3 miles west
- ✓ Water Pump Station and Water Tower (S-715; Two structures) 1.0 mile west
- ✓ Housing Storage Supply Warehouse (S-726) 1.2 miles west
- ✓ Civil Engineering Maintenance Shop (S-735) 1.0 mile west
- ✓ Ammo Bunker (S-1007) 1.7 miles west
- ✓ Ammo Bunker (S-1008) 1.7 miles west

As part of NEPA-level assessments for individual projects, further consultation with the SHPO and Tribal Historic Preservation Office (THPO) will be required to identify potential impacts to these resources.

Section 4(f) Property

According to Section 4(f) of the Department of Transportation Act (re-codified as 49 USC, Subtitle I, Section 303), "no publicly owned park, recreation area, wildlife or waterfowl refuge, or land of historic site that is of national, state or local significance shall be used, acquired, or affected by programs or projects requiring federal assistance for implementation unless there is no feasible or prudent alternative."

No designated wildlife preserves are located within the airport vicinity. The nearest public park, Monterey Park, is located approximately 5.6 miles north of IWA.

The Gila River Indian Community owns and operates the Toka Sticks Golf Course that is located immediately west of the Airport and south of East Ray Road. As discussed in the previous section, 14 NHRP-listed or eligible resources are present on or near the Airport.

Protected 4(f) properties may also include places of traditional religious and cultural importance to a Native American tribe. No known protected Native American tribe sites occur in the immediate vicinity of the Airport. The Gila River Indian Community is 28 miles southwest of the Airport, and the Salt River Reservation is 28 miles northwest of the Airport.

Consultation with the SHPO and THPO is required to identify, avoid, and minimize potential impacts to Section 4(f) resources. However, no Section 4(f) resources are anticipated to be affected by future development projects identified in this Master Plan.

Farmland

The Farmland Protection and Policy Act (FPPA), administered by the US Department of Agriculture (USDA), was enacted to minimize the conversion of prime and unique farmland to non-agriculture by urban development and projects involving federal agencies. Prime farmland, as defined by the FPPA, is "farmland that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops."[27] The FPPA defines unique farmland as "farmland other than prime farmland which is used for production of specific high-volume food and fiber crops."[28] Unique farmland, according to the FFPA, "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."[29] FPPA requires federal programs to comply with state, local, and private programs and policies dedicated to the protection of farmlands.

According to the Natural Resources Conservation Service Web Soil Survey Data Explorer reviewed in June 2018, IWA property is mostly classified as prime farmland, if irrigated. The FPPA exempts farmlands "already in or committed to urban development… [including] lands identified as 'urbanized area' on the Census Bureau Map." According to the 2010 Census Urbanized Area Reference Map, the airport is included in the urbanized area associated with Phoenix-Mesa, Arizona; therefore, the farmland at the Airport is exempt from the FPPA.

Threatened and Endangered Species

The Endangered Species Act, as amended, requires each "Federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species."[30] Threatened species are those likely to become endangered. Endangered species are those in danger of extinction. The U.S. Fish and Wildlife Service (USFWS) is responsible for listing threatened and endangered species and has listed the Yellow-billed Cuckoo (*Coccyzus americanus)* and Mexican spotted owl (*Strix occidentalis lucida)* as threatened for Maricopa County[31].

[27] USDA. (2012, August). *Part 523 – Farmland Protection Policy Act Manual* [PDF]. Retrieved June 2018, from https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1049284.pdf
[28] Ibid.
[29] Ibid.
[30] U.S. Fish and Wildlife Service. (2003, November 24). *Endangered Species Act of 1973*[PDF]. Department of the Interior. Retrieved June 2018, from https://www.fws.gov/endangered/esa-library/pdf/ESAall.pdf
[31] Environmental Conservation Online System [Advertisement]. (n.d.). Retrieved June 2018, from https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=04013

The USFWS lists the following species as endangered[32]:

- ✓ Yuma clapper rail (*Rallus longirostris yumanensis)*
- ✓ California least tern (*Sterna antillarum browni)*
- ✓ Southwestern willow flycatcher (*Empidonax traillii extimus)*
- ✓ Colorado pike minnow (*Ptychochelius lucius*), formerly squawfish
- ✓ Gila topminnow (*Poeciliopsis occidentalis*), including Yaqui
- ✓ Desert pupfish (*Cyprinodon macularius)*
- ✓ Razorback sucker (*Xyrauchen texanus)*
- ✓ Spikedace (*Meda fulgida)*
- ✓ Acuna Cactus (*Echinomastus erectocentrus var. acunesis)*
- ✓ Nichol's Turk's head cactus (*Echinocactus horizonthalonius var. nicholii)*
- ✓ Arizona hedgehog cactus (*Echinocereus triglochidiatus var. arizonicus)*
- ✓ Arizona Cliffrose (*Purshia subintegra)*
- ✓ Sonoran pronghorn (*Antilocapra americana sonoriensis)*
- ✓ Ocelot (*Leopardus paradis)*

Though the bald eagle was removed from the federal list of threatened and endangered species in August of 2007, the species is still protected under the Bald and Golden Eagle Protection Act. The USFWS has issued a recovery status for bald eagles in Maricopa County. Other recovery status species for Maricopa County include: the American peregrine falcon (*Falco peregrinus anatum*), the Brown pelican (*pelecanus occidentalis*), the California least tern (*Sterna antillarum browni)*, and the Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae)*.[33]

A fourth status is identified for Maricopa County species: Experimental Population, Non-Essential. Section 10 of the Endangered Species Act, titled Exceptions, defines Experimental Population as "any population (including offspring arising solely therefrom) authorized by the Secretary for release under paragraph (2), but only when and at such times as, the population is wholly separate geographically from nonexperimental populations of the same species."[34] Paragraph two of section 10(j) states, "The secretary may authorize the release (and related transportation) of any population (including eggs, propagules, or individuals) of an endangered species or a threatened species outside the current range of such species."[35] The nonessential designation pertains to species that are not essential to the continued existence. The woundfin (*Plagopterus argentissimus*) is solely listed as Experimental population, non-essential for Maricopa County[36]. The Colorado pikeminnow (*Ptychochelius lucius)* and Sonoran pronghorn (*Antilocapra americana sonoriensis)* are listed as endangered and experimental population, non-essential.[37]

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[32] Ibid
[33] Ibid.
[34] ENDANGERED SPECIES ACT OF 1973, § 10 (1973).
[35] Ibid.
[36] Environmental Conservation Online System [Advertisement]. (n.d.). Retrieved June 2018, from https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=04013
[37] Ibid.

The Information for Planning and Consultation (IPAC) tool lists USFWS endangered and threatened species that may be impacted by activities at a specific site location. IPAC lists the California least tern (*Sterna antillarum browni)* and yellow-billed cuckoo (*Coccyzus americanus*) as endangered species identified in the immediate airport vicinity.[38] Migratory birds that warrant special concern/attention or are on the USFWS Birds of Conservation Concern for the immediate vicinity of the Airport are as follows[39]:

- ✓ Bald eagle (*Haliaeetus leucocephalus*)
- ✓ Bendire's thrasher (*Toxostoma bendirel*)
- ✓ Burrowing owl (*Athene cunicularia)*
- ✓ Gila woodpecker (*Melanerpes uropygialis)*
- ✓ Lawrence's goldfinch (*Carduelis lawrenci)*
- ✓ Rufous hummingbird (*Selasphorus rufus)*

Floodplains

Executive Order 11988, Floodplain Management, requires federal agencies to avoid, to the extent possible, indirect and direct short and long-term impacts to floodplains. As part of the National Flood Insurance Program, the Federal Emergency Management Agency (FEMA) produces Flood Insurance Rate Maps (FIRM), which depict Special Flood Hazard Areas (SFHA). FEMA distinguishes SFHAs as those that will be inundated by the base flood, or the flood event having a 1-percent chance of being equaled or exceeded in any given year.

Airport property is located in a floodplain classified as Zone D, which is an area where flood hazards are undetermined, but possible. Land located north, northwest, south, and southeast of the airfield is designated as having a 0.2 percent annual chance of flooding (Shaded Zone X). A retention canal located approximately 1 mile west of the airfield is designated as Zone A. SFHA Zone A has no based flood elevation but has a 1-percent annual chance of flooding.[40]

Hazardous Material, Pollution Prevention, and Solid Waste

The handling and disposal of hazardous materials, chemicals, substances, and wastes are primarily governed by the following laws:

- ✓ Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (as amended by the Superfund Amendments and Reauthorization Act of 1986 and the Community Environmental Response Facilitation Act of 1992)
- ✓ Pollution Prevention Act of 1990
- ✓ Toxic Substances Control Act of 1976 (TSCA), as amended

[38] U.S. Fish & Wildlife Service. (n.d.). *Endangered Species and Migratory Birds*. Retrieved June 2018, from https://ecos.fws.gov/ipac/location/OWUQZCX6NZAHFHYEBLX6OFY56E/resources.
[39] Ibid.
40 FEMA. (n.d.). *FEMA Flood Map Service Center*. Retrieved June 2018, from https://msc.fema.gov/portal/search?AddressQuery=6055%20s%20sossaman%20road%20mesa%2C%20az#searchresultsanchor

- ✓ The Resource Conservation and Recovery Act of 1976 (RCRA) (as amended by the Solid Waste Disposal Act of 1980 [SWDA]), the Hazardous and Solid Waste Amendment of 1984, and the Federal Facility Compliance Act of 1992 (FFCA).

The first and last statutes are of most importance to the FAA in proposing actions that could affect or be affected by hazardous materials, pollution, and solid waste.

RCRAInfo is a comprehensive information system that provides an inventory of waste handlers and their activities. RCRA requires those generating, storing, disposing, and transporting hazardous waste to disclose information regarding their activities to state environmental agencies. The Airport and several businesses operating on airport property have been identified as hazardous waste generators with the following handler types:

- ✓ Large quantity generator
- ✓ Conditionally exempt small quantity generator
- ✓ Small quantity generator
- ✓ Not in a universe (not currently classified in any hazardous waste universe)
- ✓ Superfund

While operating as the Williams Air Force Base from 1941 to 1993, 12 million gallons of jet fuel were released to an aquifer that served as a protected drinking water source[41]. Due to the discharge and disposal activities during the time, the soil and groundwater also became contaminated. As a result, portions of the former base were designated as a Superfund site and included on the National Priorities List (NPL). Extensive cleanup and maintenance operations by the United States Air Force via a Federal Facilities Agreement with the EPA, Arizona Department of Environmental Quality, and the Arizona Department of Water Resources were initiated in 1988 and are currently ongoing. As of 2018, more than 3,800 acres have been designated for reuse.[42]

Construction activities can generate hazardous wastes, and some construction materials constitute hazardous substances. These include fuel, oil, lubricants, paints, solvents, concrete-curing compounds, fertilizers, herbicides, and pesticides. Proper practices should be implemented to prevent or minimize the potential for these hazardous substances to be released into the environment. Chemicals, petroleum-based products, and waste materials, including solid and liquid waste, should be stored in areas specifically designed to prevent discharge into stormwater runoff. Areas used for storage of toxic materials should be designed with full enclosure in mind, such as the establishment of a dike around the perimeter of the storage area. Construction equipment maintenance should be performed in a designated area and control measures, such as drip pans to contain petroleum products, should be

[41] U.S. EPA. (n.d.). *Williams Air Force Base Chandler, AZ*. Retrieved June 2018, from https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0900890.
[42] Ibid.

implemented. Spills should be cleaned up immediately and disposed of properly.

As part of this Master Plan, IWA will undertake a waste study to identify or review the following data:

- ✓ Airport Recycling, Reuse, and Waste Reduction Plan (if available)
- ✓ Airport waste
- ✓ Waste management agreements
- ✓ Infrastructure available for waste collection in the community.

Based on the findings of this study, Mead & Hunt will present recommendations that could potentially aid in waste reduction and landfill diversion.

Socioeconomic, Environmental Justice, Children's Health and Safety Risks

Environmental justice is a public policy with the goal of promoting the fair treatment and meaningful involvement of all people in the decision-making process. To satisfy this goal, minority and low-income populations must receive an equitable distribution of the benefits of a project without suffering disproportionate adverse impacts. An environmental justice evaluation is undertaken to determine whether the proposed action would result in an inequitable distribution of negative effects to minority, special ethnicity, or low-income populations. Environmental justice is examined during evaluation of other impact categories, such as noise, air quality, water, hazardous materials, and cultural resources. This analysis complies with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* and the Department of Transportation (DOT) Order 5610.2, *Order to Address Environmental Justice in Minority Populations and Low-Income Populations.* According to DOT Order 5610.2, a disproportionately adverse impact is defined as one that is:

- ✓ Predominantly borne by a minority population and/or low-income population; or
- ✓ Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or low-income population.

DOT Order 5610.2 also states that any disproportionate impacts on these populations should be avoided, if practicable, unless the avoidance of these impacts would result in other significant impacts to social, economic, or environmental resources.

According to the American Community Survey (2012-2016), Mesa has a population of approximately 470,456, Queen Creek has a population of 30,849, and Gilbert has a population of 226,832. According to Census Tract 5228 that contains the Airport and the immediate surrounding community, there is an estimated population of 1,251 people. Of that population, 19.4 percent is minority.[43] Population, racial, and housing statistics are shown in the ***Table 1-8: Statistics of Mesa and Surrounding Communities.***

Table 1-8: Statistics of Mesa and Surrounding Communities

Category	Mesa	Queen Creek	Gilbert
Population	**470,456**	**30,849**	**226,832**
Male	231,917	15,679	110,907
Female	238,539	15,170	115,925
Race			
One Race	**456,769**	**30,191**	**218,314**
White	398,554	27,082	189,933
Black or African American	16,695	799	6,810
American Indian and Alaska Native	10,261	293	2,034
Asian	9,196	777	14,003
Native Hawaiian and Other Pacific Islander	1,643	39	466
Other	20,420	1,201	5,068
Two or more races	**13,687**	**658**	**8,518**
White and Black or African American	3,268	80	2,752
White and American Indian and Alaska Native	3,004	54	1,178
White and Asian	2,691	261	2,109
Black or African American and American Indian and Alaska Native	272	0	144
Hispanic or Latino	**127,274**	**5,059**	**36,320**
Mexican	110,838	3,376	29,000
Puerto Rican	3,260	490	1,513
Cuban	666	34	392
Other Hispanic or Latino	12,510	1,159	5,415
Total Housing Units	**204,833**	**10,545**	**77,444**
Occupied housing units	172,705	9,146	71,903
Families Below Poverty Total (percentage)	**12.2%**	**--**	**--**
Population for whom poverty status is determined (percentage)	**--**	**7.85%**	**6.17%**

Source: Census American Community Survey (2012-2016)

FAA Order 1050.1F states "Pursuant to Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, federal agencies are directed, as appropriate and consistent with the agency's mission, to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. The FAA is encouraged to identify and assess

[43] U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates. Retrieved June 2018, from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_17_5YR_B02001&prodType=table

environmental health risks and safety risks that the agency has reason to believe could disproportionately affect children. Environmental health risks and safety risks include risks to health or safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to."[44]

The nearest school, Legacy Traditional School – Gilbert, is located 3.1 miles west of the Airport. According to the Census American Community Survey (2012-2016), 24.3 percent of Mesa, 38.4 percent of Queen Creek, and 31.4 percent of Gilbert are under the age of 18.[45]

Issues Summary

On April 24, 2018, the Master Plan Team conducted a workshop to gather a comprehensive understanding of development challenges faced by the Airport. Data obtained during the workshop was summarized in a list of improvement goals that will be considered during the development and analysis of the Master Plan's improvement alternatives. The developed goals of the Master Plan will include recommendations that:

- ✓ Maximize the safety and efficiency for the use of the aircraft operational areas and comply with FAA guidance.
- ✓ Consider the significant amount of airport property that can be developed and marketable for development. The Master Plan will identify a development program that makes efficient use of airport land for aviation, aviation/airport support, and non-aeronautical facilities to maximize the potential for revenue generation.
- ✓ Consider the layout of the airfield based upon the demands related to existing and all potential future aircraft types that could regularly operate at the Airport. This includes consideration of all safety and object clearing standards, and current FAA configuration guidance.
- ✓ Consider passenger terminal improvements that are scalable and flexible in their ability to accommodate potential demands. Recommendations will be tied to trigger points that tie improvements to passenger activity levels.
- ✓ Consider comprehensive improvements for landside facilities (e.g. ATCT, ARFF, fuel storage and delivery, storage hangars, maintenance hangars, air cargo facilities, etc.).
- ✓ Continue to work with the surrounding communities to promote land use compatibility initiatives that minimize the potential for negative impacts, without restricting potential airport improvements and increased activity.

[44] FAA. (2015, July). Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks. Retrieved June 2018, from https://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/policy/faa_nepa_order/desk_ref/media/12-socioecon-enviro.pdf.

[45] U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates: Population Under 18 Years. Retrieved June 2018, from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_17_5YR_B09001&prodType=table

- ✓ Promote a Capital Improvement Plan that provides financial sustainability, anticipates reasonable levels of expense and income, and balances facility improvements and infrastructure recommendations with revenues and funding sources.
- ✓ Consider the additional passenger transportation modes (i.e., Lyft, Rideshare, and other transportation network companies) in the development of the future terminal improvement program.
- ✓ Recognize environmental development constraints and appropriately consider the constraints in improvement recommendations.

CHAPTER 2
AVIATION ACTIVITY FORECASTS

Introduction

Aviation activity forecast development is important in airport master planning because the forecasts serve as the basis for determining future airport capacity needs and facility development plans. This chapter presents forecasts of aviation activity at Phoenix-Mesa Gateway Airport (IWA) for a 20-year period through 2038. Aviation activity at the airport includes commercial passenger service, general aviation (GA), and military operations. The chapter discussion is organized into these sections:

- ✓ Airport service area
- ✓ Commercial passenger traffic
- ✓ Noncommercial aviation activity
- ✓ Sources of forecast risk and uncertainty
- ✓ Summary

Forecast development involved a comprehensive process consisting of these four steps:

- ✓ Analysis of the airport's business environment
- ✓ Analysis of the airport's historical activity trends
- ✓ Assessment of future air service development possibilities
- ✓ Forecast development and risk assessment

This chapter documents the details of this comprehensive forecast development process and presents three planning scenarios: Master Plan Base Growth, Low Growth, and High Growth. The Master Plan Base Growth and Low Growth forecasts include only commercial passenger service and noncommercial aviation activity because IWA currently has no air cargo service. The High Growth scenario includes SkyBridge Arizona's plans to begin and ramp-up all air-cargo carrier service at IWA during the planning horizon of this master plan as part of their 636.5-acre development on IWA airport property. SkyBridge Arizona's fleet and facility projections include utilization of Boeing 747-400 and 767-300 freighters and will be the first air cargo hub to house both U.S. & Mexico Customs inspection services.[1]

[1] See *SkyBridge Arizona Concept Master Plan, Final Document Draft*, September 2018.

The designated Master Plan Base Growth forecasts compare closely to the most recent Federal Aviation Administration (FAA) Terminal Area Forecasts (TAF) for the airport:

- ✓ Forecast enplanements are no more than 10 percent above the TAF for the first 5 years and no more than 11 percent above the TAF beyond 5 years through 2038.
- ✓ Forecast commercial passenger aircraft operations are no more than 7 percent below the TAF for the first 5 years and no more than 9 percent below the TAF beyond 5 years through 2038.
- ✓ Forecast noncommercial operations (GA and military) are no more than 2 percent above the TAF for the first 5 years and no more than 10 percent above the TAF beyond 5 years through 2038.
- ✓ Forecast total aircraft operations (commercial and noncommercial) are no more than 2 percent above the TAF for the first 5 years and are no more than 9 percent beyond 5 years through 2038.

They all meet the FAA's approval threshold of a 10 percent difference for the first five years and a 15 percent difference beyond five years.

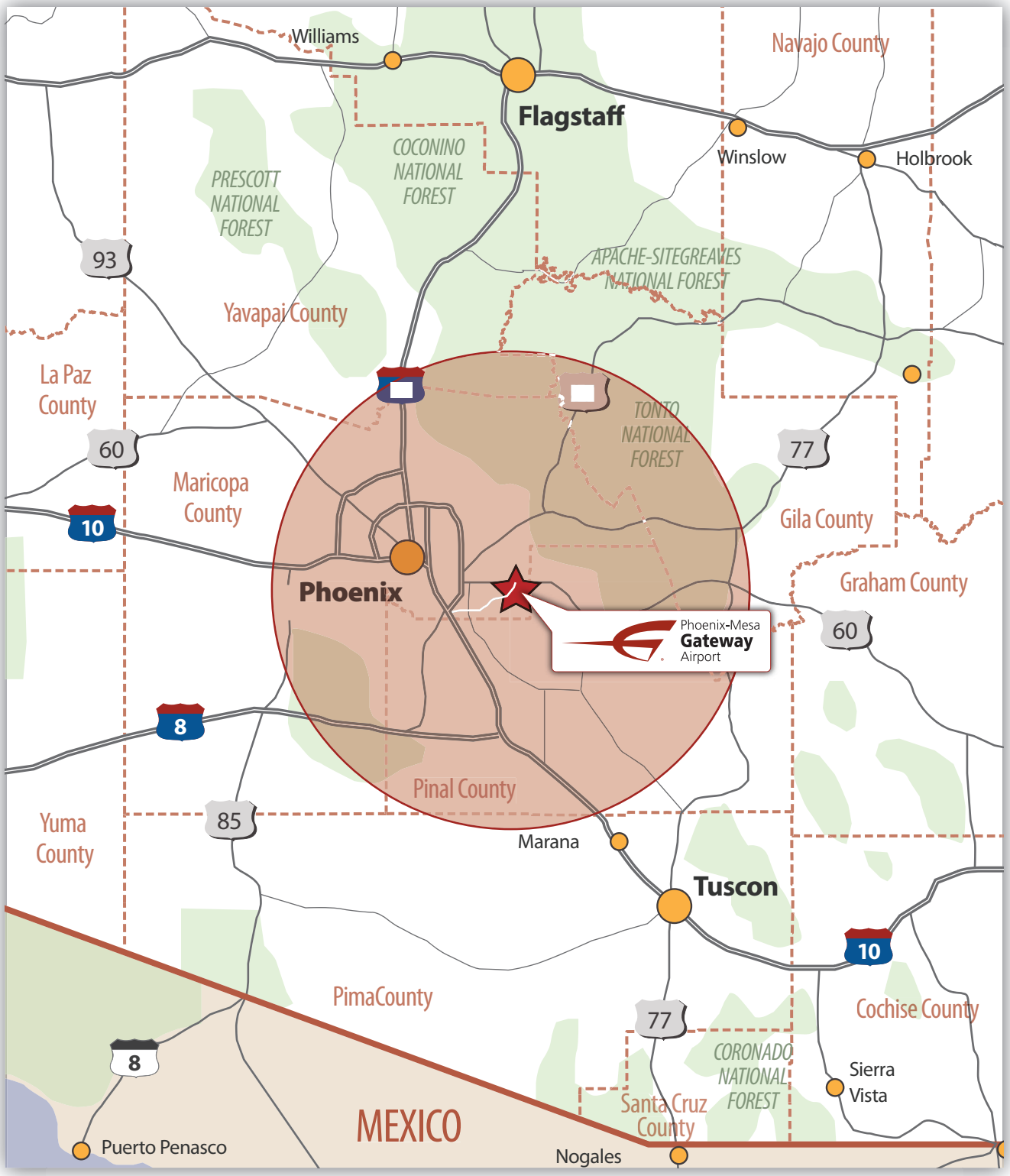
Like the TAF, this chapter presents unconstrained forecasts of aviation activity driven by growth in market demand factors, assuming the Phoenix-Mesa Gateway Airport Authority (PMGAA) will continue efforts to:

- ✓ Maintain and develop air service.
- ✓ Undertake airport capital development as needed to accommodate forecast growth in aviation activity.

Airport Service Area

Three factors delineate the boundaries of the service area of an airport: the airport location, the location of other airports, and highway accessibility. The 2009 *Airport Master Plan for Phoenix-Mesa Gateway Airport, Final Report* (2009 Master Plan) presents an approximate commercial passenger service area for IWA that corresponds to the area within a 60-mile radius as shown in ***Figure 2-1: Area Within a 60-Mile Radius from Phoenix-Mesa Gateway Airport***. This area encompasses most of Pinal County and Maricopa County in Arizona. These two counties comprise the Phoenix-Mesa-Scottsdale, Arizona, Metropolitan Statistical Area (Phoenix MSA),[2] a service area shared with Phoenix Sky Harbor International Airport (PHX).

[2] Metropolitan and micropolitan statistical areas (also referred to as metro and micro areas) are delineated by the Office of Management and Budget for the production and dissemination of federal statistical data. Each metro or micro area consists of one or more whole counties, and includes the counties containing a core urban area and any adjacent counties with a high degree of social and economic integration (measured by commuting to work) with the urban core.



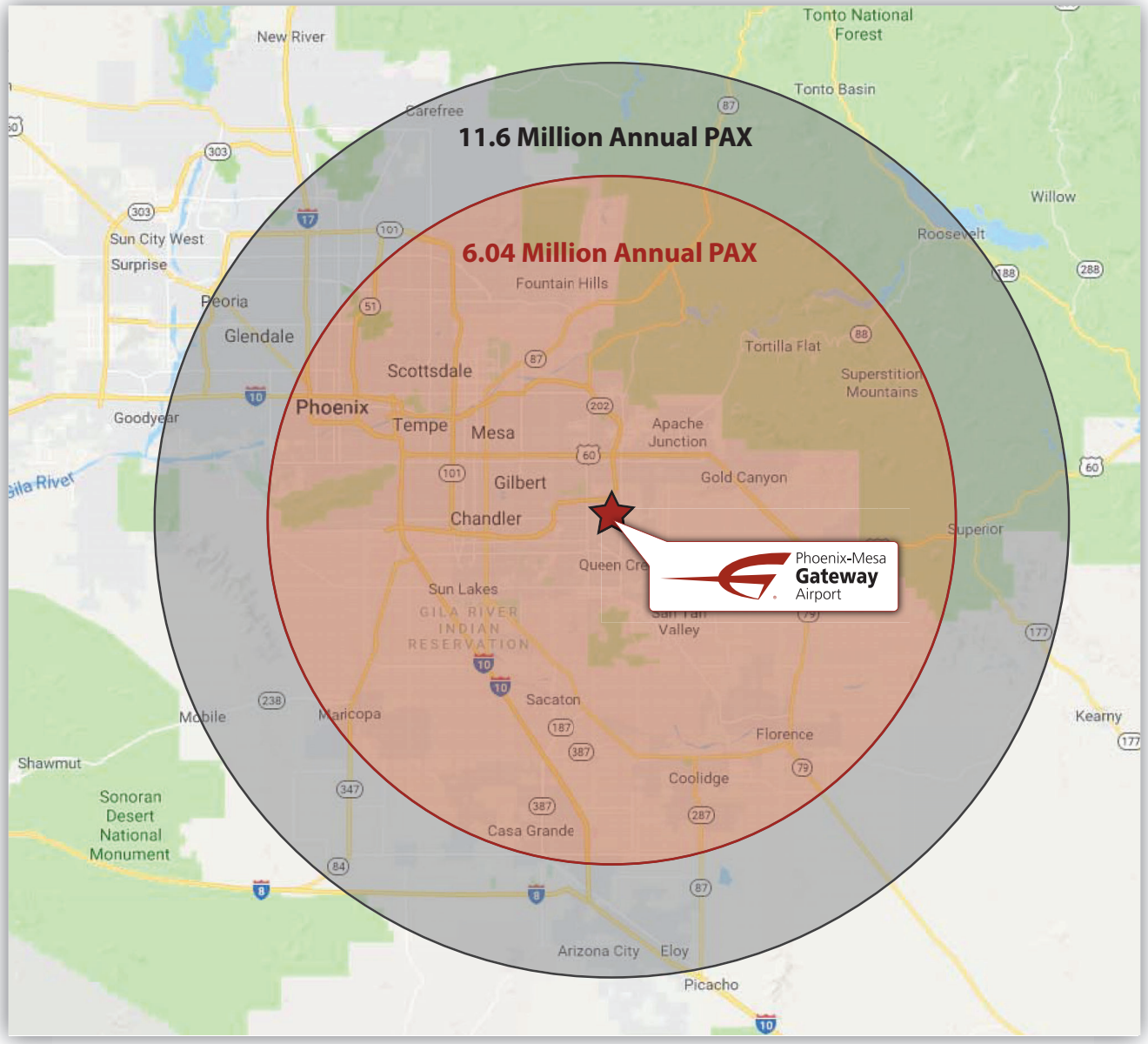
Source: *Google Maps, 2018*

Figure 2-1: **Area Within a 60-Mile Radius from Phoenix-Mesa Gateway Airport**

The March 2016 *Mesa Gateway Airport Market Assessment Analysis* (2016 Market Analysis) defines a core catchment area within a 30-mile radius of IWA and a total catchment area within a 50-mile radius, smaller than the 60-mile service area defined in the 2009 Master Plan. ***Figure 2-2: Catchment Area*** shows the core and total catchment areas for IWA defined in the 2016 Market Analysis.

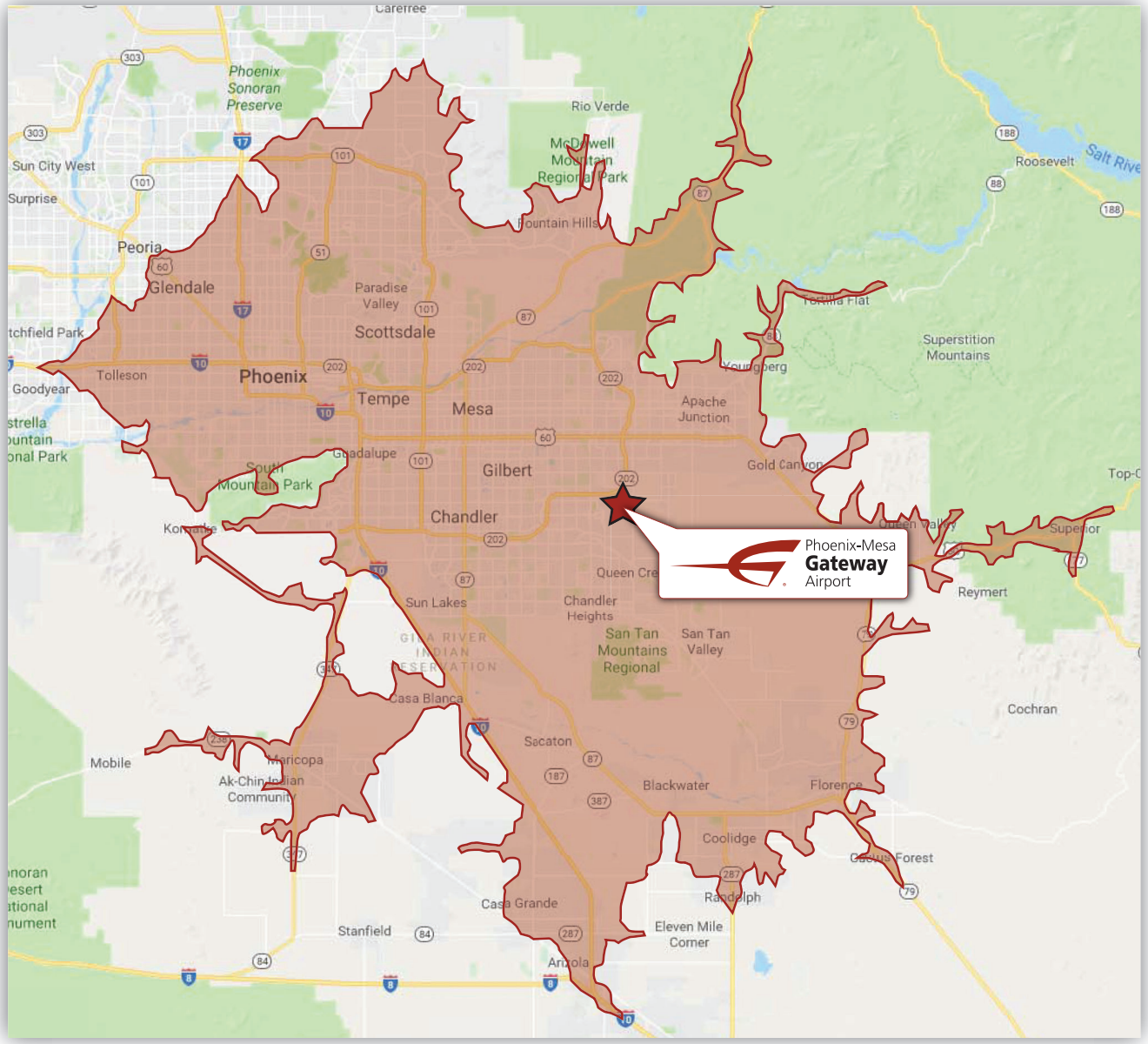
Figure 2-3: 1-Hour Drive Area from Phoenix-Mesa Gateway Airport accounts for the highway network and delineates an area within a 1-hour drive from IWA. This area also covers most of the Phoenix MSA. IWA shares this service area with PHX. ***Figure 2-4: 30-Minute Drive Areas from Phoenix-Mesa Gateway Airport and Phoenix-Sky Harbor International Airport*** shows the areas within a 30-minute drive of PHX and IWA. The two areas overlap, as indicated by the darker-shaded area. IWA and PHX are about 31 miles apart (about a 35-minute drive). In addition, the completion of State Route 202 will place additional areas of the western portion of the Phoenix metropolitan area within the drive area of IWA.

Tucson International Airport (TUS) in Pima County, Arizona, is the next closest commercial passenger service airport to IWA. TUS is 110 miles from IWA, a 2-hour drive. As shown in ***Figure 2-5: 1-Hour Drive Areas from Phoenix-Mesa Gateway Airport and Tucson International Airport***, the 1-hour drive areas from IWA and TUS do not overlap.



Source: *Google Maps, 2018*

Figure 2-2: **Catchment Area**



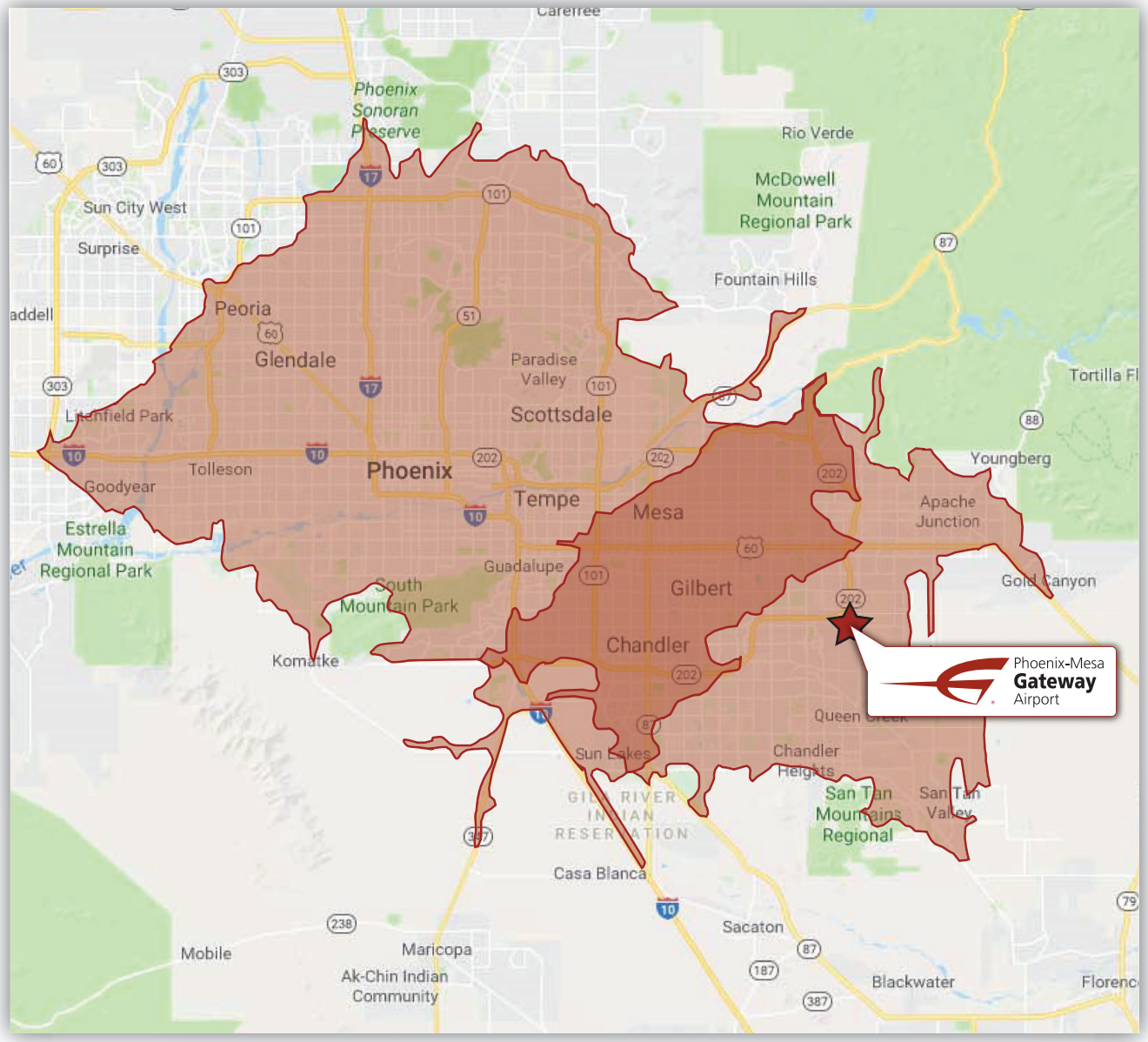
1-Hour Drive Area from Airport

0 6 **12** 18

Graphic Scale in Miles

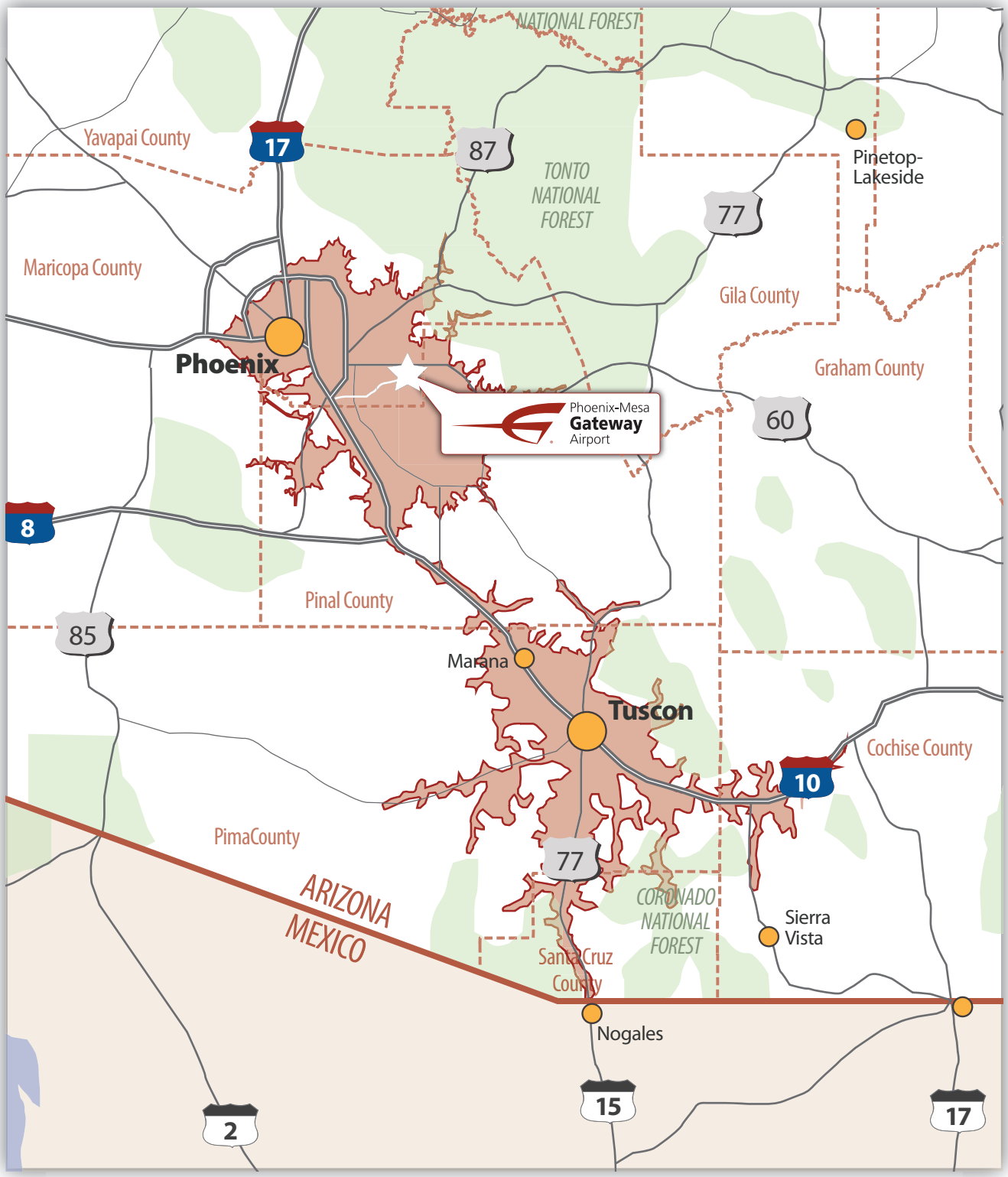
Source: *Google Maps, 2018*

Figure 2-3: **1-Hour Drive Area from Phoenix-Mesa Gateway Airport**



Source: *Google Maps, 2018*

Figure 2-4: **30-Minute Drive Areas from Phoenix-Mesa Gateway Airport and Phoenix Sky Harbor International Airport**



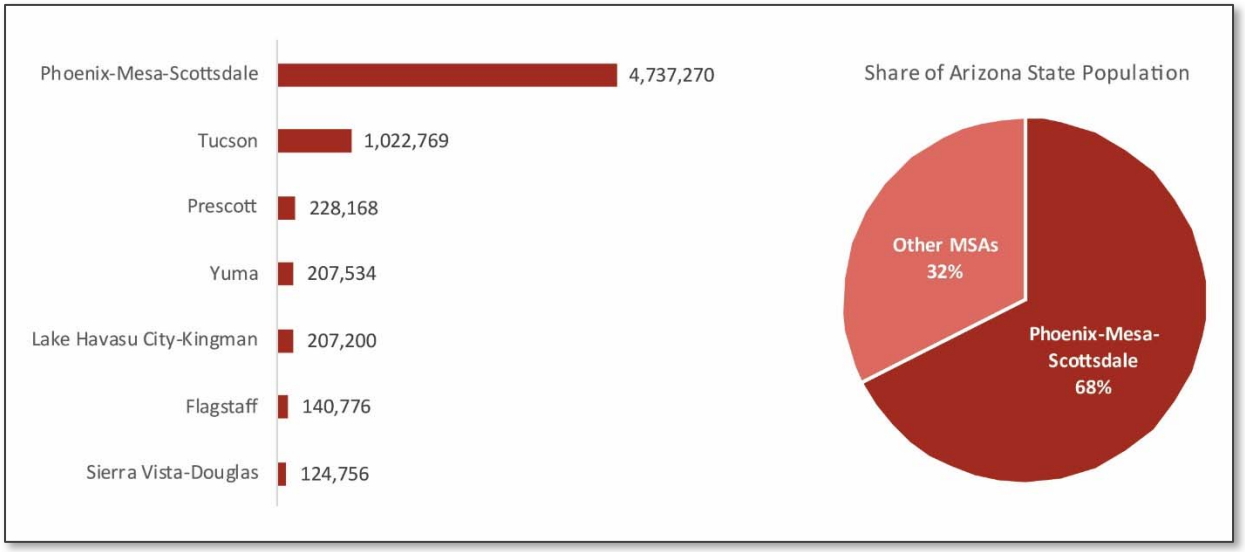
Source: *Google Maps, 2018*

Figure 2-5: **One-Hour Drive Areas from Phoenix-Mesa Gateway Airport and Tucson International Airport**

Population

The Phoenix MSA is the 11th largest metropolitan area in the United States by 2017 population. It is the largest MSA in Arizona, with a 2017 population of 4.74 million that accounts for 68 percent of the state population, as shown in ***Figure 2-6: Arizona MSA Populations in 2017***.

Figure 2-6: Arizona MSA Populations in 2017



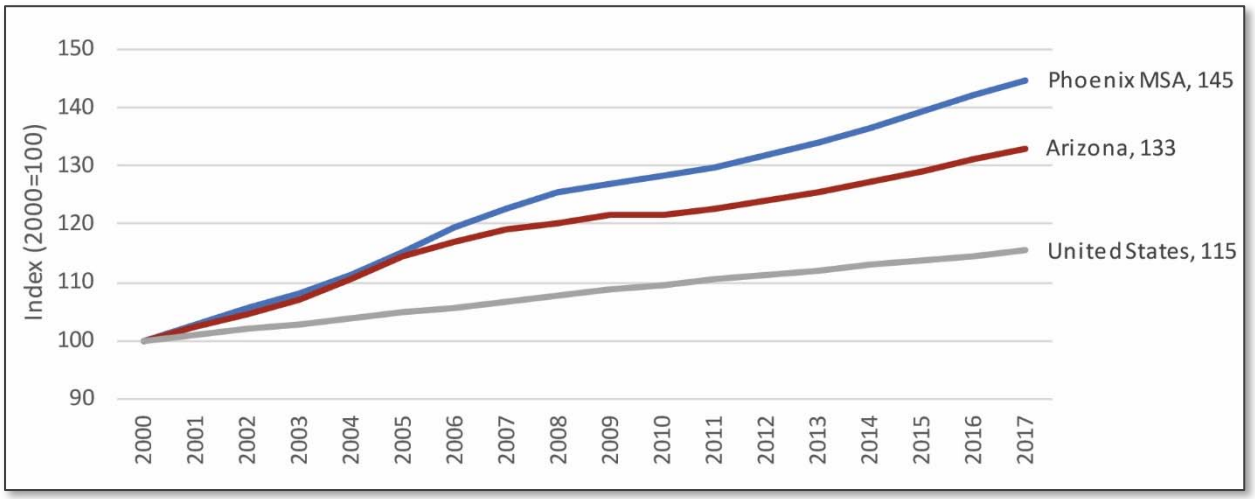
Source: U.S. Census Bureau.

The Phoenix MSA is one of the fastest growing metropolitan areas in terms of population. From 2000 to 2017, the population grew 45 percent, more than the population growth in Arizona (33 percent) and the United States (15 percent, ***Figure 2-7: Population Growth***).

In the 1980s and the 1990s, Phoenix ranked among the top 10 fastest-growing large metropolitan areas. Population growth began to slow from an average of 3.8 percent per year in the 1990s to 2.5 percent per year in the 2000s, slowing further to an average of 1.7 percent per year after 2010. Even with population growth slowing, the Phoenix MSA continues to outpace Arizona and the United States. The slowing of population growth is happening nationally.

Despite the national trend, population growth in Phoenix is expected to continue at more than double the national pace. Moody's Analytics, an economic forecasting firm, projects faster population growth for the Phoenix MSA at an average annual rate of 2 percent over the next 20 years.[3] By comparison, for the United States, Moody's Analytics projects an average annual growth rate of 0.6 percent over the next 20 years, consistent with the U.S. Census Bureau's latest projection. Population growth is increasingly driven by net migration because natural increase (the difference between births and deaths each year) is diminishing due to the aging of the population.[4]

Figure 2-7: Population Growth



Average Annual Growth Rate			
Period	**Phoenix MSA**	**Arizona**	**United States**
2000-2010	2.5%	2.0%	0.9%
2010-2017	1.7%	1.3%	0.7%
2000-2017	2.2%	1.7%	0.8%

Source: Unison Consulting, Inc., using data from U.S. Census Bureau.

IWA is located in a rapidly growing area within the Phoenix MSA known as the East Valley, a loosely defined region that includes the communities of Apache Junction, Chandler, Gilbert, Mesa, Queen Creek, and Tempe (***Figure 2-8: Phoenix East Valley***). Since 2010 alone, this area's population has grown more than 40 percent. In 2017, the population of East Valley was estimated at 1.3 million, accounting for more than 26 percent of the Phoenix MSA population. The East Valley Partnership expects the population of East Valley to reach nearly 1.6 million in 2030,[5] representing an average annual growth of 1.9 percent.

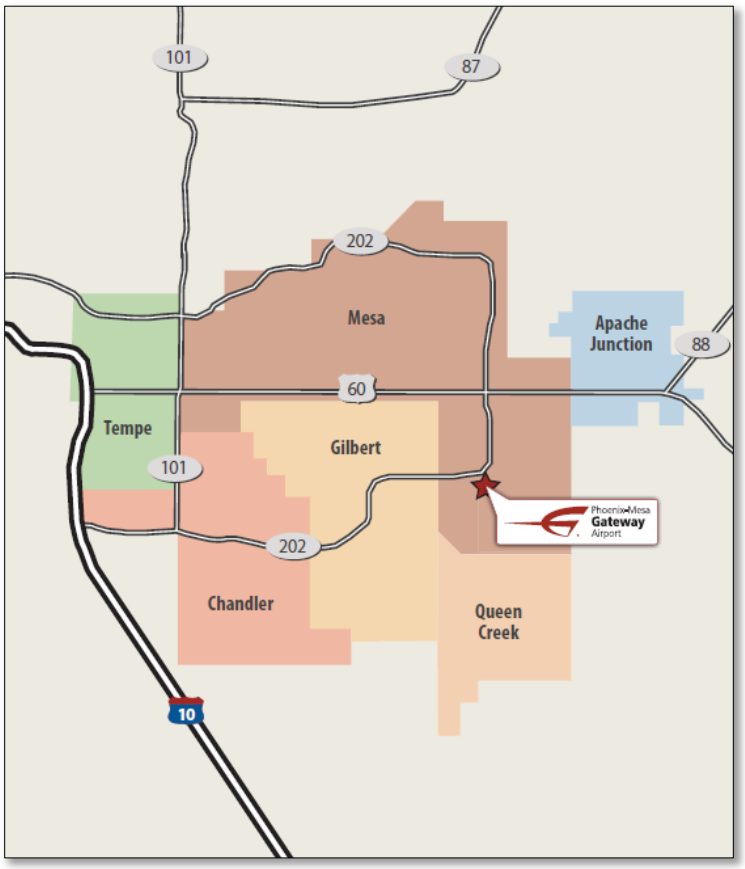
[3] The University of Arizona Economic and Business Research Center (EBRC) prepares a 30-year forecast, which expects the Phoenix MSA to add 2.6 million residents through 2047 at an average annual rate of 1.5 percent. Source: George W. Hammond, Ph.D., EBRC Director and Research Professor, "Growth on the Horizon: Arizona's 30-Year Outlook," *Arizona's Economy*, The University of Arizona Eller College of Management Economic and Business Research Center, September 1, 2017.

[4] *Ibid.*

[5] East Valley Partnership, *2018 PHX East Valley Economic Profile.*

The East Valley Partnership is a coalition of regional leaders who advocate to improve the business climate in the East Valley. Its members represent a broad array of civic, business, educational and political organizations in Apache Junction, Chandler, Florence, Fountain Hills, Gila River Indian Community, Gilbert, Mesa, Queen Creek, Salt River Pima-Maricopa Indian Community, Tempe, and Pinal County.

Figure 2-8: Phoenix East Valley



Source: East Valley Partnership, *2018 PHX East Valley Economic Profile*.

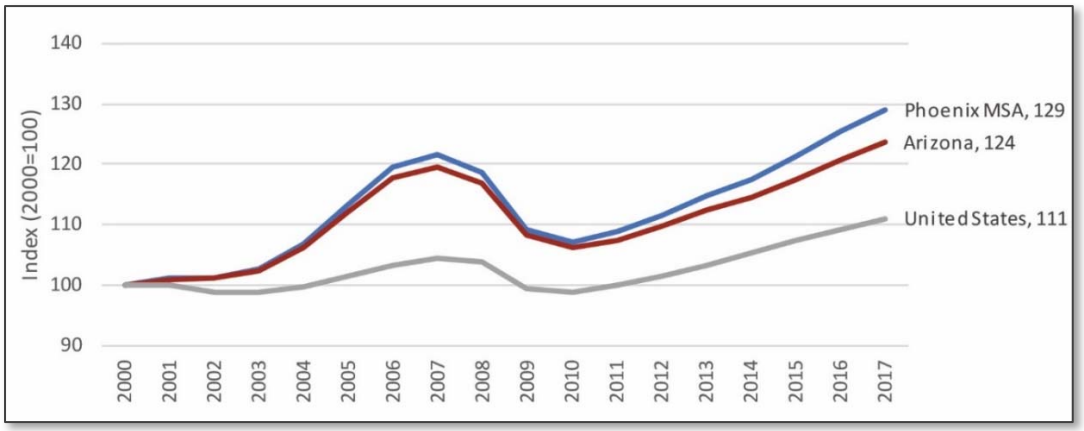
Labor Market

Trends in the labor market reflect business conditions and overall economic well-being—factors that influence the demand for air travel. Job growth is necessary for income growth. Job growth indicates overall economic growth, which is important for raising living standards, boosting consumer confidence, and increasing consumer spending.

Employment trends follow the business cycles, rising during economic expansions and falling during recessions (***Figure 2-9: Employment Growth***). Since 2000, the U.S. economy has been through two recessions, the brief and mild recession in 2001, and the long and deep recession in 2008-2009, that has become known as the Great Recession. Like the rest of the country, the Phoenix MSA suffered job losses particularly during the Great Recession. But over the long term, employment has grown, with Phoenix MSA outpacing both the entire state of Arizona and the nation. From 2000 to 2017, employment grew 29 percent in Phoenix MSA (1.5 percent per year), compared with 24 percent (1.3 percent per year) in the entire state and only 11 percent nationally (0.6 percent per year).

The Phoenix MSA is expected to continue outpacing the nation in job creation. Moody's Analytics projects employment in Phoenix to grow at an average rate of 1.3 percent per year over the next 20 years, nearly double its projection for the nation (0.7 percent per year).

Figure 2-9: Employment Growth

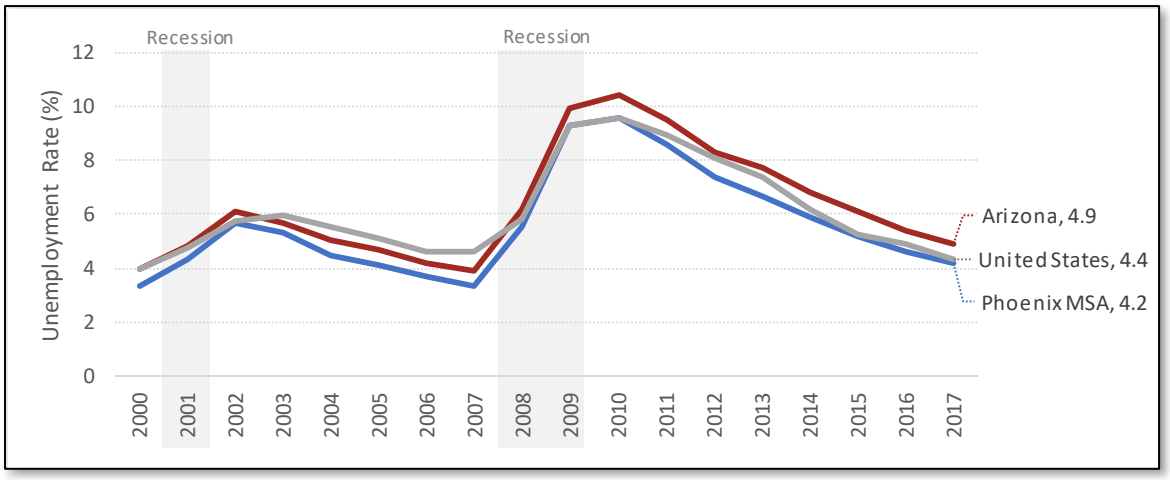


Average Annual Growth Rate			
Period	**Phoenix MSA**	**Arizona**	**United States**
2000-2010	0.7%	0.6%	-0.1%
2010-2007	2.7%	2.2%	1.7%
2000-2017	1.5%	1.3%	0.6%

Source: Unison Consulting, Inc., using nonfarm employment data from U.S. Bureau of Labor Statistics.

The unemployment rate in the Phoenix MSA, which rose to a peak of 9.6 percent during the Great Recession, has fallen to 4.2 percent, the lowest since the Great Recession began in 2008 (***Figure 2-10: Unemployment Rate***). Phoenix had seen unemployment rates lower than 4 percent before the Great Recession.

Figure 2-10: Unemployment Rate



Source: Unison Consulting, Inc., using data from U.S. Bureau of Labor Statistics.

Within the Phoenix MSA is a growing employment hub in the East Valley area. Over the past several years, East Valley has attracted numerous organizations including specialty hospitals, sports facilities, and educational institutions. In addition, more than 100 companies in aviation, aerospace, and high-tech manufacturing have clustered near IWA. The airport is in an area designated as Foreign Trade Zone #221 by the U.S. Foreign-Trade Zones Board and as a Military Reuse Zone by the Arizona state legislature. Adjacent to the IWA taxiways is a development greater than 360 acres called SkyBridge Arizona. This development is ideal for logistics; aerospace manufacturing; research and development; maintenance, repair, and overhaul facilities; and other industrial uses. ***Figure 2-11: Selected Leading Institutions and Companies in the Phoenix East Valley*** lists selected, leading organizations and companies in East Valley.[6] The growth of East Valley as an employment hub will generate demand for business travel. It will help draw more people to live in the area and increase the market for air service at IWA.

[6] East Valley Partnership, *Phoenix East Valley Brochure*.

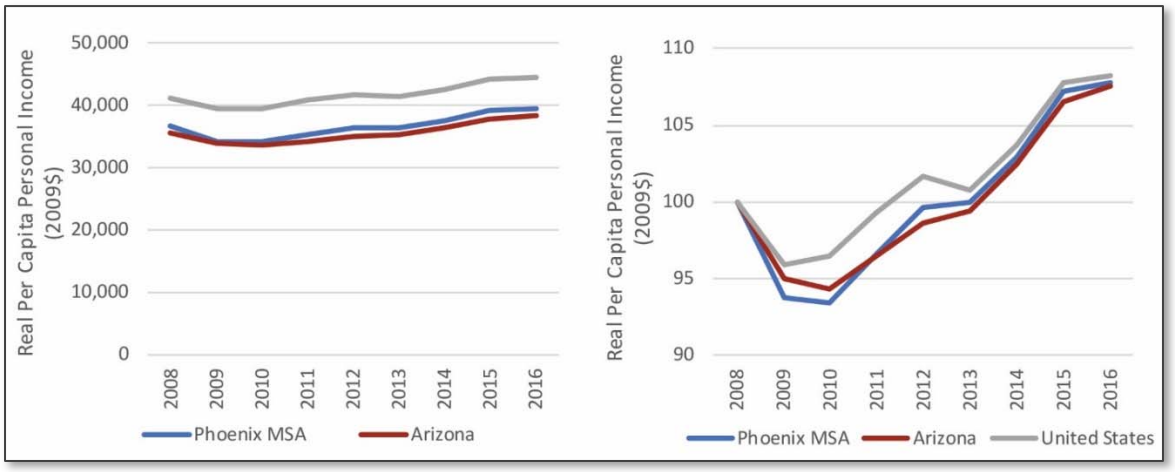
Figure 2-11: Selected Leading Institutions and Companies in the Phoenix East Valley

Source: East Valley Partnership, *Phoenix East Valley Brochure*.

Personal Income

Personal income is another key economic indicator that measures the ability of consumers to spend and build wealth. Growth in personal income boosts demand for air travel. Real per capita personal income in the Phoenix MSA is lower than the national average, but its growth has kept pace with the national trend (***Figure 2-12: Real Per Capita Personal Income***). From 2008 to 2016, real per capita personal income in Phoenix increased 8 percent (about 1 percent per year) as it did nationwide. Over the next 20 years, real per capita income in Phoenix is expected to increase at a slightly faster pace of 1.2 percent per year, according to an independent economic forecast by Moody's Analytics.

Figure 2-12: Real Per Capita Personal Income



Source: Unison Consulting, Inc., using data from U.S. Bureau of Economic Analysis, which is available only for the period 2008-2016.

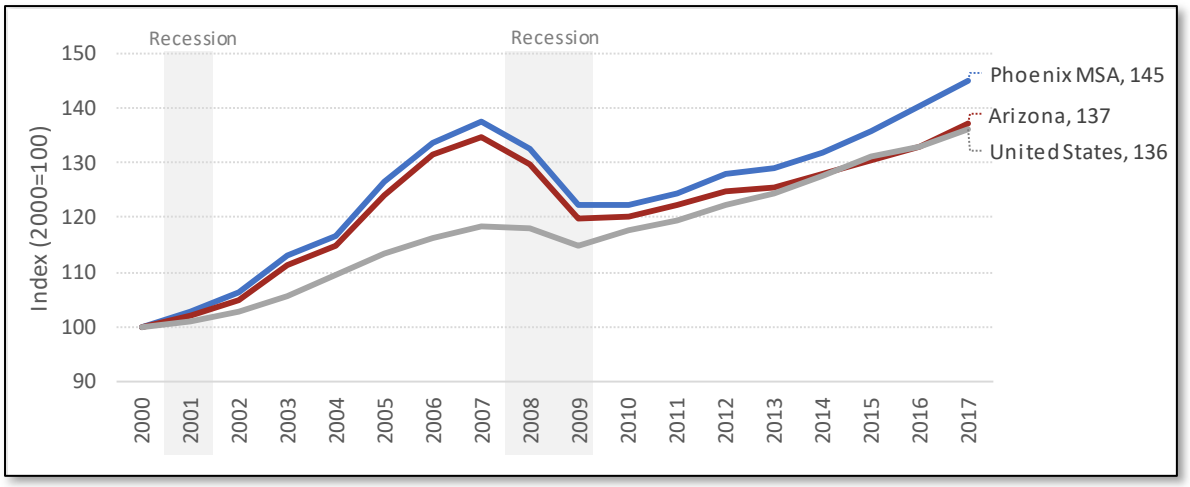
Economic Output

Economic growth drives growth in air travel. It promotes growth in employment and income, boosts consumer and business confidence, and increases consumer and business spending. While business cycles are inevitable, and recessions occur, the long-term trend is always upward.

Despite the two recessions the U.S. economy experienced from 2000 to 2017, real gross domestic product (GDP) grew nationally in Arizona and in the Phoenix MSA over the entire period (***Figure 2-13: Real Gross Domestic Product***). GDP measures the value of all goods and services produced within a geographic area. Real GDP measures economic output in inflation-adjusted dollars. The real GDP of Phoenix MSA grew 45 percent, an average rate of 2.2 percent per year, which means Phoenix outpaced both the state and the nation. The real GDP of Arizona grew 37 percent (1.9 percent per year), and the U.S. real GDP grew 36 percent (1.8 percent per year).

Over the next 20 years, the real GDP of Phoenix MSA is projected to grow at a faster pace of 3.6 percent per year compared to its average pace of growth in the past 17 years, according to an independent economic forecast by Moody's Analytics. The U.S. real GDP, a major driver to the Phoenix MSA economy and to the demand for air travel nationwide, is projected to grow at an average rate of 2 percent per year, also faster than its average pace of growth in the past 17 years. These projections do not anticipate a deep recession like the Great Recession in 2008-2009.

Figure 2-13: Real Gross Domestic Product



Average Annual Growth Rate			
Period	**Phoenix MSA**	**Arizona**	**United States**
2000-2010	2.0%	1.9%	1.6%
2010-2007	2.5%	1.9%	2.1%
2000-2017	2.2%	1.9%	1.8%

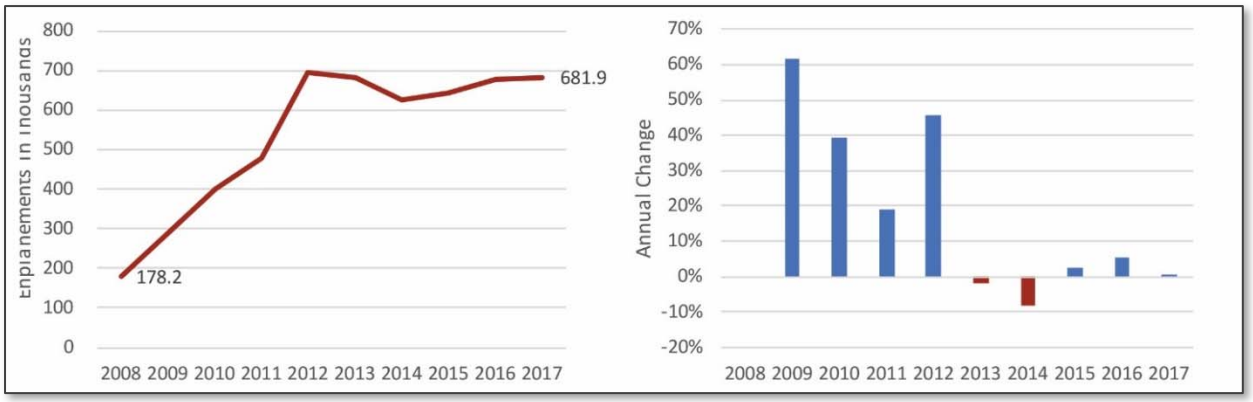
Source: Unison Consulting, Inc., using data from Moody's Analytics, U.S. Bureau of Economic Analysis and Federal Reserve Bank of St. Louis.

Commercial Passenger Traffic

When IWA opened as the Williams Gateway Airport in 1994, the airport initially marketed itself to charter operators, attracting Western Airlines, Sky Value, Vision Airlines, and Allegiant, with combined enplanements ranging from 955 to 2,991 annually during the years 2003-2006.[7] Once regular scheduled passenger service by Allegiant began at the airport in 2007, IWA had 24,500 enplanements, which quickly increased to 178,200 in 2008—nearly all of them served by Allegiant. Allegiant prospered at IWA, making the airport one of the airline's "Focus Cities."[8] Total enplanements at IWA increased to nearly 682,000 in 2017, a 283 percent increase from 2008 (***Figure 2-14: Phoenix-Mesa Gateway Airport Enplanement Trends, 2008-2017***). The steep ascent ended in 2012; annual enplanement levels decreased in the following two years, reaching a low of around 625,300 in 2014. Since then, annual enplanements have increased steadily at an average rate of 2.9 percent per year.

[7] Coffman Associates, Inc., *Airport Master Plan for Phoenix-Mesa Gateway Airport, Final Report*, February 2009, pages 1-15 and 1-16.
[8] The other Allegiant "Focus Cities" are Orlando Sanford (SFB), Tampa/Saint Pete (PIE), Punta Gorda (PGD), and Las Vegas (LAS).

Figure 2-14: Phoenix-Mesa Gateway Airport Enplanement Trends, 2008-2017



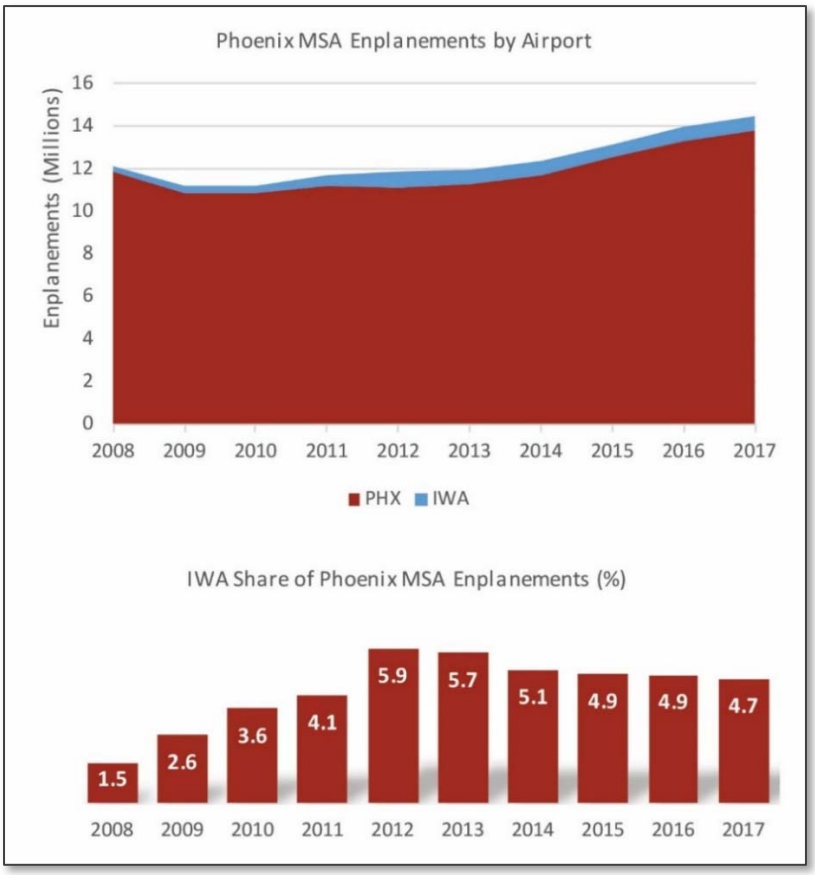
CY	EP (1,000s)	AGR		CY	EP (1,000s)	AGR
2008	178.2	626.1%		2013	680.2	-2.0%
2009	287.8	61.5%		2014	625.3	-8.1%
2010	401.4	39.4%		2015	641.3	2.5%
2011	477.5	19.0%		2016	677.1	5.6%
2012	694.3	45.4%		2017	681.9	0.7%

Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority.
Notes: CY = Calendar Year
EP = Enplaned Passengers
AGR = Annual Growth Rate

Share of Regional Passenger Traffic

With its growth as a Focus City for Allegiant, IWA has provided the Phoenix MSA residents with an alternative to PHX particularly for low-fare passenger service. The share of the regional passenger traffic IWA has carved out has grown from 1.5 percent in 2008 to 4.7 percent in 2017 (***Figure 2-15: Phoenix MSA Total Enplanements and Phoenix-Mesa Gateway Airport Share, 2008-2017***).

Figure 2-15: Phoenix MSA Total Enplanements and Phoenix-Mesa Gateway Airport Share, 2008-2017

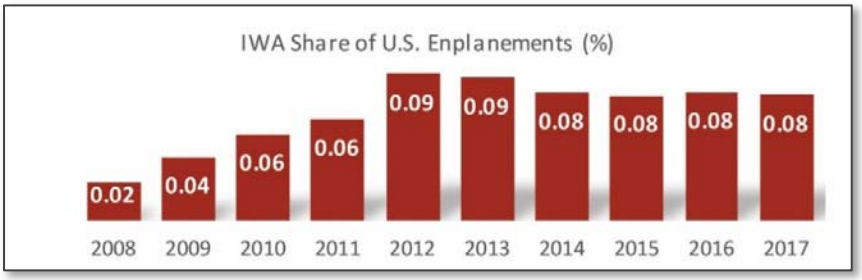


Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority and the U.S. Department of Transportation T100.

Phoenix-Mesa Gateway Airport Share of U.S. Total Passenger Traffic

The IWA share of total U.S. enplanements increased from 0.02 percent in 2008 to 0.08 percent in 2017 (***Figure 2-16: Phoenix-Mesa Gateway Airport Share of U.S. Enplanements, 2008-2017***). With this increase, IWA moved up in airport classification by the FAA from a non-hub to a small hub primary commercial service airport that enplanes between 0.05 percent and 0.25 percent of national enplanements.

Figure 2-16: Phoenix-Mesa Gateway Airport Share of U.S. Enplanements, 2008-2017

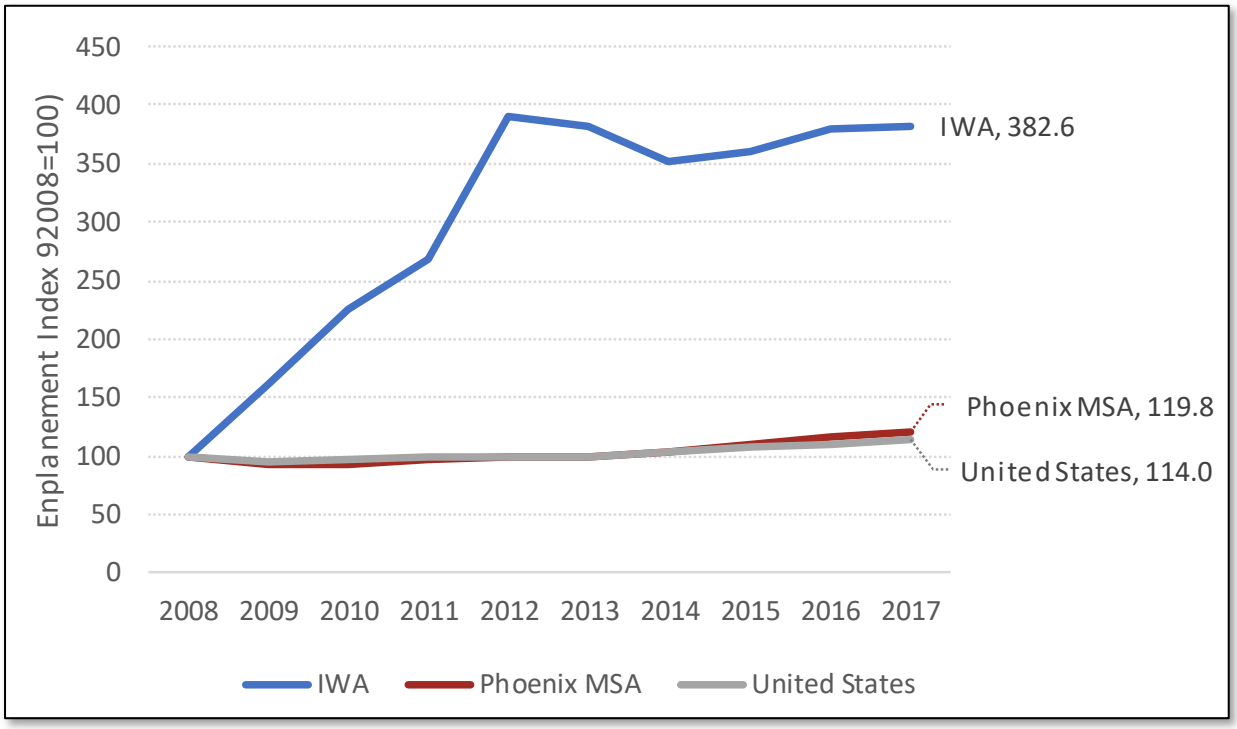


Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority and the U.S. Department of Transportation T100.

Comparison of Overall Enplanement Growth

The growth in enplanements at IWA from 2008 to 2017 (283 percent) outpaced the growth in total enplanements in the region (20 percent) and in the nation (14 percent) (***Figure 2-17: Enplanement Growth at Phoenix-Mesa Gateway Airport, the Phoenix MSA, and the United States, 2008-2017***). This pattern is typical in the early years of air carrier service expansion. It is not expected to continue over the long term. From 2014 to 2017, the growth in enplanements at IWA (9 percent) lagged the growth for the entire region (17 percent) and the nation (11 percent).

Figure 2-17: Enplanement Growth at Phoenix-Mesa Gateway Airport, the Phoenix MSA, and the United States, 2008-2017



Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority and the U.S. Department of Transportation T100.

Air Carriers Serving Phoenix-Mesa Gateway Airport

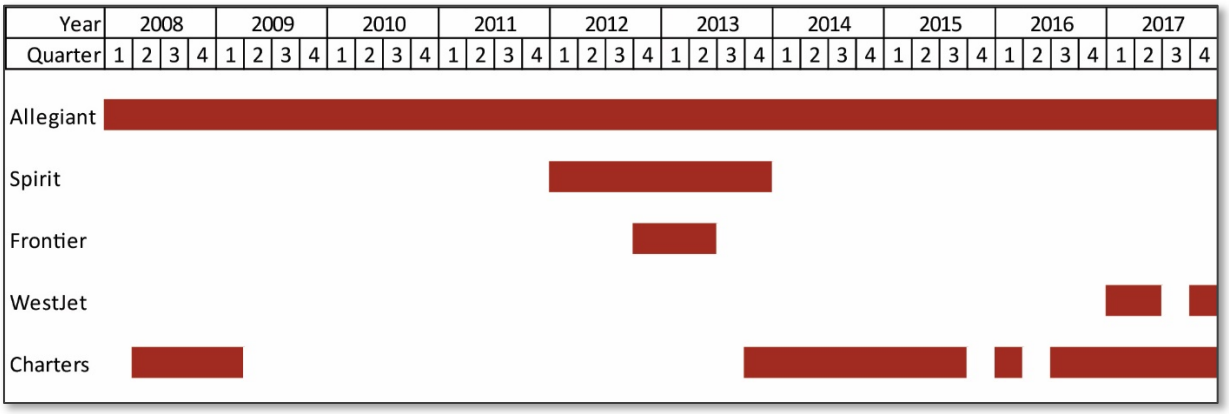
Allegiant and WestJet currently provide scheduled passenger service at IWA (***Figure 2-18: Air Carriers Serving Phoenix-Mesa Gateway Airport, 2008-2017*** and ***Figure 2-19: Phoenix-Mesa Gateway Airport Total Passengers by Air Carrier, 2008-2017***). Allegiant, a U.S. carrier, has provided regular scheduled passenger service since October 2007; before that, it operated seasonal charter flights at IWA. WestJet, a Canadian carrier, just began offering seasonal, scheduled passenger service from IWA to Canadian destinations in the past year.

Other air carriers operated at IWA in the past. Spirit and Frontier provided scheduled service in 2012-2013. They were unable to continue service profitably because of intense competition and operational challenges. These airlines consolidated their Phoenix service at PHX.[9] A few other airlines provided charter service at IWA to include Vision, Republic, and Elite.

Attracting and maintaining scheduled service at IWA has been a challenge because of its proximity to PHX. The growth of service provided by Allegiant is the result of the proactive efforts of PMGAA to develop air service and engage the community in the process. These efforts included incentives to Allegiant in the form of a landing fee waiver, a terminal rent waiver, reduced jet fuel rates for 12 months, and a 24-month discount on these rates for every new city Allegiant added. PMGAA also implemented various marketing initiatives, including advertising to local travel agencies, radio advertising, and promotions. PMGAA has also worked closely with the local Convention and Visitors Bureau, the Chamber of Commerce, and the City of Mesa to attract local businesses to use Allegiant for air service. The growth of Allegiant at IWA can also be credited to growth of East Valley as a market for air service.[10]

Since 2008, Allegiant has accounted for nearly all the passenger air carrier service at IWA. Its passenger traffic increased from 357,000 to 1.3 million in 2017. PMGAA has been working to attract other low-cost carriers. A recent success is the new service by Canadian carrier WestJet that brought 22,497 passengers to IWA in 2017, about 1.7 percent of total passengers at IWA that year.

Figure 2-18: Air Carriers Serving Phoenix-Mesa Gateway Airport, 2008-2017



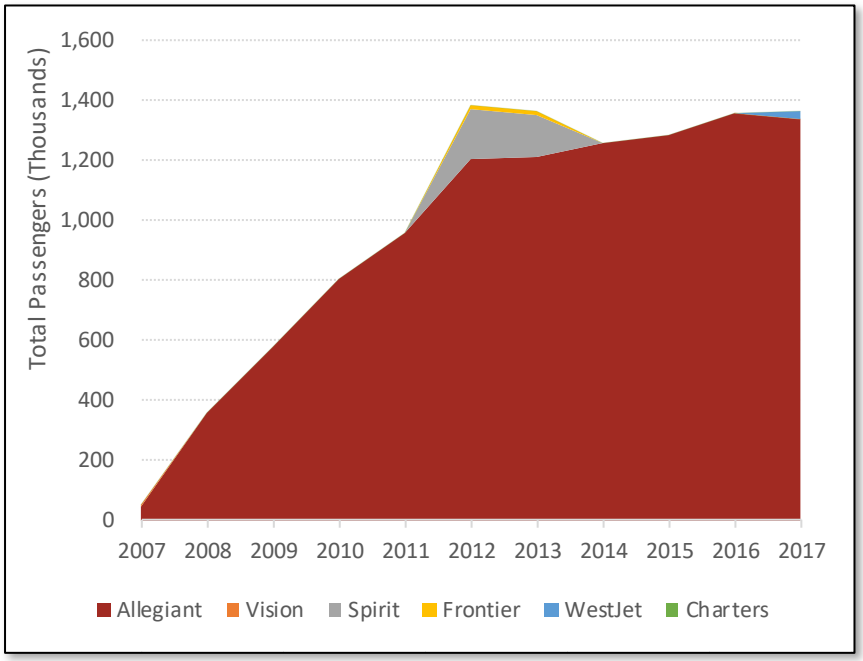
Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority.

[9] William Spitz, Mitchell O'Connor, and Sonjia Murray, *ACRP Report 142, Effects of Airline Industry Changes on Small- and Non-Hub Airports*, Transportation Research Board, Washington, D.C., 2015, page 86.
[10] Ibid, page 87.

Figure 2-19: Phoenix-Mesa Gateway Airport Total Passengers by Air Carrier, 2008-2017

Enplaned and Deplaned Passengers (1,000s)					
CY	Scheduled				Allegiant's Share
	Allegiant	Other	Charters	Total	
2008	357	1	0	358	99.7%
2009	579	0	0	579	100.0%
2010	804	0	0	804	100.0%
2011	955	0	0	955	100.0%
2012	1,202	181	0	1,383	86.9%
2013	1,211	154	0	1,365	88.7%
2014	1,252	0	2	1,255	99.8%
2015	1,282	0	2	1,284	99.9%
2016	1,352	0	3	1,355	99.8%
2017	1,338	22	2	1,363	98.2%

Note: CY = Calendar Year



Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority.

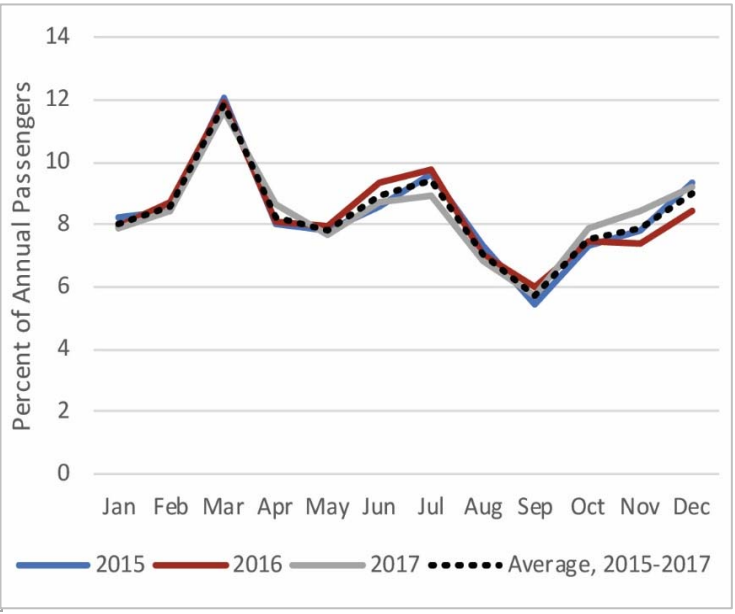
WestJet continues to have flights from PHX. A few other low-cost carriers, other than Southwest, serve the Phoenix MSA from PHX. They are U.S. carriers jetBlue, Spirit, Frontier, Sun Country, Boutique Air, and Mexican carrier Volaris. These airlines present opportunities for expanding service at IWA over the long-term.

Seasonal Patterns in Passenger Traffic

Throughout the year, the distribution of passenger traffic by month at IWA is different from the typical distribution elsewhere. IWA sees its highest traffic level in March and the lowest level in September (***Figure 2-20: Monthly Distribution of Passenger Traffic at Phoenix-Mesa Gateway Airport, 2015-2017***). This pattern is largely explained by temperature levels in Phoenix—cool in early spring and very hot in September. These trends also reflect the spring training period of Major League Baseball, spring breaks, and the post-summer decline in leisure travel. Elsewhere, peak passenger traffic typically occurs during the summer months.

Figure 2-20: Monthly Distribution of Passenger Traffic at Phoenix-Mesa Gateway Airport, 2015-2017

	2015	2016	2017	Average, 2015-2017
Jan	8.2	7.9	7.9	8.0
Feb	8.5	8.7	8.4	8.5
Mar	12.1	11.9	11.7	11.9
Apr	8.0	8.1	8.6	8.2
May	7.8	7.9	7.6	7.8
Jun	8.6	9.4	8.7	8.9
Jul	9.6	9.8	8.9	9.4
Aug	7.4	7.1	6.8	7.1
Sep	5.5	6.0	5.7	5.7
Oct	7.3	7.5	7.9	7.6
Nov	7.8	7.4	8.5	7.9
Dec	9.3	8.4	9.2	9.0



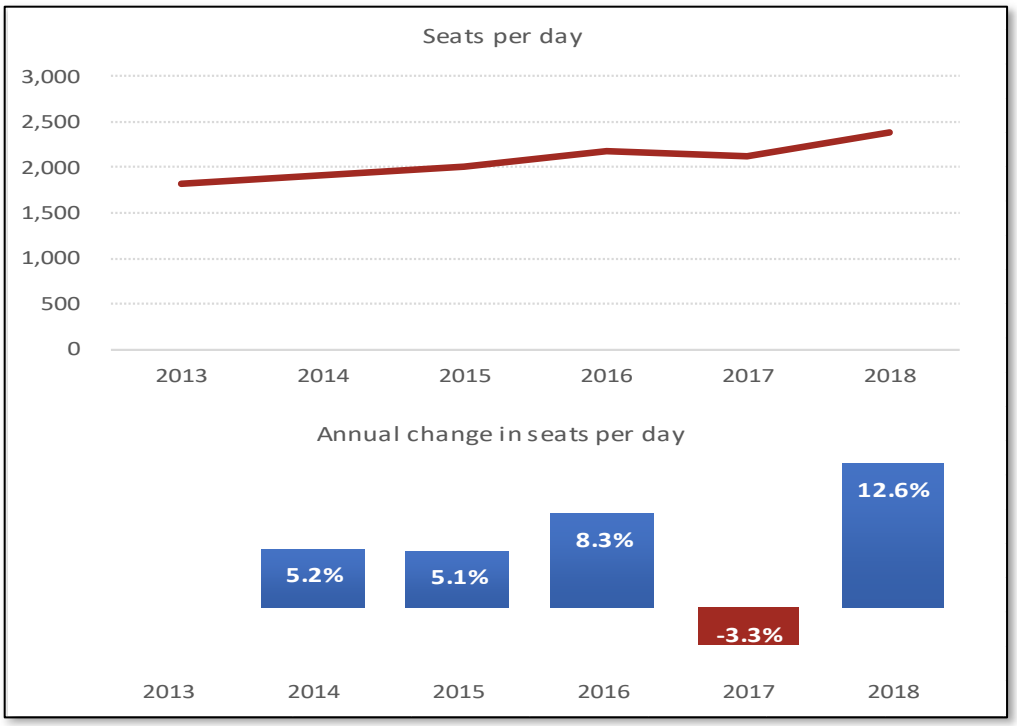
Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority.

Scheduled Passenger Service by Allegiant

Allegiant currently has nonstop service from IWA to 44 U.S. airports in 23 states, a decrease from 47 in 2017 but still an increase from 38 in the previous three years (***Figure 2-21: Scheduled Passenger Service by Allegiant***). Its 14 flight departures per day in 2018 represent an increase of only one flight from the past two years. That one additional flight in 2018, however, increased seats by 13 percent from 2017. From 2013 to 2018, Allegiant added seven destinations, an average of three flights per day, and 30 percent more seat capacity. Allegiant began operating the larger A320 aircraft and increased frequency of service in some markets.

Figure 2-21: Scheduled Passenger Service by Allegiant

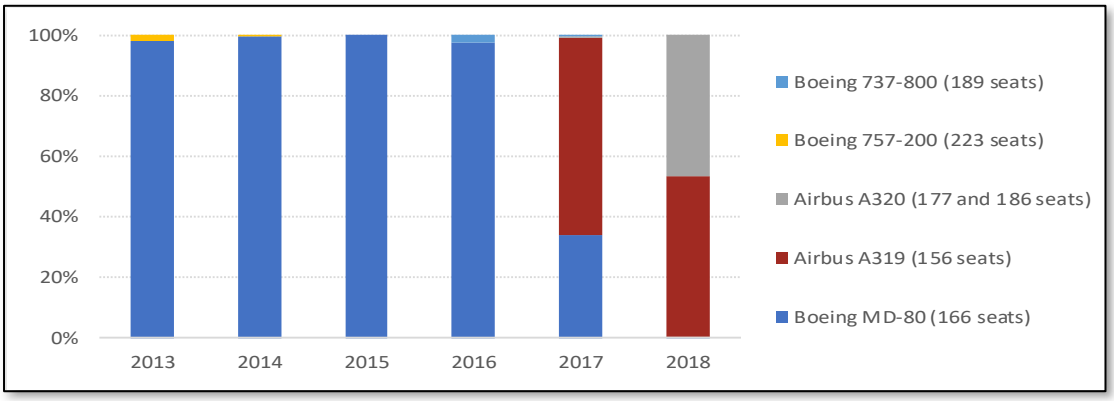
	2013	2014	2015	2016	2017	2018
Airport destinations	37	38	38	38	47	44
Flights per day	11	12	12	13	13	14
Seats per day	1,826	1,921	2,018	2,185	2,114	2,381



Source: Unison Consulting, Inc., using data from OAG Analyzer.

Before 2017, Allegiant used its 166-seat MD-80s for most or all flights at IWA (***Figure 2-22: Aircraft Used by Allegiant at Phoenix-Mesa Gateway Airport, 2013-2018***). In 2017, Allegiant phased in its new Airbus fleet (the 156-seat A319 and the larger 177- and 186-seat A320s) to replace all MD-80 flights in 2018.

Figure 2-22: Aircraft Used by Allegiant at Phoenix-Mesa Gateway Airport, 2013-2018



Source: Unison Consulting, Inc., using data from OAG Analyzer.

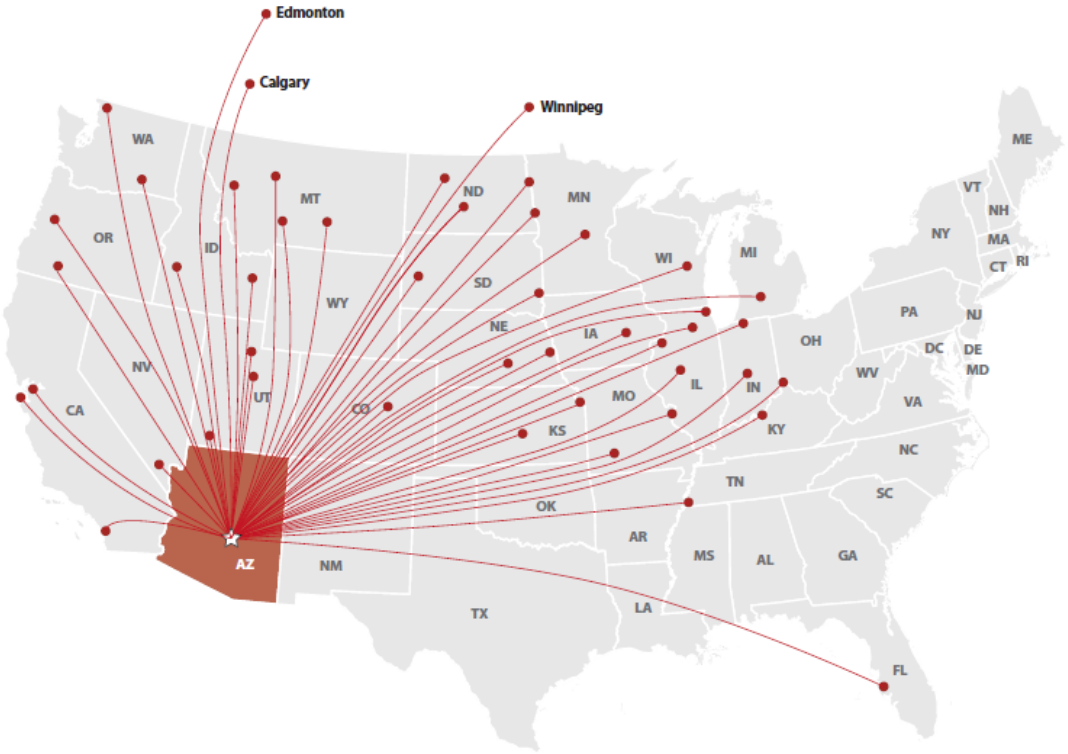
WestJet and Swoop Service at Phoenix-Mesa Gateway Airport

For 2018, WestJet and its low fare subsidiary Swoop have scheduled seasonal flights from IWA to three Canadian destinations: Edmonton (twice a week), Winnipeg (twice a week), and Calgary (twice a week). These flights are operated from January-April and from October-December using B737 aircraft with 113 to 189 seats.

Nonstop Destinations from Phoenix-Mesa Gateway Airport

For the 12-month period that ended in September 2018, Allegiant and WestJet together offered nonstop service from the Airport to a total of 45 destinations (***Figure 2-23: Nonstop Destinations from Phoenix-Mesa Gateway Airport for the 12-Month Period Ended September 2018***).

Figure 2-23: Nonstop Destinations from Phoenix-Mesa Gateway Airport for the 12-Month Period Ended September 2018

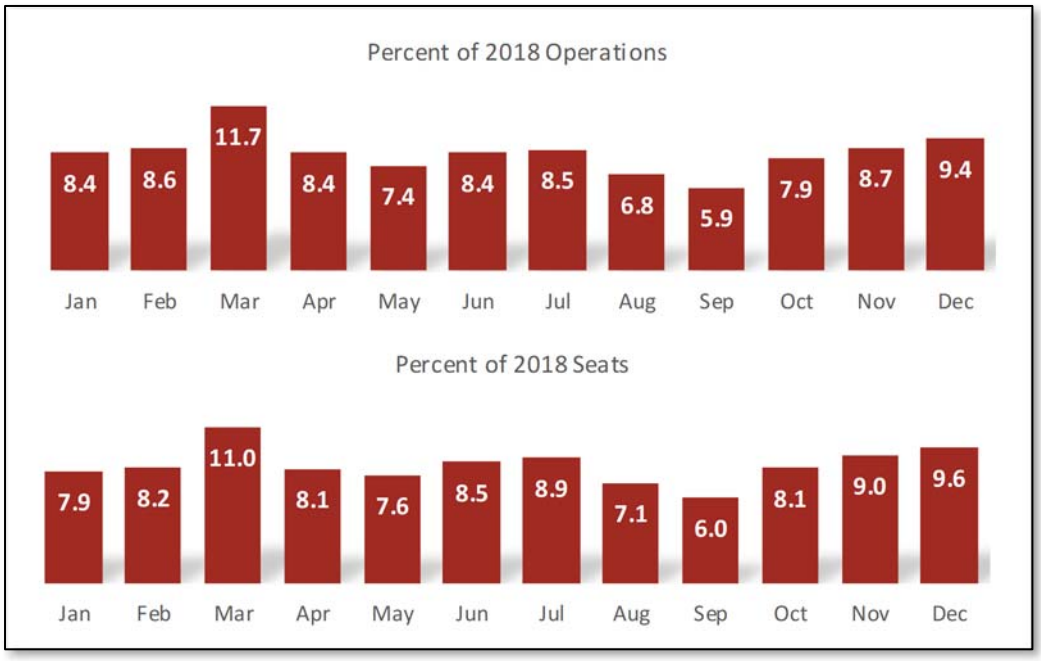


Source: OAG Analyzer.

Monthly Distribution of Operations and Seats

Figure 2-24: Monthly Distribution of Scheduled Commercial Passenger Aircraft Operations and Seats, 2018 shows the monthly distribution of scheduled commercial passenger aircraft operations and seats for 2018. The peak month is March with 11.7 percent of operations and 11.0 percent of seats.

Figure 2-24: Monthly Distribution of Scheduled Commercial Passenger Aircraft Operations and Seats, 2018

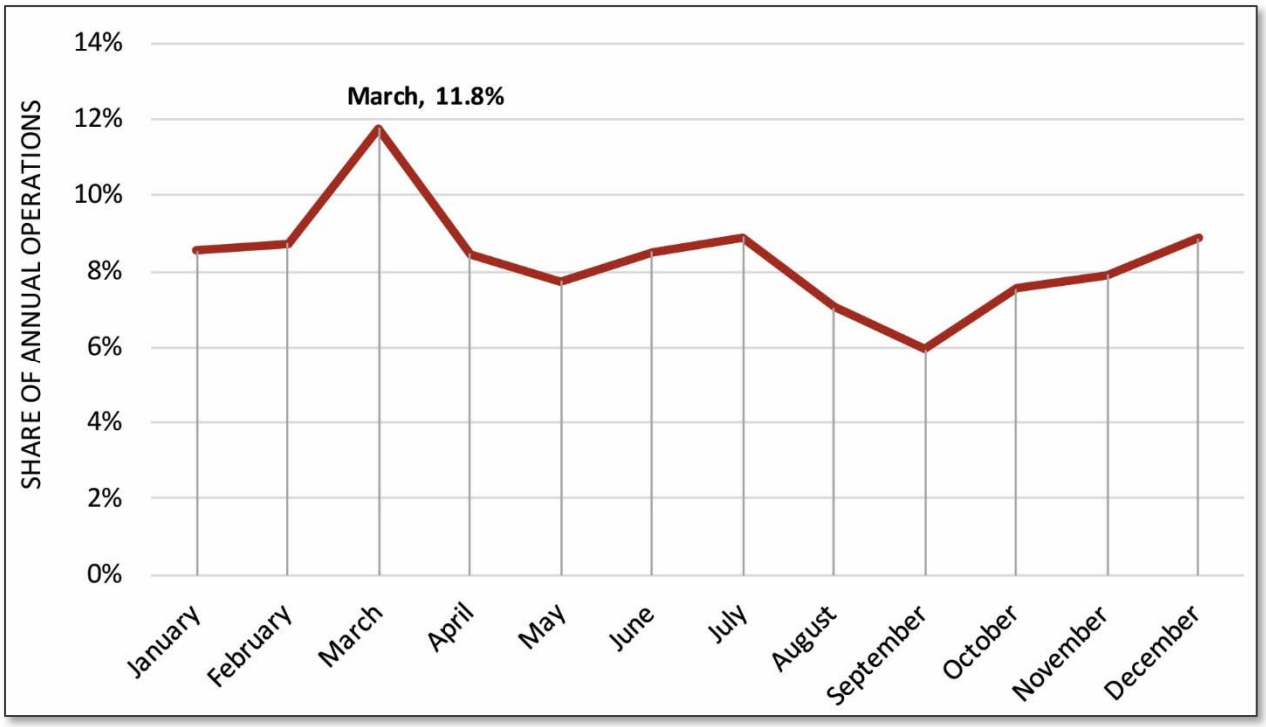


Source: OAG Analyzer.

Peak Month Average Day Distribution of Operations and Seats

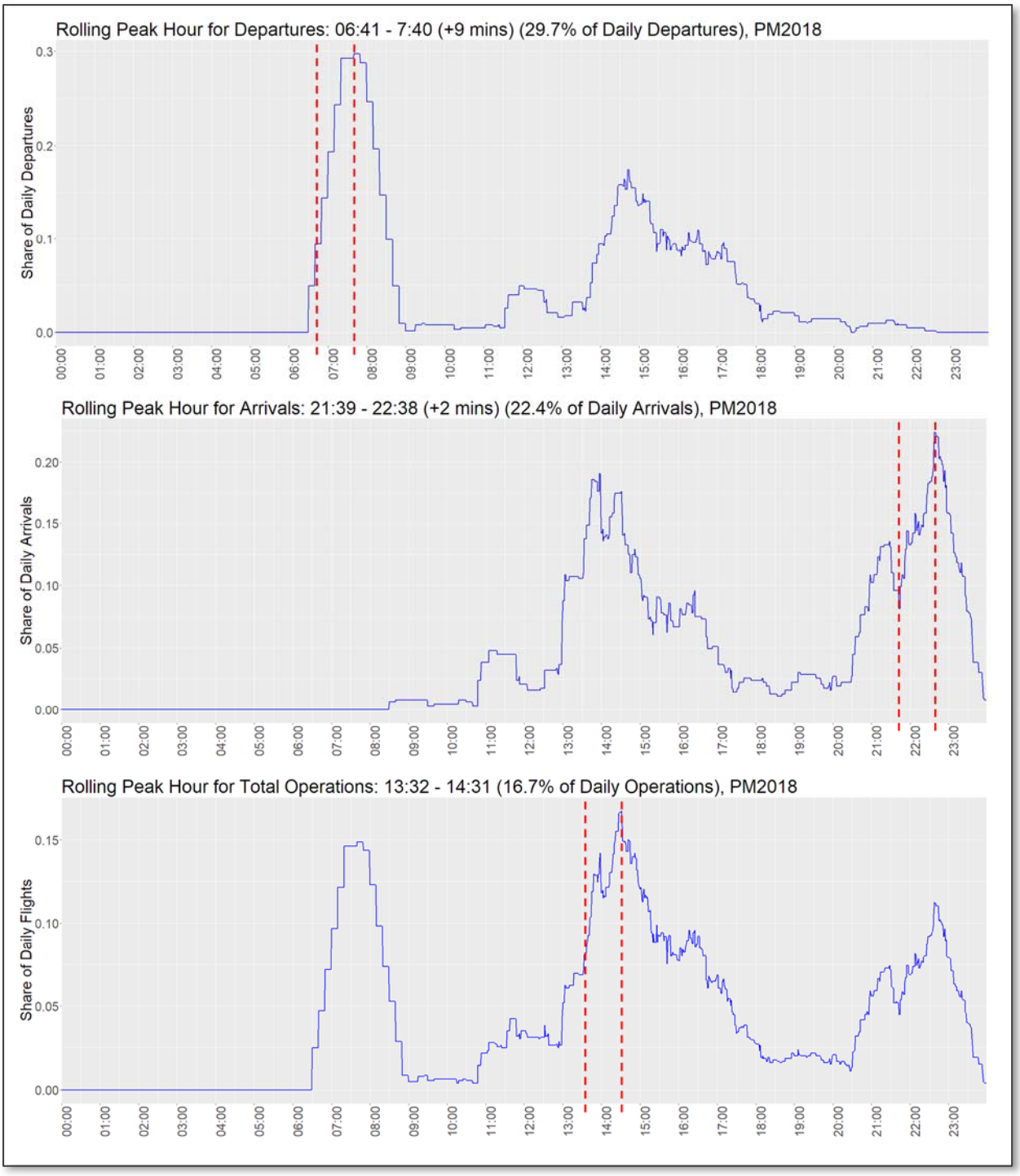
Figure 2-25: Monthly Distribution of Scheduled Commercial Passenger Aircraft Operations, 2013-2018 shows the monthly distribution of commercial passenger aircraft operations at IWA, based on airline flight schedules for 2013-2018. The peak month is March, with an average of 11.8 percent of annual operations taking place during this month. ***Figure 2-26: Peak Month Average Day Distribution of Scheduled Commercial Passenger Aircraft Operations, March 2018*** shows the hourly distribution of operations during the average day in March, based on airline flight schedules for March 2018. Arrivals and departures are distributed differently throughout the day. The rolling peak hour for aircraft departures is from 6:41 to 7:40 a.m., an hour during which 29.7 percent of daily departures take place. The rolling peak hour for aircraft arrivals is from 9:39 to 10:38 p.m., during which 22.4 percent of daily arrivals take place. The peak hour for total aircraft operations (departures and arrivals) is from 1:32 to 2:31 p.m., during which 16.7 percent of total daily operations take place.

Figure 2-25: Monthly Distribution of Scheduled Commercial Passenger Aircraft Operations, 2013-2018



Sources: OAG Analyzer and Unison Consulting, Inc. The distribution is based on scheduled flights for 2013-2018.

Figure 2-26: Peak Month Average Day Distribution of Scheduled Commercial Passenger Aircraft Operations, March 2018

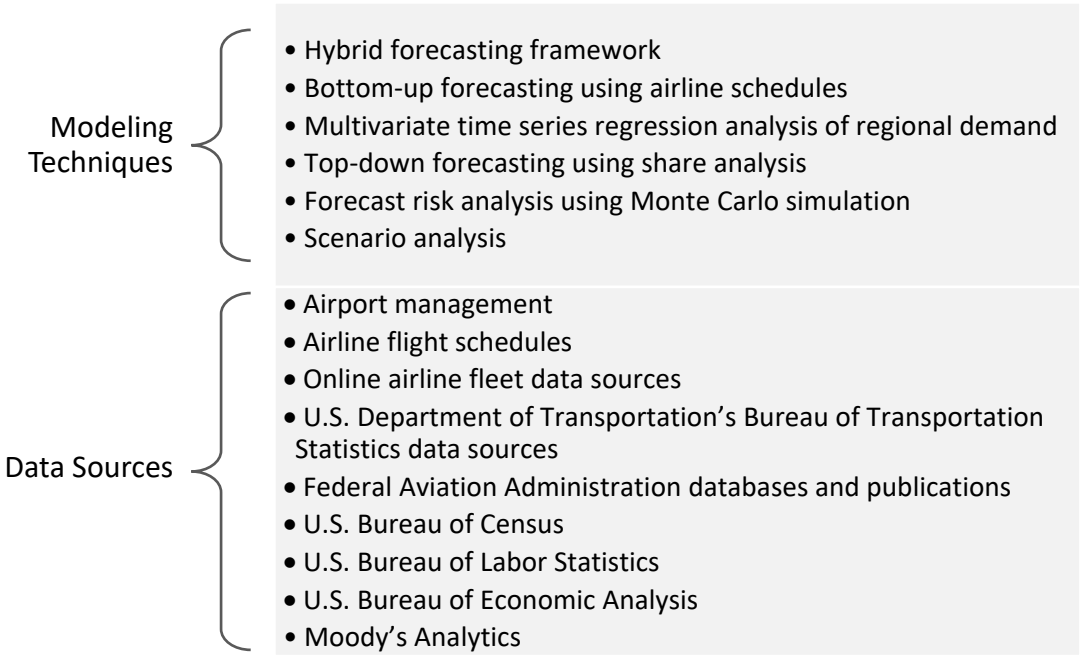


Sources: OAG Analyzer and Unison Consulting, Inc. The distributions are based on scheduled flights for March 2018.

Forecast Commercial Passenger Traffic

Forecast development for commercial passenger aviation activity uses a hybrid forecasting framework that combines quantitative techniques and data from various sources (***Figure 2-27: Commercial Passenger Activity Forecast Techniques and Data Source*****).**

Figure 2-27: Commercial Passenger Activity Forecast Techniques and Data Sources



The forecast of commercial passenger activity for 2018 reflects actual performance through August 2018. The forecasts for the remainder of 2018 and for 2019 are supply-driven, derived using a bottom-up forecasting approach based primarily on published air carrier flight schedules. Given that air carriers plan their schedules in consideration of passenger bookings, the schedules reflect near-term market demand. The published airline schedules also establish the baseline data on commercial aircraft operations and fleet mix.

Beyond 2019, forecasts are demand driven. Multivariate regression analysis links growth in enplanements to trends in market demand factors. Regression analysis provides a systematic framework for quantifying how different factors contribute to growth in enplanements and for generating enplanement forecasts based on the projected trends in key market demand factors. The Consultant takes regression analysis a step further by performing Monte Carlo simulation to produce a range of forecast enplanements with corresponding probability estimates. Forecast enplanements, in turn, serve as the basis for projecting aircraft operations and corresponding landed weight, along with assumptions about trends in boarding load factors and changes in aircraft fleet mix.

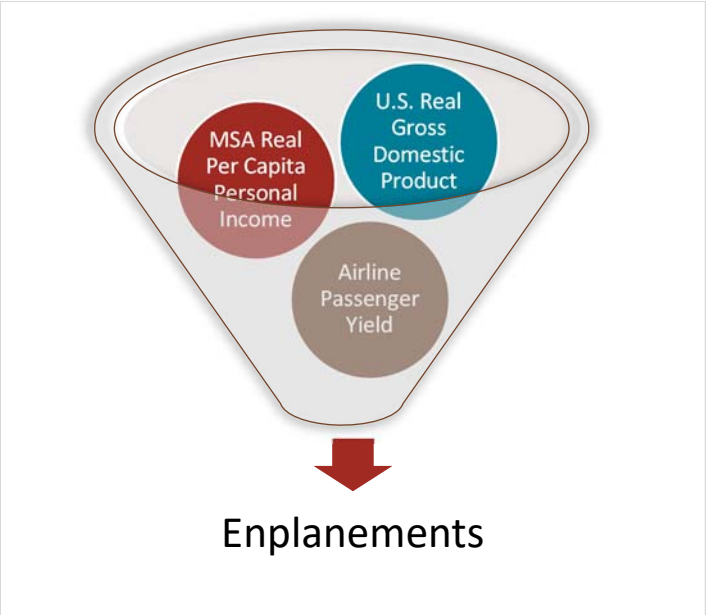
Since IWA is one of two commercial service airports within the air service area, the Consultant approached long-term forecast development for IWA from a regional demand perspective. The Consultant performed multivariate regression analysis of regional demand measured as total origin and destination (O&D) enplanements at the Phoenix MSA commercial service airports (IWA and PHX) and initially developed forecasts of O&D enplanements for the entire region. The Consultant then developed forecasts of annual enplanements at IWA assuming that IWA enplanements would grow according to the growth rates in regional demand under selected forecast scenarios.

The multivariate regression model for regional demand uses total O&D enplanements in the Phoenix MSA as the dependent variable. The Consultant selected the following explanatory variables based on the underlying theory of air travel demand and the dynamics of traffic growth in the Phoenix MSA:

- ✓ **Regional demographic and economic trends** – Personal income per capita for the MSA captures regional demographic and economic trends. Holding all other factors constant, growth in regional per capita personal income promotes growth in airport enplanements. Conversely, decreases in income reduce enplanements.
- ✓ **National economic trends** – Air traffic activity at IWA and PHX is also driven by national economic trends. Visitors who fly to the Phoenix MSA come from other parts of the nation and other countries, and their demand for air travel is influenced by national economic trends. The regression model uses U.S. GDP adjusted for inflation to capture national economic trends. Holding all other factors constant, growth in real U.S. GDP promotes growth in airport enplanements, while decreases in real U.S. GDP reduce enplanements.
- ✓ **Airline yield trends** – Consumer demand is inversely related to price. Demand increases when price decreases, and decreases when price increases, holding all other factors constant. Average airline yield is used to represent the price of air travel. Airline yield, measured as the average revenue per passenger mile, is a better price indicator than the average fare, because it controls for trip distance. Demand theory suggests an inverse relationship between demand and price. Demand rises when price decreases and falls when price increases if all other things are equal.

Figure 2-28: Key Drivers of Enplanement Growth shows the three market demand drivers that proved the most effective in explaining growth trends in O&D enplanements in the Phoenix MSA.

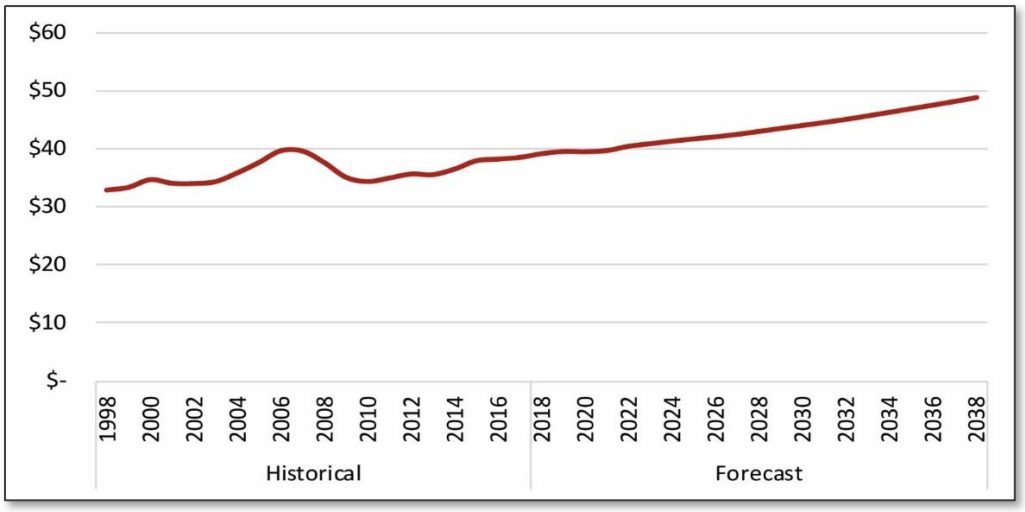
Figure 2-28: Key Drivers of Enplanement Growth



The historical trends and the most likely projections for the key demand drivers are described below:

MSA Real Per Capita Personal Income – The real per capita income of the Phoenix MSA grew between 1998 and 2006 at an annual average rate of 2.4 percent, reaching approximately $40,000 (in 2009 dollars) in 2006. It declined slightly in 2007 before decreasing nearly 12 percent during the Great Recession of 2008 and 2009. Having fallen to $35,000 in 2009, the real per capita income of the Phoenix MSA declined further by 2.1 percent in 2010. Since 2011, it has grown at annual average rate of 1.6 percent and is expected to approach pre-recession levels by 2019. The per capita personal income for the metro area is expected to grow annually at an average rate of 1.1 percent over the Master Plan forecast period, according to projections by Moody's Analytics (***Figure 2-29: Phoenix, AZ, Metropolitan Area Real Per Capita Income (2009 Dollars, Thousand***).

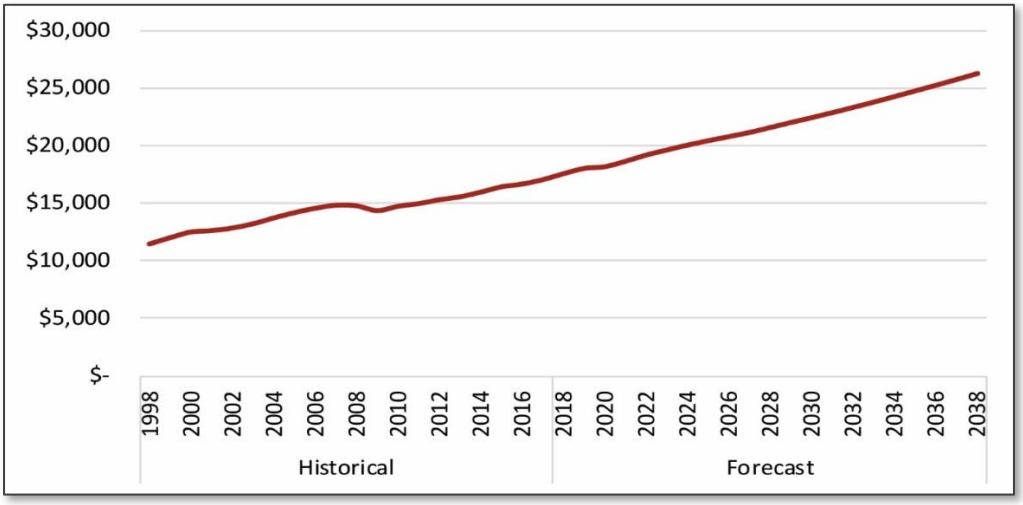
Figure 2-29: Phoenix, AZ, Metropolitan Area Real Per Capita Income (2009 Dollars, Thousands)



Sources: U.S. Bureau of Economic Analysis, Moody's Analytics, and Unison Consulting, Inc.

U.S. Real GDP – U.S. real GDP is calculated using historical data and forecast data on real U.S. GDP from Moody's Analytics, an independent economic forecasting firm. The real U.S. GDP increased 2.9 percent per year, on average, from 1998 to 2007. It decreased 0.3 percent and 2.8 percent in 2008 and 2009, respectively, when the U.S. economy was in deep recession, and then increased at an average annual rate of 2.2 percent through 2017. Moody's Analytics projects a 3.0 percent increase in real U.S. GDP in 2018. After 2018, the annual growth rate in real U.S. per capita GDP will slow to 2.0 percent on average through 2038. Moody's Analytics' economic forecast anticipates a slowing of economic growth in some years, but no downturns (***Figure 2-30: U.S. Real Gross Domestic Product (GDP) (2009 Dollars, Billions)***).

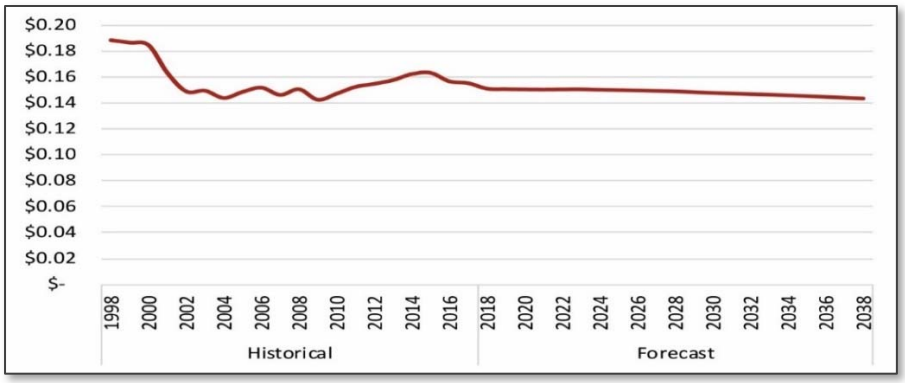
Figure 2-30: U.S. Real Gross Domestic Product (GDP) (2009 Dollars, Billions)



Sources: U.S. Bureau of Economic Analysis, Moody's Analytics, and Unison Consulting, Inc.

Airline Yields – According to data from the U.S. Department of Transportation 10 percent ticket survey, the average real airline yield at airports in the Phoenix, Arizona, metro area fell more than 20 percent between 1998 and 2002, from $0.19 to $0.15 (in 2009 dollars). After levelling off above $0.14 through 2010, it increased steadily for five years to reach $0.16 in 2015. The average real airline yield currently reflects national trends, as it declined by 5 percent in 2016 and 2017. Over the Master Plan forecast period, the future trends in real airline yield in the MSA are assumed to follow the projections of the FAA for real domestic mainline passenger yields of continued decreases averaging around 0.3 percent annually (***Figure 2-31: Phoenix, Phoenix-Mesa Gateway Airport, Metropolitan Area Average Airline Yield (2009 Dollars)***). Decreases in yields make air travel cheaper and promote growth in consumer demand.[11]

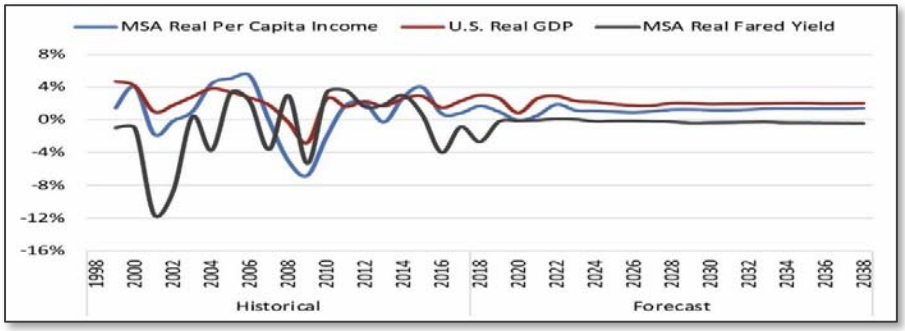
Figure 2-31: Phoenix, Phoenix-Mesa Gateway Airport, Metropolitan Area Average Airline Yield (2009 Dollars)



Sources: US DOT DB1B, Federal Aviation Administration, and Unison Consulting, Inc.

The historical and projected annual growth rates in all three market demand drivers are shown in ***Figure 2-32: Historical and Forecast Annual Change in the Key Explanatory Variables***.

Figure 2-32: Historical and Forecast Annual Change in the Key Explanatory Variables



Sources: U.S. Bureau of Transportation Statistics (DB1B 10% ticket survey) and Federal Aviation Administration for MSA real passenger yield projections; U.S. Bureau of Economic Analysis (BEA) and Moody's Analytics for U.S. real per capita GDP and employment trends in Phoenix-Mesa-Scottsdale, AZ, MSA.

[11] Federal Aviation Administration, *Aerospace Forecast for FY2018-2038*, March 2018.

The regression model also includes an indicator variable to control for structural changes in the air travel industry since the terrorist attacks on September 11, 2001. More stringent airport security screening after the terrorist attacks dampened air travel demand, particularly short-haul trips. Traffic declines and fuel cost increases prompted changes in the operations and business practices of air carriers, including capacity rationalization, network consolidation, pricing changes, and cost-cutting measures. Financial difficulties led to bankruptcies, industry exits, and mergers.

The measured contributions (coefficient estimates) of all the explanatory variables are consistent with theory and expectations. The coefficient estimates for per capita personal income and GDP have the expected signs (positive) and are both statistically significant, providing strong evidence of their effect on enplanement trends. The estimated coefficient on airline yield also has the expected negative sign, although it was not statistically significant. The effects of airline yield changes on enplanement trends at the MSA airports may be masked by stronger effects from the other demand drivers.

Calibrated with the estimated coefficients measuring the contributions of market drivers to growth in the MSA's O&D enplanements, the regression model is used to project long-term annual growth in regional O&D enplanements driven initially by the projections of trends in the three key market demand drivers (MSA real per capita personal income, U.S. real GDP, and average real airline yield) discussed in the previous pages. Recognizing uncertainty in future economic trends and the future yield trends, the Consultant performed Monte Carlo simulation to consider a wider range of possible future values for the key market drivers. A comprehensive approach to forecast risk analysis, Monte Carlo simulation uses probability distributions and random sampling techniques for assigning future values to the key explanatory variables of the regression model. The simulation, involving 5,000 iterations, produces a range of possible scenarios for future growth in regional O&D enplanements driven by trends in the market demand drivers. It also produces a percentile ranking of forecast results. Percentiles provide an indication of the likelihood of each forecast scenario.

Interpretation of Percentiles

A percentile indicates the value at or below which a given percentage of results fall. For example, if we arrange 100 forecast results for one year from lowest to highest, 25 results (25 percent) will be at or below the 25-percentile, 75 results (75 percent) will be at or below the 75-percentile, and 50 results (50 percent) will be at or below the 50-percentile (also known as the median). A percentile gives the probability that actual outcome will be as forecast or lower.

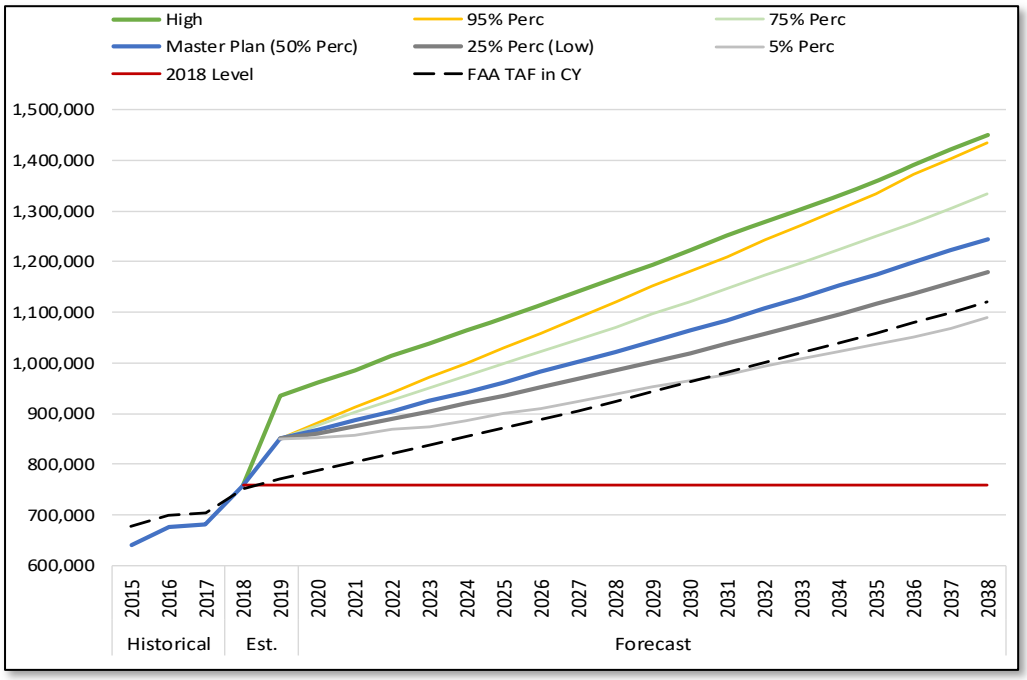
The following examples illustrate how the percentile results can be used to indicate forecast probability:

- ✓ The 75-percentile results have a 25 percent probability that actual enplanements will exceed the forecast and a 75 percent probability that actual enplanements will be at or below the forecast.
- ✓ The 25-percentile results have a 75 percent probability that actual enplanements will exceed the forecast and a 25 percent probability that actual enplanements will be at or below the forecast.

The range of forecasts bounded by the 25-percentile and the 75-percentile is called the interquartile range—the middle 50 percent of results fall within this range.

Monte Carlo simulation produced a wide range of scenarios for future growth in IWA's enplanements, as shown in ***Figure 2-33: Phoenix-Mesa Gateway Airport Historical and Forecast Total Enplanements.*** For enplanement growth at IWA beyond 2019, the Consultant used the 50-percentile or median growth scenario for the Master Plan Base Growth forecast, the 75-percentile growth scenario for the High Growth planning forecast, and the 25-percentile growth scenario for the Low Growth planning forecast.

Figure 2-33: Phoenix-Mesa Gateway Airport Historical and Forecast Total Enplanements



Sources: Airport Statistics, U.S. Department of Transportation, OAG Analyzer, and Unison Consulting, Inc.
Note: The TAF is shown on calendar year basis.

Master Plan Base Growth Forecast

Forecast enplanements for 2018 and 2019 were derived using a bottom-up approach, based on actual performance through August 2018, published airline schedules for the remainder of 2018, and published airline schedules for the first four months of 2019. Actual performance through August 2018 shows a 10.8 percent year-over-year growth in enplanements, and the published airline schedules for the remainder of 2018 show a 14.2 percent year-over-year increase in seats. Assuming IWA maintains the 85 percent boarding load factor it has achieved through August 2018, enplanements are projected to increase 11.3 percent for the entire year in 2018. For 2019, the Master Plan forecast considers only 20 percent of the growth implied by Allegiant's advance flight schedules, the continuation of WestJet's seasonal service to Canadian destinations, and all the new service announced by Canadian low-cost carrier Flair and the new U.S. scheduled regional carrier California Pacific, resulting in a 16.4 percent increase in seats in 2019. Maintaining an 85 percent boarding load factor, enplanements increase 12.0 percent in 2019. Beyond

2019, annual growth in IWA enplanements follows the growth rates from the Monte Carlo simulation 50-percentile (median) results, driven by the most likely trends for the key market demand drivers (i.e., regional economy, national economy, and passenger yield).

Enplanements increase from an estimated 759,000 in 2018 to 1.25 million in 2038 at an average annual rate of 2.5 percent. IWA's share of total regional enplanements increases slightly from 5.2 percent in 2018 to 5.7 percent by 2020. Compared with the TAF, adjusted from federal fiscal year to calendar year basis, the Master Plan forecast annual enplanements are higher by no more than 10 percent through 2023, and by no more than 11 percent through 2038.

Passenger aircraft operations increase 2.2 percent annually on average from 10,920 in 2018 to 16,840 in 2038, while total landed weight increases 2.3 percent annually on average from 0.75 billion pounds in 2018 to 1.17 billion pounds in 2038. Passenger aircraft operations make up all commercial aircraft operations. They are lower than the calendar year TAF forecast commercial aircraft operations by no more than 7 percent through 2023 and by no more than 9 percent through 2038.

The average number of enplanements per aircraft departure increases at a slightly faster rate than the average number of seats per aircraft departure, because of small increases in the average boarding load factor totaling 1.0 percentage point over the entire 20-year forecast period.

High Growth Forecast

As in the Master Plan Base Growth forecast, IWA enplanements increase 11.3 percent in 2018, based on actual performance through August 2018 and the published airline schedules for the remainder of 2018. For 2019, the High Growth forecast considers 100 percent of the growth in Allegiant's advance flight schedules, the continuation of WestJet's seasonal service to Canadian destinations, and all the new service announced by Canadian low-cost carrier Flair and the new U.S. scheduled regional carrier California Pacific, resulting in a 23.4 percent increase in seats in 2019. Maintaining an 85 percent boarding load factor, enplanements increase 23.2 percent in 2019. Beyond 2019, annual growth in IWA enplanements follows the growth rates from the Monte Carlo simulation 75-percentile results, largely driven by more favorable regional and national economic conditions than projected for the Master Plan forecast.

Enplanements grow at an average annual rate of 3.3 percent, reaching 1.45 million by 2038. IWA's share of regional enplanements increases to 6.6 percent. Forecast annual enplanements exceed the 95-percentile results from the Monte Carlo simulation.

Passenger aircraft operations increase 3.0 percent annually on average from 10,920 in 2018 to 19,570 in 2038, while total passenger aircraft landed weight increases 3.1 percent annually on average from 0.75 billion pounds in 2018 to 1.36 billion pounds in 2038.

Low Growth Forecast

IWA enplanements grow in line with the Master Plan forecast in 2018 and 2019. Beyond 2019, enplanements grow according to the Monte Carlo simulation 25-percentile results, driven by more modest regional and national economic conditions. Enplanements grow at an average annual rate of 2.2 percent, reaching 1.18 million by 2038. IWA's share of regional enplanements increases to 5.7 percent in 2020 and 2021, then gradually decreases to 5.4 percent by 2034. Passenger aircraft operations make up all commercial aircraft operations, which increase from 10,920 in 2018 to 15,967 in 2038 at an average annual rate of 1.9 percent, with landed weight increasing from 0.75 billion pounds in 2018 to 1.11 billion pounds in 2038 at an average annual rate of 2.0 percent. The Low Growth scenario can be used as a conservative basis for financial analysis.

Table 2-1: Metropolitan Statistical Area (MSA) and Phoenix-Mesa Gateway Airport Enplanements (EPs) (In Thousands) shows historical and forecast O&D enplanements for the entire Phoenix MSA, and historical and forecast enplanements for IWA and corresponding shares of regional demand under the Master Plan, High Growth, and Low Growth scenarios.

Table 2-1: Metropolitan Statistical Area (MSA) and Phoenix-Mesa Gateway Airport Enplanements (EPs) (In Thousands)

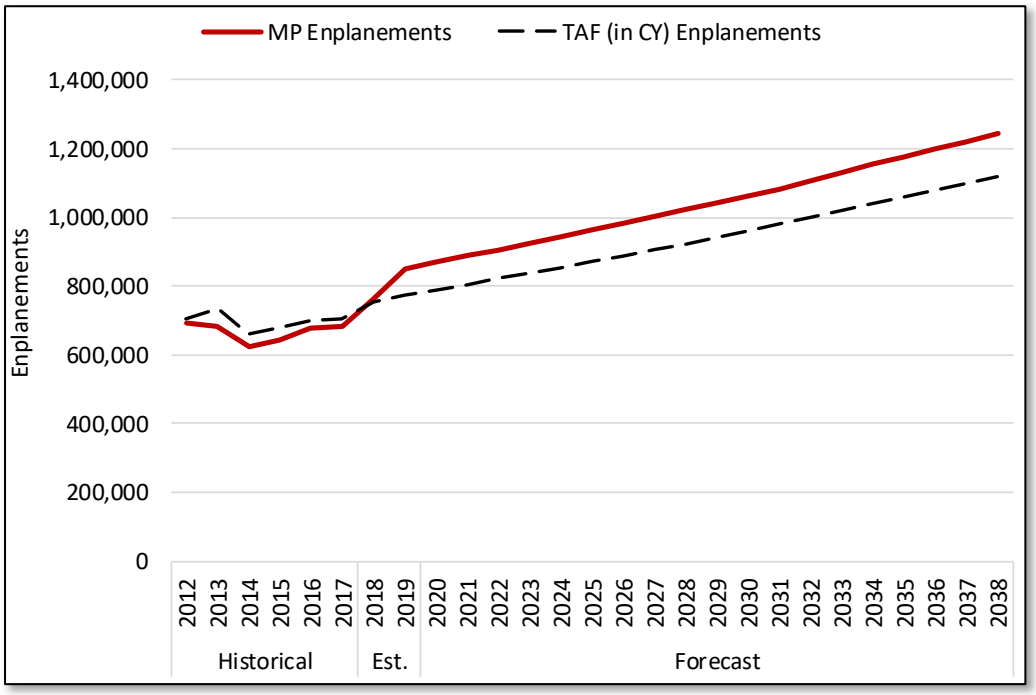
	CY	MSA O&D EPs	AGR	IWA MP EPs	AGR	IWA MP Share of MSA EPs	IWA HG EPs	AGR	IWA HG Share of MSA EPs	IWA LG EPs	AGR	IWA LG Share of MSA EPs
Historical	2012	11,837	1.4%	694	45.4%	5.9%	694	45.4%	5.9%	694	45.4%	5.9%
	2013	11,943	0.9%	680	-2.0%	5.7%	680	-2.0%	5.7%	680	-2.0%	5.7%
	2014	12,359	3.5%	625	-8.1%	5.1%	625	-8.1%	5.1%	625	-8.1%	5.1%
	2015	13,144	6.4%	641	2.5%	4.9%	641	2.5%	4.9%	641	2.5%	4.9%
	2016	13,938	6.0%	677	5.6%	4.9%	677	5.6%	4.9%	677	5.6%	4.9%
	2017	14,472	3.8%	682	0.7%	4.7%	682	0.7%	4.7%	682	0.7%	4.7%
Est.	2018	14,718	1.7%	759	11.3%	5.2%	759	11.3%	5.2%	759	11.3%	5.2%
	2019	15,053	2.3%	850	12.0%	5.6%	935	23.2%	6.2%	850	12.0%	5.6%
Forecast	2020	15,115	0.4%	868	2.1%	5.7%	961	2.8%	6.4%	862	1.4%	5.7%
	2021	15,399	1.9%	887	2.2%	5.8%	986	2.6%	6.4%	876	1.6%	5.7%
	2022	15,884	3.1%	905	2.0%	5.7%	1,013	2.7%	6.4%	890	1.6%	5.6%
	2023	16,234	2.2%	925	2.2%	5.7%	1,037	2.4%	6.4%	904	1.6%	5.6%
	2024	16,569	2.1%	942	1.9%	5.7%	1,065	2.6%	6.4%	921	1.9%	5.6%
	2025	16,876	1.8%	962	2.1%	5.7%	1,089	2.3%	6.5%	936	1.6%	5.5%
	2026	17,157	1.7%	983	2.1%	5.7%	1,115	2.3%	6.5%	952	1.8%	5.6%
	2027	17,462	1.8%	1,002	2.0%	5.7%	1,141	2.3%	6.5%	968	1.6%	5.5%
	2028	17,824	2.1%	1,022	2.0%	5.7%	1,169	2.4%	6.6%	985	1.8%	5.5%
	2029	18,197	2.1%	1,042	1.9%	5.7%	1,194	2.2%	6.6%	1,001	1.7%	5.5%
	2030	18,557	2.0%	1,064	2.1%	5.7%	1,223	2.4%	6.6%	1,019	1.8%	5.5%
	2031	18,924	2.0%	1,084	1.9%	5.7%	1,251	2.3%	6.6%	1,038	1.8%	5.5%
	2032	19,305	2.0%	1,108	2.2%	5.7%	1,277	2.1%	6.6%	1,057	1.8%	5.5%
	2033	19,715	2.1%	1,130	2.0%	5.7%	1,303	2.1%	6.6%	1,076	1.8%	5.5%
	2034	20,136	2.1%	1,153	2.1%	5.7%	1,331	2.2%	6.6%	1,095	1.8%	5.4%
	2035	20,565	2.1%	1,176	2.0%	5.7%	1,360	2.2%	6.6%	1,116	1.9%	5.4%
	2036	20,993	2.1%	1,198	1.9%	5.7%	1,391	2.2%	6.6%	1,137	1.8%	5.4%
	2037	21,430	2.1%	1,222	1.9%	5.7%	1,422	2.2%	6.6%	1,158	1.9%	5.4%
	2038	21,886	2.1%	1,245	1.9%	5.7%	1,451	2.1%	6.6%	1,180	1.9%	5.4%
CAGR	2018-2038	2.0%	--	2.5%	--	--	3.3%	--	--	2.2%	--	--

Sources: Airport Statistics, U.S. Department of Transportation, OAG Analyzer, and Unison Consulting, Inc.

Notes: CY = Calendar Year; EP = Enplanements; HG = High Growth
MSA = Metropolitan Statistical Area; AGR = Annual Growth Rate; LG = Low Growth
O&D = Origin and Destination; MP = Master Plan; CAGR = Compound Annual Growth Rate

Figure 2-34: Phoenix-Mesa Gateway Airport Historical and Forecast Total Enplanements compares the Master Plan base forecast enplanements for IWA with the FAA TAF released in January 2018, adjusted to calendar year basis. Compared with the TAF, the Master Plan base forecast annual enplanements are higher by no more than 10 percent through 2023, and by no more than 11 percent through 2038.

Figure 2-34: Phoenix-Mesa Gateway Airport Historical and Forecast Total Enplanements



Sources: Airport Statistics, U.S. Department of Transportation, OAG Analyzer, and Unison Consulting, Inc.

Table 2-2: Phoenix-Mesa Gateway Airport Forecast Enplanements shows the forecast enplanements for three scenarios: Master Plan Base Growth, High Growth, and Low Growth. ***Table 2-3: Phoenix-Mesa Gateway Airport Forecast Commercial Aircraft Operations*** shows the corresponding forecasts of commercial passenger aircraft operations. ***Table 2-4: Phoenix-Mesa Gateway Airport Forecast Commercial Aircraft Landed Weight (1,000 Pounds)*** shows the corresponding forecasts for commercial passenger aircraft landed weight.

Table 2-2: Phoenix-Mesa Gateway Airport Forecast Enplanements

	Actual	Estimate		Forecast			Compound Annual Growth Rate					
Scenario	2017	2018	2019	2023	2028	2038	2017-2018	2018-2019	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan (MP)	681,892	759,033	850,292	924,667	1,022,420	1,245,211	11.3%	12.0%	4.0%	2.0%	2.0%	2.5%
High Growth (HG)	681,892	759,033	934,839	1,037,426	1,168,589	1,451,202	11.3%	23.2%	6.4%	2.4%	2.2%	3.3%
Low Growth (LG)	681,892	759,033	850,292	903,617	984,846	1,180,070	11.3%	12.0%	3.5%	1.7%	1.8%	2.2%
TAF (CY)	704,268	751,856	771,352	838,428	923,717	1,120,895	6.8%	2.6%	2.2%	2.0%	2.0%	2.0%
Ratio MP - TAF (CY)	0.97	1.01	1.10	1.10	1.11	1.11	--	--	--	--	--	--
Ratio HG - TAF (CY)	0.97	1.01	1.21	1.24	1.27	1.29	--	--	--	--	--	--
Ratio LG - TAF (CY)	0.97	1.01	1.10	1.08	1.07	1.05	--	--	--	--	--	--

Sources: Airport Statistics, U.S. Department of Transportation, OAG Analyzer, and Unison Consulting, Inc.
Notes: TAF = Terminal Area Forecast
CY = Calendar Year

Table 2-3: Phoenix-Mesa Gateway Airport Forecast Commercial Aircraft Operations

	Actual	Estimate		Forecast			Compound Annual Growth Rate					
Scenario	2017	2018	2019	2023	2028	2038	2017-2018	2018-2019	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan (MP)	10,372	10,920	11,994	12,953	14,070	16,840	5.3%	9.8%	3.5%	1.7%	1.8%	2.2%
High Growth (HG)	10,372	10,920	13,120	14,463	16,020	19,570	5.3%	20.1%	5.8%	2.1%	2.0%	3.0%
High Growth (HG)*	10,372	10,920	13,120	16,795	22,184	31,482	5.3%	20.1%	9.0%	5.7%	3.6%	5.4%
Low Growth (LG)	10,372	10,920	11,994	12,662	13,558	15,967	5.3%	9.8%	3.0%	1.4%	1.6%	1.9%
TAF (CY)	11,630	12,505	12,819	13,899	15,273	18,439	7.5%	2.5%	2.1%	1.9%	1.9%	2.0%
Ratio MP - TAF (CY)	0.89	0.87	0.94	0.93	0.92	0.91	--	--	--	--	--	--
Ratio HG - TAF (CY)	0.89	0.87	1.02	1.04	1.05	1.06	--	--	--	--	--	--
Ratio HG* - TAF (CY)	0.89	0.87	1.02	1.21	1.45	1.71	--	--	--	--	--	--
Ratio LG - TAF (CY)	0.89	0.87	0.94	0.91	0.89	0.87	--	--	--	--	--	--

Sources: Airport Statistics, U.S. Department of Transportation, OAG Analyzer, SkyBridge Arizona, and Unison Consulting, Inc.
Notes: *Including all air-cargo aircraft operations projected by SkyBridge Arizona.
TAF = Terminal Area Forecast
CY = Calendar Year

Table 2-4: Phoenix-Mesa Gateway Airport Forecast Commercial Passenger Aircraft Landed Weight (1,000 Pounds)

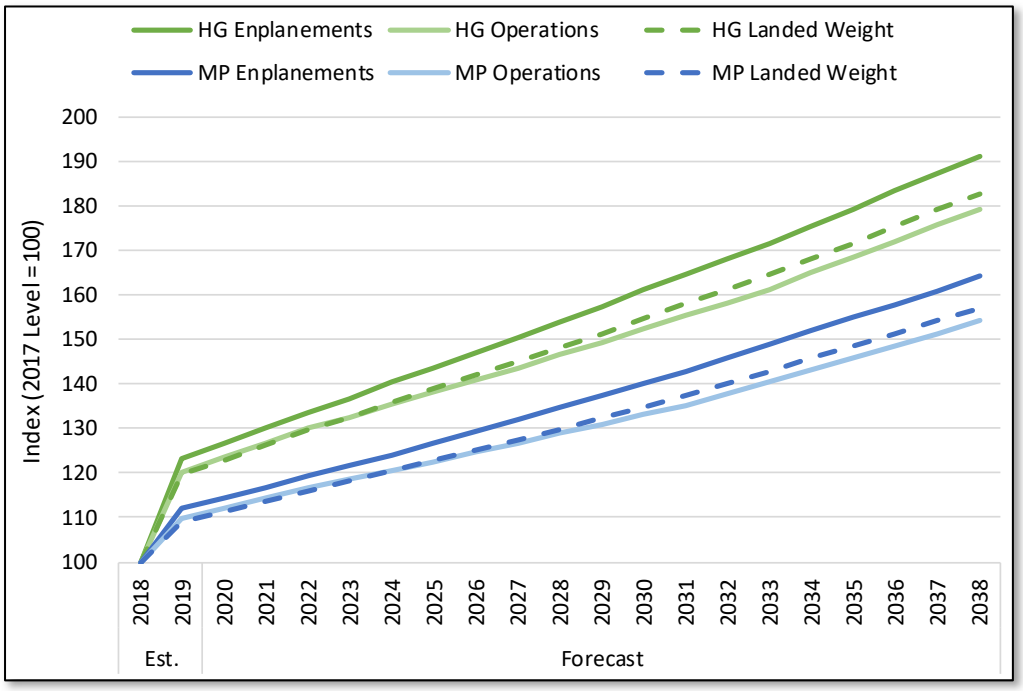
	Actual	Estimate		Forecast			Compound Annual Growth Rate					
Scenario	2017	2018	2019	2023	2028	2038	2017-2018	2018-2019	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan (MP)	698,565	747,698	815,094	883,539	971,348	1,173,779	7.0%	9.0%	3.4%	1.9%	1.9%	2.3%
High Growth (HG)	698,565	747,698	894,777	989,667	1,108,435	1,365,960	7.0%	19.7%	5.8%	2.3%	2.1%	3.1%
High Growth (HG)*	698,565	747,698	894,777	1,485,900	2,325,904	3,665,281	7.0%	19.7%	14.7%	9.4%	4.7%	8.3%
Low Growth (LG)	698,565	747,698	815,094	863,624	935,971	1,112,831	7.0%	9.0%	2.9%	1.6%	1.7%	2.0%

Sources: Airport Statistics, U.S. Department of Transportation, OAG Analyzer, SkyBridge Arizona, and Unison Consulting, Inc.

* Including all air-cargo aircraft operations projected by SkyBridge Arizona.

Figure 2-35: Growth Trends in Enplanements, Operations, and Landed Weight shows the forecast growth in enplanements, operations, and landed weight under the Master Plan and High Growth scenarios. Compared with enplanements, operations and landed weight grow at a slower pace because of continuing efforts by airlines to improve load factors and up-gauge their fleet. Compared with operations, landed weight grows at a slightly faster pace also due to fleet up-gauging within the narrow-body jet aircraft group.

Figure 2-35: Growth Trends in Enplanements, Operations, and Landed Weight



Sources: U.S. Department of Transportation for historical data and Unison Consulting, Inc., for the forecasts.

Table 2-5: Peak Month Average Day Peak Hour Operations – Commercial Passenger Carriers shows the calculations for the peak month average day (PMAD) peak hour number of operations for commercial passenger carriers. March is typically the peak month for passenger aircraft operations, accounting for 11.7 percent of operations in Calendar Year (CY) 2018. In March 2018, 16.7 percent of passenger aircraft operations during the average day took place during the peak hour.

Table 2-5: Peak Month Average Day Peak Hour Operations – Commercial Passenger Carriers

	Estimate		Forecast		
Scenario	**2018**	**2019**	**2023**	**2028**	**2038**
Master Plan (MP)	**10,920**	**11,994**	**12,953**	**14,070**	**16,840**
Peak Month (11.7% of CY Total)	1,280	1,400	1,520	1,650	1,970
Peak Month Average Day (PMAD) (PM/31 days)	41	45	49	53	64
PMAD Peak Hour (16.7% of PMAD)	7	8	8	9	11
High Growth (HG)	**10,920**	**13,120**	**14,463**	**16,020**	**19,570**
Peak Month (11.7% of CY Total)	1,280	1,540	1,690	1,870	2,290
Peak Month Average Day (PMAD) (PM/31 days)	41	50	55	60	74
PMAD Peak Hour (16.7% of PMAD)	7	8	9	10	12

Sources: OAG Analyzer and Unison Consulting, Inc. Operations are rounded to the nearest ten.

Table 2-6: Peak Month Average Day Peak Hour Passengers – Commercial Passenger Carriers shows the calculations for the PMAD peak hour number of passengers based on available airline seats. The peak month for seats is also March, accounting for 11.0 percent of total seats in CY 2018. The peak hour for passenger traffic is expected to be consistent with the peak hour for total seats on all passenger aircraft operations (arrivals and departures). Given that operating aircraft at IWA have comparable seating capacities, the peak hour share of PMAD total passenger traffic is the same as the peak hour share of PMAD total operations, 16.7 percent.

Table 2-6: Peak Month Average Day Peak Hour Passengers – Commercial Passenger Carriers

	Estimate		Forecast		
Scenario	**2018**	**2019**	**2023**	**2028**	**2038**
Master Plan (MP)	**1,518,100**	**1,700,600**	**1,849,300**	**2,044,800**	**2,490,400**
Peak Month (11.0% of CY Total)	167,600	187,700	204,200	225,700	274,900
Peak Month Average Day (PMAD) (PM/31 days)	5,406	6,055	6,587	7,281	8,868
PMAD Peak Hour (16.7% of PMAD)	903	1,011	1,100	1,216	1,481
High Growth (HG)	**1,518,100**	**1,869,700**	**2,074,900**	**2,337,200**	**2,902,400**
Peak Month (11.0% of CY Total)	167,600	206,400	229,100	258,000	320,400
Peak Month Average Day (PMAD) (PM/31 days)	5,406	6,658	7,390	8,323	10,335
PMAD Peak Hour (16.7% of PMAD)	903	1,112	1,234	1,390	1,726

Sources: OAG Analyzer and Unison Consulting, Inc. Passengers are rounded to the nearest hundred.

Forecast Commercial All Air-Cargo Operations

The PMGAA granted SkyBridge Arizona a 49-year lease to develop 363.5 acres of airport property located at the southeast corner of Sossaman Road and Velocity Way for an air cargo hub offering both U.S. and Mexican Customs services—the first of its kind in the United States. The Master Lease Agreement, which took effect in 2018, has allowed SkyBridge Arizona to proceed with the master planning and environmental review process for the proposed development. SkyBridge Arizona has committed to invest approximately $25 million for site improvements, including a taxiway extension, roadways, sewer and

water, and other basic infrastructure. At full build-out, SkyBridge Arizona will not only include a joint U.S.-Mexico Customs inspections facility, but it will also offer 1.35 million square feet of aeronautical development, 2.19 million square feet of non-aeronautical development, and 270,000 square feet of commercial development.[12]

While IWA currently has no all air-cargo carrier service, SkyBridge Arizona plans to begin and ramp-up all air-cargo carrier service at IWA during the planning horizon of this master plan. SkyBridge Arizona's fleet and facility projections include utilization of Boeing 747-400 and 767-300 freighters. SkyBridge projects they will have at least 500 annual 747-400 operations by around their fifth year of service. The High Growth scenario includes SkyBridge Arizona's high-range IWA operations projections *(**Table 2-7: SkyBridge Arizona: Commercial Activity Forecast – Landings by Equipment**)*.[13] As a result, total commercial aircraft operations at IWA could increase 5.4 percent annually on average to 31,482 in 2038 (***Table 2-3: Phoenix-Mesa Gateway Airport Forecast Commercial Aircraft Operations***), and commercial aircraft landed weight could increase 8.3 percent annually on average to 3.66 billion pounds in 2038 ***(Table 2-4: Phoenix-Mesa Gateway Airport Forecast Commercial Aircraft Landed Weight (1,000 Pounds)).***

Table 2-7: SkyBridge Arizona: Commercial Activity Forecast – Landings by Equipment

	Forecast									
Air-Cargo Carrier	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
SkyBridge Arizona	**354**	**354**	**708**	**1,166**	**1,166**	**2,020**	**2,020**	**2,020**	**3,082**	**3,082**
Boeing 747-400	104	104	208	416	416	520	520	520	832	832
Boeing 767-300	250	250	500	750	750	1,500	1,500	2,250	2,250	2,250
Air-Cargo Carrier	**2030**	**2031**	**2032**	**2033**	**2034**	**2034**	**2036**	**2037**	**2038**	
SkyBridge Arizona	**3,540**	**3,540**	**4,248**	**5,206**	**5,206**	**5,206**	**5,956**	**5,956**	**5,956**	
Boeing 747-400	1,040	1,040	1,248	1,456	1,456	1,456	1,456	1,456	1,456	
Boeing 767-300	2,500	2,500	3,000	3,750	3,750	3,750	4,500	4,500	4,500	

Source: Unison, IWA Airport Master Plan Activity Forecast - Landings by Equipment

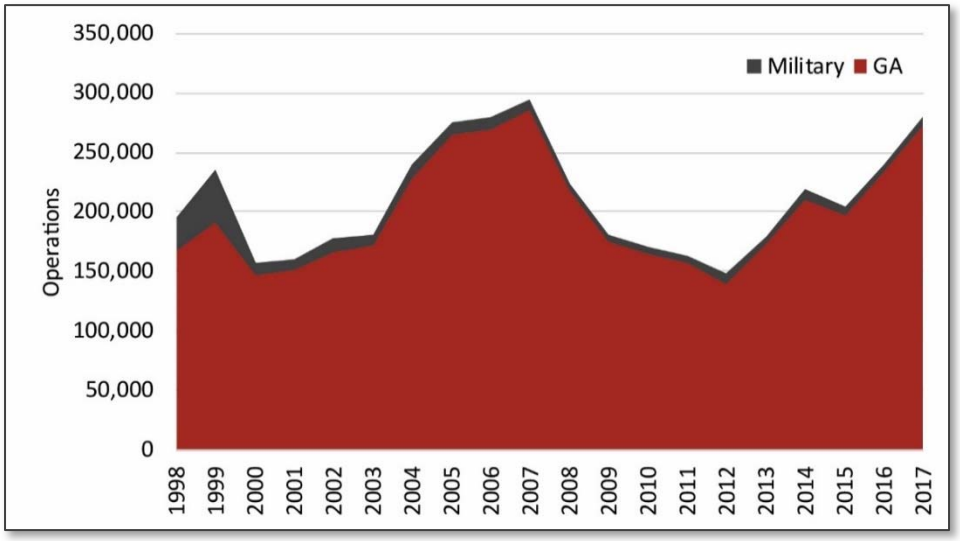
Noncommercial Aviation Activity

Noncommercial aviation activity includes operations of GA and military aircraft. Air taxi activity is grouped with GA operations. ***Figure 2-36: Trends in Noncommercial Aviation Activity at Phoenix-Mesa Gateway Airport, 1998-2017*** shows the historical trends in noncommercial aviation activity at IWA. Since 2000, GA operations have accounted for more than 90 percent of IWA's noncommercial aviation activity, while military operations accounted for less than 10 percent (less than 5 percent in more recent years). GA operations grew at an annual average rate of 10 percent beginning in 2001, but declined precipitously beginning in 2008, and through the Great Recession. They fell by 43 percent between 2007 and 2009 and decreased another 21 percent through 2012 before showing signs of recovery in 2013 and 2014. Military

[12] *SkyBridge Arizona Concept Master Plan, Final Document Draft*, September 2018.
[13] Preliminary projections by SkyBridge Arizona.

operations declined rapidly in 2000, more than offsetting their 66 percent growth in the previous year. They remained on a slower downward trend from 2000 to 2017, declining at the annual average rate of 2 percent through 2017. Both GA and military operations have recovered in recent years. GA operations accounted for 97 percent of noncommercial aviation activity in 2017, while military operations made up the remaining 3 percent.

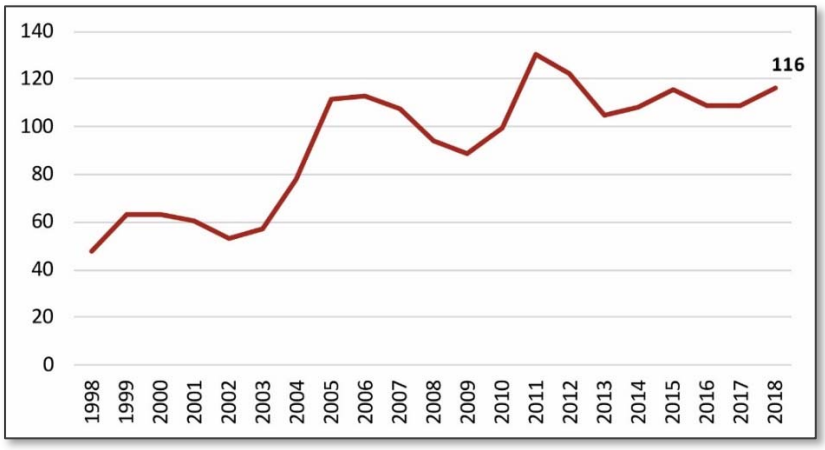
Figure 2-36: Trends in Noncommercial Aviation Activity at Phoenix-Mesa Gateway Airport, 1998-2017



Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.

Figure 2-37: Trends in Based Aircraft at Phoenix-Mesa Gateway Airport, 1998-2018 shows the number of based aircraft at IWA, which increased sharply between 2003 and 2005. The number of based aircraft peaked in 2011 with just over 130 aircraft. They declined through 2013 but have remained relatively stable through 2017. The airport's most recent statistics for 2018 indicate that 116 aircraft are currently based at IWA.

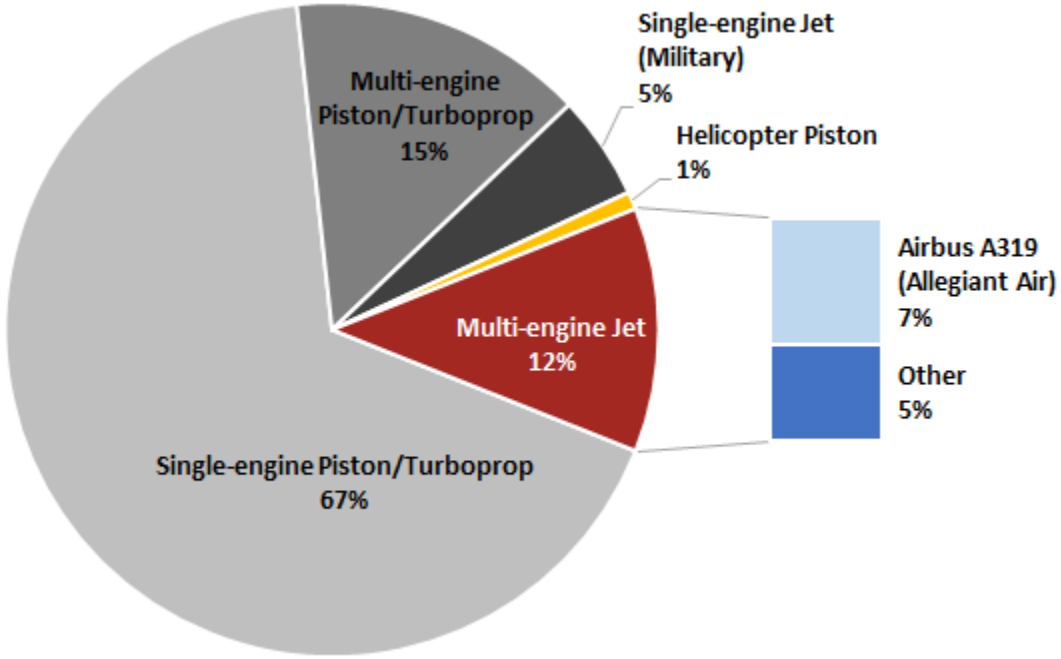
Figure 2-37: Trends in Based Aircraft at Phoenix-Mesa Gateway Airport, 1998-2018



Sources: FAA TAF 2018, Airport Statistics and Unison Consulting, Inc.

Figure 2-38: Phoenix-Mesa Gateway Airport Based Aircraft Composition, 2018 shows the latest composition of IWA-based aircraft by aircraft type (as of Quarter 1-2018). The based aircraft at IWA are GA aircraft consisting of 78 single-engine piston/turboprop, 17 multi-engine piston/turboprop, and 20 jet-engine aircraft used to cover a broad spectrum of military, commercial (Allegiant Air)m and GA service needs. A Bell 47 helicopter is also currently based at the airport.

Figure 2-38: Phoenix-Mesa Gateway Airport Based Aircraft Composition, 2018



Sources: Airport Statistics and Unison Consulting, Inc.

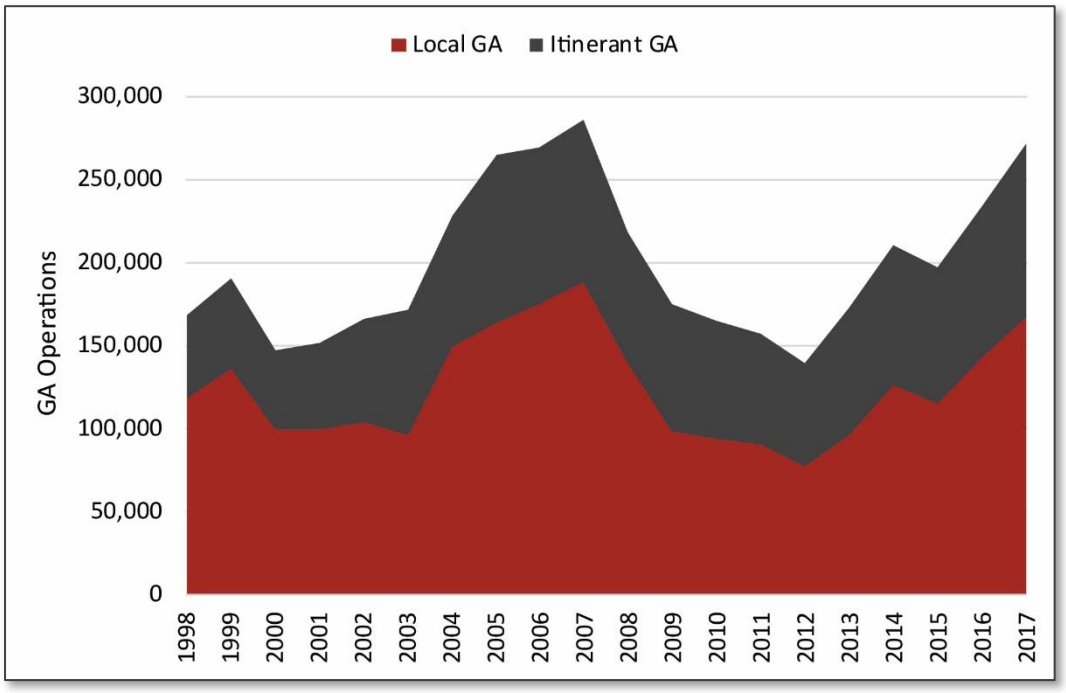
General Aviation (GA) Activity – Airport Trends

IWA's GA activity, comprised of itinerant and local operations, covers non-commercial and non-military passenger or cargo services provided at the airport. Itinerant operations are flights that go to and come from a different airport; they have generally accounted for around 40 percent of IWA's GA operations. Accounting for 60 percent of GA activity, local operations include flights within the local traffic pattern of the airport. Local GA operations typically involve operations related to personal and instructional flying and include flights to designated practice areas within 20 miles of an airport. Business and corporate-related GA activities are usually grouped under itinerant operations. Other aerial GA activities, such as sightseeing, observation, and air medical, account for a small share of GA operations, and would also fall under the local GA category.

GA activity typically satisfies local demands for air transport, including business travel, emergency transport, flight instruction, and recreational flying. It is therefore sensitive to both local and national economic conditions.

Figure 2-39: Phoenix-Mesa Gateway Airport Local and Itinerant GA Operations, 1998-2017 shows the trends in GA activity at IWA from 1998. Total GA operations peaked at 285,325 in 2007, growing 70 percent over nine years. Itinerant GA traffic grew by 93 percent over this period, while local GA traffic increased by 60 percent. Both itinerant and local GA operations declined sharply after 2007 and did not show signs of recovery until 2013. Combined, itinerant and local GA activity decreased over 50 percent over the five years between 2007 and 2012. Although GA operations have not recovered to pre-recession levels at IWA, they have rebounded strongly since 2013, nearly doubling activity levels through 2017.

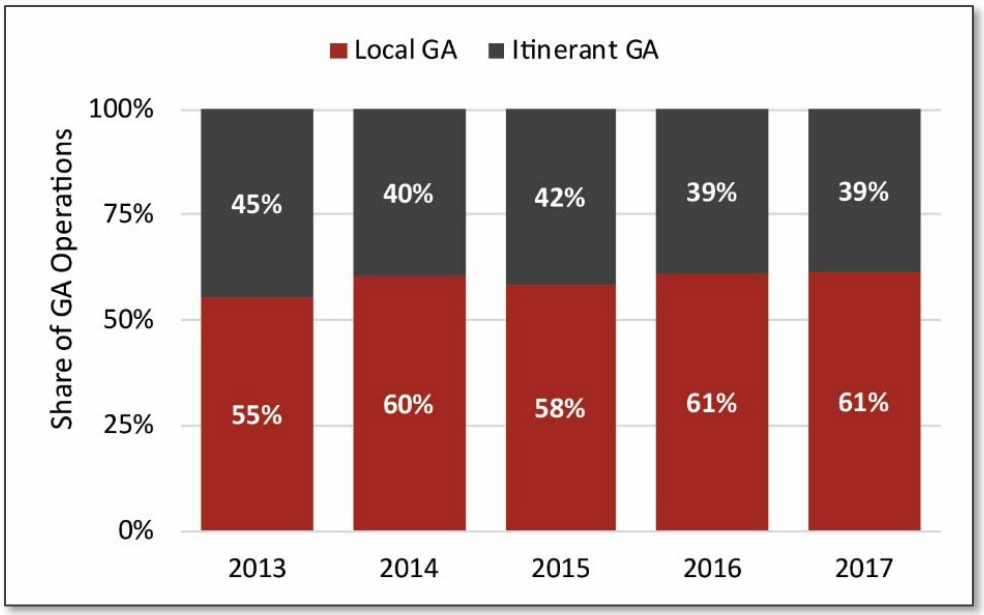
Figure 2-39: Phoenix-Mesa Gateway Airport Local and Itinerant GA Operations, 1998-2017



Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.

Figure 2-40: Phoenix-Mesa Gateway Airport Itinerant and Local GA Operations, 2013-2017 shows the distribution of GA operations between local and itinerant operations over the past five years. Itinerant operations decreased in share from 45 percent in 2013 to 39 percent in 2016, while local operations increased in share from 55 percent in 2013 to 61 percent in 2016. These shares remained the same in 2017. The increase in local operations is attributable to the growth in flight school activity.

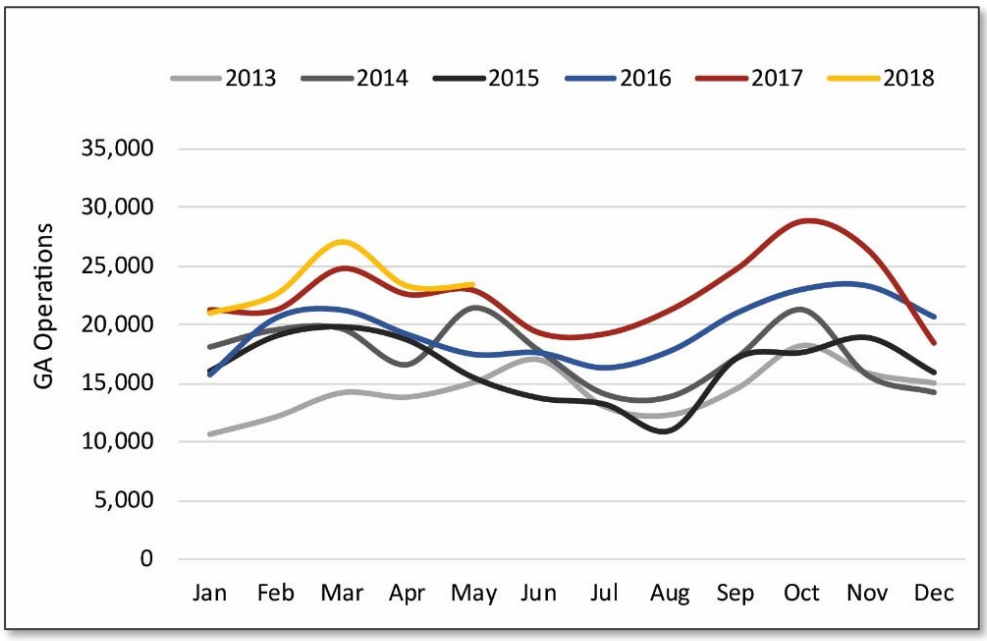
Figure 2-40: Phoenix-Mesa Gateway Airport Itinerant and Local GA Operations, 2013-2017



Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.

Figure 2-41: Monthly GA Operations at Phoenix-Mesa Gateway Airport, Jan 2013-May 2018 provides the monthly trends of all GA operations at IWA between January 2013 and May 2018. GA activity exhibits a seasonal pattern, with peaks occurring most frequently in the early spring and fall. Better weather during the spring and the fall permits more flight training operations.

Figure 2-41: Monthly GA Operations at Phoenix-Mesa Gateway Airport, Jan 2013-May 2018

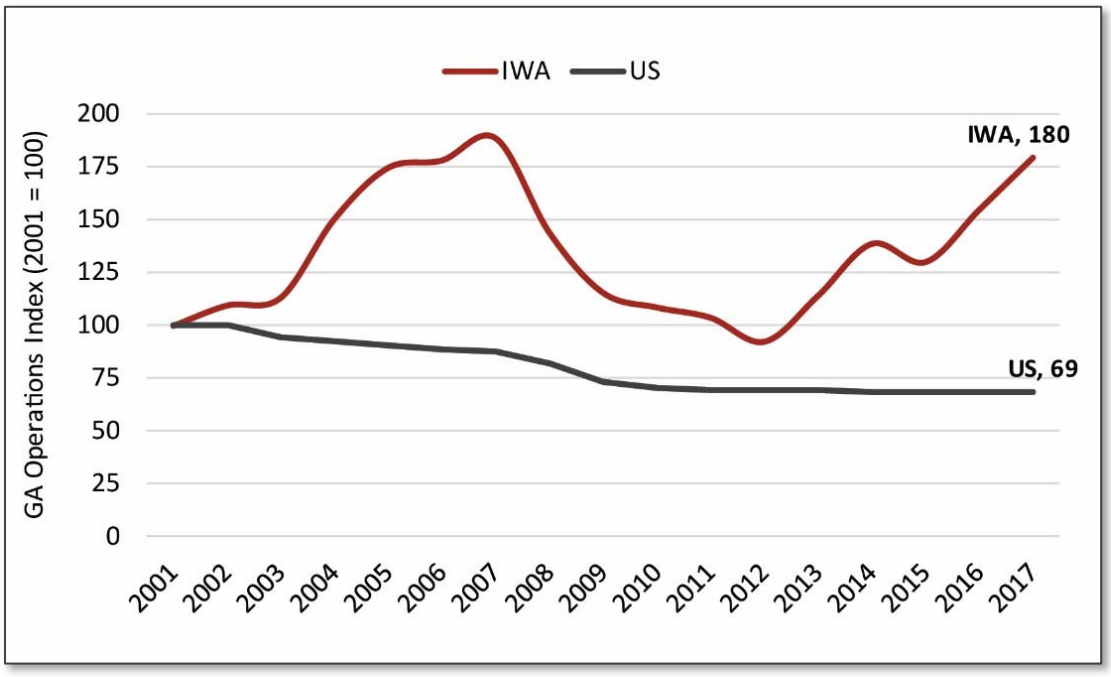


Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.

GA Activity – National Trends

GA activity at IWA does not follow the national trend of declining operations, which began four decades ago. ***Figure 2-42: GA Operations at Phoenix-Mesa Gateway Airport and in U.S. (2001 Levels = 100)*** shows the trends in GA operations at IWA alongside national trends since 2001. Compared with the national trend, GA operations at IWA have increased and decreased more sharply. GA operations at IWA have increased 80 percent compared with 2001 levels, while national GA activity declined 31 percent over the same period. Nationally GA operations decreased since the early 1990s. The U.S. economic recessions, particularly the Great Recession in 2008-2009 and the subsequent slow economic recovery, depressed GA activity nationwide. Other factors also contributed to the decrease in GA activity. The pilot population has shrunk since reaching its peak in the 1980s. GA aircraft production has also decreased and has not kept up with the pace of aircraft retirement from the existing fleet. Finally, aviation fuel prices rose to record high levels until their decline in 2014.

Figure 2-42: GA Operations at Phoenix-Mesa Gateway Airport and in U.S. (2001 Levels = 100)



Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.

Forecast Noncommercial Aviation Activity

Since GA activity at IWA is affected by regional drivers of air traffic demand, GA operations at IWA are projected to follow regional trends. Airports that are proximate to IWA are also expected to influence its GA activity, potentially complementing or competing with the GA services provided there. For the Master Plan forecast, the Consultant developed a regression model to estimate the relationship between GA traffic drivers and regional GA operations. Itinerant and local GA operations are forecast separately for IWA and regional airports with GA activity. Then, based on assumptions about IWA's share of the region's

GA traffic, future GA activity levels at the Airport are estimated. These regional airports included in the analysis are within 40 nautical miles of IWA:

- ✓ Phoenix Deer Valley Airport (DVT)
- ✓ Falcon Field (FFZ)
- ✓ Chandler Municipal Airport (CHD)
- ✓ Scottsdale Airport (SDL)
- ✓ Phoenix Goodyear Airport (GYR)
- ✓ Phoenix Sky Harbor International Airport (PHX)

The selected airports have control towers and serve both GA and military operations (***Table 2-8: GA and Military Operations at Selected Regional Airports, 2017***). Together, these six airports offer many fixed base operator and ancillary services that are attractive to GA operators. With a few exceptions, the busier GA airports generally have higher shares of the based aircraft in the region. Most notably, DVT has the highest share of based aircraft and the highest level of GA activity. Though IWA has a relatively small share of based aircraft, the Airport maintains a higher level of GA activity in comparison to the other selected airports. The number and diversity of based aircraft may also reflect aircraft storage capacity at an airport, as well as its proximity to population centers.

Table 2-8: GA and Military Operations at Selected Regional Airports, 2017

Airport*	GA	Military	Based Aircraft	Market Share of Based Aircraft
DVT	378,631	134	934	38%
FFZ	287,374	4,074	635	26%
IWA	271,446	7,503	116	5%
CHD	193,859	348	154	6%
SDL	167,482	639	378	15%
GYR	107,567	3,397	192	8%
PHX	49,761	2,296	78	3%

Sources: FAA OPSNET/ATADS, Airport IQ 5010, Airport Statistics, and Unison Consulting, Inc.
*See bullet list in narrative above for airport abbreviations.

Regional Forecast for GA

Analyzing annual traffic trends at IWA and the selected regional airports together with demand-side drivers of air traffic forms the basis for forecasting GA operations. Multivariate time series regression analysis is used to link changes in GA operations to trends in local demand drivers. This approach combines elements of multiple regression analysis and time series regression analysis, providing the ability to incorporate many explanatory variables while quantifying their unique contributions to GA activity trends. Using the least squares method, the model estimation process is designed to minimize forecast errors. The modeling approach controls for serial correlation and common trends over time between operations and explanatory variables.

GA services satisfy local demands for air transport, including business travel, emergency transportation, flight training, and tourism. In view of these local drivers, variables that capture regional economic trends are incorporated into the forecast model. Considering potential differences in their drivers and in their historical trends at IWA and regional airports, the Consultant modeled itinerant and local GA operations separately.

The regression model for the region's GA operations is specified to measure the contribution of local economic factors that drive GA activity. Regression coefficients measure contributions of demand drivers (explanatory variables) to the GA activity growth trends in the region. These coefficients are estimated using annual data from 1998 to 2017. The estimated regression coefficients are then used to generate forecasts of GA activity at IWA based on projected trends for the model's explanatory variables.

The model specification for local GA operations uses total nonfarm employment in the Phoenix MSA to measure the impacts of regional economic development trends and population growth, both factors that are strong predictors of demand for local GA services. Holding all other factors constant, growth in regional employment promotes growth in GA operations. Conversely, decreases in employment reduce operations. The model also includes controls for the impacts of the 9/11 terrorist attacks and autocorrelation (correlation of current and prior values of the dependent variable) in the time series data.

The model specification for itinerant GA operations includes the following explanatory variables: real per capita GDP of the Phoenix MSA, real jet fuel price,[14] a dummy variable to capture the impacts of the 9/11 terrorist attacks, and a linear trend variable to control for common trends over time between operations and explanatory variables.[15] The model specification also includes corrections for autocorrelation.

The estimated regression coefficient for nonfarm employment has the expected positive effect on local GA traffic projections, implying that a larger traffic base for the region stimulates traffic. In the itinerant GA model, real per capita GDP also confirms the expected influence of the variable on the itinerant GA trends of the region. Holding all other factors constant, growth in regional real GDP, which indicates overall regional economic growth, stimulates growth in its itinerant GA operations. Conversely, downturns in the economy of the region decrease itinerant GA operations. The estimated coefficients, each measuring the GA traffic impacts of the remaining variable in the regression model, also confirm the expected effects of the explanatory variables on both local and itinerant GA traffic.

[14] Jet fuel prices track closely with aviation gasoline prices. Aviation gasoline price was not used since the data were sparse for recent years and projections were not available for forecast years.

[15] Real per capita GDP for the Phoenix MSA proved to be a better predictor of the itinerant GA activity in the region than the other economic indicators tested, namely, aggregate and per capita personal income in the MSA, nonfarm employment in the MSA, and national measures of economic activity (U.S. unemployment rate, per capita GDP, and per capita personal income).

Forecast Noncommercial Aviation Activity at Phoenix-Mesa Gateway Airport

Table 2-9: Regional and Phoenix-Mesa Gateway Airport GA Operations presents the resulting forecast of regional GA operations and IWA's share. For the Master Plan forecast, IWA maintains its current shares of the region's local GA traffic (20 percent) and itinerant GA traffic (18 percent).

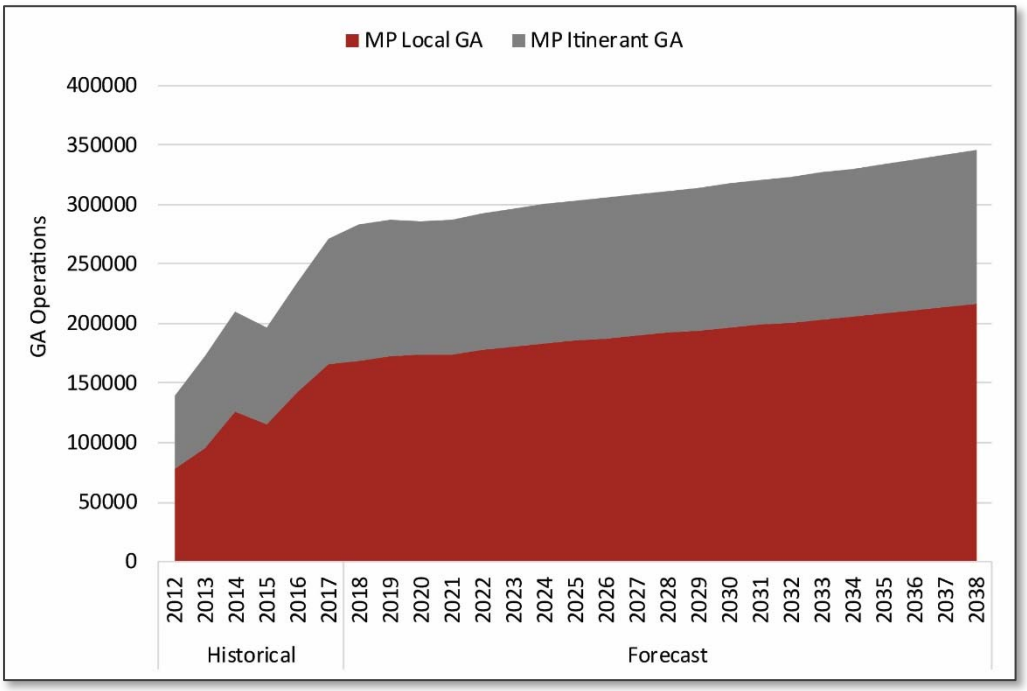
Table 2-9: Regional and Phoenix-Mesa Gateway Airport GA Operations

		Regional GA Operations				IWA GA Operations				IWA's Share of Regional GA Operations
	CY	Local	Itinerant	Total	AGR	Local	Itinerant	Total	AGR	
Historical	2008	878,291	616,305	1,494,596		139,808	78,055	217,863		14.6%
	2009	785,444	674,640	1,460,084	-2.3%	97,721	77,070	174,791	-19.8%	12.0%
	2010	670,482	596,007	1,266,489	-13.3%	94,138	70,171	164,309	-6.0%	13.0%
	2011	628,213	582,413	1,210,626	-4.4%	90,006	66,947	156,953	-4.5%	13.0%
	2012	655,547	611,072	1,266,619	4.6%	77,634	62,198	139,832	-10.9%	11.0%
	2013	708,556	634,288	1,342,844	6.0%	95,544	77,113	172,657	23.5%	12.9%
	2014	711,576	591,918	1,303,494	-2.9%	126,265	83,514	209,779	21.5%	16.1%
	2015	752,213	612,485	1,364,698	4.7%	114,725	82,040	196,765	-6.2%	14.4%
	2016	809,915	628,160	1,438,075	5.4%	142,617	91,492	234,109	19.0%	16.3%
	2017	819,427	636,693	1,456,120	1.3%	166,519	104,927	271,446	15.9%	18.6%
Est.	2018	843,934	643,526	1,487,461	2.2%	168,360	114,236	282,596	4.1%	19.0%
Forecast	2019	864,922	647,670	1,512,592	1.7%	172,546	114,972	287,518	1.7%	19.0%
	2020	870,148	629,636	1,499,785	-0.8%	173,589	111,771	285,360	-0.8%	19.0%
	2021	873,343	633,742	1,507,084	0.5%	174,226	112,500	286,726	0.5%	19.0%
	2022	890,791	645,890	1,536,681	2.0%	177,707	114,656	292,363	2.0%	19.0%
	2023	904,397	652,529	1,556,926	1.3%	180,421	115,835	296,256	1.3%	19.0%
	2024	917,580	658,200	1,575,780	1.2%	183,051	116,841	299,893	1.2%	19.0%
	2025	930,452	662,558	1,593,009	1.1%	185,619	117,615	303,234	1.1%	19.0%
	2026	941,313	665,687	1,607,000	0.9%	187,786	118,170	305,956	0.9%	19.0%
	2027	951,578	668,209	1,619,787	0.8%	189,834	118,618	308,452	0.8%	19.0%
	2028	962,678	672,654	1,635,332	1.0%	192,048	119,407	311,455	1.0%	19.0%
	2029	974,561	676,547	1,651,108	1.0%	194,419	120,098	314,517	1.0%	19.0%
	2030	986,277	680,363	1,666,640	0.9%	196,756	120,776	317,532	0.9%	19.1%
	2031	997,268	683,950	1,681,218	0.9%	198,949	121,412	320,361	0.9%	19.1%
	2032	1,008,189	688,777	1,696,967	0.9%	201,127	122,269	323,397	0.9%	19.1%
	2033	1,020,106	694,189	1,714,294	1.0%	203,505	123,230	326,734	1.0%	19.1%
	2034	1,032,985	699,992	1,732,977	1.1%	206,074	124,260	330,334	1.1%	19.1%
	2035	1,046,001	706,395	1,752,396	1.1%	208,671	125,397	334,067	1.1%	19.1%
	2036	1,058,900	712,572	1,771,472	1.1%	211,244	126,493	337,737	1.1%	19.1%
	2037	1,072,327	717,795	1,790,122	1.1%	213,922	127,420	341,343	1.1%	19.1%
	2038	1,086,633	724,581	1,811,214	1.2%	216,776	128,625	345,401	1.2%	19.1%
CAGR	2018-2028	1.3%	0.4%	1.0%		1.3%	0.4%	1.0%		
	2028-2038	1.2%	0.7%	1.0%		1.2%	0.7%	1.0%		
	2018-2038	1.3%	0.6%	1.0%		1.3%	0.6%	1.0%		

Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.
Notes: CY = Calendar Year
AGR = Annual Growth Rate
CAGR = Compound Annual Growth Rate

Figure 2-43: Forecast GA Operations – Breakdown between Local and Itinerant Operations shows the forecast GA operations for IWA, broken down between itinerant and local operations. Local operations continue to account for around 60 percent of total GA operations, while itinerant operations make up the remaining 40 percent. Both segments are expected to grow between 2018 and 2038. Consistent with recent trends, local operations grow faster than itinerant operations. The modest decreases in both local and itinerant operations in 2020 correspond to a projected economic slowdown in the Phoenix MSA, ending the current economic expansion and marking the beginning of another economic cycle.

Figure 2-43: Forecast GA Operations – Breakdown between Local and Itinerant Operations



Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.

Table 2-10: Forecast Noncommercial Aviation Activity presents the resulting forecast of GA operations, along with forecasts of military operations and based aircraft at IWA. GA operations for 2018 are estimated based on year-to-date actual data. Beyond 2018, forecast GA operations for IWA are derived from forecast regional GA operations, assuming IWA maintains its share of regional local and itinerant GA operations. IWA's local and itinerant operations grow at the same rate as regional local and itinerant GA operations, respectively. Military operations are held constant at their 2017 level, while the growth in the number of based aircraft is projected to keep pace with the growth in GA operations.[16]

[16] Based aircraft of Allegiant Air are also assumed to remain constant (they do not grow in proportion with forecast GA operations).

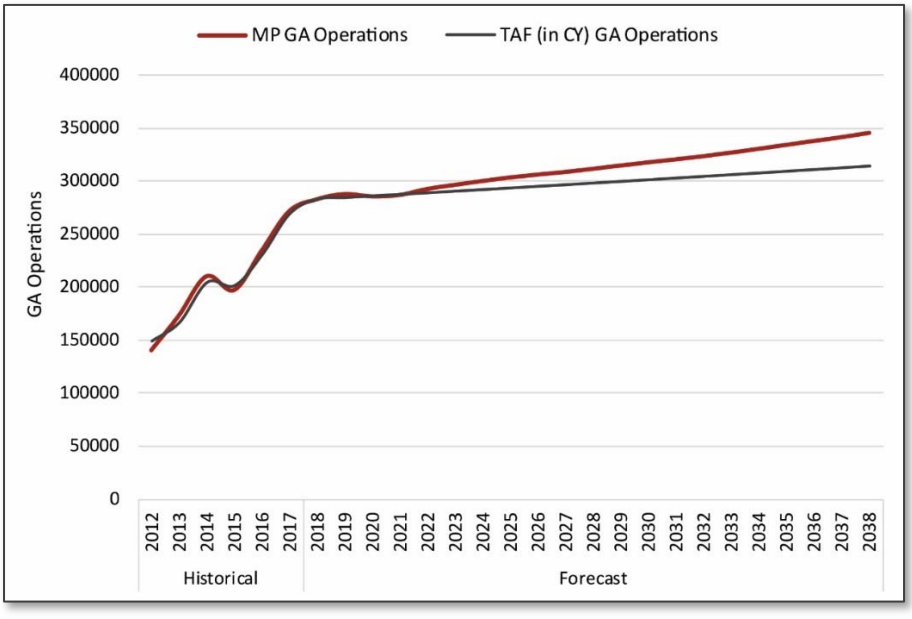
Table 2-10: Forecast Noncommercial Aviation Activity at Phoenix-Mesa Gateway Airport

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2017-2018**	**2018-2023**	**2023-2028**	**2028-2038**
Noncommercial Operations	278,949	290,099	303,759	318,958	352,904	4.0%	0.9%	1.0%	1.0%
General Aviation	271,446	282,596	296,256	311,455	345,401	4.1%	0.9%	1.0%	1.0%
Itinerant	104,927	114,236	115,835	119,407	128,625	8.9%	0.3%	0.6%	0.7%
Local	166,519	168,360	180,421	192,048	216,776	1.1%	1.4%	1.3%	1.2%
Military	7,503	7,503	7,503	7,503	7,503	0.0%	0.0%	0.0%	0.0%
Based Aircraft	109	116	121	126	139	6.4%	0.8%	0.9%	0.9%

Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.

Figure 2-44: Master Plan Forecast GA Operations Compared with the TAF and ***Table 2-11: Master Plan Forecast GA Operations Compared with the TAF*** compare forecast GA operations with those published for IWA in the 2018 FAA TAF, adjusted to calendar year basis. They differ by no more than 2 percent over the first five years and no more than 10 percent beyond five years through 2038. The estimated levels in the TAF for the base year 2016 are lower than observed levels for the same year. This difference of about 0.8 percent accounts for some of the difference between the TAF and the Master Plan forecast levels over the forecast period.

Figure 2-44: Master Plan Forecast GA Operations Compared with the TAF



Sources: Airport Statistics, FAA and Unison Consulting, Inc.

Table 2-11: Master Plan Forecast GA Operations Compared with the TAF

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2017-2018**	**2018-2023**	**2023-2028**	**2028-2038**
GA Total	271,446	282,596	296,256	311,455	345,401	4.1%	0.9%	1.0%	1.0%
Itinerant	104,927	114,236	115,835	119,407	128,625	8.9%	0.3%	0.6%	0.7%
Local	166,519	168,360	180,421	192,048	216,776	1.1%	1.4%	1.3%	1.2%
TAF (in CY)	269,167	282,758	290,167	297,796	313,757	5.0%	0.5%	0.5%	0.5%
Ratio of MP GA Total to TAF (in CY)	1.01	1.00	1.02	1.05	1.10	--	--	--	--

Sources: Airport Statistics, FAA and Unison Consulting, Inc.
Note: CY = Calendar Year

FAA Aerospace Forecasts of GA Activity

Each year the FAA publishes high-level forecasts for national aviation activity, including forecasts on GA operations. Based on economic drivers of GA activity, the FAA also provides forecasts of aircraft fleet mix, hours of operation by category of aircraft, and the number of active pilots. The highlights of the FAA's long-term outlook for GA activity are as follows:

- ✓ Stable growth in GA operations, averaging 0.3 percent annually between 2018 and 2038, with local operations growing slightly faster than itinerant operations
- ✓ Growth in the active GA fleet at an average annual rate of 0.08 percent
- ✓ Decrease in fixed-wing piston aircraft, the largest category of the current fleet, at an average annual rate of 1.1 percent, and increase in turbine-powered aircraft at an average annual rate of 1.8 percent annually, driving growth of the GA aircraft population
- ✓ Increase in GA hours flown by 0.8 percent annually
- ✓ Increase in the number of active air transport pilots by 0.7 percent annually and decrease in the number of active GA pilots by 0.4 percent annually
- ✓ Decreases in active private and commercial pilot populations at average annual rates of 0.9 percent and 0.4 percent, respectively
- ✓ Increases in sport pilots at an average annual rate of 3.3 percent.

Table 2-12: FAA Forecast for U.S. GA Activity presents the annual average growth rates for U.S. GA operations, active GA fleet and hours flown contained in the FAA forecast.

Table 2-12: FAA Forecast for U.S. GA Activity

GA Operations			2017-18	2018-28	2018-38
GA		Itinerant	0.2%	0.2%	0.3%
		Local	1.8%	0.3%	0.3%
		Total GA Operations	**0.9%**	**0.3%**	**0.3%**
Active GA Fleet			**2017-18**	**2018-28**	**2018-38**
Fixed Wing	Piston	Single-Engine	0.1%	-0.9%	-1.0%
		Multi-Engine	-0.3%	-0.3%	-0.4%
	Turbine	Turbo Prop	-2.5%	0.7%	1.7%
		Turbo Jet	2.2%	2.3%	2.2%
Rotorcraft		Piston	1.8%	1.5%	1.5%
		Turbine	2.2%	2.0%	1.9%
		Total GA Fleet	**0.4%**	**-0.1%**	**0.0%**
Hours Flown			**2017-18**	**2018-28**	**2018-38**
Fixed Wing	Piston	Single-Engine	-0.9%	-1.6%	-1.1%
		Multi-Engine	-1.1%	-0.6%	-0.3%
	Turbine	Turbo Prop	-1.2%	0.8%	1.8%
		Turbo Jet	7.7%	3.2%	2.7%
Rotorcraft		Piston	3.0%	1.9%	1.7%
		Turbine	3.4%	2.6%	2.3%
Other*			0.5%	0.0%	0.1%
		Total GA Hours	**1.2%**	**0.5%**	**0.8%**

Notes: * Source: 2001-2010, 2012-2014, FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.
An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.
Experimental Light-sport category that was previously shown under Sport Aircraft is moved under Experimental Aircraft category, starting in 2012.

Sources of Forecast Risk and Uncertainty

The forecasts are based on information available at the time of the study, measurable factors that drive air traffic, and assumptions about their future trends. The airport operates in a dynamic environment. Actual results could differ materially from the forecasts if any of the assumptions do not hold or if unexpected events cause traffic to decrease or increase significantly.

PMGAA Air Service Development Initiatives

One fundamental assumption is that the airport will retain and grow scheduled commercial passenger service by Allegiant and WestJet or similar carriers. For an airport that shares a service area with a large commercial service airport, aggressive air service development initiatives are crucial for retaining and growing service.

In its strategic business plan, PMGAA has identified seven goals that will guide the development and operation of IWA during the next decade; its number one goal is to increase air service, targeting passenger traffic growth of 3 to 5 percent each year.

PMGAA has committed to:

- ✓ Work with incumbent airline(s) to retain and expand current level of air service by increasing the frequency of flights to existing destinations and expanding the number of nonstop destinations served.
- ✓ Recruit additional commercial passenger, charter, and cargo airlines by executing an air service development strategy, fostering professional relationships with potential airlines, and articulating a strong business case for new air service.
- ✓ Attract more corporate jet/private aircraft and military training operations to enhance revenue and economic contribution.[17]

PMGAA's air service development goal is not limited to commercial passenger traffic; it also includes cargo and noncommercial operations.

Airline Financial Conditions and Business Strategies

Airports face risks of air service capacity cuts when airlines encounter financial difficulties or change their business strategies. As we have seen in the last 10 years, small airports are the most vulnerable to these risks. They also have limited ability to reverse or mitigate these risks. Following the Great Recession, airlines cut capacity, restructured business operations, changed business strategies, and entered mergers to improve finances. Those that were not successful went out of business altogether. These actions resulted in cuts in air service at certain airports, particularly smaller ones.

IWA is currently served by five airlines—Allegiant, WestJet, California Pacific, Flair Airlines and Swoop (a subsidiary of WestJet).[18] The commercial passenger traffic forecasts assume that IWA will retain and grow the service provided by these airlines, especially Allegiant, which accounted for approximately 98.2 percent of passengers at IWA in 2017. The remaining passengers were served by WestJet (1.7 percent) and charters (0.2 percent).

Allegiant

Allegiant Air is the ninth largest commercial airline in the United States, a leader in the new class of ultra low-cost carriers (ULCCs). It is a wholly owned subsidiary of Allegiant Travel Company. As of the first quarter of 2018, Allegiant Travel Company has achieved 61 consecutive quarters of profitability. It earned net incomes of $220.3 in 2015, $219.6 million in 2016, and $194.9 million in 2017.

[17] *Phoenix-Mesa Gateway Airport Strategic Business Plan 2017*, pages 5-7.
[18] As of 2019, Phoenix-Mesa Gateway Airport is now served by only three airlines. California Pacific Airlines ceased operations effective December 28, 2018 and Flair no longer serves the Airport. Their activity in terms of aircraft operations and total passengers represent less than one percent of the FAA approved forecast.

Allegiant Air has grown from one aircraft and one route in 1999 to more than 85 aircraft and 350 routes across the country with base airfares less than half the cost of the average domestic roundtrip ticket. Currently, Allegiant provides scheduled air carrier service to 124 airports.

IWA is one of the first airports that Allegiant served since starting operations in 1997. As of 2018, IWA ranks 5th in total scheduled seats offered by Allegiant for year's operations. Allegiant has increased its scheduled seats at IWA by 28 percent since 2013 (12 percent since 2017). The airline also indicated plans to add frequencies and new destinations beyond what is reflected in its 2018 schedules for IWA as of July 2018.

WestJet

WestJet is a Canadian low-cost airline founded in 1996 as a low-cost alternative to major Canadian airlines. It is now the second largest Canadian airline, behind Air Canada. As of March 31, 2018, WestJet offered scheduled service to over 100 destinations in North America, Central America, the Caribbean, and Europe. As of the first quarter of 2018, WestJet has been profitable for 52 consecutive quarters.

WestJet operates at both PHX and IWA. The airline believes that the Phoenix market is large enough to support operations at both airports to reach different market segments. WestJet sees potential for expanding its IWA service.

Economic Conditions

National and regional economic conditions affect airport traffic trends. The national economy is a major driver of the regional economy, and it is an important determinant of air travel demand. Economic expansions increase income, boost consumer confidence, stimulate business activity, and increase demand. In contrast, economic recessions reduce income, diminish consumer confidence, dampen business activity, and weaken demand. Generally, air travel demand declines during economic recessions and grows during economic recoveries and expansions. While the diversity of the regional economy helps temper the effects of business cycles, the regional economy can be vulnerable to a national economic recession as deep as the Great Recession in 2008-2009.

The U.S. economy is now on its ninth year of expansion after the Great Recession. Driven by growth in consumer spending and business investment, the U.S. economy is predicted to continue growing over the next few years. While the probability of a recession in the near-term remains low, many factors within the country and abroad present economic risks. Sources of economic risks include reduced consumer travel demand, significant economic policy changes, the high level of U.S. government and private debt, tightening monetary policy, the adverse effects of volatile oil prices on the U.S. energy and manufacturing sectors, and continuing political tensions abroad.

Oil Prices and Jet Fuel Prices

Oil prices affect one of the largest components of airline costs—jet fuel. The sharp increases in oil prices in the past decade caused sharp increases in jet fuel costs. The U.S. airline industry suffered huge financial losses, pushing many airlines into bankruptcy and prompting significant changes in airlines' operations and business practices. In contrast, the sharp decrease in oil prices since June 2014 has brought airlines windfall profits, allowing them to renew their fleets and invest in other service improvements.

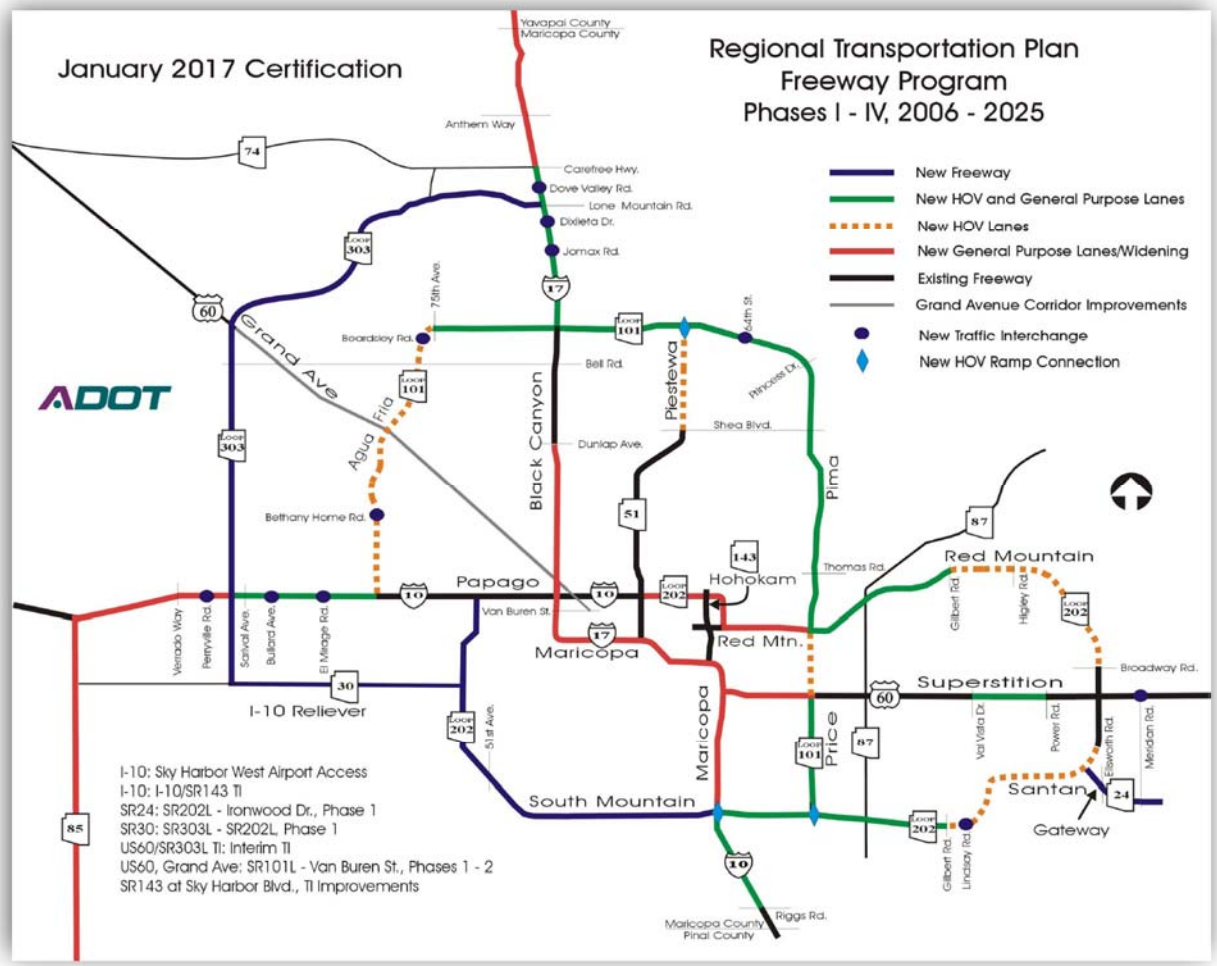
World oil prices are slowly recovering. Since June 2017 they have been on a steady upward trend, raising the average spot price per barrel for 2017 to $50.79 and for April 2018 to $66.25. According to the U.S. Energy Information Administration forecast, WTI spot prices could average around $66 per barrel in 2018 and around $61 per barrel in 2019.

U.S. airlines yet again face increases in jet fuel prices, although this time with more fuel-efficient fleet, more cost-efficient business operations, and better financial conditions.

ADOT Regional Transportation Plan

Planned regional highway network improvements under the current ADOT Regional Transportation Plan Freeway Program will improve the relative accessibility of IWA. As **Figure 2-45: ADOT Regional Transportation Plan Freeway Program** shows, the planned SR202 – South Mountain and SR30 – I10 Reliever freeways will provide new access to the westside of the Phoenix metropolitan area by bypassing downtown. The SR202 is now open connecting the east and west valley, and the I-10 Reliever is scheduled to open sometime in the future.

Figure 2-45: ADOT Regional Transportation Plan Freeway Program



Source: Arizona Department of Transportation.

Summary of Master Plan Forecasts and Comparison with the FAA Terminal Area Forecast (TAF)

Table 2-13: Summary of Phoenix-Mesa Gateway Airport Forecast Activity provides a summary of IWA's key aviation activity measures, broken down by selected forecast scenarios for commercial and total operations. The table also provides a summary of noncommercial aviation activity, which includes GA and Military operations.

Table 2-13: Summary of Phoenix-Mesa Gateway Airport Forecast Activity

	Actual	Estimate	Forecast			CAGR			
Measure/Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2017-2018**	**2018-2023**	**2023-2028**	**2028-2038**
Enplanements									
Master Plan	681,892	759,033	924,667	1,022,420	1,245,211	11.3%	4.0%	2.0%	2.0%
High Growth	681,892	759,033	1,037,426	1,168,589	1,451,202	11.3%	6.4%	2.4%	2.2%
Low Growth	681,892	759,033	903,617	984,846	1,180,070	11.3%	3.5%	1.7%	1.8%
Commercial Aircraft Operations									
Master Plan	10,372	10,920	12,953	14,070	16,840	5.3%	3.5%	1.7%	1.8%
High Growth	10,372	10,920	14,463	16,020	19,570	5.3%	5.8%	2.1%	2.0%
High Growth*	10,372	10,920	16,795	22,184	31,482	5.3%	9.0%	5.7%	3.6%
Low Growth	10,372	10,920	12,662	13,558	15,967	5.3%	3.0%	1.4%	1.6%
Noncommercial Aircraft Operations									
General Aviation	271,446	282,596	296,256	311,455	345,401	4.1%	0.9%	1.0%	1.0%
Military	7,503	7,503	7,503	7,503	7,503	0.0%	0.0%	0.0%	0.0%
Subtotal	278,949	290,099	303,759	318,958	352,904	4.0%	0.9%	1.0%	1.0%
Total Aircraft Operations									
Master Plan	289,321	301,019	316,712	333,028	369,744	4.0%	1.0%	1.0%	1.1%
High Growth	289,321	301,019	318,222	334,978	372,474	4.0%	1.1%	1.0%	1.1%
High Growth*	289,321	301,019	320,554	341,142	384,386	4.0%	1.3%	1.3%	1.2%
Low Growth	289,321	301,019	316,421	332,516	368,871	4.0%	1.0%	1.0%	1.0%

Sources: Airport Statistics, U.S. Department of Transportation, OAG Analyzer, SkyBridge Arizona, FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc., and Unison Consulting, Inc.

* Including all air-cargo aircraft operations projected by SkyBridge Arizona.

Table 2-14: Summary of Master Plan Forecasts and Comparison with the TAF summarizes the Master Plan forecasts of the key measures of aviation activity at IWA and compares them with the TAF published in January 2018. The TAF contain the FAA's forecasts for active airports in the *National Plan of Integrated Airport Systems* (NPIAS). The FAA prepares the TAF to meet its budget and planning needs and provide information for use by state and local authorities, the aviation industry, and the public. As such, the TAF represent the policy benchmark of the FAA for federal review and approval of airport master plan forecasts. Air traffic data in the TAF are reported annually on the basis of the federal fiscal year. Since the

IWA activity forecasts are on a calendar year basis, the TAF federal fiscal year totals were converted to calendar year totals for a consistent comparison.

Table 2-14: Summary of Master Plan Forecasts and Comparison with the TAF

	Actual	Estimate	Forecast			CAGR			
Measure	**2017**	**2018**	**2023**	**2028**	**2038**	**2017-2018**	**2018-2023**	**2023-2028**	**2028-2038**
Enplanements									
Master Plan	681,892	759,033	924,667	1,022,420	1,245,211	11.3%	4.0%	2.0%	2.0%
TAF (CY)	704,268	751,856	838,428	923,717	1,120,895	6.8%	2.2%	2.0%	2.0%
Ratio of MP to TAF	0.97	1.01	1.10	1.11	1.11	-	-	-	-
Commercial Aircraft Operations									
Master Plan	10,372	10,920	12,953	14,070	16,840	5.3%	3.5%	1.7%	1.8%
TAF (CY)	11,630	12,505	13,899	15,273	18,439	7.5%	2.1%	1.9%	1.9%
Ratio of MP to TAF	0.89	0.87	0.93	0.92	0.91	-	-	-	-
Noncommercial Aircraft Operations (GA and Military)									
Master Plan	278,949	290,099	303,759	318,958	352,904	4.0%	0.9%	1.0%	1.0%
TAF (CY)	276,839	290,430	297,839	305,468	321,429	4.9%	0.5%	0.5%	0.5%
Ratio of MP to TAF	1.01	1.00	1.02	1.04	1.10	-	-	-	-
Total Aircraft Operations									
Master Plan	289,321	301,019	316,712	333,028	369,744	4.0%	1.0%	1.0%	1.1%
TAF (CY)	288,469	302,935	311,738	320,741	339,867	5.0%	0.6%	0.6%	0.6%
Ratio of MP to TAF	1.00	0.99	1.02	1.04	1.09	-	-	-	-

Sources: Airport Statistics, FAA and Unison Consulting, Inc.

CHAPTER 3
FACILITY REQUIREMENTS

Introduction

The purpose of the Facility Requirements Chapter is to assess the ability of existing facilities at the Phoenix-Mesa Gateway Airport (IWA) to accommodate current and forecasted demand. Presented here are evaluations of the airside facilities, landside facilities, airspace system, and navigational aids identified in the **Inventory Chapter** that afford a variety of aircraft the ability to perform takeoff and landing operations, to continue operations during inclement weather, and to receive fuel, repair, and hangar services. As part of the Facility Requirements, a critical aircraft analysis and designation has been completed according to the design standards in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A, *Airport Design* (AC 150/5300-13A). The selected critical aircraft, or critical family of aircraft, will be a driving force for the chapter and remainder of the IWA Master Plan process.

Critical Aircraft Analysis

Determining the existing and future critical aircraft is paramount during the master plan process. AC 150/5000-17, *Critical Aircraft and Regular Use Determination* (AC 150/5000-17), defines critical aircraft as "the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport." Regular use is defined as 500 or more annual operations (takeoffs and landings), excluding touch-and-go operations.

Based on operational and design characteristics, the Airport Reference Code (ARC) derives from the designated critical aircraft and is used to evaluate current facilities and to plan for future development needs. Based on the array of aircraft regularly conducting and expected to conduct operations at IWA, a critical ARC representing the most demanding group of aircraft has been chosen. AC 150/5000-17 defines similar characteristics as "the practice of grouping aircraft by comparable operational performance and/or physical dimensions." Both operational performance and physical dimensions are characterized by the two components of the ARC: Aircraft Approach Category (AAC) and Airplane Design Group (ADG). Represented by a letter ranging from A-E, AAC refers to aircraft approach speed (***Table 3-1: Aircraft Approach Category (AAC)***). ADG is characterized by a roman numeral ranging from I-VI and refers to the tail height and wingspan of an aircraft as identified in ***Table 3-2: Airplane Design Group (ADG)***.

Table 3-1: Aircraft Approach Category (AAC)

Category	VREF/Approach Speed
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

Source: FAA AC 150/5300-13A, *Airport Design*
Note: VREF = The reference landing approach speed of an aircraft.

Table 3-2: Airplane Design Group (ADG)

Group #	Tail Height (feet)	Wingspan (feet)
I	Less than 20’	Less than 49’
II	20’ - < 30’	49’ - < 79’
III	30’ - < 45’	79’ - < 118’
IV	45’ - < 60’	118’ - < 171’
V	60’ - < 66’	171’ - < 214’
VI	66’ - < 80’	214’ - < 262’

To determine regular use of IWA facilities, the AAC and ADG of the most demanding aircraft that regularly use IWA were chosen referencing the following:

- ✓ Traffic Flow Management System Counts (TFMSC)
- ✓ 2016 Noise Exposure and Potential Noise Policy Revisions
- ✓ Aviation Activity Forecast Chapter
- ✓ 2018 and 2019 Air Carrier Flight Schedules
- ✓ SkyBridge Arizona

Traffic Flow Management System Counts (TFMSC)

The guiding AC for critical aircraft determination requires the most recent 12-month period of aircraft activity to be used as a basis for critical aircraft selection. The TFMSC provides a database of an airport’s arrivals and departures based on filed flight plans or radar-recognition of an en route aircraft by an airport’s Airport Surveillance Radar. The database is publicly accessible and breaks down operations by aircraft type and ARC.

According to the TFMSC summary of arriving flights, approximately 6,022 category C aircraft and 647 category D aircraft conducted landing operations at IWA. ADG-III aircraft proved to be the most demanding, with an arrival count exceeding 5,320. The following non-military C and D category aircraft reportedly operated at IWA in 2017:

- ✓ Airbus 319
- ✓ Airbus 320
- ✓ Boeing 737-400
- ✓ Boeing 737-800
- ✓ Boeing 757-200
- ✓ Bombardier Learjet 55
- ✓ Embraer ERJ-145 EX
- ✓ Gulfstream IV/G400
- ✓ MD-83 and 88

2016 Noise Exposure and Potential Noise Policy Revisions

The Aviation Environmental Design Tool (AEDT), Version 2.0(c), used in the production of updating the 2016 IWA noise contours, is software used to estimate environmental impacts including noise. To generate aircraft noise information specific to IWA, analysts must enter an aircraft fleet mix projected to operate at IWA into the AEDT software. The projected itinerant aircraft fleet for IWA consisted of 33 non-military aircraft types, and the local aircraft fleet consisted of 13 non-military aircraft types. Aircraft within the study were chosen based on the following assumptions:

- ✓ Future commercial service at IWA would mirror current service, in terms of markets served and the size of aircraft.
- ✓ Older aircraft types (MD-80, B737-300, and B757), noisy business jets, and older military aircraft would be retired from the domestic fleet and would be replaced by quieter aircraft of similar size and range.

Though the analysis was conducted in 2016, the projected aircraft fleet mix has been proven to operate at IWA through examination of the 2017 TFMSC IWA aircraft arrival database. The following is a list of C and D category aircraft from the AEDT aircraft fleet mix projection:

- ✓ Airbus 319
- ✓ Airbus 320
- ✓ Boeing 767-300
- ✓ Boeing 737-700
- ✓ Boeing 737-800
- ✓ Embraer EMB-145
- ✓ Embraer EMB-190

2018 and 2019 Air Carrier Flight Schedules

Allegiant Air has been IWA's primary air carrier service provider since 2007. During the development of the **Aviation Activity Forecast (Forecast) Chapter**, new air carrier service to and from IWA was announced resulting in a new addition of commercial aircraft to the current fleet. Air carrier flight schedules for the remainder of 2018 and beginning months of 2019 were obtained. The following C and D air carrier fleets with an ADG-II or ADG-III classification are projected to operate at IWA for the remainder of 2018 and beginning months of 2019:

- ✓ Airbus 319 and 320
- ✓ Boeing Douglas MD-80
- ✓ Boeing 737-400
- ✓ Boeing 737-600 (passenger)
- ✓ Boeing 737-700 (winglets; passenger)
- ✓ Boeing 737-800 (scimitar winglets; passenger)
- ✓ Boeing 737-800 (winglets)
- ✓ Embraer RJ 135/140/145

Introduction of Cargo Operations

SkyBridge Arizona (SkyBridge) is the first inland U.S. air cargo hub to house both U.S. and Mexican Customs inspection services[1] and is scheduled to begin all-air cargo carrier service at IWA in the near future. SkyBridge's operational forecast projects the use of a cargo fleet comprising Boeing 747-400 and Boeing 767-300 freighters.[2] The Boeing 747-400 has an approach speed of 158 knots and a wingspan of 213 feet, deeming it not only an AAC-D, but an ADG-V aircraft. In review of projections provided by SkyBridge, the Boeing 747-400 is anticipated to conduct 416 landings, or 832 total operations, by 2023, or within five years of service beginning, so it will surpass the 500 annual critical aircraft operational threshold.

Conclusion

In accordance with the guidance in AC 150/5300-13A, *Airport Design*, and considering the specific safety and operation needs, the future ARC within this master planning horizon is determined to be D-V. A D-V ARC is representative of the aircraft types that will regularly operate at IWA in the future, including the SkyBridge fleet.

Airside Facility Requirements

As identified in the **Inventory Chapter**, airside facilities are those that involve aiding an aircraft in transition from land to air. These facilities include runways, taxiways, and aprons. The purpose of evaluating airside facilities is to ensure they can accommodate critical aircraft and meet FAA design standards. Design standards for runways, taxiways, aprons, safety areas, object free areas, and other physical airport features are predicated on the ARC and instrument approach availability. The following sections will detail airside facility matters including:

- ✓ Airfield Capacity
- ✓ Runway Length and Pavement Condition
- ✓ Runway, Taxiway, and Apron Design

Airfield Capacity

Airfield capacity is defined as the maximum number of aircraft operations that a specific airfield configuration can accommodate within a specific time interval of continuous demand. Used by the FAA as an indicator of relative operating capacity, Annual Service Volume (ASV) is a reasonable estimate of an airport's annual capacity that accounts for differences in runway use, aircraft mix, weather conditions, and other variables encountered over a year's time. ASV assumes an acceptable level of aircraft delay, as described in AC 150/5060-5, *Airport Capacity and Delay*. Existing and forecast annual demand is compared with the ASV to determine the percentage capacity at which the airport is operating, and to gauge the timing of future airfield capacity improvements.

[1] SkyBridge Arizona Concept Master Plan, Final Document Draft, September 2018.
[2] Preliminary projections by Mesa SkyBridge, LLC.

As annual demand approaches ASV, average delays increase. Airport capacity is not always constant and will likely change over time depending on airfield and airspace geometry, air traffic control procedures, weather, fleet mix, and airport improvements.

For this master plan, the capacity analysis utilizes conclusions provided in the January 2017, *Airport Land Use Compatibility Plan Update* prepared for IWA, in which the ASV for IWA was calculated to be 498,000 annual operations[3], as depicted in ***Table 3-3: Annual Service Volume by User Category***. The key variables used in calculating the ASV include:

- ✓ Operations (takeoffs and landings) by user category – This establishes a baseline annual demand level, which is then correlated with a weighted peak hour demand level as part of the ASV calculation.
- ✓ Generalized aircraft category mix – This variable accounts for differences in required aircraft separation distances, which influence the number of operations that can be accommodated on the runway at any given time. Heavier aircraft require greater separation from lighter aircraft due to their greater wake turbulence.
- ✓ Touch-and-go activity (local operations) – These types of operations require less runway occupancy time than itinerant operations. They contribute to a higher ASV on runways with high proportions of touch-and-go activity.
- ✓ Average peak hour operations during peak month – This is correlated with the average annual demand as part of the ASV calculation.
- ✓ Runway configuration (three parallel runways) – The number of runways and their configuration influence ASV. The more runways an airport has, the more activity it can accommodate. Parallel runways tend to increase ASV, compared with crossing runways, because of the potential to use all runways simultaneously without the possibility of crossing conflicts.
- ✓ Average annual runway use by direction – Calculations of ASV for each runway direction must first be calculated to obtain the overall ASV.
- ✓ Percent arrivals and departures – Arrivals and departures are assumed to be equal.
- ✓ Qualifying exit taxiways – Exit taxiways must be within a certain location from the threshold and at a certain distance away from each other to positively contribute to ASV. Exit taxiways influence runway occupancy time for arrivals. The more qualifying exit taxiways there are, the less the runway occupancy time, and the greater the ASV for that runway.
- ✓ Weather conditions – Visual Meteorological Conditions (VMC) were assumed 100 percent of the time (Instrument Meteorological Conditions (IMC) occur less than one percent of the time over

[3] Ricondo & Associates, Inc. Phoenix-Mesa Gateway Airport, *Airport Land Use Compatibility Plan Update*, January 2017.

an average year and have a negligible effect on the calculation of ASV). A relatively large percentage of IMC would reduce ASV due to the greater aircraft separation distances required.

Table 3-3: Annual Service Volume by User Category

User Category	Operations		
	Itinerant	Local	Total
Air Carrier	32,123	0	32,123
Air Taxi	50,819	0	50,819
General Aviation	159,904	247,383	407,287
Military	3,755	4,017	7,772
Total	246,600	251,400	498,000

Source: Ricondo & Associates, Inc. Phoenix-Mesa Gateway Airport, *Airport Land Use Compatibility Plan Update, January 2017.*

In 2038, the airfield will operate at 77.2 percent of its ASV when compared to IWA's Master Planning High Growth Scenario operational forecast of 384,386 annual aircraft operations[4]. No major airfield changes will be required at IWA for capacity or delay issues.

Runway Length Analysis and Pavement Condition

The performance requirements of the critical aircraft designated for a runway determine the recommended runway length. Performance capabilities of individual aircraft are, in turn, affected by factors including the aircraft payload and fuel load, runway elevation, wind conditions, and air temperature. Currently, Runway 12R/30L is 10,401 feet long, Runway 12C/30C is 10,201 feet long, and Runway 12L/30R is 9,300 feet long. At these lengths, the runways adequately serve the aircraft now operating at IWA.

This section examines whether the available runway length meets the needs not only of existing users, but also those of future critical aircraft serving future destinations. To analyze the runway requirements for these new aircraft types, an understanding of the factors that impact aircraft performance is necessary. The following paragraphs explain the terminology and variables used in the runway length assessment.

Elevation

IWA has six runway ends from which aircraft can operate, ranging from 1,340 feet above mean sea level (AMSL) to 1,384 feet AMSL, which is the official airport elevation.

International Standard Atmosphere (ISA)

This mathematical model describes how the earth's atmosphere, or air pressure and density, changes depending on altitude. The atmosphere is less dense at higher elevations. ISA is frequently used in aircraft

[4] Ibid.

performance calculations because deviation from ISA will change how an aircraft performs. ISA at sea level occurs when the temperature is 59°Fahrenheit (F). ISA at IWA's 1,383 feet AMSL occurs when the temperature is 52°F.

Density Altitude (DA)

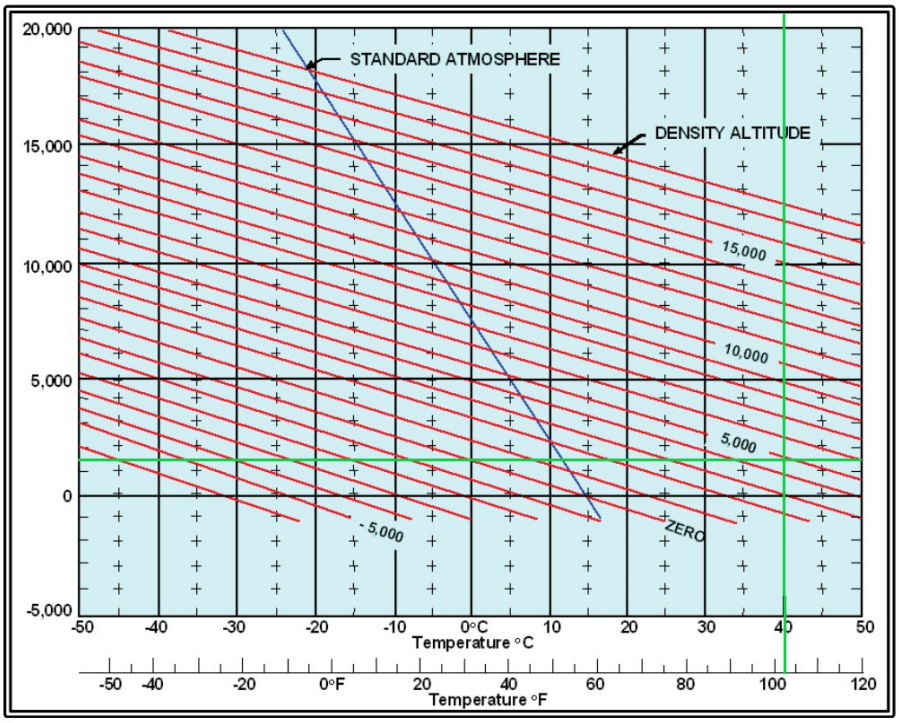
This measurement comparing air density at a point in time and specific location to ISA is a critical component of aircraft performance calculations. DA is used to understand how aircraft performance differs from the performance that would be expected under ISA. DA is primarily influenced by elevation and air temperature. To examine the effect of changes to either variable, this calculation holds the other variable constant.

- ✓ When elevation is constant: When air temperature increases, DA increases. When air temperature decreases, DA decreases. This comparison is often used when analyzing aircraft performance at an airport during different times of the day and on different days of the year.
- ✓ When temperature is constant: When elevation increases, DA increases. When elevation decreases, DA decreases. This comparison, which is not often used, can be employed to compare aircraft performance at different airports under identical climate conditions.

Figure 3-1: Density Altitude for Phoenix-Mesa Gateway Airport Average Maximum Temperature illustrates how DA is impacted when factoring in the average maximum daily temperature of the hottest month (103°F) for IWA. The result is a DA increased to approximately 4,900 feet MSL.

For year-round planning purposes, a DA of 4,900 feet MSL is assumed for the aircraft performance-based runway length analysis here.

Figure 3-1: Density Altitude for Phoenix-Mesa Gateway Airport Average Maximum Temperature



Source: Federal Aviation Administration

Future Fleet and Range

DA, aircraft takeoff weight, and aircraft performance are the three primary factors to be considered when determining runway length requirements for critical aircraft. Aircraft takeoff weight is directly related to the distance of the flight. For shorter distances, aircraft may be able to depart with a full passenger load and less than full fuel tanks. In those instances, the aircraft will typically be departing below maximum takeoff weight (MTOW) and experience better takeoff performance. Aircraft typically require more fuel for longer trips. A full passenger load and full load of fuel will be close to the aircraft's MTOW.

The Airport's most demanding route/fleet combinations are listed below, and were analyzed for this runway length analysis:

- ✓ Cargo Boeing 747-400F with a 2,000 nautical miles (nm) range (planned)
- ✓ Cargo Boeing 767-300F with a 2,000 nm range (planned)
- ✓ Boeing 737-800 to Edmonton, Canada (1,384 nm)

The following analysis documents specific destination, equipment combination, payload available, and resulting takeoff weight. Resulting takeoff weights are then used with the aircraft manufacturer's performance tables contained in their respective airport planning manuals to determine a runway length requirement for the future.

Runway Length Recommendation

It is expected that Boeing 747-400F cargo aircraft will provide service to destinations within a 2,000 nm radius of IWA. A maximum payload for that aircraft and destination radius would result in an approximate takeoff weight of 740,000 pounds. This configuration would require approximately 9,500 feet of runway length for departures.

The usage of a Boeing 767-300F cargo aircraft is also expected to serve IWA in the future. Like the Boeing 747-400F, the Boeing 767-300F will serve destinations within a 2,000 nm radius of IWA. Maximum payload for the Boeing 767-300F for destinations within 2,000 nm would result in an approximate takeoff weight of 351,000 pounds. This configuration would require approximately 8,900 feet of runway length for departures.

The most demanding route and aircraft combination currently at IWA is the Boeing 737-800 route to Edmonton, Canada (1,384 nm) operated by WestJet. Operating on this route with a maximum payload results in an approximate takeoff weight of 162,500 pounds. This configuration requires an approximate runway length of 9,500 feet for departures. ***Table 3-4: Runway Length Requirements*** summarizes the runway length and weight requirements needed for the existing and future fleet at IWA. Existing runway lengths are expected to remain adequate throughout the planning period.

Table 3-4: Runway Length Requirements

Aircraft Type	Takeoff Length Required for Farthest Expected Destination (Feet)
Existing Fleet	**Existing Requirement**
Boeing 737-800	9,500’
Airbus 320	8,500’
Future Fleet	**Future Requirement**
Boeing 747-400	9,500’
Boeing 767-300 Freighter	8,900’

Source: Mead & Hunt.

Pavement Condition

In 2017, select airfield pavement at IWA underwent a Pavement Condition Index (PCI) and Airfield Classification Number-Pavement Classification Number (ACN-PCN) assessment as part of the Arizona Department of Transportation (ADOT) Airport Pavement Management System (APMS) update. Only pavement that had been constructed or reconstructed since the last APMS (2014) was assessed, excluding singular sections of Runways 12C/30C and 12R/30L that have not been reconstructed since 1958. The PCI assessment proved airfield pavement at IWA is in excellent condition, except for the singular sections of Runway 12C/30C and Runway 12R/30L. These sections were identified as having lower PCIs partially due to load-related stress.

An ACN is defined as a number that expresses the relative effect of an aircraft at a given weight on a pavement structure for specified standard subgrade strength. The higher an ACN is, the greater effect that aircraft has on certain pavement. A PCN is assigned to a pavement and expresses the relative load carrying capacity of that pavement in terms of allowable load for unrestricted operations, based on aircraft departures (frequency and weight) and pavement layer properties. To avoid structural damage to airfield pavement, aircraft should only operate on pavement with a PCN equivalent to the aircraft's ACN, or on pavement with a PCN higher than the aircraft's ACN. Occasional overloads are permitted but should be avoided on a constant basis. The ACN-PCNs calculated in the APMS report are reflective of an aircraft fleet that did not include operations by Boeing 747-400F or Boeing 767-300F cargo aircraft; therefore, an ACN for neither aircraft was determined. Using a Boeing 747-400F ACN of 88 and a Boeing 767-300F ACN of 65 calculated by Transport Canada, the section of Runways 12C/30C and 12R/30L constructed in 1958 cannot support operations by either aircraft as the PCNs are 25 and 24, respectively. Though the remaining section of Runway 12C/30C is 66, the lowest PCN is considered the controlling PCN of the entire branch (comprised of sections). The highest PCN of Runway 12R/30L is 73, which is insufficient for Boeing 747-400F operations. Also, Taxiway C has a PCN of 55, and cannot support Boeing 747-400F or Boeing 767-300F operations.

In addition to the PCIs and ACN-PCNs, allowable aircraft weights were calculated. The sections of Runway 12C/30C and Runway 12R/30L constructed in 1958 have a dual tandem allowable aircraft weight of 140,000 and 149,000 pounds, respectively. The remaining section of Runway 12C/30C has a dual tandem allowable aircraft weight of 402,000 pounds. The remaining sections of Runway 12R/30L have a dual tandem allowable aircraft weight of 423,000 and 446,000 pounds. The 1958-constructed pavement sections of Runway 12C/30C and Runway 12R/30L cannot accommodate Boeing 767-300F operations unless reconstructed. Runway 12R/30L or Runway 12C/30C could accommodate continuous Boeing 747-400F operations if reconstructed to meet necessary pavement strengths.

Runway Design

The appropriate design of individual runways is accomplished through adherence to FAA dimensional standards based on the Runway Design Code (RDC). Three components comprise the RDC: the AAC and ADG (together referred to as the ARC), and lowest visibility minimum. Visibility minimums are dependent on the lowest designated, or planned, instrument approach procedure and supporting instrumentation available to a runway end. Runway design, protection, and separation criteria, including Runway Safety Areas (RSA), parallel runway separation, and runway to taxiway separation are determined by RDC and Taxiway Design Group (TDG), which will be discussed in a later section.

Since aircraft utilization, visibility minimums, and instrumentation vary per runway, RDCs may not be the same for every runway. Though the **Inventory Chapter** designated Runways 12R/30L as the General Aviation (GA) runway, 12C/30C as the instrument runway, and 12L/30R as the heavy aircraft runway, runway utilization is dependent on weather conditions, pilot preference, and Air Traffic Control Tower (ATCT) instruction. As a result, all runways are D-V. Visibility minimums vary per runway at IWA; therefore, so does the third component of their RDCs.

Runway 12R/30L

Runway 12R/30L is equipped for instrument procedures with visibility minimums not lower than one mile. For RDC purposes, instrument approach visibility minimums are expressed as Runway Visual Range (RVR) values in feet. An RVR of 5,000 feet is equivalent to visibility not lower than one mile. The RDC for Runway 12R/30L is D-V-5000 and, as noted in ***Table 3-5: Runway 12R/30L Runway Design Table,*** has no deficiencies at this time.

Table 3-5: Runway 12R/30L Runway Design Table

Runway Design Code: D-V-5000 (Not lower than 1-mile visibility)					
Design Criteria	**FAA Design Standards**	**Existing Conditions 12R/30L**		**Are Standards Met? 12R/30L**	
Runway Design					
Runway width	150'	150'		Yes	
Shoulder width	35'	35'		Yes	
Blast Pad length	400'	400'	400'	Yes	Yes
Blast Pad width	220'	220'	220'	Yes	Yes
Runway Protection					
Runway Safety Area (RSA)					
Length beyond departure end	1,000'	1,000'	1,000'	Yes	Yes
Length prior to threshold	600'	600'	600'	Yes	Yes
Width	500'	500'	500'	Yes	Yes
Runway Object Free Area (ROFA)					
Length beyond runway end	1,000'	1,000'	1,000'	Yes	Yes
Length prior to threshold	600'	600'	600'	Yes	Yes
Width	800'	800'	800'	Yes	Yes
Runway Obstacle Free Zone (ROFZ)					
Length beyond runway end	200'	200'	200'	Yes	Yes
Width	400'	400'	400'	Yes	Yes
Runway Protection Zone (RPZ)					
Length	1,700'	1,700'	1,700'	Yes	Yes
Inner width	500'	500'	500'	Yes	Yes
Outer width	1,010'	1,010'	1,010'	Yes	Yes
Runway Separation (Runway centerline to:)					
Parallel runway centerline (Rwy 12C/30C)	1,200'[1]	1,500'	1,500'	Yes	Yes
Holding position	250'	250'	250'	Yes	Yes
Parallel taxiway/taxilane centerline	450'	450'	450'	Yes	Yes
Aircraft parking area	500'	500'+	500'+	Yes	Yes

Source: AC 150/5300-13A and Mead & Hunt Analysis.

Note: [1] AC 150/5300-13A lists the standard separation for simultaneous parallel runway operations in Visual Flight Rules (VFR) conditions as 700 feet but recommends 1,200 feet for ADG V and VI runways. For simultaneous departures or approaches and departures during Instrument Flight Rules (IFR) conditions, a separation of 2,700 feet must exist between Runways 12R/30L and 12C/30C. This is explained further in the *Parallel Runway Separation* section.

Runway 12C/30C

Runway 12C/30C is considered the instrument runway at IWA. An instrument approach with a visibility minimum of ¾ mile is available to Runway 30C. As a result, Runway 12C/30C has an RDC of D-V-4000 (RVR value 4,000 is equivalent to visibility lower than 1 mile, but not lower than ¾ mile). According to AC 150/5300-13A, runways with instrument approach procedures with visibility minimums below 1 mile are required to be served by a full parallel taxiway. Runway 12C/30C is not served by a full parallel taxiway; however, a full parallel taxiway is shown for future development on the current Airport Layout Plan (ALP). Taxiway evaluations are discussed in the subsequent section. ***Table 3-6: Runway 12C/30C Runway Design Table*** details the evaluation of Runway 12C/30C according to RDC D-V-4000 design standards.

Table 3-6: Runway 12C/30C Runway Design Table

Runway Design Code: D-V-4000 (Not lower than ¾ mile visibility)						
Design Criteria	**FAA Design Standards**	**Existing Conditions 12C/30C**			**Are Design Standards Met? 12C/30C**	
Runway Design						
Runway width	150’	150’			Yes	
Shoulder width	35’	35’			Yes	
Blast Pad length	400’	400’		400’	Yes	Yes
Blast Pad width	220’	220’		220’	Yes	Yes
Runway Protection						
Runway Safety Area (RSA)						
Length beyond departure end	1,000’	1,000’		1,000’	Yes	Yes
Length prior to threshold	600’	600’		600’	Yes	Yes
Width	500’	500’		500’	Yes	Yes
Runway Object Free Area (ROFA)						
Length beyond runway end	1,000’	1,000’		1,000’	Yes	Yes
Length prior to threshold	600’	600’		600’	Yes	Yes
Width	800’	800’		800’	Yes	Yes
Runway Obstacle Free Zone (ROFZ)						
Length beyond runway end	200’	200’		200’	Yes	Yes
Width	400’	400’		400’	Yes	Yes
Precision Obstacle Free Zone (POFZ)						
Length	200’	N/A		200’	N/A	Yes
Width	800’	N/A		800’	N/A	Yes
Inner-Approach Obstacle Free Zone						
Length beyond last light unit of ALS	200’	N/A		200’	N/A	Yes
Width	400’	N/A		400’	N/A	Yes
Slope	50:1	N/A		50:1	N/A	Yes
Runway Protection Zone (RPZ)						
Length	1,700’	1,700’	1,700’	1,700’	Yes	Yes
Inner width	500’	1,000’	500’	1,000’	Yes	Yes
Outer width	1,010’	1,510’	1,010’	1,510’	Yes	Yes
Runway Separation (Runway centerline to:)						
Parallel runway centerline (Rwy 12R/30L)	1,200’[1]	1,500’		1,500’	Yes	Yes
Parallel runway centerline (Rwy 12L/30R)	700’	1,000’		1,000’	Yes	Yes
Holding position	250’	400’		285’	Yes	Yes
Parallel taxiway/taxilane centerline [2]	450’	N/A		N/A	N/A	N/A
Aircraft parking area	500’	500’+		500’+	Yes	Yes

Source: FAA AC 150/5300-13A and Mead & Hunt Analysis.

Note: [1] AC 150/5300-13A lists the standard separation for simultaneous parallel runway operations in VFR conditions as 700 feet but recommends 1,200 feet for ADG V and VI runways. For simultaneous departures or approaches and departures during IFR conditions, a separation of 2,700 feet must exist between Runways 12C/30C and 12R/30L. This is explained further in the *Parallel Runway Separation* section.

[2] Red text = standards not met.

Runway 12L/30R

Unlike Runways 12R/30L and 12C/30C, Runway 12L/30R is not equipped for instrument approach procedures. As a result, the RDC for Runway 12L/30R is D-V-VIS (visual). No Runway 12L/30R deficiencies exist at this time, as seen in ***Table 3-7: Runway 12l/30R Runway Design Table***.

Runway Protection Zones (RPZ)

RPZs are located within the approach and departure path of a runway beginning 200 feet beyond the runway threshold. They are centered about the extended runway centerline and vary in dimensions depending on visibility minimums of an RDC. The purpose of an RPZ, which is trapezoidal, is to enhance the protection of people and property on the ground. This is best achieved by minimizing and/or eliminating mandated incompatible land uses and activities set forth in AC 150/5300-13A and FAA *Interim Guidance on Land Uses Within a Runway Protection Zone* (FAA Interim Guidance).

AC 150/5300-13A and the FAA Interim Guidance provide different insights on an RPZ. The AC states it is desirable to clear the entire RPZ of all above-ground objects, then briefly lists permissible activities and land uses within an RPZ. In contrast, the FAA Interim Guidance documents incompatible land uses and activities in the event RPZ dimensions increase due to various factors, such as an airfield project or a change in critical design aircraft. This suggests incompatible land uses and activities located within an existing RPZ are permitted, given the dimensions do not increase. The FAA Interim Guidance identifies a proposal for local development within an RPZ that results in incompatible land uses as the only factor that results in a non-standard RPZ, regardless of change in dimensions.

The FAA prefers airport sponsors possess ownership of the land within RPZs to minimize and/or eliminate incompatible land use and activities. Ownership grants an airport the ability to mitigate current incompatibilities and preclude future ones. Land within all RPZs at IWA are on airport property and owned via fee simple title, except the RPZ of Runway 30R, as seen in ***Figure 3-2: Runway Protection Zones***. It is intersected by a public road, Ellsworth Road, which is considered an incompatible land use. Approximately 0.56 acres of land within the RPZ is located beyond Ellsworth. Though IWA does not completely own the land within the RPZ of Runway 30R, and a road within an RPZ is considered an incompatible land use, IWA owns an avigation easement on 52 acres beyond airport property. The avigation easement provides airspace protection, ensures land use compatibility, and should be retained.

Table 3-7: Runway 12L/30R Runway Design Table

Runway Design Code: D-V-VIS (Visual approach only)					
Design Criteria	FAA Design Standards	Existing Conditions[3] 12L/30R		Are Standards Met? 12L/30R	
Runway Design					
Runway width	150'	150'		Yes	
Shoulder width	35'	35'		Yes	
Blast Pad length	400'	400'	400'	Yes	
Blast Pad width	220'	220'	220'	Yes	
Runway Protection					
Runway Safety Area (RSA)					
Length beyond departure end	1,000'	1,000'	1,000'	Yes	Yes
Length prior to threshold	600'	600'	600'	Yes	Yes
Width	500'	500'	500'	Yes	Yes
Runway Object Free Area (ROFA)					
Length beyond runway end	1,000'	1,000'	1,000'	Yes	Yes
Length prior to threshold	600'	600'	600'	Yes	Yes
Width	800'	800'	800'	Yes	Yes
Runway Obstacle Free Zone (ROFZ)					
Length beyond runway end	200'	200'	200'	Yes	Yes
Width	400'	400'	400'	Yes	Yes
Runway Protection Zone (RPZ)					
Length	1,700'	1,700'	1,700'	Yes	Yes[1]
Inner width	500'	500'	500'	Yes	Yes
Outer width	1,010'	1,010'	1,010'	Yes	Yes
Runway Separation (Runway centerline to:)					
Parallel runway centerline (Rwy 12R/30L)	700'[2]	1,000'	1,000'	Yes	Yes
Holding position	250'	250'+	255'	Yes	Yes
Parallel taxiway/taxilane centerline	450'	450'	450'	Yes	Yes
Aircraft parking area	500'	500'+	500'	Yes	Yes

Source: AC 150/5300-13A and Mead & Hunt Analysis.

Notes: [1] IWA owns an avigation easement for land within the RPZ of Runway 30R.

[2] AC 150/5300-13A lists the standard separation for simultaneous parallel runway operations in VFR conditions as 700 feet but recommends 1,200 feet for ADG V and VI runways. For simultaneous departures and approaches and departures, parallel runways in IFR conditions must have a separation of 2,500 feet. This is explained further in the *Parallel Runway Separation* section.

[3] The referenced table reflects conditions prior to the FAA implementing a new ¾ mile approach procedure and expanded RPZ to Runway 30R in December 2019. The preferred development concept and developed ALP reflect the new ¾ mile approach procedure and expanded RPZ.

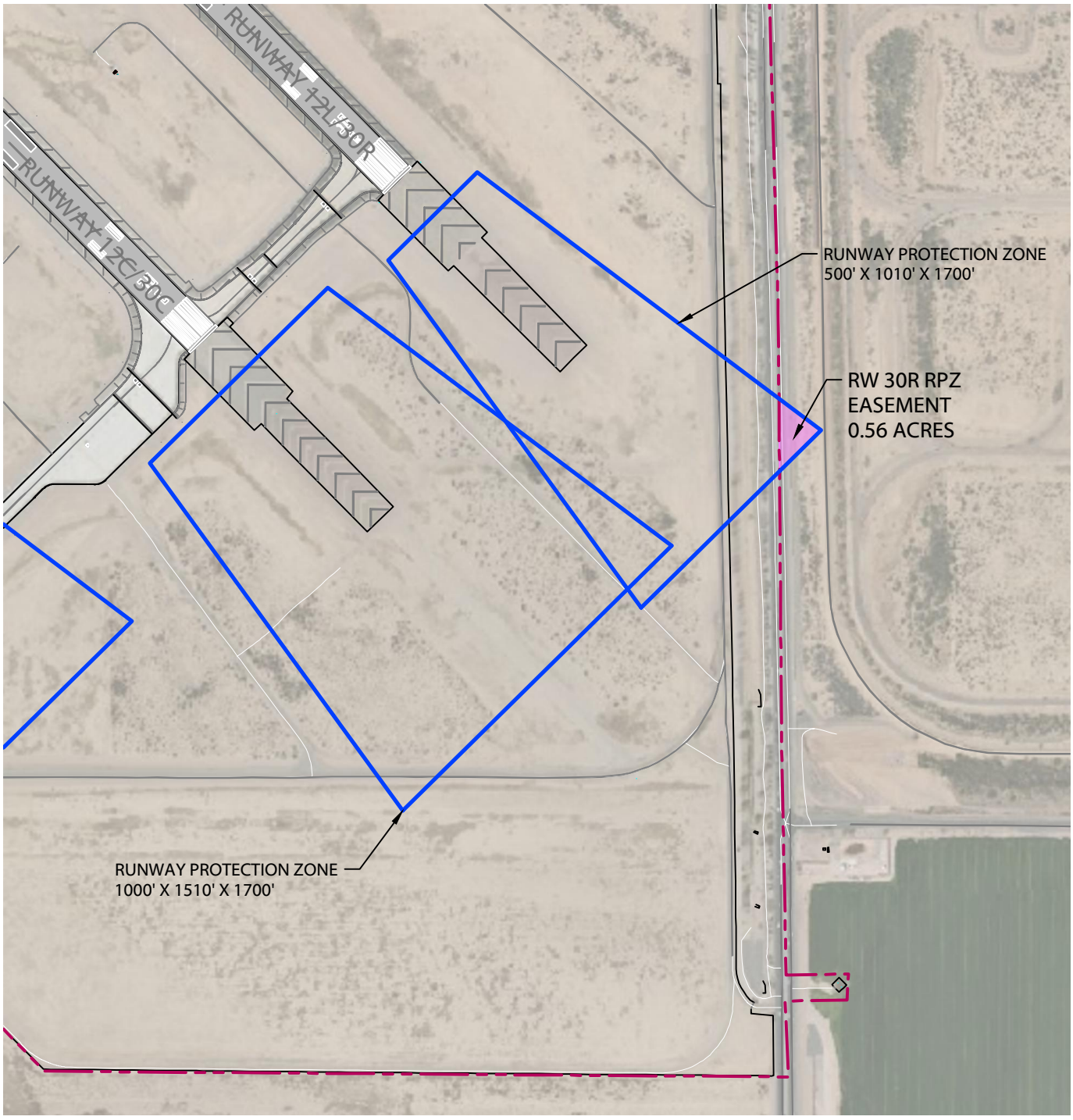


Figure 3-2:
Runway Protection Zones

Parallel Runway Separation

The following narrative details IWA's ability to accommodate simultaneous Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) operations. Parallel runways are beneficial as they afford simultaneous operations, and therefore, increase airfield capacity. Due to wake vortices, various wingspans and, in some cases, aircraft not aligning on centerline on final approach or when landing, separation standards between runways have been established. Centerline-to-centerline separation for simultaneous operations on parallel runways is dependent on the type of operation. For simultaneous VFR operations on parallel runways, centerline-to-centerline separation must be 700 feet. However, AC 150/5300-13A recommends 1,200 feet separation for parallel runways having an ADG of IV or V. The existing separation distance of 1,500 feet between Runways 12R/30L and 12C/30C meets and exceeds these standards. The existing separation of 1,000 feet between Runways 12C/30C and 12L/30R meets the simultaneous VFR operations standards, but does not meet the recommended separation standard for runways having an ADG of IV or V. Since the separation criteria of 700 feet is met between all runways, aircraft may conduct VFR operations simultaneously on Runways 12R/30L, 12C/30C, and 12L/30R.

Instrument procedures are established for Runways 12R/30L and 12C/30C. According to AC 150/5300-13A, parallel runways 12R/30L and 12C/30C must have a minimum centerline-to-centerline separation of 2,500 feet to accommodate simultaneous IFR departures in a radar environment. Separation requirements vary for simultaneous approach and departure operations on parallel runways that have staggered thresholds. The thresholds of Runways 12R/30L and 12C/30C are staggered, and as a result, Runway 30C is considered the near threshold, and Runway 30L is considered the far. To accommodate a simultaneous approach to a near threshold and departure from a far threshold, the minimum centerline to centerline separation is 2,300 feet. If an instrument approach is to the far threshold and a simultaneous departure from the near, the minimum centerline-to-centerline separation is 2,700 feet. Though a minimum of 2,500 feet is required, Runways 12R/30L and 12C/30C should be a minimum centerline-to-centerline separation of 2,700 feet to afford simultaneous IFR operations due to the staggered thresholds. The existing centerline-to-centerline separation is 1,500 feet, and therefore, does not meet separation criteria for simultaneous IFR approaches and departures. During IFR conditions, both runways will be considered as one runway requiring aircraft to approach or depart singularly per runway.

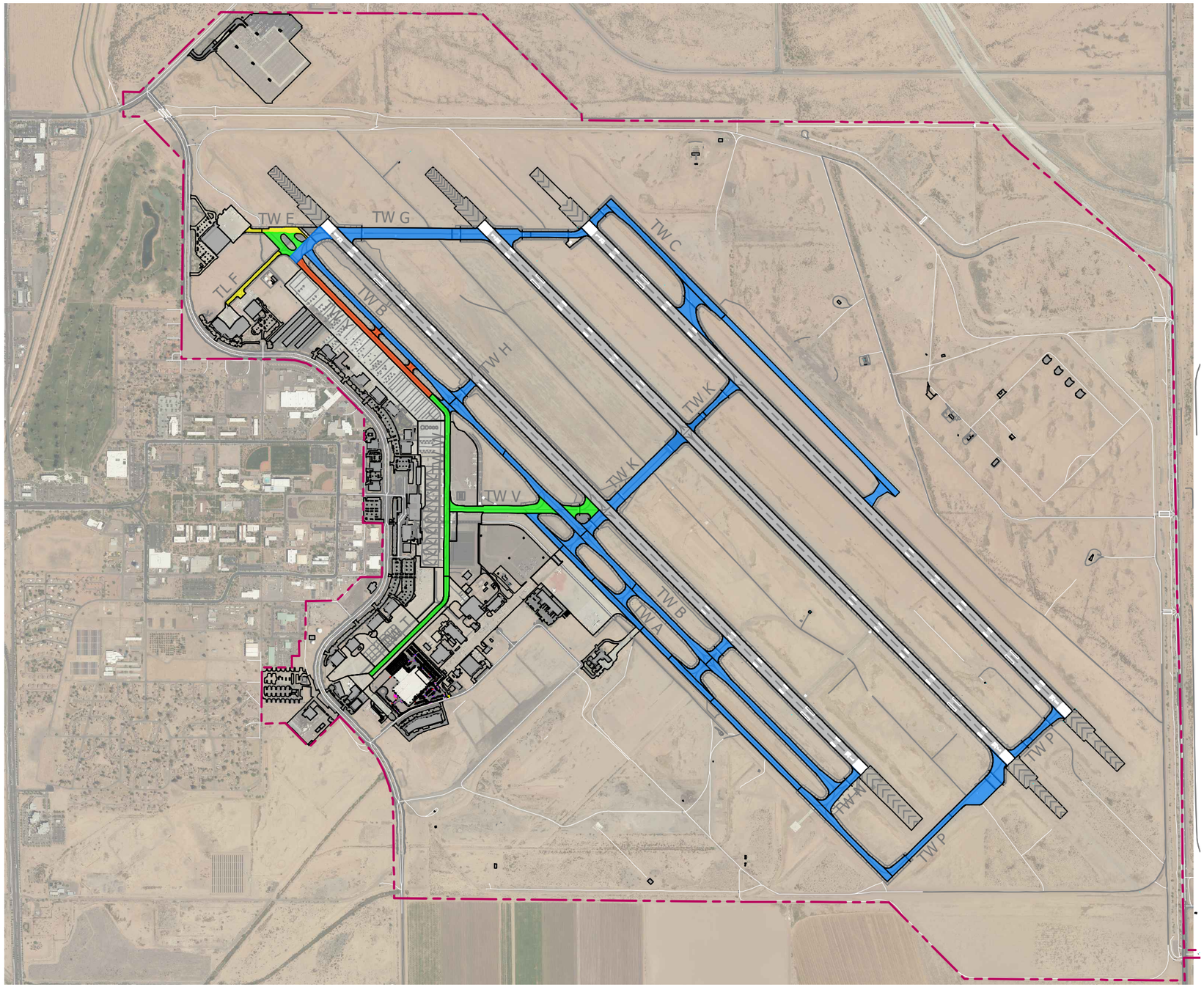
Runway combination 12R/30L and 12C/30C and runway combination 12L/30R and 12C/30C are considered singular due to a centerline-to-centerline separation requirement of 2,500 feet when wake turbulence exists. This separation requirement is met between Runways 12R/30L and 12L/30R; therefore, simultaneous operations can proceed as normal if operating on these runways.

Taxiway Design

Taxiways and taxilanes are designed according to current and future aircraft wingspans (ADG), wingtip clearance, and aircraft undercarriage, referred to as the landing gear (TDG). Inclusion of wingspan and wingtip clearance in taxiway design assures adequate taxiway separation and protection. Wingtip clearance is defined as the maximum horizontal distance between wingtips. Pilots of large aircraft are typically not able to see their wingtips, and as a result, wingtip clearances are established per ADG to ensure an aircraft's wing does not collide with a fixed or movable object.

Taxiway Design Group considers aircraft undercarriage dimensions and comprises two components: Cockpit to Main Gear distance (CMG) and Main Gear Width (MGW). As stated in its name, CMG is the distance from the cockpit of an aircraft to the main landing gear. MGW is the distance between the outer tires of the main landing gear. Taxiways and taxilanes should be designed to accommodate the MGW of the most demanding aircraft. Though taxiways and taxilanes are designed for cockpit-over-centerline taxiing, taxiway and taxilane design should be sufficiently wide to allow for wander from the centerline. Cockpit-over-centerline taxiing is not always achieved for various reasons, such as when turning. Wander from centerline is provided by the Taxiway Edge Safety Margin (TESM), which is measured from the outside of the landing gear to the taxiway edge and should be maintained throughout the entire length of the taxiway. Taxiway widths assigned to TDGs account for TESM.

The taxiway system at IWA has been divided and evaluated using several different ADGs and TDGs, based on current and future aircraft utilization, and design limitations. Taxiways and taxilanes with ADGs and TDGs of II, III, and V are present at IWA; therefore, taxiway separation and width requirements vary. ***Figure 3-3: Taxiway Design Group Map*** illustrates the various TDGs at IWA.



Legend

- Taxiway Design Group II
- Taxilane Design Group III
- Taxiway Design Group III
- Taxiway Design Group V

NOTE: Taxiway Design Group IV operations are permitted on Taxiway T and a segment of Taxiway W prior to Taxiway V if wing walkers are present to assist aircraft.

Figure 3-3:
Taxiway Design Group Map

ADG/TDG V Taxiways

SkyBridge's cargo fleet of Boeing 767-300 and 747-400 freighters have a TDG V classification. However, the Boeing 767-300F has an ADG IV classification. Despite its different ADG, taxiways predicted to be used by the Boeing 767-300F are evaluated using ADG and TDG V standards, as presented in ***Table 3-8: ADG V Taxiway Design Standards*** and ***Table 3-9: TDG V Taxiway Design Standards*.** Taxiway B is considered an ADG and TDG V taxiway because it serves Runway 12R/30L. Its dual taxiway, Taxiway Y, is not ADG or TDG V. According to the Airport Facilities Directory (AFD), operations on Taxiway Y are restricted to aircraft with wingspans less than 79 feet, thus indicating the taxiway is ADG and TDG I and II. Since Taxiways B and Y are parallel taxiways with differing ADGs, the wingtip clearance requirement is used for taxiway-to-taxiway separation. Using the most demanding wingspans of both ADGs, the required wingtip clearance of 53 feet is not met.

The Taxiway/Taxilane Safety Area (TSA) is centered on the taxiway/taxilane centerline and ensures taxiway protection needed for the occasional aircraft overrun and support of airport/aircraft support vehicles/equipment, such as Aircraft Rescue and Fire Fighting (ARFF). TSAs must be:

- ✓ Cleared and graded.
- ✓ Drained by grading or storm sewers.
- ✓ In dry conditions, capable of supporting ARFF equipment, and the occasional passage of aircraft without causing structural damage to the aircraft or its occupants.
- ✓ Free of non-functional objects unless an object needs to be located in the TSA because of its function. If an object needs to be located within the TSA and is taller than 3 inches, the object should be mounted on frangible structures.

The Taxiway Object Free Area (TOFA) guarantees taxiway protection by encompassing the TSA and wingtip clearance in its dimensions. Precluded in this area are parked aircraft, service vehicle roads/access roads, and other objects, unless the object must be located there for its function. The TSAs and TOFAs of Taxiways G, K, and P, between Runways 12R/30L and 12C/30C, and of Taxiway P, between Runways 30C and 30R, are intersected by airport service roads. Markings signaling airport vehicles to stop are located on these roads outside of the TOFAs; therefore, the TOFAS of the aforementioned taxiways meet design standards.

Unprotected soils adjacent to a taxiway are susceptible to jet blast erosion that could potentially lead to ingestion problems for jet engines that overhang the taxiway edge. For these reasons, paved shoulders that run the full length of the taxiway are required for taxiways/taxilanes accommodating aircraft with an ADG of IV or higher. Taxiway G's paved shoulders, between Runways 12R and 12C, and Taxiway K's paved shoulders, between Runways 12R/30L and 12C/30C, are not paved throughout the entire length of the taxiways, as noted in ***Table 3-9: Taxiway Design Group (TDG) V Taxiway Design Standards*.** The taxiway shoulders should be constructed to a width of 30 feet to meet standards.

Table 3-8: ADG V Taxiway Design Standards

Taxiway Protection			Taxiway Separation		Wingtip Clearance	Are standards met?
Design Standards	Taxiway Safety Area	Taxiway Object Free Area	Taxiway Centerline to Parallel Taxiway Centerline	Taxiway Centerline to Fixed or Movable Object	Taxiway Wingtip Clearance	
	214 feet	320 feet	267 feet	160 feet	53 feet	
Taxiway B	214’	320’	160’ (to TWY Y)[1] 340’ (to TWY A)	160’	13.5’[2]	No. (Wingtip clearance)
Taxiway B4	214’	320’	1,415’ (to TWY L) 997’ (to TWY K)	160’	Met and exceeded.	Yes
Taxiway C	214’	320’	N/A	160’	Met and exceeded.	Yes
Taxiway C1	214’	320’	1,710’ (to TWY C2)	160’	Met and exceeded.	Yes
Taxiway C2	214’	320’	1,710’ (to TWY C1) 3,600’ (to TWY C3)	160’	Met and exceeded.	Yes
Taxiway C3	214’	320’	3,600’ (to TWY C2)	160’	Met and exceeded.	Yes
Taxiway G	214	320’	1,520’ (to TWY B2)[3]	160’	Met and exceeded.	Yes
Taxiway P	214’	320’	1,270’ (to TWY N)	160’	Met and exceeded.	Yes
Taxiway A	214’	320’	340’	160’	Met and exceeded.	Yes
Taxiway H	214’	320’	2,010’ (to TWY G)	160’	Met and exceeded.	Yes
Taxiway L	214’	320’	1,416’ (to TWY B4) 2,500’ (to TWY N)	160’	Met and exceeded.	Yes
Taxiway K	214’	320’	267’[4]	160’	Met.	Yes
Taxiway N	214’	320’	2,500’ (to TWY L)	160’	Met and exceeded.	Yes

Source: AC 150/5300-13A and Mead & Hunt Analysis.

Notes: [1] Taxiways B and Y are of differing ADGs and TDGs and as a result taxiway centerline to parallel taxiway centerline is dependent on taxiway wingtip clearance of the most demanding ADG.

[2] Distance between the most demanding wingspans of ADG II and V.

[3] The remainder of Taxiway G between Runways 12R/30L, 12C/30C, and 12L/30R exceed the 267 ft. separation standard.

[4] ADG standards are met by all sections of Taxiway K. The 267 ft. taxiway centerline to parallel taxiway centerline was measured between the portion of Taxiway K leading from the cargo apron and Taxiway V. Taxiway K between Runways 12R/30L, 12C/30C, and 12L/30R exceed the 267-foot separation standard.

Red text = standards not met.

Table 3-9: Taxiway Design Group (TDG) V Taxiway Design Standards

Design Standards	Taxiway Width	Taxiway Edge Safety Margin[1]	Taxiway Shoulder Width	Are standards met?
	75 feet	15 feet	30 feet	
Taxiway B	75’	19’	35’	Yes
Taxiway B4	130’	46.5’	35’	Yes
Taxiway C	75’	19’	35’	Yes
Taxiway C1	103’	33’	35’	Yes
Taxiway C2	325’	144’	35’	Yes
Taxiway C3	90’	26.5’	30’	Yes
Taxiway G (between RWYs 12R and 12C)	150’	56.5’	---	Shoulders are not paved throughout.
Taxiway G (between RWYs 12C and 12L)	75’	19’	35’	Yes
Taxiway P	75’	19’	35’	Yes
Taxiway H	104’	35.5’	35’	Yes
Taxiway L	130’	46.5’	35’	Yes
Taxiway K (between RWYs 12C and 12L)	75’	19’	35’	Yes
Taxiway K (between RWYs 12R and 12C)	150’	56.5’	---	Shoulders are not paved throughout.
Taxiway K (between RWY 12R and Cargo Apron)	150’	56.5’	35’	Yes
Taxiway A	75’	19’	35’	Yes
Taxiway N	100’	31.5’	35’	Yes

Source: AC 150/5300-13A and Mead & Hunt Analysis.

Note: [1] The Taxiway Edge Safety Margin (TESM) is per outer tire(s). A TESM total of 30 feet should be provided for the entire length of the taxiways. A Main Gear Width (MGW) of 37 feet (747-400F) was used to calculate the TESM.

Red text = standards not met.

ADG/TDG II and III Taxiways

The taxiways presented in ***Table 3-10: ADG II and III Taxiway Design Standards*** were evaluated using different ADG and TDG standards due to utilization by varying aircraft and operation caveats in place. Though the ADG V wingtip clearance standard is in effect between Taxiways Y and B, remaining design standards associated with ADG and TDG II apply to Taxiway Y. Taxiway connectors B2 and B3 are classified as ADG and TDG II since aircraft in ADG V are restricted from using the connectors to access Taxiway Y. All standards are met and/or exceeded for Taxiways Y, B2, and B3, excluding the wingtip clearance between Taxiway Y and B addressed earlier.

Current and projected air carrier aircraft are classified as ADG and TDG III; therefore, Taxiway W serving the commercial service apron is evaluated using ADG and TDG III standards. Operations by aircraft with wingspans between 119-170 feet (ADG IV) are permitted on Taxiway T, south of Taxiway W, if there are wing walkers present and assisting the aircraft while taxiing. Though ADG IV aircraft are permitted to operate on Taxiway T, and on the segment of Taxiway W that adjoins Taxiway T to provide access to the remainder of the airfield, Taxiway T is evaluated using ADG and TDG III.

Though an airport service road is located within the TOFA dimensions of Taxiway W and T, road markings alerting vehicles to stop and give way to aircraft are located outside both taxiway TOFAs, resulting in a standard TOFA. All ADG and TDG III taxiway design standards are met, as presented in ***Tables 3-10: ADG II and III Taxiway Design Standards*** and ***3-11: TDG II and III Taxiway Design Standards***.

ADG/TDG III

Taxilane design and separation standards differ from taxiways of the same ADG and TDG classification. Taxilanes E and F provide access to the Southwest Jet Center, Embraer, and Cessna. These businesses primarily service ADG and TDG III aircraft. As a result, both taxilanes are considered and evaluated using ADG and TDG III design and separation standards listed in ***Tables 3-12: ADG III Taxilane Design Standards*** and ***3-13: TDG III Taxilane Design Standards***.

An airport access road intersects the taxilanes; however, paved road markings outside of the TOFA are present signaling airport vehicles to stop and give way to passing aircraft. To prevent potential taxilane protection and separation deficiencies, aircraft should not be parked near the taxilanes leading to the aprons as they may infringe upon the TSA.

Table 3-10: ADG II and III Taxiway Design Standards

Taxiway Protection			Taxiway Separation		Wingtip Clearance	Are standards met?
Group II Design Standards	Taxiway Safety Area	Taxiway Object Free Area	Taxiway Centerline to Parallel Taxiway Centerline	Taxiway Centerline to Fixed or Movable Object	Taxiway Wingtip Clearance	
	79 feet	131 feet	105 feet	65.5 feet	26 feet	
Taxiway Y	79’	131’	160’	65.5’ (to access road) 160’ (to TWY B)	13.5’	No
Taxiway B2	79’	131’	1,520’ (to TWY G) 662’ (to TWY B3)	65.5’	Met and Exceeded.	Yes
Taxiway B3	79’	131’	662’ (to TWY B2) 737’ (to TWY H)	65.5’	Met and Exceeded.	Yes
Group III Design Standards	118 feet	186 feet	152 feet	93 feet	34 feet	Are standards met?
Taxiway W	118’	186’	210’[1]	93’[2]	Met and Exceeded.	Yes
Taxiway T	118’	186’	N/A	93’[3]	Met.	Yes
Taxiway V	118’	186’	265’[4]	160’[5]	Met.	Yes

Source: AC 150/5300-13A and Mead & Hunt Analysis.

Notes: [1] Distance ranges from 210 feet to approximately 1,300 feet.
[2] The access road west of the taxiway was used a fixed object.
[3] Ibid.
[4] Measured between Taxiway V and K hold short lines.
[5] The access road south of Taxiway V was used as a fixed object.
Red text = standards not met.

Table 3-11: TDG II and III Taxiway Design Standards

Group II Design Standards	Taxiway Width	Taxiway Edge Safety Margin	Taxiway Shoulder Width	Are standards met?
	35 feet	7.5 feet per outer tire(s)[1]	15 feet	
Taxiway Y	76’	13’ per outer tire(s)	15’	Yes
Taxiway B2	90’	35’ per outer tires(s)	35’	Yes
Taxiway B3	90’	35’ per outer tire(s)	35’	Yes
Group III Design Standards	50 feet	10 feet[2]	20 feet	
Taxiway W	75’	22.5’ per outer tire(s)	35’	Yes
Taxiway V	75’[3]	22.5’ per outer tire(s)	35’	Yes
Taxiway T	60’	15’ per outer tire(s)	N/A[4]	Yes

Source: AC 150/5300-13A and Mead & Hunt Analysis.

Notes: [1] The Taxiway Edge Safety Margin (TESM) is per outer tire(s). A TESM total of 15 feet should be provided for the entire length of the taxiways. A Main Gear Width (MGW) of 20 feet was used to calculate the TESM.
[2] A TESM total of 20 feet should be provided for the entire length of the taxiways. An MGW of 30 feet was used to calculate the TESM.
[3] Taxiway V ranges in width from 75 feet to 100 feet. When taxiway is 100 feet, the TESM is 35 feet per outer tire(s).
[4] Taxiway T is surrounded by paved aircraft operating areas. Taxiway shoulders are not required for group III taxiways.

Table 3-12: ADG III Taxilane Design Standards

Design Standards	Taxilane Protection		Taxilane Separation		Wingtip Clearance	Are standards met?
	Taxilane Safety Area	Taxilane Object Free Area	Taxilane Centerline to Parallel Taxilane Centerline	Taxilane Centerline to Fixed or Movable Object	Taxilane Wingtip Clearance	
	118 feet	162 feet	140 feet	81 feet	22 feet	
Taxilane E	118’	162’	382’	81’	22’	Yes
Taxilane F	118’	162’	382’	81’	22’	Yes

Source: AC 150/5300-13A and Mead & Hunt Analysis.

Table 3-13: TDG III Taxilane Design Standards

Design Standards	Taxiway Width	Taxiway Edge Safety Margin	Taxiway Shoulder Width	Are standards met?
	50 feet	10 feet[1]	20 feet	
Taxilane E	50’	13’ per outer tire(s)	25’	Yes
Taxilane F	50’	15’ per outer tire(s)	20’	Yes

Source: AC 150/5300-13A and Mead & Hunt Analysis.

Note: [1] The Taxiway Edge Safety Margin (TESM) is 10 feet per outer tire(s). A TESM total of 20 feet should be provided for the entire length of the taxiways. A Main Gear Width (MGW) of 24 feet for Taxilane E and 20 feet for Taxilane F was used to calculate the TESM.

Taxiway Design Methodology

FAA requires simple taxiway design to prevent possible runway incursions and/or pilot confusion. Certain taxiway designs are now discouraged and are recommended to be addressed when practicable because they no longer comply with FAA design standards. Taxiway layouts no longer acceptable include those that permit or have:

- ✓ Four or more node intersections
- ✓ Direct access from a runway to an apron
- ✓ Wide expanses of pavement
- ✓ Judgmental oversteering
- ✓ Dual purpose (using a runway as a taxiway, or a taxiway as a runway)
- ✓ Acute angled intersections
- ✓ Runway crossings
- ✓ High energy intersections in the middle third of a runway
- ✓ Limited visibility.

A three-node concept that provides pilots with only three options at an intersection (straight, left, or right) is the preferable design due to its simplicity and the ability to properly place airfield signage, markings, and lighting. Complex intersections that offer more than three options, or have excess pavement, increase the possibility of pilot error. In recent years, taxiway design has been under great scrutiny to limit runway incursions and pilot error resulting from poor taxiway design. To combat these risks, the FAA established a Runway Incursion Mitigation program to identify hot spots, defined as a location(s) on an airport movement area with history of potential collision risk or runway incursion, and where heightened attention by pilots and drivers is necessary. Certain hot spots are considered high priority for mitigation if three or more peak annual incursions, or more than eight cumulative runway incursions have occurred between fiscal year (FY) 2008 and calendar year (CY) 2015 at the hot spot location.

Hot Spot 1 (HS1) at IWA is caused by the complexity of the intersection of Taxiways V, B, and K and has been identified as a high priority hot spot. At this hot spot location, three peak annual runway incursions and nine cumulative runway incursions have occurred. From Runway 12R/30L, pilots are provided more than three options as they can exit at collocated Taxiways V and K that form intersections at Taxiways A and B. Taxiway V, an acute angled high-speed taxiway, provides direct access to the commercial service apron and results in poor visibility. Taxiway K provides direct access from Runway 12R/30L to the airport support apron.

Non-standard geometry and an acute angle intersection exist at Taxiways V and A. Despite its non-standard design, Taxiway V is used by GA aircraft, including business jets, as an exit taxiway. GA aircraft also use Taxiway K as an entrance taxiway to Runway 12R/30L for midfield takeoffs to the northwest.
In 2017, a Hot Spot Mitigation report was prepared. The report presented five alternatives to address HS1. After consultation with airport staff and ATCT personnel, a final alternative was chosen to mitigate HS1 and the issues it causes. Future remedies are illustrated in ***Figure 3-4: Hotspot Mitigation*****.**

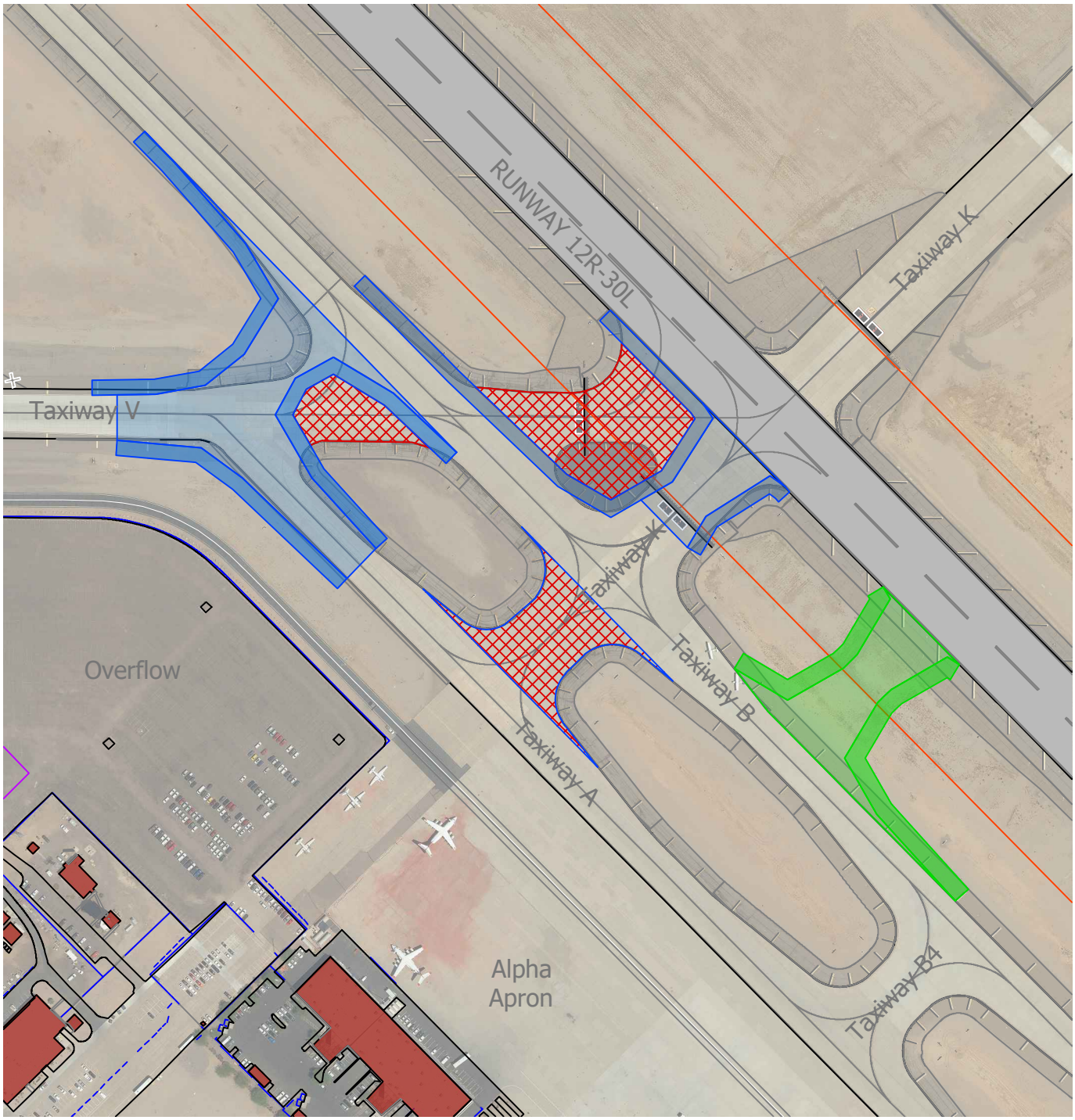


Figure 3-4:
Hotspot Mitigation

Exit Taxiway Analysis

Exit taxiways can be right or acute angled with the primary purpose of permitting aircraft free flow passage completely beyond the hold short line. Right-angled taxiways provide bi-directional use and better pilot visibility than acute angled taxiways. Acute angled taxiways are considered high-speed exit taxiways and allow aircraft to exit runways at a faster speed than right angled taxiways. Their allowance for high speed exits increases capacity by reducing an aircraft's runway occupancy time. They do not allow for bi-directional use as they only allow use by aircraft landing in the same direction the taxiway is angled.

Runway 12R/30L exit taxiways appear to be sufficient for large (12,500-300,000 pounds MTOW) and heavy (over 300,000 pounds MTOW) aircraft with long landing rollouts but are spaced too far apart for smaller aircraft (less than 12,500 pounds MTOW). The first available exit taxiway for Runway 12R is Taxiway H at approximately 2,950 from the threshold, and for Runway 30L, the first available exit taxiway is Taxiway L at 2,500 feet from the threshold. According to AC 150/5300-13A, most single and twin GA aircraft exit a runway 2,000 – 4,000 feet from the runway threshold. Though within the range specified by the AC, if a smaller aircraft's landing rollout continues beyond the initial exit taxiways, the next available exit taxiway for Runway 12R is Taxiway V at approximately 2,280 feet beyond Taxiway H, and the next available exit taxiway for Runway 30L is Taxiway K at 2,415 feet beyond Taxiway L. This significant distance between exit taxiways causes small aircraft to use Runway 12R/30L as a taxiway until the next taxiway connector, consequently delaying aircraft waiting to land and decreasing airport capacity.

Runway 12C/30C is served by three taxiway connectors, Taxiways G, P, and K. Taxiways G and P serve as entrance and exit taxiways for Runway 12C and 30C, respectively. Taxiway K, located approximately 3,945 feet from Runway 12C threshold and approximately 6,260 feet from Runway 30C threshold, can be used for traffic exiting the runway. According to AC 150/5300-13A, large aircraft exit runways within the first 4,500 feet, thus aircraft landing on Runway 30C utilize an additional 1,760 feet and occupy the runway for an additional amount of time. For both small and large aircraft, the lack of available exit taxiways cause issues identical to those faced by Runway 12R/30L.

Runway 12L/30R is currently served by a partial parallel taxiway with three exit taxiways, Taxiways C1, C2, and C3, of which one is acute angled. The first available exit taxiway, Taxiway C3, for aircraft landing on Runway 12L is 5,360 feet from the threshold. Taxiway C3 is also the first available exit taxiway for aircraft landing on Runway 30R. From Runway 30R threshold, Taxiway C3 is located 3,945 feet away. By the conclusion of this master plan, Taxiway C will be extended to the full length of Runway 12L/30R and include three additional exit taxiways. The extension and added taxiways will not be sufficient for small aircraft but will prove sufficient for the large and heavy aircraft that primarily operate on the runway.

Conclusion

Construction of additional exit taxiways that lessen the significant separation that currently exists for Runways 12R/30L, 12C/30C, and 12L/30R should be considered to accommodate all aircraft that operate at IWA.

Apron Design

The function of an apron is to accommodate aircraft during loading and unloading of passengers and cargo, short- and long-term aircraft storage, and other activities, such as fueling and maintenance. Similar to runways and taxiways, design standards have been established for aprons. Two main aprons paved with taxilanes that provide access to designated aircraft parking exist at IWA. These taxilanes must meet TOFA and wingtip clearance standards of the ADG designated for that particular apron. Though aircraft utilization varies, it is best to design the apron to accommodate the most demanding aircraft projected to use the area to avoid collision between taxiing and parked aircraft.

In addition to the evaluation of taxilane design standards, apron capacity is also evaluated. Apron space should be able to accommodate transient and/or based aircraft, if not stored in a hangar, during the planning period. Apron design and capacity are detailed in the following sections.

Commercial Service Apron

For ease of reference, the commercial service apron is discussed within the *Landside Facility* section as part of the terminal facilities evaluation.

General Aviation (GA) Aprons

Determining the appropriate ADG for GA aprons can prove challenging. GA aprons are typically adjacent to and associated with Fixed Based Operators (FBOs) that provide aircraft and pilot services, such as marshalling and fueling to transient and based aircraft. Transient aircraft ranges from light sport aircraft to business jets. Though military aircraft are not classified as GA, they can be parked on GA aprons and serviced by FBOs. GA aprons should be designed to accommodate transient aircraft and so that aircraft of similar design characteristics can be parked together.

To maximize apron capacity and comply with FAA design standards, aircraft parking space on the GA apron adjacent to the FBO and surrounding infrastructure at IWA is grouped by ADG. The GA apron is segmented by taxilanes that divide the apron into 18 rows designated for based and transient aircraft parking. Within the rows are 130 parking positions of which some are “T” shaped (T-spots). The taxilanes positioned around the designated parking areas provide access to the taxiway system. Apron taxilanes must meet TOFA and wingtip clearance. An evaluation of the GA apron concluded that all taxilanes meet TOFA and wingtip clearance standards associated with ADG I, excluding the taxilane that provides access to row 15. This taxilane meets TOFA and wingtip clearance standards associated with ADG II.

Rows 1 and 2 are designated as an aircraft run-up area, which helps prevent jet blast damage to surrounding aircraft and reduces apron and taxiway usage. Adjacent to the three T-hangars are rows 3 and 4 that house based aircraft classified as ADG I. Row 5 is also adjacent to the T-hangars and is reserved for larger twin aircraft classified as ADG I. Rows 6-12 are reserved for the Cessna and Piper Seminoles in ADG I that comprise the flight school fleet. Currently, row 13 accommodates three based aircraft with the remaining spaces available for future based aircraft. Rows 14-18 are available for itinerant aircraft; however, row 15 is primarily for short-term transient aircraft in ADG II. Of the 130 aircraft parking positions, 77 are occupied or reserved for based and flight school aircraft resulting in an apron occupancy of 59 percent.

The manner in which the demand for itinerant GA parking positions was determined is illustrated in ***Table 3-14: Itinerant GA Parking Demand*****.** Using 2017 as the base year, due to reliable data, October was the peak month for GA operations with approximately 28,857 operations. Thirty-five percent of October 2017 GA operations were itinerant, resulting in a total of 10,188 operations and an average of 329 operations per day. To account for a busy day during the peak month and plan for the most demanding scenario, a multiplier of 10 percent was applied to the average day of peak month operations resulting in the average peak day of peak month operations provided in ***Table 3-14: Itinerant GA Parking Demand***. A minimum of two operations per aircraft were assumed, resulting in operations by 181 aircraft. This number was further reduced to 90 aircraft, and later 45 aircraft, that would need tiedown positions.

Table 3-14: Itinerant GA Parking Demand

Year	Annual GA Itinerant Operations	Average Peak Day of Peak Month Operations	Number of Tiedowns
2017	104,927	362	45
2018	114,236	394	49
2023	115,835	399	50
2028	119,407	411	51
2038	128,625	443	55

Source: Mead & Hunt.

The calculations used to determine transient tiedown needs are reflective of the most demanding scenario. Approximately 20 transient aircraft parking positions are currently available and have proved sufficient for airport needs. Additional apron space is available adjacent to row 18 in the event additional transient parking positions reach capacity.

Airport Support Apron

The airport support apron is not destined for use by SkyBridge. As stated in the **Inventory Chapter**, this apron is primarily utilized by charter operators, United States Forest Service, and Swift Air. Cargo operators also use the apron on an as-needed basis. The apron meets design standards and is sufficient for simultaneous use by charter and cargo operators, United States Forest Service, and Swift Air.

Landside Facility Requirements

Terminal Facilities

The following summarizes the passenger terminal requirements at IWA for the 20-year planning horizon from 2018 through 2038.

Methodology

The method for determining future requirements is informed by, and consistent with, guidance from the Airport Cooperative Research Program (ACRP), Report 25: *Airport Passenger Terminal Planning and Design*, as well as the International Air Transport Association (IATA), *Airport Development Reference Manual*, 10th Edition. For each passenger terminal function, specific assumptions in accordance with this guidance, industry standards, and airline input are documented. For baseline planning, terminal facilities are often sized to meet IATA's optimum Level of Service (LoS), which is a measure of the quality of service provided inside the terminal in terms of ease of flows and delays. Optimum LoS corresponds to overall good levels of service, where flows are stable, delays are acceptable, and a good level of comfort is provided. Previous versions of IATA's *Airport Development Reference Manual* referred to the designated optimum level of service as being LoS C.

To understand the impact of varying certain assumptions, sensitivity analyses are conducted. These sensitivities are used to inform the planning recommendation for each terminal facility. Notably, the aim of the requirements analysis is to inform the optimal capability of various terminal functions, rather than recommending to the terminal's existing constraints. This industry practice allows solutions to be explored that would overcome existing constraints within the terminal building area, and if in the alternatives evaluation, they are found imprudent or impractical to overcome, a solution that accounts for said constraints can be identified. Commentary is provided as to what might be prudent given the existing terminal's physical characteristics.

To derive passenger terminal requirements, an estimate of average day, peak month (ADPM) enplanements is required. Scenario-based ADPM flight schedules provide the basis for the terminal requirements. Specifically, the ADPM flight schedule provides the basis for aircraft gates and apron parking requirements. Passenger peak hour enplanements from the ADPM flight schedule drive check-in, checked baggage, security screening, and holdroom requirements. Similarly, peak hour deplanements determine baggage claim requirements.

Planning Activity Levels

There is a level of uncertainty associated with long-range demand forecasting and associated planning exercises. As a result, Planning Activity Levels (PALs) are identified to inform future levels of passenger activity at which facilities become congested and expansion would be required. PALs help to disassociate projects from specific years as realized activity levels may occur earlier or later than the baseline forecast predicts. PALs were chosen to represent conditions expected within the first five years, ten years, and at the end of the planning period, according to the baseline forecast produced by Unison Consulting.

PAL 1 coincides with 925,000 enplanements, which the baseline forecast predicts would occur in 2023. PAL 2 represents 1,022,500 enplanements, which may occur in 2028, and PAL 3 coincides with 1,245,200 enplanements at the end of the 20-year forecast horizon. Annual and peak passenger airline flight operations and passenger data for each PAL are summarized in ***Table 3-15: Peak Period Activity***. Where appropriate, the use of PALs will be used in the identification of terminal facility requirements.

Table 3-15: Peak Period Activity Summary

Activity	Base Year		Planning Activity Levels (PAL)		
	2018	2019	PAL 1 (2023)	PAL 2 (2028)	PAL 3 (2038)
Annual enplanements	759,000	850,300	925,000	1,022,500	1,245,200
ADPM enplanements	2,703	3,029	3,294	3,642	4,435
Peak hour passengers					
Enplanements (Departures Peak Hour)	803	900	978	1,082	1,317
Deplanements (Arrivals Peak Hour)	606	679	738	816	994
Peak Hour Total Passengers (Total Operations Peak Hour)[1]	903	1,011	1,100	1,216	1,481
Annual passenger departure operations	5,460	5,997	6,477	7,035	8,420
ADPM passenger departure operations	21	23	25	27	32
Peak hour passenger operations					
Departures	6	7	7	8	9
Arrivals	5	5	5	6	7
Peak hour total passenger operations	7	8	8	9	11

Source: Unison, IWA MP 2018 – PMAD PH and Fleet Mix Details, October 2018.
Note: [1] Peak hour enplanements and deplanements do not equal total passengers based on peaking characteristics.

Activity Profiles

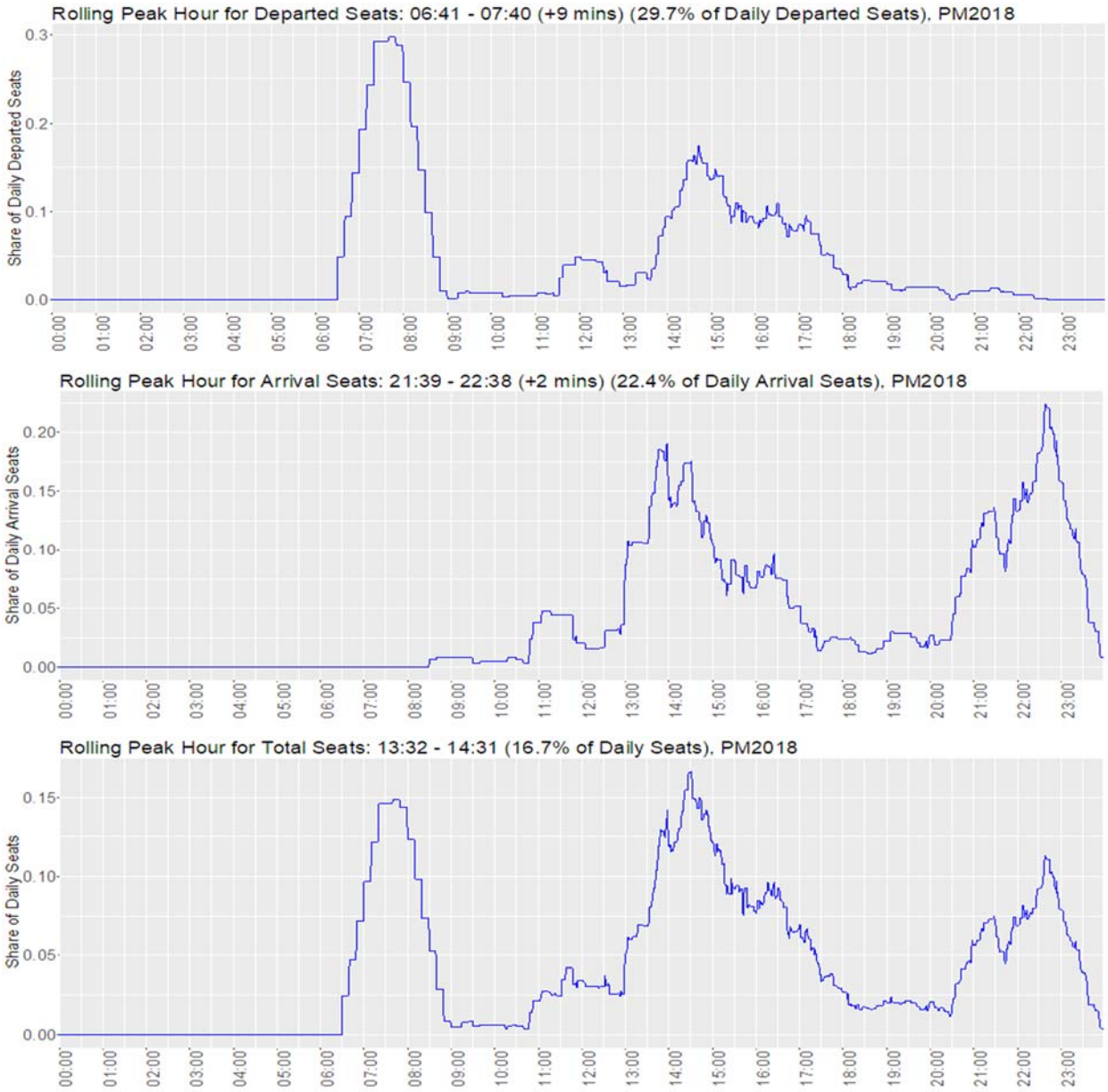
The activity profiles associated with the flight schedules for passenger seats, aircraft operations, and peak hour periods are shown in ***Figure 3-5: Arriving and Departing Seats Activity Profile*** and ***Figure 3-6: Arriving and Departing Flight Activity Profile***, respectively. In the Peak Month Average Day Peak Hour

analysis, three different peak hours are identified: a peak for departing seats (6:41 a.m.-7:40 a.m.), a peak for arriving seats (9:39 p.m.-10:38 p.m.), and a peak for total seats (1:32 p.m.-2:31 p.m.).

During the departure peak hour, it is estimated that there are 803 enplanements or 29.7 percent of daily departing seats. During the arrival peak hour, it is estimated that 22.4 percent of daily arriving seats take place, or 606 deplanements. This implies that IWA has a busier peak hour for departures compared with arrivals. The busiest peak hour for the Airport, however, occurs when both departures and arrivals are taking place. Including both departing and arriving seats, the identified peak hour for total seats (1:32 p.m.-2:31 p.m.) accounts for 16.7 percent of total seats, or approximately 903 departing or arriving passengers.

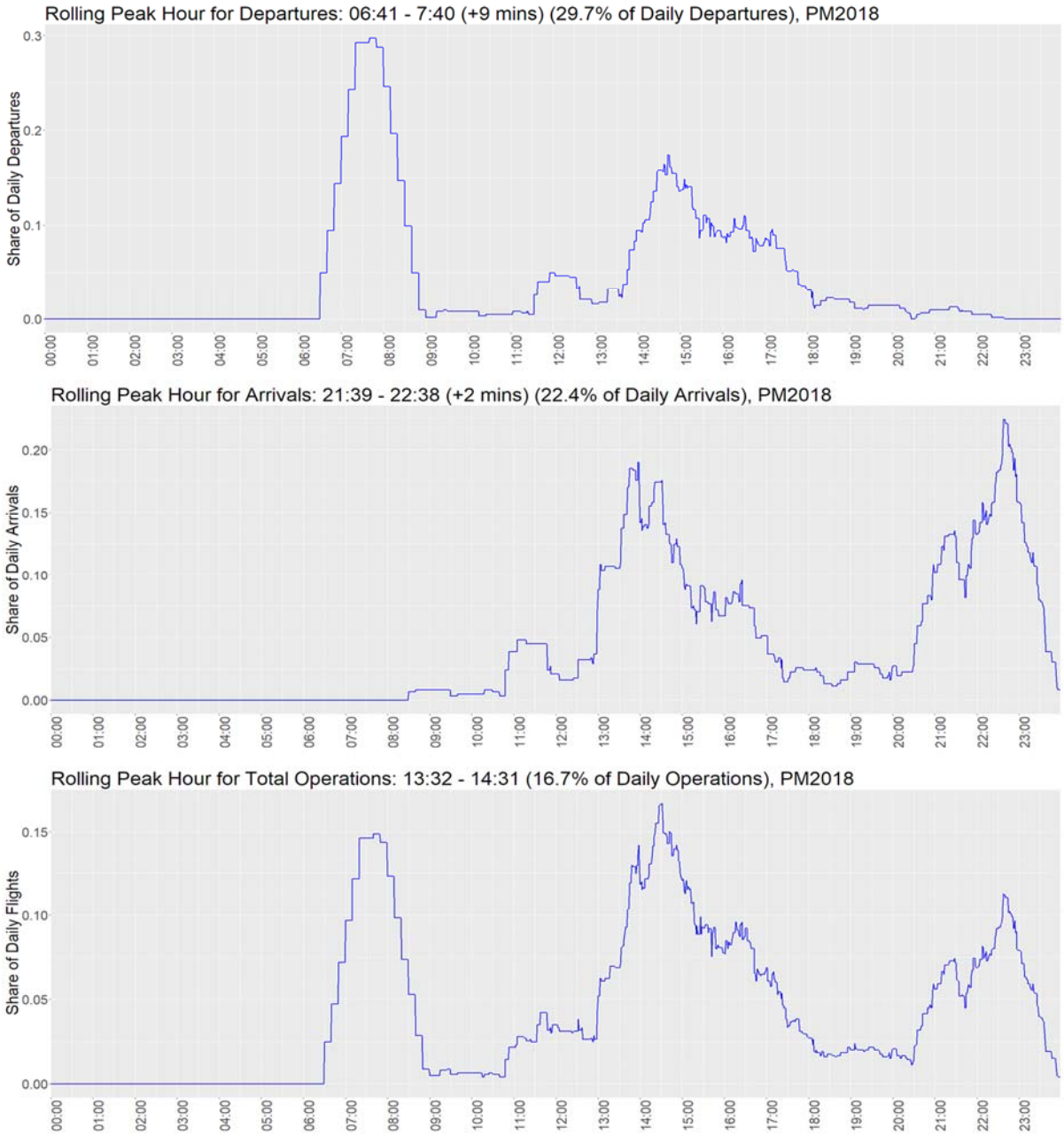
Peak hour departure and arrival times occur at different times of the day and do not directly relate with the peak number of passengers as outlined in ***Table 3-15: Peak Period Activity***, therefore the number of enplanements and deplanements will not equal the peak hour of total passengers. The same applies for the Peak Hour Total Passenger operations. The peak hour departures and the arrivals will not equal the peak hour total passengers.

Figure 3-5: Arriving and Departing Seats Activity Profiles



Source: Unison, IWA MP 2018 – PMAD PH and Fleet Mix Details, October 2018.

Figure 3-6: Arriving and Departing Flight Activity Profile



Source: Unison, IWA MP 2018 – PMAD PH and Fleet Mix Details, October 2018.

Passenger Terminal Requirements

This section provides the assumptions, methodology, and results associated with the analysis of the future terminal requirements for each major function within the passenger terminal building.

Check-In Lobby

The size of the check-in lobby and the number of ticket counter positions are typically a function of:

- ✓ The number of peak departing flights
- ✓ The number of peak enplaning passengers
- ✓ The distribution of passenger arrival time to the terminal
- ✓ The ratio of passengers checking in at ticket counters, self-service kiosks, or via airline websites/mobile apps.

The ticket lobby currently provides 32 ticketing counter positions and occupies an area of approximately 9,350 square feet (including counter positions, passenger processing, and queueing spaces). The check-in positions operate as common use, although the existing carriers tend to use the same desks throughout the day. These assumptions regarding check-in behavior were used to determine future requirements:

- ✓ 90 percent of passengers use traditional check-in desks, while the remaining 10 percent use mobile check-in, evolving to a 75/25 percent split by the end of the planning period due to trends in check-in automation
- ✓ A maximum queue time of 15 minutes at the check-in desk and 5 minutes at baggage-drop (for mobile check-in passengers), per IATA optimum LoS
- ✓ A transaction time of 90 seconds per passenger, improving to 80 seconds by 2038 to account for technology improvements, and greater familiarity with the process by passengers
- ✓ 14 square feet per passenger in queue, per IATA optimum LoS.

Based on the above assumptions, the existing check-in lobby and the number of check-in desks can accommodate passengers throughout the planning period. The required number of desks and size of the check-in queue area are shown in ***Table 3-16: Check-In Lobby Requirements***.

Table 3-16: Check-In Lobby Requirements

Check-in Lobby	Existing Facilities	Planning Activity Levels (PAL)		
		PAL 1	PAL 2	PAL 3
Number of check-in desks	32	26	27	31
Queue area (sf)	4,500	3,550	3,700	4,350

Source: Inter*VISTAS*, November 2018.

Sensitivity Analysis

If the 15-minute wait time standard were to increase to 20 minutes due to airline staffing restrictions, then 28 check-in desks and a queue of 4,900 square feet would be required. If the processing time were to increase from 90 seconds per passengers to 120 seconds per passenger, 10 additional desks would be required.

Recommendation

The 32 existing check-in positions and the current queueing area are sufficient to accommodate demand through PAL 3. As the technology offered by the airlines evolves, some of the traditional full-service counters may be enhanced or replaced with automated bag-drop capability to provide reduced transaction times thereby enhancing the capability of the existing lobby area. As part of the alternatives evaluation, it would be prudent to explore the possibility of providing additional passenger queue space, if either (1) airport management would like to account for an airline's tendency not to staff all available positions or (2) the additional space would not inhibit other terminal functions.

Checked Baggage Screening

All checked baggage screening is performed using two CT-80 Explosive Detection System (EDS) machines operating in a mini in-line configuration located south of the check-in lobby. Two baggage carrying belts service the system from the check-in counters. The following planning factors are based on the U.S. Department of Homeland Security – Transportation Security Administration's (USDHS-TSA) *Planning Guidelines and Design Standards for Checked Baggage Inspection Systems* (PGDS, v6.0) to evaluate baggage screening requirements:

- ✓ The average number of checked bags per passenger is 0.9, based on industry averages and informed by consultation with airport management and local conditions.
- ✓ The certified throughput rate for the two CT-80s in a mini in-line configuration is 240 bags per hour.
- ✓ The ticket counter baggage capacity is 1,000 bags per hour.

EDS requirements are not based on average baggage flows, but on surged 10-minute flows to account for random variability in the expected average flow rate. The existing surged peak hour bag flow is estimated at 855 bags per hour, growing to 1,355 by the end of the planning period.

Faster speed EDS reduces the overall machine count while slower speed EDS increases the count. If optimizing the EDS system is not feasible, additional manual screening of bags by USDHS-TSA in a facility at the south end of the ticketing lobby would likely be required to meet demand. Manual screening has a lower capital cost than constructing a new baggage system but would have higher operating costs requiring additional USDHS-TSA staffing.

If the airport can upgrade to a medium speed (MS-EDS) inline solution with EDS throughputs of around 540 bags per hour (e.g., L-3 3DX 6600), four EDS would be required for operation by PAL 2, as shown in ***Table 3-17: Baggage Screening Requirements***[5].

Table 3-17: Baggage Screening Requirements

Baggage Screening Factors	Existing Facilities	Planning Activity Levels (PAL)		
		PAL 1	PAL 2	PAL 3
Originating peak hour passengers	803	978	1,082	1,317
Surged peak hour flow	855	1,025	1,125	1,355
Number of EDS units	2 CT-80	3 MS-EDS	4 MS-EDS	4 MS-EDS

Source: Inter*VISTAS*, November 2018.

Sensitivity analysis

Three inline EDS, which includes one for redundancy, would be required through end of planning period with certified throughput of at least 675 bags per hour (e.g., L-3 3DX 6700 ES or MDI CTX-9800 Dsi). Five inline EDS, including one for redundancy, would be required through end of planning period with a certified throughput of 360 bags per hour (e.g., MDI CTX-5800).

Recommendation

Further discussion with USDHS-TSA is required to select the optimal baggage screening solution as the existing system is likely to reach capacity in the near future. Upgrades to the ticket counter baggage feeds should be considered as the airport reaches PAL 1 to accommodate the projected peak hour bags. Further, we recommend that an inline system with four medium speed EDS be implemented prior to the airport reaching PAL 2.

Checked Baggage Makeup

In the existing condition, baggage is loaded onto carts after screening to be transported to the aircraft. The number of checked bags, the size of aircraft, and the number of departures in the peak two hours impact the number of carts required. Typically, a single cart can handle 60 bags on average given the size and type of bags checked. The number of carts required is also a function of passenger arrival times and how early check-in begins before scheduled departure time.

The following planning factors used to determine baggage makeup requirements are based on ACRP Report 25 guidance and the demand forecast:

- ✓ Each cart requires 600 square feet of space.
- ✓ Nine peak hour departures would occur at PAL 3.

[5] One EDS is required per PGDS guidelines for redundancy in inline configurations

Sensitivity analysis

In a more efficient operation, at 70 bags per luggage cart, the required baggage makeup area at PAL 3 could be reduced from 15,700 square feet to 13,500 square feet as fewer carts would be staged for peak hour flights.

Recommendation

Provide approximately 15,700 square feet of baggage makeup by PAL 3, as shown in ***Table 3-18: Baggage Makeup Requirements***, which includes area for the carts, room needed to maneuver and stage baggage, and room needed for the carts to be loaded. With the estimated shortfall occurring by PAL2, the recommendation is for IWA to implement a project to expand the baggage makeup such that it would come online as demand reaches PAL2, sized for the PAL3 requirement.

Table 3-18: Baggage Makeup Requirements

Baggage	Existing Facilities	Planning Activity Level (PAL)		
		PAL 1	PAL 2	PAL 3
Makeup area (sf)	11,500	11,400	12,800	15,700

Source: Inter*VISTAS*, November 2018.

Security Screening Checkpoint

The area dedicated to passenger security screening currently occupies approximately 8,900 square feet, of which approximately 3,800 square feet is provided for passenger queueing, the remaining space for screening and egress. This area includes five, 70-foot long security lanes and space for passenger queueing. These lanes are shorter than those recommended by USDHS-TSA to obtain maximum throughput in terms of passengers per hour. The following assumptions regarding passenger security screening were used to inform future requirements:

- ✓ The passenger processing rate would decrease from 26.7 seconds per passenger (135 passengers per hour) to 20 seconds per passenger (180 passengers per hour) over the planning horizon, due to technological improvements. Regular lanes, on average, process 160 passengers per hour today while Pre✓® lanes process over 205 passengers. Reduced throughputs at the Airport reflect local conditions, specifically the increased number of mobility impaired passengers and infrequent travelers.
- ✓ A maximum queue time of 10 minutes, per IATA optimum LoS.
- ✓ Each security lane is 15 feet wide by 70 feet long, as recommended in the USDHS-TSA *Checkpoint Design Guidelines* (CDG) v6.1.

Based on these assumptions, six security lanes would be required at PAL 1, and a seventh would be required at PAL 3.

Sensitivity analysis

A number of sensitivity analyses were conducted to inform the recommendation:

1. If the airport could provide automated screening lanes (ASL), passenger throughput would likely be between 250 and 300 passengers per hour, resulting in a requirement of 5 lanes and 10,610 square feet, or 4 lanes and 8,960 square feet, respectively. Notably, these lanes would need to be approximately 85 feet long, as recommended in the USDHS-TSA *CDG – Innovation and Concept Supplemental Information 1-2017 v.1*, with the understanding that this may not be practical given building constraints.

2. If the wait time standard were allowed to increase by 15 minutes and throughput assumptions started at 135 passengers per hour growing to 180 passengers per hour, 5 lanes and 8,620 square feet would be required.

3. If the wait time standard were allowed to increase by 20 minutes and throughput assumptions started at 135 passengers per hour growing to 180 passengers per hour, 5 lanes and 9,000 square feet would be required.

Checkpoint dimensions corresponding to each of the sensitivity analyses are provided in ***Table 3-19: Security Screening Sensitivity Analysis Dimensions***.

Table 3-19: Security Screening Sensitivity Analysis Dimensions

Screening Sensitivities	Lanes	Queue	Screening	Egress	Total Area
Existing	5	Approx. 45 ft deep x 80 ft wide	Approx. 70 ft deep x 90 ft wide	Variable depth x 12 ft wide	12,700 SF
Sensitivity 1	5 4	26 ft deep x 87.5 ft wide 33 ft deep x 70 ft wide	85 ft deep x 87.5 ft wide 85 ft deep x 70 ft wide	10 ft deep x 87.5 ft wide 10 ft deep x 70 ft wide	10,610 SF 8,960 SF
Sensitivity 2	5	35 ft deep x 75 ft wide	70 ft deep x 75 ft wide	10 ft deep x 75 ft wide	8,620 SF
Sensitivity 3	5	40 ft deep x 75 ft wide	70 ft deep x 75 ft wide	10 ft deep x 75 ft wide	9,000 SF

Source: Inter*VISTAS*, November 2018.

Recommendation

Plan for five lanes at a 15-minute wait time standard, assuming the lanes cannot be reconfigured with ASL technology. This wait time standard negates the need to add a sixth lane, as shown in ***Table 3-20: Security Screening Requirements***. Notably, during the forecasted peak morning period, the wait time would exceed the airport's goal of 10 minutes; however, it would remain below 15 minutes. Throughout the rest of the day, it is expected that a 10-minute wait time level of service would be achieved.

If in the alternatives evaluation additional length for the lanes may be provided, we recommend providing additional area for queuing and re-composure to be in place no later than PAL1 to both enhance the throughput of the existing lanes and allow for the possibility of future ASL technology. Relocation of the rental car counters should be evaluated to provide the additional length, as this would allow for improvement to the current screening technologies or implementation of new ASL technology. A

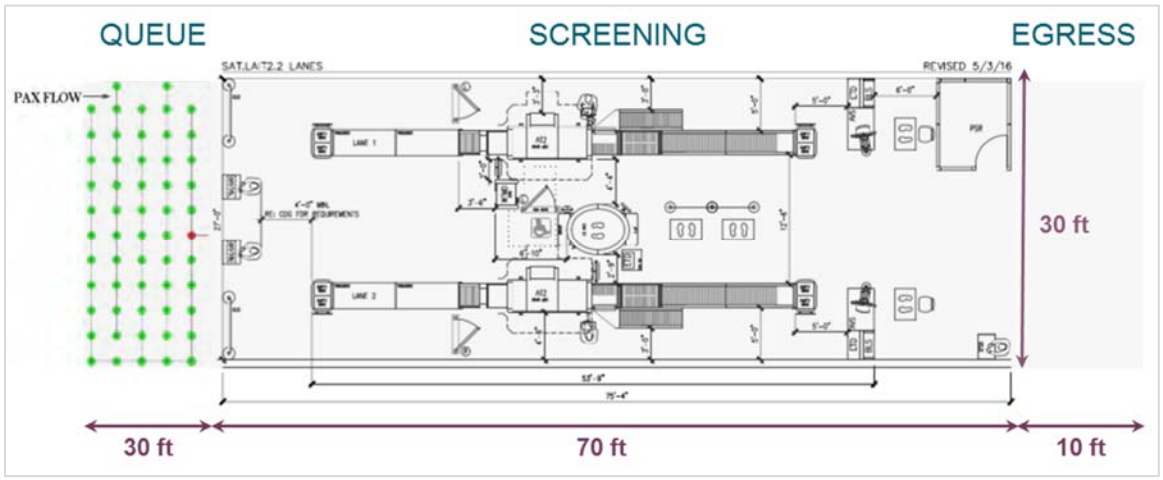
conceptual layout is indicated in ***Figure 3-7: Sample Layout for Each Pair of Lanes to Achieve Passenger Throughput with Existing Technology***, to achieve greater passenger throughput with existing technology.

Table 3-20: Security Screening Requirements

Screening Area Components	Existing Facilities	Planning Activity Level (PAL)		
		PAL 1	PAL 2	PAL 3
Number of lanes	5	5	5	5
Screening area (sf)	6,800	5,250	5,250	5,250
Queue area (sf)	3,800	1,950	2,250	2,625
Egress area (sf)	2,100	750	750	750
Total checkpoint area (sf)	12,700	7,950	8,250	8,625

Source: Inter*VISTAS*, November 2018.

Figure 3-7: Sample Layout for Each Pair of Lanes to Achieve Passenger Throughput with Existing Technology



Source: TSA Checkpoint Design Guidelines v6.1, modified by Inter*VISTAS*, November 2018.

Passenger Holdroom

Holdroom requirements are derived from the design aircraft for each gate as well as the number of departures expected to occur in the peak hour. The existing holdrooms provided approximately 15,000 square feet, not accounting for queueing and egress space in the circulation corridor.

Based on the future flight schedules, the design aircraft is the Airbus A320 with 186 seats, at a 90 percent load factor (in line with Allegiant's dense seating configuration for their Airbus A320). Nine departures are forecast to occur in the peak hour by PAL 3.

One of the most critical assumptions in determining future holdroom requirements is the percentage of passengers that may be occupying other space in the terminal prior to their departure (concessions, restrooms, et cetera).

To inform this assumption, we have reviewed the proposed concession reconfiguration and estimate:

- ✓ Approximately 6,400 square feet of post-security space will be dedicated to restaurants and quick service, about 60 percent to 65 percent of which would provide public seating, as well as an additional 2,550 square feet of outdoor patio.
- ✓ These concession spaces can accommodate about 360 seated passengers, or about 36 passenger per gate, which represents approximately 20 percent of passengers on the design aircraft.

Given this program, the baseline assumptions include:

- ✓ Approximately 20 percent of passengers on a given flight will be located in the concessions or elsewhere in the terminal prior to their flight.
- ✓ Approximately 85 percent of passengers in the holdroom are seated, which is greater than the traditional range for optimum LoS. The remaining 15 percent of passengers are assumed to be standing.
- ✓ Each seated passenger requires 18.5 square feet and each standing passenger 13 square feet, which is consistent with IATA optimum LoS.
- ✓ It is assumed that 5 percent of the seating capacity is unused to account for passenger belongings that are often placed on adjacent seats.

As shown in ***Table 3-21: Holdroom Requirements***, using these assumptions, approximately 19,700 square feet of holdroom is required to serve the PAL 3 demand (about 2,200 square feet for each holdroom). Further, the space requirement is increased by 525 square feet at each gate to account for the requirement to accommodate boarding operations, queueing, and the gate service counter.

Sensitivity analysis

If the percentage of passengers located outside the holdroom were reduced to 15 percent, each holdroom would require about 2,300 square feet of space (20,800 square feet of total holdroom). Further, if 10 percent of passengers were located outside of the holdroom, each holdroom would require about 2,450 square feet of space (22,000 square feet of total holdroom).

Recommendation

The alternatives evaluation should provide for approximately 24,400 square feet of passenger holdroom, boarding, and queueing, which should be designed at PAL 2 and be open before PAL 3.

Table 3-21: Holdroom Requirements

Holdroom Components	Existing Facilities	Planning Activity Level		
		PAL 1	PAL 2	PAL 3
Holding area (sf)	15,260	13,000	15,300	19,700
Podium, queuing, egress (sf)	3,950	3,150	3,675	4,725
Total holdroom area (sf)	19,210	16,150	18,975	24,425

Source: Inter*VISTAS*, November 2018.

Commercial Service Apron

The number of aircraft contact gates is the most significant factor in determining the size and configuration of the passenger terminal. The existing commercial service apron provides six aircraft parking positions capable of accommodating ADG III[6], and four positions that can accommodate an ADG IV (Boeing 757-200).

The following assumptions were made to inform the future aircraft gate requirement:

- ✓ Airlines would require 45 minutes to conduct a turn (which consists of an arrival and then subsequent departure).
- ✓ A 15-minute buffer is assumed to exist between each operation to allows for aircraft towing and flight schedule delays.

Using these assumptions, nine aircraft parking positions would be required to accommodate the design flight schedule through PAL3.

Sensitivity analysis

If more severe schedule perturbation were to occur and average turn times were to increase from 45 minutes to 50 minutes, then 10 aircraft parking positions would be required. If turn times were to increase to 55 minutes, then 11 aircraft parking positions would be required for PAL 3 demand.

Recommendation

To account for both schedule delays and longer turn times associated with legacy airlines, a minimum of 11 aircraft parking positions should be provided. The alternatives evaluation should identify the apron space that may be occupied should a widebody aircraft occasionally be on the ground as the result of a charter or diversion. ***Table 3-22: Aircraft Parking Position Requirements*** summarizes the recommended aircraft contact gates.

[6] Most narrow body aircraft are ADG III, such as the Airbus A320 and Boeing 737 aircraft.

Table 3-22: Aircraft Parking Position Requirements

Location	Existing Facilities	Planning Activity Level (PAL)		
		PAL 1	PAL 2	PAL 3
Apron (gates)	6 ADG III 4 ADG IV	8 ADG III	9 ADG III	11 ADG III

Source: InterVISTAS, November 2018.

Baggage Claim

Baggage claim requirements are a function of peak hour deplaning passengers, the concentration of deplaning passengers within the peak 30 minutes, and the percentage of passengers with checked baggage. In the existing condition, two flat-plate claim devices are provided in the baggage claim. The following assumptions were utilized to determine the baggage claim device requirements:

- ✓ Provide three feet of claim frontage per passenger, based on ACRP 25 guidelines.
- ✓ Ninety percent of passengers are assumed to check bags (equivalent of 0.9 bags per passenger).
- ✓ There is an average claim device occupancy time of 10 minutes per flight.
- ✓ A retrieval area between 10 to 12 feet deep around the baggage claim device will allow for active claiming of bags and maneuvering
- ✓ The two, existing flat-plate claim devices provide 326 feet of linear frontage combined (which accounts for the proposed expansion of the devices).
- ✓ Passengers typically arrive in the baggage claim area before bags are offloaded on the belts.

Given these assumptions, two baggage claim devices are sufficient to accommodate the demand through the entire planning period based on linear frontage required.

Sensitivity analysis

If the claim occupancy time assumption was increased from 10 to 20 minutes, a third device would be required to accommodate a larger number of passengers queueing around the claim devices.

Recommendation

We recommend that a third device be evaluated within the alternatives process to accommodate seven peak hour arrivals by PAL 2, as well as any schedule perturbations. The recommended number of baggage claim devices is shown in ***Table 3-23: Baggage Claim Requirements***.

Table 3-23: Baggage Claim Requirements

Baggage Claim	Existing Facilities	Planning Activity Levels (PAL)		
		PAL 1	PAL 2	PAL 3
Claim devices (each)	2	2	3	3

Source: Inter*VISTAS*, November 2018.

Summary of Terminal Requirements

This section of the chapter analyzed the passenger terminal requirements at IWA for the 20-year planning horizon from 2018 through 2038. The requirements and recommendations are summarized as follows, and the individual requirements are summarized in ***Table 3-24: Terminal Requirements Summary***:

- ✓ Check-in lobby – The 32 existing check-in positions and the current queueing area are sufficient to accommodate demand through PAL 3. As part of the alternatives evaluation, it would be prudent to explore the possibility of providing additional passenger queue space, if either (1) airport management would like to account for airline's tendency not to staff all available positions or (2) the additional space would not inhibit other terminal functions.
- ✓ Checked baggage screening – Further discussion with USDHS-TSA is required to select the optimal baggage screening solution as the existing system is likely to reach capacity in the near future. Upgrades to the ticket counter baggage feeds should be considered as the airport reaches PAL 1 to accommodate the projected peak hour bags. Further, the recommendation is for an inline system with four medium speed EDS to be implemented prior to the airport reaching PAL 2.
- ✓ Security screening checkpoint – Five lanes at a 15-minute wait time standard are sufficient, assuming the lanes cannot be reconfigured with ASL technology. Notably, during the forecasted peak morning period, the wait time would exceed the airport's preference of 10 minutes for a period of time; however, it would remain below 15 minutes. Throughout the rest of the day, it is expected that a 10-minute wait time level of service could be achieved.
- ✓ Passenger holdroom – The alternatives evaluation should provide for approximately 24,400 square feet of passenger holdroom (includes queueing and boarding operations), which should be designed at PAL 2 and be open before PAL 3.
- ✓ Aircraft gates – To account for both schedule delays and longer turn times associated with legacy airlines, the recommendation is that the alternatives evaluation provide at least 11 ADG III capable aircraft gates.
- ✓ Baggage claim – The possibility of a third device should be evaluated within the alternatives process to accommodate seven peak hour arrivals by PAL 2.

Landside facility requirements, financial planning, and other considerations may result in a need for new passenger terminal and support facilities in the long term looking toward PAL 3 demand. If that is the case, the airport may well consider embarking upon a terminal enhancement over the next 10 years that would meet the most critical needs associated with PAL3, namely security checkpoint enhancement and passenger holdroom expansion, reserving the majority of financial capacity for the future passenger terminal building.

Table 3-24: Terminal Requirements Summary

Functional Areas	Existing Facilities[1]	Planning Activity Level (PAL)		
		PAL 1 (2023)	PAL 2 (2028)	PAL 3 (2038)
Check-in Queue (sf) Counters/Bag drops	4,500 32	3,550 26	3,700 27	4,350 31
Checked baggage EDS machines[2] Makeup area (sf)	2 CT-80 11,500	3 MS-EDS 11,400	4 MS-EDS 12,800	4 MS-EDS 15,700
Security screening checkpoint Queue (sf) Lanes	3,800 5	1,950 5	2,250 5	2,650 5
Passenger holdroom Holdroom (sf) Podium, queuing, egress (sf)	15,260 3,950	13,000 3,150	15,300 3,675	19,700 4,725
Apron (gates)	6 ADG III 4 B757	8 ADG III	9 ADG III	11 ADG III
Baggage claim (devices)	2	2	3	3

Source: Inter*VISTAS*, November 2018.
Notes: [1] Existing queues are estimated based on terminal drawings.
[2] Requirement, which is based on a hypothetical medium speed inline system (MS-EDS), includes one EDS machine for redundancy.
Sf = square feet.
Green squares = Surplus / Red squares = Deficiency.

GA Facilities

Based Aircraft Storage

Located at IWA are three hangar facilities that offer 54 aircraft storage units for based aircraft. Pilots also can base an aircraft on the GA apron. Neither the hangars nor designated based aircraft storage areas on the GA apron are at capacity and are not projected to be in the near future. The Airport recently leased land for two new hangar developments, which will not only store aircraft for existing companies, but also for potential based aircraft. Additional hangar development for small aircraft is not needed but should be considered for larger business jets.

Cargo Facility

SkyBridge is in the planning stage of developing a currently vacant 363-acre site on IWA property, southwest of the airfield. It will become the location of an international air cargo hub that will contain both U.S. and Mexican Customs facilities. In September 2018, SkyBridge completed a Concept Master Plan for the project. Their Concept Master Plan indicated the development will contain a mix of aeronautical (24 percent) and non-aeronautical (76 percent) land uses. The conceptual plans have been designed with consideration given to Federal Aviation Regulation Part 77 Airspace Surfaces and taxiway and taxilane setback requirements. Additionally, the plan considers site development based on the existing ATCT line-of-sight requirements. The preferred site for the ATCT relocation will only lessen the impact on the proposed project site. No conflicts exist between preliminary plans and existing facilities at IWA.

Airport Support Facilities

Fuel Storage Facilities

IWA currently offers aircraft fueling services using AVGAS and Jet A fuel products. AVGAS and Jet A fuel are provided by the FBO from airport-owned fuel trucks that obtain fuel from fuel storage/dispensing facilities sited west of Taxiway T. According to fuel sale records provided by airport management, an average of 364,919 gallons of AVGAS and 14,856,711 gallons of Jet A has been sold per year, over the past seven years. Based on 2017 total operation counts, this equates to just under 3 gallons of AVGAS fuel sold per piston-powered aircraft operation, and just under 158 gallons of Jet A fuel sold per turbine-powered aircraft operation as seen in ***Tables 3-25: Estimated AVGAS Fuel Storage Requirements, 2017-2038*** and ***3-26: Estimate Jet A Fuel Storage Requirements, 2017-2038***. It is expected the ratio of both AVGAS and Jet A gallons sold per operation will slightly increase throughout the 20-year planning period, based on forecast operations and the introduction of cargo operations by Skybridge.

Table 3-25: Estimated AVGAS Fuel Storage Requirements, 2017-2038

AVGAS Operations	2017[1]	2018	2023	2028	2038
Average Day of Peak Month Operations	616	641	674	709	787
Two Week Operations	8,624	8,972	9,440	9,926	11,021
Gallons per Operation	2.7	2.7	3	3.3	3.6
Fuel Storage (Total Gallons)	**23,037**	**24,225**	**28,320**	**32,757**	**39,675**
AVGAS Storage	**12,500**				

Source: PMGAA Fuel Storage/Sales Records and Mead & Hunt.
Note: [1] Base year estimates.

Table 3-26: Estimate Jet A Fuel Storage Requirements, 2017-2038

Jet A Fuel Operations	2017[1]	2018	2023	2028	2038
Average Day of Peak Month Operations	317	330	347	365	406
Two Week Operations	4,442	4,622	4,863	5,114	5,677
Gallons per Operation	157.9	157.9	167.9	187.9	217.9
Fuel Storage (Total Gallons)	**701,421**	**729,829**	**816,508**	**960,844**	**1,237,097**
Jet A Fuel Storage	**250,000**				

Source: PMGAA Fuel Storage/Sales Records and Mead & Hunt.
Note: [1] Base year estimates.

Using the increasing gallons sold per operation ratio, an estimate of future fuel storage is calculated based on a two-week demand during the peak month of operations. Based on this calculation, IWA's existing AVGAS and Jet A fuel storage facilities are insufficient. In a two-week span during the peak operation month of 2017, based upon a generalized planning standard, it is recommended IWA have a fuel storage of 23,037 gallons of AVGAS and 701,421 gallons of Jet A fuel. As stated in the **Inventory Chapter**, one aboveground 12,500-gallon AVGAS tank, two aboveground 50,000-gallon Jet A fuel tanks, and six aboveground 25,000-gallon Jet A fuel tanks are located within the fuel farm.

Aircraft Rescue and Fire Fighting (ARFF)

As mentioned in the **Inventory Chapter**, IWA meets and maintains ARFF Index C standards. ARFF services are provided by Mesa Fire Station 215, constructed in 2010, a 26,000-square-foot facility located on airport property west of Runway 30L. Station 215 houses all ARFF equipment within its bays. All ARFF equipment is owned by the PMGAA.

Transportation Facilities

The West Terminal Optimization Study, completed in 2015, details an analysis of the roadway system and parking facilities' ability to accommodate growing activity at IWA. Forecasted passenger activity was compared to the existing facilities' capacity. In conclusion, the terminal and its support facilities were determined to suit then and future aviation activity for a 10-year planning period given functional elements of the roadway system and parking facilities will be modified. The study determined the following to cause and/or suffer from a degraded level of service specifically during peak times:

- ✓ S. Sossaman Road left turn pocket
- ✓ Terminal access roads
- ✓ Parking facilities.

With the coordination of a stakeholder committee, which comprised airport staff, airline staff, and other businesses located at IWA, several recommendations were made to alleviate the degraded level of service, enhance the level of service within the existing terminal, and improve the traveling public and tenant experience until a terminal on the east portion of the airfield could be planned, funded, and constructed.

The recommendations made within the West Terminal Optimization Study were further developed in the 2017 Sossaman Road and West Terminal Access Road Optimization Improvements Scoping Study (2017 Scoping Study). Using the West Terminal Optimization Study as a foundation, conceptual designs were devised to alleviate the degraded level of service of, or caused by, the S. Sossaman road left turn pocket, terminal access roads, and parking facilities. The conceptual designs proposed included alterations of existing facilities, including reconfiguring the terminal's entrance and exit, reconfiguring the southbound Sossaman Road left turn pocket that provides access to the terminal, and reconfiguring the southbound

Sossaman Road left turn pocket located at the intersection of Sossaman Road ¼-mile south of Texas Avenue.

Using the conceptual designs, construction began on several of the modifications. As a result, the conceptual designs presented in the study, including those completed and awaiting construction, are considered existing conditions. The recommendations presented in the West Terminal Optimization Study, on which the conceptual designs are predicated, are to alleviate the degraded level of service for only a 10-year planning period. Due to the time that has passed since the completion of the studies and due to the change in forecasted aviation and vehicular activity at IWA, a supplemental analysis of the transportation facilities that considers current and future activity throughout the master plan planning period has been prepared. The subsequent narrative detailing the transportation network at, and adjacent to, IWA documents the issues initially presented and suffered by the transportation system, ongoing and awaiting optimizations, followed by the supplemental transportation system capacity and parking demand analysis.

Arterial Roadway Capacity

Sossaman Road

Sossaman Road is a major four-lane arterial road divided by raised medians into two lanes for northbound and southbound traffic. Previously, a left turning pocket, approximately 150 feet long, extended from one of the southbound through lanes to provide access to the terminal. The left turning pocket was the sole access point to the terminal for vehicles transiting southbound. From the left turn pocket, airport users would access the:

- ✓ Daily lot
- ✓ Hourly lot
- ✓ Arrivals, departures, and commercial curb.

Vehicular access to the terminal was stunted due to the conditions of the southbound Sossaman Road left turn pocket. Labeled as the “most significant issue” and identified in the 2015 West Terminal Optimization Study as a “current failing service,” the left turning pocket did not adequately service passenger terminal traffic during peak times due to its length and configuration. Both its length and configuration resulted in a queue of waiting vehicles that overflowed into the adjacent through lane, interrupting the free flow of traffic on Sossaman Road. Reportedly, the queue line extended 0.25 miles from the terminal entrance and into the transition area of the Texas Avenue and Sossaman Road intersection during peak hours. In the past, law enforcement had to patrol traffic to prevent congestion and delays.

The 2017 Scoping Study determined converting the north and southbound intersection, located at the southbound Sossaman Road left turn pocket, would improve both existing and future traffic operations. Since the study, the Sossaman Road left turn pocket that provides access to the terminal has been

extended to a length of 250 feet to provide additional space for vehicles. A traffic light was also installed at this location to mitigate queuing and congestion.

Automobile Parking Lot Ingress/Egress

Hourly Parking Lot

The entrance of the Hourly Parking Lot was located adjacent to the entrance of the commercial curb. Both were accessed by the third lane furthest from the terminal, which is also used as a through lane for vehicles transporting arriving and departing passengers. Due to the former layout of the Hourly Parking Lot, and former location of its entrance and dual lane exit, substantial congestion was generated. Entry to the Hourly Parking Lot was gate-controlled, allowing one vehicle per entry. During peak hours, typically a three-hour span from 2 p.m. – 5 p.m., multiple vehicles occupied the third lane, causing stagnated traffic flow. The third lane extends from the initial two-lane terminal entrance. During peak hours, the Hourly Parking Lot entry queue caused cars to extend beyond the sidewalk along the third lane and wrap into one of the two terminal entrance lanes. Entry to the terminal then became limited, adding to the delay and congestion of vehicles that occupied the southbound Sossaman Road left turn pocket. Commercial vehicles, including taxis and airport shuttles, were also affected by the Hourly Parking Lot queue as the third lane is used to access the commercial curb, which caused commercial vehicles to wait.

Located on the west side of the Hourly Parking Lot was a dual lane exit that only permitted one vehicle per lane. Once both exit lanes were occupied, other exiting vehicles had to queue to the left or right, causing congestion within the lot for vehicles that were actively searching for parking spots. Additionally, parked cars became blocked in for periods of time by the exiting queue of vehicles. The toll booths located at the former exit lanes were reported to malfunction constantly, which caused further delay and congestion within the lot, and led to several vehicular collisions. The dual lane exit provided exiting vehicles the option to proceed north or southbound on Sossaman Road, which posed safety concerns as exiting vehicles had to merge quickly into oncoming traffic if traveling north, or cross oncoming northbound traffic to merge into southbound traffic. As an arterial road that primarily provides access to the local colleges and IWA, Sossaman Road has constant traffic flow. No stop signs or traffic lights are present for approximately 1.5 miles south of the former dual lane exit, which caused an influx of transiting vehicles on Sossaman Road that exiting vehicles from the Hourly Parking Lot had to yield to and merge into and also caused vehicles to wait at the Hourly Parking Lot exit for long periods of time, which added to the queuing of vehicles in the lot.

Since the completion of the 2017 Scoping Study, the modifications listed below have been implemented to the Hourly Parking Lot. All issues detailed previously have been resolved, however, access to the new Hourly Parking Lot entrance, detailed below, from the terminal exit lanes is complicated. Completed modifications to the Hourly Parking Lot are as follows:

- ✓ The entrance of the Hourly Parking Lot was relocated. This was done by removing 14 parking spaces on the west half of the west aisle to construct a new dual-lane, gate-controlled entrance. Access to the entrance is now provided by a left turning lane from Sossaman Road southbound at its intersection with Texas Avenue. The southbound Sossaman Road left turning pocket is 200 feet for storage of vehicles accessing the Hourly Parking Lot. The new lot entrance has the capacity to accommodate six queued cars to eliminate congestion on Sossaman Road. The new entrance also reduces vehicle use of the terminal lanes.
- ✓ The crosswalk area located on the north side of the west aisle was removed and six new parking spaces were added in its place. This prevents vehicles from entering the lot and immediately turning left to access the east aisle of the lot. The crosswalk was replaced.
- ✓ The dual lane exit to the north of the east aisle was relocated and replaced with eight parking spaces. A portion of the roundabout median was removed to construct three gate-controlled Hourly Parking Lot exit lanes. A lane was constructed for exiting vehicles from the Hourly Parking Lot. This lane is now a considered a third lane that adjoins with the current terminal and commercial exit lanes to provide access from the lot to Texas Avenue and Sossaman Road. This lane is a left-only turn lane. If vehicles exiting the lot desire to continue straight on Texas Avenue or northbound on Sossaman road, a single lane shift is required.

Supplemental Transportation System Capacity Analysis

Mead & Hunt has prepared the following supplemental analysis of the transportation facilities that considers current and future activity throughout the master plan planning period. The purpose of the capacity analysis is to determine the operational capacity of South Sossaman Road with and without the proposed development for the 2030 and 2040 design years.

Existing Arterial Roadway Conditions

The 2024 expected peak hour traffic volumes at the intersection of South Sossaman Road and the Texas Avenue/Airport entrance were obtained from the *Phoenix-Mesa Gateway Airport Authority Sossaman Road and West Terminal Access Road Optimization Improvements Scoping Study* dated *March 13, 2017*. An area growth rate of 2.3 percent, along with a 7 percent truck percentage was obtained from the *Arizona Department of Transportation Data Management System* web site that was used to complete the roadway capacity analysis. By using the 2024 existing peak hour traffic volumes and applying the 2.3 percent growth rate we can determine the 2030 and 2040 design year peak hour volumes for the intersection. The 2024 existing traffic volumes and the projected 2030 and 2040 traffic volumes for the intersection of South Sossaman Road and Texas Avenue/Airport entrance are shown below in ***Table 3-27: Texas Avenue and S. Sossaman Road Existing Conditions (No Build Alternative)*** and will be referred to

as the No Build Alternative. The No Build Alternative comprises the existing traffic volumes projected to the 2030 and 2040 study years using population growth and does not include any new development. The total 24-hour average daily traffic (ADT) is then calculated by dividing the total approach peak hour volumes by the peak hour factor of 0.09. The ADT for South Sossaman Road northbound and southbound is shown in the table below.

Table 3-27: Texas Avenue and S. Sossaman Road Existing Conditions (No Build Alternative)

2024 Peak Hour – No Build												
	Eastbound			**Westbound**			**Northbound**			**Southbound**		
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	Texas Avenue/Airport						**S. Sossaman Road**					
Peak	45	0	24	194	0	401	32	1,323	37	130	1,727	73
Total 24- hour Volume (ADT)	-			-			**15,467**			**21,444**		
2030 Peak Hour – No Build												
	Eastbound			**Westbound**			**Northbound**			**Southbound**		
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	Texas Avenue/Airport						**S. Sossaman Road**					
Peak	51	0	27	221	0	457	36	1,508	42	148	1,969	83
Total 24-hour Volume (ADT)	-			-			**17,632**			**24,447**		
2040 Peak Hour – No Build												
	Eastbound			**Westbound**			**Northbound**			**Southbound**		
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	Texas Avenue/Airport						**S. Sossaman Road**					
Peak	62	00	33	266	0	549	44	1813	51	178	2366	100
Total 24-hour Volume (ADT)	-			-			**21,189**			**29,379**		

Source: Mead & Hunt.

Area Developments

There are two planned expansions and one new development expected to occur within the study area. The planned expansions and the new development are listed below, along with a brief description of the expected growth.

IWA Terminal-Expansion

The airport expansion will result in additional traffic volumes. The projected average day peak hour passengers for IWA are listed in ***Table 3-28: Phoenix-Mesa Gateway Airport Average Daily Peak Passenger Projections***. By using the predicted passenger data, we can determine the increase in traffic volumes on South Sossaman Road.

Table 3-28: Phoenix-Mesa Gateway Airport Average Daily Peak Passenger Projections

Passengers	2018	2019	2023 (PAL 1)	2028 (PAL 2)	2038 (PAL 3)
Average Day					
Deplanements	2,703	3,029	3,294	3,642	4,435
Enplanements	2,703	3,029	3,294	3,642	4,435
Passengers	5,406	6,055	6,587	7,281	8,868
Peak Hours					
Deplanements	606	679	738	816	994
Enplanements	803	900	978	1,082	1,317
Passengers	903	1,011	1,100	1,216	1,481

Source: Unison, IWA MP 2018 – PMAD PH and Fleet Mix Details; October 2018.

In ***Table 3-28: Phoenix-Mesa Gateway Airport Average Daily Peak Passenger Projections,*** the Average Day Deplanements and Enplanements do not total the number of passengers due to a rounding error that is within an acceptable range. As presented in ***Table 3-15: Peak Period Activity Summary***, the peak hour for deplanements occurs from 6:41 a.m. - 7:40 a.m. The peak hour of enplanements occurs from 9:39 p.m. -10:38 p.m., and the peak hour for total passengers occurs from 1:32 p.m. - 2:31 p.m. Therefore, there is no direct correlation between passengers, deplanements, and enplanements. The increase in passengers from 5,406 passengers in 2018 to 7,281 passengers in 2023 is 1,875. The increase in passengers from 2018 to 2038 is 3,462 passengers. Using an estimate of one vehicle trip per passenger, the increase in trips to the airport will be 1,875 vehicles in 2028 and 3,462 vehicles in 2038.

Arizona State University Polytechnic Campus – Expansion

Based upon information obtained from the Board of Regents for Arizona's Public Universities, the current and expected enrollment projections for the Arizona State University – Polytechnic Campus are shown below:

- ✓ Fall 2016 Actual full-time enrollment – 4,482
- ✓ Fall 2020 Projection full-time enrollment – 7,839
- ✓ Fall 2024 Projection full-time enrollment – 9,896.

The increase in students is 5,414 by the fall of 2024.

SkyBridge Development – New Development

Currently there are plans for a multi-use development referred to as the SkyBridge Development for the area south of IWA. The land use summary for the SkyBridge development is shown in ***Figure 3-8: SkyBridge Development Land Use Summary***. Access to the SkyBridge Development will be from South Sossaman Road, as shown in ***Figure 3-9: SkyBridge Development Vehicular Access.*** SkyBridge development is currently under construction, with a three-phase construction sequence over the next 15

years. For the purpose of this study it will be assumed that 70 percent of the SkyBridge development will be completed by 2030 with 100 percent of the development completed by 2040.

Figure 3-8: SkyBridge Development Land Use Summary

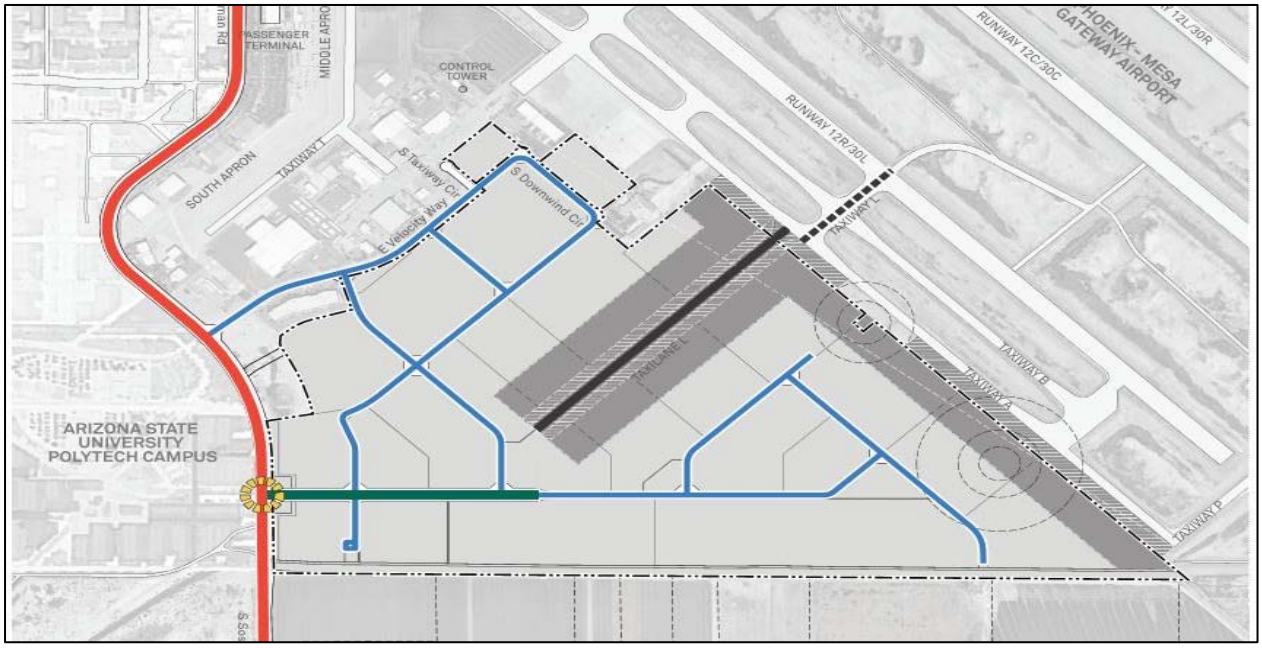
DISTRICT	LAND USE	LAND AREA (SF)	LAND AREA (AC)	LAND DISTRBUTION	GFA (SF)	FAR	NUMBER OF ROOMS *
Area A	Non-Aeronautical Use	141,203	3.2	1%	60,000	0.42	
Area B	Aeronautical Use	216,666	5.0	1%	82,500	0.38	
Area C		15,475,937	355.3	98%	3,683,654	0.24	150
	Taxilane/ Taxilane OFA	666,077	15.3	4%			
	Detention Basins	1,058,346	24.3	7%	11,158		
	Open Space	774,199	17.8	5%			
	Roadway	1,144,346	26.3	7%			
	Non-Developable Total	**3,642,968**	**83.6**	**23%**	**11,158**		
	Non-Aeronautical Use	4,797,616	110.1	30%	2,069,430	0.43	
	Aeronautical Use	3,692,787	84.8	23%	1,333,066	0.36	
	R&D / Office **	533,902	12.3	3%	200,000	0.37	
	Hotel / Retail ***	314,574	7.2	2%	70,000	0.22	150
	Ramp	2,494,090	57.3	16%			
	Developable Total	**11,832,969**	**271.7**	**75%**	**3,672,496**	**0.31**	**150**
TOTAL		**15,833,806**	**363.5**	**100%**	**3,826,154**		

Table 4.4: Land Use Summary

* Number of Room assuming hotel GFA 50,000sf and 330sf per room
** Office / R&D assuming 3 story buildings
*** Retail / Hotel assuming 3 story buildings

Source: SkyBridge Arizona, 2018.

Figure 3-9: Skybridge Development Vehicular Access



Source: SkyBridge Arizona, 2018.

Projected Traffic Volumes for the Three Plan Development (IWA Terminal, Arizona State University Polytechnic Campus, and SkyBridge)

Using the latest edition of the Institute of Transportation Engineers *Trip Generation Manual*, expected average weekday peak hour trips can be calculated for each expansion or planned development, as described above. ***Table 3-29: Trip Generation Table*** identifies the total ADT for the three planned developments for 2030 and 2040 design years.

Table 3-29: Trip Generation Table

Trip Generation			
Existing/Proposed Development	**Weekday**		
	Total Daily Trips	**Entering**	**Exiting**
SkyBridge Development			
70% by 2030	9,372	4,686	4,686
100% by 2040	13,390	6,695	6,695
Arizona State University – Polytechnic Campus			
2024 -5,414 Students	8,446	4,223	4,223
Phoenix-Mesa Gateway Airport			
Passengers by 2028	1,875	938	938
Passengers by 2038	3,462	1,731	1,731
Total Development ADT by 2030		9,847	9,487
Total Development ADT by 2040		12,649	12,649

Source: Mead & Hunt.

2030 and 2040 Traffic Volumes with Development

The total 2030/2040 Build traffic volumes can be determined by taking the No Build 2030/2040 traffic volumes on South Sossaman Road and adding the calculated development trips determined in the trip generation. The 2030/2040 Build scenarios consist of a projection of expected progress towards the completion of planned developments highlighted in ***Table 3-29: Trip Generation Table*****.** The 2030/2040 ADT for the Build condition is shown in ***Table 3-30: Texas Avenue and S. Sossaman Road 2024, 2030, 2040 Peak Hour (Build Alternative)*****.**

Note that as a result of growing terminal and parking lot access constraints from traffic along S. Sossaman Road, discussion has begun about opportunities to mitigate truck traffic anticipated by the Skybridge Arizona development. This discussion includes the potential for building additional roadways to accommodate the development's needs. In addition, it is difficult to anticipate the impact of growing enrollment on traffic volumes along S. Sossaman Road, as a portion of this additional volume will be accommodated elsewhere in the system (Power Road, Williams Field Road). For these reasons, traffic volumes may vary in the future from values presented here.

Table 3-30: Texas Avenue and S. Sossaman Road 2024, 2030, 2040 Peak Hour (Build Alternative)

2024 Peak Hour – Build												
	Eastbound			Westbound			Northbound			Southbound		
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	Texas Avenue/Airport						S. Sossaman Road					
Peak	45	0	24	194	0	401	32	1,323	37	130	1,727	73
Total ADT Volume	-			-			1,392			1,930		
2030 Peak Hour – Build												
	Eastbound			Westbound			Northbound			Southbound		
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	Texas Avenue/Airport						S. Sossaman Road					
Peak	51	0	27	221	0	457	36	1,508	42	148	1969	83
Total ADT	-			-			1,587			2,200		
Development Volume (ADT)				-			9,847			9,847		
Total ADT w/ Development							2,473			3,086		
2040 Peak Hour – Build												
	Eastbound			Westbound			Northbound			Southbound		
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	Texas Avenue/Airport						S. Sossaman Road					
Peak	62	0	33	266	0	549	44	1,813	51	178	2,366	100
Total ADT	-			-			1,907			2,644		
Development Volume (ADT)				-			12,649			12,649		
Total ADT w/ Development							3,045			3,783		

Source: Mead & Hunt.

Arterial Roadway Capacity Analysis Summary

The Highway Capacity Software, current edition was used to complete the capacity analysis for South Sossaman Road to determine the roadway operational level of service for the 2030 and 2040 design years. The capacity results are shown below in ***Table 3-31: S. Sossaman Road – Arterial Level of Service*** for the South Sossaman Road for the 2024 No Build and the 2030 and 2040 Build conditions. The results are represented in Density (passenger cars per mile per lane-pc/mi/ln) and LoS. A LoS of A, B, C or D during the peak hours can be considered acceptable.

Table 3-31: S. Sossaman Road – Arterial Level of Service

South Sossaman Road -Arterial Level of Service					
2024 No Build		2030 Build		2040 Build	
LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
D	26.4	E	42.6	F	-

Source: Mead & Hunt.

Based on the results of the roadway capacity analysis, South Sossaman Road from East Ray Road to East Pecos will operate at an acceptable LoS of D for the 2024 design year but does not operate at acceptable levels of services from 2030 and beyond. Airport generated traffic can be removed from South Sossaman Road if the terminal entrance is relocated to the east side of the airport. If the airport entrance is relocated, then South Sossaman Road would operate at an acceptable LoS D with a density of 29.4 pc/mi/ln until 2030.

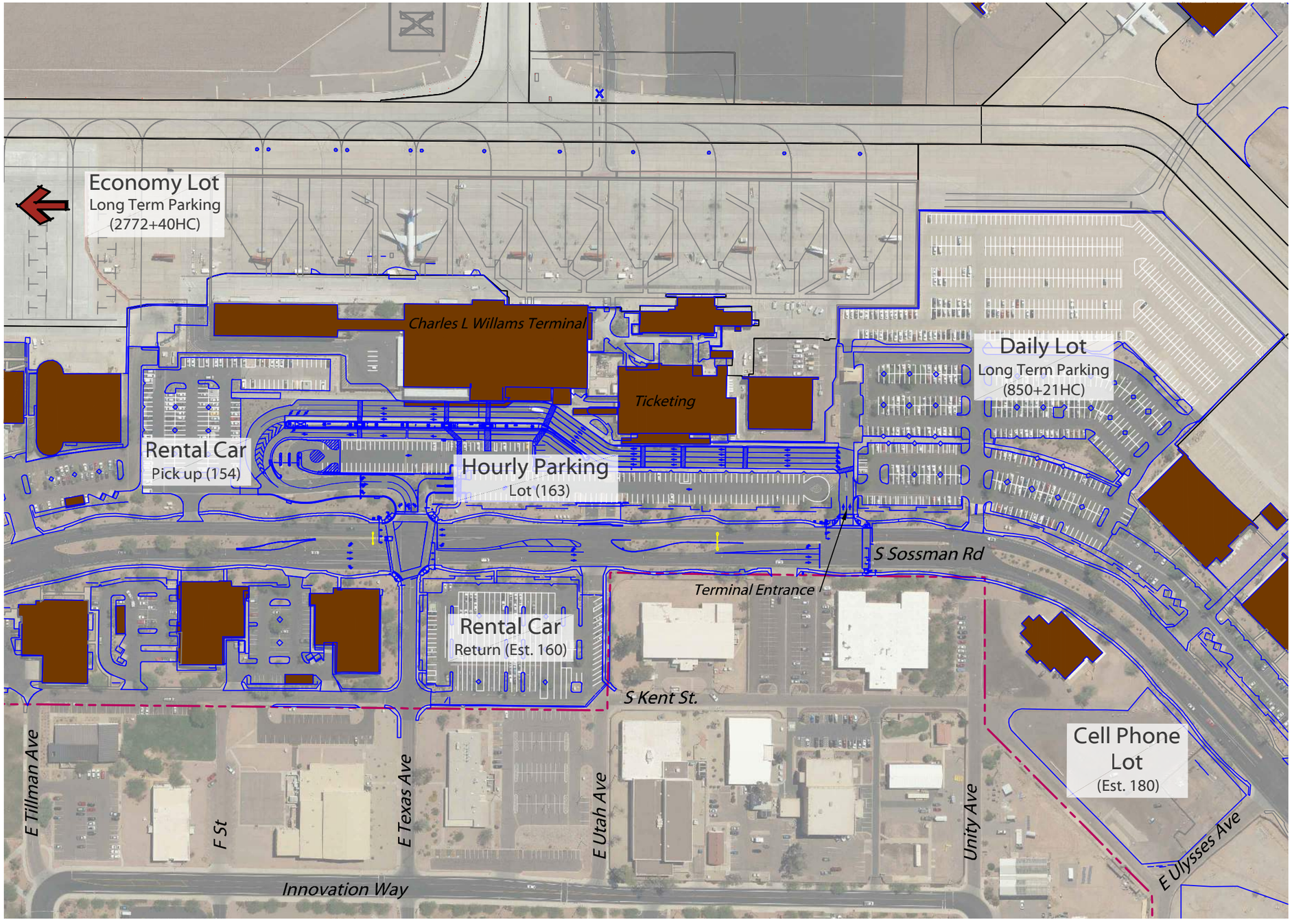
Automobile Parking Facility Needs/Demand Analysis

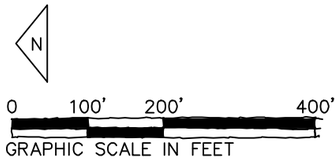
The Automobile Parking Facility Needs/Demand Analysis looks at the relationship of recent enplanement and parking data over a similar time period. This is done to evaluate the adequacy of existing parking supply to meet future parking needs at the Airport. This analysis will focus on four (4) primary automobile parking components found within the immediate Airport Vicinity[7].

- ✓ Public Parking
- ✓ Rental Car Parking
- ✓ Employee Parking
- ✓ Temporary Parking

Figure 3-10: Existing Parking Supply shows the locations of each parking facility. ***Table 3-32: Phoenix-Mesa Gateway Airport Existing Parking Supply*** shows the existing availability of parking facilities to support each automobile parking component.

[7] Commercial Tenant Parking was not included in this analysis. Parking needs are determined on a lease-by-lease basis. Parking enforcement is provided by the Airport to ensure stalls are reserved for tenants.





Economy Parking Lot
Location Map

1.8 Miles from Terminal (free shuttle)

LEGEND

Existing Building

Figure 3-10
Terminal Parking

Table 3-32: Phoenix-Mesa Gateway Airport Existing Parking Supply

	Lot Function	Number of Spaces	ADA Spaces	Total Spaces
Public Parking				
Hourly Lot[8]	Short-Term	-	-	183
Daily Lot	Long-Term	850	21	871
Ray Road Economy Lot	Long-Term	2772	40	2812
Rental Car Parking				
Ready Lot	Pick-Up	154	-	
Return Lot[9]	Return	180	-	180
Temporary Parking				
Cell Phone Lot[10]	Short-Term	180	-	180
(GA) Employee Parking[11]	-	-	-	-

Source: Data provided by PMGAA.

The basis for projecting parking demand in this section is forecasted enplanements versus the most recently available parking data in 2017 and 2018. For this analysis, the Master Plan forecasted growth scenario is used, with an average growth rate of 2.0 percent.

Table 3-33: Enplanement Projections and Ration (Master Plan Rate) shows forecasted enplanements and ratios that will be used to determine increase in parking demand. Ratios are presented for each planning horizon (short, mid, long) to provide an added level of analysis over time.

Table 3-33: Enplanement Projections and Ratio (Master Plan Rate)

Planning Horizon	Year	Enplanements	Demand Ratios
Current	2017	681,892	1.00
Short-Term	2023	849,894	1.25
Mid-Term	2028	933,157	1.37
Long-Term	2038	1,145,806	1.68

[8] Existing Hourly Parking Lot Supply assumes modifications recommended by the West Terminal Optimization Study are existing Conditions.

[9] There are approximately twenty-nine (29) rental car return lot spaces not included in this analysis. Parking numbers are estimated based on return lanes and an estimated ten (10) vehicle lane capacity. A total of eighteen (18) lanes are available in the rental return lot.

[10] Parking spaces have not been paved within the cell phone lot. An estimation of 180 spots has been made.

[11] Employees utilize a keycard system that provides them access to any of the public parking lots. For this analysis, employees are included as part of the parking needs projections.

Public Parking Demand

In establishing a baseline for peak public parking demand (or peak daytime occupancy), the month of July was evaluated. July was used for the baseline because it is the month the Airport experiences a confluence of high numbers for each metric that influence parking demand.

- ✓ Second highest enplanements
- ✓ Greatest frequency of overnight stays for each lot
- ✓ First or second longest duration of stays.

Table 3-34: Enplanements, 2012-2017 shows historical data for enplanements by month. July enplanements for 2017 were 16 percent above the annual average. The number of parking transactions that occurred in July 2017 was 15 percent above average monthly transactions. This highlights the correlation between enplanements and parking demand. For the purpose of this analysis, it is assumed that parking demand and enplanements have a strong correlation. As such, an incremental increase in forecasted enplanements will also correlate to an increase in parking demand.

Table 3-34: Enplanements, 2012 – 2017

Month	2012	2013	2014	2015	2016	2017	2017 % to Avg.
January	36,376	47,458	62,256	51,372	51,556	52,126	92%
February	34,971	55,594	65,232	53,255	53,110	57,891	103%
March[12]	51,758	83,810	92,753	76,779	77,585	80,720	143%
April	39,613	67,281	67,327	49,973	54,579	58,345	103%
May	35,638	54,178	53,930	50,348	51,351	55,094	98%
June	42,731	57,115	56,729	55,824	56,709	65,632	116%
July	49,228	61,829	59,033	57,140	61,403	65,703	116%
August	37,371	49,570	45,653	44,531	46,575	47,023	83%
September	30,258	41,576	37,957	35,093	34,903	40,294	71%
October	32,962	49,010	40,748	45,896	45,103	48,895	87%
November	37,359	60,141	45,012	47,528	49,904	49,451	88%
December	49,191	66,688	53,573	57,580	58,482	55,957	99%
Total	**477,456**	**694,250**	**680,203**	**625,319**	**641,260**	**677,131**	-
Average	**39,788**	**57,854**	**56,684**	**52,110**	**53,438**	**56,428**	-

Source: Mead & Hunt
Note: Red text = Peak parking demand vs enplanements.

[12] March is the peak month for enplanements, however, has a lower than average number of vehicles utilizing parking overnight, and has a lower than average length of stay for each parking lot. As a result, March does not represent peak parking demand.

Peak Daytime occupancy for the Hourly Lot has been observed as full capacity, which is used as the baseline for demand in the Hourly Lot[13]. The following equation is used to determine the baseline peak daytime occupancy (or peak parking demand) for the Daily and Economy Lots.

Peak Daytime Occupancy = Average Overnight Occupancy + (Average Overnight Occupancy/ Average Duration of Stay)

The average duration of stay for each lot was determined from parking transaction data (2017), and the average overnight occupancy was determined from overnight vehicle counts (2017). Evaluating the overnight occupancy and lot utilization for July 2017 illustrates parking demand and the ability for the existing parking facilities to accommodate it.

The baseline parking demand (Peak Daytime Occupancy) was determined for the short term (2023), mid-term (2028), and long term (2038). Along with the baseline parking demand, forecasted enplanements were used to project future parking demand for each lot.

Table 3-35: Peak Public Parking Demand (Master Plan Projection Rate) shows the projected peak parking demand for each public parking lot for the short-term, mid-term, and long-term planning horizons.

Table 3-35: Peak Public Parking Demand (Master Plan Projection Rate)

Lot	FY 2018	Short-Term	Mid-Term	Long-Term
Hourly Lot	156	194	213	262
Daily Lot	717	894	982	1,205
Ray Road Economy Lot	747	931	1,022	1,255

Source: Mead & Hunt.

Best practices for managing parking supply and demand suggest that a parking inventory should be considered at capacity when the demand reaches 85 percent utilization. This is considered the effective parking supply and should be used when determining the surplus or deficit for the parking system. The remaining 15 percent of inventory is the flow factor, providing enough spaces to accommodate peak period overlap of arrival and departure passengers and limits a patron's time cycling the parking field in search of the last remaining parking space. Note that since the Hourly Lot is currently at full capacity, parking demand assumes the existing lot is 85 percent of demand.

[13] Stakeholder meetings during the completion of the West Terminal Optimization study found that the Hourly Lot fills up during peak times. Additional observations from Airport staff suggest the Hourly Lot operates at maximum capacity. For the purpose of this analysis, effective lot supply is used as peak daytime occupancy.

Table 3-36: Peak Public Parking Demand Forecasts (Master Plan Projection Rate) shows the parking supply, demand, and corresponding surplus/deficit for each parking lot considering the effective parking supply for the Master Plan forecasted growth.

Table 3-36: Peak Public Parking Demand Forecasts (Master Plan Projection Rate)

Lot	FY 2018 Peak	Short–Term	Mid–Term	Long–Term
Hourly Lot				
Supply	183	183	183	183
Effective Supply	156	156	156	156
Demand	156	194	213	262
Surplus/Deficit	0	-38	-57	-106
Daily Lot				
Supply	871	871	871	871
Effective Supply	740	740	740	740
Demand	717	894	982	1,205
Surplus/Deficit	23	-154	-241	-465
Ray Road Economy Lot				
Supply	2,812	2,812	2,812	2,812
Effective Supply	2,390	2,390	2,390	2,390
Demand	747	931	1,022	1,255
Surplus/Deficit	1,643	1,459	1,368	1,135
Grand Total				
Supply	3,866	3,866	3,866	3,866
Effective Supply	3,286	3,286	3,286	3,286
Demand	1,620	2,020	2,218	2,723
Surplus/Deficit	**1,666**	**1,266**	**1,069**	**563**

Source: Mead & Hunt.
Note: Green squares = Surplus / Red squares = Deficiency

Based on the analysis of parking demand for the public parking lots there is an overall surplus of parking supply in existing, short-, mid-, and long-term planning horizons at the forecasted growth rate.

Despite this surplus, there is an immediate deficit in parking in the Hourly Lot. This is a result of the lack of parking availability for vehicle cycling (flow factor), which may be contributing to issues elsewhere in the Airport transportation network. This issue becomes exacerbated over time leading to a near doubling of parking demand in the Long-Term.

The Daily Lot meets existing demand with a small surplus; however, demand quickly exceeds supply in the short-term horizon (2023). The Ray Road Economy Lot has a significant surplus of spaces through the Long-Term and will likely absorb demand from the at-capacity Daily Lot. This will likely lead to a nearly immediate increase in shuttle service demand during peak seasons.

As might be expected, forecasts from ***Table 3-36: Peak Public Parking Demand Forecasts (Master Plan Projection Rate)*** illustrate the need for interventions in a shorter window and should be consulted if growth continually outpaces Master Plan projected growth rates.

Rental Car Parking Demand

There are four (4) rental car companies present at the Airport, with Enterprise, Alamo, and Avis falling under the Enterprise parent flag.

- ✓ Enterprise Rent-A-Car
- ✓ Alamo National
- ✓ Avis Rent-A-Car
- ✓ Hertz

Rental car parking is broken into two separate lots, the Ready Lot (Pick-up) and the Return Lot. As shown previously in ***Table 3-32: Phoenix-Mesa Gateway Airport Existing Parking Supply***, the Ready Lot has 154 spaces and the Return Lot has 18 return lanes that accommodate approximately 10 vehicles each. Enterprise has 131 reserved spots in the Ready Lot and 12 lanes in the return lot, which it allocates to its respective brands. Hertz has 23 reserved spots in the Ready Lot and the remaining 6 return lanes. Each rental company has access to the recently constructed on-airport wash facility and will have access to the planned on-airport fueling facility.

The number of parking spaces required to accommodate the forecasted levels of rental car activity is dependent on several factors, including enplanements, special events, and the desires and policies of each rental car operator. A survey was provided to rental car operators to determine the ability of existing facilities to meet their needs.

The results of the survey show that the Ready Lot and Return Lot are currently operating at maximum capacity. Based on this assumption we can use existing enplanements as a basis for current demand, and enplanement projections for future rental car parking demand. Since rental car lots operate differently than public parking facilities it may be possible to accommodate an increase in demand by modifying operation of the lots, such as increasing staff available for shuttling vehicles between facilities. This analysis assumes this condition for the Return Lot. Nonetheless, the demand for spaces in the Ready Lot will illustrate the capacity of existing facilities to meet future needs.

Table 3-37: Rental Car Ready Lot Parking Demand Projections (Master Plan Projections Rate) shows the projected peak rental car Ready Lot parking demand for each operator in the short-term, mid-term, long-term planning horizons.

Table 3-37: Rental Car Ready Lot Parking Demand Projections (Master Plan Projection Rate)

Rental Car Operator	Existing Supply	Short – Term	Mid – Term	Long – Term
Enterprise Rent-A-Car Enterprise Rent-A-Car Alamo National Avis Rent-A-Car	131	163	180	220
Hertz	23	29	31	39
Total Demand	154	192	211	259
Surplus/Deficit	0	-38	-57	-105

Source: Mead & Hunt.
Note: Red squares = Deficiency

Table 3-37: Rental Car Ready Lot Parking Demand Projections (Master Plan Projections Rate) shows that as soon as the short-term (5-year) planning horizon, demand for parking in the Ready Lot will exceed supply. It is unlikely that operational efficiencies will be able to accommodate this increase in demand. Additional rental car parking supply should be provided as soon as feasible. ***Table 3-35: Peak Public Parking Demand (Master Plan Projection Rate)*** shows that if growth exceeds the Master Plan forecasts, a solution will need to be developed.

Employee Parking Demand

Employees at the Airport are provided with an electronic keycard that allows them to access the public parking lots without fee. Most employee parking transactions are sited at the Daily Lot. To establish a baseline for projecting peak daytime employee parking demand, March 2017 transaction data for the three largest employers was used. An aggregate count of peak employee parking was compiled to determine the maximum number of spaces occupied by employees at a time interval, this serves as peak employee parking demand.

It is expected that the relationship between enplanements and employees staffed at the Airport are linearly correlated, and as such, so is the relationship to employee parking demand. ***Table 3-38: Employee Parking Demand Forecast*** shows the projected peak employee parking demand for each operator in the short-term, mid-term, long-term planning horizons. It also shows the projected increase in employee parking demand as a result of Master Plan projections.

Table 3-38: Employee Parking Demand Forecast

Scenario	Current (2018)	Short – Term	Mid – Term	Long – Term
Master Plan Projection	168	209	230	282
Added Demand	-	41	62	114

Source: Mead & Hunt.

As ***Table 3-38: Employee Parking Demand Forecast*** shows, the demand for employee parking will grow to over 200 spaces in the short term and continue to increase by nearly 68 percent by the end of the 20-year planning horizon. Since employees currently occupy spaces in the public parking lots, this demand will begin to have an immediate impact on parking supply and overall parking revenue (employees not charged to park) during peak times.

Temporary Parking (Cell Phone Lot) Demand

The Cell Phone Lot is intended as a temporary lot, where no vehicle may be left unattended. Its primary purpose is to limit demand and congestion at the arrival curb, and reduces volumes attributed to recirculating traffic. Cell phone lots are typically located with easy access to the main airport access road but are not walking distance to the terminal to discourage their use as a no-cost short-term lot. The proximity of the Cell Phone Lot to the terminal (0.25 mile) may be having the previously mentioned effect.

In addition, because cell phone lots are meant to function as temporary parking, they do not require the same number of spaces as other parking lots. Industry standards for the development of cell phone lots recommend a site that accommodates between 20 and 60 parking stalls[14]. At 180 spaces, the Cell Phone Lot is out of scale with the needs for the Airport, having a surplus of 120 spaces. If visitors intend to stay longer than one-hour, other parking facilities at the Airport have been provided for this need.

Parking Facility Needs/Parking Demand Summary

Table 3-39: Overall Peak Parking Supply/Deficit (Master Plan Projection Rate) provides a snapshot of the four primary parking facilities in the Airport vicinity, based on Master Plan Projected growth. Parking supply deficits that show up in the Short-Term (2023) planning horizon, are projected to increase in the Mid-Term (2028), and Long-Term (2038).

[14] *National Academies of Sciences. "Guidebook for Evaluating Airport Parking Strategies and Supporting Technologies." National Academies Press: OpenBook, 21 Jan. 2010*

Table 3-39: Overall Peak Parking Surplus/Deficit (Master Plan Projection Rate)

Lot	FY 2018 Peak	Short – Term	Mid – Term	Long – Term
Public Parking Total	1,666	1,266	1,069	563
Hourly Lot	0	-38	-57	-106
Daily Lot	23	-154	-241	-465
Ray Road Economy Lot	1,643	1,459	1,368	1,135
Rental Parking	0	-38	-57	-105
Employee Parking	0	-41	-62	-114
Temporary Parking (Cell Phone Lot)	120	120	120	120

Source: Mead & Hunt.
Note: Green squares = Surplus / Red squares = Deficiency

The following are parking facility issues that will need to be addressed through various interventions. With each listed issue, supplemental information is provided to lend context to the urgency and scale of the problem.

- ✓ Deficit in Hourly Lot
  - o Existing Deficit (0)
    - Deficit will begin to grow as enplanements increase
      - ➢ Intervention can be seasonal or interim
    - Large proportion of overnight stays during peak times for a short-term lot
      - ➢ Intervention can be seasonal
  - o Short-Term, Mid-Term, and Long-Term Deficit (-38, -57, -106)
    - Need to increase supply by Short-Term. Intervention must be scalable for future demand.
    - Need to also address Drop-Off Curb and S. Sossaman Rd operational issues identified in the West Terminal Optimization Study.
    - If unaddressed has potential to cause future operational issues at arrival curb.
- ✓ Deficit in Daily Lot
  - o Short-Term, Mid-Term, and Long-Term Deficit (-154, -241, -465)
    - Need to significantly increase supply by Short-Term. Intervention must be scalable for future demand.
      - ➢ Ray Road Economy Lot will naturally take on this demand without intervention, however, additional shuttle service will be needed.
    - Need to address increase in demand for public parking and employee parking.
      - ➢ Intervention can be seasonal or interim

- ✓ Surplus in Ray Road Economy Lot
  - Current, Short-Term, Mid-Term, and Long-Term Surplus (+1,643, +1,459, +1,368, +1,135)
    - Underutilized facility
    - Likely to absorb part if not all of deficits in other public parking areas, but only with added shuttle service.

- ✓ Deficit in Rental Car Ready Lot
  - Deficit projected to occur immediately
    - Immediate intervention needed
      - ➢ Intervention can be seasonal or interim
  - Short-Term, Mid-Term, and Long-Term Deficit (-38, -57, -105)
    - Need moderate increase in supply by Short-Term. Intervention must be scalable for future demand.

- ✓ At capacity in Rental Car Return Lot
  - Deficit projected to occur immediately
    - Immediate intervention needed
      - ➢ Intervention implemented by Rental Car Operators.
      - ➢ Can be addressed with staffing modifications.
  - Short-Term, Mid-Term, and Long-Term Deficit
    - As enplanements increase so will rental return demand. This demand will likely outpace staffing improvements in the Short-Term, and the capacity of the existing lot. Need to moderately increase supply by Short-Term. Intervention must be scalable for future demand.

- ✓ Deficit in Employee Parking
  - Deficit projected to occur immediately
    - Immediate intervention needed
      - ➢ Intervention can be seasonal or interim
      - ➢ Compounds with supply deficits in Daily Lot since this is currently designated as employee lot.
  - Short-Term, Mid-Term, and Long-Term Deficit (-41, -62, -114)
    - Need moderate increase in supply by Short-Term. Intervention must be scalable for future demand.
    - Intervention must account for flexibility and convenience for employees.
    - Increased demand will impact revenues as employees take up additional supply.

- ✓ Surplus in Temporary Parking (Cell Phone Lot)
  - o Current, Short-Term, Mid-Term, and Long-Term Surplus (+120)
    - Underutilized facility
    - May impact revenue in Hourly Parking Lot due to proximity to terminal
      - ➢ May account for underrepresented demand in the Hourly Parking Lot.

Airspace System and Navigational Aids (NAVAIDs)

IWA airspace and existing NAVAIDS, including instrument approach capabilities and associated equipment, airport lighting, and weather/airspace services, were detailed in the **Inventory Chapter**. The Airport is currently equipped for a CAT I Instrument Landing System (ILS) precision instrument approach, and Global Positioning System (GPS) and Very High Frequency Omni-Directional Range (VOR) non-precision instrument approaches.

The existing precision approach procedure available for Runway 30C provides excellent instrument approach capabilities under a variety of wind conditions and operational circumstances and should be maintained. Precision instrument approach procedures should be considered for Runway 12L/30R due to the inability of Runways 12R/30L and 12C/30C to support Boeing 747-400F and Boeing 767-300F cargo operations, as a result of low weight-bearing capacity. The non-precision approaches available to IWA also provide excellent instrument approach capabilities under a variety of wind conditions and operational circumstances and should be maintained.

Air Traffic Control Tower (ATCT)

Tower height, cab size, and distance from critical operating areas, such as the traffic pattern, all runway structural pavement, final approaches to runway ends, and other operational surfaces controlled by ATCT personnel, should be sufficient to support visibility from the tower cab. It is essential for all movement areas on the airport to be visible from the tower cab; however, visibility of taxilane centerlines is preferred, not mandatory. The current ATCT at IWA was constructed in 1970 and has undergone several maintenance efforts to sustain its functionality. The existing ATCT has mechanical, electrical, and structural deficiencies that have been identified. The current ATCT height causes parallax and does not provide sufficient cab capacity to accommodate planned operations, airport growth, or future additional staff.

A Visibility Siting Requirement Analysis was conducted for the existing ATCT at IWA. All visibility criteria were met except line of sight to Runways 30C and 30R, resulting in .62 and .54 angles, respectively, which is less than the required .8 angle. The existing ATCT has proven to be height deficient. The tower height fails to provide visibility to the entire airfield and lacks safety equipment, such as sprinklers and redundant cab ventilation.

An ATCT Site Survey was completed in 2016 to evaluate and determine a potential new location at IWA that would comply with visibility criteria and eliminate the spending of additional funds on the current tower. Five sites were considered and evaluated with the input of airport staff. Site 4 located southwest of Runway 12R/30L, approximately 410 feet northwest of the existing tower, was selected because it provides the best line of sight to the entire airport and terminal area. The location and recommended height of 194 feet present no site access issues; have no effect on IFR departures, non-precision instrument approaches, or precision instrument approaches; improve the parallax of the current tower; and present no impact to communications, navigation, and surveillance equipment.

Facility Requirements Conclusion and Influence on Alternative Considerations

The purpose of this section is to describe the findings of the Facility Requirements analysis and to identify the influence these findings have on IWA development alternatives.

Airfield Configuration

Runway Orientation

In consideration of the prevailing winds, the 12/30 orientation for the existing runways at IWA provides adequate crosswind coverage for the existing and proposed aircraft fleets. An additional runway in a different orientation is not required to meet anticipated demand.

Airfield Operational Capacity

In consideration of forecast operational demand (number of forecast aircraft landings and takeoffs), the three parallel runways at IWA provide adequate capacity to accommodate demand for the 20-year planning horizon and beyond.

Runway Length

In consideration of forecast demand by the most critical aircraft in the fleet, with regard to runway length requirements and projected required payloads and stage lengths, existing runway lengths are adequate to accommodate projected demand within the 20-year planning horizon, excluding Runway 12L/30R.

As identified previously in this chapter, a runway length requirement of 9,500 feet is required by the Boeing 747-400F on expected routes operated by SkyBridge. The existing runway with a pavement strength to accommodate anticipated payloads of the Boeing 747-400 is Runway 12L/30R, which is 9,300 feet long, approximately 200 feet short of the identified requirement of 9,500 feet. **Therefore, the extension of Runway 12L/30R to a length of 9,500 feet will be examined as a development alternative.**

The existing ALP indicates that ultimately the following runway length improvements will be implemented:

- ✓ Runway 12L/30R – Will be extended from 9,300 feet long to 10,299 feet (extension to the north).
- ✓ Runway 12R/30L – Will be extended from 10,401 feet long to 12,499 feet (extensions to the north and the south).

These potential extensions will also be examined in the alternative analysis

- ✓ Runway Design and Dimensional Criteria (RSAs, Runway Object Free Areas, and others) – With no identified exceptions, IWA meets all runway safety and object clearing standards specified by AC 150/5300-13A.
- ✓ RPZs. The Airport owns all land contained within every RPZ, excluding 0.56 acres of Runway 30R's RPZ. Although not owned in fee simple, the area that extends beyond airport property at the eastern corner of the Runway 30R RPZ is covered by an avigation easement. The easement should be retained to meet FAA identified land use compatibility guidelines.
- ✓ Parallel Runway Separation – The current runway configuration provides adequate separation between parallel runways to allow for simultaneous operations during VFR conditions. However, the separation is inadequate to allow for simultaneous operations during IFR conditions.
- ✓ Taxiway Design (TSAs, TOFAs, separation standards, and others) – Taxiway dimensional criteria standards are met with the existing layout for all taxiways except Taxiways Y and B. Insufficient separation exists between Taxiways Y and B (in consideration of TDG – the wingtip clearance should be 53 feet; the existing separation is 13.5 feet).

Operational alternatives will be examined to resolve this non-standard condition.

Parallel Taxiway Improvement Considerations

The existing ALP indicates that ultimately the following parallel taxiway improvements will be implemented:

- ✓ The parallel taxiway on the west side of 12R/30L will be extended as a component of the runway extension projects proposed.
- ✓ A new parallel taxiway will be provided on the east side of Runway 12R/30L.
- ✓ New parallel taxiways are proposed for both sides of Runway 12C/30C.
- ✓ In conjunction with the proposed passenger terminal complex on the east side of the Airport, a dual parallel taxiway system is proposed for the east side of Runway 12L/30R.

FAA guidance on conditions required to enable the provision of an approach procedure with a ¾-mile visibility minimum (existing for approaches to Runway 30C) indicate that a full parallel taxiway is required. Currently, Runway 12C/30C does not have a full parallel taxiway.

The potential benefit of each of these taxiway improvements will be examined in the alternative analysis. The addition of a full parallel taxiway serving 12C/30C will be examined as a master planning alternative.

Exit Taxiways

Due to the varying size of aircraft that operate on all runways at IWA, additional exit taxiways are recommended to reduce runway occupancy time.

Passenger Terminal

The passenger terminal requirements at IWA for the 20-year planning horizon from 2018 through 2038 is summarized below. The requirements and recommendations are summarized as follows:

- ✓ Inbound and outbound baggage improvements are required to accommodate forecast passenger growth.
- ✓ Additional concourse holdroom space is required to meet level of service goals.
- ✓ Aircraft parking requirements could require one or two additional parking positions depending on future demand profiles and airline operations.
- ✓ Expansion of the security checkpoint can be mitigated by changes in level of service goals and/or investment in higher throughput technologies.
- ✓ Check-in lobby is adequate through the planning period using conservative assumptions regarding process automation and offsite check-in.

Passenger Terminal Summary

- ✓ Terminal functional areas can likely be accommodated through expansions to the existing terminal complex toward or along the existing apron. A long-term solution located on the east side of IWA will be explored in the Airport Development Alternatives Chapter.
- ✓ In the near-term, terminal improvements should focus on in-filling the terminal buildings and reconfiguring the existing space in a phased program to address the capacity shortfalls.

Therefore, in the short-term, terminal expansion and improvement options will focus on utilization of the existing terminal area. In the long-term, a new terminal development area on the Airport's vacant east side will be identified.

Transportation Facilities

The passenger terminal support facility requirements at IWA for the 20-year planning horizon from 2018 through 2038 are summarized below:

Vehicular Access and Parking

Access Roadway System

Future vehicular access was evaluated considering traffic projections from SkyBridge, IWA Terminal-Expansion, and Arizona State University Polytechnic Campus-Expansion. Based on these projections, S. Sossaman Road will have a failing LoS (E) in the 2030 horizon, and a LoS (F) by 2040, impacting access to the Airport.

Passenger Parking System

The system needs to be optimized to address deficits projected to begin in the short-term (Hourly Lot, Daily Lot). These deficits will be further intensified as Daily Parking facilities on the tarmac are reclaimed by aviation uses. (Anticipated to impact approximately 141 Daily Parking spaces.)

Rental Car Parking

Projected future demand is anticipated to require expansion of Ready Lot and Return Lot. The existing layout and location of Rental Parking facilities does not support this expansion. In addition, the separation of Ready and Return facilities does not meet customer standards, particularly for those with limited mobility. Interventions may require relocation of rental parking or expansion elsewhere.

Employee Parking

Projected future demand for employee parking coincides with projected deficits in the Daily Parking Lot, which is the primary lot used for employees, resulting in significant impact on parking supply and revenues (employees do not pay for parking). Interventions may require relocating employee parking to reserve premium spaces for passengers. Americans with Disabilities Act compliant employee parking must also be a consideration as part of interventions.

Temporary Parking (Cell Phone Lot)

According to the *Guidebook for Evaluating Airport Parking Strategies and Support Technologies,* the capacity of the existing Cell Phone Lot exceeds facility needs. Additionally, the lot is too close in proximity to the terminal, which may be having undetermined impacts to passenger parking facilities (Hourly Lot). Interventions may require the relocation of the temporary lot and/or utilizing it for parking needs found elsewhere.

In the short term, access and parking improvement options will focus on utilization of the existing terminal area. In the long term, a new terminal development area (including terminal support facilities) on the Airport's vacant east side will be identified and explored as to the alternatives.

Other Landside Facilities

Air Cargo Facilities

SkyBridge will be developing its own facilities that will support future cargo operations.

Aircraft Rescue and Fire Fighting (ARFF)/Airport Maintenance

The current facilities hosting ARFF, and airport maintenance equipment are adequate.

Air Traffic Control Tower (ATCT)

An ATCT siting study was completed, and a site for a new ATCT location was selected. The construction of a new ATCT will solve the existing issues presented by the current facility.

Fuel Storage

After consultation with airport staff, the current AVGAS and Jet A fueling facilities were determined to be currently inadequate in capacity.

Therefore, alternatives to expand the fuel storage facilities will be examined as a component of the master plan.

Aircraft Storage

All indications are that demand for these facilities will remain strong for the foreseeable future. Hangars and apron space for future based small aircraft are adequate. Additional hangar space should be considered for larger aircraft.

Alternatives will be explored on how to best utilize the west side development area to accommodate this demand.

CHAPTER 4
AIRPORT DEVELOPMENT ALTERNATIVES

Chapter Summary

This chapter evaluates a series of alternative solutions to satisfy the facility requirements described in the **Facility Requirements Chapter** for Phoenix-Mesa Gateway Airport (IWA or the Airport). The purpose of this analysis is to enable development of airport facilities that can realistically accommodate forecasted demand. The process of defining and evaluating alternatives is iterative, beginning with a broad range of possibilities that are then refined based on alternative evaluation criteria and airport development goals. The process is structured to systematically evaluate options and provide the technical basis for arriving at a recommended conceptual development plan. Criteria used to evaluate development alternatives include:

- ✓ Performance Requirements (Ability to accommodate demand)
- ✓ Operational Capabilities (Specific to Functional Area)
- ✓ Land Use Compatibility
- ✓ Environmental Impacts
- ✓ Stakeholder Feedback
- ✓ Constructability

Various sets of improvement plans were developed for the Airport's airside, landside, and terminal. Although they do not exhaust all the possibilities, the developed alternatives form an appropriate base to produce a recommended conceptual development plan for the Airport. The recommended conceptual development plan can be a combination of proposed improvement projects from similar categories. It will serve as a guide for capital improvement planning and as a base for the Airport Layout Plan (ALP).

A summary of the recommended alternatives that comprise the recommended conceptual development plan is included below, and the remainder of the chapter describes the analysis that led to their selection:

- ✓ Airfield Development Alternative
  - o The recommended alternative is a combination of improvement projects from Airfield Development Alternatives 1 and 2, as shown in ***Figures 4-2: Airfield Development Alternative 1*** and ***4-3: Airfield Development Alternative 2***. Improvements within the recommended Airfield Development alternative include:
    - A 200-foot Runway 12L/30R extension to achieve the runway length requirement and a 1,275-foot Runway 12R/30L extension to provide additional runway length
    - Reconstruction of the taxiway system to incorporate additional taxiways, mitigate taxiway design deficiencies, and strengthen access to future eastside facilities

- Implementation of 1-mile instrument approaches for Runway 12L/30R to provide for continued operations during weather conditions with low visibility.

✓ Airfield Support Facilities Alternative

- The recommended run-up area alternative, as shown in ***Figure 4-4: Dependent Aircraft Maintenance Run-up Area – ADG II/III***, establishes a new area, adjacent to the existing run-up area, that accommodates both Airplane Design Group (ADG) II and III aircraft. The recommended run-up area alternative also provides for blast fence adjacent to Taxilane Foxtrot. This alternative provides an area for ADG II and III aircraft to perform engine run-ups associated with Maintenance, Repair, and Overhaul (MRO) operations and concurrent use for aircraft performing preflight operations.
- The recommended compass calibration pad alternative, as shown in ***Figure 4-7: Compass Calibration Pad Alternative 2***, relocates this airfield support facility to the north apron area of the Airport. The new location removes it from a future development project and provides the greatest access for users. The relocated function will require a magnetic survey to meet the magnetic interference requirements presented in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A, Change 1, *Airport Design* (AC 150/5300-13A).

✓ Westside Development Facility Improvement Alternative

- The recommended alternative, as shown in ***Figures 4-10: Westside Development Facility Improvements Alternative 1: Short-Term***, ***4-11: Westside Development Facility Improvements Alternative 1: Medium-Term***, and ***4-12: Westside Development Facility Improvements Alternative 1: Long-Term***, identifies a variety of landside improvements to:
  - Hourly, daily, economy, and employee parking
  - Rental car operations
  - Staging lots for cellphone, taxicabs, and transportation network companies (TNC) such as Uber and Lyft
  - Economic development and facility redevelopment opportunities
  - Pedestrian crossings at strategic locations in the westside roadway network.

  As part of these individual improvement projects, approximately 200 Daily Lot parking stalls located on the apron will be repurposed as three ADG-III Remain Overnight (RON), Remain Over Day (ROD) aircraft parking positions.

  The recommended alternative further develops and improves existing westside facilities while preserving space for long-term eastside development projects. Eastside development projects include an eastside replacement passenger terminal served by a new roadway network, passenger vehicle parking, Consolidated Rental Car Center (ConRAC), and supporting fueling and maintenance facilities.

- ✓ Replacement Passenger Terminal Alternative
  - o The recommended alternative, as shown in ***Figure 4-18: Linear-Pier Design (28 Gates)***, identifies a 28-gate, linear-pier replacement passenger terminal on the east side of the Airport. The initial terminal development program is based on ADG III aircraft (A320, B737, and Max 8) and 10 contact gates that can be expanded over time as demand dictates. ADG IV gate or hardstand space should be given consideration to accommodate possible larger aircraft demand. The terminal program will include expanded ticket counters, number of positions, airline ticket offices, outbound baggage screening and baggage claim, Transportation Security Administration (TSA) security screening, concessions, retail, restrooms, and terminal support facilities.

Introduction

Various IWA facility alternatives are introduced in this chapter coupled with an associated analysis of each alternative. The outcome of the analysis is the selection of preferred development alternatives that formulate the recommended conceptual development Plan for the Master Plan. Once selected, the recommended conceptual development Plan identified in ***Figure 4-19: Recommended Conceptual Development Plan*** becomes the basis for preparing the implementation plan (to be described in a subsequent chapter). The implementation plan includes phasing of improvements, expected capital costs, and key decision points where the Airport will reevaluate implementation assumptions prior to further development.

The chapter is organized as follows:

- ✓ Airport Development Objectives
- ✓ Alternatives Development Process
- ✓ Evaluation Categories
- ✓ Evaluation Process
- ✓ Airport Development Alternatives
- ✓ Recommended Conceptual Development Plan Summary

Airport Development Objectives

Prior to developing and evaluating specific alternatives, the Airport's development objectives must be understood. Development objectives for IWA's Master Plan include:

- ✓ Maximize the safety and efficiency of aircraft operational areas to comply with AC 150/5300-13A.
- ✓ Accommodate future demand over the next 20 years and position the Airport to attract additional tenants and businesses.
- ✓ Increase revenue generation through the development of non-aeronautical land.
- ✓ Develop the passenger terminal and associated facilities to provide high levels of service.
- ✓ Develop facilities consistent with stakeholder and airport user needs.
- ✓ Develop facilities to be compatible with the environment.
- ✓ Develop facilities in accordance with all federal, state, and local regulations.

Development to meet long-term demand requires consideration of both the airside and landside needs. Airside facilities include runways, taxiways, and support facilities, while landside facilities include the terminal area, vehicle parking areas, walkways, public access roads, rental car facilities, taxi and ground transportation, and any other areas accessible to the public. Those needs are presented in the following airside and landside planning sections.

Airside Planning

Airside needs include:

- ✓ Analyze existing and future capacity constraints, which include a commercial passenger terminal, apron area, additional supporting taxiways, and runway extensions.
- ✓ Analyze the ability of the Airport to meet design standards identified in AC 150/5300-13A.
- ✓ Incorporate the FAA-approved solution to Hot Spot 1.
- ✓ Incorporate the planned new Airport Traffic Control Tower (ATCT).
- ✓ Identify a new building footprint for redevelopment of the existing Terminal Annex (Gates 1 to 4).
- ✓ Identify a new location for a relocated compass calibration pad.
- ✓ Identify a new location for a relocated aircraft engine run-up area for pre-flight and MRO activities.
- ✓ Increase airfield efficiency through improved taxiway locations.
- ✓ Identify aircraft RON and ROD parking areas.
- ✓ Identify existing terminal area redevelopment opportunities based on the opening of a new eastside terminal complex.
- ✓ Improve instrument approach capabilities to Runway 12L/30R.

Landside Planning

Landside needs include:

- ✓ Analyze the locations for improved passenger vehicle parking, rental car operators and associated support facilities, employee parking, and overflow parking.
- ✓ Maximize the buildable property for aeronautical and non-aeronautical development.
- ✓ Analyze the existing landside access and roadway networks to support future development.
- ✓ Identify redevelopment opportunities based on the opening of a new eastside terminal complex.

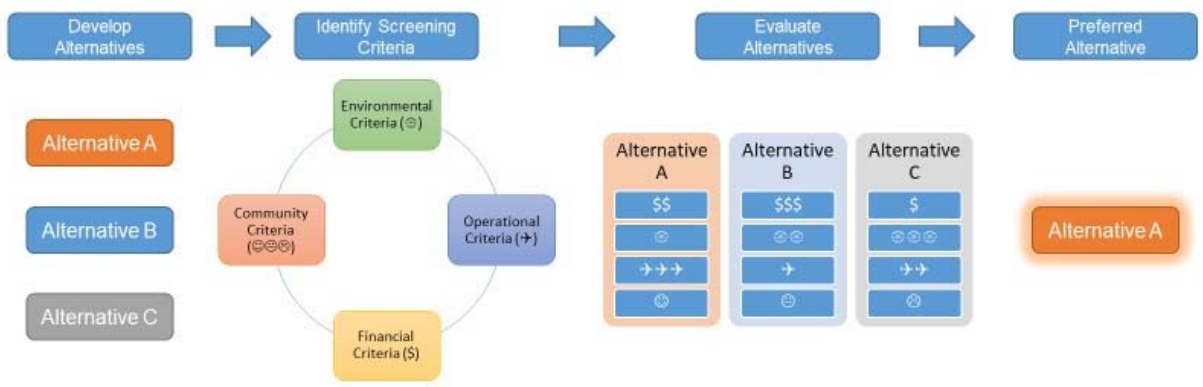
Alternatives Development Process

The framework for developing the alternatives was established in the **Inventory Chapter**, **Aviation Activity Forecasts Chapter**, and **Facility Requirements Chapter**. The information contained in these three chapters guided the development of layouts that support the Airport's ability to accommodate forecasted demand and to prepare a 20-year facility plan for the Airport. Developing the alternatives included examining these factors:

- ✓ FAA Airport Design Standards
- ✓ Land Development Strategies
- ✓ Revenue-Producing Opportunities
- ✓ Aircraft Operations
- ✓ Passenger Enplanements
- ✓ Vehicular Traffic and Parking Data
- ✓ Stakeholder Working Group (SWG) and Technical Advisory Committee (TAC) input

The typical alternatives development and evaluation process is illustrated in the following ***Figure 4-1: Typical Alternatives Development Process***.

Figure 4-1: Typical Alternatives Development Process



Airport Master Plan Input Committees

Throughout this planning process, public involvement and stakeholder outreach has been a continuous process involving education, listening, and collaboration. Stakeholder groups include the Stakeholder Working Group (SWG), Technical Advisory Committee (TAC), Airport Board and staff, elected officials, on- and off-airport businesses, and members of the public from the city of Mesa and neighboring communities. The role of the stakeholder groups is to help shape the Master Plan into a document that reflects community goals and interests while satisfying FAA requirements for airport development. Feedback was collected throughout the planning process and is used to qualitatively compare the alternatives.

Evaluation Categories

Alternatives are analyzed using evaluation criteria developed and agreed upon during the initial scoping of the Master Plan. Each alternative was evaluated according to six categories:

- ✓ Performance Requirements (Ability to accommodate demand)
- ✓ Operational Capabilities (Specific to Functional Area)
- ✓ Land Use Compatibility
- ✓ Environmental Impacts
- ✓ Stakeholder Feedback
- ✓ Constructability

Performance Requirements

This evaluation category gauges the ability of alternatives to support the demand identified in the **Aviation Activity Forecasts Chapter**.

Operational Capabilities

This evaluation category gauges the ability of alternatives to satisfy the facility requirements identified in the **Facility Requirements Chapter**.

Land Use Compatibility

This category evaluates alternatives based on compatible land use and potential impacts to land or other environmental factors that can influence the success of an alternative.

Environmental Impacts

This category evaluates alternatives based on compatibility with existing environmental assets with the goal of developing in an environmentally sustainable manner. The following impacts to specific environmental elements were considered:

- ✓ Air Quality
- ✓ Biological Resources (including fish, wildlife, and plants)
- ✓ Climate
- ✓ Department of Transportation Act, Section 4(f)
- ✓ Farmland
- ✓ Hazardous Materials, Solid Waste, and Pollution Prevention
- ✓ Historical, Architectural, Archaeological, and Cultural Resources
- ✓ Natural Resources and Energy Supply
- ✓ Socioeconomic, Environmental Justice and Children's Environmental Health and Safety Risks
- ✓ Water Resources (including Floodplains, Surface Waters, Groundwater)

Early identification of these environmental factors may help avoid impeding future development plans. The analysis is not intended to fulfill the environmental clearance requirements as defined in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act*. Additional analyses or studies will need to be pursued when the Airport is ready to implement the planned development (before construction begins).

Stakeholder Feedback

Stakeholder input was obtained through master plan committee meetings and public open house meetings with stakeholder groups, the Airport, and the FAA to assist in developing and evaluating the alternatives. Public and committee meetings took place on the following dates:

- ✓ Airport Goals and Objectives Session – March 20, 2018
- ✓ Phoenix-Mesa Gateway Airport Authority (PMGAA) Board Meeting – May 15, 2018
- ✓ SWG Meeting #1 – July 31, 2018
- ✓ TAC Meeting #1 – July 31, 2018
- ✓ PMGAA Board Meeting – September 18, 2018
- ✓ PMGAA Alternatives Development Meeting – December 12, 2018
- ✓ TAC Meeting #2 – January 15, 2019
- ✓ SWG Meeting #2 – January 16, 2019
- ✓ Public Open House Meeting #1 – January 16, 2019
- ✓ PMGAA Board Meeting – April 16, 2019
- ✓ SWG Meeting #3 – June 25, 2019
- ✓ TAC Meeting #3 – June 26, 2019
- ✓ Public Open House Meeting #2 – June 26, 2019
- ✓ SWG Meeting #4 – October 23, 2019
- ✓ TAC Meeting #4 – October 23, 2019
- ✓ PMGAA Board Meeting – November 19, 2019
- ✓ PMGAA Board Meeting – June 16, 2020

Constructability

This category evaluates alternatives based on implementing the alternative in logical and practical phases. Improper timing and sequence of construction can create delays, increase cost, and impact airport operations. Each alternative was examined to determine the degree of its impact on airport operations.

Evaluation Process

This section defines the alternatives analysis process used in accordance with FAA AC 150/5070-6B, *Airport Master Plans* (AC 150/5070-6B). Developing multiple alternatives represents the first of a multi-step process. The current FAA-approved ALP for IWA identifies future improvements recommended in a prior master planning effort. This master planning process addresses facility needs; but also allows the components of the previous preferred alternative to be retained or modified, if they still meet current and/or future needs.

Airport development alternatives are created to respond to defined facility needs, with the goal of identifying general preferences for both individual items and the overall concepts being presented. This strategy will allow the widest range of ideas to be considered and the most effective facility development concept to be defined.

From this evaluation process, elements of a preferred alternative will emerge that can best accommodate all required facility improvements. Based on a wide range of input from multiple stakeholders, elements of the various alternatives will be consolidated into a preferred alternative that can be refined further as the Airport proceeds through the process of finalizing the remaining elements of the airport Master Plan. Throughout this process, public input and coordination with the TAC, SWG, FAA, and IWA will also help to shape the preferred alternative.

Once IWA selects the preferred alternatives, and the recommended conceptual development plan is developed, a detailed capital improvement program will be created that identifies and prioritizes the implementation of specific projects. The elements of the preferred alternative will be integrated into the updated ALP drawings that will guide future improvements at the Airport.

Airport Development Alternatives

The initial conceptual airport development alternatives are intended to facilitate a discussion and evaluation of the most efficient way to meet the facility needs of the Airport. The airport development alternatives are organized into these groups:

- ✓ Airfield Development Alternatives
- ✓ Airfield Support Facilities Alternatives
- ✓ Landside Development Alternatives
- ✓ Replacement Passenger Terminal Alternatives

Figures 4-2 through **4-19** illustrate the airport development alternatives.

Airfield Development Alternatives

Chapters 1 and **2** identified the goals and objectives relative to aviation development and economic enhancement, including input from airport staff, tenants, and operators, were considered in the formulation of alternatives that are outlined and discussed in the following sections. Because all airport functions relate to and revolve around the basic runway layout, runway development alternatives must first be carefully examined and evaluated. Specific airside development considerations include runway occupancy, runway length, taxiway design, and airport support facilities needed to support forecast use through the planning period and to comply with FAA design standards. Specific development features proposed are not necessarily exclusive to an individual alternative. Each alternative concept discussed below is a collection of features, many of which can be moved from alternative to alternative.

ALTERNATIVE 1: Airfield Development Alternative 1

This alternative, as shown in ***Figure 4-2: Airfield Development Alternative 1***, involves providing a safe and efficient taxiway system to expedite aircraft movements to and from the runways and apron areas. Layouts must be operationally efficient, enhance safety, improve circulation, increase capacity, and address needs identified in the **Facility Requirements Chapter**. As that chapter states, Runway 12C/30C offers ¾-mile instrument approaches and must be served by a full parallel taxiway. Runways 12R/30L and 12C/30C are served by insufficient exit taxiways. Additionally, non-standard taxiway design such as direct access, high energy intersections, acute-angled entrance taxiways, and expansive pavement exist throughout the airfield. The **Facility Requirements Chapter** identified the taxiways that serve ADG and Taxiway Design Group (TDG) IV and above that are required to have paved shoulders along their entire length. Taxiways G and K between Runways 12R/30L and 12C/30C are not equipped with paved shoulders. Runway 12L/30R is utilized by existing commercial and future cargo aircraft, but it does not offer instrument approaches. The primary purpose of Airfield Development Alternative 1 is to enhance the taxiway and instrument approach system. ***Figure 4-2: Airfield Development Alternative 1*** showcases Airfield Development Alternative 1 and its proposed developments:

- ✓ Existing runway length and width are maintained.
- ✓ One-mile instrument approaches are implemented for Runway 12L/30R.
- ✓ A full-length parallel taxiway is constructed west of Runway 12C/30C. A dual full-length parallel taxiway is constructed east of Taxiway C.
- ✓ Taxiway K (between Taxiways A and B) is removed.
- ✓ Taxiway V (between Runway 12R/30L and Taxiway A) and Taxiway G are reconstructed.
- ✓ Taxiways G and K's shoulders between Runways 12R/30L and 12C/30C are paved.
- ✓ Bypass taxiways are constructed for Runways 30L and 12L. A connector taxiway is constructed across Runway 12R.
- ✓ A cross-field taxiway is constructed between Runways 12C/30C and 12L/30R.

Advantages of this alternative:

- ✓ Non-standard taxiway design is corrected.

- ✓ Implementation of 1-mile instrument approaches for Runway 12L/30R enhances the instrument approach system and maintains instrument approach consistency, increases runway utility, and provides for continued operations during inclement and low visibility weather conditions.
- ✓ Hot Spot 1 is mitigated with the reconstruction of Taxiway V and partial removal of Taxiway K.
- ✓ Bypass taxiways reduce congestion caused by queued aircraft not ready for takeoff with the provision of an adjacent entrance taxiway.
- ✓ Implementation of cross-field taxiways outside of the middle third of the runway between Runways 12R/30L and 12C/30C reduces runway occupancy, decreases taxi time for aircraft accessing airport facilities located on the west side of the Airport, and assists ATCT personnel in the maneuvering of aircraft.
- ✓ Implementation of a cross-field taxiway outside of the middle third of the runway between Runways 12C/30C and 12L/30R reduces runway occupancy, decreases taxi time for commercial aircraft accessing the future east commercial facilities from Runway 12C/30C, and assists ATCT personnel in the maneuvering of aircraft.
- ✓ Construction of a full-length parallel taxiway west of Runway 12C/30C fulfills the full-length parallel taxiway requirement for runways offering ¾-mile and lower instrument approaches.
- ✓ Construction of a dual full-length parallel taxiway east of Taxiway C expedites the transition of aircraft to and from future east commercial facilities and offers additional support for future eastside development.
- ✓ Construction of additional taxiways mitigates the lack of exit taxiways, serves future terminal facilities, reduces runway occupancy and fuel consumption, and increases efficiency overall.

Disadvantages of this alternative:

- ✓ Taxiway K intersects Runways 12R/30L and 12C/30C in the middle third of the runways, which is a high energy area by FAA definition.
- ✓ AC 150/5300-13A discourages cross-field taxiways. This alternative presents four cross-field taxiways, including Taxiway K.
- ✓ The costs to reconfigure and construct the taxiways are high.

ALTERNATIVE 2: Airfield Development Alternative 2

This alternative, as shown in ***Figure 4-3: Airfield Development Alternative 2***, involves achieving the 9,500-foot runway length required for B767-300 and B747-400 cargo aircraft that will operate at the Airport within the first five years of the planning period. The primary purpose of Airfield Development Alternative 2 is to satisfy the runway length requirement of critical Airport Reference Code (ARC) aircraft regularly operating at IWA, and to enhance the taxiway and instrument approach system. Although similar to Airfield Development Alternative 1 in design and purpose, Airfield Alternative 2 offers a few distinct development changes:

- ✓ Extending Runway 12L/30R to an ultimate length of 9,500 feet.
- ✓ Implementing ½-mile and ¾-mile instrument approaches for Runways 12C/30C and 12L/30R, respectively.

- ✓ Extending Runway 30L and Taxiway B south to Taxiway P.
- ✓ Constructing a full-length parallel taxiway east of Runway 12C/30C.
- ✓ Not constructing a connector taxiway across Runway 12R.
- ✓ Constructing a bypass taxiway at Runway 12R.
- ✓ Reconfiguring Taxiway G to accommodate the Runway 12L/30R extension.
- ✓ Not constructing a cross-field taxiway between Runways 12C/30C and 12L/30R.

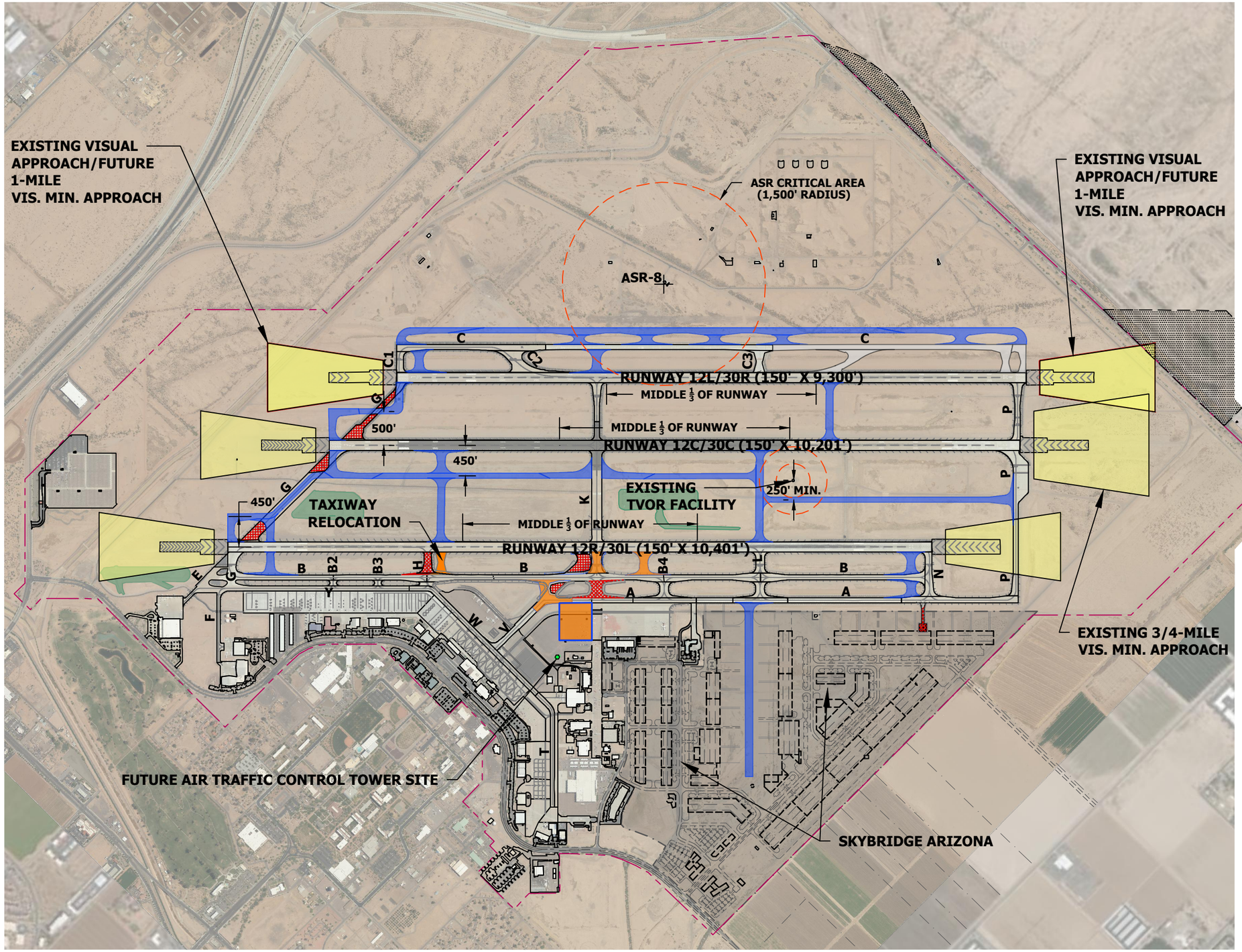
Advantages of this alternative:

- ✓ Non-standard taxiway design is corrected.
- ✓ Hot Spot 1 is mitigated with the reconstruction of Taxiway V and partial removal of Taxiway K.
- ✓ Bypass taxiways reduce congestion caused by queued aircraft not ready for takeoff with the provision of an adjacent entrance taxiway.
- ✓ Implementation of cross-field taxiways outside of the middle third of the runway between Runways 12R/30L and 12C/30C reduces runway occupancy, decreases taxi time for aircraft accessing airport facilities located on the west side of the Airport, and assists ATCT personnel in the maneuvering of aircraft.
- ✓ The 9,500-foot runway length requirement is achieved.
- ✓ Improvement of visibility minimums for all runways, excluding Runway 12R/30L, enhances the instrument approach system, increases the utility of multiple runways, and provides for continued operations to multiple runways during inclement and low visibility weather conditions.
- ✓ Construction of a dual full-length parallel taxiway east of Taxiway C expedites the transition of aircraft to and from future east commercial facilities and offers additional support for future eastside development.
- ✓ Construction of additional taxiways mitigates the lack of exit taxiways, serves future terminal facilities, reduce runway occupancy and fuel consumption, and increases efficiency overall.
- ✓ Extension of Runway 12R/30L provides additional runway length.

Disadvantages of this alternative:

- ✓ Taxiway K intersects Runways 12R/30L and 12C/30C in the middle third of the runways, which is a high energy area by FAA definition.
- ✓ AC 150/5300-13A discourages cross-field taxiways. This alternative presents three cross-field taxiways, including Taxiway K.
- ✓ Costs to reconfigure and construct the taxiways are high.
- ✓ Runway 30C and Runway 30R's Runway Protection Zone (RPZ) dimensions expand off airport property as a result of the improvement and the introduction of instrument approach procedures.
- ✓ Extension of Runway 12R/30L and Taxiway B south to Taxiway P will repurpose Taxiway P as an entrance taxiway to Runway 12R/30L. This could cause congestion, delayed operations for aircraft needing to use Taxiway P to taxi to Runways 12C/30C and 12L/30R, and/or rerouting of aircraft that will increase taxi time and fuel consumption. The entire extension scenario could increase ATCT personnel workload.

- ✓ Reconfiguration of Taxiway G in this alternative requires a portion of Taxiway G to be constructed through a detention pond requiring mitigation or relocation.
- ✓ The improvement to Runway 12L visibility minimums puts the new full-length parallel taxiway east of Runway 12C/30C in the future RPZ.



Legend

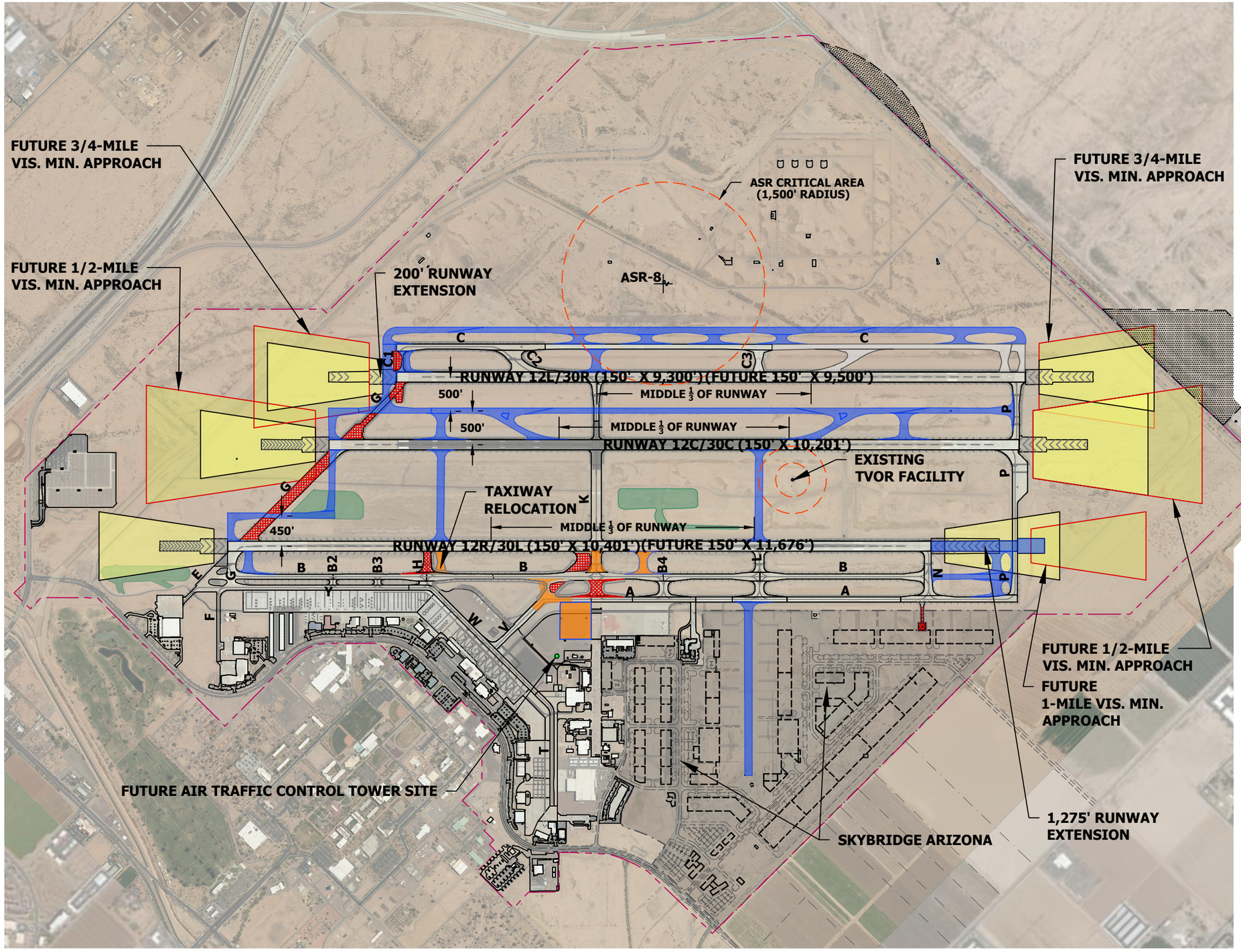
- Existing Runway Protection Zone
- Existing Detention Ponds
- Existing Easement
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Existing IWA Programmed Project
- Pavement to be Removed

N

0 750' 1500' 3000'

GRAPHIC SCALE IN FEET

Figure 4-2
Airfield Development Alternative 1



Legend

- Existing Runway Protection Zone
- Existing Detention Ponds
- Existing Easement
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Existing IWA Programmed Project
- Pavement to be Removed

N

0 750' 1500' 3000'

GRAPHIC SCALE IN FEET

Figure 4-3
Airfield Development Alternative 2

Summary Evaluation of Airfield Alternatives

Table 4-1 presents an evaluation of the various alternatives for the airfield at IWA.

Table 4-1: Summary Evaluation Matrix of Airfield Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2
Description of Improvement	Airfield Development Alternative 1	Airfield Development Alternative 2
PERFORMANCE REQUIREMENTS		
Addresses Runway Length Requirements	No	Yes
Accommodates Forecasted Demand	Yes	Yes
OPERATIONAL CAPABILITIES		
Airfield Operability & Access	Improved	Improved
Reduces Aircraft Runway Occupancy Times	Yes	Yes
Increases Potential for Development	Yes	Yes
Resolves 150/5300-13A Deficiencies	Yes	Yes
LAND USE COMPATABILITY		
Impact to On-Airport Property	Yes	Yes
Impact to Off-Airport Property	No	No
Land Acquisitions/Easements	No	No
ENVIRONMENTAL IMPACT POTENTIAL		
Increases Impervious Pavement	Yes	Yes
Existing Detention Pond Impact	No	Yes
STAKEHOLDER FEEDBACK		
Considers Stakeholder Input	Yes	Yes
Addresses Stakeholder Concerns	Yes	Yes
CONSTRUCTABILITY		
Impact to Airport Operations	Minimal	Minimal
ALTERNATIVES EVALUATION		
DETERMINATION	**FAVORABLE**	**NEUTRAL**

Airfield Support Facility Alternatives

This section details the evaluation of alternatives for aviation support facilities including aircraft run-up areas and a compass calibration pad. These facilities are necessary to support existing tenants, airline operators, and the local aviation community with the ability to calibrate an aircraft engine for maintenance, perform pre-flight engine run-ups prior to takeoff, and calibrate an aircraft's on-board compass prior to flight. Key factors in the siting of these facilities were to minimize runway crossings, separate GA aircraft from commercial aircraft, and comply with applicable operational and safety requirements.

Aircraft Run-Up Area Alternatives

The function of a run-up area is to provide a place for aircraft to perform preflight operations and, for some aircraft, maintenance checks. Pilots using run-up areas for preflight or maintenance operations must orient their aircraft into prevailing winds. Winds at IWA tend to blow south and southeast, therefore favoring Runways 12R, 12C, and 12L. Currently, only one run-up area for all local and itinerant aircraft utilization exists at IWA. It is on the furthest north end of the North Apron. ATCT personnel have reported that, despite the existence of this run-up, aircraft are using movement areas near runway ends and Taxiway K to perform run-up tasks. Additionally, future hangar development will be located adjacent to the existing T-hangars resulting in the current run-up area being used for ingress/egress to the hangars. Two run-up area alternatives have been developed to alleviate undesirable use of the movement area for preflight operations and meet future needs.

ALTERNATIVE 1: Dependent Aircraft Run-Up Area – ADG II/III

This alternative, as shown in ***Figure 4-4: Dependent Aircraft Maintenance Run-up Area – ADG II/III***, involves developing a run-up area for ADG II and III aircraft. The proposed run-up area is south of Taxilane F adjacent to the existing run-up facility located on the North Apron. Functionality of this run-up area for MRO operations is dependent on the aircraft that use it at a given time due to limited spacing, design and separation criteria, and jet blast. Multiple non-jet ADG II and ADG III aircraft are capable of using the run-up area concurrently; however, jet engine ADG II and III aircraft will need to use the facility separately for MRO operations. Ingress and egress to the run-up apron is offset from Taxiway G. Access to the run-up area is also provided via Taxilane F and Taxiway Y. AC 150/5300-13A recommends consideration for the effects of jet blast be made as jet aircraft power up to move out of parking/stationary positions. Jet blast from aircraft engines may require Taxilane F operations to cease until the aircraft has concluded preflight operations or maintenance checks. The placement of blast fences west of Taxilane F and west of the newly established run-up area will protect neighboring facilities. The purpose of the Alternative 1 is to provide an alternate run-up area location that is compatible for both preflight and maintenance operations and discontinues the use of movement areas for preflight operations.

Advantages of this alternative:

- ✓ The run-up area meets ADG III separation criteria.
- ✓ The run-up area is close to the aircraft that will use it.
- ✓ This alternative addresses ATCT personnel concern by providing a consolidated run-up area for GA aircraft in the non-movement area.
- ✓ This alternative does not affect future development.
- ✓ The area offers multiple access points.
- ✓ Jet blast fencing is incorporated.

Disadvantages of this alternative:

- ✓ The layout and positioning of the run-up area preclude the inclusion of a ground run-up enclosure, should the Airport desire to incorporate one in the future.
- ✓ The layout does not provide for multiple aircraft to perform MRO operations
- ✓ The apron adjoins taxiways and taxilanes.

ALTERNATIVE 2: North GA Run-Up/Holding Bay & Maintenance Run-Up Area

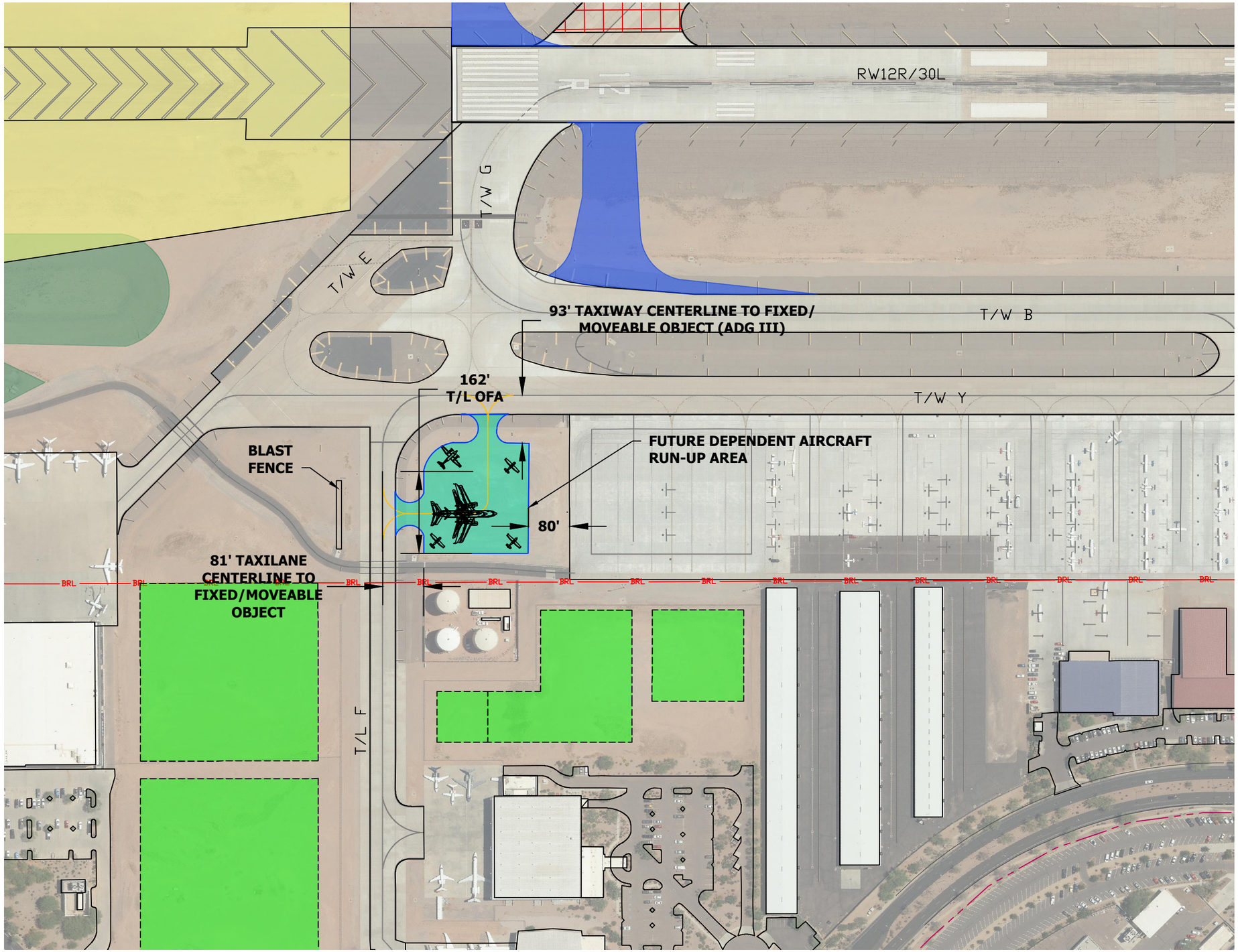
This alternative, as shown in ***Figure 4-5: North GA Run-Up/Holding Bay & Maintenance Run-Up Area***, involves redesigning the current run-up area for ADG II preflight utilization and constructing an ADG III maintenance run-up area on adjacent land for preflight and maintenance operations. Redesign of the existing run-up area includes three holding bay positions that concurrently act as individual run-up positions. Access to the run-up apron is offset from Taxiway G and adjoining Taxiways E, B, and Y. Ingress/egress spacing for future hangar tenants is provided west of the ADG II designated run-up area as well as a taxilane that routes future hangar-based aircraft to Taxiway Y. The purpose of the North GA Run-Up/Holding Bay & Maintenance Run-Up Area alternative is to provide an alternate run-up design that accommodates GA and MRO facility needs and aligns with future development.

Advantages of this alternative:

- ✓ It is close to the aircraft that will use the GA and maintenance run-up areas.
- ✓ It addresses ATCT personnel concern by providing a consolidated run-up area for GA aircraft in the non-movement area.
- ✓ Multiple ADG aircraft can use the areas at a given time.
- ✓ Jet blast fencing is incorporated.

Disadvantages of this alternative:

- ✓ Prop wash from preflight operations by ADG II aircraft may affect hangar tenants.
- ✓ Tie-down positions will be removed to meet taxilane separation criteria. Apron-based aircraft will need to be relocated.
- ✓ Due to future apron development, the proposed taxilane will intersect a holding bay position rendering that holding bay position inoperable during taxi operations.



Key Map
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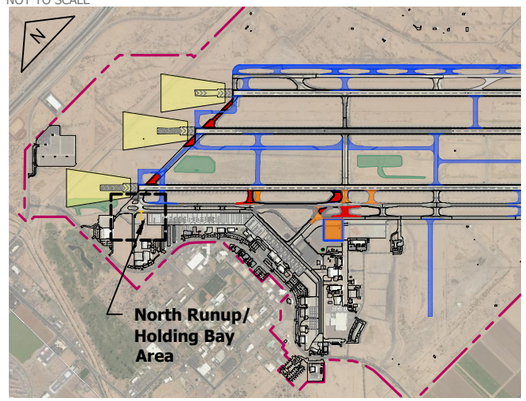


Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Pavement to be Removed
- Future Buildings/Development

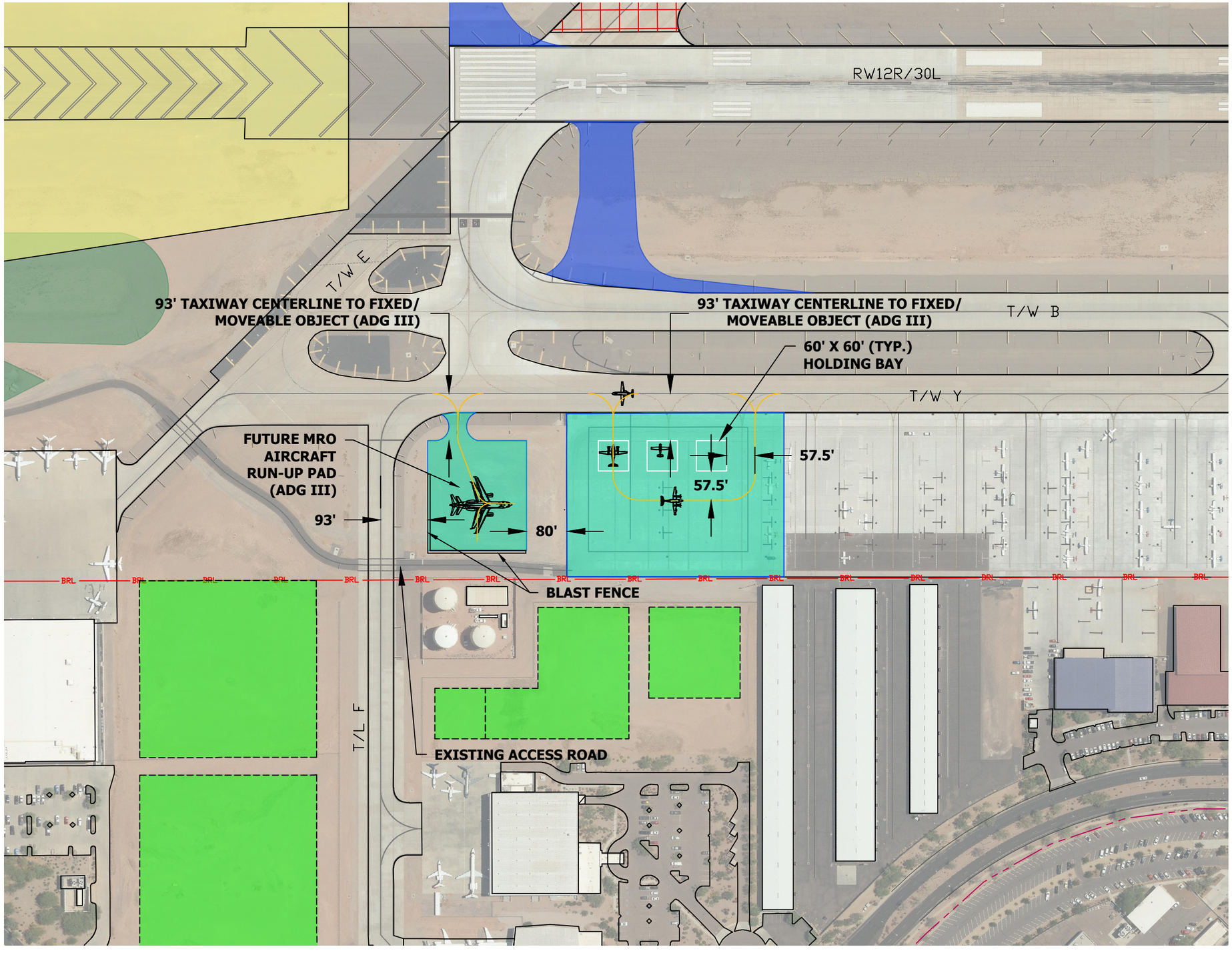
N

0 100' 200' 400'
GRAPHIC SCALE IN FEET

GA and Maintenance Run-up Area Design Criteria

- Illustrates ADG III TOFA Criteria

Figure 4-4
Dependent Aircraft Run-Up Area - ADG II/III Alternative 1



Key Map
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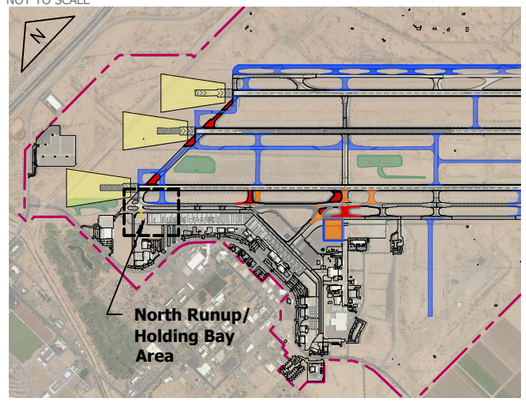
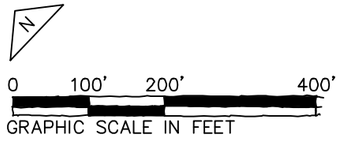


Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Pavement to be Removed
- Future Buildings/Development



GA Run-up/Holding Bay Design Criteria
- Illustrates ADG II & III TOFA Criteria

MRO Run-up Pad Design Criteria
- Illustrates ADG III TOFA Criteria

Figure 4-5
North GA Run-up/Holding Bay & Maintenance Run-up Area Alternative 2

Summary Evaluation of Aircraft Run-up Area Alternatives

Table 4-2 presents an evaluation of the various alternatives for the aircraft run-up areas at IWA.

Table 4-2: Summary Evaluation Matrix of Aircraft Run-up Area Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2
Description of Improvement	Dependent Aircraft Run-up Area - ADG II/III	North GA Run-Up/Holding Bay & Maintenance Run-up Area
PERFORMANCE REQUIREMENTS		
Category Is Not Applicable		
OPERATIONAL CAPABILITIES		
Operability & Access	Consolidated Run-up Area	Consolidated Run-up Area
Accommodates Anticipated ADG-II/III Aircraft	Yes	Yes
Compatible with Existing / Future Facilities	Yes	No
Simultaneous Operations	No	Yes
LAND USE COMPATABILITY		
Impact to On-Airport Property	Yes	Yes
Land Acquisitions/Easements	No	No
Relocation of Existing Facilities Required	No	Yes
ENVIRONMENTAL IMPACT POTENTIAL		
Increases Impervious Pavement	Yes	Yes
Jet Blast/Prop Wash Impacts	High	Moderate
STAKEHOLDER FEEDBACK		
Considers Stakeholder Input	Yes	Yes
Addresses Stakeholder Concerns	Yes	Yes
CONSTRUCTABILITY		
Impact to Airport Operations	Yes	Yes
ALTERNATIVES EVALUATION		
DETERMINATION	**FAVORABLE**	**NEUTRAL**

Compass Calibration Pad Alternatives

A compass calibration pad enables pilots to calibrate their on-board magnetic compass by aligning their aircraft on known magnetic headings and to adjust the compass and/or placard markings to indicate the required corrections. A compass calibration pad located west of Taxiway A is currently available to all tenants and users of the Airport. Future SkyBridge Arizona development will surround the existing compass calibration pad possibly resulting in magnetic interference, inoperability, and need for relocation. Aircraft tenants and operators have expressed concern with the possible decommissioning of this airport support facility. The concern has prompted compass calibration relocation alternatives outlined in the following section.

AC 150/5300-13A, Appendix 6, specifies detailed requirements for the siting of a compass calibration pad. The FAA recommends the following design and separation criteria:

- ✓ Locate the center of the pad at least:
  - o 600 feet from magnetic objects such as large parking lots, busy roads, railroad tracks, high voltage electrical transmission lines, or cables carrying direct current (either above or below ground)
  - o 300 feet from buildings, aircraft arresting gear, fuel lines, or electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
  - o 150 feet from runway and taxiway light bases, airfield signs, ducts, and grates for drainage that contain iron, steel, or ferrous materials.
- ✓ Avoid Navigational Aid (NAVAID) interference in accordance with other NAVAID siting criterion.
- ✓ Locate the compass calibration pad outside airport design surfaces to satisfy the runway and taxiway clearances applicable to the airport on which it is located.
- ✓ Conduct a comprehensive magnetic survey of the area to ensure compliance with magnetic interference requirements.

Three alternative compass calibration pad locations are presented in the next three sub sections. All three alternatives will require construction of an access taxiway.

ALTERNATIVE 1: Compass Calibration Pad Option 1

This alternative, as shown in ***Figure 4-6: Compass Calibration Pad Alternative 1***, involves relocating the compass calibration pad between Taxiways W and B. Relocation of the compass calibration pad to this location requires the MRO hardstand apron to be relocated. As part of this alternative, the MRO hardstand apron is proposed to relocate to the existing ROD/RON apron once the portion of the south apron currently used for the Daily Lot is repurposed as apron space. The ROD/RON aircraft will relocate to the repurposed apron space. The repurpose of this apron and relocation of the ROD/RON aircraft are detailed in subsequent sections.

Advantages of this alternative:

- ✓ Design and separation criteria are met.
- ✓ The compass calibration pad is in a remote location that does not interfere with operations or require aircraft to cross active runways.
- ✓ The new ATCT is located outside of the 600-foot radius required to clear magnetic objects.

Disadvantages of this alternative:

- ✓ Relocation of MRO hardstand apron is required.
- ✓ Pavement will need to be constructed and reconstructed based upon identified FAA criteria for a compass calibration pad.

ALTERNATIVE 2: Compass Calibration Pad Option 2

This alternative, as shown in ***Figure 4-7: Compass Calibration Pad Alternative 2***, involves relocating the compass calibration pad east of the reconfigured Taxiway G and Runway 12R/30L. This location is in an undeveloped area of the Airport.

Advantages of this alternative:

- ✓ Design and separation criteria are met.
- ✓ The compass calibration pad is in a remote location.
- ✓ The compass calibration pad is close to the aircraft that will use it.

Disadvantages of this alternative:

- ✓ Relocating the compass calibration pad in this area requires aircraft to cross an active runway. Aircraft could possibly mistake the access taxiway to the compass calibration pad as the connecting/entrance taxiway to Runway 12C/30C.
- ✓ ATCT personnel workload will increase.
- ✓ Pavement will need to be constructed based upon identified FAA criteria for a compass calibration pad.

ALTERNATIVE 3: Compass Calibration Pad Option 3

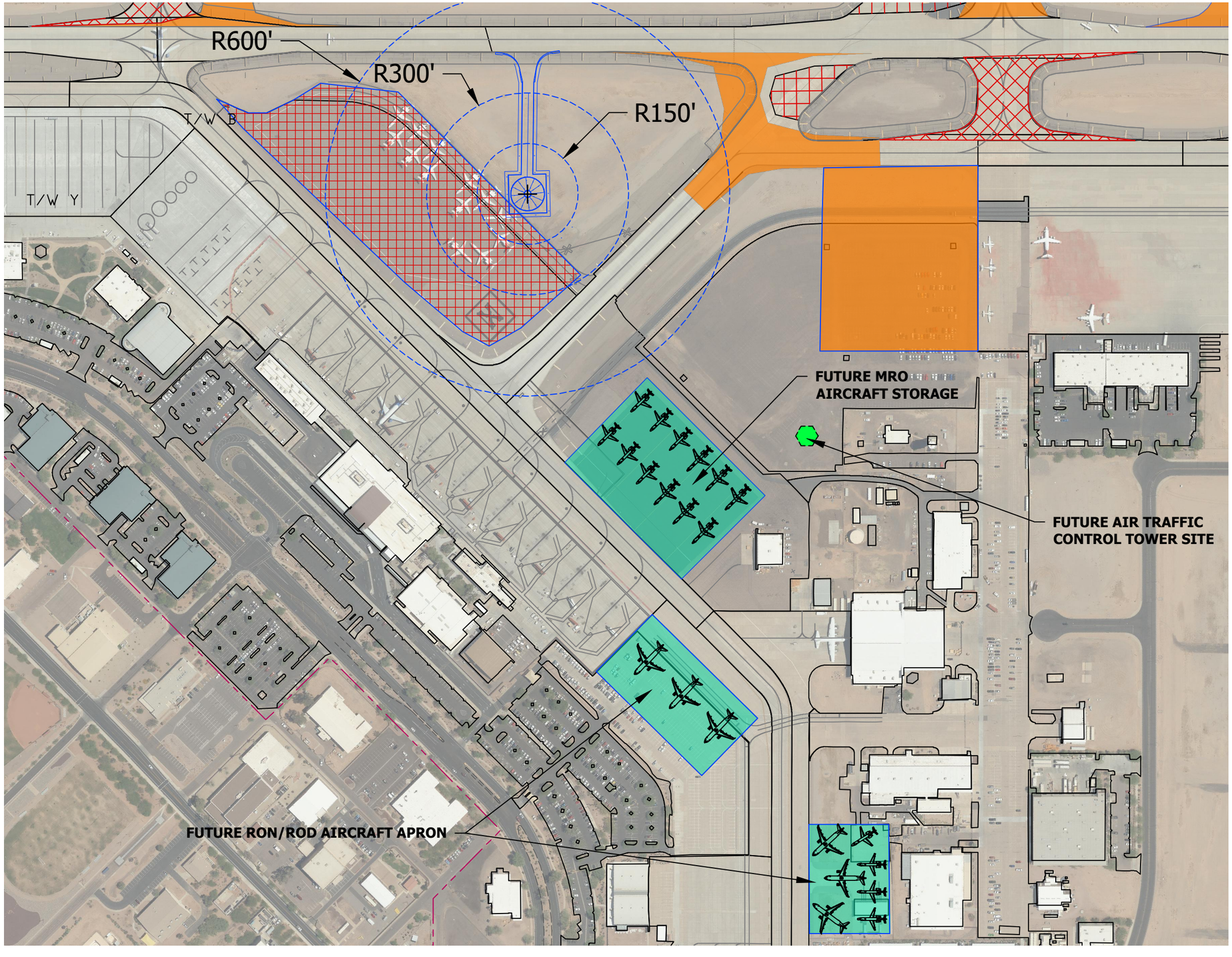
This alternative, as shown in ***Figure 4-8: Compass Calibration Pad Alternative 3***, involves relocating the compass calibration pad east of the proposed dual taxiway that will serve Runway 12L/30R. This location is in an undeveloped area of the Airport and underlies a powerline.

Advantages of this alternative:

- ✓ Design and separation criteria are met.
- ✓ The compass calibration pad is in a remote location.
- ✓ The positioning of the compass calibration pad aligns with future development as the pad is in an area designated for future airport support facilities.

Disadvantages of this alternative:

- ✓ Aircraft are required to cross several active runways.
- ✓ ATCT personnel workload will increase.
- ✓ Taxi operations and fuel consumption will increase.
- ✓ The compass calibration pad is far from the aircraft that will use it.
- ✓ Pavement will need to be constructed based upon identified FAA criteria for a compass calibration pad.
- ✓ The existing powerline could cause magnetic interference and will therefore need to be relocated outside of the 600-foot radii.



Key Map
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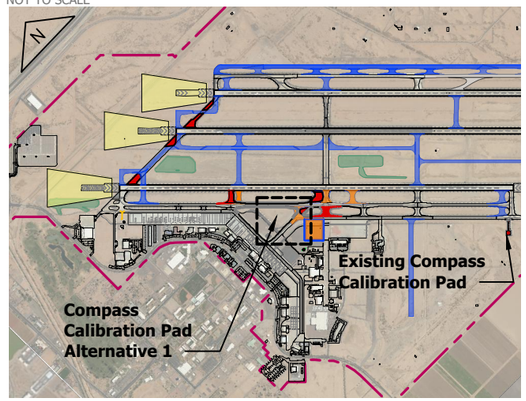


Legend

- Existing Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Existing IWA Programmed Project
- Pavement to be Removed
- Future Buildings/Development

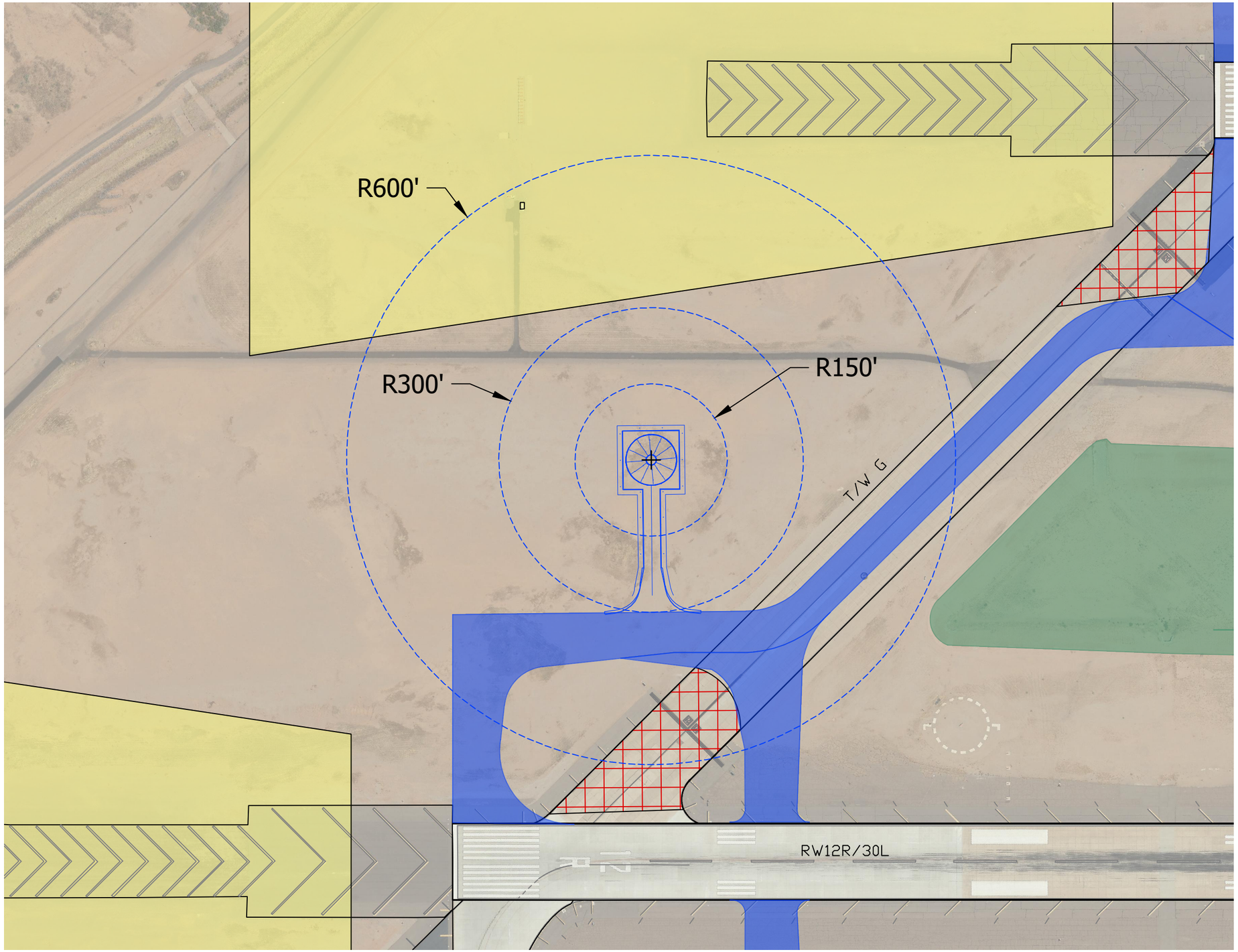
ERJ-145 (ADG C-II)
ERJ-135 (ADG C-II)
A-320 (ADG C-III)

N
0 150' 300' 600'
GRAPHIC SCALE IN FEET

Compass Calibration Setback Criteria

- 150 feet from runway and taxiway light bases, airfield signs, ducts, grates for drainage when they contain iron, steel, or ferrous materials
- 300 feet from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
- 600 feet from magnetic objects including large parking lots, busy roads, railroad tracks, and high voltage electrical transmission lines

Figure 4-6
Compass Calibration Pad Relocation Alternative 1



Key Map
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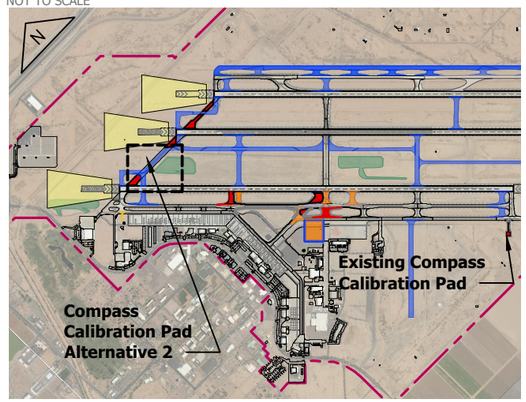


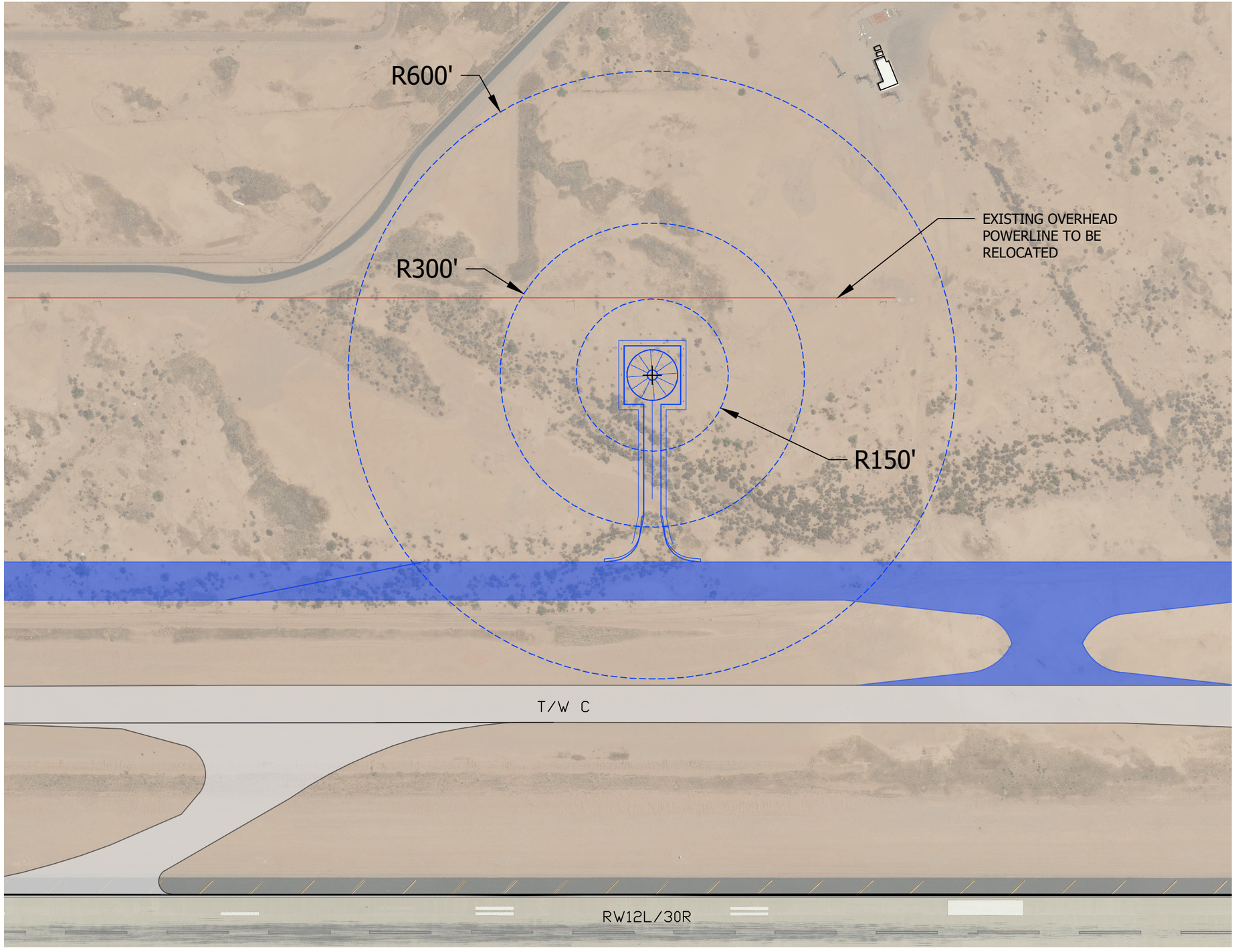
Legend

- Existing Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Existing IWA Programmed Project
- Pavement to be Removed

Compass Calibration Setback Criteria

- 150 feet from runway and taxiway light bases, airfield signs, ducts, grates for drainage when they contain iron, steel, or ferrous materials
- 300 feet from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
- 600 feet from magnetic objects including large parking lots, busy roads, railroad tracks, and high voltage electrical transmission lines

Figure 4-7
Compass Calibration Pad Relocation Alternative 2



Key Map
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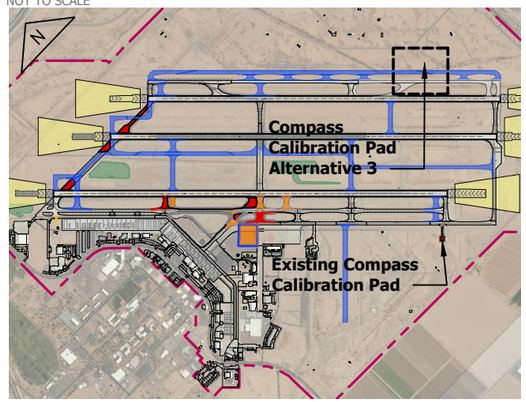
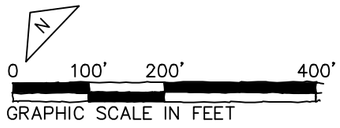


Legend

- Existing Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Existing IWA Programmed Project
- Pavement to be Removed



Compass Calibration Setback Criteria

- 150 feet from runway and taxiway light bases, airfield signs, ducts, grates for drainage when they contain iron, steel, or ferrous materials
- 300 feet from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
- 600 feet from magnetic objects including large parking lots, busy roads, railroad tracks, and high voltage electrical transmission lines

Figure 4-8
Compass Calibration Pad Relocation Alternative 3

Summary Evaluation of Compass Calibration Pad Alternatives

Table 4-3 presents an evaluation of the various alternatives for the compass calibration pad alternatives at IWA.

Table 4-3: Summary Evaluation Matrix of Compass Calibration Pad Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Description of Improvement	Compass Calibration Pad Option 1	Compass Calibration Pad Option 2	Compass Calibration Pad Option 3
PERFORMANCE REQUIREMENTS			
Category Is Not Applicable			
OPERATIONAL CAPABILITIES			
Meets 150/5300-13A, Appendix 6 Requirements	Yes	Yes	Yes
Airfield Operational Impacts	No	No	No
LAND USE COMPATABILITY			
Impact to On-Airport Property	Yes	No	Yes
Land Acquisitions/Easements	No	No	No
Relocation of Existing Facilities Required	Yes	No	Yes
ENVIRONMENTAL IMPACT POTENTIAL			
Increases Impervious Pavement	Yes	Yes	Yes
STAKEHOLDER FEEDBACK			
Considers Stakeholder Input	Yes	Yes	Yes
Addresses Stakeholder Concerns	Yes	Yes	Yes
CONSTRUCTABILITY			
Impact to Airport Operations	Moderate	Minimal	Minimal
ALTERNATIVES EVALUATION			
DETERMINATION	**NEUTRAL**	**FAVORABLE**	**NOT FAVORABLE**

Westside Development Facility Improvement Alternatives

The **Facility Requirements Chapter** identified the need for the redistribution of public parking as well as additional parking for rental car operators and employees. Peak daily demand at the Airport reached effective capacity for the Hourly Lot and near effective capacity for the Daily Lot and Rental Parking during 2018. Due to increased activity at the Airport, projections indicate deficits for each in the short term, increasing in significance throughout the 20-year planning horizon. An additional 1,009 parking stalls will be needed to meet demand for public, employee, and rental parking through 2038. This coincides with a substantial surplus of parking supply at the Ray Road Economy Lot (1,135 stalls).

In addition to parking needs, vehicular access to the terminal and parking facilities are stunted as a result of traffic along S. Sossaman Road. Interim improvements made to ingress/egress at the terminal and parking facilities are helping, though a supplemental operational analysis conducted as part of the **Facility Requirements Chapter** found that the roadway is anticipated to experience a failing level of service by 2030.

This section analyzes westside development alternatives focused on addressing parking deficits adjacent to the terminal and maximizing the use of facilities elsewhere at the Airport. This includes the relocation of employee parking, a change in parking fee structure to encourage use of the Economy Lot, adding hourly and premium vehicle parking, and expanding rental operator parking capacity.

TNCs such as Uber and Lyft both operate at the Airport. TNCs have the potential to influence or alter future demand for taxicab, ride-share vans, limousines, car rental services, and parking. Service by TNCs theoretically reduces future parking demand if passengers opt to take TNCs to and from the Airport rather than using their own vehicles.

Turo, a new company that can also influence or alter future demand for taxicabs, ride-share vans, limousines, car rental services, and parking, offers peer-to-peer car sharing. This business allows private car owners to rent out their personal vehicles to airport passengers for a fee. Airports are typically accommodating this service at designated locations within designated rental car areas.

It is recommended that the Airport monitor how TNCs and peer-to-peer type rental car operations impact parking demand and adjust planning assumptions accordingly.

Alternatives 1 and 2 were developed to identify short-, medium- and long-term development and the repurpose of existing parking facilities as future economic development opportunities once a new 28-gate eastside terminal becomes operational. The alternatives maintain approximately the same parking supply in the short term. In the mid-term, parking is reduced by approximately 200 stalls as a result of reclaiming portions of the Daily Lot Annex for aeronautical purposes. This loss of supply is accommodated by the transition of parking facility types between rental, employee parking, and temporary parking (Cell phone Lot), coinciding with a parking fee change to encourage use of the Economy Lot. In the long term, the eastside terminal development will provide parking supply for each use type adjacent to the terminal. The Ray Road Economy lot will continue to provide long-term and daily parking.

During the existing rental parking capacity analysis, the analysts determined that rental car tenants anticipate a need for additional drop-off and pick-up parking supply. Due to the variability of projecting the distribution of this demand, Alternatives 1 and 2 highlight locations for “Rental Flex.” These areas provide dedicated supply for future rental parking demand, while allowing flexibility in programming between future pick-up, drop-off needs, and support facility needs.

ALTERNATIVE 1: Westside Development Facility Improvements Alternative 1 – Short, Medium, and Long Term

In the short term (five years), as identified in ***Figure 4-9: Existing Terminal Annex Redevelopment***, the redevelopment of the existing Terminal Annex building (Gates 1 through 4) is anticipated as the facility will have reached the end of its useful life. This facility is a single-story building, with three departure lounges serving four gates and supported by a food and beverage concession, and restrooms. The building is set within the existing site, allowing for aircraft ground service vehicle access to inbound and outbound baggage make-up and drop-off areas at the terminal, and respecting the boundary set by the Fergie and Feller Field gardens.

The proposed concourse is larger than the one it is replacing, for a total building size of 23,250 square feet. ***Table 4-4: Replacement Departures Concourse Requirements*** identifies the basic planning assumptions used in developing the space requirements.

Table 4-4: Replacement Departures Concourse Requirements

Departing Flights	4
Design Aircraft Seats	177
Total Departing Seats	708
Design Load Factor	85%
Peak Hour Departing Passenger	602
Departures Lounge Area/Passenger[1]	17
Departures Lounge Area (SF)[2]	13,000
Concourse Area (SF)	6,500
Concessions/Food & Beverage (SF)	1,500
Restrooms 2 @ 1,125 SF	2,250
Total Concourse Area (SF)	23,250

1] 18 SF/Passenger is IATA standard for a high level of service.

2] Maximum allowable on site.. Includes ticket lifts and boarding corridors

The departures lounges provide a good level of service and will allow for a variety of seating, from standard airport bench seats to worktables and soft furnishings allocated throughout the space. The concourse is narrower than a standard double-loaded concourse, set at twenty-feet wide, and with little crossflow from entrances at concessions and restrooms, it will serve both arriving and departing passengers at peak periods with a good level of service.

Food and beverage concessions are recommended at the concourse given their higher demand and limited area to work within the existing concourse. The restrooms are located to best serve passengers arriving and departing, a short distance to walk from all points.

The building layout will allow the designers to take advantage of the adjacent gardens. The site orientation would also provide an opportunity to build a higher volume of space, allowing the gardens to extend onto the concourse and sunlight to enter the space.

Other westside facility development opportunities within the short-term timeframe are identified in ***Figure 4-10: Westside Development Facility Improvements Alternative 1: Short-Term***, to include converting the existing Cell Phone Lot to employee parking spaces designed to American with Disabilities Act (ADA) standards close to the terminal. Associated pedestrian improvements will ensure safe crossing from the employee parking.

The Cell Phone Lot and rideshare/taxi staging are moved to a parcel to the north of the terminal along S. Sossaman Road. Additional demand for rental parking supply will be accommodated by the Economy Lot and/or expansion of the rental support and staging facilities south of the terminal on S. Sossaman Road.

In the mid-term (10 years), as identified in ***Figure 4-11: Westside Development Facility Improvements Alternative 1: Medium-Term***, the Rental Drop-Off will be converted to a Daily Lot and Rental Pick-up to a Flex Lot with premium covered hourly parking and value-added service. This will shift the majority of rental parking supply to the economy lot, with Rental Flex Space remaining with the support and staging facilities to the south of the terminal. Pedestrian crossing improvements will ensure the safe crossing from the daily parking to the terminal. Additional Employee Parking demand will also be shifted to the Economy Lot. An increase in Economy Lot shuttle service may be needed during peak times. Demand is expected to shift to added Daily and Economy Lots, approximately 200 vehicle parking stalls are reclaimed for aeronautical purposes in the Daily Lot Annex to support three ADG-III RON, ROD aircraft parking positions.

In the long term (20 years), as identified in ***Figure 4-12: Westside Development Facility Improvements Alternative 1: Long-Term***, failing roadway operation of S. Sossaman Road is anticipated to require relocation of the terminal to the east side of the Airport. This coincides with the repurposing of parking on the south side of S. Sossaman road for future economic development opportunities. The Flex Lot will be converted to private aviation parking, and the Daily Lot Annex will be redeveloped for future aeronautical uses. The existing passenger terminal will be redeveloped for private and GA uses.

Considerations for future uses of the passenger terminal include:

- ✓ Relocation of the Gateway Aviation Center, an Airport-owned Fixed Base Operator (FBO), or similar type facility
- ✓ Additional hangar facilities

Advantages of this alternative:

- ✓ Addresses short- and mid-term deficits with minimal infrastructure and construction costs
  - o Striping in the Cell Lot for employee parking

  - Striping and modification of Rental Drop-Off
  - Improved pedestrian crossings
  - Improvements to the proposed northern Cell-Phone Lot
- ✓ Addresses short- and mid-term deficits while maintaining passenger parking proximity to terminal and "Just Plane Easy" Theme
- ✓ Capitalizes on covered parking in Rental Pick-Up by providing value-added service for hourly parking
- ✓ Provides rental operators with choice and flexibility based on developing needs
  - Economy Lot: Rental Flex, or
  - S. Sossaman Road Support Facilities: Rental Flex
- ✓ Westside terminal redevelopment
- ✓ Simplicity in phasing

Disadvantages of this alternative:

- ✓ Requires increased shuttle service from Economy Lot, for both passengers and Airport employees
- ✓ Daily Parking Lot in two locations during Mid-Term
  - Former Rental Drop-Off
  - Existing Daily Parking Lot
- ✓ Relocates rental car operators

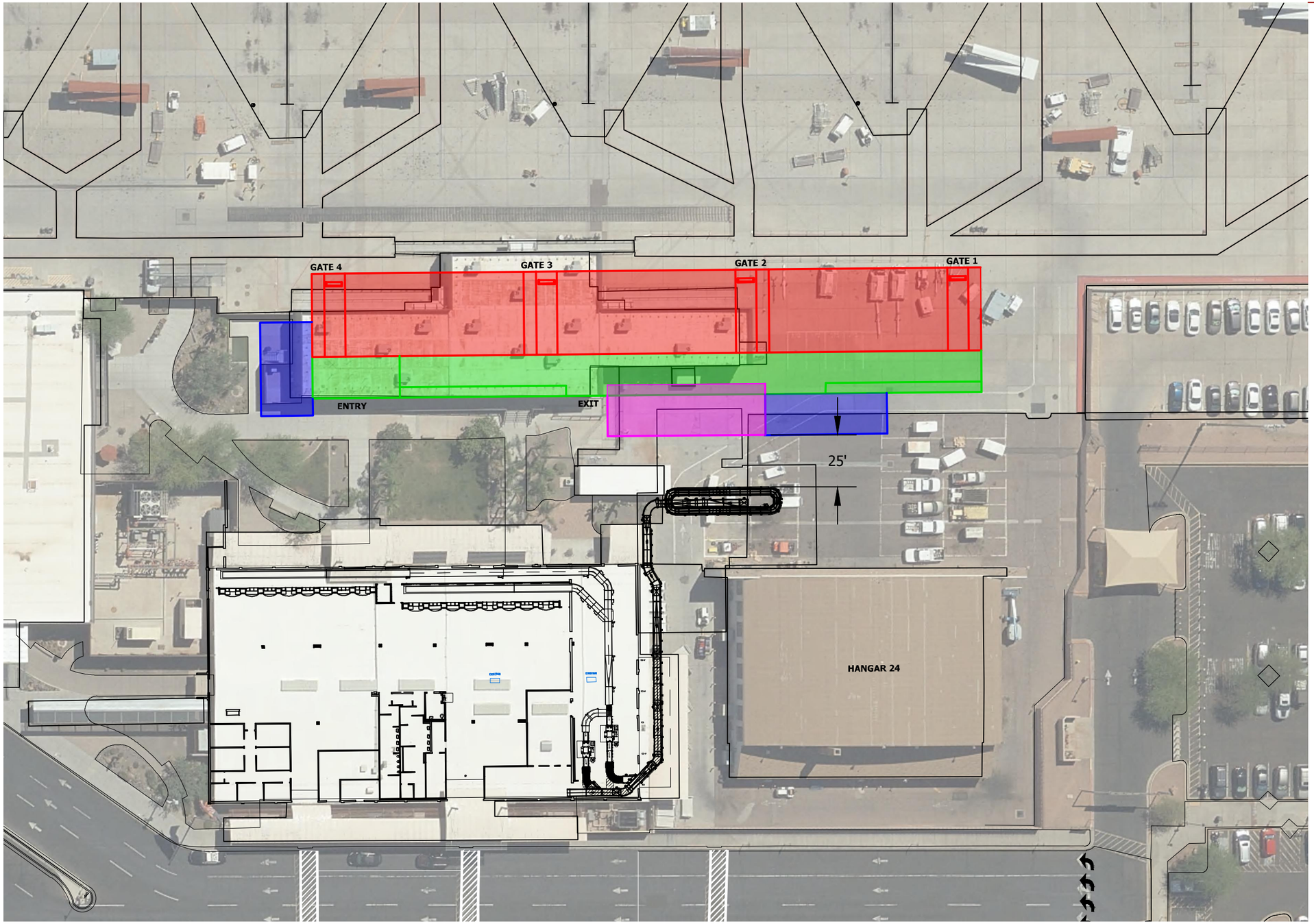
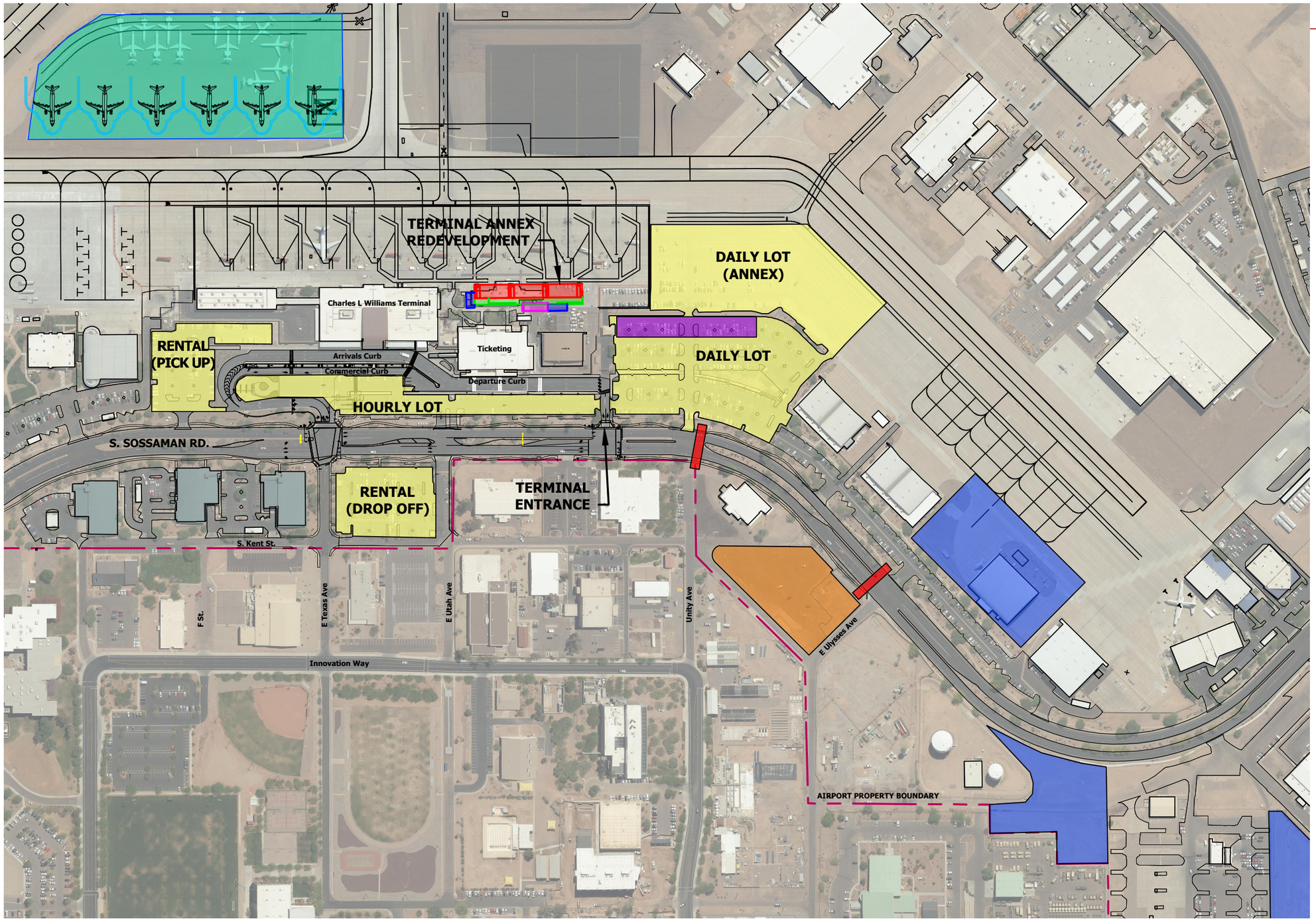
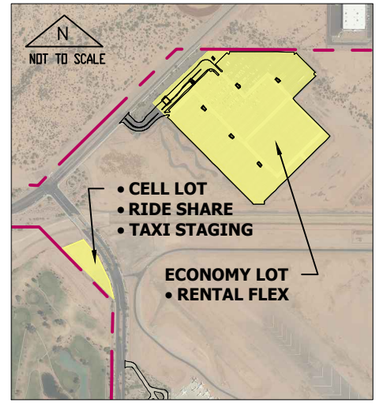


Figure 4-9
Terminal Annex Redevelopment Plan





Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Future ADA Employee Parking
- Future Employee Parking
- Improved Pedestrian Crossing
- Future Apron Pavement

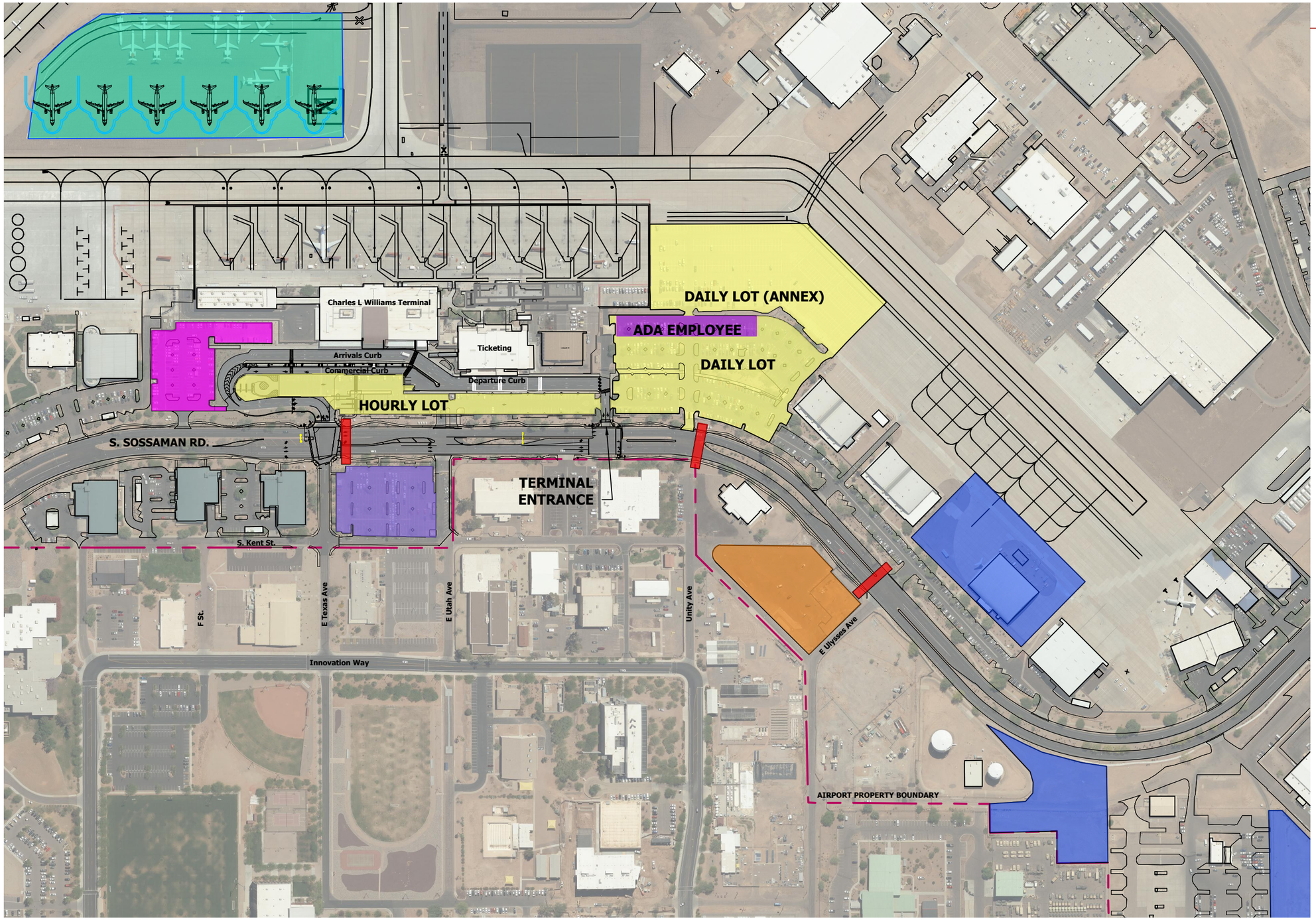
Terminal Annex Legend

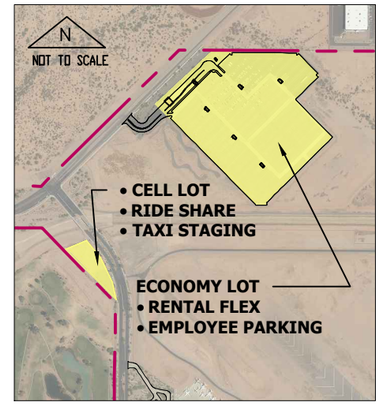
- Departure Lounges
- Food & Beverage
- Concourse
- Restroom

Note: Accompanied by changes to parking fee structure to encourage use of the Economy Lot.

N 0 150' 300' 600'
GRAPHIC SCALE IN FEET

Figure 4-10
Westside Development - Facility Improvement Alternative 1 Short Term





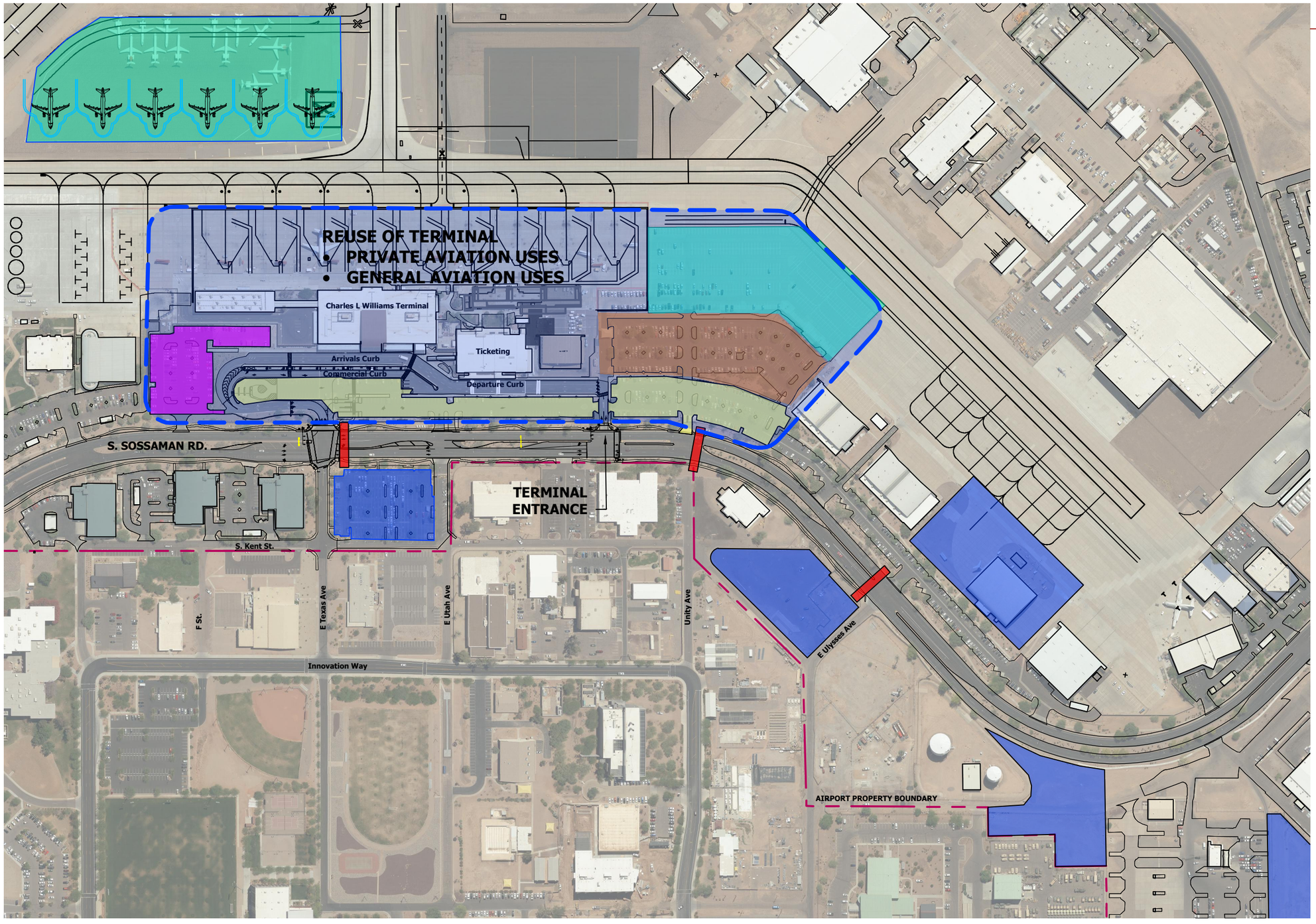
Northern Lots

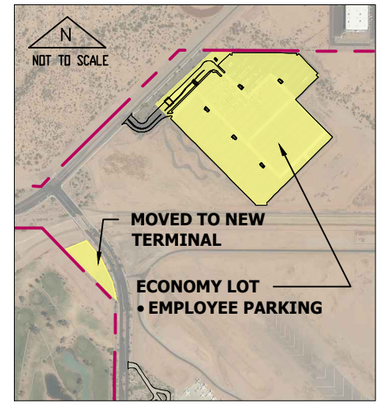
Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Future ADA Employee Parking
- Future Employee Parking
- Future Additional Daily Lot Parking
- Future Flex Lot Parking
  - Hourly
  - Value Added
- Future Reclaimed Apron
- Improved Pedestrian Crossing
- Future Apron Pavement

N 0 150’ 300’ 600’
GRAPHIC SCALE IN FEET

Figure 4-11
Westside Development - Facility Improvement Alternative 1 Mid Term





Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Potential Future Aeronautical Use
- Private Aviation Parking
- Future Reclaimed Apron
- Improved Pedestrian Crossing
- Future Apron Pavement

Note: Long-term changes dependent on terminal relocation.

N 0 150' 300' 600'
GRAPHIC SCALE IN FEET

Figure 4-12
Westside Development - Facility Improvement Alternative 1 Long Term

ALTERNATIVE 2: Westside Development Facility Improvements Alternative 2 – Short, Medium, and Long-Term

In the short term (five years), as identified in ***Figure 4-13: Westside Development Facility Improvements Alternative 2: Short-Term***, the existing Cell Phone Lot will be converted to employee parking, keeping ADA employee parking close to the terminal. Pedestrian improvements will ensure safe crossing from the new employee parking. The Cell Phone Lot and rideshare/taxi staging will be moved to a parcel north of the terminal along S. Sossaman Road. The existing Rental Drop-Off lot will be converted to a Rental Flex Lot, and along with the expansion of the rental support, and staging facilities will accommodate any additional Rental Parking demand. The Economy Lot will accommodate the bulk of Rental Drop-Off supply.

In the mid-term (10 years), as identified in ***Figure 4-14: Westside Development Facility Improvements Alternative 2: Medium-Term***, the Rental Drop-Off/Flex Lot will be converted to additional Employee Parking and Rental Pick-up as Flex Lot with premium covered hourly parking and value-added service. All rental parking demand will be accommodated in the Rental Flex areas of the Economy Lot in the form of a ConRAC facility. The existing Rental Car support and flex facilities to the south of the terminal will be relocated as part of the ConRAC facility. These areas will be made available for future economic development opportunities at that time. Pedestrian crossing improvements will ensure safe crossing from the new Employee Parking to the terminal. An increase in Economy Lot shuttle service may be needed during peak times.

During this timeframe, demand is expected to shift to the converted lots; approximately 200 vehicle parking stalls are reclaimed for aeronautical purposes in the Daily Lot Annex to support three ADG-III RON, ROD aircraft parking positions.

In the long term (20 years), as identified in ***Figure 4-15: Westside Development Facility Improvements Alternative 2: Long-Term***, failing roadway operation of S. Sossaman Road is anticipated to require relocation of the terminal to the east side of the Airport. This coincides with the repurposing of parking on the south side of S. Sossaman road for future economic development opportunities. The Flex Lot will be converted to private aviation parking, and the Daily Lot will be converted to general parking.

The passenger terminal itself will be redeveloped for private and GA uses. Considerations for future uses include:

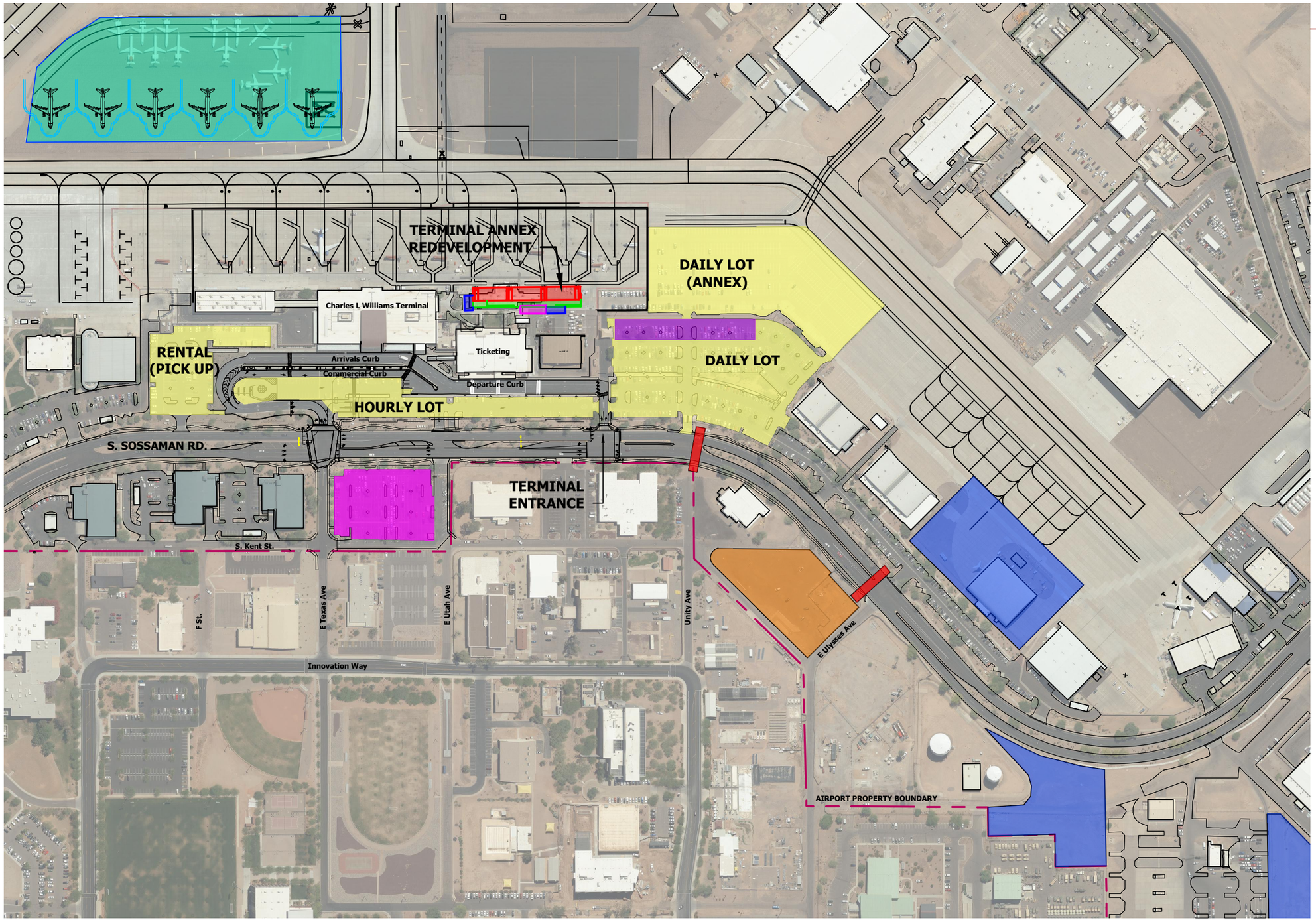
- ✓ Relocation of the Gateway Aviation Center, an Airport-owned FBO, or similar type facility
- ✓ Additional hangar facilities

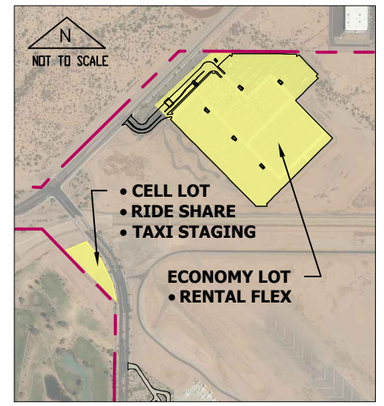
Advantages of this alternative:

- ✓ Addresses most short and mid-term deficits with minimal infrastructure and construction costs
  - o Striping in the Cell Lot for employee parking
  - o Striping and modification of Rental Drop-Off
  - o Improved pedestrian crossings
  - o Improvements to proposed northern Cell-phone Lot
- ✓ Capitalizes on covered parking in Rental Pick-Up by providing value-added service for hourly parking
- ✓ Location of Employee Parking is in close proximity to the terminal
- ✓ Provides Rental Car Operators with a permanent home by the mid-term
  - o ConRAC Facility at Economy Lot
- ✓ Westside terminal redevelopment in the mid-term timeframe

Disadvantages of this alternative:

- ✓ Requires increased shuttle service from Economy Lot, for both passengers and Airport employees
  - o More significant impact than Alternative 1
- ✓ Requires significant infrastructure and construction costs for Rental Car Facilities
  - o ConRAC Facility in economy lot
  - o Removal of fueling and car wash station





Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Future ADA Employee Parking
- Future Employee Parking
- Future Flex Lot Parking
  - Hourly
  - Value Added
- Improved Pedestrian Crossing
- Future Apron Pavement

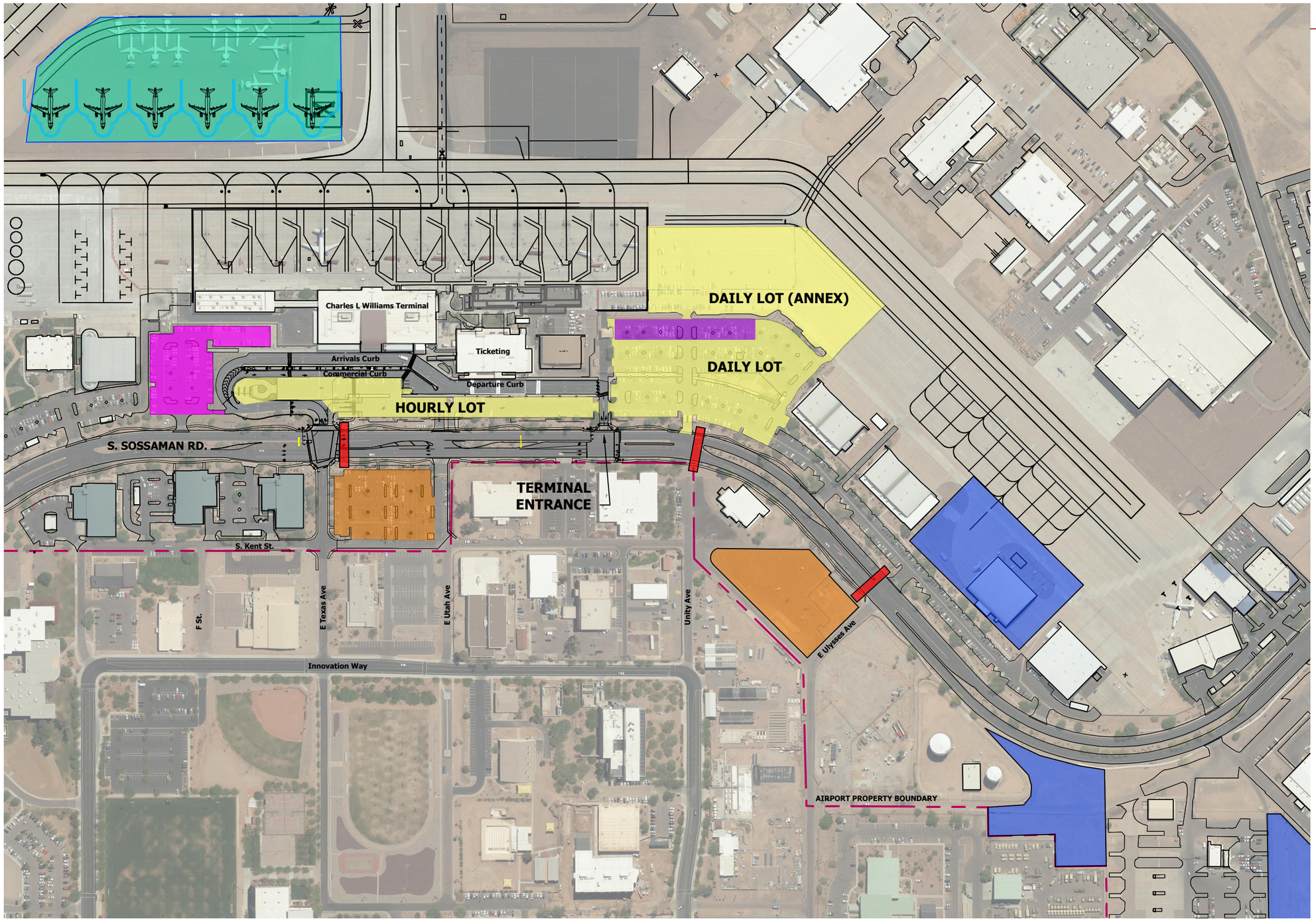
Terminal Annex Legend

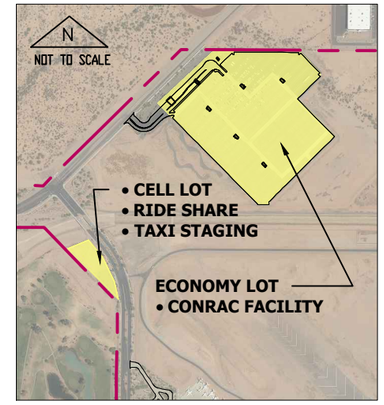
- Departure Lounges
- Food & Beverage
- Concourse
- Restroom

Note: Accompanied by changes to parking fee structure to encourage use of the Economy Lot.

N 0 150’ 300’ 600’
GRAPHIC SCALE IN FEET

Figure 4-13
Westside Development - Facility Improvement Alternative 2 Short Term





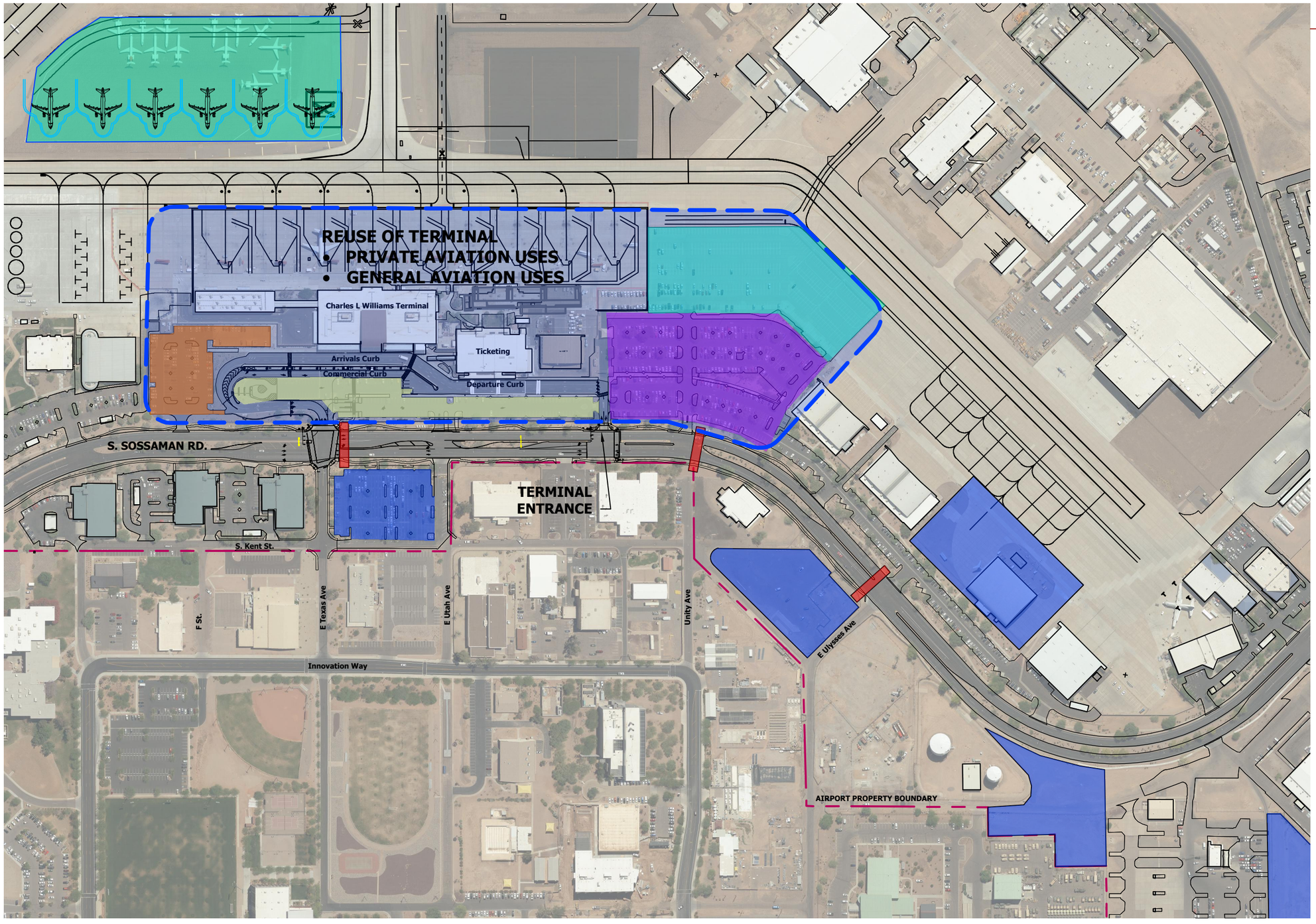
Northern Lots

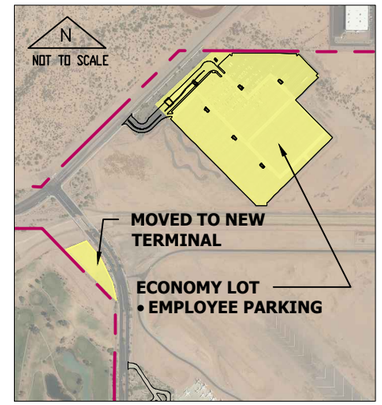
Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Future ADA Employee Parking
- Future Employee Parking
- Future Flex Lot Parking
  - Hourly
  - Value Added
- Future Reclaimed Apron
- Improved Pedestrian Crossing
- Future Apron Pavement

N
0 150' 300' 600'
GRAPHIC SCALE IN FEET

Figure 4-14
Westside Development - Facility Improvement Alternative 2 Mid Term





Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- General Parking to be Determined
- Private Aviation Parking
- Future Reclaimed Apron
- Improved Pedestrian Crossing
- Future Apron Pavement

Note: Long-term changes dependent on terminal relocation.

N
0 150’ 300’ 600’
GRAPHIC SCALE IN FEET

Figure 4-15
Westside Development - Facility Improvement Alternative 2 Long Term

Summary Evaluation of Westside Development Facility Improvement Alternatives

Table 4-5 presents an evaluation of the various alternatives for the westside development facility improvements at IWA.

Table 4-5: Summary Evaluation Matrix of Westside Development Facility Improvement Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2
Description of Improvement	Landside Development *(Short, Medium, and Long-Term)*	Landside Development *(Short, Medium, and Long-Term)*
PERFORMANCE REQUIREMENTS		
Accommodates Forecasted Parking Demand	Yes	Yes
Estimated Distance from Terminal to Vehicle Parking Lot/CONRAC	Shorter	Longer
OPERATIONAL CAPABILITIES		
Operability & Access to the Terminal	Yes	Yes
Operability & Access to Tenants	Yes	Yes
Surface Transportation Requirement Tenant/Airport Busing	Yes	Yes
LAND USE COMPATABILITY		
Impacts to Airport Property Use	Yes	Yes
Property Acquisition	No	No
Business Relocation	Yes	Yes
Impacts to Off-Airport Land Use	No	No
ENVIRONMENTAL IMPACT POTENTIAL		
Property Acquisitions/Easements	None	None
NEPA Compliance	Required	Required
Tenant Relocation	Yes	Yes
Existing Support/Utilities Infrastructure	Site Specific	Site Specific
STAKEHOLDER FEEDBACK		
"Just Plane Easy" Theme	Yes	No
Compatible with Existing Development	Yes	Yes
CONSTRUCTABILITY		
Impact to Airport Operations	Yes	Yes
Impact to Tenant Operations	Yes	Yes
Building/Facility Demolition	Yes	Yes
Phasing Complexity	Medium	High
ALTERNATIVES EVALUATION		
DETERMINATION	**FAVORABLE**	**NEUTRAL**

Replacement Passenger Terminal Alternatives

As discussed in the **Facility Requirements Chapter**, a new replacement passenger terminal, located on the Airport's east side, is identified as a long-term solution in meeting anticipated passenger demand and airport service level goals, and providing growth for the future. The forecasted passenger growth will require a 28-gate passenger replacement terminal to provide additional space in almost every functional terminal area component. The initial 10 gates serve as one-for-one replacement gates with the remaining 18 gates to be phased in over time to provide maximum flexibility. The overall terminal area was designed to represent a maximum-build scenario. It was determined that the new replacement terminal will consist of 28 contact gates, supporting aircraft apron area, passenger vehicle parking, ConRAC with a supporting Quick Turn Area (QTA) for maintenance and fueling facilities, an Airport-owned fuel farm, and a supporting roadway network to support growth in future aeronautical and non-aeronautical development. This section describes the evaluation of alternatives for an eastside replacement passenger terminal and identified support facilities.

Overview of Terminal Concepts and Planning Assumptions

Development of an airport terminal program involves specific operational considerations that create a unique environment. These considerations include air carriers serving the public, passenger population characteristics and needs, and the number of daily flights. Air carriers have a proprietary brand that defines their culture and service. Most carriers maintain customer service standards for processing passengers in acceptable wait and processing times. Over time, these standards have become similar across air carrier service models, with an acceptable level of service closely tied to company metrics on staffing. For this master plan, multiple carriers are considered to be operating from this replacement passenger terminal. Improvements in all processes over time are included, given the timeframe within which they will be developed. Generally, the analysis reflects these assumptions and standards:

- ✓ Design Aircraft: Airbus 320-200, Boeing 737-800, and Boeing Max 8 aircraft
- ✓ Aircraft Seats: 177–178 Seats
- ✓ Design Load Factor: 85 percent
- ✓ Peak Hour Passenger Demand: 65 percent

Peak hour demand is determined by factoring aircraft seat capacity, a total of all aircraft arriving or departing within the period. With air carrier load factors increasing over the past 10 years, the design load factor was set at 85 percent of the total aircraft seats, corresponding to the existing terminal planning criteria. Passengers arrive at the Airport over a period of two to three hours prior to their departure time. Recent experience at destination airports indicates that the greatest number of passengers arrive approximately 100 to 60 minutes prior to their flights' scheduled departures. The figure used in planning for this future terminal is approximately 65 percent of departing passengers. This reflects passenger behavior in response to factors such as distance traveled to the airport, access from parking to the terminal, processing time through check-in and security screening, amenities offered post-security, and distance to gates. The terminal planning assumptions are identified in ***Table 4-6*.**

Table 4-6: Terminal Planning Assumptions – Peak Hour Passenger Demand by Development Phase

PEAK HOUR DEPARTING PASSENGERS	PHASE 1	PHASE 2	PHASE 3
Departing Flights	10	9	9
Total Aircraft Seats	1,770	1,593	1,593
Design Load Factor (85%)	1,505	1,354	1,354
Peak Hour Departing Passengers (65%)	1,151	1,035	1,035
Passenger Checking Bags (30%)	531	478	478
Security Screening Capacity/Lane/HR	180	200	220
Departures Lounge Area/Passenger	20	20	20
PEAK HOUR ARRIVING PASSENGERS	**PHASE 1**	**PHASE 2**	**PHASE 3**
Arriving Flights	8	9	10
Total Aircraft Seats	1,416	1,593	1,770
Design Load Factor (85%)	1,204	1,354	1,505
Passengers Claiming Bags (30%)	361	406	451
Baggage Claim Display Frontage	542	609	677
Baggage Claim Area/Passenger	25	25	25

Notes: Departing passenger flights are cumulative, 10 flights in Phase 1, 19 in Phase 2 and 28 total in Phase 3 for early morning departures.
Arriving passenger flights are cumulative, occur in various flight banks with nighttime peak arrival periods.
Assumes multiple airlines operating at the Airport.

Ticketing Hall

The terminal ticketing and baggage check-in hall processing and space requirements were determined using assumptions for departing flights, using the first outbound bank of morning departures as the peak period, a time when all gates are occupied and anticipated to depart within the hour. For opening day of the new terminal, all flights were assumed to depart in this period, reflecting an evolution in the flight schedule over time.

Other factors affecting this terminal component are check-in preference and bag check-in processes, the former moving toward passenger self-check-in over the past 10 years and continuing this trend over the next 10 years. Baggage check-in will move toward self-check as well, using facial recognition as the vehicle to make it secure based on current work by Customs & Border Protection, with passengers managing the process. Ticket counters will include traditional agent, kiosk, and self-check baggage machines.

These trends are expected to produce gains in processing such that the number of positions will increase at a slower pace than has traditionally been the case, one of a direct correlation between an increasing number of passengers and additional ticket positions. In the future, check-in positions will process more passengers, absorbing growth. ***Table 4-7*** is a summary of the ticket hall requirements.

Table 4-7: Ticketing Hall Requirements

TICKETING	PHASE 1	PHASE 2	PHASE 3	TOTAL
Kiosks	36	32	32	101
Counter Positions	27	25	25	75
Total Positions	**63**	**57**	**57**	**176**
Airline Ticket Office Public Space-Passenger Contact & Q (SF)	2,616	2,454	2,502	7,572
Airline Ticket Office Public Counter Space (SF)	2,616	2,454	2,502	7,572
Airline Ticket Office Operations Areas (SF)	6,540	6,135	6,255	18,930
Ticket Hall Circulation (SF)	6,540	6,135	6,255	18,930
Ticket Hall Waiting Area (SF)	5,450	5,113	5,213	15,775
Ticketing Check-In / Baggage Check-In Area	**24,852**	**23,313**	**23,769**	**71,934**

Security Screening Checkpoint

The TSA has installed passenger security screening checkpoint (SSCP) advanced imaging technology (AIT) to assist with the detection of weapons, explosives, and other objects concealed under a person's clothing that may not trigger a metal detector. AIT creates a visual image of an individual showing the surface of the skin and revealing other objects on the body, and may include devices using backscatter x-rays, millimeter waves, and/or devices referred to as "whole-body imaging technology" or "body scanning machines." Security screening will transform over the next ten years as new screening technologies are introduced, such as automated security lanes (ASL), which have already dramatically reduced the time it takes to screen passengers. The TSA is working on programs that will incorporate biometric identification and computed tomography screening systems that will continue to streamline passenger identification and baggage screening, respectively. The TSA's Pre✓® program subscription will also continue to grow, further reducing overall wait and processing times, allowing fewer machines required for security screening.

The security checkpoint lane area detailed in ***Table 4-8: TSA Security Screening Requirements*** will include additional depth over the traditional TSA layouts in the checkpoint design guide, mainly for queueing and re-composure, leading to longer lanes. ***Table 4-8*** is a summary of the security screening requirements.

Table 4-8: TSA Security Screening Requirements

PASSENGER SECURITY SCREENING CHECKPOINT	PHASE 1	PHASE 2	PHASE 3	TOTAL
Peak Hour Originating Aircraft Seats	**1,770**	**1,593**	**1,593**	**4,956**
Peak Hour Design Load Factor	85%	85%	85%	
Peak Hour Originating Passengers (PHOP)	1,505	1,354	1,354	4,213
Peak 10 Minutes Arriving Percentage of PHOP	10%	10%	10%	10%
Peak 10 Minutes Arriving PHOP	151	136	136	423
Passenger Security Screening 10 Minute Screening Capacity Per Lane	30	33	36	33
Total Security Screening Checkpoint (SSCP) Lanes Required	**6**	**5**	**4**	**13**
SSCP PreCheck Lanes	**1**	**1**	**1**	**3**
SSCP Advanced Imaging Technology (AIT) Machines Required	**3**	**2**	**2**	**7**

Gate Departures Lounges

The lounge area for gate departures is determined by the aircraft type at each gate. The design aircraft is an Airbus 320. Generally, the ADG III maximum wingspan plus wingtip separation is multiplied by a 30-foot departure lounge depth to yield the total area required for the departure lounge. This component has been evolving as more amenities are inserted into the lounge or set at the perimeter. Planning for this program assumed a central market concept with smaller concessions along the concourse, providing a greater concentration of options for customers and a higher revenue for vendors. A combination of embedded concessions and a central market will become more relevant as the concourses expand and distance to lounges factors into passengers' decisions to visit concessions.

Total concourse area was calculated using a 120-foot-wide concourse, allowing for center concourse concessions as well as those embedded in the lounges.

Table 4-9 is a summary of the departures lounge requirements.

Table 4-9: Departures Lounge Requirements

PASSENGER GATE DEPARTURE LOUNGE	PHASE 1	PHASE 2	PHASE 3	TOTAL
Peak Hour Originating Aircraft Seats	**1,770**	**1,593**	**1,593**	**4,956**
Peak Hour Design Load Factor	85%	85%	85%	
Peak Hour Originating Passengers	1,505	1,354	1,354	4,213
Passenger Gate Departure Lounge Area Per Passenger (SF)	18.3	18.3	18.3	18.3
Passenger Gate Departure Lounge Recommended Area (SF)	27,532	24,779	24,779	77,091
Total Narrow-Body Aircraft Group III Gates	**10**	**9**	**9**	**28**
Passenger Gate Departure Lounge Area (SF)	27,532	24,779	24,779	77,091
Passenger Gate Departure Lounge Average Area Per Gate (SF)	2,753	2,753	2,753	
Gate Ticket Lift Area (SF)	240	240	240	240
Passenger Boarding Corridor (SF)	180	180	180	180
Total Gate Ticket Lift and Passenger Boarding Corridor Area	4,200	3,780	3,780	11,760
Total Passenger Departure Lounge Area Required	**31,732**	**28,559**	**28,559**	**88,851**

Baggage Claim Hall

Inbound baggage claim devices operate for relatively short periods of time. When bags are delivered to the device, passengers can quickly reclaim their luggage and move on to car rental counters or leave the claim hall. Overlapping arrivals generate congestion. Providing adequate display frontage and capacity for the baggage claim device can be addressed by the type of device used. Because a sloped palette provides more capacity than flat-plate devices, the sloped palette was assumed for this master plan.

The baggage claim hall also will include airline baggage service offices, car rental counters, restrooms, the concourse and waiting area. ***Table 4-10*** is a summary of the baggage claim hall area requirements.

Table 4-10: Baggage Claim Hall Requirements

BAGGAGE CLAIM AREA & CLAIM HALL	PHASE 1	PHASE 2	PHASE 3	TOTAL
Peak Hour Arriving Aircraft Seats	**1,770**	**1,593**	**1,593**	**4,956**
Peak Hour Design Load Factor	85%	85%	85%	
Peak Hour Arriving Passengers	1,505	1,354	1,354	4,213
Peak Hour Arriving Passengers Terminating	100%	100%	100%	
Peak Hour Terminating Passengers w/Bags (Percent)	30%	30%	30%	
Peak Hour Terminating Passengers w/Bags	452	407	407	1,266
Peak Twenty Minute Terminating Passengers w/Bags (Percent)	100%	100%	100%	
Peak Twenty Minute Terminating Passengers w/Bags	452	407	407	1,266
Bags Per Passenger Claiming	1.0	1.0	1.0	
Sub-Total Baggage Claim Area (SF)	14,072	12,836	12,836	39,743
Baggage Claim Hall Area Circulation Factor (Adjacent Concourse)	25%	25%	25%	
Baggage Claim Hall Area	3,518	3,209	3,209	
Total Baggage Claim Area Recommended (SF)	17,590	16,045	16,045	49,679

Summary

The terminal building program will be supplemented by other components and ancillary space. The estimates above will drive terminal development to achieve performance and space requirements. The main hall between the ticketing and baggage claim halls serves as a central entrance to the terminal, providing a gathering point for departing passengers and leading to security screening. Although passenger processing may change, the sequential flow through the terminal will remain the same.

TSA inspection services for checked baggage and make-up areas for air carrier outbound baggage are proposed in lower level space under the concourse or vertical circulation hall. Airline line cargo and aircraft maintenance areas are proposed to be contained under the concourses, as are mechanical, electrical and plumbing/fiber and telecom (MEP/FT) and concessions stores. Airport maintenance areas will also be housed under the terminal area.

ALTERNATIVE 1: Pier-Finger Design (28 Gates)

This alternative, shown in ***Figure 4-16: Pier-Finger Design (28 Gates)***, will replace the terminal with a pier-finger passenger terminal in a three phased development program. The concept of a pier-finger terminal is a simple passenger terminal with "fingers" or concourses attached to the terminal building with gates for aircraft parking. Ticketing and security screening occur in the main area of the terminal, and then passengers walk to the holding areas of the concourse to board an aircraft. Baggage claim will also be in the main terminal area. The pier-finger terminal design will offer a centralized passenger processing concept.

Two concourses will serve the terminal with a total of 28 contact gates that accommodate ADG-III aircraft such as the Airbus A320, Boeing B737, and the Max 8. The initial terminal program will require 10 contact gates with supporting infrastructure. Demand will dictate when the remaining 18 gates will be developed. All passenger boarding bridges will have 400 Hertz power, pre-conditioned air, and potable water. Hydrant fueling capability is possible for each aircraft parking position, if so desired. The terminal apron will be

designed according to ADG-III dual taxilane criteria to facilitate efficient aircraft movements to and from the airfield.

Support facilities for the replacement terminal will be:

- ✓ A dedicated fuel farm
- ✓ Passenger vehicle parking
- ✓ A ConRAC with supporting QTA for maintenance and fueling facilities
- ✓ A new roadway network with the main entrance to the terminal from Hawes Road
- ✓ Indirect access from Ellsworth Road
- ✓ A supporting roadway network to allow access to the landside areas.

This terminal concept will support 244 acres of aeronautical development, and 360 acres of non-aeronautical development. ***Table 4-11*** details the planning assumptions used in the pier-finger terminal design.

Table 4-11: Pier-Finger Terminal Planning Assumptions - Arrivals, Departures Demand Profile

ARRIVALS/DEPARTURES DEMAND PROFILE	PHASE 1	PHASE 2	PHASE 3	TOTAL
Design Aircraft	A320/B737	A320/B737	A320/B737	A320/B737
Design Aircraft Seats	177	177	177	177
Peak Hour Design Load Factor	85%	85%	85%	85%
Peak Hour Originating Aircraft Seats[1]	**1,770**	**1,593**	**1,593**	**4,956**
Total Peak Hour Passengers	1,505	1,354	1,354	4,213
Peak Hour Originating Passengers (PHOP)	**1,505**	**1,354**	**1,354**	**4,213**
Peak Ten Minute Percent of Originating Passengers	20%	20%	20%	20%
Peak Ten Minute Originating Passengers	301	271	271	843
Peak Hour Arrving Flights	8	9	10	27
Peak Hour Terminating Aircraft Seats	1,416	1,593	1,770	
Peak Hour Terminating Passengers (PHTP)	**1,204**	**1,354**	**1,505**	**1,505**
Peak Hour Terminating Passengers w/Bags Percent	30%	30%	30%	30%
Peak Hour Terminating Passengers w/Bags Percent	361	406	451	451
Peak Twenty Minute Terminating Passengers w/Bags	**361**	**406**	**451**	**451**
Peak Twenty Minute Terminating Passengers w/Bags Percent	100%	100%	100%	100%
Source: Mead & Hunt & InterVistas, 2019				
1] Mead & Hunt Master Plan Options, 2019				

As identified in ***Table 4-12***, a detailed terminal component program summary was developed for the pier-finger terminal alternative.

Table 4-12: Pier-Finger Terminal Component Program

TERMINAL COMPONENT PROGRAM SUMMARY	PHASE 1	PHASE 2	PHASE 3	TOTAL
Ticketing				
Kiosks	22	19	19	101
Counter Positions	13	12	12	75
Total Positions	**35**	**31**	**31**	**97**
Airline Ticket Office Public Space-Passenger Contact & Q (SF)	2,616	2,454	2,502	7,572
Airline Ticket Office Public Counter Space (SF)	2,616	2,454	2,502	7,572
Airline Ticket Office Operations Areas (SF)	6,540	6,135	6,255	18,930
Ticket Hall Circulation (SF)	6,540	6,135	6,255	18,930
Ticket Hall Waiting Area (SF)	5,450	5,113	5,213	15,775
Ticketing Check-In / Baggage Check-In Area	**30,302**	**28,426**	**28,982**	**87,709**
Outbound Checked Baggage Screening				
EDS Inline Checked Baggage Screening Machines	4	2	2	8
ETD Machines	5	5	5	15
Total Area	**10,000**	**5,000**	**5,000**	**20,000**
Departing Passenger Security Screening				
Total SSCP Lanes Required	**6**	**5**	**4**	**13**
SSCP PreCheck Lanes	1	1	1	3
SSCP AIT Machines Required	3	2	2	7
Total SSCP Area Required	**9,900**	**8,250**	**6,600**	**21,450**
Passenger Gate Departure Lounge				
Total Recommended Aircraft Gates	**10**	**10**	**8**	**28**
Passenger Gate Departure Lounge Area (SF)	27,532	24,779	24,779	77,091
Total Gate Ticket Lift and Passenger Boarding Corridor Area	4,200	4,200	3,360	11,760
Total Passenger Departure Lounge Area Required	**31,732**	**28,979**	**28,139**	**88,851**
Baggage Claim Hall				
Recommended Number of Baggage Claim Devices	**3**	**3**	**3**	**8**
Active Claim Area (SF)	8,678	7,814	7,814	24,307
Area of Baggage Claim Devices	4,339	3,907	3,907	12,154
Meeter/Greeter Area @ 20 SF Each (SF)	904	814	814	0
Smarte Cart Staging/Storage Device Area (SF)	150	300	300	750
Airline Baggage Services Offices	5	6	7	0
Airline Baggage Services Offices Area (SF)	825	990	1,155	2,970
Baggage Claim Hall Area (Adjacent Concourse)	3,518	3,209	3,209	0
Total Baggage Claim Area Recommended (SF)	**18,415**	**16,045**	**16,045**	**49,679**
Concessions/Retail				
Central Hall Marketplace	12,000	-	-	12,000
Concourse Food & Beverage	2,000	2,000	2,000	6,000
Concourse Retail News/Gifts	1,000	1,200	1,200	3,400
Total Concessions/Retail	**15,000**	**3,200**	**3,200**	**21,400**
Restrooms				
Arrivals Hall	1,875	-	-	1,875
Departures Hall	1,875	-	-	1,875
Concourse	3,751	3,751	3,751	11,252
Total Restrooms	7,501	3,751	3,751	15,002
Total Functional Component Area Requirements	**115,349**	**86,699**	**84,765**	**286,813**
Support Function Area Requirements				
Concourse Circulation	40,500	40,500	32,400	113,400
North & South Halls	22,400	22,400	-	44,800
Other Circulation @ 20% of Total Component Area	23,070	17,340	16,953	57,363
Airline Operations Ground Support Areas @ 20% of Concourse	14,446	13,896	12,108	40,450
Airport Facilities Maintenance	10,000	5,000	5,000	20,000
Total Support Functions Area Requirements	110,416	99,136	66,461	276,013
Sub-Total Support Function Area Requirements	**225,765**	**185,835**	**151,226**	**562,826**
Building MEP/FT @ 8% of Total Area [Enclosed Area]	18,061	14,867	12,098	45,026
Sub-Total	**243,826**	**200,702**	**163,324**	**607,852**
Building Structure & Envelope @ 5% of Total Area	12,191	10,035	8,166	30,393
Total Building	**256,018**	**210,737**	**171,490**	**638,244**

Advantages associated with this alternative are:

- ✓ Shorter passenger walking distances for transfer passengers
- ✓ Greater efficiency of double-loaded concourses over single-loaded concourses
- ✓ Efficient use of land and economical construction
- ✓ Dual ADG-III taxilane criteria supporting the terminal
- ✓ Potential to expand the terminal to accommodate additional gates and larger ADG-IV aircraft
- ✓ Consolidated equipment rooms and utility runs.

Disadvantages associated with this alternative:

- ✓ Longer walking distances for passengers from vehicle to aircraft gate
- ✓ Future expansion limited by alleyway that the Pier-finger concept creates between concourses
- ✓ Greater roadway congestion at terminal curbs for passenger pick-up and drop-off due to short curb frontage
- ✓ Reduced aircraft circulation for ingress/egress to/from taxiway system.

ALTERNATIVE 2: Curvilinear-Pier Design (30 Gates)

This alternative, shown in ***Figure 4-17: Curvilinear-Pier Design (30 Gates)***, will replace the existing terminal with a curvilinear-pier passenger terminal in a five phased development program. The curvilinear-pier terminal concept is considered a hybrid of the "pier-finger" and "linear-pier" terminal concepts. Many of the design attributes for the curvilinear-pier terminal are the same as the pier-finger terminal concept. Certain portions of the concourse area will be either double- or single-loaded, which determines the efficiencies and inefficiencies relative to aircraft parking. The main functions of the terminal, passenger processing (ticketing and security screening), and baggage claim, are accomplished in the main terminal area, with passenger holding areas in the concourse. This hybrid concept design will centralize passenger processing.

Ultimately, three concourses will serve the terminal with a total of 30 contact gates that accommodate ADG-III aircraft such as the Airbus A320, Boeing B737, and the Max 8. The initial terminal program requires 10 contact gates with supporting infrastructure. Demand will dictate when the remaining 20 gates will be developed. All passenger boarding bridges will have 400 Hertz power, pre-conditioned air, and potable water. Hydrant fueling capability is possible for each aircraft parking position, if desired. The terminal apron will be designed according to ADG-III dual taxilane criteria to facilitate efficient aircraft movements to and from the airfield. An important differentiator between the pier-finger and the curvilinear terminal design is that aircraft using gates in the vicinity of the building curvature may experience delays accessing and leaving the airfield due to reduced ingress/egress access routes to aircraft parking positions.

Support facilities for the replacement terminal will be:

- ✓ Dedicated fuel farm
- ✓ Passenger vehicle parking
- ✓ ConRAC with supporting QTA for maintenance and fueling facilities

- ✓ New roadway network with the main entrance to the terminal from Hawes Road
- ✓ Indirect access from Ellsworth Road
- ✓ Supporting roadway network to allow access to the landside areas.

This terminal concept supports 244 acres of aeronautical development, and 360 acres of non-aeronautical development. ***Table 4-13*** details the planning assumptions used in the curvilinear-pier terminal design.

Table 4-13: Curvilinear-Pier Terminal Planning Assumptions - Arrivals, Departures Demand Profile

ARRIVALS/DEPARTURES DEMAND PROFILE	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	TOTAL
Design Aircraft	A320/B737	A320/B737	A320/B737	A320/B737	A320/B737	A320/B737
Design Aircraft Seats	177	177	177	177	177	177
Peak Hour Design Load Factor	85%	85%	85%	85%	85%	85%
Peak Hour Originating Aircraft Seats[1]	**1,770**	**1,239**	**1,239**	**531**	**531**	**5,310**
Total Peak Hour Passengers	1,505	1,053	1,053	451	451	4,514
Peak Hour Originating Passengers (PHOP)	**1,505**	**1,053**	**1,053**	**451**	**451**	**4,514**
Peak Ten Minute Percent of Originating Passengers	20%	20%	20%	20%	20%	20%
Peak Ten Minute Originating Passengers	301	211	211	90	90	903
Peak Hour Arrving Flights	8	9	10	11	12	-
Peak Hour Terminating Aircraft Seats	1,416	1,593	1,770	1,947	2,124	2,124
Peak Hour Terminating Passengers (PHTP)	**1,204**	**1,354**	**1,505**	**1,655**	**1,805**	**1,805**
Peak Hour Terminating Passengers w/Bags Percent	30%	30%	30%	30%	30%	30%
Peak Hour Terminating Passengers w/Bags Percent	361	406	451	496	542	**542**
Peak Twenty Minute Terminating Passengers w/Bags	**361**	**406**	**451**	**496**	**542**	**542**
Peak Twenty Minute Terminating Passengers w/Bags Percent	100%	100%	100%	100%	100%	100%
Source: Mead & Hunt & InterVistas, 2019						
1] Mead & Hunt Master Plan Options, 2019						

As identified in ***Table 4-14***, a detailed terminal component program summary was developed for the curvilinear-pier terminal design.

Table 4-14: Curvilinear-Pier Terminal Component Program

TERMINAL COMPONENT PROGRAM SUMMARY	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	TOTAL
Ticketing						
Kiosks	22	15	15	-	-	52
Counter Positions	13	9	9	-	-	31
Total Positions	35	24	24	-	-	83
Airline Ticket Office Public Space-Passenger Contact & Q (SF)	2,616	1,908	1,956	-	-	6,480
Airline Ticket Office Public Counter Space (SF)	2,616	1,908	1,956	-	-	6,480
Airline Ticket Office Operations Areas (SF)	6,540	4,770	4,890	-	-	16,200
Ticket Hall Circulation (SF)	6,540	4,770	4,890	-	-	16,200
Ticket Hall Waiting Area (SF)	5,450	3,975	4,075	-	-	13,500
Ticketing Check-In / Baggage Check-In Area	30,302	22,101	22,657	-	-	75,060
Outbound Checked Baggage Screening						
EDS Inline Checked Baggage Screening Machines	4	3	3	2	2	10
ETD Machines	5	4	4	2	2	17
Total Area	10,000	7,500	7,500	5,000	5,000	25,000
Departing Passenger Security Screening						
Total SSCP Lanes Required	6	4	3	2	2	17
SSCP PreCheck Lanes	1	1	1	1	1	5
SSCP AIT Machines Required	3	2	1	1	1	8
Total SSCP Area Required	9,900	6,600	4,950	3,300	3,300	28,050
Passenger Gate Departure Lounge						
Total Recommended Aircraft Gates	10	7	7	3	3	30
Passenger Gate Departure Lounge Area (SF)	27,532	19,273	19,273	8,260	8,260	82597
Total Gate Ticket Lift and Passenger Boarding Corridor Area	4,200	2,940	2,940	1,260	1,260	12600
Total Passenger Departure Lounge Area Required	31,732	22,213	22,213	9,520	9,520	95,197
Baggage Claim Hall						
Recommended Number of Baggage Claim Devices	3	2	2	1	1	9
Active Claim Area (SF)	8,678	6,067	6,067	2,611	2,611	26,035
Area of Baggage Claim Devices	4,339	3,034	3,034	1,306	1,306	13,018
Meeter/Greeter Area @ 20 SF Each (SF)	904	632	632	272	272	0
Smarte Cart Staging/Storage Device Area (SF)	150	300	300	300	300	1350
Airline Baggage Services Offices	5	6	7	7	7	0
Airline Baggage Services Offices Area (SF)	825	990	1,155	1,155	1,155	5,280
Baggage Claim Hall Area (Adjacent Concourse)	3,518	2,508	2,508	1,122	1,122	10,779
Total Baggage Claim Area Recommended (SF)	18,415	12,541	12,541	5,611	5,611	53,894
Concessions/Retail						
Central Hall Marketplace	12,000	-	-	-	-	12,000
Concourse Food & Beverage	2,000	2,000	2,000	1,200	1,200	8,400
Concourse Retail News/Gifts	1,000	1,200	1,200	600	600	4,600
Total Concessions/Retail	15,000	3,200	3,200	1,800	1,800	25,000
Restrooms						
Arrivals Hall	1,875	-	-	-	-	1,875
Departures Hall	1,875	-	-	-	-	1,875
Concourse	3,751	3,751	3,751	1,875	1,875	15,002
Total Restrooms	7,501	3,751	3,751	1,875	1,875	18,753
Total Functional Component Area Requirements	122,850	77,905	76,811	3,751	3,751	320,954
Support Function Area Requirements						
Concourse Circulation	40,500	28,350	28,350	12,150	12,150	121,500
Other Circulation @ 20% of Total Component Area	24,570	15,581	15,362	750	750	55,513
Airline Operations Ground Support Areas @ 20% of Concourse	14,446	10,113	10,113	4,334	4,334	34,672
Airport Facilities Maintenance	10,000	5,000	5,000	5,000	5,000	20,000
Total Support Functions Area Requirements	89,516	59,044	58,825	22,234	22,234	231,685
Sub-Total Support Function Area Requirements	212,367	136,949	135,636	25,985	25,985	552,638
Building MEP/FT @ 8% of Total Area [Enclosed Area]	16,989	10,956	10,851	0	0	44,211
Sub-Total	229,356	147,905	146,487	25,985	25,985	596,849
Building Structure & Envelope @ 5% of Total Area	11,468	7,395	7,324	0	0	29,842
Total Building	240,824	155,300	153,811	25,985	25,985	626,692

Advantages associated with this alternative are:

- ✓ Less roadway congestion due to long curb frontage at terminal curbs for passenger pick-up and drop-off
- ✓ Expansion of terminal possible to accommodate ADG-IV and greater aircraft
- ✓ Dual ADG-III taxilane criteria supporting the terminal
- ✓ Simplistic design and layout of aircraft parking.

Disadvantages associated with this alternative are:

- ✓ Longer walking distances for transfer passengers
- ✓ Longer walking distances for passengers from vehicle to aircraft gate
- ✓ Less efficient passenger processing due to size and vertical circulation requirement
- ✓ Limited expansion capabilities beyond 30 gates
- ✓ Hybrid design yields less efficient, single-loaded concourses compared to more efficient, double-loaded concourses
- ✓ Reduced aircraft circulation for ingress/egress to/from taxiway system as a result of the building design (building curve).

ALTERNATIVE 3: Linear-Pier Design (28 Gates)

This alternative, shown in ***Figure 4-18: Linear-Pier Design (28 Gates)***, will replace the existing terminal with a linear-pier passenger terminal in a three phased development program. The linear-pier terminal concept allows for aircraft to be positioned in a perpendicular, nose-in relationship to the pier. This type of configuration works well for airports that predominately serve origin and destination travelers, and hub characteristics. Access to the terminal area will be at the base of the concourse or pier. Pedestrian circulation will move down the center of the pier through a corridor with holdrooms. Various services and amenities will be arranged along both sides of the circulation spine to serve enplaning and deplaning passengers. This concept will fully separate the passenger processing functions from the concourse activities, thus enabling each element to develop according to its own requirements.

Ultimately, a single concourse will serve the terminal with a total of 28 contact gates accommodating ADG-III aircraft such as the Airbus A320, Boeing B737, and Max 8. The initial terminal program will require 10 contact gates with supporting infrastructure. Demand will dictate when the remaining 18 gates will be developed. All passenger boarding bridges will have 400 Hertz power, pre-conditioned air, and potable water. Hydrant fueling capability is possible for each aircraft parking position, if desired. The terminal apron will be designed according to ADG-III dual taxilane criteria to facilitate efficient aircraft movements to and from the airfield. Backside gates, however, will only meet ADG-III single taxilane criteria due to space and setback requirements, which may lead to increased aircraft taxi times to the active airfield.

Support facilities for the replacement terminal will be:

- ✓ Dedicated fuel farm
- ✓ Passenger vehicle parking
- ✓ ConRAC with supporting QTA for maintenance and fueling facilities
- ✓ New roadway network with the main entrance to the terminal from Hawes Road
- ✓ Indirect access from Ellsworth Road
- ✓ Supporting roadway network to allow access to the landside areas.

This terminal concept will support 244 acres of aeronautical development, and 360 acres of non-aeronautical development. ***Table 4-15*** details the planning assumptions used in the linear-pier terminal design.

Table 4-15: Linear-Pier Terminal Planning Assumptions - Arrivals, Departures Demand Profile

ARRIVALS/DEPARTURES DEMAND PROFILE	PHASE 1	PHASE 2	PHASE 3	TOTAL
Design Aircraft	A320/B737	A320/B737	A320/B737	A320/B737
Design Aircraft Seats	177	177	177	177
Peak Hour Design Load Factor	85%	85%	85%	85%
Peak Hour Originating Aircraft Seats[1]	**1,770**	**1,593**	**1,593**	**4,956**
Total Peak Hour Passengers	1,505	1,354	1,354	4,213
Peak Hour Originating Passengers (PHOP)	**1,505**	**1,354**	**1,354**	**4,213**
Peak Ten Minute Percent of Originating Passengers	20%	20%	20%	20%
Peak Ten Minute Originating Passengers	301	271	271	843
Peak Hour Arrving Flights	8	9	10	27
Peak Hour Terminating Aircraft Seats	1,416	1,593	1,770	
Peak Hour Terminating Passengers (PHTP)	**1,204**	**1,354**	**1,505**	**1,505**
Peak Hour Terminating Passengers w/Bags Percent	30%	30%	30%	33%
Peak Hour Terminating Passengers w/Bags Percent	361	406	451	451
Peak Twenty Minute Terminating Passengers w/Bags	**361**	**406**	**451**	**451**
Peak Twenty Minute Terminating Passengers w/Bags Percent	100%	100%	100%	100%
Source: Mead & Hunt & InterVistas, 2019				
1] Mead & Hunt Master Plan Options, 2019				

As identified in ***Table 4-16***, a detailed terminal component program summary was developed for the linear-pier terminal design.

Table 4-16: Linear-Pier Terminal Component Program

TERMINAL COMPONENT PROGRAM SUMMARY				
TICKETING	PHASE 1	PHASE 2	PHASE 3	TOTAL
Kiosks	22	19	19	60
Counter Positions	13	12	12	37
Total Positions	**35**	**31**	**31**	**97**
Airline Ticket Office Public Space-Passenger Contact & Q (SF)	2,616	2,454	2,502	7,572
Airline Ticket Office Public Counter Space (SF)	1,616	2,454	2,502	7,572
Airline Ticket Office Operations Areas (SF)	6,540	6,135	6,255	18,930
Ticket Hall Circulation (SF)	6,540	6,135	6,255	18,930
Ticket Hall Waiting Area (SF)	5,450	5,113	5,213	15,775
Ticketing Check-In / Baggage Check-In Area	**30,302**	**28,426**	**28,982**	**87,709**
Outbound Checked Baggage Screening				
EDS Inline Checked Baggage Screening Machines	4	2	2	8
ETD Machines	5	5	4	13
Total Area	**10,000**	**5,000**	**5,000**	**20,000**
Departing Passenger Security Screening				
Total SSCP Lanes Required	**6**	**5**	**4**	**13**
SSCP PreCheck Lanes	1	1	1	3
SSCP AIT Machines Required	3	2	2	7
Total SSCP Area Required	**9,900**	**8,250**	**6,600**	**21,450**
Passenger Gate Departure Lounge				
Total Recommended Aircraft Gates	**10**	**9**	**9**	**28**
Passenger Gate Departure Lounge Area (SF)	27,352	24,779	24,770	77,091
Total Gate Ticket Lift and Passenger Boarding Corridor Area	4,200	3,780	3,780	11,760
Total Passenger Departure Lounge Area Required	**31,732**	**28,559**	**28,559**	**88,851**
Baggage Claim Hall				
Recommended Number of Baggage Claim Devices	**3**	**3**	**3**	**9**
Active Claim Area (SF)	8,678	7,814	7,814	24,307
Area of Baggage Claim Devices	4,339	3,907	3,907	12,154
Meeter/Greeter Area @ 20 SF Each (SF)	904	814	814	0
Smarte Cart Staging/Storage Device Area (SF)	150	300	300	750
Airline Baggage Services Offices	5	6	7	
Airline Baggage Services Offices Area (SF)	825	990	1,155	2,970
Baggage Claim Hall Area (Adjacent Concourse)	3,581	3,209	3,209	9,936
Total Baggage Claim Area Recommended (SF)	**18,415**	**16,045**	**16,045**	**49,679**
Concessions/Retail				
Central Hall Marketplace	12,000	-	-	12,000
Concourse Food & Beverage	2,000	2,000	2,000	6,000
Concourse Retail News/Gifts	1,000	1,200	1,200	3,400
Total Concessions/Retail	**15,000**	**3,200**	**3,200**	**21,400**
Restrooms				
Arrivals Hall	1,875	-	-	1,875
Departures Hall	1,875	-	-	1,875
Concourse	3,750	3,750	3,750	11,250
Total Restrooms	7,500	3,750	3,750	15,000
Total Functional Component Area Requirements	**115,349**	**86,280**	**85,186**	**286,815**
Support Function Area Requirements				
Concourse Circulation	40,500	36,450	36,450	113,400
Other Circulation @ 20% of Total Component Area	23,070	17,256	17,037	57,363
Airline Operations Ground Support Areas @ 30% of Concourse	21,670	19,503	19,503	60,676
Airport Facilities Maintenance	10,000	5,000	5,000	20,000
Total Support Functions Area Requirements	95,240	78,209	77,990	251,439
Sub-Total	**210,589**	**159,489**	**158,176**	**538,254**
Building MEP/FT @ 8% of Total Area [Enclosed Area]	16,847	12,759	12,654	43,060
Sub-Total	**227,436**	**172,248**	**170,830**	**581,314**
Building Structure & Envelope @ 12% of Total Area	11,372	8,612	8,541	29,066
Total Building	**238,808**	**180,860**	**179,371**	**610,380**

Advantages associated with this alternative are:

- ✓ Shorter walking distances for passengers from vehicle to aircraft gate
- ✓ Less roadway congestion due to longer curb frontage at the terminal curbs for passenger pick-up and drop-off
- ✓ Expansion of the terminal possible to accommodate additional gates and larger ADG-IV aircraft
- ✓ Efficient passenger processing due to size
- ✓ Clear passenger orientation and wayfinding
- ✓ Simplistic construction methodology
- ✓ Dual ADG-III taxilane system on the apron supporting terminal.

Disadvantages associated with this alternative are:

- ✓ Longer walking distances for transfer passengers
- ✓ Less efficient, single-loaded concourses compared to more efficient, double-loaded concourses
- ✓ Single ADG-III taxilane on all backside gates
- ✓ Longer minimum connection time requirements
- ✓ Longer conduit runs for supporting utility infrastructure
- ✓ Duplication of facilities and amenities due to length of concourse.

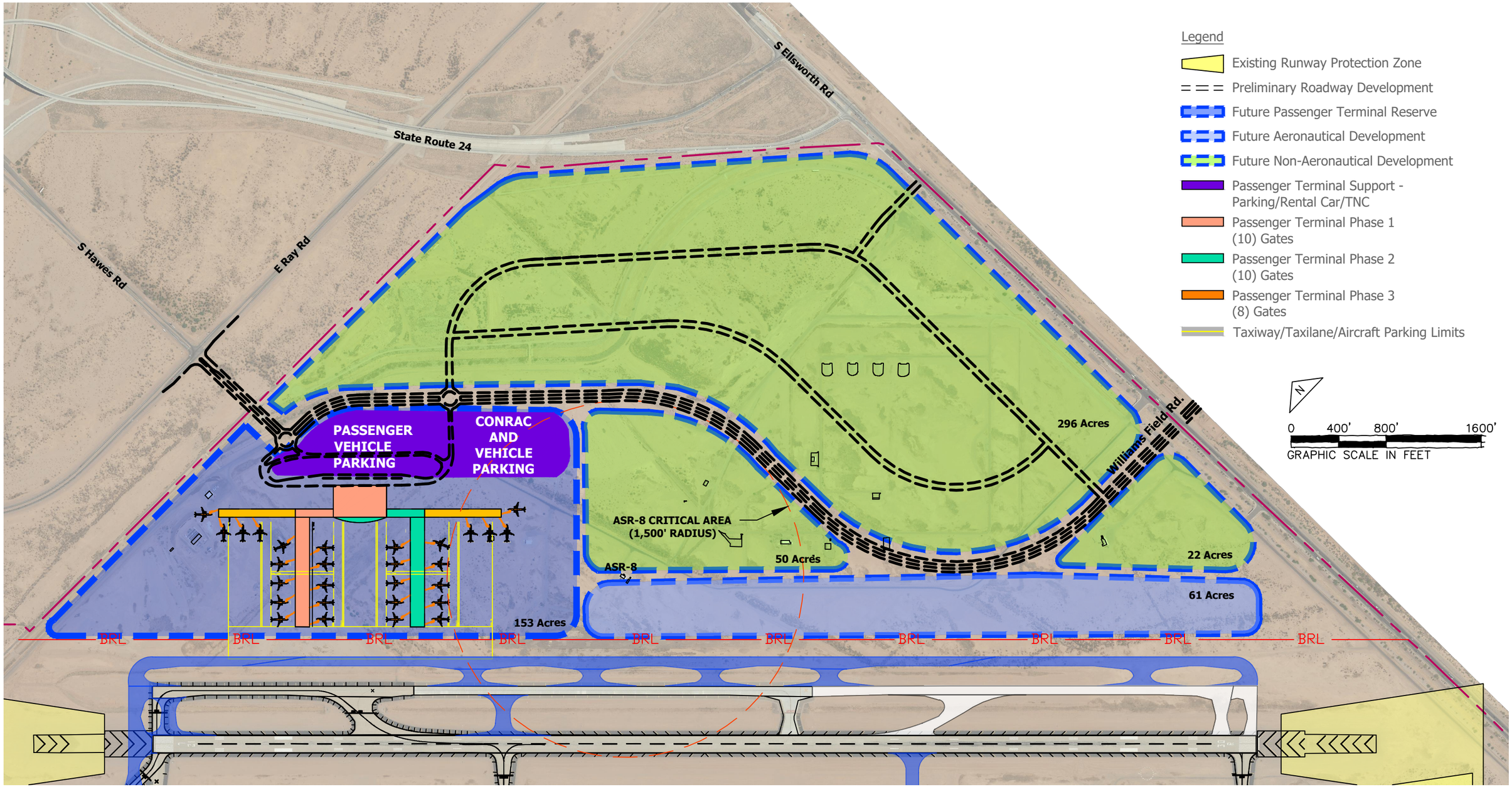


Figure 4-16

Terminal Development
Alternative 1
Pier-Finger Design - 28 Gates

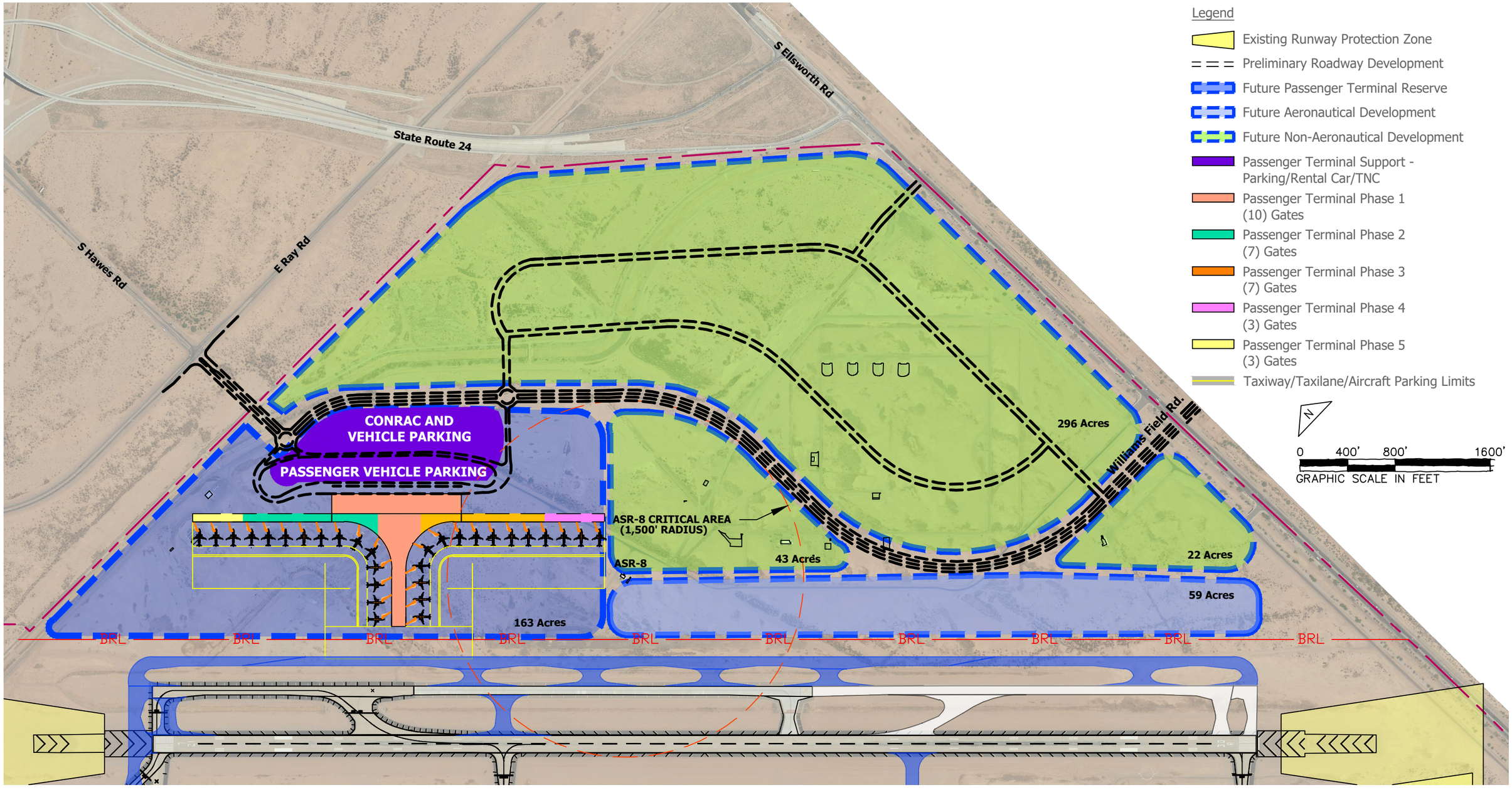


Figure 4-17

Terminal Development
Alternative 2
Curvilinear-Pier Design - 28 Gates

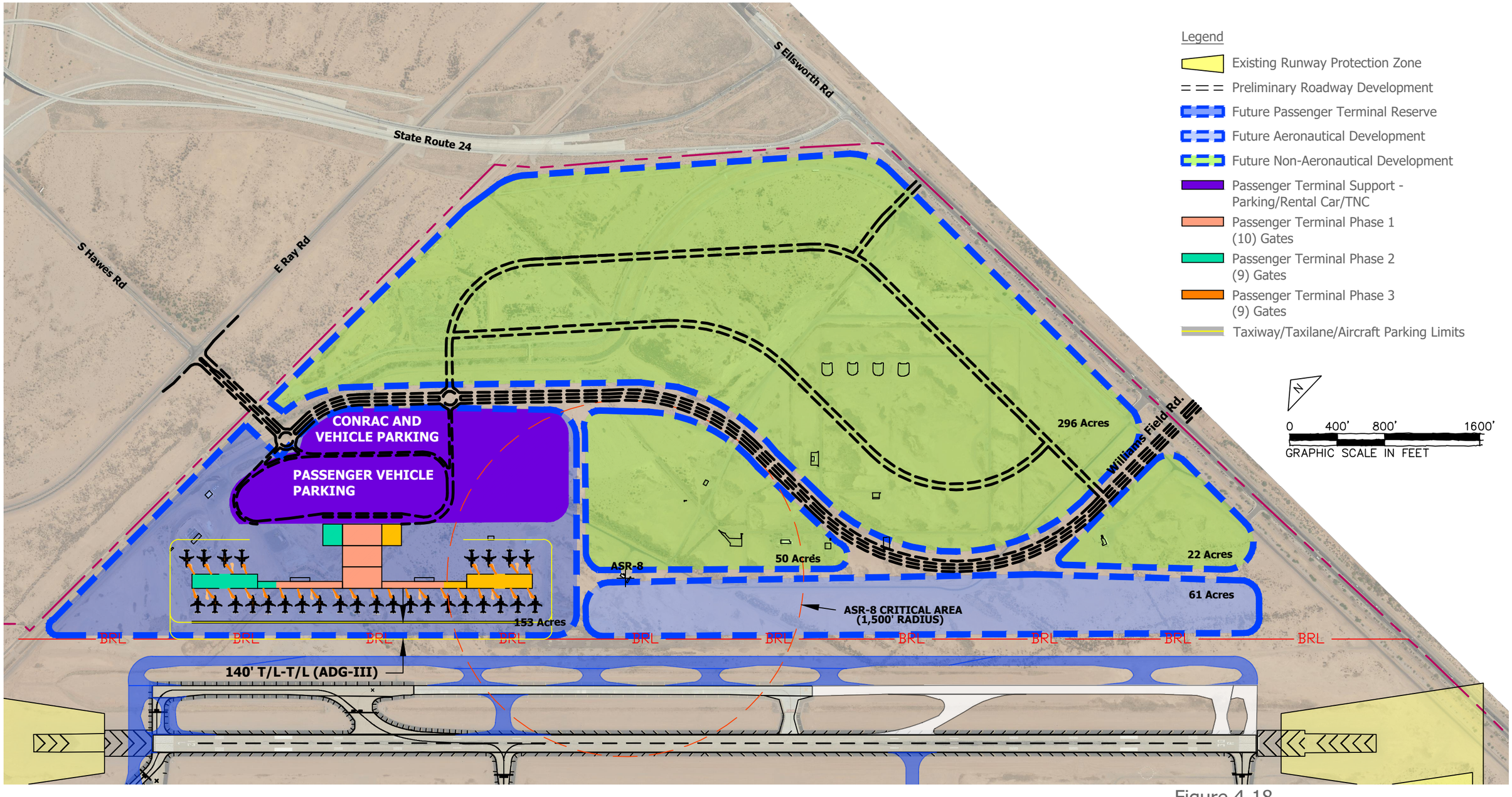


Figure 4-18
Terminal Development Alternative 3
Linear-Pier Design - 28 Gates

Summary Evaluation of Replacement Passenger Terminal Alternatives

Table 4-17 presents an evaluation of the various alternatives for the replacement of the commercial passenger terminal at IWA.

Table 4-17: Summary Evaluation Matrix of Replacement Passenger Terminal Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Description of Improvement	Pier-Finger Terminal Design *(28 Gates)*	Curvilinear-Pier Terminal Design *(30 Gates)*	Linear-Pier Terminal Design *(28 Gates)*
PERFORMANCE REQUIREMENTS			
Accommodates Anticipated Passenger Demand	Yes	Yes	Yes
Accommodates Anticipated ADG-III Aircraft (A320 / B737)	Yes	Yes	Yes
OPERATIONAL CAPABILITIES			
Passenger Walk Distance *(Full Terminal Buildout)*	Shortest	Medium Length	Longest
Terminal Curb Length	Shortest	Longest	Medium Length
Aircraft Taxilane Entry Point *(Degree of Difficulty)*	Somewhat Restrictive	Somewhat Restrictive	Least Restrictive
Accommodates ADG-III and Greater Aircraft	Yes	Yes	Yes
Aircraft Maneuverability	Potential Delay for Aircraft Entering Movement Area	Potential Aircraft Delay on Pushback Based on Gate Location	Single ADG-III Taxilane on Backside Terminal Gates
Operational Impacts	Terminal Design Creates Dual ADG-III Taxilane in Alleyway	Potential Restriction on Curved Portion of Concourse	Single ADG-III Taxilane on Backside Terminal Gates
LAND USE COMPATABILITY			
Impacts to Airport Property Use	No	No	No
Property Acquisitions/Easements	No	No	No
Impact to Other Facilities	No	No	No
ENVIRONMENTAL IMPACT POTENTIAL			
NEPA Compliance *(Initial Development Phase)*	Yes	Yes	Yes
Tenant Relocation	No	No	No
Utilities and Support Infrastructure	Required	Required	Required
STAKEHOLDER FEEDBACK			
Supports "Just Plane Easy" Theme	Yes	Yes	Yes
Compatible with Existing Development	Yes	Yes	Yes
CONSTRUCTABILITY			
Roadway Upgrades	Required	Required	Required
Expansion Potential	Simplistic	Simplistic	Simplistic
Impact to Airport Operations	No	No	No
Phasing Complexity	Simplistic	Simplistic	Simplistic
ALTERNATIVES EVALUATION			
DETERMINATION	**NEUTRAL**	**NEUTRAL**	**FAVORABLE**

Recommended Conceptual Development Plan

The recommended conceptual development plan outlines the proposed development and facility improvements that will not only meet the forecasted demand presented in the **Aviation Activity Forecasts Chapter** and mitigate the deficiencies presented in the **Facility Requirements Chapter**, but also support competitiveness and financial viability for the Airport. During the development of the master plan, the Airport acquired approximately 21 acres on the northeast quadrant, completed Taxiway Charlie full-length in Portland Cement Concrete Pavement (PCCP), expanded the left-turn lane from Sossaman Road into the existing terminal, and the FAA implemented a new ¾ mile approach procedure to Runway 30R. These projects in addition to the projects identified as part of the development alternatives process to support demand through the planning period are reflected in the conceptual development plan and subsequent ALP. These improvement alternative recommendations include:

Airfield

- ✓ Extend Runway 12R/30L by 1,275 feet and Runway 12L/30R by 200 feet.
- ✓ Construct a dual full-length parallel taxiway east of Taxiway C.
- ✓ Construct a full-length parallel taxiway system west of Runway 12C/30C.
- ✓ Construct a cross-field taxiway between Runways 12C/30C and 12L/30R.
- ✓ Continue to implement the FAA-approved solution to Hot Spot 1.
- ✓ Retain the existing easement on the approach end of Runway 30R.
- ✓ Reconstruct Taxiway G.
- ✓ Construct bypass taxiways for Runways 12L and 30L, and a taxiway connector across Runway 12R.

Airfield Support Facilities

- ✓ Construct the Compass Calibration Pad proposed in Alternative 2.
- ✓ Construct the dependent ADG II/ADG III run-up area proposed in Alternative 1.

Westside Development Facility Improvements

- ✓ Arterial Roadway System
  - o Discourage additional traffic along S. Sossaman Road by encouraging alternative access to development that may increase traffic volumes.
- ✓ Parking (Short-Term)
  - o Restructure fees to discourage overnight parking in Hourly Lot (shift to Daily Lot) and to encourage increased use of Economy Lot.
  - o Monitor parking preference changes (impact to Daily Lot) with the addition of Covered Parking.
  - o Transition employee parking out of the Daily Lot as soon as feasible:
    - Temporary location in Economy Lot during anticipated peak month/ events.
    - Permanent location at existing Cell/Ride Share/Taxi lot.

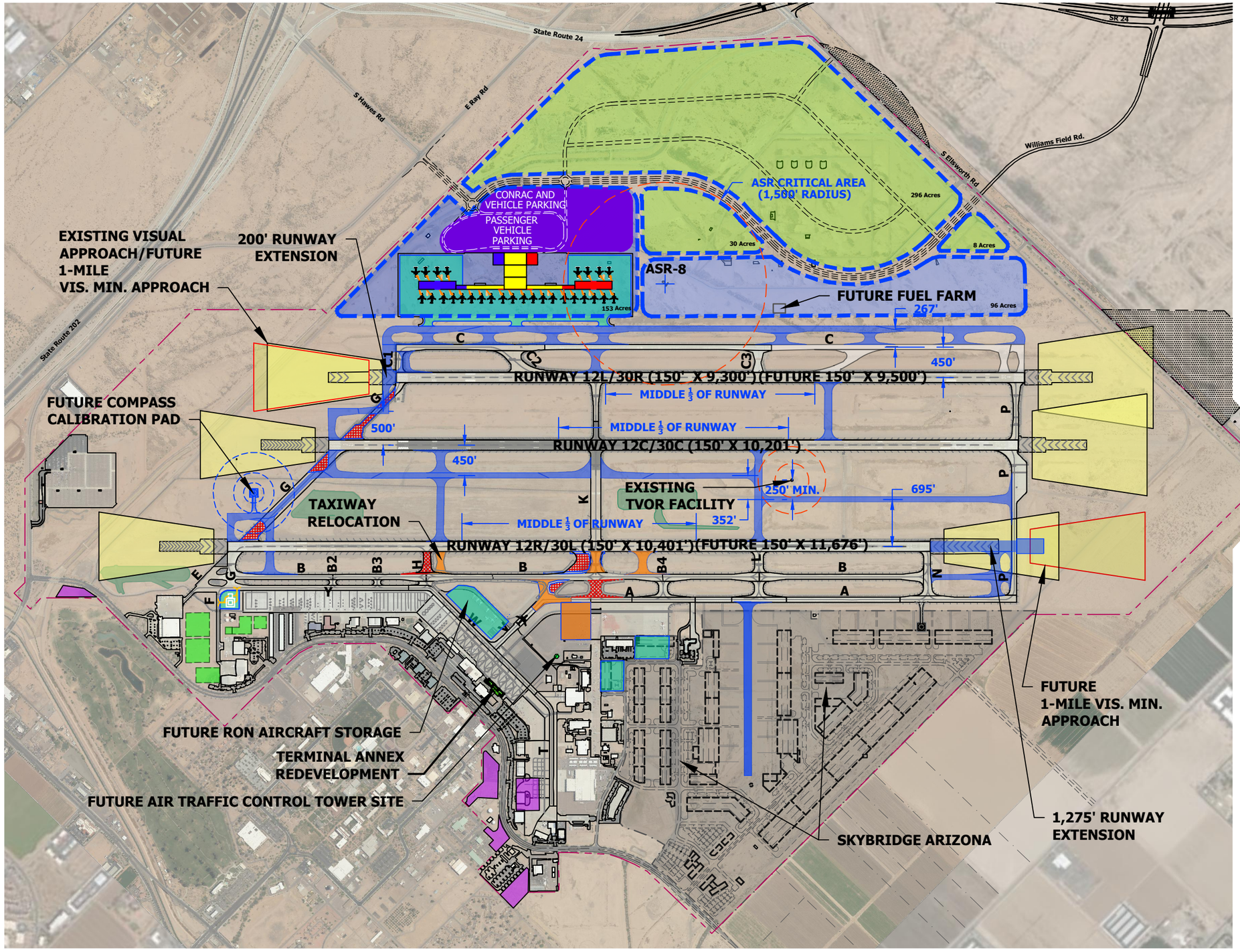
- Relocate the Cell/Ride Share/Taxi Lot to the northern parcel off S. Sossaman Road.
- Accommodate additional rental car parking demand in expanded Rental Support Facility on S. Sossaman Road, and/or Ray Road Economy Lot based on operator needs/wants (Rental Flex).
- Make improvements to pedestrian crossings:
  - Pavement markings
  - Refuge islands
  - Signal/crosswalk timing at controlled intersection.

✓ Parking (Mid-Term)
- Relocate all rental parking supply to the expanded Rental Support Facility on S. Sossaman Road, and/or Ray Road Economy Lot based on operator needs/wants (Rental Flex).
- Convert Rental Pick-Up to a Premium Hourly Flex Lot with value added covered parking.
- Covert Rental Drop-Off lot to additional Daily Lot parking in anticipation of reclaiming a portion of the Daily Lot Annex for Aeronautical use (RON/ROD aircraft parking positions).

✓ Parking (Long-Term)
- Relocate the terminal to the east side.
- Convert the westside terminal to accommodate private and general aviation uses.
- Transition westside parking facilities to alternative support and value-added uses:
  - Private aviation parking
  - Future aeronautical uses
  - Future economic development opportunities.

✓ Replacement Passenger Terminal
- Develop a linear-pier passenger terminal on the east side of the Airport.
- Develop adequate support facilities for the initial Phase 1 development program.

The Airport's conceptual development plan will successfully satisfy the Airport's needs through 2038. The preferred conceptual development plan is shown in ***Figure 4-19: Recommended Conceptual Development Plan***. Capital costs will be calculated and added to the improvement projects identified in the conceptual development plan. A list of projects and the associated environmental documentation requirements will be incorporated into the subsequent **Facilities Implementation** and **Financial Feasibility Chapters**. An ALP will be developed to identify the airport layout options through the end of the planning period in 2038.



Legend

- Existing Runway Protection Zone
- Preliminary Roadway Development
- Future Passenger Terminal Reserve
- Future Aeronautical Development
- Future Non-Aeronautical Development
- Passenger Terminal Support - Parking/Rental Car/TNC
- Existing Detention Ponds
- Existing Easement
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Future Apron Pavement
- Existing IWA Programmed Project
- Pavement to be Removed
- Future Buildings/Development
- Future Economic Development Opportunity
- Passenger Terminal Phase 1 (10) Gates
- Passenger Terminal Phase 2 (9) Gates
- Passenger Terminal Phase 3 (9) Gates

N

0 750' 1500' 3000'

GRAPHIC SCALE IN FEET

Figure 4-19

Preferred Airport Conceptual Development Plan

CHAPTER 5
AIRPORT LAYOUT PLAN NARRATIVE

Introduction

The Airport Layout Plan (ALP) is intended to graphically portray existing conditions at the Airport, detail design standards outlined in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A Airport Design, future development, and areas in which future development may occur. This document consists of a set of public drawings used by the FAA when budgeting for future projects, assessing impacts to the Airport, and to determine zoning and other land uses in the Airport environment. The ALP also serves as a planning tool for the FAA to use when reviewing planned development and AIP grants and for the surrounding communities to use when determining zoning and land use planning

This ALP drawing set was prepared to present conclusions of an update to the Master Plan for IWA. The Master Plan thoroughly documented the existing conditions, forecasts, facility requirements, analysis, and findings to depict the near-, mid-, and long-term development plans to meet future aviation demand.

The ALP graphically presents airport facilities, their location on airport, and the pertinent clearance and dimensional information required to show conformance with applicable design standards. Specifically, the ALP depicts an airport as it exists today along with areas that are identified for future development to meet forecasted growth in aviation and related activity.

A reduced-sized copy of the FAA approved ALP set is attached at the end of this section. The ALP package for the Phoenix-Mesa Gateway Airport consists of the following drawings:

- ✓ Sheet 1 - Cover Sheet
- ✓ Sheet 2 - Airport Data
- ✓ Sheet 3 - Existing Airport Layout Plan
- ✓ Sheet 4 - Future Airport Layout Plan
- ✓ Sheet 5 - Part 77 Airspace Plan - Conical Surface
- ✓ Sheet 6 - Part 77 Outer Approaches
- ✓ Sheet 7 - Part 77 Approach Profiles Runways 12L-30R
- ✓ Sheet 8 - Part 77 Approach Profiles Runways 12C-30C
- ✓ Sheet 9 - Part 77 Approach Profiles Runways 12R-30L
- ✓ Sheet 10 - Runway 12L Inner Portion of the Approach Surface
- ✓ Sheet 11 - Runway 30R Inner Portion of the Approach Surface
- ✓ Sheet 12 - Runway 12C Inner Portion of the Approach Surface
- ✓ Sheet 13 - Runway 30C Inner Portion of the Approach Surface

- ✓ Sheet 14 - Runway 12R Inner Portion of the Approach Surface
- ✓ Sheet 15 - Runway 30L Inner Portion of the Approach Surface
- ✓ Sheet 16 - Runway 12L-30R Runway Departure Surfaces
- ✓ Sheet 17 - Runway 12C-30C Runway Departure Surfaces
- ✓ Sheet 18 - Runway 12R-30L Runway Departure Surfaces
- ✓ Sheet 19 - Building Area Plan - Westside Facilities Drawing
- ✓ Sheet 20 - Building Area Plan - East Facilities Drawing
- ✓ Sheet 21 - Airport Land Use Plan
- ✓ Sheet 22 - Airport Property Map - Exhibit "A"

Airport Data Sheet

The Airport Data Sheet is designed to be a compiled source of all pertinent Airport data. This sheet is intended to be used in conjunction with the Airport Layout Plan sheet as a reference document for existing and planned Airport development. Various tables and graphics depicted on this sheet are as follows:

- ✓ **Runway Data Table** – This table is a compiled tabulation of information relating specifically to runways at the Airport. Various specifications are listed for each existing and future runway, including runway location, dimensions, design group, available lighting and navigational aids, as well as safety areas as defined in AC 150/5300-13A.
- ✓ **Runway Surfaces Table** – This table and an associated graphic depict the approach visibility minimums for each runway, as well as dimensions for various safety areas, including the RSA/OFA, RPZ, and OFZ. The elevation of each runway end is also provided on this table.
- ✓ **Airport Data Table** – This table lists existing and future information specific to the Airport, such as Airport elevation, service level, role, reference code, design aircraft, owner, Airport Reference Point, temperature information, and available navigational aids.
- ✓ **Taxiway Data Table** – This table lists the existing and future width and safety area dimensions for each major taxiway at the Airport.
- ✓ **Modifications to Standards/Non-Standard Conditions** – These tables show any approved modifications to applicable design standards or any non-standard conditions that may be depicted on the ALP or present at the Airport. IWA does not have any listed modifications to standards or nonstandard conditions.

- ✓ **Wind Rose and Wind Coverage Table** – These components detail the percentage of time a runway end or combination of ends or runways are available for arrivals. When combined, the coverage is intended to be as near as possible to 100 percent. The Wind Rose depicts the runway orientation and percentages over which winds from a given direction occur. The box width varies based on the crosswind component desired and is intended to graphically portray the information displayed in the Wind Coverage Table.

Airport Layout Plan

The Airport Layout Plan depicts both the existing and planned Airport facilities and safety areas. All existing and planned airfield and Airport related development is depicted on this sheet and identified with legend items for quick reference. Together with the Airport Data Sheet, this sheet serves as an overview for the FAA and Airport sponsors as grant and other federal funding for future improvements are assigned. The Airport Layout Plan also graphically depicts compliance with standards set forth in AC 150/5300-13A or necessary modifications to those standards.

Airport Airspace

The Airport Airspace sheet is a set of drawings depicting the 14 CFR Part 77 Objects Affecting Navigable Airspace (Part 77) imaginary airspace surfaces for the Airport. Part 77 details requirements for the safe and efficient use of navigable airspace. These surfaces are intended to provide airports and sponsors with a mechanism to evaluate existing and proposed objects as part of the 7460 process for determining hazards to air navigation. Part 77 surfaces correspond to available navigational aids and types of approaches available to a runway end. The following surfaces are depicted on the Airport Airspace sheet:

- ✓ **Primary Surface** – The primary surface is located closest to the runway environment. It is a rectangular area symmetrically located about the runway centerline and extends a distance of 200 feet beyond each runway threshold. Its elevation is the same as the runway centerline at a point perpendicular to the runway centerline. The width of the primary surface depends on the type of runway approach capability (visual, non-precision, or precision).

  The primary surface must remain clear of most objects to allow unobstructed passage of aircraft. Objects are only permitted if they are no taller than two feet above the ground, and if they are constructed on frangible (breakaway) mounts. The only exception to this rule is for objects for which location is "fixed by function," such as navigational and visual aid facilities (glide slope, precision approach path indicator, windsock, etc.).

- ✓ **Approach Surface** – The approach surface is also established for each runway end. The approach surface has the same inner width as the primary surface, and then flares (gets wider) as it rises upward and outward along the extended runway centerline. The approach surface begins 200 feet beyond the runway end. The slope of the rise and the length of the approach surface is

dictated by the type of approach available to the runway (visual, non-precision or precision), and by the approach category of the aircraft for which the runway is designed.

- ✓ **Transitional Surface** – Each runway has a transitional surface that begins at the outside edge of the primary surface, and at the same elevation as the runway centerline. There are three transitional surfaces: the first is off the sides of the primary surface, the second is off the sides of the approach surface, and the third is outside the conical surface and pertains to precision runways only. The transitional surface rises at a slope of one-foot vertically for each 7 feet of horizontal distance (7:1) up to a height, which is 150 feet above the highest runway elevation.
- ✓ **Horizontal Surface** – The horizontal surface is established at 150 feet above the published airport elevation. This is an oval-shaped flat surface that connects the transitional and approach surfaces to the conical surface at a distance of 10,000 feet from the primary surface.
- ✓ **Conical Surface** – The conical surface begins at the outer edge of the horizontal surface. The conical surface continues for a distance of 4,000 feet horizontally at a slope of one-foot rise for each 20 feet of horizontal distance (20:1).

Inner Portion of Runway Approach Surface Drawings

The Inner and Outer Approach Surface Drawings presents the entirety of the Part 77 approach surface to the end of each runway. They also depict the runway centerline profile with elevations. These drawings provide profile details that the Approach Profiles does not. The drawings include identified penetrations to the approach surface. Penetrations to the approach surface are considered obstructions. The FAA will determine if any obstructions are also hazards which require mitigation. The FAA utilizes other design criteria such as the threshold siting surface (TSS) and various surfaces defined in FAA Order 8260.3B, Terminal Instrument Procedures (TERPS), to determine if an obstruction is a hazard. If an obstruction is a hazard, the FAA can take many steps to protect air navigation. The mitigation options range from the airport owner removing the hazard to installing obstruction lighting, to the FAA adjusting the instrument approach minimums.

Departure Surface

The Departure Surface Drawings provides detailed analysis of the existing and ultimate departure surface for each corresponding runway end. A composite profile of the extended ground line is depicted. Obstructions are shown where appropriate.

Building Area Plans

The Building Area Plans depicts larger scale plan view drawing of the existing and future terminal and apron areas, buildings, hangars, parking lots, and other landside facilities. The contents of the Building Area Plans include a large-scale plan view of the area; building data table; legend table; and title and revision blocks. Additionally, the Building Area Plan identify each building's height if available and any existing or planned obstruction markings.

On and Off Airport Land Use

The Airport Land Use Drawing is a composite drawing that depicts that land uses for areas within and around airport property in a manner compatible with the functional design of the airport facility. Airport land use planning is important for orderly development and efficient use of available space. There are two primary considerations for airport land use planning. These are to secure those areas essential to the safe and efficient operation of the airport and to determine compatible land uses for the balance of the property which would be most advantageous to the airport and community. In essence, this drawing depicts the suggested highest and best potential uses for airport property. The On-Airport Land Use Drawing presents generalized proposed uses of property for the future. The on-airport land uses on this drawing become the official FAA acceptance of current and future land uses. The map also depicts the existing and ultimate noise exposure limits set at the 65 Yearly Day-Night, Average Sound Level (DNL).

Airport Property Map

The Exhibit "A" Airport Property Map identifies parcels that make up dedicated airport property. The Exhibit 'A' indicates how the land was acquired, the funding source for the land and if the land was conveyed as Federal surplus land or Government Property. Other detached parcels owned by the Airport Sponsor that are dedicated to airport purposes must also be shown on the Exhibit 'A'. The Exhibit 'A' must show all dedicated airport property regardless of the type of funds (AIP, state, local, etc.) used to acquire that property.

Airport Layout Plan - Disclaimer

The preparation of this ALP was supported, in part, with financial assistance from the FAA through the Airport Improvement Program. The contents 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 herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public law.

The ALP has been developed in accordance with accepted FAA standards to include FAA Standard Operating Procedure (SOP) 2.00, *Standard Procedure for FAA Review and Approval of Airport Layout Plans (ALPs)*, and ALP SOP 3.00, *Standard Operating Procedure for FAA Review of Exhibit 'A' Airport Property Inventory Maps*.

Airport Layout Plan

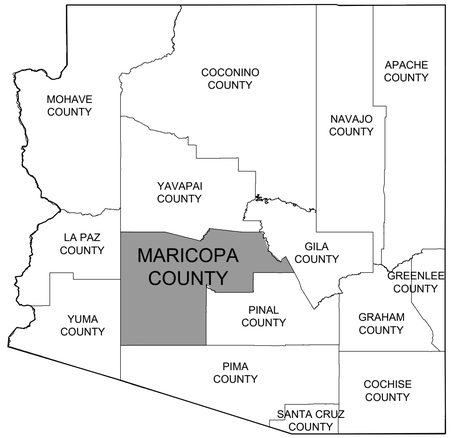
PHOENIX-MESA GATEWAY AIRPORT

AIRPORT LAYOUT PLAN

5835 S SOSSMAN RD

MESA, AZ 85212

MARCH 2020



STATE OF ARIZONA

Arizona Department of Transportation-Aeronautics State Grant: E9M1C

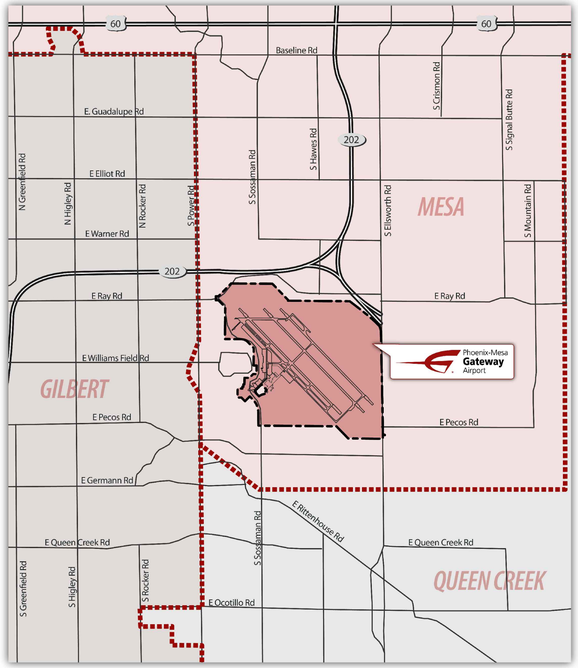
Airport Improvement Program Grant: 3-04-0078-041-2018

PMGAA Project Number: 929

AIRPORT LAYOUT PLAN SET

SHEET NUMBER	SHEET TITLE	REVISION
1	COVER SHEET	MAR 2020
2	AIRPORT DATA	MAR 2020
3	EXISTING AIRPORT LAYOUT	MAR 2020
4	FUTURE AIRPORT LAYOUT PLAN	MAR 2020
5	PART 77 AIRSPACE PLAN - CONICAL SURFACE	MAR 2020
6	PART 77 OUTER APPROACHES	MAR 2020
7	PART 77 APPROACH PROFILES RUNWAY 12L-30R	MAR 2020
8	PART 77 APPROACH PROFILES RUNWAY 12C-30C	MAR 2020
9	PART 77 APPROACH PROFILES RUNWAY 12R-30L	MAR 2020
10	RUNWAY 12L INNER PORTION OF THE APPROACH SURFACE	MAR 2020
11	RUNWAY 30R INNER PORTION OF THE APPROACH SURFACE	MAR 2020
12	RUNWAY 12C INNER PORTION OF THE APPROACH SURFACE	MAR 2020
13	RUNWAY 30C INNER PORTION OF THE APPROACH SURFACE	MAR 2020
14	RUNWAY 12R INNER PORTION OF THE APPROACH SURFACE	MAR 2020
15	RUNWAY 30L INNER PORTION OF THE APPROACH SURFACE	MAR 2020
16	RUNWAY 12L-30R DEPARTURE SURFACES	MAR 2020
17	RUNWAY 12C-30C DEPARTURE SURFACES	MAR 2020
18	RUNWAY 12R-30L DEPARTURE SURFACES	MAR 2020
19	BUILDING AREA PLAN - WEST FACILTIES	MAR 2020
20	BUILDING AREA PLAN - EAST FACILITIES	MAR 2020
21	AIRPORT LAND USE PLAN	MAR 2020
22	EXHIBIT 'A' AIRPORT PROPERTY INVENTORY MAP	MAR 2020

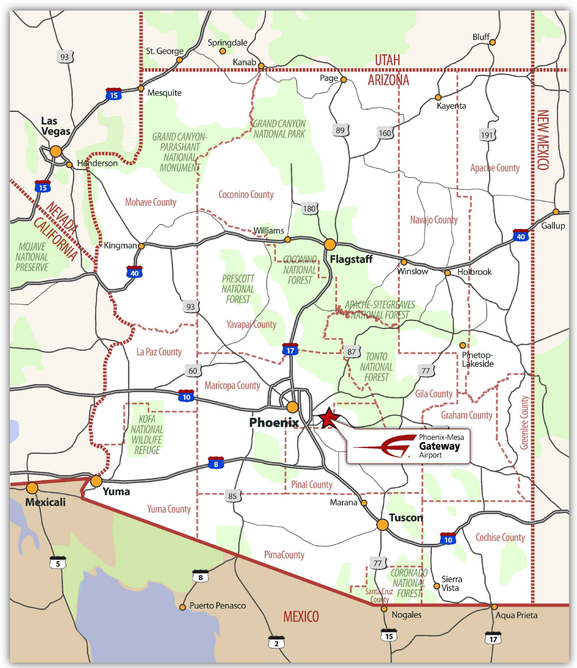
VICINITY MAP



0 2,000' **4,000'** 6,000'
Graphic Scale in Feet

Source: *Google Maps, 2018*

LOCATION MAP



0 12.5 **25** 37.5
Graphic Scale in Miles

Source: *Google Maps, 2018*

SPONSOR APPROVAL AND REVISIONS

J. BRIAN O'NEILL, A.A.E., EXECUTIVE DIRECTOR/CEO — DATE

NO.	DESCRIPTION	DATE
△		

Mead & Hunt

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Phoenix-Mesa Gateway Airport

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PHOENIX-MESA GATEWAY AIRPORT
AIRPORT LAYOUT PLAN

5835 S SOSSMAN RD
MESA, AZ 85212

ISSUED

M&H NO.: 2327700-171799.01
DATE: MARCH 2020
DESIGNED BY: M&H
DRAWN BY: JWB
CHECKED BY: BJM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
COVER SHEET

SHEET NO.
1

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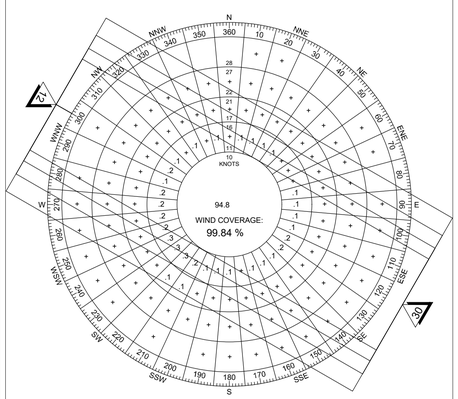
ALL WEATHER WINDROSE

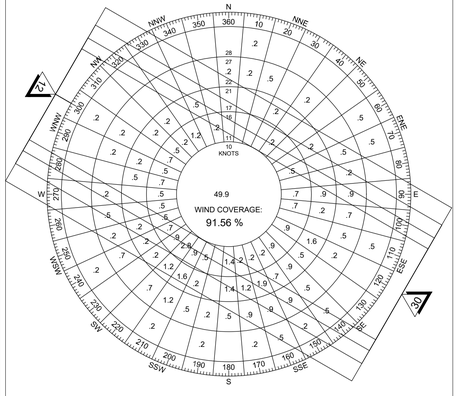


RUNWAY	10.5 KNOT	13 KNOT	16 KNOT	20 KNOT
RUNWAY 12	89.74%	90.33%	90.98%	91.22%
RUNWAY 30	73.66%	74.46%	75.24%	75.52%
RUNWAY 12/30	97.66%	98.60%	99.51%	99.84%

SOURCE: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL CLIMATIC DATA CENTER, STATION 722786, WILLIAMS GATEWAY AIRPORT, MESA, AZ.

PERIOD OF REPORTING 2008-2017; 141,148 TOTAL OBSERVATIONS, AND TAILWIND COMPONENT OF FIVE KNOTS FOR UNIDIRECTIONAL RUNWAYS AND SIXTY KNOTS FOR BIDIRECTIONAL RUNWAYS.

IFR WINDROSE



RUNWAY	10.5 KNOT	13 KNOT	16 KNOT	20 KNOT
RUNWAY 12	56.03%	62.23%	68.96%	74.86%
RUNWAY 30	46.74%	49.97%	53.83%	57.37%
RUNWAY 12/30	69.26%	76.74%	84.66%	91.56%

SOURCE: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL CLIMATIC DATA CENTER, STATION 722786, WILLIAMS GATEWAY AIRPORT, MESA, AZ.

PERIOD OF REPORTING 2008-2017; 429 TOTAL OBSERVATIONS, AND TAILWIND COMPONENT OF FIVE KNOTS FOR UNIDIRECTIONAL RUNWAYS AND SIXTY KNOTS FOR BIDIRECTIONAL RUNWAYS.

RUNWAY DATA

SEE NOTE 10.

	RUNWAY 12L		RUNWAY 30R		RUNWAY 12C		RUNWAY 30C		RUNWAY 12R		RUNWAY 30L	
(NOTE 5)	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE
RUNWAY DESIGN CODE (RDC)	D-V-VISUAL	D-V-5000	D-V-4000	SAME	D-V-5000	SAME	D-V-4000	SAME	D-V-5000	SAME	D-V-5000	SAME
AIRPORT REFERENCE CODE (APRC)	D-V-VISUAL	D-V-5000	D-V-4000	SAME	D-V-5000	SAME	D-V-4000	SAME	D-V-5000	SAME	D-V-5000	SAME
DEPARTURE REFERENCE CODE (DPRC)	D-V	SAME	D-V	SAME	D-V	SAME	D-V	SAME	D-V	SAME	D-V	SAME
RUNWAY PAVEMENT STRENGTH (IN 1000 LBS.)	75(S),210(D),590(DT),850(DDT)	SAME	75(S),210(D),590(DT),850(DDT)	SAME	55(S),95(D),185(DT),550(DDT)	60(S),155(D),300(DT),650(DDT)	55(S),95(D),185(DT),550(DDT)	60(S),155(D),300(DT),650(DDT)	55(S),95(D),185(DT),550(DDT)	60(S),155(D),300(DT),650(DDT)	55(S),95(D),185(DT),550(DDT)	60(S),155(D),300(DT),650(DDT)
RUNWAY PAVEMENT TYPE	CONCRETE	SAME	CONCRETE	SAME	ASPHALT/CONCRETE	SAME	ASPHALT/CONCRETE	SAME	CONCRETE	SAME	CONCRETE	SAME
RUNWAY PAVEMENT STRENGTH (PCN)	88 /R/C/W/T	SAME	88 /R/C/W/T	SAME	26 /R/D/W/T	SAME	26 /R/D/W/T	SAME	71 /R/C/W/T	SAME	71 /R/C/W/T	SAME
RUNWAY SURFACE TREATMENT	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME
EFFECTIVE RUNWAY GRADIENT %	0.30	SAME	-0.30	SAME	0.32	SAME	0.32	SAME	0.32	SAME	-0.32	SAME
LINE OF SIGHT CRITERIA MET	YES	SAME	YES	SAME	YES	SAME	YES	SAME	YES	SAME	YES	SAME
PERCENT WIND COVERAGE (20-kt)	91.22%	SAME	75.52%	SAME	91.22%	SAME	75.52%	SAME	91.22%	SAME	75.52%	SAME
RUNWAY WIDTH X LENGTH	150' x 9,300'	150' X 9,500'	150' x 9,300'	150' X 9,500'	150' X 10,201'	SAME	150' X 10,201'	SAME	150' x 10,401'	150' X 11,676'	150' x 10,401'	150' X 11,676'
DISPLACED THRESHOLD LENGTH	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME
RUNWAY SAFETY AREA (RSA) WIDTH - ACTUAL	500'	SAME	500'	SAME	500'	SAME	500'	SAME	500'	SAME	500'	SAME
RSA LENGTH BEYOND STOP END - ACTUAL	1000'	SAME	1000'	SAME	1000'	SAME	1000'	SAME	1000'	SAME	1000'	SAME
RUNWAY SAFETY AREA (RSA) WIDTH - ADG STANDARD	500'	SAME	500'	SAME	500'	SAME	500'	SAME	500'	SAME	500'	SAME
RSA LENGTH BEYOND STOP END - ADG STANDARD	1000'	SAME	1000'	SAME	1000'	SAME	1000'	SAME	1000'	SAME	1000'	SAME
RUNWAY LIGHTING	HIRL	SAME	HIRL	SAME	HIRL	SAME	HIRL	SAME	MIRL	SAME	MIRL	SAME
RUNWAY PROTECTION ZONE (RPZ) DIMENSIONS	500' X 1010' X 1700'	SAME	1000' X 1510' X 1700'	SAME	500' X 1010' X 1700'	SAME	1000' X 1510' X 1700'	SAME	500' X 1010' X 1700'	SAME	500' X 1010' X 1700'	SAME
RUNWAY MARKING	PRECISION	SAME	PRECISION	SAME	PRECISION	SAME	PRECISION	SAME	PRECISION	SAME	PRECISION	SAME
FAR PART 77 APPROACH SLOPE	20:1	34:1	34:1	SAME	34:1	SAME	50:1	SAME	34:1	SAME	34:1	SAME
FAR PART 77 APPROACH TYPE (NOTE 10)	VIS (B[V])	NON-PRECISION (C)	NON PRECISION (D)	SAME	NON-PRECISION (C)	SAME	PIR	SAME	NON-PRECISION (C)	SAME	NON-PRECISION (C)	SAME
APPROACH VISIBILITY MINIMUMS	VISUAL	1-MILE	3/4-MILE	SAME	1-MILE	SAME	3/4-MILE	SAME	1-MILE	SAME	1-MILE	SAME
AERONAUTICAL SURVEY REQUIRED	NON-VERT. GUIDED	SAME	VERTICALLY GUIDED	SAME	VERTICALLY GUIDED	SAME	VERTICALLY GUIDED	SAME	NON-VERT. GUIDED	SAME	NON-VERT. GUIDED	SAME
DEPARTURE SURFACE	YES	SAME	YES	SAME	YES	SAME	YES	SAME	YES	SAME	YES	SAME
RUNWAY OBJECT FREE AREA (ROFA) WIDTH	800'	SAME	800'	SAME	800'	SAME	800'	SAME	800'	SAME	800'	SAME
ROFA LENGTH BEYOND STOP END	1000'	SAME	1000'	SAME	1000'	SAME	1000'	SAME	1000'	SAME	1000'	SAME
RUNWAY OBSTACLE FREE ZONE (OFZ) WIDTH	400'	SAME	400'	SAME	400'	SAME	400'	SAME	400'	SAME	400'	SAME
ROFZ LENGTH	200'	SAME	200'	SAME	200'	SAME	200'	SAME	200'	SAME	200'	SAME
INNER APPROACH OFZ (IAOFZ) WIDTH	N/A	SAME	N/A	SAME	N/A	SAME	400'	SAME	N/A	SAME	N/A	SAME
INNER APPROACH OFZ (IAOFZ) LENGTH	N/A	SAME	N/A	SAME	N/A	SAME	2,470'	SAME	N/A	SAME	N/A	SAME
INNER TRANSITIONAL OFZ (IAOFZ) WIDTH	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME
PRECISION OBSTACLE FREE ZONE	N/A	SAME	N/A	SAME	N/A	SAME	200' X 800'	SAME	N/A	SAME	N/A	SAME
THRESHOLD SITING SURFACE (EB99)	TYPE 3	TYPE 4	TYPE 4	SAME	TYPE 4	SAME	TYPE 4, 6	SAME	TYPE 4	SAME	TYPE 4	SAME
VISUAL APPROACH AIDS	PAPI-4.REILS	SAME	PAPI-4.REILS	SAME	PAPI-4	SAME	PAPI-4	PAPI-4, MALSR	PAPI-4	SAME	PAPI-4	SAME
INSTRUMENT APPROACH AIDS	N/A	RNAV (GPS)	RNAV (GPS)	SAME	RNAV (GPS)	SAME	ILS or LOC RNAV (GPS) Y VOR or TACAN RNAV (RNP) Z	SAME	RNAV (GPS)	SAME	RNAV (GPS)	SAME

RUNWAY END DATA

	RUNWAY 12L	RUNWAY 30R	RUNWAY 12C	RUNWAY 30C	RUNWAY 12R	RUNWAY 30L
RUNWAY END COORDINATES (NOTE 3 & 8) VG SURVEY 05/02/2018 EXISTING	N 33° 19' 03.32" W 111° 39' 40.73"	N 33° 17' 57.61" W 111° 38' 24.02"	N 33° 19' 03.41" W 111° 39' 57.32"	N 33° 17' 51.34" W 111° 38' 33.19"	N 33° 19' 3.62" W 111° 40' 22.33"	N 33° 17' 50.14" W 111° 38' 56.53"
FUTURE (ESTIMATED)	N 33° 19' 04.75" W 111° 39' 42.36"	SAME SAME	SAME SAME	SAME SAME	SAME SAME	N 33° 17' 41.15" W 111° 38' 46.00"
DISPLACED THRESHOLD COORDINATES EXISTING	N/A	N/A	N/A	N/A	N/A	N/A
FUTURE	N/A	N/A	N/A	N/A	N/A	N/A

RUNWAY ELEVATIONS (NOTE 3 & 8)	RUNWAY 12L/30R		RUNWAY 12C/30C		RUNWAY 12R/30L	
VG SURVEY 05/02/2018	EXISTING	FUTURE (EST)	EXISTING	FUTURE	EXISTING	FUTURE (EST)
END	1356.3'/1384.1'	1355.9'/SAME	1347.7'/1380.5'	SAME	1341.2'/1374.2'	SAME/1378.5'
HIGH POINT	1384.1'	SAME	1380.5'	SAME	1373.2'	SAME
LOW POINT	1356.3'	1355.9'/SAME	1347.7'	SAME	1341.2'	SAME
TOUCHDOWN ZONE ELEVATION	1365.0'/1384.1'	1364.2'/SAME	1358.5'/1380.5'	SAME	1348.7'/1374.2'	SAME/1378.5'
DISPLACED THRESHOLD ELEVATION	N/A	SAME	N/A	SAME	N/A	SAME

DECLARED DISTANCES

	RUNWAY 12L		RUNWAY 30R		RUNWAY 12C		RUNWAY 30C		RUNWAY 12R		RUNWAY 30L	
(NOTE 4)	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE
TAKE OFF RUN AVAILABLE (TORA)	9,300'	9,500'	9,300'	9,500'	10,201'	SAME	10,201'	SAME	10,401'	11,676'	10,401'	11,676'
TAKE OFF DISTANCE AVAILABLE (TODA)	9,300'	9,500'	9,300'	9,500'	10,201'	SAME	10,201'	SAME	10,401'	11,676'	10,401'	11,676'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	9,300'	9,500'	9,300'	9,500'	10,201'	SAME	10,201'	SAME	10,401'	11,676'	10,401'	11,676'
LANDING DISTANCE AVAILABLE (LDA)	9,300'	9,500'	9,300'	9,500'	10,201'	SAME	10,201'	SAME	10,401'	11,676'	10,401'	11,676'

TAXIWAY DATA

		T/W 'A'		T/W 'B'		T/W 'C'		T/W 'E'		T/L 'F'		T/W 'G'		T/W 'H'	
(NOTE 5)		EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE
TAXIWAY DESIGN GROUP		5	SAME	5	SAME	5	SAME	3	SAME	3	SAME	5	SAME	5	SAME
WIDTH IN FEET (STANDARD)		75' (75')	SAME	75' (75')	SAME	75' (75')	SAME	50' (50')	SAME	50' (50')	SAME	75' (75')	SAME	104' (75')	SAME
SAFETY AREA WIDTH (ADG)		214' (V)	SAME	214' (V)	SAME	214' (V)	SAME	118' (III)	SAME	118' (III)	SAME	214' (V)	SAME	214' (V)	SAME
OBJECT FREE AREA WIDTH (ADG)		320' (V)	SAME	320' (V)	SAME	320' (V)	SAME	186' (III)	SAME	162' (III)	SAME	320' (V)	SAME	320' (V)	SAME
SEPARATION	T/W TO T/W	340'	SAME	340'	SAME	267'	SAME	382'	SAME	382'	SAME	1,520'	SAME	N/A	SAME
	T/W TO OBJECT	160'	SAME	160'	SAME	160'	SAME	93'	SAME	81'	SAME	160'	SAME	160'	SAME
	T/W TO R/W	788'	SAME	450'	SAME	450'	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME
LIGHTING		MITL	SAME	MITL	SAME	MITL	SAME	MITL	SAME	MITL	SAME	MITL	SAME	MITL	SAME
TAXIWAY EDGE SAFETY MARGIN		19'	SAME	15'	SAME	19'	SAME	13'	SAME	10'	SAME	15'	SAME	15'	SAME
TAXIWAY SHOULDER WIDTH		35'	SAME	35'	SAME	35'	SAME	25'	SAME	15'	SAME	30'	SAME	30'	SAME

TAXIWAY DATA

		T/W 'K'		T/W 'L'		T/W 'N'		T/W 'P'		T/W 'T'		T/W 'V'		T/W 'W'		T/W 'Y'		FUTURE T/W	
(NOTE 5)		EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE
TAXIWAY DESIGN GROUP		5	SAME	5	SAME	5	SAME	5	SAME	3	SAME	3	SAME	3	SAME	2	SAME	N/A	5
WIDTH IN FEET (STANDARD)		150'(75')	SAME	130'(75')	SAME	100'(75')	SAME	75'(75')	SAME	60' (50')	SAME	75' (50')	SAME	75' (50')	SAME	75' (35')	SAME	N/A	75' (75')
SAFETY AREA WIDTH (ADG)		214' (V)	SAME	214' (V)	SAME	214' (V)	SAME	214' (V)	SAME	118' (III)	SAME	118' (III)	SAME	118' (III)	SAME	79' (II)	SAME	N/A	214' (V)
OBJECT FREE AREA WIDTH (ADG)		320' (V)	SAME	320' (V)	SAME	320' (V)	SAME	320' (V)	SAME	186' (III)	SAME	186' (III)	SAME	186' (III)	SAME	131' (II)	SAME	N/A	320' (V)
SEPARATION (IN FEET)	T/W TO T/W	267'	SAME	267'	SAME	N/A	SAME	N/A	SAME	152'	SAME	210'	SAME	210'	SAME	162'	SAME	N/A	267'
	T/W TO OBJECT	160'	SAME	160'	SAME	160'	SAME	160'	SAME	93'	SAME	93'	SAME	93'	SAME	65.5'	SAME	N/A	160'
	T/W TO R/W	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME	N/A	SAME	612'	SAME	N/A	450'
LIGHTING		MITL	SAME	MITL	SAME	MITL	SAME	MITL	SAME	MITL	SAME	MITL	SAME	MITL	SAME	MITL	SAME	N/A	MITL
TAXIWAY EDGE SAFETY MARGIN		15'	SAME	15'	SAME	15'	SAME	15'	SAME	15'	SAME	15'	SAME	15'	SAME	7.5'	SAME	N/A	15'
TAXIWAY SHOULDER WIDTH		30'	SAME	30'	SAME	30'	SAME	30'	SAME	20'	SAME	22.5'	SAME	22.5'	SAME	15'	SAME	N/A	30'

MODIFICATION OF STANDARDS

ITEM	STANDARD	EXISTING	FUTURE	APPROVAL DATE	AIRSPACE CASE NO.
NONE REQUIRED					

REVISIONS & NOTES

NO.	DESCRIPTION	DATE

NOTES:

1. THIS AIRPORT LAYOUT PLAN REFLECTS PLANNING STANDARDS SPECIFIC TO THIS AIRPORT, AND IS NOT A PRODUCT OF DETAILED ENGINEERING DESIGN ANALYSIS. IT IS NOT INTENDED TO BE USED FOR CONSTRUCTION DOCUMENTATION OR NAVIGATION.
2. AERIAL PHOTOGRAPHY ACQUIRED BY MARTINEZ GEOSPATIAL (MAY 10, 2018). AGIS DATA PROVIDED BY MARTINEZ GEOSPATIAL (RUNWAY SURVEY MAY 2, 2018).
3. AIRPORT LAYOUT PLAN INCORPORATES AN FAA APPROVED AIRPORT GEOGRAPHIC INFORMATION SURVEY FROM MAY 2018, A 2018 OBSTRUCTION SURVEY, AND FAA APPROVED NOISE CONTOURS FROM PMGAA AIRPORT LAND USE COMPATIBILITY PLAN UPDATE, JAN. 2017 AND BASED ON ANNUAL SERVICE VOLUME.
4. RUNWAY DECLARED DISTANCES FROM AIRPORT FACILITIES DIRECTORY.
5. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULARS 150/5300-13A CHANGE 1, AIRPORT DESIGN, FAA STANDARD OPERATING PROCEDURES 2.0 & 3.0, AND PART 77 OF THE FEDERAL AVIATION REGULATIONS (FAR), SAFE, EFFICIENT USE, AND PRESERVATION OF THE NAVIGABLE AIRSPACE.
6. CRITICAL DESIGN AIRCRAFT AND RUNWAY DESIGN CODE DETERMINED THROUGH OPERATION RECORDS AND FORECASTS. RUNWAY DESIGN STANDARDS AND AIRCRAFT SPECIFICATION DATA SOURCE: FAA ADVISORY CIRCULAR 150/5300-13A (CHANGE 1), AIRPORT DESIGN, APPENDIX 1.
7. ALL COORDINATES NAD83 AND ALL ELEVATIONS NAVD88. HORIZONTAL AND VERTICAL DATUM SOURCE: AGIS SURVEY 2018, OBSTRUCTION SURVEY 2018; SUPPLEMENTED WITH 5010 AIRPORT MASTER RECORD AND AIRPORT AVN DATA SHEET.
8. MAGNETIC DECLINATION SOURCE: NATIONAL GEOPHYSICAL DATA CENTER, JULY 2019.
9. EXISTING APPROACH MINIMUMS, APPROACH CATEGORY AND DEPARTURE PROCEDURES BASED ON PUBLISHED APPROACH PLATES.
10. RUNWAY DESIGNATIONS HAVE CHANGED DUE MAGNETIC DECLINATION AND WILL BE RE-DESIGNATED TO 13/31.

AIRPORT DATA

	EXISTING	FUTURE
AIRPORT REFERENCE CODE	C-III	D-V
MEAN MAX. TEMPERATURE (HOTTEST MONTH)	108.4°F (JULY)	SAME
AIRPORT ELEVATION (AMSL) (NOTE 8)	1384.1'	SAME
AIRPORT & TERMINAL NAVAIDS	ILS, LOC, VOR, TACAN (RW30C), PAPI, REILS, BEACON	SAME
AIRPORT REFERENCE POINT (ARP) NAD 83 EXISTING / FUTURE	N 33° 18' 28.2" W 111° 39' 19.7"	N 33° 18' 26.7" W 111° 39' 18.6"
MISCELLANEOUS FACILITIES	ATCT, ASR-8, WINDCONES, ATIS/ASOS, MITL RUNWAY LIGHTS	SAME
GPS APPROACHES	RNAV(GPS) 12C RNAV(GPS) 12R/30L RNAV(RNP) Z 30C RNAV(GPS) Y 30C	SAME SAME SAME SAME RNAV(GPS)12L/30R
CRITICAL AIRCRAFT (NOTE 6)	AIRBUS A320	BOEING 747-400
WINGSPAN	111.9' ADG III	213' ADG V
UNDERCARRIAGE	29.4'	41.3'
APPROACH SPEED	136 KNOTS ADG III	158 KNOTS ADG V
MAGNETIC VARIATION (DATE) (NOTE 8)	10°8'E (JULY 2019)	SAME
NPIAS SERVICE LEVEL	PRIMARY	SAME
STATE (AZ) EQUIVALENT SERVICE ROLE	PRIMARY COMM SERV	SAME
COMBINED WIND COVERAGE % (20kt,16kt,13kt,10.5kt)	99,84,99,51,98,6,97,66	SAME

Mead & Hunt

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8800 East Raintree Drive,
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Phoenix-Mesa Gateway Airport

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PHOENIX-MESA GATEWAY AIRPORT
AIRPORT LAYOUT PLAN

5835 S SOSSMAN RD
MESA, AZ 85212

ISSUED

NOT FOR CONSTRUCTION

M&H NO.: 2327700-171799.01
DATE: MARCH 2020
DESIGNED BY: M&H
DRAWN BY: JWB
CHECKED BY: BJM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
AIRPORT DATA

SHEET NO.
2

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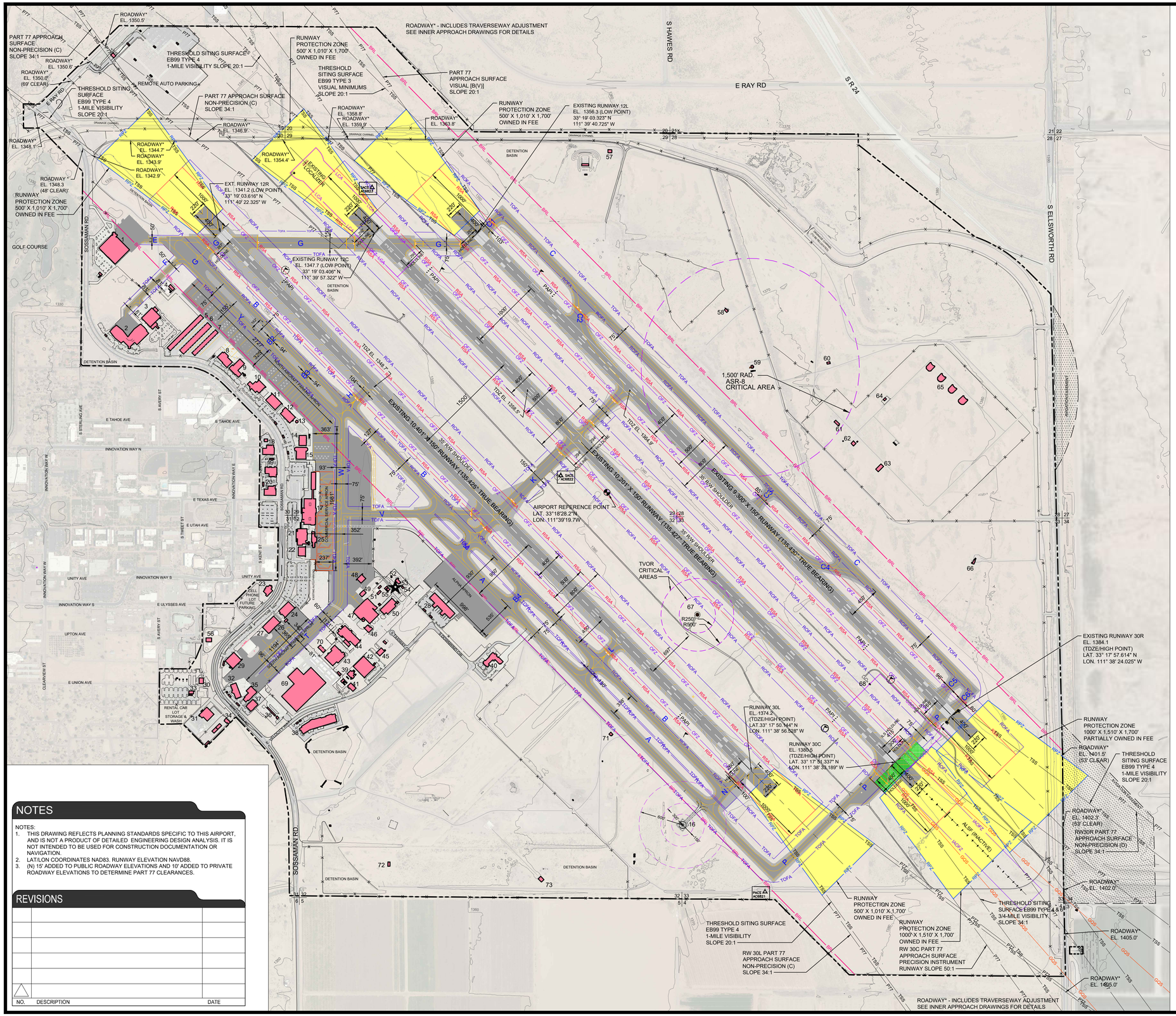

FACILITY LEGEND

NO.	DESCRIPTION	TOP ELEVATION
1	HANGAR/OFFICE	EL. 1383.4
2	HANGAR/OFFICE	EL. 1382.3
3	HANGAR/OFFICE	EL. 1382.3
4	FIRE SUPPRESSION SYSTEM	EL. 1355.1
5	T-HANGAR	EL. 1365.7
6	T-HANGAR	EL. 1361.0
7	T-HANGAR	EL. 1359.4
8	HANGAR/OFFICE	EL. 1376.0
9	HANGAR/OFFICE	EL. 1377.9
10	HANGAR/OFFICE	EL. 1383.3
11	HANGAR/OFFICE	EL. 1382.9
12	GENERAL AVIATION CENTER (FBO/OFFICES)	EL. 1365.2
13	BUILDING (GAZEBO)	EL. 1358.1
14	AIRPORT ADMINISTRATION OFFICE BUILDING	EL. 1369.3
15	HANGAR/OFFICE	EL. 1378.5
16	COMPASS PAD	EL. 1365.0
17	TERMINAL BUILDING	EL. 1366.5
18	OFFICE BUILDING	EL. 1379.9
19	OFFICE BUILDING	EL. 1380.2
20	OFFICE BUILDING	EL. 1378.9
21	TERMINAL BUILDING	EL. 1371.6
22	HANGAR #24	EL. 1366.7
23	OFFICE BUILDING	EL. 1369.5
24	HANGAR	EL. 1383.7
25	TERMINAL ANNEX	EL. 1365.6
26	HANGAR	EL. 1379.6
27	HANGAR	EL. 1391.3
28	LINE SERVICES BUILDING	EL. 1392.2
29	OFFICE BUILDING	EL. 1391.1
30	OFFICE BUILDING	EL. 1358.9
31	INDUSTRIAL BUILDING	EL. 1363.9
32	OFFICE BUILDING	EL. 1379.7
33	CAR WASH AREA	EL. 1373.5
34	OFFICE BUILDING	EL. 1359.9
35	OFFICE BUILDING	EL. 1375.1
36	FUEL FARM	EL. 1360.6
37	OFFICE BUILDING	EL. 1360.6
38	OFFICE BUILDING	EL. 1375.5
39	BUILDING	EL. 1380.6
40	ARFF	EL. 1401.6
41	BUILDING	EL. 1368.1
42	OFFICE BUILDING	EL. 1383.1
43	OFFICE BUILDING	EL. 1375.6
44	BUILDING	EL. 1381.3
45	OFFICE BUILDING	EL. 1378.8
46	OFFICE BUILDING	EL. 1374.5
47	HANGAR/OFFICE	EL. 1406.9
48	BUILDING	EL. 1382.4
49	SHADE	EL. 1362.9
50	OFFICE BUILDING	EL. 1372.5
51	FIRE SUPPRESSION SYSTEM	EL. 1361.7
52	COMMUNICATIONS VAULT	EL. 1360.0
53	OFFICE BUILDING	EL. 1370.4
54	ATCT/AIRPORT BEACON	EL. 1474.3
55	BUILDING	EL. 1364.5
56	FIRE SUPPRESSION SYSTEM	EL. 1366.3
57	BUILDING	EL. 1376.5
58	EAST LIGHTING VAULT	EL. 1385.3
59	ASR-8	EL. 1381.5
60	BUILDING	EL. 1386.7
61	BUILDING	EL. 1387.6
62	BUILDING	EL. 1390.0
63	BUILDING	EL. 1391.7
64	BUILDING	EL. 1395.7
65	BUNKER	EL. 1401.8
66	RTR BUILDING	EL. 1392.7
67	TVOR	EL. 1400.9
68	ILS GLIDE SLOPE	EL. 1385.0
69	HANGAR/MANUFACTURING/OFFICE	EL. 1368.0' EST.
70	HUSH HOUSE	EL. 1370.1'
71	WEST LIGHTING VAULT	EL. 1374.6'
72	BUILDING	EL. 1377.1'
73	BUILDING	EL. 1403.5'

10° 8' E ± 0° 20' changing by 0° 5' W per year (July 2019)

0 660 1320

DRAWING LEGEND

	EXISTING
AIRPORT PROPERTY LINE	
AVIGATION EASEMENT	
AIRPORT BUILDINGS	
AIRFIELD PAVEMENT	
PAVED ROADS	
RUNWAY PROTECTION ZONE	RPZ
THRESHOLD SITING SURFACE	TSS
PART 77 APPROACH SURFACE	P77
BUILDING RESTRICTION LINE	BRL
RUNWAY OBSTACLE FREE ZONE	OFZ
INNER APPROACH OBSTACLE FREE ZONE	IADFZ
PRECISION OBSTACLE FREE ZONE	
RADAR CRITICAL AREAS	
GLIDE SLOPE CRITICAL AREA	GSCA
LOCALIZER CRITICAL AREA	LCA
RUNWAY SAFETY AREA	RSA
RUNWAY OBJECT FREE AREA	ROFA
TAXIWAY OBJECT FREE AREA	TOFA
AIRPORT SECURITY FENCE (8' HEIGHT)	
APRON/ITAXIWAY/TAXILANE MARKING	
AIRPORT BEACON	
LIGHTED WIND CONE & SEGMENTED CIRCLE	
WIND CONE	
PRECISION APPROACH PATH INDICATOR (PAPI)	
RUNWAY END IDENTIFIER LIGHTS (REIL)	
AIRPORT REFERENCE POINT (ARP)	
AIRPORT SURVEY CONTROL STATIONS	

NOTES

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2. LAT/LON COORDINATES NAD83. RUNWAY ELEVATION NAVD88.
3. (N) 15' ADDED TO PUBLIC ROADWAY ELEVATIONS AND 10' ADDED TO PRIVATE ROADWAY ELEVATIONS TO DETERMINE PART 77 CLEARANCES.

REVISIONS

NO.	DESCRIPTION	DATE

Mead & Hunt

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Phoenix-Mesa Gateway Airport

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PHOENIX-MESA GATEWAY AIRPORT
AIRPORT LAYOUT PLAN

5835 S SOSSMAN RD
MESA, AZ 85212

ISSUED

NOT FOR CONSTRUCTION

M&H NO.: 2327700-171799.01
DATE: MARCH 2020
DESIGNED BY: M&H
DRAWN BY: JWB
CHECKED BY: BJM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
EXISTING AIRPORT LAYOUT

SHEET NO.
3

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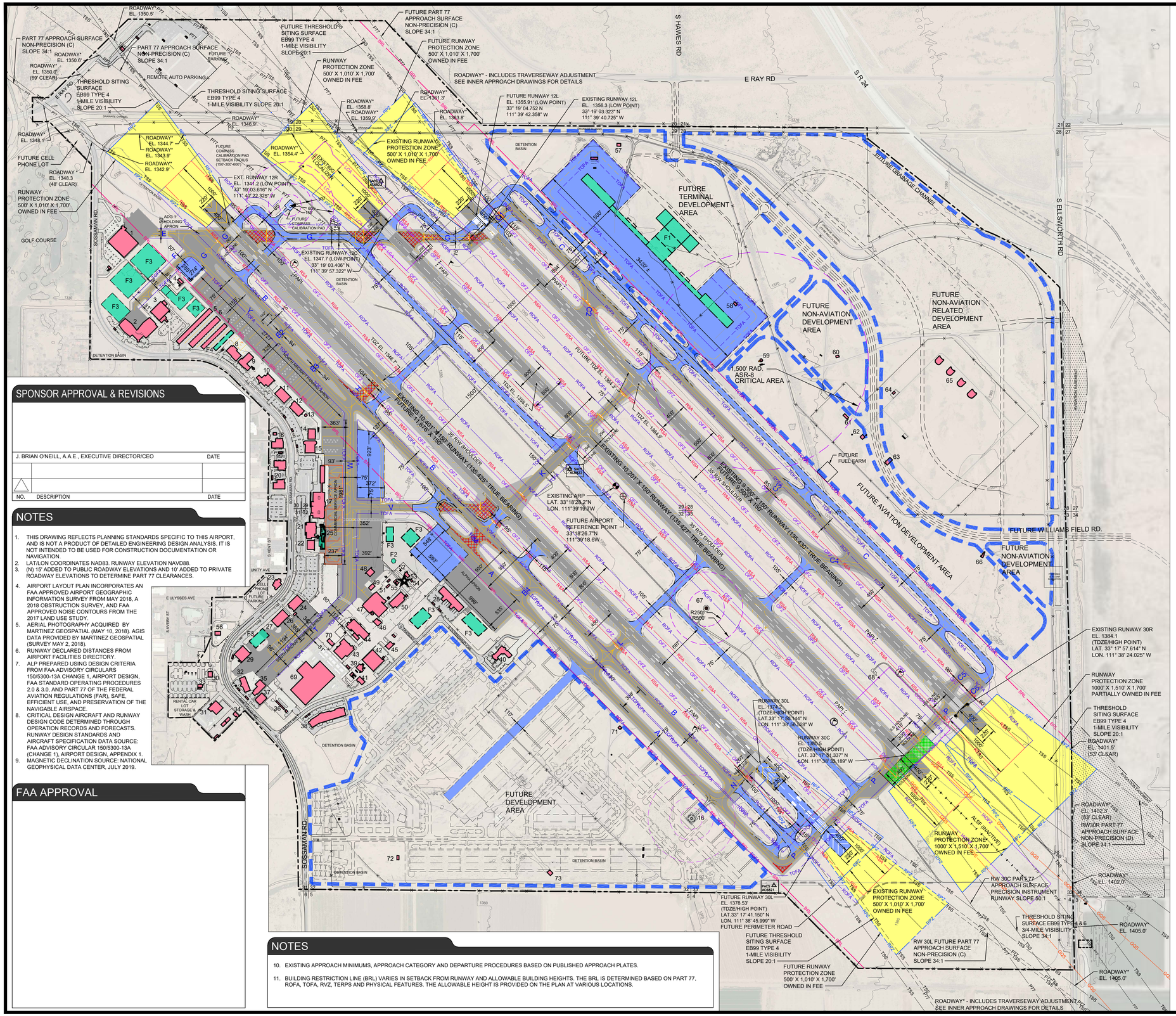

SPONSOR APPROVAL & REVISIONS

J. BRIAN O'NEILL, A.A.E., EXECUTIVE DIRECTOR/CEO — DATE

NO.	DESCRIPTION	DATE

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9. MAGNETIC DECLINATION SOURCE: NATIONAL GEOPHYSICAL DATA CENTER, JULY 2019.

FAA APPROVAL

NOTES

10. EXISTING APPROACH MINIMUMS, APPROACH CATEGORY AND DEPARTURE PROCEDURES BASED ON PUBLISHED APPROACH PLATES.
11. BUILDING RESTRICTION LINE (BRL) VARIES IN SETBACK FROM RUNWAY AND ALLOWABLE BUILDING HEIGHTS. THE BRL IS DETERMINED BASED ON PART 77, ROFA, TOFA, RVZ, TERPS AND PHYSICAL FEATURES. THE ALLOWABLE HEIGHT IS PROVIDED ON THE PLAN AT VARIOUS LOCATIONS.

FACILITY LEGEND

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5	T-HANGAR	EL. 1365.7
6	T-HANGAR	EL. 1361.0
7	T-HANGAR	EL. 1359.4
8	HANGAR/OFFICE	EL. 1376.0
9	HANGAR/OFFICE	EL. 1377.9
10	HANGAR/OFFICE	EL. 1383.3
11	HANGAR/OFFICE	EL. 1382.9
12	GENERAL AVIATION CENTER (FBO/OFFICES)	EL. 1365.2
13	BUILDING (GAZEBO)	EL. 1358.1
14	AIRPORT ADMINISTRATION OFFICE BUILDING	EL. 1369.3
15	HANGAR/OFFICE	EL. 1378.5
16	COMPASS PAD	EL. 1365.0
17	TERMINAL BUILDING	EL. 1366.5
18	OFFICE BUILDING	EL. 1379.9
19	OFFICE BUILDING	EL. 1380.2
20	OFFICE BUILDING	EL. 1378.9
21	TERMINAL BUILDING	EL. 1371.6
22	HANGAR #24 (TO BE REMOVED)	EL. 1366.7
23	OFFICE BUILDING	EL. 1369.5
24	HANGAR	EL. 1383.7
25	TERMINAL ANNEX (TO BE REPLACED)	EL. 1365.6
26	HANGAR	EL. 1379.6
27	HANGAR (TO BE REPLACED)	EL. 1391.3
28	LINE SERVICES BUILDING	EL. 1392.2
29	OFFICE BUILDING	EL. 1391.1
30	OFFICE BUILDING	EL. 1358.9
31	INDUSTRIAL BUILDING	EL. 1363.9
32	OFFICE BUILDING	EL. 1379.7
33	CAR WASH AREA	EL. 1373.5
34	OFFICE BUILDING	EL. 1359.9
35	OFFICE BUILDING	EL. 1375.1
36	FUEL FARM	EL. 1360.6
37	OFFICE BUILDING	EL. 1360.6
38	OFFICE BUILDING	EL. 1375.5
39	BUILDING	EL. 1380.6
40	ARFF	EL. 1401.6
41	BUILDING	EL. 1368.1
42	OFFICE BUILDING	EL. 1383.1
43	OFFICE BUILDING	EL. 1375.6
44	BUILDING	EL. 1381.3
45	OFFICE BUILDING	EL. 1378.8
46	OFFICE BUILDING	EL. 1374.5
47	HANGAR/OFFICE	EL. 1406.9
48	BUILDING	EL. 1382.4
49	SHADE	EL. 1362.9
50	OFFICE BUILDING	EL. 1372.5
51	FIRE SUPPRESSION SYSTEM	EL. 1361.7
52	COMMUNICATIONS VAULT	EL. 1360.0
53	OFFICE BUILDING	EL. 1370.4
54	ATCT/AIRPORT BEACON	EL. 1474.3
55	BUILDING	EL. 1364.5
56	FIRE SUPPRESSION SYSTEM	EL. 1386.3
57	BUILDING (REMOVE/RELOCATE OFF AIRPORT)	EL. 1376.5
58	EAST LIGHTING VAULT (TO BE RELOCATED)	EL. 1385.3
59	ASR-8 (TO BE RELOCATED)	EL. 1381.5
60	BUILDING (TO BE REMOVED)	EL. 1386.7
61	BUILDING (TO BE REMOVED)	EL. 1387.6
62	BUILDING (TO BE REMOVED)	EL. 1390.0
63	BUILDING (TO BE REMOVED)	EL. 1391.7
64	BUILDING (TO BE REMOVED)	EL. 1395.7
65	BUNKER (TO BE REMOVED)	EL. 1401.8
66	RTR BUILDING (TO BE RELOCATED)	EL. 1392.7
67	TVOR	EL. 1400.9
68	ILS GLIDE SLOPE	EL. 1385.0
69	HANGAR/MANUFACTURING/OFFICE	EL. 1368.0' EST.
70	HUSH HOUSE	EL. 1370.1'
71	WEST LIGHTING VAULT	EL. 1374.6'
72	BUILDING (TO BE REMOVED)	EL. 1377.1'
73	BUILDING (TO BE REMOVED)	EL. 1403.5'
F1	FUTURE PASSENGER TERMINAL	
F2	FUTURE AIR TRAFFIC CONTROL TOWER	
F3	FUTURE BUILDING	
F4	FUTURE T-HANGAR	

10° 8' E ± 0° 20' changing by 0° 5' W per year (July 2019)

0 660 1320

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AVIGATION EASEMENT		N/A
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
PAVED ROADS		
RUNWAY PROTECTION ZONE	RPZ	RPZ
GLIDE PATH QUALIFICATION SURFACE		N/A
PART 77 APPROACH SURFACE	77	77
THRESHOLD SITING SURFACE	TSS	TSS
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY OBSTACLE FREE ZONE	OFZ	OFZ
INNER APPROACH OBSTACLE FREE ZONE	IAOFZ	N/A
PRECISION OBSTACLE FREE ZONE		N/A
RADAR CRITICAL AREAS		N/A
GLIDE SLOPE CRITICAL AREA	GSCA	N/A
LOCALIZER CRITICAL AREA	LCA	N/A
RUNWAY SAFETY AREA	RSA	RSA
RUNWAY OBJECT FREE AREA	ROFA	ROFA
TAXIWAY OBJECT FREE AREA	TOFA	TOFA
AIRPORT SECURITY FENCE (8' HEIGHT)		
APRON/TAXIWAY/TAXILANE MARKING		N/A
AIRPORT BEACON		N/A
LIGHTED WIND CONE & SEGMENTED CIRCLE		N/A
WIND CONE		N/A
PRECISION APPROACH PATH INDICATOR (PAPI)		N/A
RUNWAY END IDENTIFIER LIGHTS (REIL)		N/A
AIRPORT REFERENCE POINT (ARP)		
AIRPORT SURVEY CONTROL STATIONS		N/A
FUTURE DEVELOPMENT AREAS		

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PHOENIX-MESA GATEWAY AIRPORT
AIRPORT LAYOUT PLAN

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SHEET CONTENTS

FUTURE AIRPORT LAYOUT PLAN

SHEET NO.

4

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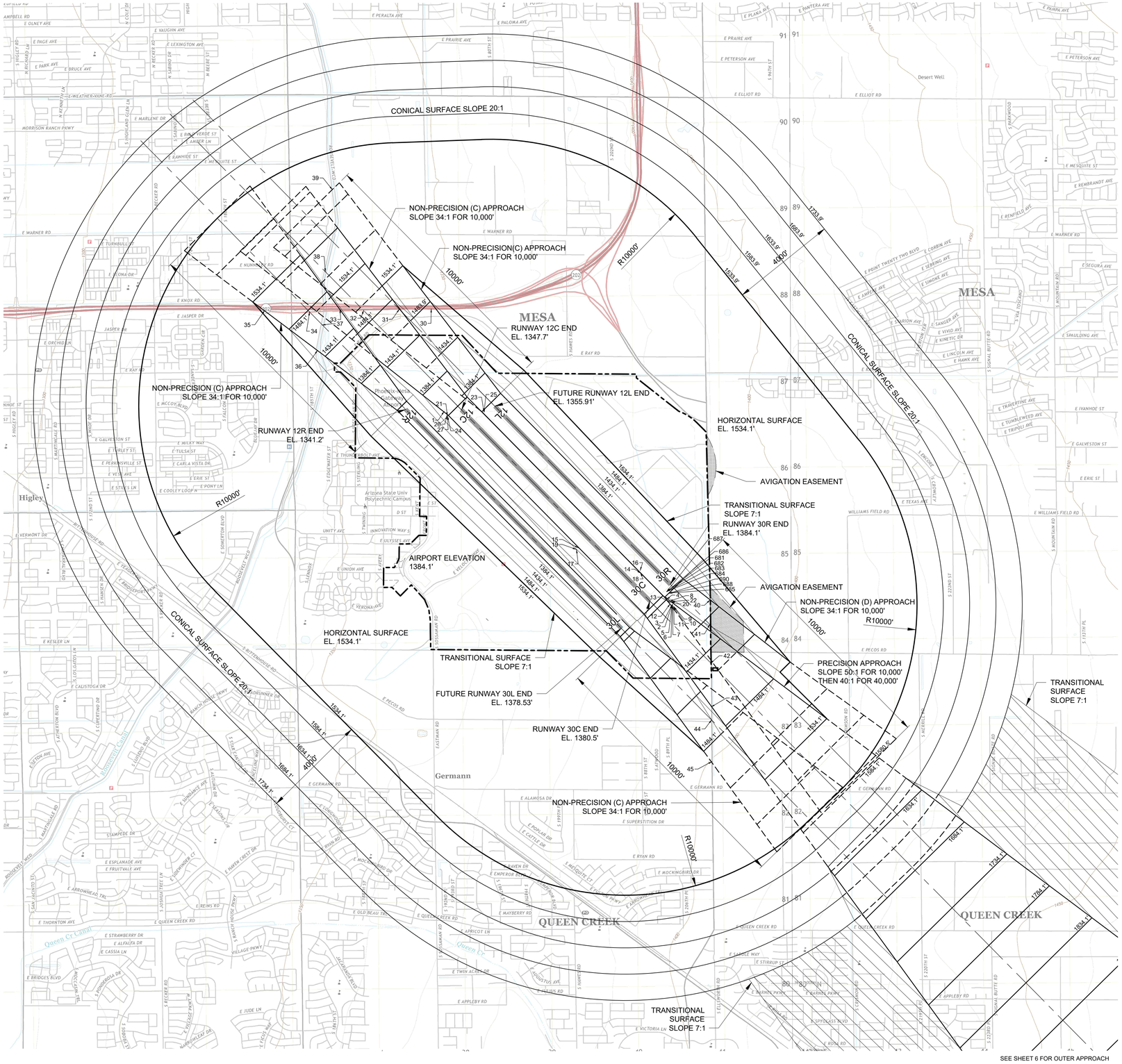

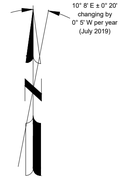

0 2000 4000

PART 77 OBSTRUCTIONS

NUMBER	DESCRIPTION	TOP ELEVATION (MSL)	PENETRATION	SURFACE	HEIGHT ABOVE GROUND	GROUND EL.	DISPOSITION
1	ACCESS ROAD	1354.8	0.5	12C APPROACH	10.0	1344.8	TO REMAIN
2	ACCESS ROAD	1393.1	2.8	30C APPROACH	10.0	1383.1	TO REMAIN
3	ACCESS ROAD	1393.1	2.7	30C APPROACH	10.0	1383.1	TO REMAIN
4	TREETOP	1387.2	2.6	30C APPROACH	6.2	1381.0	REMOVE
5	ACCESS ROAD	1392.8	2.6	30C APPROACH	10.0	1382.8	TO REMAIN
6	ACCESS ROAD	1392.7	2.4	30C APPROACH	10.0	1382.7	TO REMAIN
7	ACCESS ROAD	1392.9	2.0	30C APPROACH	10.0	1382.9	TO REMAIN
8	TREETOP	1388.4	1.4	30C APPROACH	6.6	1381.8	REMOVE
9	ACCESS ROAD	1393.4	1.1	30C APPROACH	10.0	1383.4	TO REMAIN
10	ACCESS ROAD	1393.4	1.1	30C APPROACH	10.0	1383.4	TO REMAIN
11	ACCESS ROAD	1393.3	1.0	30C APPROACH	10.0	1383.3	TO REMAIN
12	TREETOP	1389.2	0.4	30C APPROACH	6.9	1382.3	REMOVE
13	TREETOP	1388.6	0.4	30C APPROACH	6.1	1382.5	REMOVE
14	ANTENNA	1408.6	31.6	30C PRIMARY	32.2	1376.4	TO REMAIN
15	VOR	1400.1	27.9	30C TRANS.	34.0	1366.1	TO REMAIN
16	ANTENNA	1408.5	23.1	30C TRANS.	32.3	1376.2	TO REMAIN
17	UTILITY POLE	1401.7	15.2	30C TRANS.	37.0	1364.7	TO REMAIN
18	BLDG PEAK ELEV	1384.7	7.7	30C TRANS.	8.4	1376.3	TO BE LIGHTED
19	ANTENNA	1392.2	6.2	30C TRANS.	27.3	1364.9	TO REMAIN
20	ACCESS ROAD	1392.0	2.7	30R APPROACH	10.0	1382.0	TO REMAIN
21	ACCESS ROAD	1355.4	2.1	30C TRANS.	10.0	1345.4	TO REMAIN
22	ACCESS ROAD	1391.9	1.4	30R APPROACH	10.0	1381.9	TO REMAIN
23	ACCESS ROAD	1359.9	4.0	PRIMARY	10.0	1349.9	TO REMAIN
24	ACCESS ROAD	1355.2	0.7	30C TRANS.	10.0	1345.2	TO REMAIN
25	ACCESS ROAD	1360.4	4.5	PRIMARY	10.0	1350.4	TO REMAIN
26	ACCESS ROAD	1355.5	0.4	30C TRANS.	10.0	1345.5	TO REMAIN
27	ACCESS ROAD	1355.8	0.2	30C TRANS.	10.0	1345.8	TO REMAIN
681	ACCESS ROAD	1390.4	6.3	PRIMARY	10.0	1380.4	TO REMAIN
682	ACCESS ROAD	1390.4	6.3	PRIMARY	10.0	1380.4	TO REMAIN
683	ACCESS ROAD	1390.4	6.3	PRIMARY	10.0	1380.4	TO REMAIN
684	ACCESS ROAD	1390.4	6.3	PRIMARY	10.0	1380.4	TO REMAIN
685	ACCESS ROAD	1388.7	3.3	30R APPROACH	10.0	1378.7	TO REMAIN
686	ACCESS ROAD	1390.2	6.1	PRIMARY	10.0	1380.2	TO REMAIN
687	ACCESS ROAD	1390.2	6.1	PRIMARY	10.0	1380.2	TO REMAIN
688	ACCESS ROAD	1388.8	4.7	30R APPROACH	10.0	1378.8	TO REMAIN
690	ACCESS ROAD	1388.7	4.6	30R APPROACH	10.0	1378.7	TO REMAIN

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL

SIGNIFICANT OBJECTS

NUMBER	DESCRIPTION	TOP ELEVATION (MSL)	PENETRATION	SURFACE	HEIGHT ABOVE GROUND	GROUND EL.	DISPOSITION
30	INTERSTATE	1382.0	-1498.0	RW12L APP	17.0	1365.0	TO REMAIN
31	INTERSTATE	1369.9	-122.1	RW12L APP	17.0	1352.9	TO REMAIN
32	INTERSTATE	1359.4	-150.6	RW12C APP	17.0	1342.4	TO REMAIN
33	INTERSTATE	1372.0	-103.0	RW12C APP	17.0	1355.0	TO REMAIN
34	INTERSTATE	1357.9	-139.1	RW12R APP	17.0	1340.9	TO REMAIN
35	INTERSTATE	1347.6	-169.4	RW12R APP	17.0	1330.6	TO REMAIN
36	CANAL	1330.1	-109.9	RW12R APP	0.0	1330.1	TO REMAIN
37	CANAL	1330.0	-128.0	RW12R APP	0.0	1330.0	TO REMAIN
38	CANAL	1330.0	-228.0	RW12C APP	0.0	1330.0	TO REMAIN
39	CANAL	1330.0	-204.0	HORIZONTAL	0.0	1330.0	TO REMAIN
40	ROADWAY	1401.5	-35.4	RW30R APP	15.0	1386.5	TO REMAIN
41	ROADWAY	1402.7	-53.3	RW30C APP	15.0	1387.7	TO REMAIN
42	ROADWAY	1404.3	-50.8	RW30C APP	15.0	1389.3	TO REMAIN
43	ROADWAY	1405.0	-62.5	RW30C APP	15.0	1390.0	TO REMAIN
44	ROADWAY	1405.0	-63.5	RW30L APP	15.0	1390.0	TO REMAIN
45	ROADWAY	1410.0	-89.0	HORIZONTAL	15.0	1395.0	TO REMAIN
46	ROADWAY	1495.0	-583.0	RW30C APP	15.0	1480.0	TO REMAIN
47	ROADWAY	1500.5	-699.5	RW30C APP	15.0	1485.5	TO REMAIN
48	ROADWAY	1495.0	-854.0	RW30C APP	15.0	1480.0	TO REMAIN

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL
NEGATIVE PENETRATION VALUE REPRESENTS END ELEVATION BELOW SURFACE

REVISIONS & NOTES

NO.	DESCRIPTION	DATE

1. THIS DRAWING REFLECTS PLANNING STANDARDS SPECIFIC TO THIS AIRPORT, AND IS NOT A PRODUCT OF DETAILED ENGINEERING DESIGN ANALYSIS. IT IS NOT INTENDED TO BE USED FOR CONSTRUCTION DOCUMENTATION OR NAVIGATION.
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3. AGIS DATA PROVIDED BY MARTINEZ GEOSPATIAL (SURVEY MAY 2, 2018).
4. USGS MAPS HIGHLEY, AZ 2018 & SACATON NE, AZ 2018.
5. MAGNETIC DECLINATION CALCULATED BY NATIONAL GEOPHYSICAL DATA CENTER.
6. RUNWAY ENDS, PART 77 SURFACE CONTOURS AND OBSTRUCTION ELEVATIONS ARE SHOWN IN NAD83 AND NAVD88. ALL ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL (MSL).
7. FOR OUTER APPROACH PLANS TO RUNWAY 30C SEE SHEET 6.
8. FOR APPROACH PROFILES, SEE SHEETS 7 THROUGH 9.
9. FOR CLOSE-IN OBSTRUCTION DETAIL NEAR EACH RUNWAY END, SEE INNER-APPROACH PLANS, SHEETS 10 THROUGH 15.
10. FOR DEPARTURE SURFACES, SEE SHEETS 16 THROUGH 19.

* PER PART 77, 15 FEET VERTICAL CLEARANCE ADDED TO ROAD ELEVATIONS, 17 FEET ADDED TO INTERSTATES AND 23 FEET ADDED TO RAILROADS.

DRAWING LEGEND

AIRPORT PROPERTY LINE	
AVIGATION EASEMENT	
RUNWAYS	
PART 77 CONTROLLING SURFACE	
PART 77 NON-CONTROLLING SURFACE	

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AIRPORT LAYOUT PLAN

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SHEET CONTENTS
PART 77 AIRSPACE PLAN - CONICAL SURFACE

SHEET NO.
5

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SIGNIFICANT OBJECTS

NUMBER	DESCRIPTION	TOP ELEVATION (MSL)	PENETRATION	SURFACE	HEIGHT ABOVE GROUND	GROUND EL.	DISPOSITION
45	ROADWAY	1410.0	-89.0	HORIZONTAL	15.0	1395.0	TO REMAIN
46	ROADWAY	1495.0	-583.0	RW30C APP	15.0	1480.0	TO REMAIN
47	ROADWAY	1500.5	-699.5	RW30C APP	15.0	1485.5	TO REMAIN
48	ROADWAY	1495.0	-854.0	RW30C APP	15.0	1480.0	TO REMAIN

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL
NEGATIVE PENETRATION VALUE REPRESENTS END ELEVATION BELOW SURFACE

TRANSITIONAL SURFACE SLOPE 7:1

TRANSITIONAL SURFACE SLOPE 7:1

EXTENDED APPROACH SURFACE SLOPE 40:1

10° 8' E ± 0° 20' changing by 0° 5' W per year (July 2019)

0 2000 4000

REVISIONS & NOTES

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DRAWING LEGEND

AIRPORT PROPERTY LINE	
AVIGATION EASEMENT	
RUNWAYS	
PART 77 CONTROLLING SURFACE	
PART 77 NON-CONTROLLING SURFACE	

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SHEET CONTENTS

PART 77 OUTER APPROACHES

SHEET NO.

6

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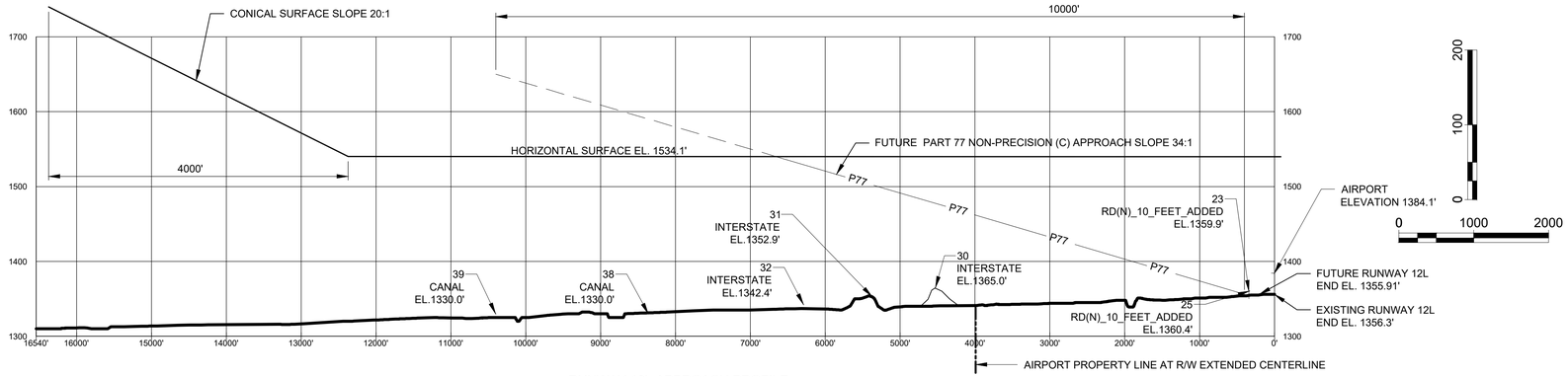
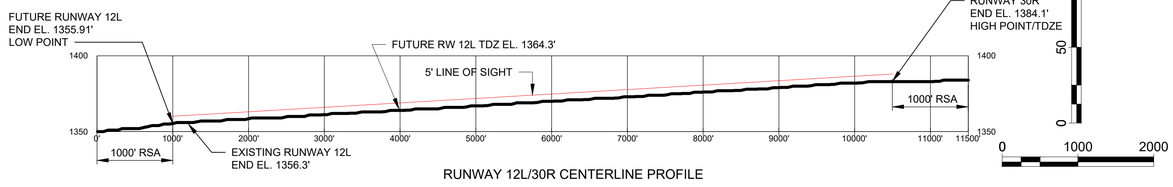


RUNWAY 12L APPROACH PROFILE

PART 77 OBSTRUCTIONS

NUMBER	DESCRIPTION	TOP ELEVATION (MSL)	PENETRATION	SURFACE	HEIGHT ABOVE GROUND	GROUND EL.	DISPOSITION
20	ACCESS ROAD	1392.0	2.7	30R APPROACH	10.0	1382.0	TO REMAIN
22	ACCESS ROAD	1391.9	1.4	30R APPROACH	10.0	1381.9	TO REMAIN
23	ACCESS ROAD	1359.9	4.0	PRIMARY	10.0	1349.9	TO REMAIN
25	ACCESS ROAD	1360.4	4.5	PRIMARY	10.0	1350.4	TO REMAIN
681	ACCESS ROAD	1390.4	6.3	PRIMARY	10.0	1380.4	TO REMAIN
682	ACCESS ROAD	1390.4	6.3	PRIMARY	10.0	1380.4	TO REMAIN
683	ACCESS ROAD	1390.4	6.3	PRIMARY	10.0	1380.4	TO REMAIN
684	ACCESS ROAD	1390.4	6.3	PRIMARY	10.0	1380.4	TO REMAIN
685	ACCESS ROAD	1388.7	3.3	30R APPROACH	10.0	1378.7	TO REMAIN
686	ACCESS ROAD	1390.2	6.1	PRIMARY	10.0	1380.2	TO REMAIN
687	ACCESS ROAD	1390.2	6.1	PRIMARY	10.0	1380.2	TO REMAIN
688	ACCESS ROAD	1388.8	4.7	30R APPROACH	10.0	1378.8	TO REMAIN
690	ACCESS ROAD	1388.7	4.6	30R APPROACH	10.0	1378.7	TO REMAIN

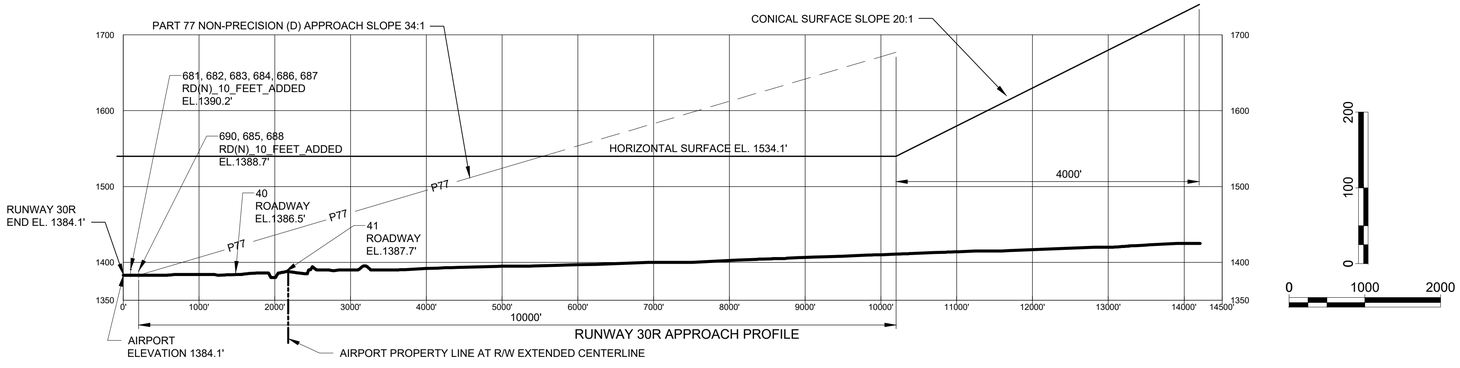


RUNWAY 12L/30R CENTERLINE PROFILE

SIGNIFICANT OBJECTS

NUMBER	DESCRIPTION	TOP ELEVATION (MSL)	PENETRATION	SURFACE	HEIGHT ABOVE GROUND	GROUND EL	DISPOSITION
30	INTERSTATE	1382.0	-1498.0	RW12L APP	17.0	1365.0	TO REMAIN
31	INTERSTATE	1369.9	-122.1	RW12L APP	17.0	1352.9	TO REMAIN
32	INTERSTATE	1359.4	-150.6	RW12C APP	17.0	1342.4	TO REMAIN
38	CANAL	1330.0	-228.0	RW12C APP	0.0	1330.0	TO REMAIN
39	CANAL	1330.0	-204.0	HORIZONTAL	0.0	1330.0	TO REMAIN
40	ROADWAY	1401.5	-68.5	RW30R APP	15.0	1386.5	TO REMAIN
41	ROADWAY	1402.7	-42.4	RW30C APP	15.0	1387.7	TO REMAIN

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL
NEGATIVE PENETRATION VALUE REPRESENTS END ELEVATION BELOW SURFACE



RUNWAY 30R APPROACH PROFILE

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8. FOR APPROACH PROFILES, SEE SHEETS 7 THROUGH 9.
9. FOR CLOSE-IN OBSTRUCTION DETAIL NEAR EACH RUNWAY END, SEE INNER-APPROACH PLANS, SHEETS 10 THROUGH 15.
10. FOR DEPARTURE SURFACES, SEE SHEETS 16 THROUGH 19.

* PER PART 77, 15 FEET VERTICAL CLEARANCE ADDED TO ROAD ELEVATIONS, 17 FEET ADDED TO INTERSTATES AND 23 FEET ADDED TO RAILROADS.

DRAWING LEGEND

AIRPORT PROPERTY LINE	
PART APPROACH SURFACE	P77
PART 77 CONTROLLING SURFACE	
PART 77 NON-CONTROLLING SURFACE	
TERRAIN PROFILE	

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PHOENIX-MESA GATEWAY AIRPORT
AIRPORT LAYOUT PLAN

5835 S SOSSMAN RD
MESA, AZ 85212

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M&H NO.: 2327700-171799.01
DATE: MARCH 2020
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SHEET CONTENTS
PART 77 APPROACH PROFILES RUNWAY 12L-30R

SHEET NO.
7

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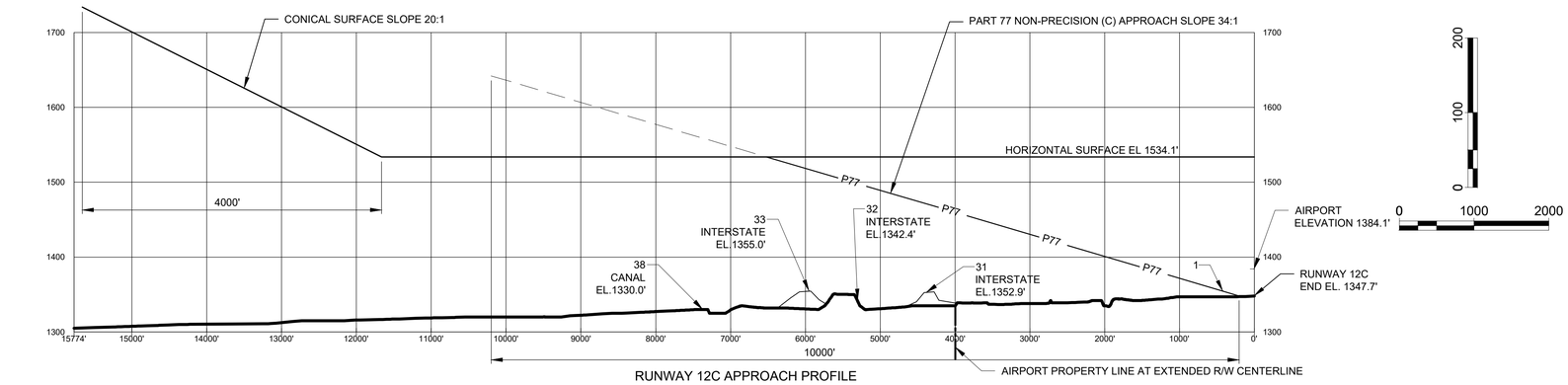
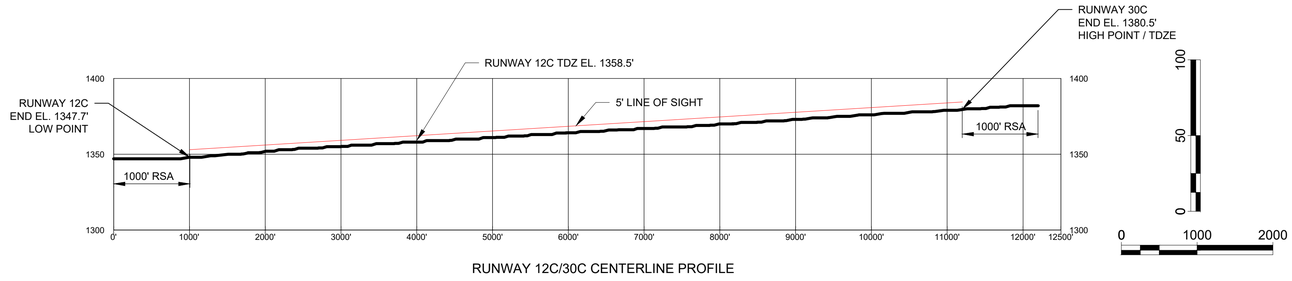
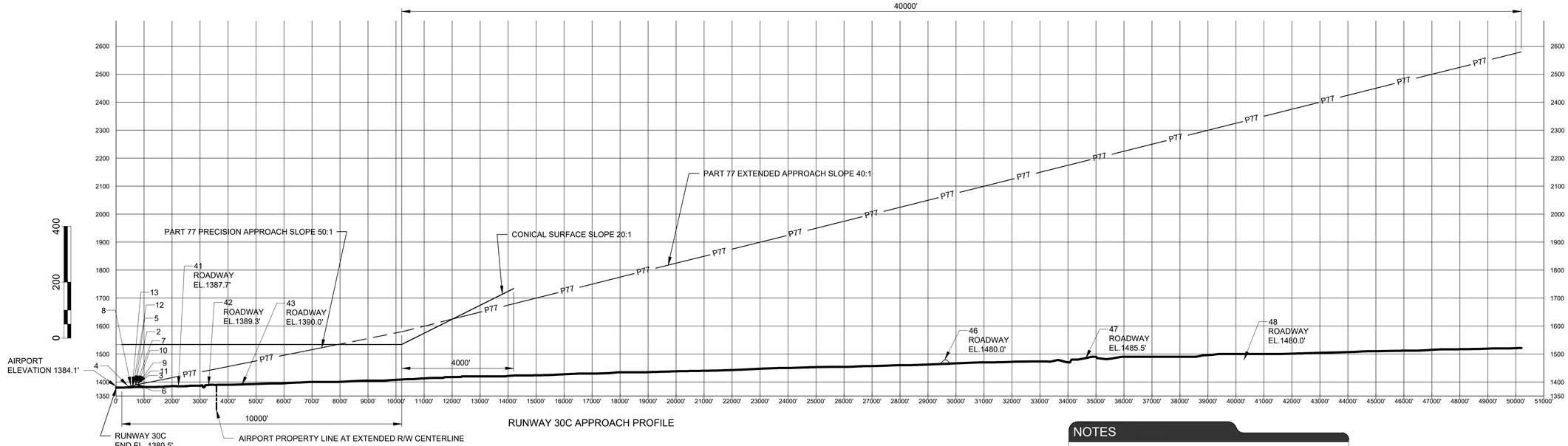


RUNWAY 12C APPROACH PROFILE



RUNWAY 12C/30C CENTERLINE PROFILE



RUNWAY 30C APPROACH PROFILE

PART 77 OBSTRUCTIONS

NUMBER	DESCRIPTION	TOP ELEVATION (MSL)	PENETRATION	SURFACE	HEIGHT ABOVE GROUND	GROUND EL	DISPOSITION
1	ACCESS ROAD	1354.8	0.5	12C APPROACH	10.0	1344.8	TO REMAIN
2	ACCESS ROAD	1393.1	2.8	30C APPROACH	10.0	1383.1	TO REMAIN
3	ACCESS ROAD	1393.1	2.7	30C APPROACH	10.0	1383.1	TO REMAIN
4	TREETOP	1387.2	2.6	30C APPROACH	6.2	1381.0	REMOVE
5	ACCESS ROAD	1392.8	2.6	30C APPROACH	10.0	1382.8	TO REMAIN
6	ACCESS ROAD	1392.7	2.4	30C APPROACH	10.0	1382.7	TO REMAIN
7	ACCESS ROAD	1392.9	2.0	30C APPROACH	10.0	1382.9	TO REMAIN
8	TREETOP	1388.4	1.4	30C APPROACH	6.6	1381.8	REMOVE
9	ACCESS ROAD	1393.4	1.1	30C APPROACH	10.0	1383.4	TO REMAIN
10	ACCESS ROAD	1393.4	1.1	30C APPROACH	10.0	1383.4	TO REMAIN
11	ACCESS ROAD	1393.3	1.0	30C APPROACH	10.0	1383.3	TO REMAIN
12	TREETOP	1389.2	0.4	30C APPROACH	6.9	1382.3	REMOVE
13	TREETOP	1388.6	0.4	30C APPROACH	6.1	1382.5	REMOVE

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL

SIGNIFICANT OBJECTS

NUMBER	DESCRIPTION	TOP ELEVATION (MSL)	PENETRATION	SURFACE	HEIGHT ABOVE GROUND	GROUND EL	DISPOSITION
31	INTERSTATE	1369.9	-122.1	RW12L APP	17.0	1352.9	TO REMAIN
32	INTERSTATE	1359.4	-150.6	RW12C APP	17.0	1342.4	TO REMAIN
33	INTERSTATE	1372.0	-103.0	RW12C APP	17.0	1355.0	TO REMAIN
38	CANAL	1330.0	-228.0	RW12C APP	0.0	1330.0	TO REMAIN
41	ROADWAY	1402.6	-42.4	RW30C APP	15.0	1387.7	TO REMAIN
42	ROADWAY	1404.3	-50.8	RW30C APP	15.0	1389.3	TO REMAIN
43	ROADWAY	1405.0	-62.5	RW30C APP	15.0	1390.0	TO REMAIN
46	ROADWAY	1495.0	-583.0	RW30C APP	15.0	1480.0	TO REMAIN
47	ROADWAY	1500.5	-699.5	RW30C APP	15.0	1485.5	TO REMAIN
48	ROADWAY	1495.0	-854.0	RW30C APP	15.0	1480.0	TO REMAIN

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL
NEGATIVE PENETRATION VALUE REPRESENTS END ELEVATION BELOW SURFACE

NOTES

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REVISIONS

NO.	DESCRIPTION	DATE

DRAWING LEGEND

AIRPORT PROPERTY LINE	
PART APPROACH SURFACE	P77
PART 77 CONTROLLING SURFACE	
PART 77 NON-CONTROLLING SURFACE	
TERRAIN PROFILE	

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SHEET CONTENTS
PART 77 APPROACH PROFILES RUNWAY 12C-30C

SHEET NO.
8

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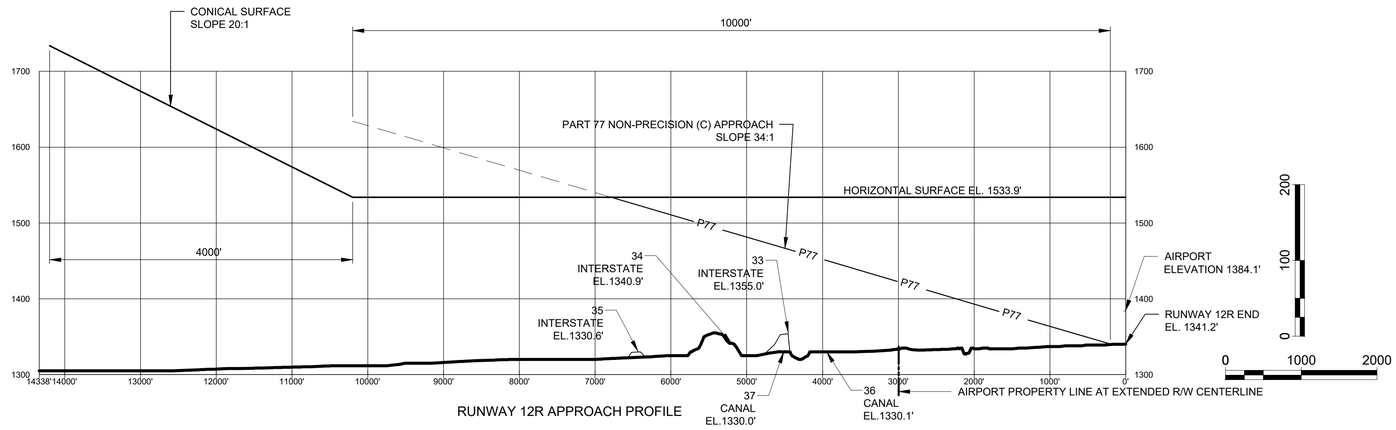
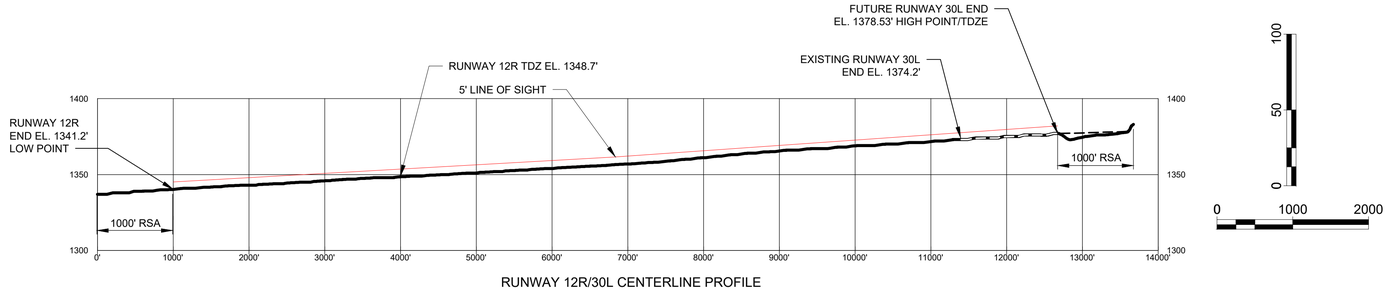
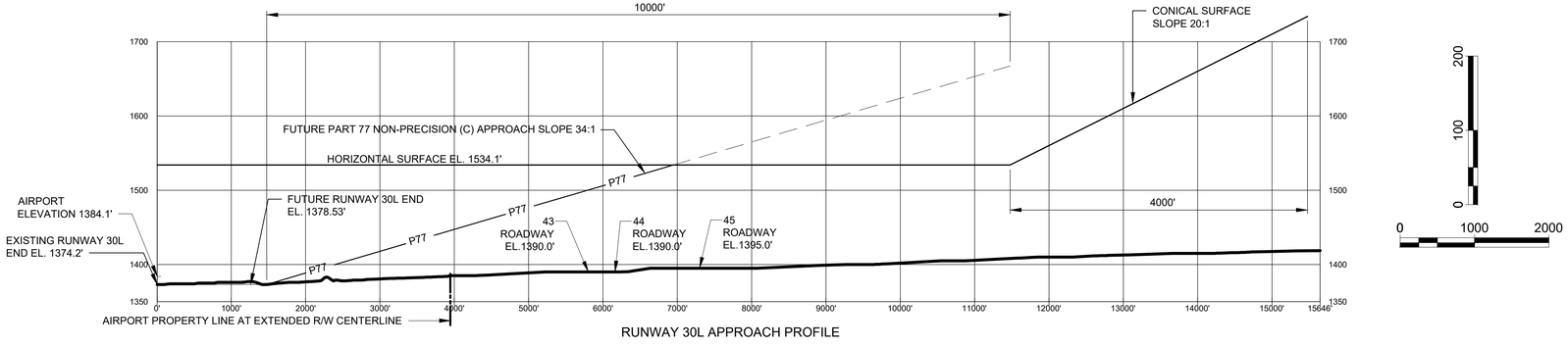


RUNWAY 12R APPROACH PROFILE



RUNWAY 12R/30L CENTERLINE PROFILE



RUNWAY 30L APPROACH PROFILE

SIGNIFICANT OBJECTS

NUMBER	DESCRIPTION	TOP ELEVATION (MSL)	PENETRATION	SURFACE	HEIGHT ABOVE GROUND	GROUND EL	DISPOSITION
33	INTERSTATE	1372.0	-103.0	RW12C APP	17.0	1355.0	TO REMAIN
34	INTERSTATE	1357.9	-139.1	RW12R APP	17.0	1340.9	TO REMAIN
35	INTERSTATE	1347.6	-169.4	RW12R APP	17.0	1330.6	TO REMAIN
36	CANAL	1330.1	-109.9	RW12R APP	0.0	1330.1	TO REMAIN
37	CANAL	1330.0	-128.0	RW12R APP	0.0	1330.0	TO REMAIN
43	ROADWAY	1405.0	-62.5	RW30C APP	15.0	1390.0	TO REMAIN
44	ROADWAY	1405.0	-63.5	RW30L APP	15.0	1390.0	TO REMAIN
45	ROADWAY	1410.0	-89.0	HORIZONTAL	15.0	1395.0	TO REMAIN

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL
NEGATIVE PENETRATION VALUE REPRESENTS END ELEVATION BELOW SURFACE

REVISIONS & NOTES

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DRAWING LEGEND

AIRPORT PROPERTY LINE	
PART APPROACH SURFACE	P77
PART 77 CONTROLLING SURFACE	
PART 77 NON-CONTROLLING SURFACE	
TERRAIN PROFILE	

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AIRPORT LAYOUT PLAN

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SHEET CONTENTS
PART 77 APPROACH PROFILES RUNWAY 12R-30L

SHEET NO.
9

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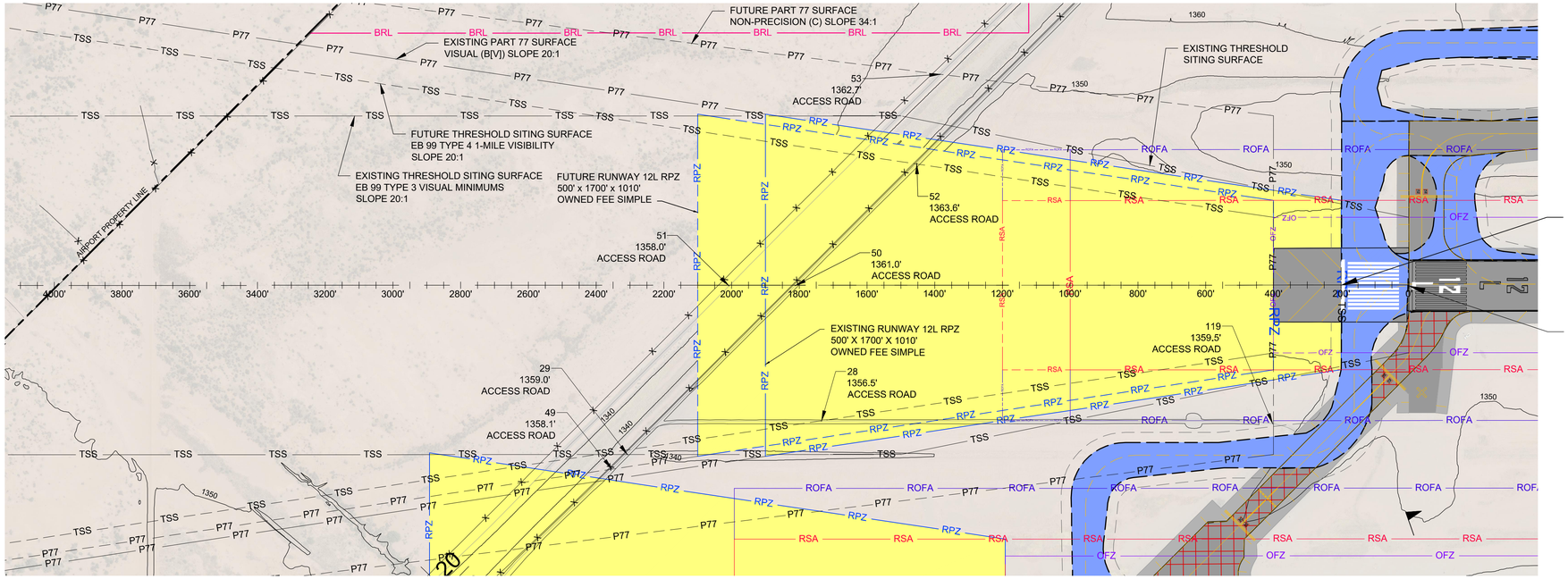

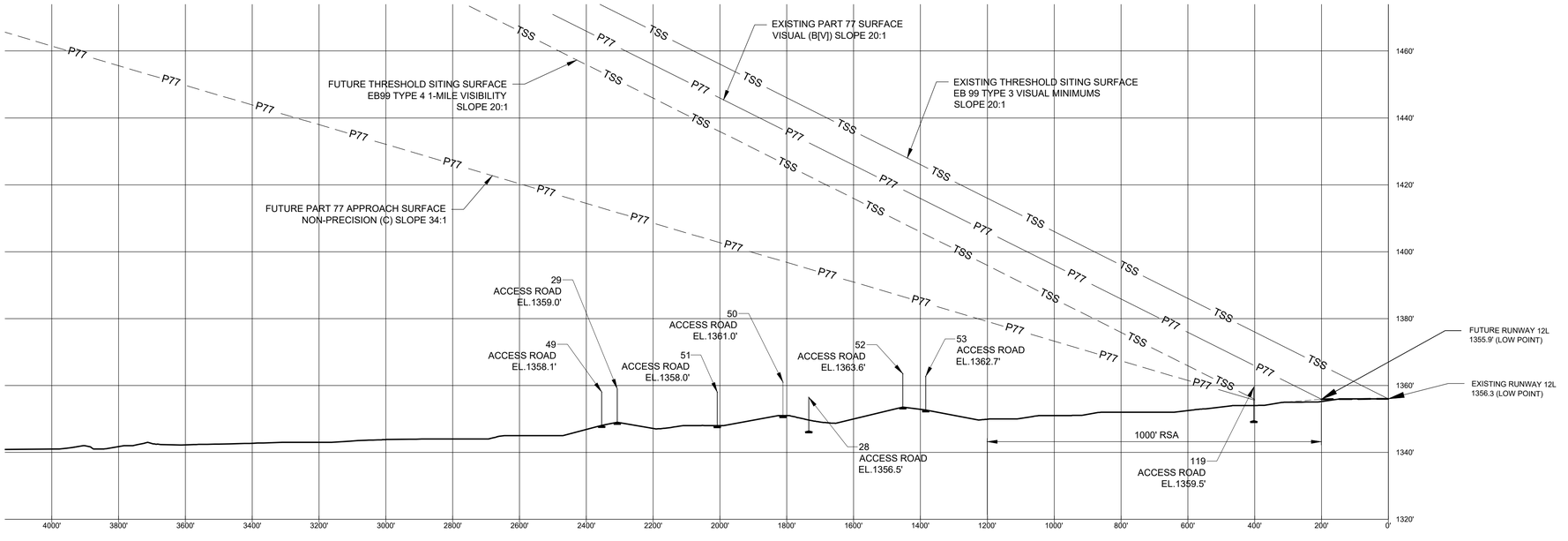

NOTE: TERRAIN PROFILE REPRESENTS THE COMPOSITE ELEVATION ALONG THE LENGTH AND ACROSS THE WIDTH OF THE APPROACH SURFACE.

APPROACH OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
28	ACCESS ROAD	TO REMAIN	1356.50	10	APPROACH	1395.20	NONE
29	ACCESS ROAD	TO REMAIN	1359.00	10	APPROACH	1416.70	NONE
49	ACCESS ROAD	TO REMAIN	1358.10	10	APPROACH	1413.10	NONE
50	ACCESS ROAD	TO REMAIN	1361.00	10	APPROACH	1397.10	NONE
51	ACCESS ROAD	TO REMAIN	1358.00	10	APPROACH	1402.90	NONE
52	ACCESS ROAD	TO REMAIN	1363.60	10	APPROACH	1386.80	NONE
53	ACCESS ROAD	TO REMAIN	1362.70	10	APPROACH	1384.70	NONE
119	ACCESS ROAD	TO REMAIN	1359.50	10	APPROACH	NONE	3.9

REVISIONS & NOTES

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DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
PAVED ROADS		N/A
RUNWAY PROTECTION ZONE	RPZ	Future RPZ
PART 77 APPROACH SURFACE	P77	P77
THRESHOLD SITING SURFACE	TSS	TSS
BUILDING RESTRICTION LINE	BRL	N/A
RUNWAY OBSTACLE FREE ZONE	OFZ	OFZ
RUNWAY SAFETY AREA	RSA	RSA
RUNWAY OBJECT FREE AREA	ROFA	ROFA
AIRPORT SECURITY FENCE (8' HEIGHT)		N/A
APRON/TAXIWAY/TAXILANE MARKING		N/A
WIND CONE		N/A

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SHEET CONTENTS
RUNWAY 12L INNER PORTION OF THE APPROACH SURFACE

SHEET NO.
10

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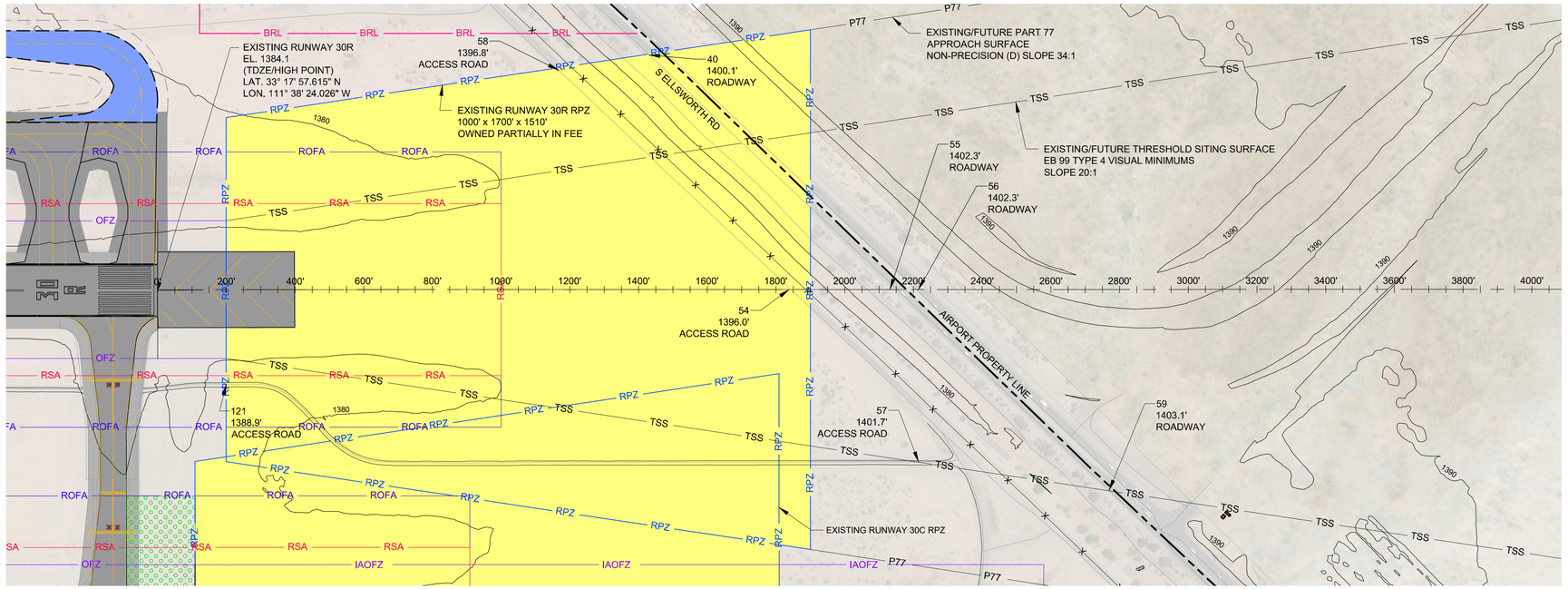
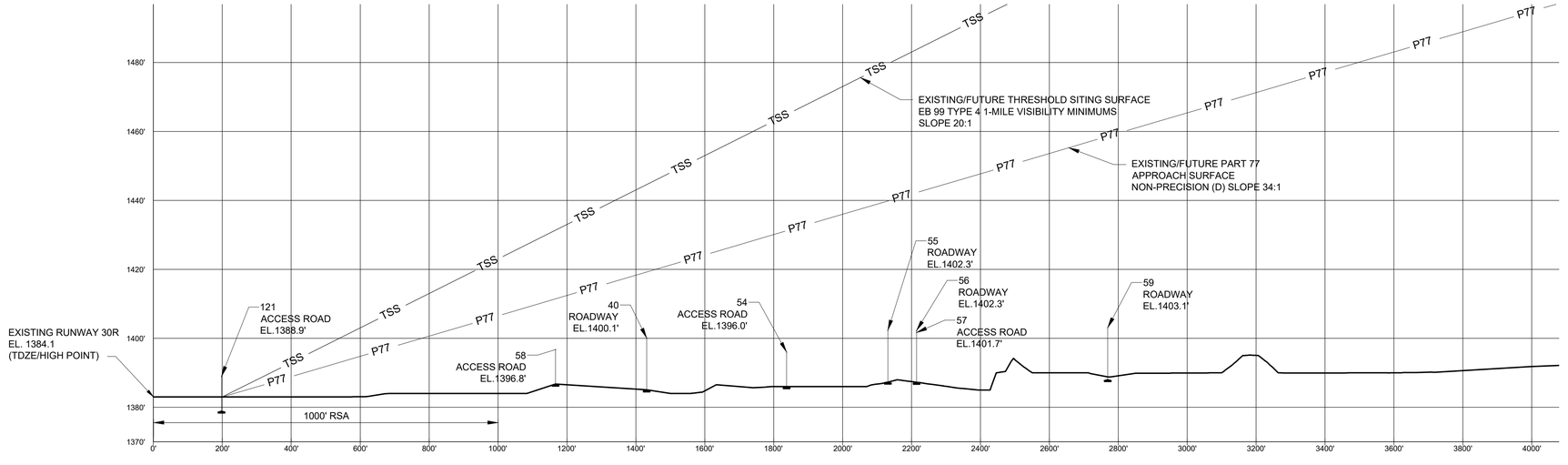
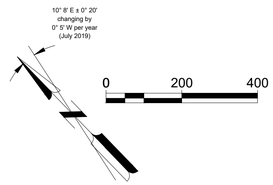




NOTE: TERRAIN PROFILE REPRESENTS THE COMPOSITE ELEVATION ALONG THE LENGTH AND ACROSS THE WIDTH OF THE APPROACH SURFACE.

APPROACH OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
40	ROADWAY	TO REMAIN	1401.5	15	APPROACH	1454.6	NONE
55	ROADWAY	TO REMAIN	1402.3	15	APPROACH	1479.5	NONE
56	ROADWAY	TO REMAIN	1402.3	15	APPROACH	1483.7	NONE
57	ACCESS ROAD	TO REMAIN	1396.0	10	APPROACH	1467.0	NONE
58	ACCESS ROAD	TO REMAIN	1396.0	10	APPROACH	1439.9	NONE
59	ROADWAY	TO REMAIN	1403.1	15	APPROACH	1513.9	NONE
121	ACCESS ROAD	TO REMAIN	1388.9	10	APPROACH	NONE	5.9



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DRAWING LEGEND

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AIRPORT PROPERTY LINE		N/A
AIRFIELD PAVEMENT		
PAVED ROADS		N/A
RUNWAY PROTECTION ZONE	RPZ	N/A
PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE	TSS	TSS
BUILDING RESTRICTION LINE	BRL	N/A
RUNWAY OBSTACLE FREE ZONE	OFZ	N/A
INNER APPROACH OBSTACLE FREE ZONE	IAOFZ	N/A
PRECISION OBSTACLE FREE ZONE		N/A
RUNWAY SAFETY AREA	RSA	N/A
RUNWAY OBJECT FREE AREA	ROFA	N/A
AIRPORT SECURITY FENCE (8' HEIGHT)		N/A
APRON/TAXIWAY/TAXILANE MARKING		N/A

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SHEET CONTENTS
RUNWAY 30R INNER PORTION OF THE APPROACH SURFACE

SHEET NO.
11

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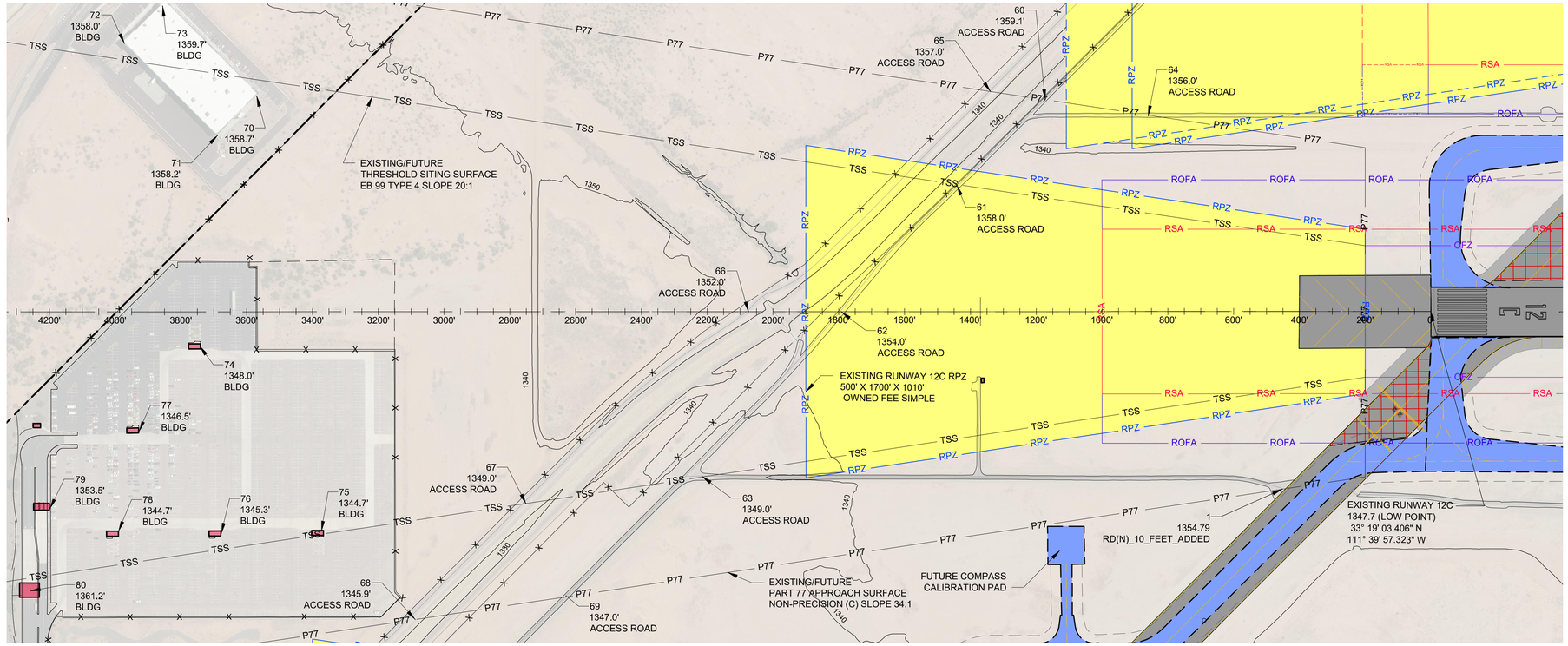

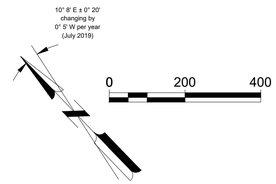

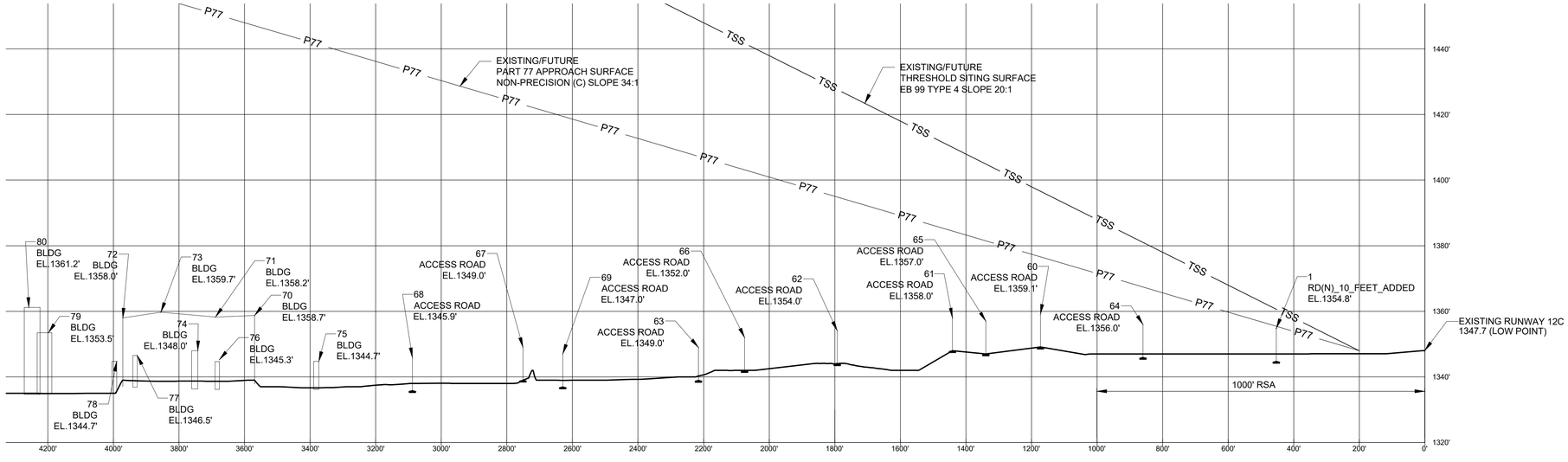

NOTE: TERRAIN PROFILE REPRESENTS THE COMPOSITE ELEVATION ALONG THE LENGTH AND ACROSS THE WIDTH OF THE APPROACH SURFACE.

APPROACH OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
1	ACCESS ROAD	TO REMAIN	1354.8	10	APPROACH	1355.4	NONE
60	ACCESS ROAD	TO REMAIN	1359.1	10	APPROACH	1376.5	NONE
61	ACCESS ROAD	TO REMAIN	1358.0	10	APPROACH	1384.4	NONE
62	ACCESS ROAD	TO REMAIN	1354.0	10	APPROACH	1394.7	NONE
63	ACCESS ROAD	TO REMAIN	1349.0	10	APPROACH	1407.2	NONE
64	ACCESS ROAD	TO REMAIN	1356.0	10	APPROACH	1367.4	NONE
65	ACCESS ROAD	TO REMAIN	1357.0	10	APPROACH	1381.4	NONE
66	ACCESS ROAD	TO REMAIN	1352.0	10	APPROACH	1403.1	NONE
67	ACCESS ROAD	TO REMAIN	1349.0	10	APPROACH	1423.0	NONE
68	ACCESS ROAD	TO REMAIN	1345.9	10	APPROACH	1432.9	NONE
69	ACCESS ROAD	TO REMAIN	1347.0	10	APPROACH	1419.4	NONE

APPROACH OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
70	BUILDING	TO REMAIN	1358.7	20	APPROACH	1447.0	NONE
71	BUILDING	TO REMAIN	1358.2	20	APPROACH	1450.5	NONE
72	BUILDING	TO REMAIN	1358.0	20	APPROACH	1458.9	NONE
73	BUILDING	TO REMAIN	1359.7	20	APPROACH	1455.4	NONE
74	BUILDING	TO REMAIN	1348.0	10	APPROACH	1452.1	NONE
75	BUILDING	TO REMAIN	1344.7	10	APPROACH	1441.2	NONE
76	BUILDING	TO REMAIN	1344.7	10	APPROACH	1450.2	NONE
77	BUILDING	TO REMAIN	1346.5	10	APPROACH	1457.5	NONE
78	BUILDING	TO REMAIN	1344.7	10	APPROACH	1459.4	NONE
79	BUILDING	TO REMAIN	1350.8	18.5	APPROACH	1462.6	NONE
80	BUILDING	TO REMAIN	1350.8	26.2	APPROACH	1455.9	NONE

REVISIONS & NOTES

NO.	DESCRIPTION	DATE

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DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
PAVED ROADS		N/A
RUNWAY PROTECTION ZONE	RPZ	RPZ
PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE	TSS	N/A
RUNWAY OBSTACLE FREE ZONE	OFZ	N/A
RUNWAY SAFETY AREA	RSA	RSA
RUNWAY OBJECT FREE AREA	ROFA	ROFA
AIRPORT SECURITY FENCE (# HEIGHT)		N/A
APRON/TAXIWAY/TAXILANE MARKING		N/A

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AIRPORT LAYOUT PLAN

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06/30/14 PROJECT MILESTONE

NOT FOR CONSTRUCTION

AIP NO.: X-XX-XXXX-XX
M&H NO.: 2327700-171799.01
DATE: MARCH 2020
DESIGNED BY: M&H
DRAWN BY: JWB
CHECKED BY: BJM
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SHEET CONTENTS
RUNWAY 12C INNER PORTION OF THE APPROACH SURFACE

SHEET NO.
12

\\CORP.MEADHUNT.COM\SHAREDFOLDERS\ENTP\2327700\171799.01\TECH\CAD\AIRPORTLAYOUTPLAN\INNER APPROACH SURFACES.DWG
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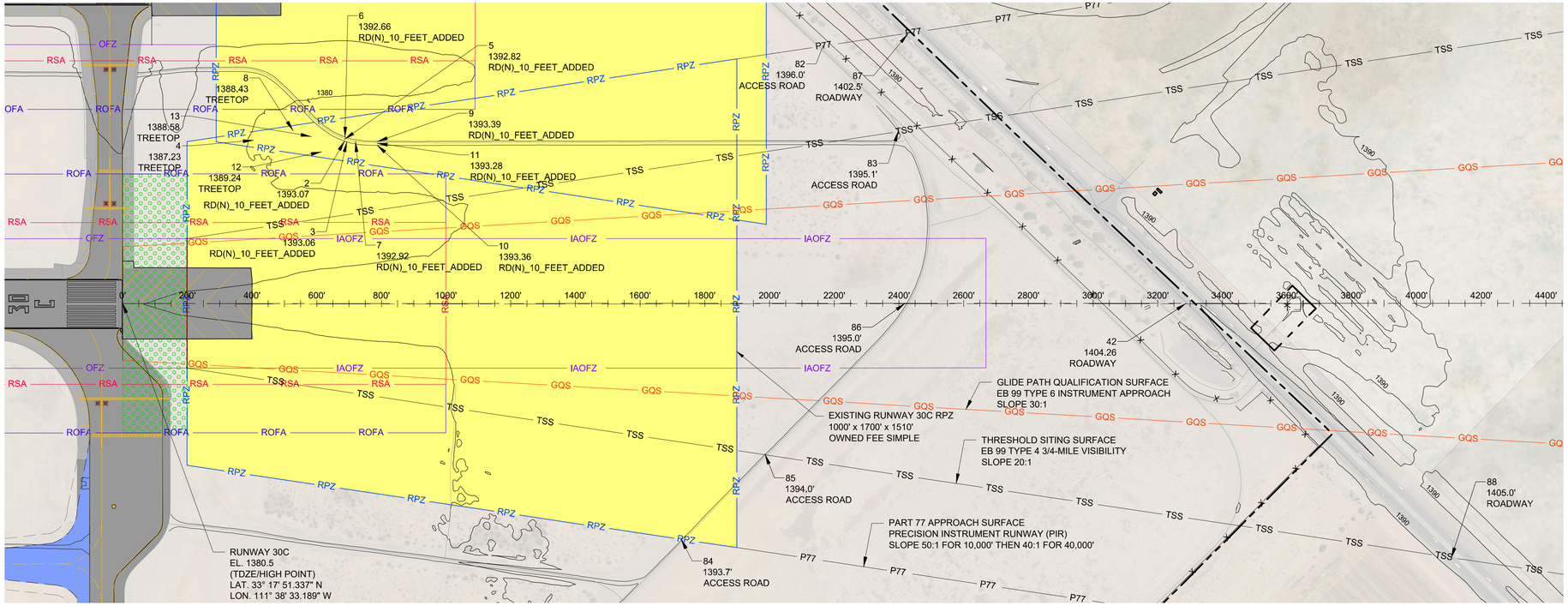

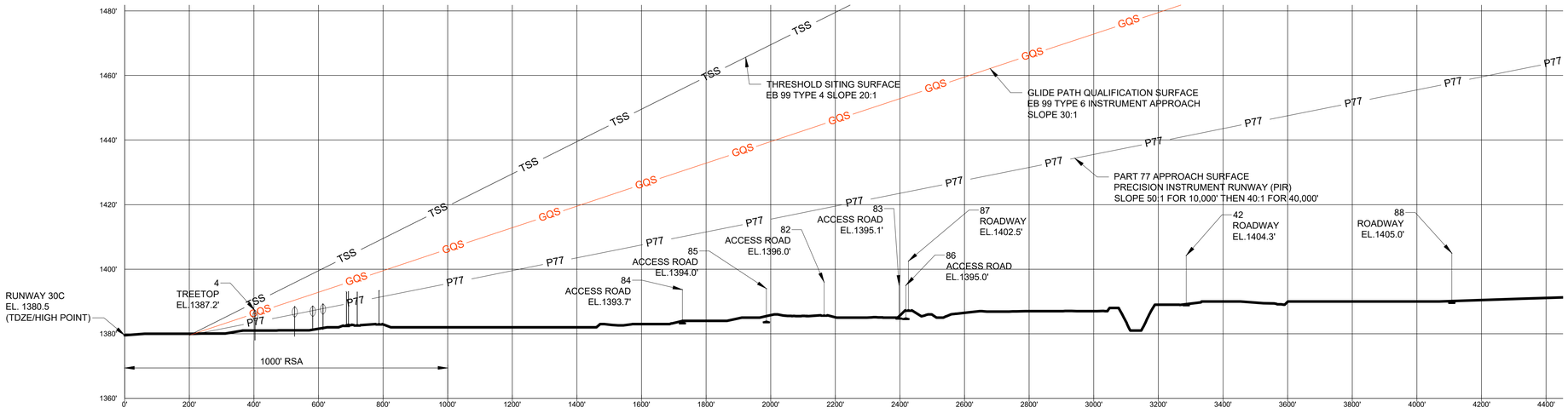

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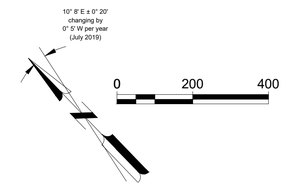
APPROACH OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
2	ACCESS ROAD	TO REMAIN	1393.1	10	APPROACH	1390.3	2.8
3	ACCESS ROAD	TO REMAIN	1393.1	10	APPROACH	1390.4	2.7
4	TREETOP	REMOVE	1387.2	6.2	APPROACH	1384.6	2.6
5	ACCESS ROAD	TO REMAIN	1392.8	10	APPROACH	1390.3	2.6
6	ACCESS ROAD	TO REMAIN	1392.7	10	APPROACH	1390.3	2.4
7	ACCESS ROAD	TO REMAIN	1392.9	10	APPROACH	1390.9	2.0
8	TREETOP	REMOVE	1388.4	7.4	APPROACH	1387.0	1.4
9	ACCESS ROAD	TO REMAIN	1393.4	10	APPROACH	1392.3	1.1
10	ACCESS ROAD	TO REMAIN	1393.4	10	APPROACH	1392.3	1.1
11	ACCESS ROAD	TO REMAIN	1393.3	10	APPROACH	1392.3	1.0
12	TREETOP	REMOVE	1389.2	7.2	APPROACH	1388.8	0.4
13	TREETOP	REMOVE	1388.6	6.5	APPROACH	1388.2	0.4

APPROACH OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
42	ROADWAY	TO REMAIN	1389.3	15	APPROACH	1426.3	NONE
82	ACCESS ROAD	TO REMAIN	1386.0	10	APPROACH	1408.9	NONE
83	ACCESS ROAD	TO REMAIN	1385.1	10	APPROACH	1413.3	NONE
84	ACCESS ROAD	TO REMAIN	1387.7	10	APPROACH	1404.1	NONE
85	ACCESS ROAD	TO REMAIN	1384.0	10	APPROACH	1405.2	NONE
86	ACCESS ROAD	TO REMAIN	1385.0	10	APPROACH	1413.9	NONE
87	ACCESS ROAD	TO REMAIN	1387.5	10	APPROACH	1409.0	NONE
88	ROADWAY	TO REMAIN	1390.0	15	APPROACH	1442.7	NONE

NOTE: NO TSS OR GQS OBSTRUCTIONS IDENTIFIED.



REVISIONS & NOTES

NO.	DESCRIPTION	DATE

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DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRFIELD PAVEMENT		
PAVED ROADS		N/A
RUNWAY PROTECTION ZONE	RPZ	N/A
PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE	TSS	N/A
GLIDE PATH QUALIFICATION SURFACE	GQS	N/A
RUNWAY OBSTACLE FREE ZONE	OFZ	N/A
INNER APPROACH OBSTACLE FREE ZONE	IAOFZ	N/A
PRECISION OBSTACLE FREE ZONE		N/A
RUNWAY SAFETY AREA	RSA	N/A
RUNWAY OBJECT FREE AREA	ROFA	N/A
AIRPORT SECURITY FENCE (8' HEIGHT)		N/A
APRON/TAXIWAY/TAXILANE MARKING		N/A

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M&H NO.:	2327700-171799.01
DATE:	MARCH 2020
DESIGNED BY:	M&H
DRAWN BY:	JWB
CHECKED BY:	BJM

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SHEET CONTENTS
RUNWAY 30C INNER PORTION OF THE APPROACH SURFACE

SHEET NO.
13

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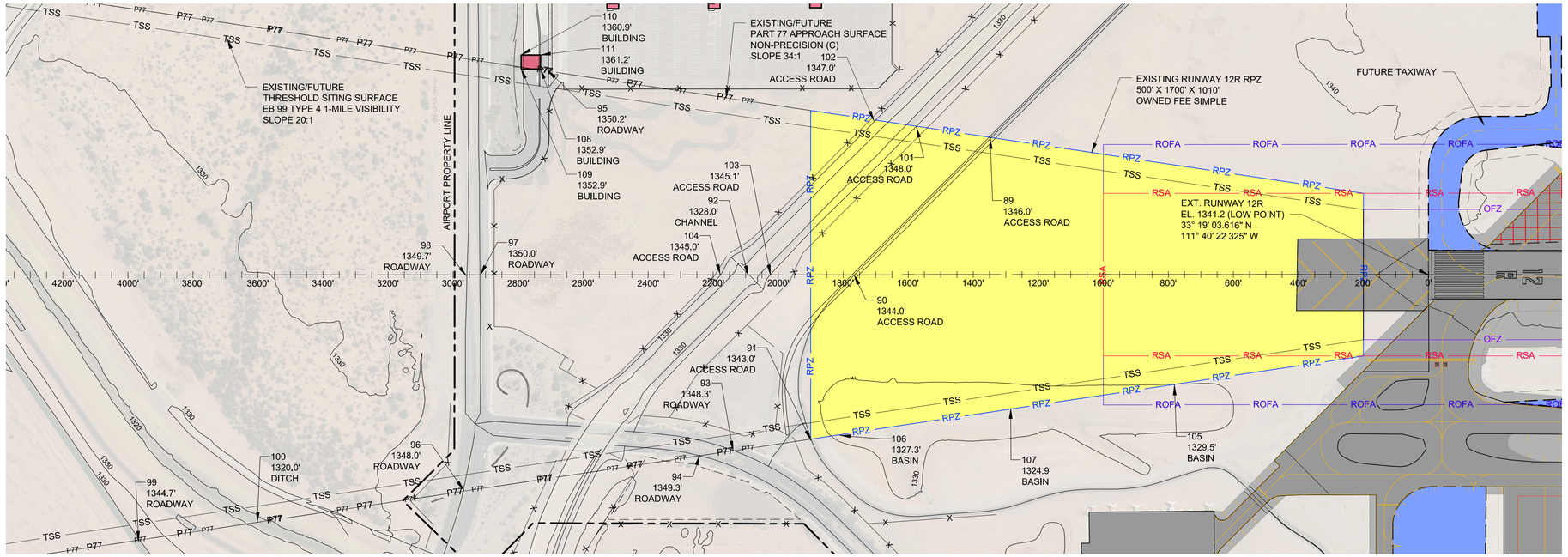

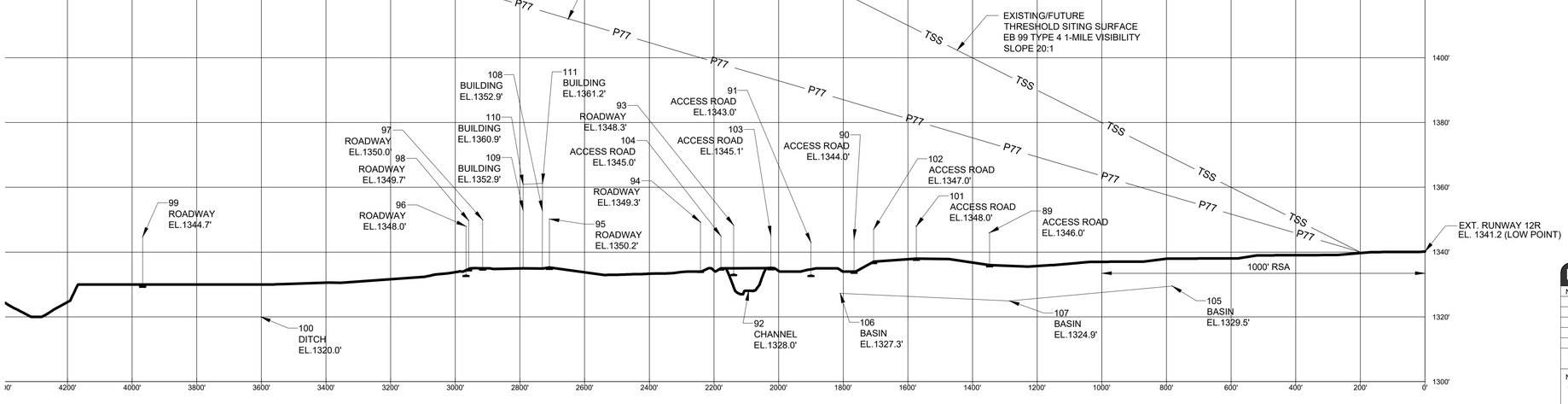

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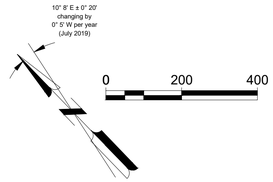
APPROACH OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
89	ACCESS ROAD	TO REMAIN	1346.0	10.0	APPROACH	1373.7	NONE
90	ACCESS ROAD	TO REMAIN	1344.0	10.0	APPROACH	1386.1	NONE
91	ACCESS ROAD	TO REMAIN	1343.0	10.0	APPROACH	1390.0	NONE
92	CHANNEL	TO REMAIN	1328.0	0.0	APPROACH	1395.6	NONE
93	ROADWAY	TO REMAIN	1348.3	15.0	APPROACH	1397.0	NONE
94	ROADWAY	TO REMAIN	1349.3	15.0	APPROACH	1400.1	NONE
95	ROADWAY	TO REMAIN	1350.2	15.0	APPROACH	1413.8	NONE
96	ROADWAY	TO REMAIN	1348.0	15.0	APPROACH	1421.2	NONE
97	ROADWAY	TO REMAIN	1350.0	15.0	APPROACH	1419.4	NONE
98	ROADWAY	TO REMAIN	1349.7	15.0	APPROACH	1420.6	NONE
99	ROADWAY	TO REMAIN	1344.7	15.0	APPROACH	1450.8	NONE
100	DITCH	TO REMAIN	1320.0	0.0	APPROACH	1439.8	NONE

APPROACH OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
101	ACCESS ROAD	TO REMAIN	1348.0	10.0	APPROACH	1380.6	NONE
102	ACCESS ROAD	TO REMAIN	1337.0	10.0	APPROACH	1374.3	NONE
103	ACCESS ROAD	TO REMAIN	1345.1	10.0	APPROACH	1393.7	NONE
104	ACCESS ROAD	TO REMAIN	1345.0	10.0	APPROACH	1398.1	NONE
105	BASIN	TO REMAIN	1329.5	0.0	APPROACH	1357.0	NONE
106	BASIN	TO REMAIN	1327.3	0.0	APPROACH	1387.6	NONE
107	BASIN	TO REMAIN	1324.9	0.0	APPROACH	1371.9	NONE
108	BUILDING	TO REMAIN	1352.9	17.9	APPROACH	1414.3	NONE
109	BUILDING	TO REMAIN	1352.9	17.9	APPROACH	1416.2	NONE
110	BUILDING	TO REMAIN	1360.9	26.2	APPROACH	1416.0	NONE
111	BUILDING	TO REMAIN	1361.2	26.2	APPROACH	1414.1	NONE



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DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
PAVED ROADS		N/A
RUNWAY PROTECTION ZONE	RPZ	N/A
PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE	TSS	N/A
RUNWAY OBSTACLE FREE ZONE	OFZ	N/A
RUNWAY SAFETY AREA	RSA	N/A
RUNWAY OBJECT FREE AREA	ROFA	N/A
AIRPORT SECURITY FENCE (6' HEIGHT)		N/A
APRON/TAXIWAY/TAXILANE MARKING		N/A

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CHECKED BY:	BJM

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SHEET CONTENTS
RUNWAY 12R INNER PORTION OF THE APPROACH SURFACE

SHEET NO.
14

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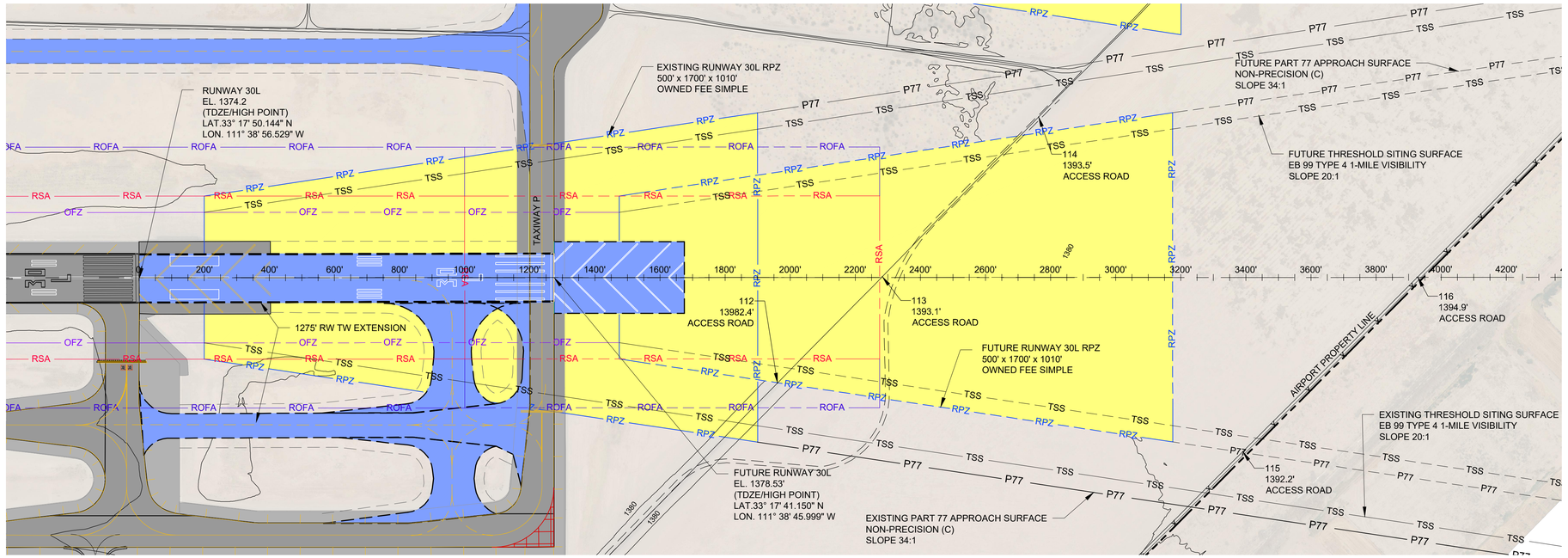

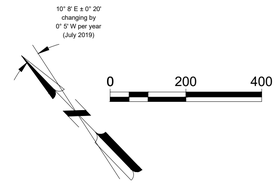

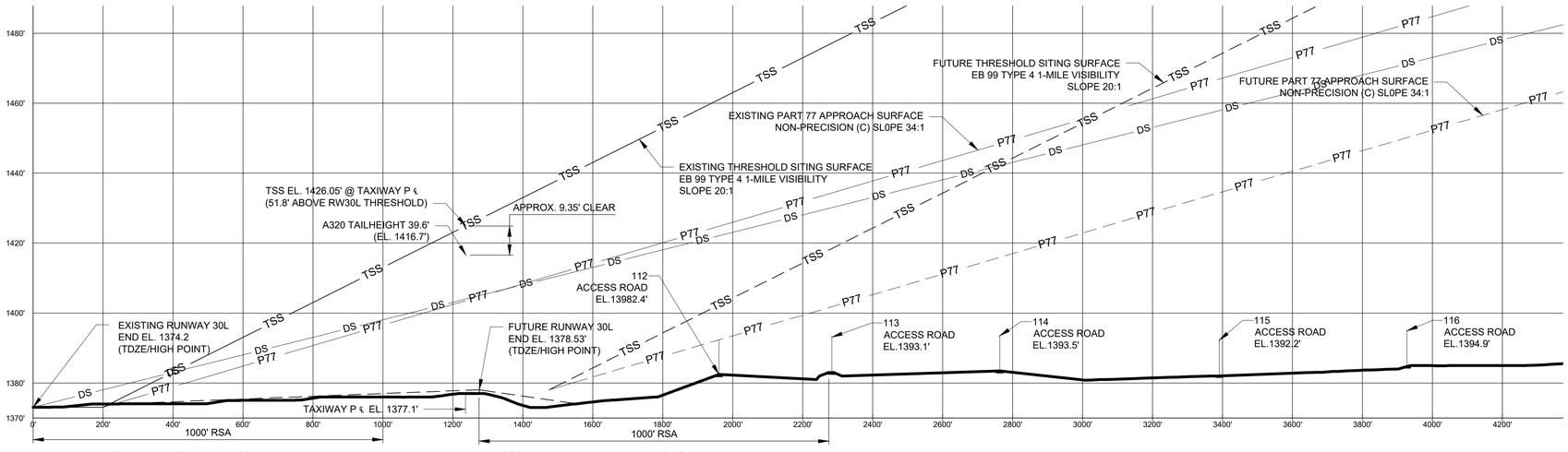

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APPROACH OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
112	ACCESS ROAD	RELOCATE	1392.4	10	APPROACH	1392.2	0.2
113	ACCESS ROAD	TO REMAIN	1393.1	10	APPROACH	1401.81	NONE
114	ACCESS ROAD	TO REMAIN	1383.5	10	APPROACH	1405.96	NONE
115	ACCESS ROAD	TO REMAIN	1392.2	10	APPROACH	1434.29	NONE
116	ACCESS ROAD	TO REMAIN	1394.9	10	APPROACH	1450.14	NONE

REVISIONS & NOTES

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AIRFIELD PAVEMENT		
PAVED ROADS		N/A
RUNWAY PROTECTION ZONE	RPZ	RPZ
PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE	TSS	N/A
RUNWAY OBSTACLE FREE ZONE	OFZ	OFZ
RUNWAY SAFETY AREA	RSA	RSA
RUNWAY OBJECT FREE AREA	ROFA	ROFA
AIRPORT SECURITY FENCE (8' HEIGHT)		N/A
APRON/TAXIWAY/TAXILANE MARKING		N/A

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DESIGNED BY: M&H
DRAWN BY: JWB
CHECKED BY: BJM
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SHEET CONTENTS
RUNWAY 30L INNER PORTION OF THE APPROACH SURFACE

SHEET NO.
15

\\CORP.MEADHUNT.COM\SHAREDFOLDERS\ENTP\2327700\171799.01\TECH\CAD\AIRPORTLAYOUTPLAN\INNER APPROACH SURFACES.DWG
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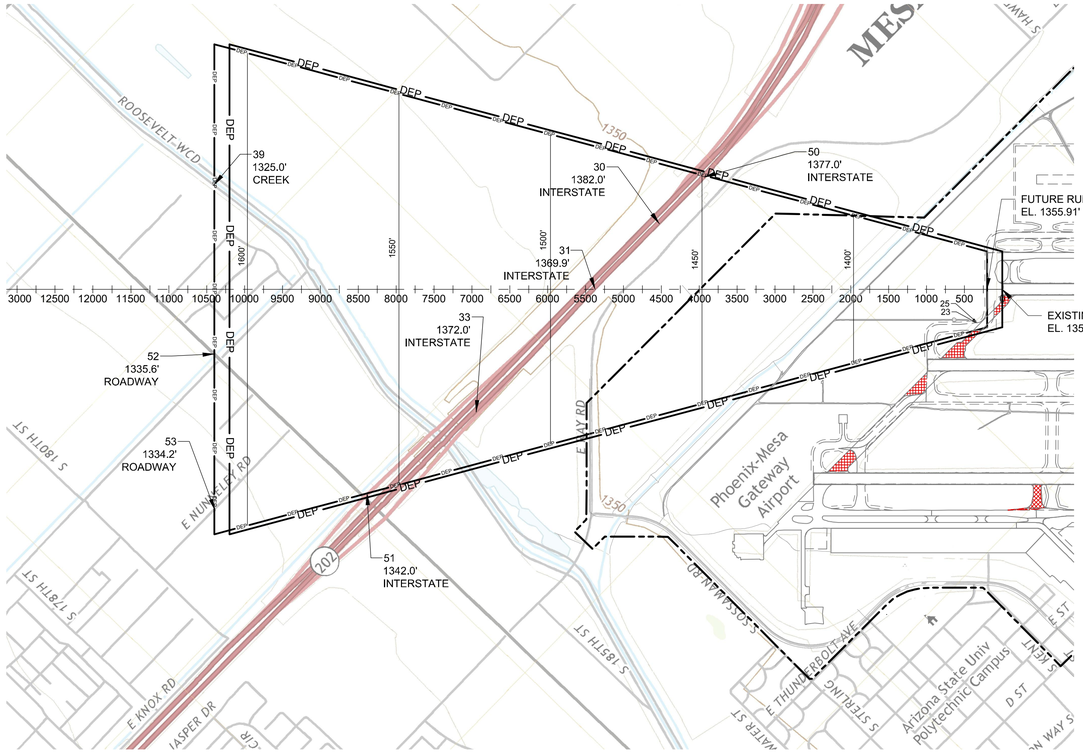

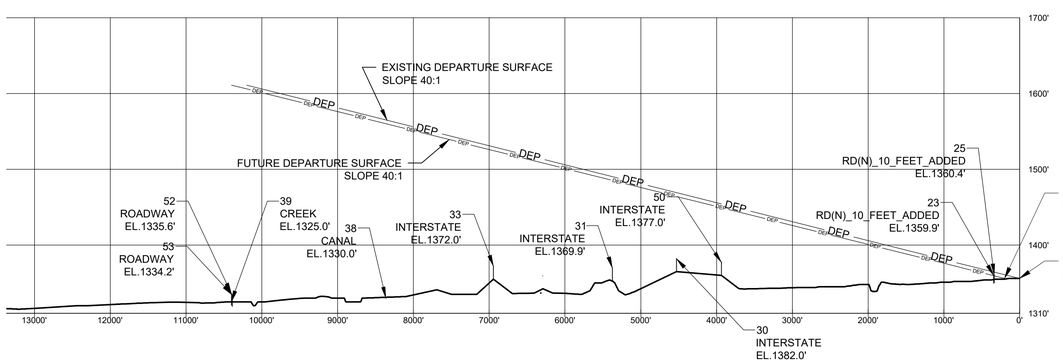

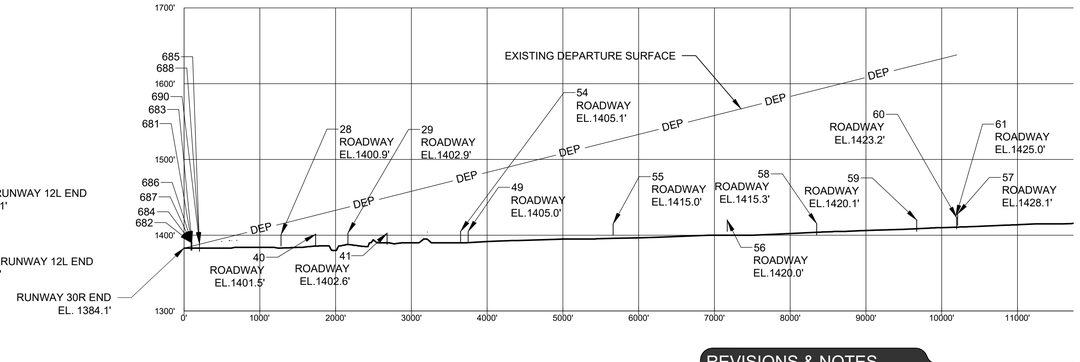

DEPARTURE OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION (MSL)	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
23	ACCESS ROAD	TO REMAIN	1359.9	10.0	DEPARTURE	1359.6	0.3
25	ACCESS ROAD	TO REMAIN	1360.4	10.0	DEPARTURE	1359.5	0.9
30	INTERSTATE	TO REMAIN	1377.0	17.0	DEPARTURE	1459.3	NONE
31	INTERSTATE	TO REMAIN	1369.9	17.0	DEPARTURE	1485.4	NONE
33	INTERSTATE	TO REMAIN	1372.0	17.0	DEPARTURE	1524.5	NONE
38	DITCH	TO REMAIN	1330.0	0.0	DEPARTURE	1559.1	NONE
39	DITCH	TO REMAIN	1325.0	0.0	DEPARTURE	1610.1	NONE
49	ROADWAY	TO REMAIN	1405.0	15.0	DEPARTURE	1477.2	NONE
50	INTERSTATE	TO REMAIN	1377.0	17.0	DEPARTURE	1448.7	NONE
52	ROADWAY	TO REMAIN	1337.6	15.0	DEPARTURE	1611.9	NONE
53	ROADWAY	TO REMAIN	1336.2	15.0	DEPARTURE	1610.5	NONE

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL

DEPARTURE OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION (MSL)	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
28	ROADWAY	TO REMAIN	1400.9	15.0	DEPARTURE	1415.0	NONE
29	ROADWAY	TO REMAIN	1402.9	15.0	DEPARTURE	1437.0	NONE
40	ROADWAY	TO REMAIN	1401.5	15.0	DEPARTURE	1426.4	NONE
41	ROADWAY	TO REMAIN	1402.7	15.0	DEPARTURE	1449.6	NONE
54	ROADWAY	TO REMAIN	1405.1	15.0	DEPARTURE	1473.3	NONE
55	ROADWAY	TO REMAIN	1415.0	15.0	DEPARTURE	1523.6	NONE
56	ROADWAY	TO REMAIN	1420.0	15.0	DEPARTURE	1561.2	NONE
57	ROADWAY	TO REMAIN	1428.1	15.0	DEPARTURE	1638.1	NONE
58	ROADWAY	TO REMAIN	1415.3	15.0	DEPARTURE	1591.5	NONE
59	ROADWAY	TO REMAIN	1420.1	15.0	DEPARTURE	1624.8	NONE
60	ROADWAY	TO REMAIN	1423.2	15.0	DEPARTURE	1637.2	NONE
61	ROADWAY	TO REMAIN	1425.0	15.0	DEPARTURE	1639.0	NONE
681	ACCESS ROAD	TO REMAIN	1390.4	10.0	DEPARTURE	1385.8	4.6
682	ACCESS ROAD	TO REMAIN	1390.4	10.0	DEPARTURE	1385.6	4.8
683	ACCESS ROAD	TO REMAIN	1390.4	10.0	DEPARTURE	1385.8	4.6
684	ACCESS ROAD	TO REMAIN	1390.4	10.0	DEPARTURE	1385.6	4.8
685	ACCESS ROAD	TO REMAIN	1388.7	10.0	DEPARTURE	1388.1	0.7
686	ACCESS ROAD	TO REMAIN	1390.2	10.0	DEPARTURE	1385.6	4.6
687	ACCESS ROAD	TO REMAIN	1390.2	10.0	DEPARTURE	1385.4	4.8
688	ACCESS ROAD	TO REMAIN	1388.8	10.0	DEPARTURE	1388.2	0.7
690	ACCESS ROAD	TO REMAIN	1388.7	10.0	DEPARTURE	1388.0	0.7

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL

REVISIONS & NOTES

NO.	DESCRIPTION	DATE

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* PER PART 77, 15 FEET VERTICAL CLEARANCE ADDED TO ROAD ELEVATIONS, 17 FEET ADDED TO INTERSTATES AND 23 FEET ADDED TO RAILROADS.

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
DEPARTURE SURFACE	DEP	

Mead & Hunt

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Phoenix-Mesa Gateway Airport

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PHOENIX-MESA GATEWAY AIRPORT
AIRPORT LAYOUT PLAN

5835 S SOSSMAN RD
MESA, AZ 85212

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SHEET CONTENTS

RUNWAY 12L-30R DEPARTURE SURFACES

SHEET NO.

16

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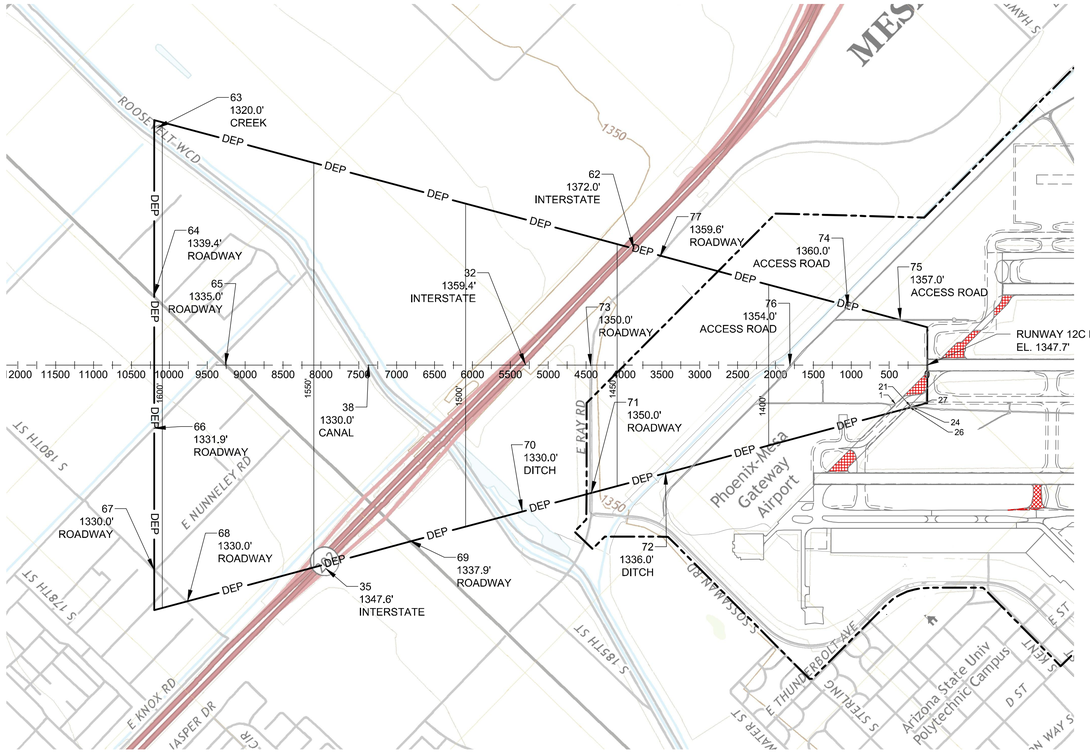

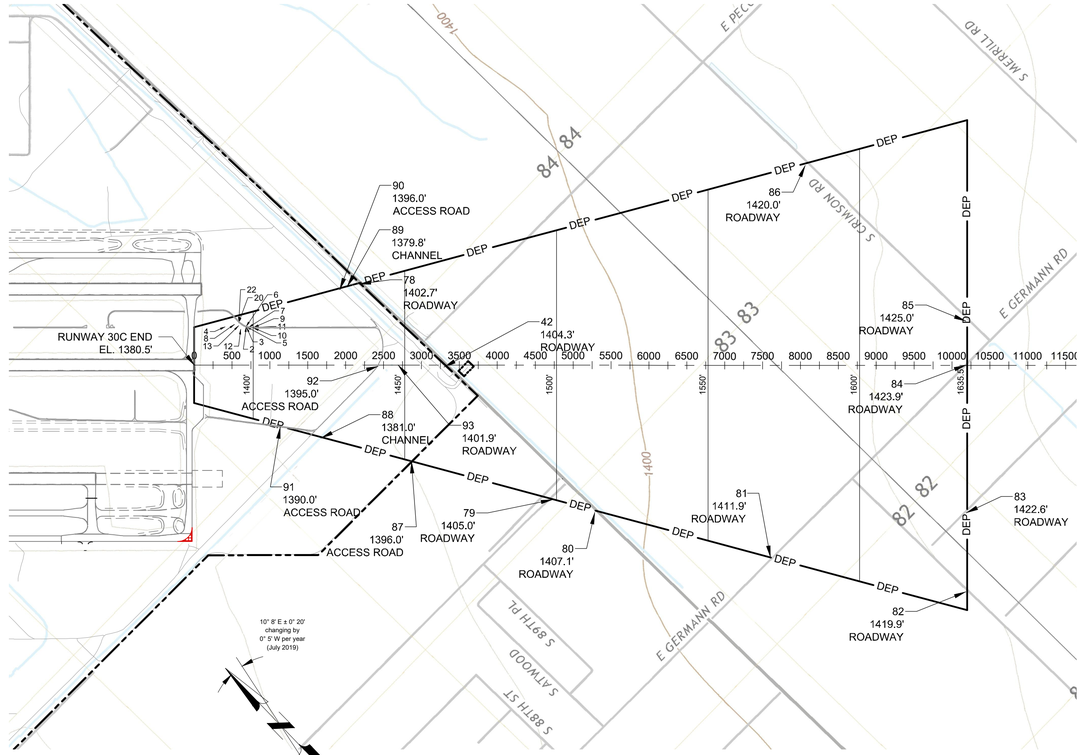

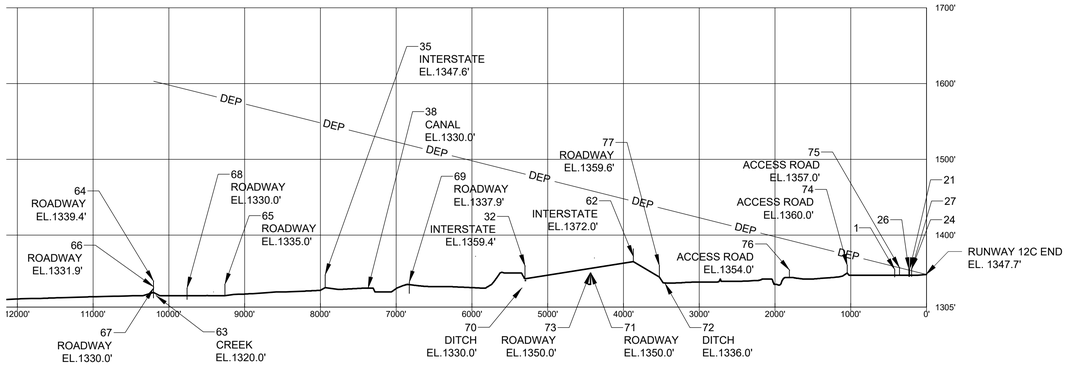

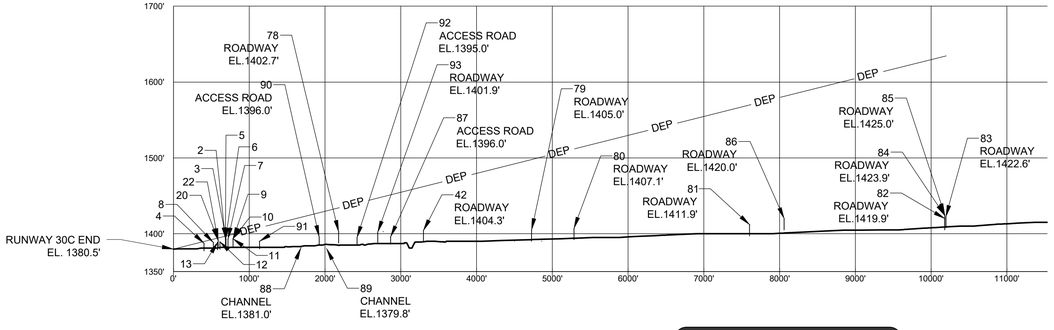

DEPARTURE OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION (MSL)	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
1	ACCESS ROAD	TO REMAIN	1354.8	10.0	DEPARTURE	1358.5	NONE
21	ACCESS ROAD	TO REMAIN	1355.4	10.0	DEPARTURE	1353.6	1.8
24	ACCESS ROAD	TO REMAIN	1355.2	10.0	DEPARTURE	1352.9	2.3
26	ACCESS ROAD	TO REMAIN	1355.5	10.0	DEPARTURE	1353.9	1.6
27	ACCESS ROAD	TO REMAIN	1355.8	10.0	DEPARTURE	1352.9	2.9
32	INTERSTATE	TO REMAIN	1342.4	17.0	DEPARTURE	1463.7	NONE
35	INTERSTATE	TO REMAIN	1330.6	17.0	DEPARTURE	1530.9	NONE
38	CANAL	TO REMAIN	1330.0	0.0	DEPARTURE	1532.5	NONE
62	INTERSTATE	TO REMAIN	1365.0	17.0	DEPARTURE	1427.7	NONE
63	DITCH	TO REMAIN	1320.0	0.0	DEPARTURE	1601.5	NONE
64	ROADWAY	TO REMAIN	1324.4	15.0	DEPARTURE	1588.0	NONE
65	ROADWAY	TO REMAIN	1320.0	15.0	DEPARTURE	1563.4	NONE
66	ROADWAY	TO REMAIN	1316.9	15.0	DEPARTURE	1587.9	NONE
67	ROADWAY	TO REMAIN	1315.0	15.0	DEPARTURE	1602.9	NONE
68	ROADWAY	TO REMAIN	1315.0	15.0	DEPARTURE	1576.0	NONE
69	ROADWAY	TO REMAIN	1322.9	15.0	DEPARTURE	1503.2	NONE
70	DITCH	TO REMAIN	1330.0	0.0	DEPARTURE	1482.4	NONE
71	ROADWAY	TO REMAIN	1335.0	15.0	DEPARTURE	1443.4	NONE
72	DITCH	TO REMAIN	1336.0	0.0	DEPARTURE	1433.5	NONE
73	ROADWAY	TO REMAIN	1335.0	15.0	DEPARTURE	1444.4	NONE
74	ACCESS ROAD	TO REMAIN	1350.0	10.0	DEPARTURE	1364.1	NONE
75	ACCESS ROAD	TO REMAIN	1347.0	10.0	DEPARTURE	1347.0	NONE
76	ACCESS ROAD	TO REMAIN	1344.0	10.0	DEPARTURE	1382.6	NONE
77	ROADWAY	TO REMAIN	1344.6	15.0	DEPARTURE	1420.7	NONE

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL

DEPARTURE OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION (MSL)	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
2	ACCESS ROAD	TO REMAIN	1393.1	10.0	DEPARTURE	1396.4	NONE
3	ACCESS ROAD	TO REMAIN	1393.1	10.0	DEPARTURE	1396.4	NONE
4	TREETOP	REMOVE	1387.2	6.3	DEPARTURE	1389.6	NONE
5	ACCESS ROAD	TO REMAIN	1392.8	10.0	DEPARTURE	1396.2	NONE
6	ACCESS ROAD	TO REMAIN	1392.7	10.0	DEPARTURE	1396.0	NONE
7	ACCESS ROAD	TO REMAIN	1392.9	10.0	DEPARTURE	1396.3	NONE
8	TREETOP	REMOVE	1388.4	7.6	DEPARTURE	1392.7	NONE
9	ACCESS ROAD	TO REMAIN	1393.4	10.0	DEPARTURE	1399.4	NONE
10	ACCESS ROAD	TO REMAIN	1393.4	10.0	DEPARTURE	1399.4	NONE
11	ACCESS ROAD	TO REMAIN	1392.3	10.0	DEPARTURE	1398.3	NONE
12	TREETOP	REMOVE	1389.2	7.5	DEPARTURE	1394.9	NONE
13	TREETOP	REMOVE	1388.6	7.8	DEPARTURE	1394.0	NONE
20	ACCESS ROAD	TO REMAIN	1392.0	10.0	DEPARTURE	1394.2	NONE
22	ACCESS ROAD	TO REMAIN	1391.9	10.0	DEPARTURE	1394.1	NONE
42	ROADWAY	TO REMAIN	1389.3	15.0	DEPARTURE	1447.1	NONE
78	ROADWAY	TO REMAIN	1387.7	15.0	DEPARTURE	1419.0	NONE
79	ROADWAY	TO REMAIN	1390.0	15.0	DEPARTURE	1482.7	NONE
80	ROADWAY	TO REMAIN	1392.1	15.0	DEPARTURE	1496.4	NONE
81	ROADWAY	TO REMAIN	1396.9	15.0	DEPARTURE	1553.9	NONE
82	ROADWAY	TO REMAIN	1404.9	15.0	DEPARTURE	1618.9	NONE
83	ROADWAY	TO REMAIN	1407.6	15.0	DEPARTURE	1618.9	NONE
84	ROADWAY	TO REMAIN	1408.9	15.0	DEPARTURE	1617.2	NONE
85	ROADWAY	TO REMAIN	1410.0	15.0	DEPARTURE	1618.3	NONE
86	ROADWAY	TO REMAIN	1405.0	15.0	DEPARTURE	1565.4	NONE
87	ACCESS ROAD	TO REMAIN	1386.0	10.0	DEPARTURE	1441.3	NONE
88	CHANNEL	TO REMAIN	1381.0	0.0	DEPARTURE	1421.7	NONE
89	CHANNEL	TO REMAIN	1379.8	0.0	DEPARTURE	1429.7	NONE
90	ACCESS ROAD	TO REMAIN	1386.0	10.0	DEPARTURE	1417.4	NONE
91	ACCESS ROAD	TO REMAIN	1380.0	10.0	DEPARTURE	1397.9	NONE
92	ACCESS ROAD	TO REMAIN	1385.0	10.0	DEPARTURE	1430.0	NONE
93	ROADWAY	TO REMAIN	1386.9	15.0	DEPARTURE	1431.6	NONE

REVISIONS & NOTES

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DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
DEPARTURE SURFACE	DEP	DEP

Mead & Hunt

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AIRPORT LAYOUT PLAN

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SHEET CONTENTS
RUNWAY 12C-30C
DEPARTURE
SURFACES

SHEET NO.
17

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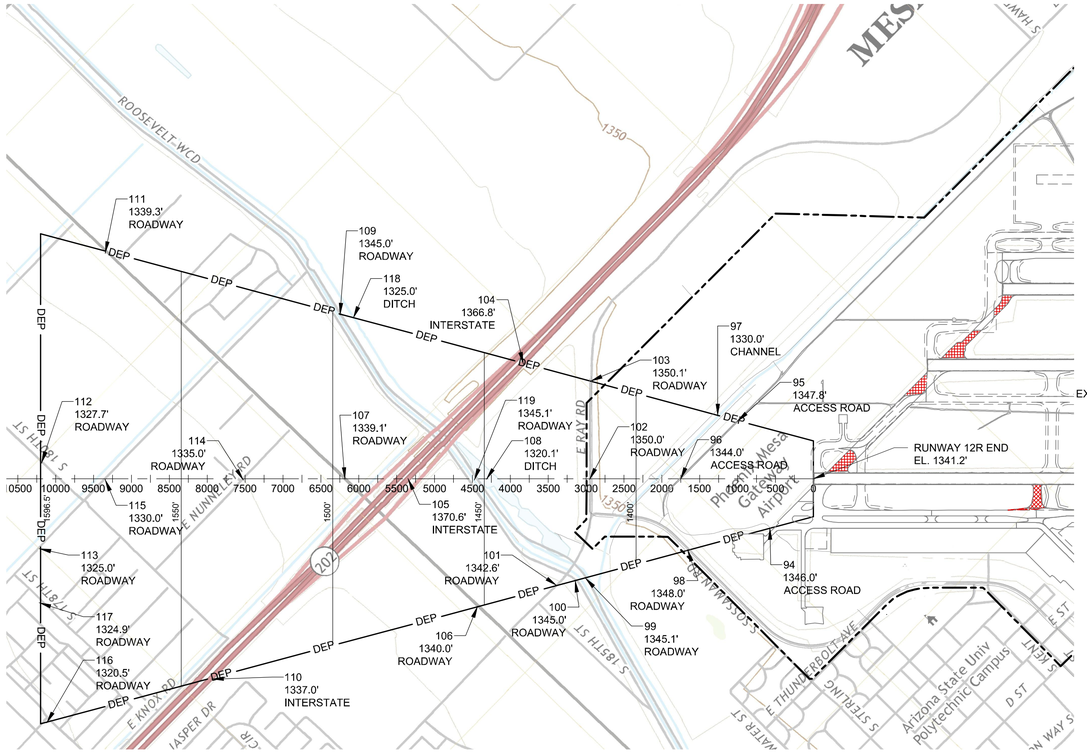

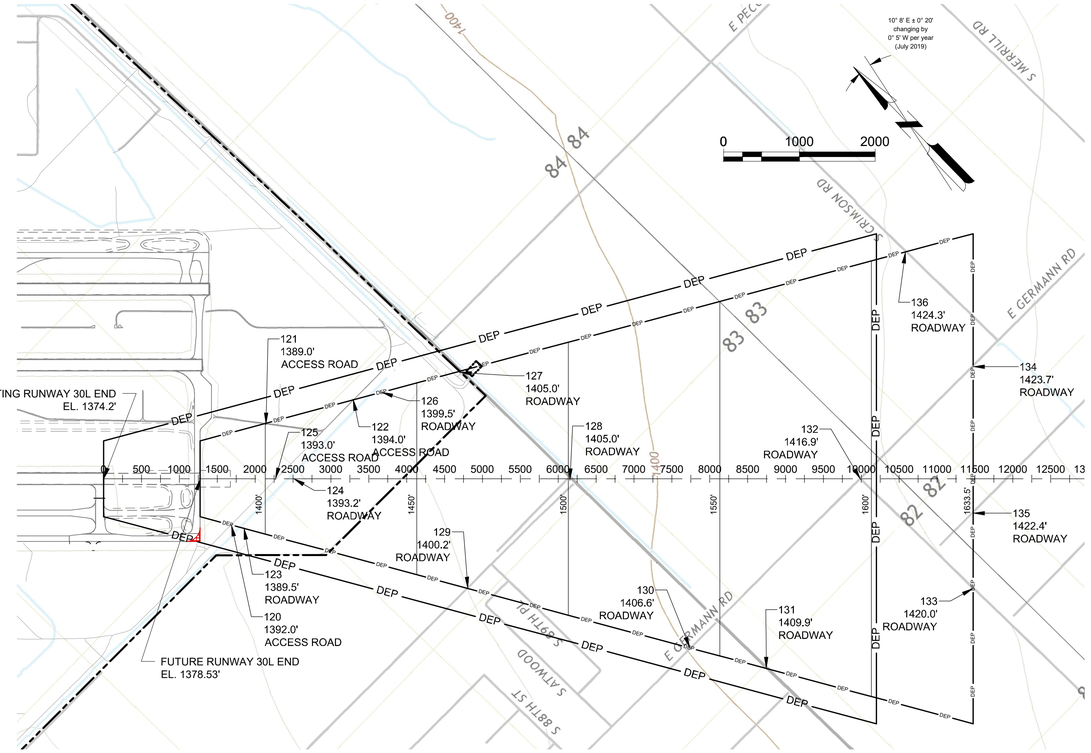

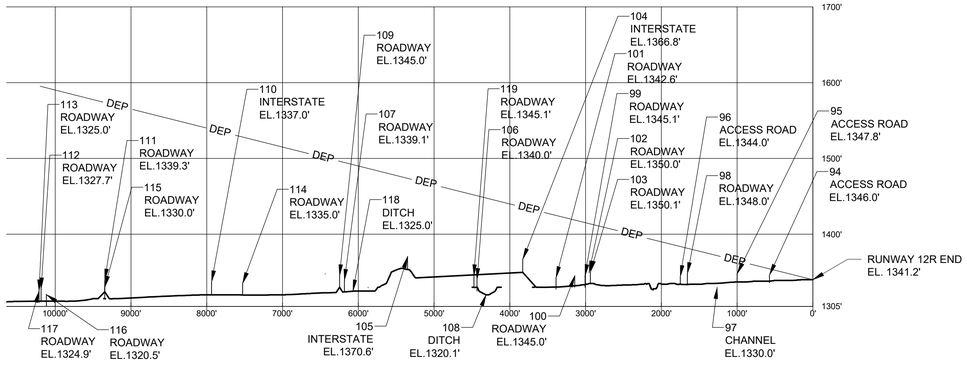

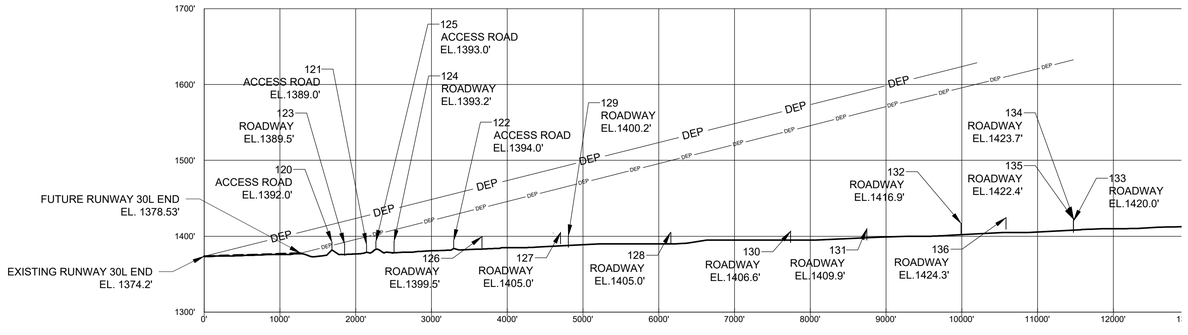

DEPARTURE OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION (MSL)	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
94	ACCESS ROAD	TO REMAIN	1336.0	10.0	DEPARTURE	1344.5	NONE
95	ACCESS ROAD	TO REMAIN	1337.9	10.0	DEPARTURE	1355.6	NONE
96	ACCESS ROAD	TO REMAIN	1334.0	10.0	DEPARTURE	1373.4	NONE
97	CHANNEL	TO REMAIN	1330.0	0.0	DEPARTURE	1371.5	NONE
98	ROADWAY	TO REMAIN	1333.0	15.0	DEPARTURE	1365.7	NONE
99	ROADWAY	TO REMAIN	1330.1	15.0	DEPARTURE	1400.7	NONE
100	ROADWAY	TO REMAIN	1330.0	15.0	DEPARTURE	1403.6	NONE
101	ROADWAY	TO REMAIN	1327.6	15.0	DEPARTURE	1409.4	NONE
102	ROADWAY	TO REMAIN	1335.0	15.0	DEPARTURE	1396.2	NONE
103	ROADWAY	TO REMAIN	1335.1	15.0	DEPARTURE	1398.5	NONE
104	INTERSTATE	TO REMAIN	1349.8	17.0	DEPARTURE	1419.2	NONE
105	INTERSTATE	TO REMAIN	1353.6	17.0	DEPARTURE	1456.5	NONE
106	ROADWAY	TO REMAIN	1325.0	15.0	DEPARTURE	1435.1	NONE
107	ROADWAY	TO REMAIN	1324.1	15.0	DEPARTURE	1479.0	NONE
108	DITCH	TO REMAIN	1320.1	0.0	DEPARTURE	1447.1	NONE
109	ROADWAY	TO REMAIN	1330.0	15.0	DEPARTURE	1480.4	NONE
110	INTERSTATE	TO REMAIN	1320.0	17.0	DEPARTURE	1520.8	NONE
111	ROADWAY	TO REMAIN	1324.3	15.0	DEPARTURE	1558.0	NONE
112	ROADWAY	TO REMAIN	1312.7	15.0	DEPARTURE	1579.9	NONE
113	ROADWAY	TO REMAIN	1310.0	15.0	DEPARTURE	1580.7	NONE
114	ROADWAY	TO REMAIN	1320.0	15.0	DEPARTURE	1511.9	NONE
115	ROADWAY	TO REMAIN	1315.0	15.0	DEPARTURE	1558.8	NONE
116	ROADWAY	TO REMAIN	1305.5	15.0	DEPARTURE	1577.1	NONE
117	ROADWAY	TO REMAIN	1309.9	15.0	DEPARTURE	1579.9	NONE
118	DITCH	TO REMAIN	1325.0	0.0	DEPARTURE	1491.0	NONE
119	ROADWAY	TO REMAIN	1330.1	15.0	DEPARTURE	1436.6	NONE

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL

DEPARTURE OBJECTS

NO.	DESCRIPTION	DISPOSITION	TOP ELEVATION (MSL)	HEIGHT ABOVE GROUND	SURFACE	ALLOWABLE ELEVATION	AMOUNT OF PENETRATION
120	ACCESS ROAD	TO REMAIN	1382.0	10.0	DEPARTURE	1377.9	4.2
121	ACCESS ROAD	TO REMAIN	1379.0	10.0	DEPARTURE	1388.6	NONE
122	ACCESS ROAD	TO REMAIN	1384.0	10.0	DEPARTURE	1417.2	NONE
123	ROADWAY	TO REMAIN	1374.5	15.0	DEPARTURE	1377.0	NONE
124	ROADWAY	TO REMAIN	1378.2	15.0	DEPARTURE	1392.9	NONE
125	ACCESS ROAD	TO REMAIN	1383.0	10.0	DEPARTURE	1392.3	NONE
126	ROADWAY	TO REMAIN	1384.5	15.0	DEPARTURE	1422.5	NONE
127	ROADWAY	TO REMAIN	1390.0	15.0	DEPARTURE	1447.6	NONE
128	ROADWAY	TO REMAIN	1390.0	15.0	DEPARTURE	1484.6	NONE
129	ROADWAY	TO REMAIN	1385.2	15.0	DEPARTURE	1450.1	NONE
130	ROADWAY	TO REMAIN	1391.6	15.0	DEPARTURE	1524.1	NONE
131	ROADWAY	TO REMAIN	1394.9	15.0	DEPARTURE	1548.6	NONE
132	ROADWAY	TO REMAIN	1401.9	15.0	DEPARTURE	1580.7	NONE
133	ROADWAY	TO REMAIN	1405.0	15.0	DEPARTURE	1616.0	NONE
134	ROADWAY	TO REMAIN	1408.7	15.0	DEPARTURE	1619.7	NONE
135	ROADWAY	TO REMAIN	1407.4	15.0	DEPARTURE	1618.4	NONE
136	ROADWAY	TO REMAIN	1409.3	15.0	DEPARTURE	1593.8	NONE

MEASUREMENTS ARE IN FEET
(MSL) MEAN SEA LEVEL

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3. AIRPORT LAYOUT PLAN INCORPORATES AN FAA APPROVED AIRPORT GEOGRAPHIC INFORMATION SURVEY FROM MAY 2018 AND A 2018 OBSTRUCTION SURVEY.
4. USGS MAPS HIGHLEY, AZ 2018 & SACATON NE, AZ 2018.
5. MAGNETIC DECLINATION CALCULATED BY NATIONAL GEOPHYSICAL DATA CENTER.
6. RUNWAY ENDS, PART 77 SURFACE CONTOURS AND OBSTRUCTION ELEVATIONS ARE SHOWN IN NAD83 AND NAVD88. ALL ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL (MSL).
7. FOR CLOSE-IN OBSTRUCTION DETAIL NEAR EACH RUNWAY END, SEE INNER-APPROACH PLANS, SHEETS 10 THROUGH 15.

* PER PART 77, 15 FEET VERTICAL CLEARANCE ADDED TO ROAD ELEVATIONS, 17 FEET ADDED TO INTERSTATES AND 23 FEET ADDED TO RAILROADS.

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
DEPARTURE SURFACE	DEP	

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SHEET CONTENTS
RUNWAY 12R-30L
DEPARTURE
SURFACES

SHEET NO.
18

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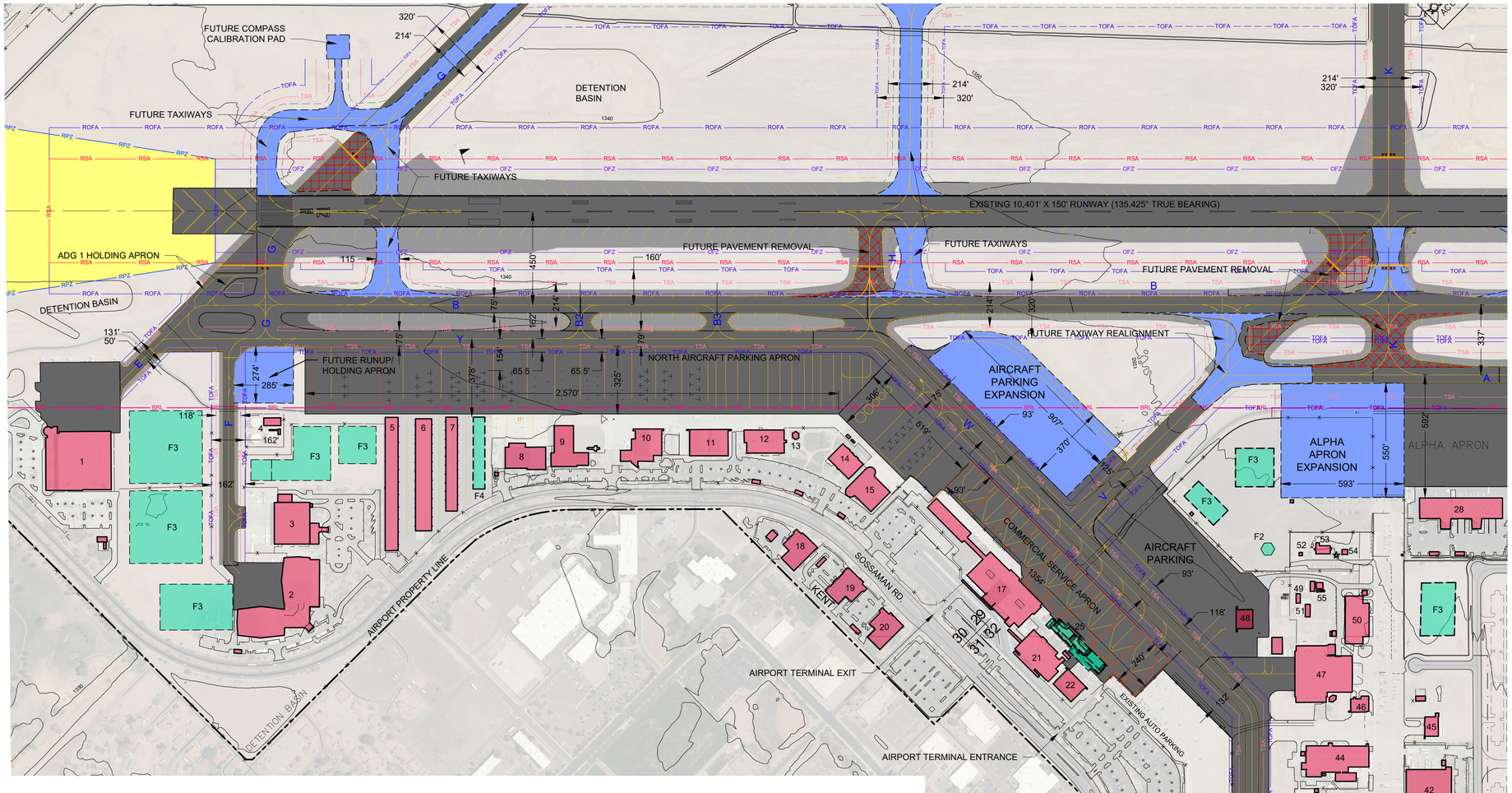

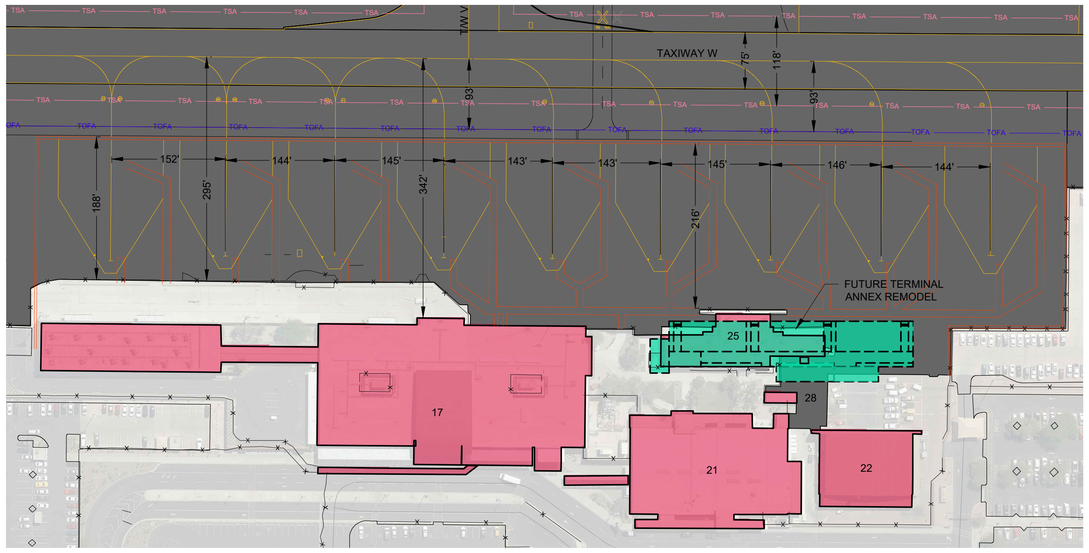

PASSENGER TERMINAL AIRCRAFT PARKING LAYOUT

0 200 400

FACILITY LEGEND

NO.	DESCRIPTION	TOP ELEVATION
1	HANGAR/OFFICE	EL. 1383.4
2	HANGAR/OFFICE	EL. 1382.3
3	HANGAR/OFFICE	EL. 1382.3
4	FIRE SUPPRESSION SYSTEM	EL. 1355.1
5	T-HANGAR	EL. 1365.7
6	T-HANGAR	EL. 1361.0
7	T-HANGAR	EL. 1359.4
8	HANGAR/OFFICE	EL. 1376.0
9	HANGAR/OFFICE	EL. 1377.9
10	HANGAR/OFFICE	EL. 1383.3
11	HANGAR/OFFICE	EL. 1382.9
12	GENERAL AVIATION CENTER (FBO/OFFICES)	EL. 1365.2
13	BUILDING (GAZEBO)	EL. 1358.1
14	AIRPORT ADMINISTRATION OFFICE BUILDING	EL. 1369.3
15	HANGAR/OFFICE	EL. 1378.5
17	TERMINAL BUILDING	EL. 1366.5
18	OFFICE BUILDING	EL. 1379.9
19	OFFICE BUILDING	EL. 1380.2
20	OFFICE BUILDING	EL. 1378.9
21	TERMINAL BUILDING	EL. 1371.6
22	HANGAR #24 (TO BE REMOVED)	EL. 1386.7
23	OFFICE BUILDING	EL. 1369.5
24	HANGAR	EL. 1383.7
25	TERMINAL ANNEX	EL. 1365.6
26	HANGAR	EL. 1379.6
27	HANGAR SHED	EL. 1391.3
28	LINE SERVICES BUILDING	EL. 1392.2
29	OFFICE BUILDING	EL. 1391.1
30	OFFICE BUILDING	EL. 1358.9
31	INDUSTRIAL BUILDING	EL. 1363.9
32	OFFICE BUILDING	EL. 1379.7
33	CAR WASH AREA	EL. 1373.5
34	OFFICE BUILDING	EL. 1359.9
35	OFFICE BUILDING	EL. 1375.1
36	FUEL FARM	EL. 1360.6
37	OFFICE BUILDING	EL. 1360.6
38	OFFICE BUILDING	EL. 1375.5
39	BUILDING	EL. 1380.6
40	ARFF	EL. 1401.6
41	BUILDING	EL. 1368.1
42	OFFICE BUILDING	EL. 1383.1
43	OFFICE BUILDING	EL. 1375.6
44	BUILDING	EL. 1381.3
45	OFFICE BUILDING	EL. 1378.8
46	OFFICE BUILDING	EL. 1374.5
47	HANGAR/OFFICE	EL. 1406.9
48	BUILDING	EL. 1382.4
49	SHADE	EL. 1362.9
50	OFFICE BUILDING	EL. 1372.5
51	FIRE SUPPRESSION SYSTEM	EL. 1361.7
52	COMMUNICATIONS VAULT	EL. 1360.0
53	OFFICE BUILDING	EL. 1370.4
54	ATCT/AIRPORT BEACON	EL. 1474.3
55	BUILDING	EL. 1364.5
56	FIRE SUPPRESSION SYSTEM	EL. 1386.3
69	HANGAR/MANUFACTURING/OFFICE	EL. 1368.0' EST.
70	HUSH HOUSE	EL. 1370.1'
F2	FUTURE AIR TRAFFIC CONTROL TOWER	
F3	FUTURE BUILDING	
F4	FUTURE T-HANGAR	

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3. BUILDING ELEVATIONS ARE NAVD88.

REVISIONS

NO.	DESCRIPTION	DATE

10° 8' E ± 0° 20' changing by 0° 5' W per year (July 2019)

0 300 600

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
PAVED ROADS		N/A
RUNWAY PROTECTION ZONE	RPZ	N/A
BUILDING RESTRICTION LINE	BRL	N/A
RUNWAY SAFETY AREA	RSA	N/A
RUNWAY OBJECT FREE AREA	ROFA	N/A
AIRPORT SECURITY FENCE (8' HEIGHT)		N/A
TAXIWAY/TAXILANE OBJECT FREE AREA	TOFA	TOFA
TAXIWAY/TAXILANE SAFETY AREA	TSA	TSA
APRON/TAXIWAY/TAXILANE MARKING		
AIRPORT BEACON		N/A
WIND CONE		N/A

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SHEET CONTENTS

BUILDING AREA PLAN - WEST FACILITIES

SHEET NO.

19

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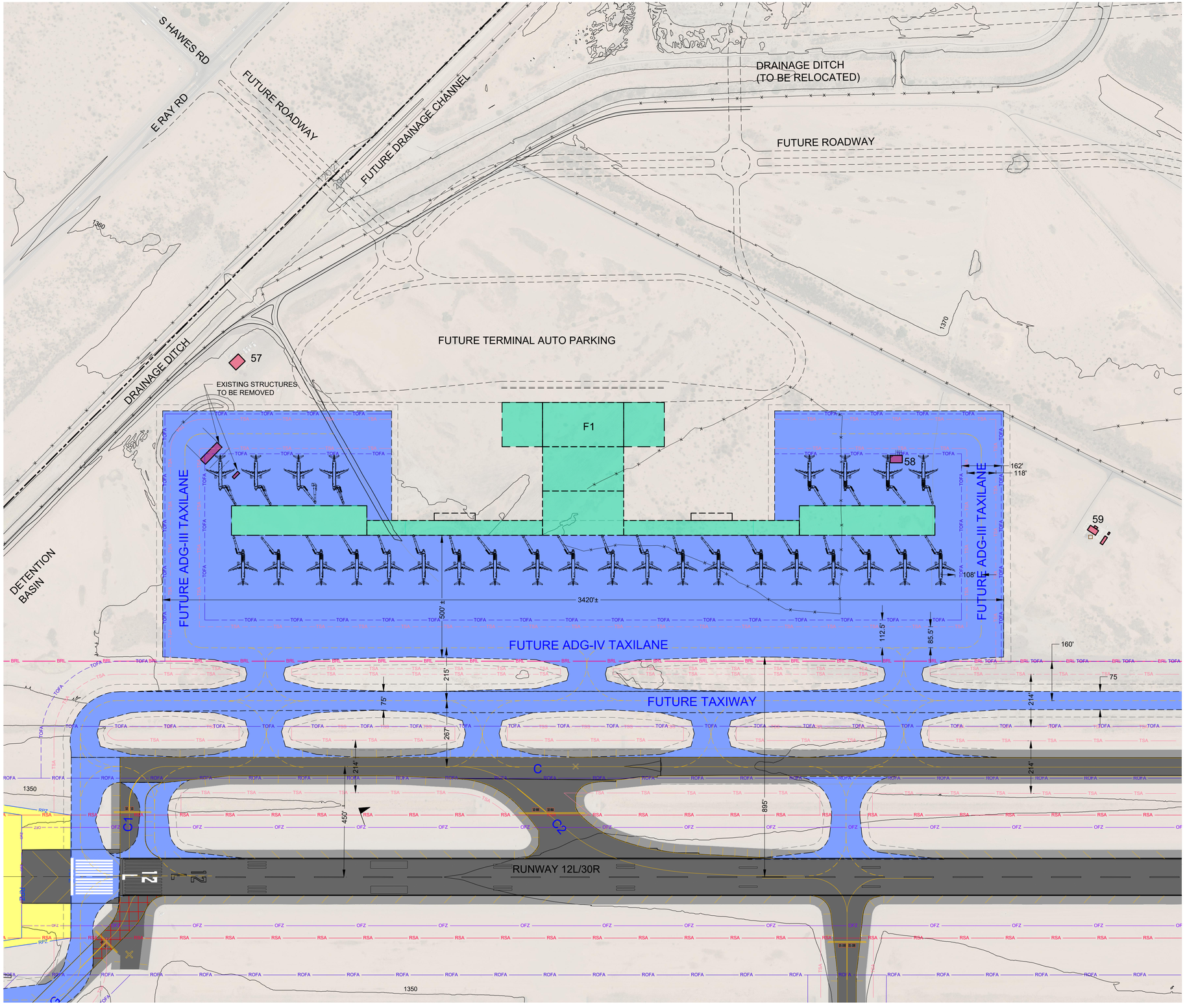

FACILITY LEGEND

NO.	DESCRIPTION	TOP ELEVATION
57	BUILDING (REMOVE/RELOCATE OFF AIRPORT)	EL. 1376.5
58	EAST LIGHTING VAULT (TO BE RELOCATED)	EL. 1385.3
59	ASR-8 (TO BE RELOCATED)	EL. 1381.5
F1	FUTURE PASSENGER TERMINAL	

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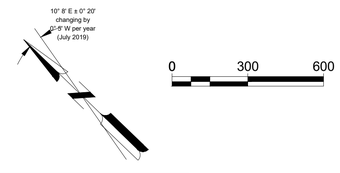
NO.	DESCRIPTION	DATE



DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
PAVED ROADS		N/A
RUNWAY PROTECTION ZONE	RPZ	N/A
BUILDING RESTRICTION LINE	BRL	N/A
RUNWAY SAFETY AREA	RSA	N/A
RUNWAY OBJECT FREE AREA	ROFA	N/A
AIRPORT SECURITY FENCE (8' HEIGHT)		N/A
TAXIWAY/TAXILANE OBJECT FREE AREA	TOFA	TOFA
TAXIWAY/TAXILANE SAFETY AREA	TSA	TSA
APRON/TAXIWAY/TAXILANE MARKING		
AIRPORT BEACON		N/A
WIND CONE		N/A

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SHEET CONTENTS

BUILDING AREA PLAN
- EAST FACILITIES

SHEET NO.

20

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3. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULARS 150/5300-13A CHANGE 1, AIRPORT DESIGN. FAA STANDARD OPERATING PROCEDURES 2.0 & 3.0, AND PART 77 OF THE FEDERAL AVIATION REGULATIONS (FAR), SAFE, EFFICIENT USE, AND PRESERVATION OF THE NAVIGABLE AIRSPACE.
4. ALL COORDINATES NAD83 AND ALL ELEVATIONS NAVD88. HORIZONTAL AND VERTICAL DATUM SOURCE: AGIS SURVEY. OBSTRUCTION SURVEY 2018; SUPPLEMENTED WITH 5010 AIRPORT MASTER RECORD AND AIRPORT AVN DATA SHEET.
5. MAGNETIC DECLINATION SOURCE: NATIONAL GEOPHYSICAL DATA CENTER, SEPTEMBER 2019.

REVISIONS

NO.	DESCRIPTION	DATE

ON-AIRPORT LAND USE LEGEND

- PASSENGER TERMINAL
- AIRFIELD OPERATIONS
- GENERAL AVIATION FACILITIES
- AVIATION-RELATED-TAXIWAY ACCESS
- NON-AVIATION RELATED
- AIRPORT SUPPORT AREA
- AVIATION RELATED
- AVIGATION EASEMENT
- 2017 PLANNING NOISE CONTOUR (65 DNL)

10° 8' E ± 0° 20' changing by 0° 5' W per year (July 2019)

0 1000 2000

DRAWING LEGEND

	EXISTING	FUTURE
JURISDICTIONAL BOUNDARIES		N/A
AIRPORT PROPERTY LINE		N/A
AVIGATION EASEMENT		N/A
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
PAVED ROADS		N/A
RUNWAY PROTECTION ZONE	RPZ	N/A
PART 77 APPROACH SURFACE	PT7	PT7
AIRPORT SECURITY FENCE (8' HEIGHT)		N/A

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SHEET CONTENTS

AIRPORT LAND USE PLAN

SHEET NO.

21

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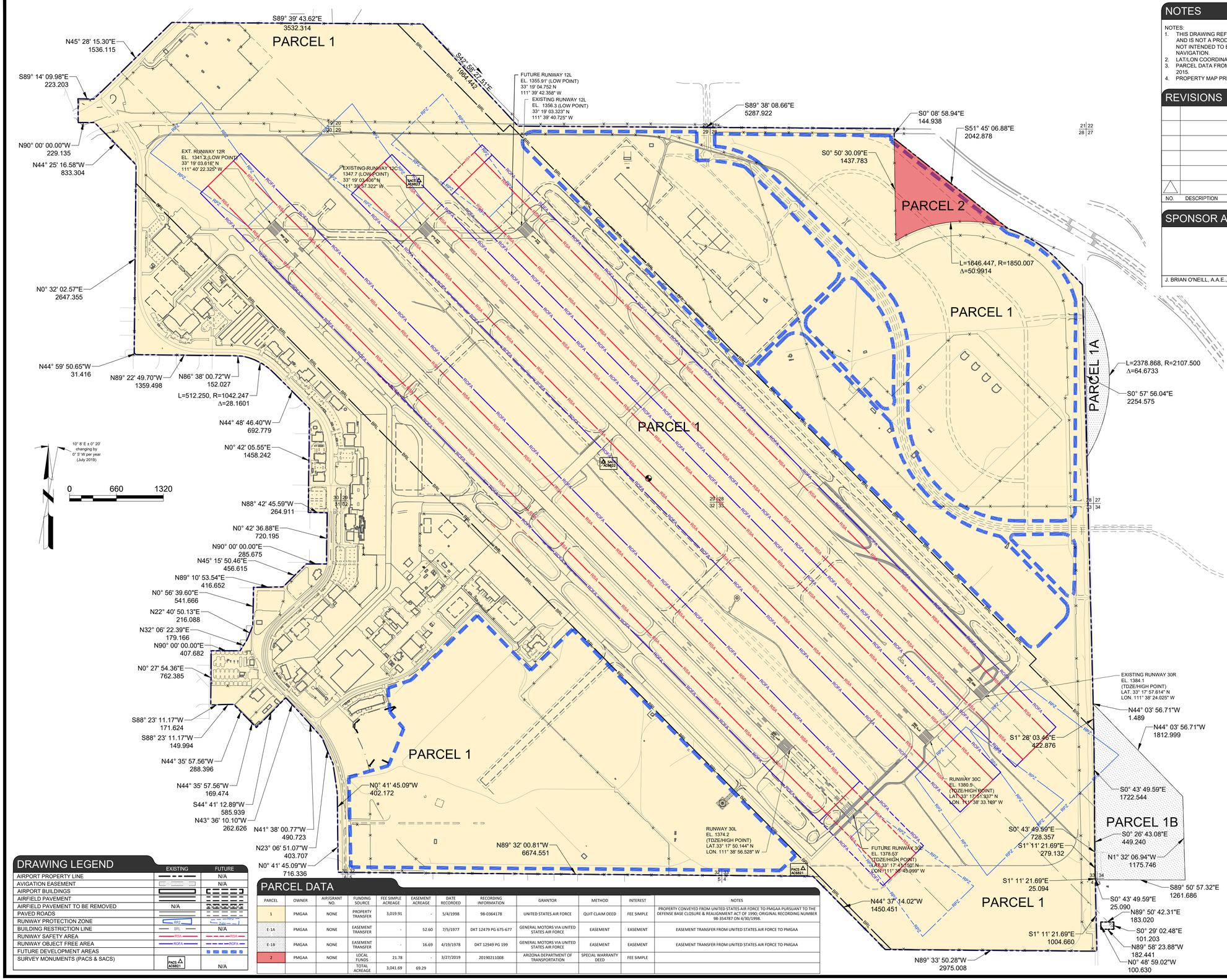

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		N/A
AVIGATION EASEMENT		N/A
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
PAVED ROADS		
RUNWAY PROTECTION ZONE	RPZ	RPZ
BUILDING RESTRICTION LINE	BRL	N/A
RUNWAY SAFETY AREA	RSA	RSA
RUNWAY OBJECT FREE AREA	ROFA	ROFA
FUTURE DEVELOPMENT AREAS		
SURVEY MONUMENTS (PACS & SACS)	PACS ACR821	N/A

PARCEL DATA

PARCEL	OWNER	AIP/GRANT NO.	FUNDING SOURCE	FEE SIMPLE ACREAGE	EASEMENT ACREAGE	DATE RECORDED	RECORDING INFORMATION	GRANTOR	METHOD	INTEREST	NOTES
1	PMGAA	NONE	PROPERTY TRANSFER	3,019.91	-	5/4/1998	98-0364178	UNITED STATES AIR FORCE	QUIT CLAIM DEED	FEE SIMPLE	PROPERTY CONVEYED FROM UNITED STATES AIR FORCE TO PMGAA PURSUANT TO THE DEFENSE BASE CLOSURE & REALIGNMENT ACT OF 1990; ORIGINAL RECORDING NUMBER 98-354787 ON 4/30/1998.
E-1A	PMGAA	NONE	EASEMENT TRANSFER	-	52.60	7/5/1977	DKT 12479 PG 675-677	GENERAL MOTORS VIA UNITED STATES AIR FORCE	EASEMENT	EASEMENT	EASEMENT TRANSFER FROM UNITED STATES AIR FORCE TO PMGAA
E-1B	PMGAA	NONE	EASEMENT TRANSFER	-	16.69	4/19/1978	DKT 12949 PG 199	GENERAL MOTORS VIA UNITED STATES AIR FORCE	EASEMENT	EASEMENT	EASEMENT TRANSFER FROM UNITED STATES AIR FORCE TO PMGAA
2	PMGAA	NONE	LOCAL FUNDS	21.78	-	3/27/2019	20190211008	ARIZONA DEPARTMENT OF TRANSPORTATION	SPECIAL WARRANTY DEED	FEE SIMPLE	
			TOTAL ACREAGE	3,041.69	69.29						

NOTES

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2. LAT/LON COORDINATES NAD83. RUNWAY ELEVATION NAVD88.
3. PARCEL DATA FROM AIRPORT PROPERTY MAP BY COFFMAN ASSOC. APRIL, 2015.
4. PROPERTY MAP PREPARED ACCORDING TO SOP 3.0 CHECKLIST FOR EXHIBIT A.

REVISIONS

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△		

SPONSOR APPROVAL

J. BRIAN O'NEILL, A.A.E., EXECUTIVE DIRECTOR/CEO — DATE

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EXHIBIT 'A' AIRPORT PROPERTY INVENTORY MAP

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22

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CHAPTER 6
FACILITIES IMPLEMENTATION PLAN

Introduction

The long-term development program or Capital Improvement Program (CIP) for the Phoenix-Mesa Gateway Airport (IWA) is intended to establish a strategy to fund airport improvements and maximize the potential to receive Federal and State grant funds, while also establishing a financially prudent plan for improvement funding on a local level. From the Federal Aviation Administration's (FAA) perspective, the CIP provides a detailed listing of projects and costs that are critical for their use in establishing priorities and budgeting expenditures at IWA, when compared with the needs of other airports. From the local sponsor's perspective, the CIP identifies improvement needs and allows budgeting or financial decisions to be made with a comprehensive understanding of financial implications.

The overall concept is to maximize the opportunities to receive FAA Airport Improvement Program (AIP) and Arizona Department of Transportation – Aeronautics Division (ADOT) grants, within the context of, and in recognition of, the amount of local funds that are available for capital needs. Although the CIP will be used for programming by the FAA, there is no financial commitment for the Federal government or the Phoenix-Mesa Gateway Airport Authority (PMGAA) to provide funding for the CIP. If federal matching funds are unavailable for a certain project during the specified timeframe, the project will almost certainly be unaffordable using only local funds, and the improvement project will not go forward until appropriate funding is available. The basic structure of the Development Program or CIP is established in this chapter, with a detailed financial analysis being provided in the subsequent **Financial Implementation Plan Chapter**.

The potential improvements necessary to accommodate the future needs for IWA have been placed into four phases: Phase I (0-5 years), Phase II (6-10 years), Phase III (11 to 20 years), and Phase IV (20+ years). The proposed CIP for the phasing of these projects is provided in ***Table 6-1: Phase-I (0-5 Years) Development Program Project Costs, Table 6-2: Phase-II (6-10 Years) Development Program Project Costs, Table 6-3: Phase-III (11-20 Years),*** and ***Table 6-4: Phase-IV (20+ Years Post Planning Period) Development Program Project Costs***. The proposed improvements are also illustrated graphically by time period on ***Figure 6-1: Project Phasing Plan***.

Implementation Schedule and Project List

Using the anticipated facility demands, along with preliminary engineering analysis focusing on additional pavement rehabilitation needs, a list of capital improvement projects has been assembled. The projects for the first five years are listed in priority order by year. In the second and third phases (years 6-20), the projects are listed without year designators, and the fourth phase (20+ years) consists of known projects listed based on long-term demand at the Airport. Post planning period projects, or those for which forecast demand does not dictate a need during the 20-year planning period, are listed in ***Table 6-4: Phase-IV (20+ Years) Post Planning Period Project Costs***. It is anticipated that the project phasing will invariably be altered as local and federal priorities evolve over the coming months and years.

The details of the CIP (including a capital improvement project list, project cost estimates, phasing recommendations, and a financial feasibility analysis) have been formulated in consideration of comments received from Airport staff, the PMGAA, and the Technical Advisory Committee and Stakeholder Working Group.

Cost Estimates

Cost estimates for individual projects, based on current year construction costs, have been prepared in 2019 dollars for the improvement projects identified as potentially being needed during the 20-year planning period and beyond. These estimates are intended to be used for planning purposes only and should not be construed as construction cost estimates. Construction cost estimates can only be generated following the preparation of detailed engineering design documents. Escalation factors have been included in the project cost estimates in the **Financial Feasibility Plan Chapter**.

Table 6-1: Phase-I (0-5 Years) Development Program Project Costs

Federal FY	MP Project Number	Airport Project Number	Project Title	Estimated Total Project Cost 2019 Dollars
Proposed FY 2021 CIP Projects				
2021	A1	1067/1072	Reconstruct sections of Runway 12R/30L in Portland Cement Concrete Pavement (PCCP), LED Lighting Upgrade - Design/Construct	$ 24,000,000.00
	A2	744	Taxiway Whiskey (Reconstruct lowest PCI section in Portland Cement Concrete Pavement) - Design/Construct	$ 800,000.00
	A3	950	Ellsworth Channel Relocation - Construction	$ 11,440,000.00
	A4	-	Employee Parking Lot and Westside cell phone lot improvements - Design/Construct	$ 665,000.00
	A5	975	Safety Management System	$ 312,000.00
			2021 Annual Subtotal	**$ 37,217,000.00**
Proposed FY 2022 CIP Projects				
2022	A6	1092	Taxiway Golf Realignment (End of Runway 12R/30L w/ 90degree connector to Twy G)- Design/Construct	$ 11,580,000.00
	A7	397	Eastside Airport and Terminal Access Roads and Infrastructure (New Spine Road and Utility Infrastructure Extensions from Ellsworth Rd to Eastside Development Area) - Design/Construction	$ 17,122,425.00
			2022 Annual Subtotal	**$ 28,702,425.00**
Proposed FY 2023 CIP Projects				
2023	A8	1201	Terminal Annex Redevelopment (Gates 1 to 4) - Design/Construct	$ 14,007,825.00
	A9	1202	Center Runway Section 30 (South end) - Design/Construct	$ 8,630,000.00
			2023 Annual Subtotal	**$ 22,637,825.00**
Proposed FY 2024 CIP Projects				
2024	A10	1203	Parallel Taxiway West of Runway 12C/30C [including VOR jog segment] - Design/Construction	$ 18,316,000.00
			2024 Annual Subtotal	**$ 18,316,000.00**
Proposed FY 2025 CIP Projects				
2025	A11	-	Remain-Over-Day (ROD)/Remain Over Night (RON) Aircraft Storage Apron - Design/Construct	$ 539,000.00
			2025 Annual Subtotal	**$ 539,000.00**
			Total Phase-I (0-5 Years) Development Program Project Costs	**$ 107,412,250.00**

Table 6-2: Phase-II (6-10 Years) Development Program Project Costs

Federal FY	MP Project Number	Airport Project Number	Project Title	Estimated Total Project Cost 2019 Dollars
Proposed FY 2026 to 2030 CIP Projects				
6 to 10 Years	B1	-	Fuel Farm Expansion: (2) 50,000 USG fuel tanks - Design/Construct	$ 1,643,300.00
	B2	-	Extend Runway 12L/30R by 200' with Bypass Taxiway - Design/Construction	$ 7,197,000.00
	B3	1204	Mid-field Connectors Project - [Hotel, Lima, crossfield connectors] - Design/Construct	$ 9,313,000.00
	B4	-	Procure 1 new Oshkosh Aircraft Rescue Firefighting Truck - 1,500 USG; 200 USG of AFFF; and 450LB dry chem capacity	$ 900,000.00
	B5	-	Relocate Compass Calibration Pad - Design/Construct	$ 1,219,000.00
	B6	-	Reconstruct 1,000' of Runway 12C approach end/Reconstruct 2,000' of Runway 12C/30C in Portland Cement Concrete Pavement (PCCP) with LED Lighting Upgrade	$ 12,748,000.00
	B7	-	Fuel Farm Expansion: (2) 50,000 USG fuel tanks - Design/Construct	$ 1,643,000.00
	B8	-	East/West Airfield Electrical Lighting Vault Replacement/Generators with Runway 12L/30R Lighting Upgrade	$ 10,805,000.00
	B9	719	Alpha Apron Phase 3 - Design/Construction	$ 5,052,000.00
	B10	-	Increase tower height/relocate existing Airport Surveillance Radar Model 8 (ASR-8)	$ 13,000,000.00
	B11	-	Maintenance Run-Up Area with Blast Fence - Design/Construct	$ 1,295,000.00
	B12	-	Runway Magnetic Change - Markings/Signage [All Runways]	$ 300,000.00
			Total Phase-II (6-10 Years) Development Program Project Costs	**$ 65,115,300.00**

Table 6-3: Phase-III (11-20 Years) Development Program Project Costs

Federal FY	MP Project Number	Airport Project Number	Project Title	Estimated Total Project Cost 2019 Dollars
Proposed FY 2031 to 2041 CIP Projects				
11 to 20 Years	C1	-	Fuel Farm Expansion: (2) 50,000 USG fuel tanks - Design/Construct	$ 1,643,000.00
	C2	-	New Taxiway Bravo 1 connector to Runway 12R/30L - Design/Construct	$ 1,824,000.00
	C3	421	Eastside Apron Phase 1 - Design	$ 1,206,000.00
	C4	415	Eastside Apron Phase 1 - Construction	$ 11,910,000.00
	C5	181	Eastside Terminal Replacement (10 gates + 4 hard stand positions) Phase 1 - Design	$ 16,716,560.00
	C6	261	Eastside Terminal Replacement (10 gates + 4 hardstand positions) Phase 1 - Construction	$ 167,165,600.00
	C7	969	Passenger Boarding Bridges for Terminal Phase 1 - Design/Construct	$ 10,000,000.00
	C8	971/972	Eastside Terminal Parking Surface Lot - Design/Construct	$ 12,981,750.00
	C9	-	Eastside Consolidated Rental Car Facility w/ConRAC - Design/Construct	$ 16,602,430.00
	C10	-	Construct New Eastside Fuel Farm (Jet A, 450,000 gallons) to support Eastside Terminal	$ 7,393,500.00
	C11	-	Parallel Taxiway to Taxiway C Phase 1 - Design	$ 950,000.00
	C12	-	Parallel Taxiway to Taxiway C Phase 1 - Construct	$ 10,448,000.00
	C13	-	New Taxiway Connector South of existing C1 Connector - Design/Construct	$ 1,520,000.00
	C14	-	New Taxiway Connector South of existing C2 Connector - Design/Construct	$ 1,520,000.00
	C15	-	Parallel Taxiway to Taxiway C Phase 2 - Design	$ 965,000.00
	C16	-	Parallel Taxiway to Taxiway C Phase 2 - Construct	$ 12,710,000.00
			Total Phase-III (11-20 Years) Development Program Project Costs	**$ 275,555,840.00**

Table 6-4: Phase-IV (20+ Years) Post Planning Period Project Costs

Federal FY	MP Project Number	Airport Project Number	Project Title	Estimated Total Project Cost 2019 Dollars
Proposed CIP Projects Beyond FY 2042				
20+ Years	D1	-	Eastside Apron Phase 2 - Design	$ 1,080,000.00
	D2	415	Eastside Apron Phase 2 - Construction	$ 10,700,000.00
	D3	181	Eastside Terminal Phase 2 Expansion (9 Gates) - Design	$ 12,660,200.00
	D4	261	Eastside Terminal Phase 2 Expansion (9 Gates) - Construction	$ 126,602,000.00
	D5	-	Passenger Boarding Bridges for Terminal Phase 2 - Design/Construct	$ 9,000,000.00
	D6	-	1,275' Extension to Runway 12R/30L, Taxiway B Extension and Bypass Taxiway in Portland Cement Concrete Pavement (PCCP) - Design/Construct	$ 12,630,000.00
	D7	-	Eastside Terminal Phase 3 Expansion (9 Gates) - Design	$ 12,555,970.00
	D8	-	Eastside Terminal Phase 3 Expansion (9 Gates) - Construction	$ 125,559,700.00
	D9	-	Passenger Boarding Bridges for Terminal Phase 3 - Design/Construct	$ 9,000,000.00
	D10	-	Eastside Apron Phase 3 - Design	$ 1,080,000.00
	D11	-	Eastside Apron Phase 3 - Construction	$ 10,700,000.00
			Total Phase-IV (20+ Years, Post Planning Period)	**$ 331,567,870.00**

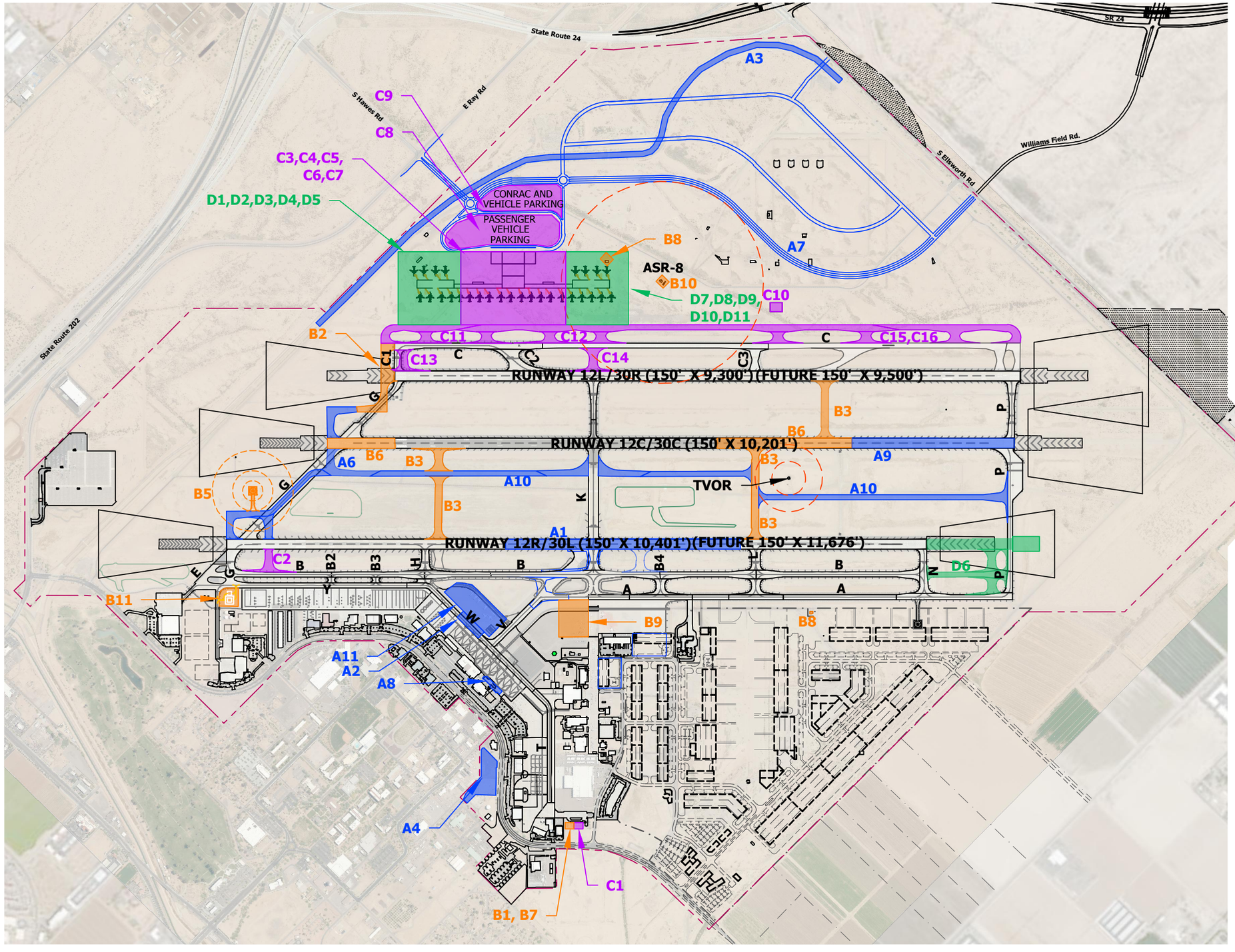
Capital Improvement Program (CIP)

To assist in preparation of the FAA's effort to provide grant funding to the most needed projects, airport staff keeps an Airport Capital Improvement Program (ACIP) on file and up to date with the FAA. The ACIP is similar in format to the CIP tables presented previously. The purpose of the proposed project list, phasing, and costs is to provide a progressive projection of capital needs for the Airport to then utilize in local and federal financing programming. It is understood that, this is a long-range planning document and could differ to some degree with the Airport's CIP on file with the FAA based on changed conditions or priorities.

Phasing Plan

To supplement the information provided by the project list and project cost estimates, a phasing plan has been prepared. **Figure 6-1: Project Phasing Plan** identifies the suggested phasing for the proposed improvement projects through the 20-year planning period.

Variance from the plan may be necessary, especially during the latter time periods. The greatest attention has been given to the first five years because the projects outlined in this timeframe include many critical improvements. The demand for certain facilities, especially later in the planning period, and the economic feasibility of their development are to be the prime factors influencing the timing of individual project construction. Care must be taken to provide for adequate lead-time for detailed planning and construction of facilities to meet aviation demands, and to prevent additional costs incurred from improper scheduling.



Legend

- Phase I - (0 - 5 Years)
- Phase II - (6 - 10 Years)
- Phase III - (11 - 20 Years)
- Phase IV - (20+ Years)

N

0 750' 1500' 3000'

GRAPHIC SCALE IN FEET

Figure 6-1
Project Phasing Plan

Sources of Capital Funding

Funding from several sources is anticipated for the implementation of the Master Plan Update CIP. These sources include FAA AIP entitlement and discretionary grants, Passenger Facility Charges (PFCs), ADOT state aviation grants, member government contributions, net operating cash flow/cash reserves, lease revenue, and other funding sources. Each of these sources of funds is described in detail in the **Financial Feasibility Chapter**.

Summary – Master Plan Capital Improvement Program

If aviation demands continue to indicate that improvements are needed, and if the proposed improvements prove to be environmentally acceptable, the financial implications discussed earlier in this chapter and in **Financial Feasibility Chapter** are likely to be acceptable for the FAA, ADOT, and the PMGAA. However, note that this chapter is only a programming analysis and not a commitment on the part of the FAA or the Airport. If the cost of an improvement project is not financially feasible, it will not be initiated.

Environmental Action Plan

This section provides recommendations for the anticipated level of environmental documentation that would be required prior to implementing the development actions identified in the Phoenix-Mesa Gateway Airport Master Plan and as part of IWA's CIP.

The list below includes Master Plan and five-year capital improvement projects that would occur within the 2021 to 2025 timeframe. For each of these actions, the anticipated level of documentation required for compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.) is identified based on the guidelines provided in FAA Order 1050.1F, Environmental Impacts: Policies and Procedures (Order 1050.1F) (effective July 16, 2015).

Per FAA Order 1050.1F, three levels of NEPA documentation could be required for a proposed action. These include:

- ✓ Categorical Exclusion (CATEX): This category typically includes actions that FAA has found do not individually or cumulatively have a significant effect on the human environment. The responsible FAA official must determine whether a proposed action is within the scope of a CATEX, but if the FAA official determines that extraordinary circumstances exist, an Environmental Assessment (EA) or Environmental Impact Statement (EIS) must be prepared. A CATEX should not be used for segmentation or an interdependent part of a larger proposed action. Actions that fall within the CATEX category can include, but are not limited to, the following:
  - Administrative or general actions;
  - Issuance of certificates or compliance with certification programs;

- Actions involving installation, repair, or upgrade of equipment or instruments necessary for operations and safety;
- Acquisition, repair, replacement, maintenance, or upgrading of grounds infrastructure, buildings, structures, or facilities that are generally minor in nature;
- Procedural actions related to airspace and air traffic; and,
- Actions involving establishment of, compliance with, or exemptions to regulatory programs or requirements.

✓ Environmental Assessment (EA): The purpose of an EA is to determine whether an action has the potential to significantly affect the human environment. An EA provides sufficient evidence for determining whether a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS, discussed below) should be prepared. To determine the scope of an EA or an EIS, the responsible FAA official must consider whether actions are connected; whether, when viewed with other proposed actions, the action under consideration would have cumulatively significant impacts; and whether similar actions, either in timing or geography, should be considered in the same environmental document. Actions that typically require an EA include, but are not limited to the following:

- Acquisition of land greater than 3 acres for construction of new office buildings, similar FAA facilities, or as a result of the following actions;
- Establishment of FAA housing, sanitation systems, fuel storage and distribution systems, and power source and distribution systems;
- Unconditional Airport Layout Plan (ALP) approval of, or federal financial participation in, a new runway at an existing airport not located in a Metropolitan Statistical Area (MSA);
- Runway strengthening having the potential to significantly increase off-airport noise impacts;
- Construction or relocation of entrance or service road connections to public roads that substantially reduce the level of service rating to such public roads below the acceptable level determined by the appropriate transportation agency.

✓ Environmental Impact Statement (EIS): An EIS must be prepared for actions that would significantly affect the quality of the human environment. The considerations listed above regarding connected actions, cumulatively significant impacts, and actions that would be similar in timing or geography must also be taken into account when determining the scope of an EIS. Direct, indirect, and cumulative impacts must be considered when determining significance. Actions for which an EIS is typically required include, but are not limited to, the following:

- Unconditional ALP approval, or federal financial participation in, the location of a new commercial service airport in an MSA; and
- A new runway to accommodate air carrier aircraft at a commercial service airport in an MSA, and major runway extension.

For some environmental resource impact categories, the FAA has identified significance thresholds (including for air quality, federally threatened or endangered species, Section 4(f) resources, and noise and noise-compatible land uses). For other environmental resource impact categories, the FAA has identified factors to consider when determining whether an action would have a significant impact.

The schedule of capital projects is based upon the forecasts presented in the **Aviation Demand Forecasts Chapter**. However, the NEPA process must be completed prior to the FAA allocating grant funds for design or construction. Depending upon the project, the NEPA process can take from a few months to several years. If FAA grant funds will be used to prepare the NEPA documents, lead times for the normal grant processes will also need to be factored in.

It is possible that projected activity levels or changes in critical aircraft will differ from the forecasts in this plan. Airport staff should monitor these factors and maintain regular communication with airlines and major users regarding potential changes in their needs. The timing and sequence of projects may need to be modified if:

- ✓ Activity levels are higher or lower than forecast
- ✓ The fleet mix changes from what was expected
- ✓ More distant destinations are added by airlines
- ✓ Schedules are modified in a way that would increase or shift peak demand.

Table 6-5: Anticipated NEPA Actions identifies the Master Plan and five-year CIP actions in the 2021 to 2025 timeframe, the anticipated level of NEPA documentation, and environmental and coordination considerations that could affect the overall level of effort associated with documentation of each anticipated action. Some actions could be documented in combination with other actions in a single environmental document based on their level of connectedness; these combined documentation recommendations are also included in the table.

Table 6-5: Anticipated NEPA Actions

MP Project Number	Airport Project Number	Project Name	Project Initiation Date	Anticipated Level of NEPA Documentation	Environmental Considerations
A1	1067/1072	Reconstruct sections of Runway 12R/30L in Portland Cement Concrete Pavement (PCCP), LED Lighting Upgrade - Design/Construct	2021	CATEX	Maintenance related project; located in a previously developed area
A2	744	Taxiway Whiskey (Reconstruct lowest PCI section in Portland Cement Concrete Pavement) - Design/Construct	2021	CATEX	Maintenance related project; located in a previously developed area
A3	950	Ellsworth Channel Relocation - Construction	2021	EA Completed January 2017	Project connected to A7
A4	-	Employee Parking Lot and Westside cell phone lot improvements - Design/Construct	2021	CatEx	Located in a previously developed area
A5	975	Safety Management System	2021	None	No documentation anticipated; no impacts to surrounding environment
A6	1092	Taxiway Golf Realignment (End of Runway 12R/30L w/ 90degree connector to Twy G)- Design/Construct	2022	CATEX	Located in a previously developed area
A7	397	Eastside Airport and Terminal Access Roads and Infrastructure (New Spine Road and Utility Infrastructure Extensions from Ellsworth Rd to Eastside Development Area) - Design/Construction	2022	EA Completed January 2017	Project connected to A3
A8	1201	Terminal Annex Redevelopment (Gates 1 to 4) - Design/Construct	2023	CATEX	Located in a previously developed area
A9	1202	Center Runway Section 30 (South end) - Design/Construct	2023	CATEX	Maintenance related project; located in a previously developed area
A10	1203	Parallel Taxiway West of Runway 12C/30C [including VOR jog segment] - Design/Construction	2024	CATEX	Located in a previously developed area
A11	-	Remain-Over-Day (ROD)/Remain Over Night (RON) Aircraft Storage Apron - Design/Construct	2025	CATEX	Located in a previously developed area

Note: All of the construction projects, except the extension of Runway 12L\30R, are likely to qualify for CATEXs. However, the Center Runway Section 30 project has the potential to impact jurisdictional wetlands. Whether there will be impacts will depend upon the engineering designs for these projects. As these designs have not yet been prepared, it cannot be known whether there will be impacts and what the magnitude of the impacts will be. It is possible that the Center Runway and Mid-field Connector projects could have minor impacts to the wetlands and still qualify for CATEXs. However, if the wetland impacts are of a magnitude to require an Individual Permit from the Army Corps of Engineers, preparation of an Environmental Assessment would be required. Given the large difference in the time required to prepare and process CATEXs and Environmental Assessments, it would be useful for sufficient engineering design to be undertaken to estimate the extent of wetland impacts. This would allow scheduling of NEPA processes to avoid delaying the construction projects.

CHAPTER 7
FINANICAL FEASIBILITY

Introduction

This section presents a financial analysis of the Capital Improvement Program (CIP) for Phoenix-Mesa Gateway Airport (IWA or the Airport), as presented in the previous **Facilities Implementation Plan Chapter**. This chapter describes the financial framework of the Phoenix-Mesa Gateway Airport Authority (PMGAA), including the airline rates and charges methodology as specified in the approved Airport's Airport Rates and Charges, which became effective on September 1, 2019. It also includes an analysis of PMGAA's historical revenues and expenses for Fiscal Years (FYs) 2015 through 2019, and projections of anticipated CIP funding sources, as well as operating revenues and operating expenses for FYs 2020 through 2030.

The potential capital improvements necessary to accommodate the future needs of IWA were presented in the **Facilities Implementation Plan Chapter** in four phases: Phase I (1-5 years), Phase II (6-10 years), Phase III (11-20 years), and Phase IV (20+ years). The financial analysis and funding plan presented in this chapter address the estimated capital costs for Phase I and Phase II, together estimated to cover the years FYs 2021 – 2030. Due to the complex nature of changing circumstances for CIP funding sources in the long-term, estimates of the funding of capital costs beyond FY 2030 (Phase III and Phase IV) are considered speculative at this point, and therefore are not presented in this chapter.

The financial projections reflect the anticipated effects of funding the CIP, to the extent of the availability of the identified funding sources through FY 2030. The funding plan anticipates the use of Federal Aviation Administration (FAA) Airport Improvement Program (AIP) grants; Passenger Facility Charges (PFCs); Arizona Department of Transportation (ADOT) grant funds; Member Government Contributions; and Other funds. Rental car Customer Facility Charges (CFCs), monies from the Operating Fund, and future lease revenues are also described in this chapter as a potential funding source for capital costs beyond FY 2030. The financial analysis uses the approved air traffic forecast contained in **Aviation Activity Forecasts Chapter** as a basis for estimating operating revenues, operating expenses, and CIP funding sources through FY 2030.

PMGAA's Organization and Financial Framework

PMGAA owns and operates the Airport. PMGAA was established on May 19, 1994, and it is made up of leadership from the cities of Mesa, Phoenix, and Apache Junction, the towns of Queen Creek and Gilbert, and the Gila River Indian Community (collectively known as the Member Governments). PMGAA Board of Directors is composed of elected officials from the member governments. PMGAA is separate from other state and local governments, and PMGAA is responsible for the Airport and its financial position. PMGAA earns revenues from aeronautical and non-aeronautical activities. In addition to traditional fees received for the use of the Airport facilities, PMGAA owns and operates a fixed base fueling operation.

PMGAA's FY begins on July 1 and ends on June 30 of the following calendar year. The audited financial statements for FY 2018, the most recent fiscal year for which audited financial statements are available, show that as of June 30, 2018 (the end date of the FY), PMGAA had Total Assets of $289.8 million, Total Liabilities of $32.6 million, and Net Assets of $257.2 million.

Proposed Capital Improvement Program

Table 7-1: Estimated Capital Costs and Funding Sources presents the estimated CIP project costs and funding sources for the recommended list of projects as noted in the **Facilities Implementation Plan Chapter**.

Table 7-1: Estimated Capital Costs and Funding Sources

		Total [1]	AIP		PFCs	ADOT Grants	Member Govt.	Other
			Entitlement	Discretionary				
Phase I - FYs 2021 - 2025								
A1	Reconstruct sections of Runway 12R/30L	$ 24,960,000	$ 3,636,000	$ 19,092,576	$ -	$ 1,115,712	$ 1,115,712	$ -
A2	Taxiway Whiskey-Design/Construct	832,000	-	-	-	748,800	83,200	-
A3	Ellsworth Channel Relocation-Construction	11,897,600	-	-	11,897,600	-	-	-
A4	Employee Parking Lot and Cell Phone Lot Improvements	691,600	-	-	-	-	691,600	-
A5	Safety Management System	324,480	-	-	324,480	-	-	-
A6	Taxiway Golf Realignment - Design/Construct	12,274,800	3,672,360	7,505,073	-	548,684	548,684	-
A7	Eastside Airport Terminal Access Roads - Design/Construct	18,149,771	-	-	10,000,000	709,362	-	7,440,409
A8	Terminal Annex Redevelopment - Design/Construct	15,128,451	-	8,954,379	-	400,260	5,773,812	-
A9	Center Runway Section 30	9,320,400	3,709,084	4,778,073	-	416,622	416,622	-
A10	Parallel Taxiway West of RW 12C/30C - Design/Construct	20,147,600	3,746,174	14,600,230	-	900,598	900,598	-
A11	Aircraft Storage Apron (RON/ROD) - Design/Construct	603,680	-	-	-	-	603,680	-
Total Projects for FYs 2021 - 2025		**$ 114,330,382**	**$ 14,763,618**	**$ 54,930,331**	**$ 22,222,080**	**$ 4,840,037**	**$ 10,133,907**	**$ 7,440,409**
Phase II - FYs 2026 - 2030								
B1	Fuel Farm Expansion - Design/Construct	$ 1,873,362	$ -	$ -	$ -	$ -	$ 1,873,362	$ -
B2	Extend Runway 12L/30R with Taxiway	9,600,640	3,783,636	4,958,707	-	429,149	429,149	-
B3	Mid-Field Connectors Project - Design/Construct	10,430,560	-	9,498,068	-	466,246	466,246	-
B4	ARFF Truck	1,026,000	-	-	1,026,000	-	-	-
B5	Relocate Compass Calibration Pad - Design/Construct	1,414,040	-	-	-	-	-	1,414,040
B6	Reconstruct Runway 12C/30C and LED Lighting Upgrade	14,532,720	3,821,473	9,412,022	-	649,613	649,613	-
B7	Fuel Farm Expansion - Design/Construct	1,938,740	-	-	-	-	1,938,740	-
B8	Electrical Lighting Vault Replacement/Generators & 12C/30R LED Upgrade	12,596,700	7,835,551	3,635,004	-	563,072	563,072	-
B9	Alpha Apron Phase 3 - Design/Construction	6,062,400	-	-	6,062,400	-	-	-
B10	Increase Tower Height/Relocate Existing ASR-8	15,860,000	-	-	-	-	-	15,860,000
B11	Maintenance Run-Up Area with Blast Fence - Design/Construct	1,579,900	-	-	-	-	1,579,900	-
B12	Runway Magnetic Change - Marking/Signage	336,000	-	305,962	-	15,019	15,019	-
Total Projects for FYs 2026 - 2030		**$ 77,251,062**	**$ 15,440,660**	**$ 27,809,762**	**$ 7,088,400**	**$ 2,123,099**	**$ 7,515,101**	**$ 17,274,040**
Total Projects for FYs 2021 - 2030		**$ 191,581,444**	**$ 30,204,278**	**$ 82,740,093**	**$ 29,310,480**	**$ 6,963,136**	**$ 17,649,008**	**$ 24,714,449**

Note: [1] The estimated project costs were developed in 2019 dollars and escalted at 2% per year from base.

Recommended Funding Plan for Phases I and II

The recommended funding plan for Phases I and II (through FY 2030) includes the following sources:

- ✓ FAA AIP Grants (Entitlement and Discretionary funds)
- ✓ Passenger Facility Charges (PFCs)
- ✓ ADOT – Aeronautics Division Grants
- ✓ Member Government Contributions
- ✓ Other Funds

In developing the CIP funding plan, the eligibility of each capital project was established to make the best use of all the Airport's federal and state funding resources. The Airport's AIP entitlement grants through FY 2030 were projected based on the enplanement forecast and matched against the anticipated AIP-eligible project costs. AIP-eligible costs in excess of projected AIP entitlement funds were considered for AIP discretionary funding, based on the nature of each project. PFC funding was identified for all projects meeting the FAA's eligibility and were subject to the projected availability of PFC revenues. ADOT grant funding was assumed to be used for a matching portion of AIP eligible projects and other select projects. Member Government Contributions are assumed to fund a portion of the projects that are not eligible for AIP or PFC funding. The financial analysis includes a projection of PMGAA's Operating Fund cash flow generated from on-going operations, which was used as a basis for determining the availability of monies from the Operating Fund for funding a portion of the capital project costs, if another assumed funding source is unavailable.

Table 7-2: Sources and Uses of Capital Funding summarizes the CIP sources and uses by project type. The largest funding sources are AIP grants, which are estimated to fund 59.0 percent of the total CIP costs. PFCs are projected to fund a total of 15.3 percent, followed by 9.2 percent from Member Government Contributions, 3.6 percent from ADOT grants, and the remainder from other funds. The largest uses of CIP funding are estimated for runway and taxiway projects, and access roads totaling approximately 60.0 percent and 9.5 percent, respectively, of total estimated CIP costs.

Table 7-2: Sources and Uses of Capital Funding

Sources of Capital Funding	Phase I 2021 - 2025	Phase II 2026 - 2030	Total
AIP Entitlements	$ 14,763,618	$ 15,440,660	$ 30,204,278
AIP Discretionary	54,930,331	27,809,762	82,740,093
PFC Paygo	22,222,080	7,088,400	29,310,480
ADOT Grants	4,840,037	2,123,099	6,963,136
Member Contributions	10,133,907	7,515,101	17,649,008
Other	7,440,409	17,274,040	24,714,449
Total Sources	**$114,330,382**	**$ 77,251,062**	**$ 191,581,444**
Uses of Capital Funding	**Phase I 2021 - 2025**	**Phase II 2026 - 2030**	**Total**
Runway/Taxiway Projects	$ 67,534,800	$ 47,496,620	$ 115,031,420
Terminal Improvements	15,128,451	-	15,128,451
Parking	691,600	-	691,600
Fuel Farm	-	3,812,102	3,812,102
Apron Rehabilitation	603,680	6,062,400	6,666,080
Access Roads	18,149,771	-	18,149,771
ARFF	-	1,026,000	1,026,000
Other Projects	12,222,080	18,853,940	31,076,020
Total Uses	**$114,330,382**	**$ 77,251,062**	**$ 191,581,444**

Note: The assumed AIP Discretionary funding is based on the FAA's funding criteria and priority system.

Federal Aviation Administration Airport Improvement Program (AIP) Grants

AIP grants are administered to construct and maintain infrastructure projects that increase the capacity, safety, and security at airports across the United States. The FAA issues either entitlement or discretionary grants for projects. Entitlement grants are awarded based on a formula that considers the number of passengers using the Airport. The FAA awards discretionary grants based on established funding priorities and airport management's discretion. ***Table 7-3: Projected AIP Entitlements*** presents the projections for AIP entitlement grants for IWA covered in the forecast period. The funding plan assumes that a total of $30.2 million in entitlement funding and $82.7 million will be awarded in discretionary funds.

Table 7-3: Projected AIP Entitlements

AIP Entitlement Cash Flow	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Enplanements [1]	759,033	850,292	884,531	920,149	957,201	995,745	1,015,961	1,036,587	1,057,632	1,079,105	1,101,013
$7.80 for first 50,000 Passengers	$ 390,000	$ 390,000	$ 390,000	$ 390,000	$ 390,000	$ 390,000	$ 390,000	$ 390,000	$ 390,000	$ 390,000	$ 390,000
$5.20 for next 50,000 Passengers	260,000	260,000	260,000	260,000	260,000	260,000	260,000	260,000	260,000	260,000	260,000
$2.60 for next 400,000 Passengers	1,040,000	1,040,000	1,040,000	1,040,000	1,040,000	1,040,000	1,040,000	1,040,000	1,040,000	1,040,000	1,040,000
$0.65 for next 500,000 Passengers	168,371	227,690	249,945	273,097	297,181	322,234	325,000	325,000	325,000	325,000	325,000
$0.50 for each passenger over 1 millio	-	-	-	-	-	-	7,981	18,294	28,816	39,552	50,506
Part A AIP Entitlements	$1,858,371	$1,917,690	$1,939,945	$1,963,097	$1,987,181	$2,012,234	$2,022,981	$2,033,294	$2,043,816	$2,054,552	$2,065,506
Part B AIP Entitlements [2]	$ 491,629	$ 432,310	$ 410,055	$ 386,903	$ 409,819	$ 418,016	$ 426,376	$ 434,903	$ 443,601	$ 452,474	$ 461,523
Total AIP Entitlements	$3,600,000	$3,636,000	$3,672,360	$3,709,084	$3,746,174	$3,783,636	$3,821,473	$3,859,687	$3,898,284	$3,937,267	$3,976,640
Capital Expenditures	$ -	$3,636,000	$3,672,360	$3,709,084	$3,746,174	$3,783,636	$3,821,473	$ -	$3,898,284	$3,937,267	$ -

Notes: [1] Enplanements used in AIP calculations have a 2 year delay. For example, 2018 enplanements are used for the 2020 AIP Entitlement calculation.
[2] Part B AIP Entitlements are distributed to nonhub primary airports from the AIP Entitlement Turnback at large and medium hub airports. This amount is grown by 2% beginning in 2024.

Passenger Facility Charge (PFC)

PFCs are fees imposed by an airport based on enplaned passengers and are used for specific projects approved by the FAA. According to federal regulations, PFC projects must (1) preserve or enhance safety, security or capacity of the national air transportation system; (2) reduce noise or mitigate noise impacts resulting from an airport; or (3) furnish opportunities for enhanced competition between or among air carriers. PMGAA is currently authorized by the FAA to collect a PFC of $4.50 per enplaned passenger at IWA.

Since the inception of the PFC program, PMGAA has received cumulative approval to collect and use a total of approximately $42.7 million in PFCs. PMGAA's most recent application, approved in February of 2018, extends PMGAA's right to collect for reimbursable projects until July 1, 2026. PMGAA funds capital costs with the Operating Fund, and then repays the PFC eligible amount with PFCs.

Table 7-4: Projected Passenger Facility Charge (PFC) Revenue shows the projected PFC collections for the projection period. The funding plan assumes that PMGAA will submit one or more future PFC applications for PFC-eligible project costs as needed during the planning horizon. PMGAA estimates that approximately $10 million in PFCs will be available during Phase I, in addition to annual PFC collections, resulting from the cancellation of previously approved PFC projects. The CIP funding plan assumes that during Phase 1, PFCs will be applied to the Ellsworth Channel Relocation project, the Safety Management System project, and the Eastside Airport Terminal Access Roads project.

Table 7-4: Projected Passenger Facility Charge (PFC) Revenue

Calculation of PFCs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
PFC Fund Beginning Balance	$3,537,240	$8,304,874	$1,042,407	($3,798,270)	$1,568,806	$7,044,845	$12,632,060	$17,306,707	$23,123,090	$29,057,559	$29,047,775
Enplanements	884,531	920,149	957,201	995,745	1,015,961	1,036,587	1,057,632	1,079,105	1,101,013	1,122,933	1,145,289
PFC Rate	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50
Administration Fee	$0.11	$0.11	$0.11	$0.11	$0.11	$0.11	$0.11	$0.11	$0.11	$0.11	$0.11
PFCs Available	$4.39	$4.39	$4.39	$4.39	$4.39	$4.39	$4.39	$4.39	$4.39	$4.39	$4.39
Annual PFC Collections	$3,883,093	$4,039,455	$4,202,113	$4,371,321	$4,460,069	$4,550,618	$4,643,006	$4,737,269	$4,833,447	$4,929,675	$5,027,819

Arizona Department of Transportation (ADOT) Grants

PMGAA management anticipates the use of ADOT grants as part of the Master Plan funding. ADOT grants are funds administered by the state for the purpose of assisting airports in funding various capital improvement projects. All projects funded with state grants must meet the FAA's eligibility criteria. For any project eligible for state funding, PMGAA receives 4.47 percent of the funding after the FAA grant. In addition, Project A2 Taxiway Whiskey reconstruction, and Project A7, Eastside Terminal Access Roads, are expected to receive 90 percent of project costs or design costs, respectively, from ADOT. It is assumed that approximately $7.0 million in state funding will be secured for the CIP projects.

Member Government Contributions

In each fiscal year, PMGAA receives a total contribution of $4.06 million from the Member Governments. The Member Government contributions, which can be used for operational expenses and capital expenses, are expected to continue at the same annual level throughout the planning period. PMGAA currently applies approximately $2.1 million per year for capital asset lifecycle replacement expenditures. PMGAA anticipates that it will continue to fund these expenditures throughout the planning period. It is assumed the annual expenditures will increase by the annual rate of inflation. The balance of the Member Government contributions will be used to fund capital expenditures that are not AIP- or PFC-eligible. The CIP Funding Plan assumes that approximately $1.9 million in annual capital project costs will be funded from the Member Government contributions.

Other

Other funds include third party funding for specific projects, and funding sources that are not yet identified.

Customer Facility Charge (CFC)

A rental car CFC is a user fee that will be imposed by PMGAA on each rental car user. CFCs are only permitted to be used for projects or expenses that benefit the rental car users or the rental car companies. PMGAA currently charges a CFC of $2.50 per vehicle rental day. The fee is collected from the rental car customers by the rental car companies and remitted to PMGAA. The current fee is used for operation and maintenance costs of the rental car facilities. CFCs will be used to fund Project C7, Eastside Consolidated Rental Car Center (ConRAC) – Design/Construct, which is in Phase III of the Master Plan. CFCs are not shown on **Table 7-2** because this source of funding will not be used during Phase I or Phase II. PMGAA will perform an analysis to determine the appropriate CFC level to generate enough revenue to complete the ConRAC project.

Airline Rates and Charges

PMGAA requires the airlines to pay rental and other fees for use of the Airport's premises. The airline pays a landing fee per 1,000 pounds of landed weight. PMGAA sets a landing fee each year, and as of September 1, 2019, the fee is $1.24 per 1,000 pounds. PMGAA has increased the landing fee by 3 percent per year; however, in an effort to maintain a competitive landing fee, PMGAA plans to increase the landing fee by 3 percent every other year. Non-signatory carriers are required to pay a 50 percent surcharge for use of the airfield. The non-signatory landing fee is currently $1.86. PMGAA's current Air Service Incentive Program waives certain fees for specified time periods of service start-up.

The airlines pay an aircraft terminal use fee for the use of the terminal facilities. Signatory carriers pay a per use fee of $50 per turn. The non-signatory carriers are required to pay a 50 percent surcharge for terminal use as well, and the current non-signatory terminal use fee is $75 per turn.

In addition, airlines are required to pay an aircraft parking fee that is charged to the carriers when an aircraft is in an aircraft parking position for longer than 3 hours. The fee is based on the size of the aircraft, and non-signatory carriers are charged a fee that includes a 50 percent surcharge.

Outstanding Long-Term Debt

In FY 2006, ADOT loaned PMGAA $3 million to finance the construction of a hangar and teaching facility at the Airport for Arizona State University's flight school. The loan has a 25-year term and a 4.77 percent interest rate. Arizona State is no longer using the hangar. PMGAA is satisfying the loan to ADOT by selling the building to ATP Flight School, and PMGAA will maintain the ground lease.

In February 2012, PMGAA issued approximately $19 million in Special Facility Revenue Bonds. PMGAA used the bond proceeds to develop and construct an aircraft maintenance repair and overhaul facility. PMGAA entered into an agreement with the City of Mesa that states the City of Mesa will pay rent to PMGAA in an amount equal to the principal and interest of the bonds plus the Trustee's expenses. The principal and interest in FY 2018 totaled approximately $1.3 million. The City of Mesa subleases the facility to Able Engineering and Component Services.

Operating Expenses

The major categories of Operating Expenses are Personnel Compensation & Benefits, Contractual Services, Costs of Goods Sold, Repair & Maintenance, Supplies & Materials, Communication & Utilities, Insurance and Other. The largest expense category is Personnel Compensation & Benefits, which represented 41.1 percent in 2019[1]. Contractual Services is the second largest expense category representing 21.3 percent, and Costs of Goods Sold is third largest expense category, representing 21.0 percent.

Operating expenses increased from $16.6 million in 2015 to $20.4 in 2019, or by an average of 5.3 percent per year as shown in ***Table 7-5: Operating Expenses***. The change in each category will be discussed below. Operating expenses are projected to increase from $23.1 million in the 2020 Budget to $28.8 million in 2030 or by an average of 2.2 percent per year as shown in ***Table 7-6: Projected Operating Expenses***.

Table 7-5: Historical Operating Expenses

Operating Expenses	Actual				Unaudited	CAGR
	2015	2016	2017	2018	2019	2015-2019
Personnel Compensation & Benefits	6,384,046	7,273,851	7,747,751	8,278,096	8,390,012	7.1%
Contractual Services	4,367,625	4,444,822	4,263,021	4,133,173	4,359,946	0.0%
Costs of Goods Sold	2,887,601	2,437,789	3,061,299	3,770,766	4,285,799	10.4%
Repair & Maintenance	766,767	959,140	770,648	727,035	677,743	-3.0%
Communications & Utilities	788,091	857,617	851,109	869,777	864,640	2.3%
Supplies & Materials	642,727	557,461	625,533	669,311	962,636	10.6%
Insurance	295,133	286,717	295,171	332,488	461,559	11.8%
Other	455,965	175,485	197,117	333,509	423,511	-1.8%
Total Operating Expenses before Depr	16,587,955	16,992,882	17,811,649	19,114,155	20,425,847	5.3%

[1] All references to years in the remainder of this chapter represent PMGAA Fiscal Years.

Table 7-6: Projected Operating Expenses

Operating Expenses	Budget	Projected									
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Personnel Compensation & Benefit	$ 9,095,588	$ 9,295,691	$ 9,500,196	$ 9,709,200	$ 9,922,803	$10,141,105	$10,364,209	$10,592,221	$10,825,250	$11,063,406	$11,306,801
Contractual Services	5,342,541	5,460,077	5,580,199	5,702,963	5,828,428	5,956,654	6,087,700	6,221,630	6,358,505	6,498,393	6,641,357
Costs of Goods Sold	4,270,869	4,364,828	4,460,855	4,558,993	4,659,291	4,761,796	4,866,555	4,973,619	5,083,039	5,194,866	5,309,153
Repair & Maintenance	1,387,910	1,418,444	1,449,650	1,481,542	1,514,136	1,547,447	1,581,491	1,616,284	1,651,842	1,688,182	1,725,322
Supplies & Materials	971,523	992,897	1,014,740	1,037,065	1,059,880	1,083,197	1,107,028	1,131,382	1,156,273	1,181,711	1,207,708
Communications & Utilities	934,784	955,349	976,367	997,847	1,019,800	1,042,235	1,065,164	1,088,598	1,112,547	1,137,023	1,162,038
Insurance	475,704	486,170	496,865	507,796	518,968	530,385	542,054	553,979	566,166	578,622	591,352
Other	659,800	674,315	689,150	704,312	719,807	735,642	751,826	768,367	785,271	802,547	820,203
Total Operating Expenses	$23,138,720	$23,647,771	$24,168,022	$24,699,719	$25,243,113	$25,798,461	$26,366,027	$26,946,080	$27,538,894	$28,144,749	$28,763,934

Personnel Compensation & Benefits

Personnel Compensation & Benefits is the largest category of operating expenses, which increased approximately $2.0 million over the historical period. During the historical period, increases were the result of PMGAA hiring additional full-time equivalents, annual merit increases, increased healthcare costs (including initiation of Health Savings Accounts), and increased Arizona State Retirement System rate. Personnel Compensation & Benefits are budgeted to continue to grow to $9.1 million in 2020 as the stated rates are expected to continue to increase. Salaries are projected to grow at the rate of inflation (2.2 percent) over the next 20 years.

Contractual Services

Contractual Services are the second largest category of operating expenses, for which expenses were relatively flat during the historical period. Contractual Services ranged from a low of $4.1 million in 2018 to a high of $4.4 million in 2016. Contractual Services are budgeted to increase to $5.3 million in 2020 because of the City of Mesa's annual increase in Fire and Police protection costs and PMGAA's plan to hire a security master plan consultant. Contractual Service expenses are projected to increase by an average of 2.2 percent per year to $6.6 million in 2030.

Costs of Goods Sold

Costs of Goods Sold (the costs associated with purchasing fuel), increased from $2.9 million in 2015 to $4.3 million in 2019. The increase was driven by increased fuel costs and PMGAA purchasing more fuel. Costs of Goods Sold are budgeted to remain relatively flat at $4.3 million in the 2020 Budget. This category is projected to increase at the 2.2 percent rate of inflation to $5.3 million in 2030.

Repair & Maintenance

Repair & Maintenance expenses fluctuated during the historical period. This category increased from approximately $767,000 in 2015 to $959,000 in 2016, mainly due to increased spending for parking equipment repairs, tire replacements, more electrical work, more lighting work and fire protection repairs. Repair & Maintenance expenses decreased to approximately $771,000 in 2017, $727,000 in 2018, and $678,000 in 2019. Most of the fluctuations in this category are a result of increases and decreases in paving repair and maintenance costs. Repair & Maintenance expenses are budgeted to increase to $1.4 million by 2020 and projected to increase by an average of 2.2 percent per year to $1.7 million in 2030.

Supplies & Materials

Supplies & Materials expenses increased by an average of 9.3 percent per year from approximately $643,000 in 2015 to $963,000 in 2019. The majority of the increase occurred in 2019. The increased

expenses in 2019 were a result of the installation of the Airport's common use system software and the associated support for the system. In addition, PMGAA purchased improved monitors and computers. Supplies & Materials are budgeted to increase to $971,000 in the 2020 Budget and projected to increase at the rate of inflation to $1.2 million in 2030.

Communications & Utilities

Communication & Utilities expenses increased by an average of 2.3 percent per year from $788,000 in 2015 to approximately $865,000 in 2019. This expense category is budgeted to continue to increase to approximately $935,000 in 2020. PMGAA needed to increase the band width for the public Wi-Fi system in the terminal, which has driven the increases. Communication & Utilities expenses are projected to increase by an average of 2.2 percent per year to $1.2 million in 2030. Recent energy efficiency improvements completed by PMGAA may be able to offset some increases.

Insurance

Insurance expenses increased from $295,000 in 2015 to approximately $462,000 in 2019. The majority of the increase occurred in 2019 as a result of workers compensation expenses being moved from fringe benefits to the insurance category. Insurance expenses are budgeted to increase to $476,000 in the 2020 Budget. The 2020 Budget includes a 20 percent increase in the workers' compensation premium and an 18 percent increase in the aviation general liability insurance, as well as added coverage for cyber insurance. Insurance expenses are projected to continue to increase to approximately $591,000 in 2030.

Other

The Other expenses category includes bad debt, dues, real estate lease, training, travel, and revenue sharing expenses. Other expenses fluctuated during the historical period, decreasing from $456,000 in 2015 to $175,000 in 2016. Other expenses then increased to $197,000 in 2017, $333,000 in 2018, and $423,000 in 2019. Other expenses are budgeted to increase to $660,000 in 2020 because of a real estate commission of $132,500 and a revenue sharing increase of approximately $119,000. Other expenses are projected to increase at the rate of inflation to approximately $820,000 in 2030.

Operating Revenues

PMGAA receives revenue from aircraft landing fees, aircraft parking fees, airline leased space in the terminal, fuel flowage fees, fuel sales, aeronautical services sold, concessions, non-aeronautical leased space, parking & ground transportation, rental car fees, and non-aeronautical services sold. The recent five-year historical trend for years 2015 to 2019 for the various revenue sources are discussed below, followed by the projections of revenues sources for 2020 and subsequent years.

Table 7-7: Historical Operating Revenues presents a summary of the historical revenues from 2015 to 2019. Total Operating revenues increased from $17.3 million in 2015 to $24.5 million in 2019 or by an average of 9.1 percent. ***Table 7-8: Projected Operating Revenues*** presents a summary of the projected revenues from 2020 to 2030. The revenues are projected to increase at an average annual growth rate of 3.4 percent during the forecast period.

Table 7-7: Historical Operating Revenues

Operating Revenues	Actual				Unaudited	CAGR
	2015	2016	2017	2018	2019	2015-2019
Aeronautical Operating Revenue						
Landing Fees	$ 797,138	$ 928,136	$ 1,029,695	$ 1,038,400	$ 1,248,257	11.9%
Aircraft Parking	221,264	227,370	306,137	314,196	250,633	3.2%
Aeronautical Lease Revenue	2,038,326	2,072,837	2,207,633	2,836,857	3,034,813	10.5%
Fuel Flowage Fees	562,284	587,726	605,837	669,927	695,513	5.5%
Fuel Sales	4,109,547	3,775,104	4,709,918	5,486,991	6,508,544	12.2%
Aeronautical Services Sold	3,408,871	4,173,055	4,097,234	4,826,243	4,719,334	8.5%
Subtotal - Aeronautical Revenue	$ 11,137,430	$ 11,764,228	$ 12,956,454	$ 15,172,614	$ 16,457,094	10.3%
Non-Aeronautical Operating Revenue						
Concessions	$ 544,449	$ 517,649	$ 593,461	$ 751,961	$ 885,214	12.9%
Non-Aeronautical Lease Revenue	1,101,360	986,472	1,215,066	1,247,131	1,212,893	2.4%
Parking & Ground Transportation	2,586,950	2,875,633	2,997,136	3,112,249	3,581,273	8.5%
Rental Car Fees	1,828,288	1,889,125	1,905,319	2,022,022	2,123,745	3.8%
Non-Aeronautical Services Sold	112,255	86,868	66,486	58,178	277,817	25.4%
Subtotal Non-Aeronautical Revenue	$ 6,173,302	$ 6,355,747	$ 6,777,468	$ 7,191,541	$ 8,080,942	7.0%
Total Operating Revenue	$ 17,310,732	$ 18,119,975	$ 19,733,922	$ 22,364,155	$ 24,538,036	9.1%

Table 7-8: Projected Operating Revenues

Operating Revenues	Budget	Projected									
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Aeronautical Operating Revenue											
Landing Fees	$ 1,415,316	$ 1,507,269	$ 1,558,442	$ 1,659,693	$ 1,691,444	$ 1,775,509	$ 1,810,824	$ 1,893,435	$ 1,922,262	$ 2,010,189	$ 2,041,028
Aircraft Parking	262,800	273,382	278,933	284,486	290,261	296,154	302,167	308,302	314,561	320,823	327,211
Aeronautical Lease Revenue	3,101,190	3,569,211	3,640,383	3,713,262	3,781,680	3,851,572	3,922,971	3,995,910	4,070,420	4,147,085	4,225,409
Fuel Flowage Fees	711,277	735,989	761,560	788,019	801,156	814,513	828,091	841,896	855,932	871,454	887,259
Fuel Sales	6,128,003	6,340,911	6,561,217	6,789,176	6,902,359	7,017,428	7,134,415	7,253,353	7,374,274	7,508,010	7,644,171
Aeronautical Services Sold	4,840,195	4,946,679	5,055,506	5,166,727	5,280,395	5,396,564	5,515,288	5,636,625	5,760,630	5,887,364	6,016,886
Subtotal - Aeronautical Revenue	$16,458,781	$17,373,442	$17,856,040	$18,401,364	$18,747,296	$19,151,740	$19,513,757	$19,929,520	$20,298,079	$20,744,926	$21,141,964
Non-Aeronautical Operating Revenue											
Concessions	$ 794,263	$ 844,423	$ 897,751	$ 954,447	$ 995,249	$ 1,037,795	$ 1,082,159	$ 1,128,420	$ 1,176,659	$ 1,226,487	$ 1,278,425
Non-Aeronautical Lease Revenue	1,080,318	1,104,085	1,128,375	1,153,199	1,178,569	1,204,498	1,230,997	1,258,079	1,285,757	1,314,043	1,342,952
Parking & Ground Transportation	3,735,800	3,886,231	4,042,719	4,205,509	4,290,890	4,378,005	4,466,888	4,557,576	4,650,105	4,742,683	4,837,104
Rental Car Fees	1,911,894	2,032,636	2,161,004	2,297,479	2,395,693	2,498,106	2,604,898	2,716,254	2,832,371	2,952,313	3,077,334
Non-Aeronautical Services Sold	159,440	162,948	166,533	170,196	173,941	177,767	181,678	185,675	189,760	193,935	198,201
Future Lease Revenues	-	-	470,448	479,857	489,454	499,243	1,568,160	1,599,523	1,631,514	1,664,144	1,697,427
Subtotal Non-Aeronautical Revenu	$ 7,681,715	$ 8,030,323	$ 8,866,830	$ 9,260,688	$ 9,523,797	$ 9,795,415	$11,134,780	$11,445,528	$11,766,165	$12,093,604	$12,431,443
Total Operating Revenue	$24,140,496	$25,403,765	$26,722,870	$27,662,052	$28,271,092	$28,947,155	$30,648,537	$31,375,048	$32,064,244	$32,838,530	$33,573,406

Aeronautical Revenues

Aeronautical Revenues include Aircraft Landing Fees, Aircraft Parking Fees, Aeronautical Lease Revenue, Fuel Flowage Fees, Fuel Sales, and Aeronautical Services Sold. Aeronautical revenues increased by an average of 10.3 percent per year from $11.1 million in 2015 to $16.4 million in 2019 and are budgeted to increase to $16.4 million in the 2020 Budget. Aeronautical revenues are projected to increase by an average of 2.5 percent per year to $21.1 million in 2030.

Landing Fees

Landing Fees increased by an average of 11.9 percent from $797,000 in 2015 to $1.2 million in 2019. The increase in landing fees is a result of increased activity at the Airport and an increase in the landing fee to $1.24 on April 1, 2019. This was the first increase in the landing fee since July 1, 2015. Landing fees are projected to increase from $1.4 million in 2020 to $2.0 million in 2030. The increase is driven by increased airline activity and an increased landing fee, which is expected to be increased by 3 percent every other year of the forecast period.

Aircraft Parking Fees

Aircraft parking fees fluctuated during the historical period. Aircraft parking fees increased from approximately $221,000 in 2015 to $227,000 in 2016, $306,000 in 2017, and $314,000 in 2018. Aircraft parking fees then decreased to approximately $251,000 in 2019 because of the demolition of a hangar. These fluctuations also occurred because of declining regional jet parking. Aircraft parking fees are budgeted to increase to $263,000 in 2020 and are projected to grow at the same rate as aircraft landings to $327,000 in 2030.

Aeronautical Lease Revenue

Aeronautical lease revenue includes terminal space used by the airlines, hangar space, office space and other facilities used by the airlines. This category increased by an average of 10.5 percent per year from $2.0 million in 2015 to $3.0 million in 2019. The majority of the increase occurred in 2018, when a tenant paid PMGAA $370,000 to extend its ground lease for an additional 10 years. This category is budgeted to increase to $3.1 million. Aeronautical lease revenue is projected to increase to $4.2 million in 2030.

Fuel Flowage Fees

Fuel flowage fees increased from $562,000 in 2015 to approximately $696,000 in 2019. Fuel flowage fees are budgeted to increase to $711,000 in the 2020 Budget and are projected to increase at the rate of aircraft landings to approximately $887,000 million in 2030.

Fuel Sales

Fuel sales increased from $4.1 million in 2015 to $6.5 million in 2019 or by an average of 12.2 percent per year. Fuel sales are budgeted to decrease to $6.1 million in the 2020 Budget. After 2020, fuel sales are projected to increase at the same rate as aircraft landings plus inflation to $7.6 million in 2030.

Aeronautical Services Sold

Aeronautical services sold are revenues from badging, cargo services, common use technology services, fire suppression fees, fuel storage fees, ground services equipment rental fees, ramp services, US Customs fees, and other miscellaneous services. This category increased by an average of 8.1 percent per year from $3.4 million in 2015 to $4.7 million in 2019. Aeronautical services sold increased to $4.8 million in the 2020 Budget and are projected to increase at the rate of inflation to $6.0 million in 2030.

Non-Aeronautical Revenues

Non-Aeronautical Revenues include Concessions, Non-Aeronautical Leased Space, Parking & Ground Transportation, Rental Car Fees, and Non-Aeronautical Services Sold. Non-Aeronautical revenues increased by an average of 7.0 percent per year from $6.2 million in 2015 to $8.1 million in 2019. Non-Aeronautical revenues are budgeted to decrease to $7.7 million in the 2020 Budget, but projected to increase to $12.4 million in 2030 or by an average of 5.0 percent per year.

Concessions

The Airport has food and beverage options that include Paradise Bakery & Café and Copper Plate - An American Grill. The Paradise Bakery & Café has a location between gates 6 and 7 and a kiosk in the baggage claim. This café offers baked goods, sandwiches, salads, coffee and other beverages that are prepared in customer view. The Copper Plate offers a casual dining experience and serves hamburgers, hot dogs, salads and desserts. The Copper Plate also offers a variety of beverages, beer, and wine. The Airport also has retail options to serve its passengers. Arizona Highways sells magazines, souvenirs, beverages, and snacks and is located at gates 3 and 4 with a kiosk at gates 9 and 10. The Phoenix sells local and national brand gifts that reflect the local area and attractions. Concessions revenues increased by an average of 12.9 percent from $544,000 in 2015 to approximately $886,000 in 2019, with significant increases occurring in 2017 and 2018 because of increased passengers. A new 2019 concessionaire contract will introduce new brands and expanded concession options as revenues are projected to increase at the same rate as enplanements plus inflation, to $1.3 million in 2030.

Non-Aeronautical Leased Space Revenues

Non-Aeronautical leased space revenues include land leases, space leased by rental car companies in the terminal, office space leased by non-aeronautical companies, and any other non-aeronautical leases. This revenue category increased by an average of 2.4 percent per year from $1.1 million in 2015 to $1.2 million in 2019. Non-Aeronautical leased space revenues are budgeted to be $1.1 million in the 2020 Budget and are projected to increase at the rate of inflation to $1.3 million in 2030. This projection does not include the projected lease revenue that is anticipated to be earmarked as a capital funding source for Phases III and IV of the CIP, as explained earlier in this chapter.

Parking & Ground Transportation

The Airport has several parking options for its passengers. The Hourly Parking Lot charges $1 per 30 minutes with a daily maximum charge of $18. The Daily Parking Lot also charges $1 per 30 minutes but has a maximum daily rate of $11. In addition, there are two economy parking lots, both of which charge $1 for the first 30 minutes. The uncovered economy lot has a maximum daily charge of $7, while the covered economy lot has a maximum daily rate of $11. Although Transportation Network Companies (TNCs) operate at the Airport (Lyft and Uber), PMGAA has not seen a decrease in parking revenue as a result of the TNC operations. PMGAA charges the TNCs a pick-up and drop-off fee of $2.00. In total, Parking & Ground Transportation revenues increased from $2.6 million in 2015 to $3.6 million in 2019 or by an average of 8.6 per year. Parking & Ground Transportation revenues are projected to increase at the rate of enplanements to $4.8 million in 2030.

Rental Car Revenues

Alamo National, Avis Rent A Car, Enterprise Rent-A-Car, and Hertz currently operate at the Airport. Rental Car revenues increased by an average of 3.8 percent per year from $1.8 million in 2015 to 2.1 million in 2019. Rental Car revenues are budgeted to be $1.9 million in the 2020 Budget and are projected to increase at the rate of enplanements plus inflation to $3.1 million in 2030.

Non-Aeronautical Services Sold

Non-Aeronautical Services Sold is revenue from internet fees, refuse fees, telephone fees, and miscellaneous services. This category increased from $112,000 in 2015 to approximately $278,000 in 2019. This category is projected to increase by 2.2 per year to $198,000 in 2030.

Future Lease Revenue

PMGAA plans to use lease revenue that it earns from tenants who use available land on the Airport's property (once it is developed) to fund a portion of the CIP costs. On the East Side of the Airport, there are approximately 700 acres of land. It is assumed that 200 of that acreage will be used for the future

terminal project and parking. The remaining 500 acres of land is available to be used and leased to future tenants. It is assumed that it will take several years for this land to be developed, and therefore, PMGAA is not anticipating receiving any revenue from this land until FY 2031. In FY 2031 it is assumed that 25 percent of the available acreage will be leased, and that leased percentage will increase by 10 percent per year until it reaches a peak of 65 percent in FY 2035. It is assumed the percentage of leased space will remain at 65 percent for the remainder of the forecast period. The space will be charged per square foot equal to $0.55 escalated by 2 percent per year. In FY 2035, the first year with 65 percent of the space leased, it is estimated to generate approximately $10.5 million.

In addition, PMGAA has recently entered into an agreement with SkyBridge Arizona, an entity that is leasing 360 acres of Airport land. SkyBridge Arizona plans to develop the land for Mexican customs inspectors to pre-clear items shipped to Mexico. The inspectors will be based at the Airport and approve shipments for immediate delivery to Mexico. This will be the first American airport to pre-clear items being shipped to Mexico. PMGAA is leasing the space to SkyBridge Arizona at a discounted rate. For the first 3 years of the lease, PMGAA has agreed to not charge SkyBridge Arizona any rent for the land. Beginning in the fourth year of the lease, PMGAA will begin collecting $0.03 per square foot plus escalation, which will generate approximately $470,000 in FY 2022 as shown in ***Table 7-9: Projected Lease Revenue***. Beginning in FY 2026, SkyBridge will begin to pay an increased rent per square foot of $0.10 plus 2 percent escalation every year thereafter, and PMGAA is estimated to receive about $1.6 million per year plus escalation throughout the forecast period.

PMGAA plans to use these revenues to fund a portion of the cost of projects that are not eligible for funding from AIP grants, PFCs, or ADOT grants. Due to the long lead time anticipated for significant lease revenue to be generated, this funding source is not expected to be applied to any CIP project costs before Phase III, and it is therefore not shown on **Table 7-2**.

Operating Fund

After PMGAA satisfies all of its financial obligations for operations, the remaining funds flow to the Operating Fund. PMGAA's operating revenue pays for operating expenses. ***Table 7-10: Projected Operating Fund Cash Flow*** shows the projected available funds for the CIP projects, including the beginning unrestricted balance of $22.5 million in the Operating Fund as of June 30, 2018. Based on the projections of operating revenues and operating expenses, as projected later in this chapter, it is projected that PMGAA will generate sufficient cash flow to fund CIP project costs that are not AIP or PFC eligible.

Table 7-9: Projected Lease Revenue

Calculation of Revenue	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
SkyBridge Acreage	360	360	360	360	360	360	360	360	360	360	360
SkyBridge Space Rented [1]	15,681,600	15,681,600	15,681,600	15,681,600	15,681,600	15,681,600	15,681,600	15,681,600	15,681,600	15,681,600	15,681,600
Rate per Square Foot [2]	$ -	$ -	$0.03	$0.03	$0.03	$0.03	$0.10	$0.10	$0.10	$0.11	$0.11
Rental Revenue	$ -	$ -	$470,448	$479,857	$489,454	$499,243	$1,568,160	$1,599,523	$1,631,514	$1,664,144	$1,697,427

Notes: [1] Assumes 43,560 square feet per acre.
[2] Rate per square foot is escalated at 2 percent per year except in FY 2022 and FY 2026. FY 2022 and FY 2026 rate are provided in the SkyBridge lease.

Table 7-10: Projected Operating Fund Cash Flow

Calculation of Cash Flow	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Beginning Balance	$22,496,683	$23,498,460	$25,254,454	$27,809,302	$30,771,634	$33,799,614	$36,948,307	$41,230,817	$45,659,785	$50,185,135	$54,878,916
Operating Revenue	24,140,496	25,403,765	26,722,870	27,662,052	28,271,092	28,947,155	30,648,537	31,375,048	32,064,244	32,838,530	33,573,406
O&M Expenses	23,138,720	23,647,771	24,168,022	24,699,719	25,243,113	25,798,461	26,366,027	26,946,080	27,538,894	28,144,749	28,763,934
Net Operating Income	$ 1,001,777	$ 1,755,994	$ 2,554,848	$ 2,962,333	$ 3,027,980	$ 3,148,693	$ 4,282,510	$ 4,428,968	$ 4,525,350	$ 4,693,781	$ 4,809,473
Less: Capital Expenditures	-	-	-	-	-	-	-	-	-	-	-
General Fund Deposit/Withdrawal	$ 1,001,777	$ 1,755,994	$ 2,554,848	$ 2,962,333	$ 3,027,980	$ 3,148,693	$ 4,282,510	$ 4,428,968	$ 4,525,350	$ 4,693,781	$ 4,809,473
Ending Balance	$23,498,460	$25,254,454	$27,809,302	$30,771,634	$33,799,614	$36,948,307	$41,230,817	$45,659,785	$50,185,135	$54,878,916	$59,688,388

Table 7-11: Projected Cost per Enplaned Passenger

Cost per Enplaned Passenger	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Landing Fees	1,415,316	1,507,269	1,558,442	1,659,693	1,691,444	1,775,509	1,810,824	1,893,435	1,922,262	2,010,189	2,041,028
Terminal Revenues	872,572	883,352	894,506	906,047	911,777	917,603	923,526	929,548	935,670	942,441	949,335
Total Revenue	2,287,889	2,390,620	2,452,948	2,565,740	2,603,221	2,693,112	2,734,350	2,822,983	2,857,932	2,952,630	2,990,363
Enplanements	884,531	920,149	957,201	995,745	1,015,961	1,036,587	1,057,632	1,079,105	1,101,013	1,122,933	1,145,289
CPE	$ 2.59	$ 2.60	$ 2.56	$ 2.58	$ 2.56	$ 2.60	$ 2.59	$ 2.62	$ 2.60	$ 2.63	$ 2.61

Projected Airline Cost per Enplaned Passenger

Airline cost per enplaned passenger (CPE) is an important metric that airports and airlines use to assess the cost of operating at a particular airport. As ***Table 7-11: Projected Cost per Enplaned Passenger*** shows, to calculate the CPE one divides the passenger airline revenues (passenger landing fee revenues and terminal rental revenue) by the total enplanements. The CPE is projected to increase from $2.59 in 2020 to $2.61 in 2030, based on the calculations presented in this chapter. However, other factors could cause the CPE to adjust over the projection period.

Summary

The following points highlight the findings of the financial analysis contained in this section:

- ✓ The proposed CIP includes four phases of projects.
  - o This financial analysis includes the first two phases (Phase I and Phase II). Phase I includes $134.7 million in project costs and Phase II includes $55.5 million in project costs.
  - o Due to the complex nature of changing circumstances for CIP funding sources in the long term, estimates of the funding of capital costs beyond FY 2030 (Phase III and Phase IV) are considered speculative at this point, and therefore are not presented in this chapter.
- ✓ The funding plan is designed to maximize the receipt of FAA funding for eligible projects. Phases I and II of the CIP will be funded with AIP Grants, PFCs, ADOT grants, contributions from the member cities, monies from the Operating Fund and Other funds. The funding plan does not assume PMGAA will be issuing any debt to fund any project costs.
- ✓ Operating Expenses are projected to grow by 2.2 percent per year to $28.8 million in FY 2030. Operating Revenues are projected to grow by an average of 3.4 percent per year to $33.6 million in FY 2030.
- ✓ The CPE is projected to remain very low, growing only slightly during the projection period.

APPENDIX A
GLOSSARY OF TERMS

This glossary includes industry standard terms, definitions, and acronyms and is intended to serve as a reference for this master plan.

A

AAC	*Aircraft Approach Category: An FAA classification based on how fast an aircraft approaches the runway on landing. Used to determine airfield design characteristics.*
AC	*Advisory Circular: FAA standards and guidelines on a variety of airport characteristics. Also Asphalt Concrete (in Pavement Condition Index): A composite material commonly used to surface roads, parking lots, and airports. It consists of mineral aggregate bound together with asphalt, laid in layers, and compacted.*
ACIP	*Airport Capital Improvement Plan: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.*
ACRP	*Airport Cooperative Research Program: An industry-driven, applied research program that develops near-term, practical solutions to problems faced by airport operators. ACRP is managed by the Transportation Research Board of the National Academies and sponsored by the Federal Aviation Administration. The research is conducted by contractors who are selected on the basis of competitive proposals. (Transportation Research Board, 2014).*
ADG	*Aircraft Design Group: An FAA classification based on the wingspan and tail height of aircraft used to determine airfield design characteristics:* *Group I: Up to but not including 49 feet.* *Group II: 49 feet up to but not including 79 feet.* *Group III: 79 feet up to but not including 118 feet.* *Group IV: 118 feet up to but not including 171 feet.* *Group V: 171 feet up to but not including 214 feet.* *Group VI: 214 feet or greater.*

ADO	*FAA Airports District Office: The local ADO is located in Phoenix, Arizona. Staff in the ADO oversee airport planning, permitting, and design projects, manage capital improvement programs, and allocate federal funding.*
AFFF	*Aqueous Film Forming Foam: A highly efficient type of fire suppressant agent, used to attack flammable liquid pool fires.*
AFSS	*Automated Flight Service Station.*
AGL	*Above Ground Level: The elevation of a point or surface above the ground.*
AIP	*Airport Improvement Program: The FAA AIP provides grants to public agencies — and, in some cases, to private owners and entities -- for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). Airports receive regular funding each year called "entitlement" and may compete against other airports nationwide for additional "discretionary" funding. (Federal Aviation Administration, 2014)*
Air Carrier	*An operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.*
Aircraft	*The terms aircraft and airplane are synonymous, referring to all types of fixed-wing airplanes, including gliders. A fixed-wing aircraft is heavier than air, and is supported in flight by the dynamic reaction of the air against its wings*
Aircraft Approach Category	*A grouping of aircraft based on 1.3 times the stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:* *Category A: Speed less than 91 knots.* *Category B: Speed 91 knots or more, but less than 121 knots.* *Category C: Speed 121 knots or more, but less than 141 knots.* *Category D: Speed 141 knots or more, but less than 166 knots.* *Category E: Speed greater than 166 knots.*
Aircraft Operation	*The landing, takeoff, or touch-and go procedure by an aircraft on a runway at an airport.*
Aircraft Owners and Pilots Association (AOPA)	*A private organization serving the interests and needs of general aviation pilots and aircraft owners.*

Airfield	*The portion of an airport which contains the facilities necessary for the operation of aircraft.*
Airline Hub	*An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.*
Airport Authority	*A quasi-governmental public organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.*
Airport Beacon	*A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.*
Airport Capital Improvement Plan	*The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.*
Airport Elevation	*The highest point on an airport's usable runways expressed in feet above mean sea level (MSL).*
Airport Master Plan	*The planner's concept of the long-term development of an airport.*
Airport Movement Area Safety System	*A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.*
Airport Obstruction Chart	*A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.*
Airport Sponsor	*The entity that is legally responsible for the management and operation of an airport, including the fulfillment of the requirements of laws and regulations related thereto.*
Airport Surface Detection Equipment	*A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport.*
Airport Surveillance Radar (ASR)	*The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.*
Airside	*A collective term for those areas of the Airport that are accessible to aircraft including runways, taxiways, aprons, and hangar areas.*

Airspace	*The volume of space above the surface of the ground that is provided for the operation of aircraft.*
Air Taxi	*An air carrier certificated in accordance with FAR Part 121 and FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally, operates small aircraft "for hire" for specific trips.*
Air Traffic Control	*A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of air traffic.*
Air Traffic Control System Command Center	*A facility operated by the FAA, which is responsible for the central flow control, the central altitude reservation system, the airport reservation position system, and the air traffic service contingency command for the air traffic control system.*
Air Traffic Hub	*A categorization of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.*
Air Transport Association of America	*An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.* *ALERT AREA: Also see Special-Use Airspace.*
ALD	*Airport Layout Drawing: The drawing of the airport showing the layout of existing and proposed airport facilities.*
ALP	*Airport Layout Plan: A scaled graphic representation of existing and proposed airport facilities, indicating their location on the airport and pertinent clearance and dimensional information required to show conformance with applicable standards.*
Airport Layout Plan Drawing Set	*A set of technical drawings depicting the current and future airport conditions. The individual sheets comprising the set can vary with the complexities of the airport, but the FAA-required drawings include the Airport Layout Plan (sometimes referred to as the Airport Layout Drawing (ALD), the Airport Airspace Drawing, and the Inner Portion of the Approach Surface Drawing, On-Airport Land Use Drawing, and Property Map.*

ALS	*Approach Lighting System: A series of lights before the runway end that guide aircraft landing in the dark and during periods of low visibility.*
ALSA	*Adjacent Lands Study Area: A general land use study of property adjacent to another parcel that may inventory variable features (acreage, values, zoning, etc.).*
ALSF-1	*Standard 2,400-foot high intensity approach lighting system with sequenced flashers. Also see Category-I (CAT I) configuration.*
ALSF-2	*Standard 2,400-foot high intensity approach lighting system with sequenced flashers. Also see Category-II (CAT II) configuration.*
Altitude	*The vertical distance measured in feet above mean sea level.*
AOA	*Aircraft Operations Area: A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.*
AOA	*Airport Overflight Area: Land use regulations within the AOAs are established to minimize the potential of aircraft accidents or incidents and risk to the public. Interference within this area with aircraft operations or movement or creation of a wildlife hazard is prohibited. No uses within the district may interfere, obstruct, or impair navigable airspace or signals, radio communications, or visibility in the vicinity of the Airport.*
Approach Minimums	*The altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.*
Approach Surface	*An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.*
Apron	*A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.*
APV	*Instrument approach procedure with vertical guidance.*

ARC	*Airport Reference Code: A combination of the AAC and ADG. These two elements combined set the design standards, setbacks, and dimensions of safety critical airport facilities, such as pavement to pavement separation, pavement width, safety areas, object free areas, and runway protection zones.*
Area Navigation	*The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.*
ARFF	*Aircraft Rescue Fire and Fighting: A special category of firefighting that involves the response, hazard mitigation, evacuation and possible rescue of passengers and crew of an aircraft involved in (typically) an airport ground emergency.*
ARP	*Airport Reference Point: The latitude and longitude of the approximate center of the airport.*
ARTCC	*Air Route Traffic Control Center: In air traffic control an air route control center, also known as a center, is a facility responsible for controlling aircraft en route in a particular volume of airspace at high altitudes between airport approaches and departures.*
ASDA	*Accelerate-Stop Distance Available: The runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff. Also see Declared Distances.*
ASDE	*Airport Surface Detection Equipment: A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport. Also see Declared Distances.*
ASOS	*Automated Surface Observation System: A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.*
ASV	*Annual Service Volume: The ASV is a reasonable estimate of an airport's annual capacity that accounts for differences in runway use, aircraft mix, weather conditions, and other variables encountered over a year's time.*
ATA	*Air Transport Association of America: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.*

ATCT	*Airport Traffic Control Tower: A manned observation tower in charge of managing ground traffic and air traffic in an airport's airspace. The ATCT staff help maintain safe separation between aircraft in the air, and aircraft and vehicles on the ground.*
ATIS	*Automated Terminal Information Service: The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.*
AVGAS	*Aviation Gasoline (also referred to at 100 low lead, LL): Leaded gasoline used in piston powered aircraft.*
Avigation Easement	*A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.*
AWOS	*Automated Weather Observation System: The AWOS provides general reports that include temperature, dew point, sky condition, visibility, cloud heights, current weather, precipitation accumulations, icing conditions and sea level pressure.*
Azimuth	*Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).*

B

Base Leg	*A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. Also see Traffic Pattern.*
Based Aircraft	*Aircraft that hangar or tie-down at an airport. These aircraft indicate that they are based at an airport on their registration form, and the owners typically live or work in the area.*
Bearing	*The horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.*
Blast Fence	*A barrier used to divert or dissipate jet blast or propeller wash.*
Blast Pad	*A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.*

BRL	*Building Restriction Line: Identifies areas on an airport where structures can be located to be compatible with airfield operations. Buildings should not conflict with the recommended airport design standards defined for a particular runway-taxiway system or the protected airspace associated with the runway. The location of the BRL is measured from the runway centerline outward in a perpendicular direction.*
BTS	*Bureau of Transportation Statistics: The statistical arm of the U.S. Department of Transportation. The BTS mission is to create, manage, and share transportation statistical knowledge with public and private transportation communities and the Nation. (U.S. Department of Transportation, 2014).*

C

CAGR	*Compound Annual Growth Rates: The average, annual rate of growth (or loss) over a period of multiple years.*
Cargo Service Airport	*An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.*
Catchment Area	*The geographic boundary from which an airport draws its users, and airport activity is primarily influenced by the movement of people and products to and from the catchment area. Catchment areas are defined by the types of services offered at an airport, proximity of competitor airports, and the tendency of the local population to use the airport.*
Category-1 (CAT-I)	*An instrument approach or approach and landing with a Height Above Threshold (HATh) or minimum descent altitude not lower than 200 ft (60 m) and with either a visibility not less than ½ statute mile (800m), or a runway visual range not less than 1800 ft (550m).*
Category-2 (CAT-II)	*An instrument approach or approach and landing with a Height Above Threshold (HATh) lower than 200 ft (60 m) but not lower than 100 ft (30 m) and a runway visual range not less than 1200 ft (350m).*
Category-3 (CAT-III)	*An instrument approach or approach and landing with a Height Above Threshold (HATh) lower than 100 ft (30m), or no HATh, or a runway visual range less than 1200 ft (350m).*
Ceiling	*The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.*

CFC	*Customer Facility Charge (CFC) is a user fee imposed by an airport operator on each rental car user, collected by rental car companies. CFC is regulated at the state level instead of the federal level. Therefore, the authorization, collection, and project eligibility vary from state to state.*
CFR	*Code of Federal Regulations: The CFR annual edition is the codification of the general and permanent rules published in the Federal Register by the departments and agencies of the Federal Government. (U.S. Government Printing Office, 2014).*
CIP	*Capital Improvement Plan: An airport's list of planned capital expenditures over the next five years, on file with the state and the FAA. The CIP is used by federal and state agencies to plan and allocate funding and use by airport sponsors to plan the local share of capital expenditures.*
Circling Approach	*A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or is not desirable.*
Class A Airspace	*See Controlled Airspace.*
Class B Airspace	*See Controlled Airspace.*
Class C Airspace	*See Controlled Airspace.*
Class D Airspace	*See Controlled Airspace.*
Class E Airspace	*See Controlled Airspace.*
Class G Airspace	*See Controlled Airspace.*
Clearway	*A defined rectangular area beyond the end of a runway cleared or suitable for use in lieu of runway to satisfy takeoff distance requirements. See Takeoff Distance Available (TODA).*
Clear Zone	*See Runway Protection Zone (RPZ).*
Commercial Service Airport	*A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.*
Compass Rose	*Marking painted on the airfield so aircraft may calibrate the magnetic compass within the cockpit.*

Conical Surface	*An imaginary obstruction-limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.*
Controlled Airport	*An airport that has an operating airport traffic control tower.*
Controlled Airspace	*Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:* *CLASS A: Generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.* *CLASS B: Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.* *CLASS C: Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.* *CLASS D: Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedure. Unless otherwise authorized, all persons must establish two-way radio communication.* *CLASS E: Generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.* *CLASS G: Generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.*

Controlled Firing Area	*See Special-Use Airspace.*
Critical Aircraft	*The most demanding aircraft or grouping of aircraft with similar characteristics that make regular use of the airport. Facility design standards and dimensions are set to accommodate the critical aircraft. For projects requiring FAA-funding, the critical aircraft must have regular use operations over 500 operations per year excluding touch and go operations.*
Crosswind	*A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.*
Crosswind Component	*The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.*
Crosswind Leg	*A flight path at right angles to the landing runway off its upwind end. Also see Traffic Pattern.*
CTAF	*Common Traffic Advisory Frequency: A radio frequency used by pilots to communicate with each other at non-towered airports, or when the tower is closed at night. The CTAF may also be used to coordinate arrivals and departures and control airfield lighting systems.*

D

Decision Height	*The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.*
Declared Distances	*The distances the airport owner declares available for a turbine powered aircraft's takeoff run, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:* *TAKEOFF RUNWAY AVAILABLE (TORA): The runway length declared available and suitable for the ground run of an airplane taking off.* *TAKEOFF DISTANCE AVAILABLE (TODA): The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.* *ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.* *LANDING DISTANCE AVAILABLE (LDA): The runway length declared available and suitable for landing.*

Department of Transportation	*The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration (FAA), which was established to promote the coordination of federal transportation programs and to act as a focal point for research and development efforts in transportation.*
Deplanement	*This term is used to reference passengers disembarking from an aircraft.*
Discretionary Funds	*Federal grant funds that may be appropriated to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety, and security, or mitigating noise.*
Displaced Threshold	*A threshold that is located at a point on the runway beyond the beginning of the runway surface.*
DME	*Distance Measuring Equipment: A transponder-based radio navigation technology that measures slant range distance by timing the propagation delay of Very-High Frequencies (VHF) or Ultra-High Frequencies (UHF) radio signals.*
DNL	*Day/Night Average Sound Level: The standard metric used to measure noise from aircraft is the Day-Night Noise Level, which measures the cumulative noise levels of all aircraft operations. DNL includes penalties for night operations (10pm-7am), when ambient noise levels tend to be lower and aircraft noise may be viewed as more disruptive.*
Downwind Leg	*A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see Traffic Pattern.*
DTWL	*Dual-Tandem Wheel Landing Gear: Runway weight bearing capacity of aircraft with dual-tandem type landing gear.*
DWL	*Dual-Wheel Landing Gear: Runway weight bearing capacity of aircraft with dual-wheel type landing gear.*

E

EA	*Environmental Assessment: A concise document that takes a thorough look at expected environmental effects of a proposed action. Projects that receive federal funding are subject to the National Environmental Policy Act and other applicable regulations. Should significant environmental impact be expected as part of a purposed action, then an environmental impact statement may be warranted. (Federal Aviation Administration, 2006).*

Easement	*The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on, or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.*
EIS	*Environmental Impact Statement: If the EA indicates the proposed action's impacts would meet or exceed a significance threshold(s) for the affected resource(s), or that mitigation would not reduce the significant impact(s) below the applicable threshold(s), FAA must prepare an EIS. An EIS provides additional, detailed evaluations of the proposed action and its alternatives, including the No Action alternative. (Federal Aviation Administration, 2006).*
Elevation	*The vertical distance measured in feet above mean sea level.*
Enplaned Passengers	*The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and nonscheduled services.*
Enplanement	*The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.*
Entitlement	*Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.*
Entrance Taxiway	*A taxiway designed to be used by an aircraft entering a runway. Entrance taxiways may also be used to exit a runway.*
Environmental Audit	*An assessment of the current status of a party's compliance with applicable environmental requirements of a party's environmental compliance policies, practices, and controls.*
EPA	*Environmental Protection Agency: The purpose of the EPA is to ensure that Americans are protected from significant risks to health and the environment; that national efforts to reduce environmental risk are based on the best available scientific information; and that federal laws protecting health and the environment are enforced; that environmental protection is an integral consideration in U.S. policies concerning natural resources, human health, economic growth, energy, transportation, agriculture, industry, and international trade, and these factors are similarly considered in establishing environmental policy. (U.S. Environmental Protection Agency, 2014).*

ESA	*Endangered Species Act: The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the U.S. Fish and Wildlife Service and the Commerce Department's National Marine Fisheries Service. Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments. (U.S. Fish and Wildlife Service, 2013).*
Essential Air Service	*A federal program which guarantees air carrier service to selected small cities by providing subsidies as needed to prevent these cities from such service.*
ETMSC	*Enhanced Traffic Management System Counts: Provides information on traffic counts by airport or by city pair for various data groupings such as aircraft type or by hour of the day. Data are created when pilots file flight plans and/or when flights are detected by the National Airspace System.*
Exit Taxiway	*A taxiway designed to be used by an aircraft only to exit a runway: Acute-Angled Exit Taxiway – A taxiway forming an angle less than 90 degrees from the runway centerline; High Speed Exit Taxiway – An acute-angled exit taxiway forming a 30-degree angle with the runway centerline, designed to allow an aircraft to exit a runway without having to decelerate to typical taxi speed.*

F

FAA	*Federal Aviation Administration: The FAA's continuing mission is to provide the safest, most efficient aerospace system in the world. (Federal Aviation Administration, 2010). They are the regulatory authority on airports, airspace, aircraft, and pilots in the U.S. FAA policy is created in Washington D.C. and administered by local, regional, and district offices.*
FAR	*Federal Aviation Regulations: The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.*
FAR Part 77	*Federal Aviation Regulation Part 77: Establishes standards and notification requirements for objects affecting navigable airspace.*

FBO	*Fixed Base Operator: Airport businesses that provide a variety of general aviation services including aircraft parking, fuel, maintenance, charter and aircraft rental, pilot lounge, flight instruction and sales.*
Federal Inspection Services	*The provision of customs and immigration services including passport inspection, inspection of baggage, the collection of duties on certain imported items, and the inspections for agricultural products, illegal drugs, or other restricted items.*
FEMA	*Federal Emergency Management Agency: FEMA coordinates the federal government's role in preparing for, preventing, mitigating the effects of, responding to, and recovering from all domestic disasters, whether natural or man-made, including acts of terror. (Federal Emergency Management Agency, 2014).*
Final Approach	*A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. Also see Traffic Pattern.*
Final Approach Fix	*The designated point at which the final approach segment for an aircraft landing on a runway begins for a non-precision approach.*
Flight Level	*A designation for altitude within controlled airspace.*
Flight Service Station	*An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground-based communication facilities.*
FONSI	*Finding of No Significant Impact: A federal agency's record of decision on an environmental assessment declaring that the proposed action poses no significant impact on natural and human resources included in the National Environmental Policy Act.*
FPO	*FAA Flight Procedures Office: The FPO is responsible for establishing instrument procedure (departure, en route, arrival, approach) design and obstacle clearance standards, criteria, and policy for the existing National Airspace System flight procedure structure and to accommodate emerging technologies and flight operation capabilities. The FPO develops and establishes criteria for terminal instrument procedures for issuance in the current edition of United States Standard for Terminal Instrument Procedures and related 8260-series orders. (Federal Aviation Administration, 2014).*

Frangible	*Retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.*
Frangible NAVAID	*A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.*
FSDO	*FAA Flight Standards District Office: A regulatory agency in charge of low-flying aircraft, accident reporting, air carrier certification and operations, aircraft maintenance, aircraft operational issues, aircraft permits, airmen certification (licensing) for pilots, mechanics, repairmen, dispatchers, and parachute riggers, certification and modification issues, enforcement of airmen & aircraft regulations. (Federal Aviation Administration, 2013).*
FTO	*Foreign Trade Zone: Designated areas intended to promote international trade and offer companies and importers a way to gain a financial edge in the global marketplace through reduction, deferral, or elimination of U.S. Customs duties*
FY	*Fiscal Year.*

G

GA	*General Aviation: Aircraft activity that is not scheduled for commercial purposes (e.g. airlines and cargo carriers) or conducted by the military. GA operations include charter and on-demand air transport, flight instruction, recreational flying, pipeline inspection, and emergency response.*
General Aviation Airport	*An airport that provides air service to only general aviation.*
GIS	*Geographic Information System: A computer system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.*
Glideslope	*Glide Slope: The vertical component of the instrument landing system (ILS) for the glide path guidance when combined with the lateral guidance of the localizer. The glideslope consists of the following:* • *Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or* • *Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.*

GPA	*Glide Path Angle: The angle of the final approach descent path relative to the approach surface baseline.*
GPS	*Global Positioning System: A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.*
GQS	*Glide Path Qualification Surface: An imaginary surface extending from the runway threshold along the runway centerline extended to the Decision Altitude (DA) point.*
Ground Access	*The transportation system on and around the airport that provides access to and from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.*

H

HAA	*Height Above Airport: The height of the circling approach descent altitude (MDA) above the airport elevation.*
HAZMAT	*Hazardous Materials: Materials that pose a risk to human health and safety, and the environment. Transport, storage, and disposal of these materials are regulated by state and federal environmental and transportation agencies.*
Helipad	*A designated area for the takeoff, landing, and parking of helicopters.*
High-Speed Exit Taxiway	*A long radius taxiway designed to expedite aircraft turning off the runway after landing (at speeds to 60 knots), thus reducing runway occupancy time.*
HIRL	*High Intensity Runway Lights: The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.*
Holding Aprons	*Aprons that allow for pilots to conduct final flight checks, wait for takeoff clearance, and use the provided area as a bypass space.*
Horizontal Surface	*An imaginary obstruction-limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.*
Hot Spot	*A location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.*

I

IAP	*Instrument Approach Procedure: Consists of a series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight rules (IFR) conditions from the beginning of the initial approach to a landing, or to a point from which the landing can be made visually. IAPs are classified as precision instrument, with both horizontal and vertical guidance; non-precision instrument, with only horizontal guidance; and visual, without positional guidance.*
ICAO	*International Civil Aviation Organization: A United Nations specialized agency that works with Member States and global aviation organizations to develop international Standards and Recommended Practices (SARPs) which States reference when developing their legally enforceable national civil aviation regulations. (International Civil Aviation Organization, 2014).*
IFR	*Instrument Flight Rules: They govern flight procedures when there is cloud ceiling less than 1,000 feet and/or visibility less than three miles. These rules require pilots to be specially licensed to navigate using instruments and air traffic control instruction, without visual reference. (FAR Part 91).*
ILS	*Instrument Landing System: An instrument landing system operates as a ground-based instrument approach system that provides precision lateral and vertical guidance to an aircraft approaching and landing on a runway, using a combination of radio signals and, in many cases, high-intensity lighting arrays to enable a safe landing during instrument meteorological conditions (IMC), such as low ceilings or reduced visibility due to fog, rain, or blowing snow. The system normally consists of the following electronic components and visual aids:* 1. *Localizer.* 2. *Glide Slope.* 3. *Outer Marker.* 4. *Middle Marker.* 5. *Approach Lights.*
IM	*Inner Marker.*
IMC	*Instrument Meteorological Conditions: An aviation flight category that describes weather conditions that require pilots to fly primarily by reference to instruments, and therefore under instrument flight rules (IFR), rather than by outside visual references under visual flight rules (VFR).*
Initial Approach Fix	*The designated point at which the initial approach segment begins for an instrument approach to a runway.*

Instrument Procedures	*A series of predetermine maneuvers consisting of navigational waypoints, headings, and minimum altitudes, intended to guide aircraft between the terminal (airport area) phase of flight and the en route phase of flight.*
ISA	*International Standard Atmosphere: This mathematical model describes how the earth's atmosphere, or air pressure and density, changes depending on altitude.*
Itinerant Aircraft	*An aircraft that is proceeding to or arriving from another location; or leaves the aerodrome traffic circuit but will be returning to land.*
Itinerant Operations	*Operations by aircraft that are not based at a specified airport.*

J

Jet	*Jet aircraft are characterized for having a turbine engine instead of a piston engine. Jet aircraft range in size from small four-passenger business jets to the largest airliners.*
Jet A	*Jet A is gasoline used in turbine engine powered aircraft. These include jets and propeller aircraft with turbine engines. Jet A is essentially kerosene, refined to meet aviation specifications.*

K

Knots	*A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.*

L

Landside	*The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.*
Large Aircraft	*An aircraft with a maximum certificated takeoff weight of more than 12,500 lbs.*
LDA	*Landing Distance Available: The runway length declared available and suitable for landing an aircraft. Also see Declared Distances.*
LDA	*Localizer Type Directional Aid*
LIRL	*Low Intensity Runway Lighting.*
LMM	*Compass Locator at ILS Outer Marker.*
LOC	*Localizer: The lateral guidance component of the instrument landing system (ILS) for the runway center line when combined with the vertical guidance of the glide slope.*

Local Area Augmentation System	*A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy integrity, continuity, and availability.*
Local Operations	*Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.*
Locator Outer-Marker	*A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.*
Local Traffic	*Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch-and-go training operations.*
Localizer Type Directional Aid	*A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.*
LORAN	*Long Range Navigation: An electronic navigational aid, or system, which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. LORAN is used for en route navigation.*
Low Intensity Runway Lights	*Low Intensity Runway Lights: The lowest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.*

M

MAC	*Missed Approach Course: The flight route to be followed if, after an instrument approach, a landing is not affected, and occurring normally:* *When the aircraft has descended to the decision height and has not established visual contact; or* *When directed by air traffic control to pull up or to go around again.*
Magnetic Bearing	*This determines the numbering scheme of runways. Runways are measured based on their orientation to the magnetic north pole (not the true North Pole, located at 90 degrees north latitude).*
MALS	*Medium Intensity Approach Lighting System with Indicator Lights.*

MALSR	*Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights: A medium approach intensity lighting system (ALS) installed in airport runway approach zones along the extended centerline of the runway. MALSR consists of a combination of threshold lamps, steady burning light bars and flashers, provides visual information to pilots on runway alignment, height perception, roll guidance, and horizontal references for Category I Precision Approaches.*
MDA	*Minimum Decent Altitude: The lowest authorized altitude on an approach that does not have vertical guidance. MDA is referenced to mean sea level (MSL).*
MEP	*Multi-Engine Piston: Aircraft with two or more engines and are typically larger than Single Engine Piston (SEP) aircraft.*
Military Operations	*Aircraft operations that are performed in military aircraft.*
Military Training Route	*An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.*
MIRL	*Medium Intensity Runway Lights: Runway lights located along the edge of the runway and used by pilots at night and in low visibility to land and take-off from the runway.*
MITL	*Medium Intensity Taxiway Lights: Taxiway lights located along the edge of the taxiway and used by pilots at night and in low visibility to navigate on taxiways.*
MLS	*Microwave Landing System: An instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.*
MM	*Middle Marker.*
MOA	*Military Operations Area: See Special-Use Airspace.*
Modification to Standards	*Any approved nonconformance to FAA standards, other than dimensional standards for Runway Safety Areas (RSAs), applicable to an airport design, construction, or equipment procurement project that is necessary to accommodate an unusual local condition for a specific project on a case-by-case basis while maintaining an acceptable level of safety.*
Monte Carlo Simulation	*Monte Carlo simulations are used to model the probability of different outcomes in a process that cannot easily be predicted due to the intervention of random variables. It is a technique used to understand the impact of risk and uncertainty in prediction and forecasting models.*

Movement Area	*The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft including helicopters and tiltrotors, exclusive of loading aprons and aircraft parking areas.*
MSA	*Metropolitan/Micropolitan Statistical Area: Metropolitan and micropolitan statistical areas (also referred to as metro and micro areas) are delineated by the Office of Management and Budget for the production and dissemination of federal statistical data. Each metro or micro area consists of one or more whole counties, and includes the counties containing a core urban area and any adjacent counties with a high degree of social and economic integration (measured by commuting to work) with the urban core.*
MSL	*Mean Sea Level: An average level of the surface of one or more of Earth's oceans from which heights such as elevations may be measured. MSL is a type of vertical datum – a standardized geodetic reference point – that is used, for example, as a chart datum in cartography and marine navigation or, in aviation, as the standard sea level at which atmospheric pressure is measured to calibrate altitude and, consequently, aircraft flight levels.*
Multivariate time series regression analysis	*Time series regression is a statistical method for predicting a future response based on the response history (known as autoregressive dynamics) and the transfer of dynamics from relevant predictors. ... Time series regression is commonly used for modeling and forecasting of economic, financial, and biological systems.*

N

NAAQS	*National Ambient Air Quality Standards: The Clean Air Act requires the Environmental Protection Agency to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. (U.S. Environmental Protection Agency, 2011).*
NAS	*National Airspace System: The airspace, navigation facilities and airports of the United States along with their associated information, services, rules, regulations, policies, procedures, personnel, and equipment.*

National Transportation Safety Board	*A federal government organization established to investigate and determine the probable cause of transportation accidents, to recommend equipment and procedures to enhance transportation safety, and to review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.*
Nautical Mile	*A unit of length used in navigation, which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.*
NAVAID	*Navigational Aid: An electronic or visual guidance system that allows pilots to maintain situational and locational awareness during periods of low visibility. NAVAIDs include airfield lights and radio beacons that convey positional information to pilots.*
NCRS	*Natural Resources Conservation Service: U.S. Department of Agriculture's principal agency for providing conservation technical assistance to private landowners, conservation districts, tribes, and other organizations.*
NDB	*Non-Directional (Radio) Beacon: A radio transmitter at a known location, used as an aviation or marine navigational aid. A NAVAID that broadcasts its location in all directions. These NAVAIDs are typically coupled with automatic direction finders, which convey their relative direction to aircraft.*
NEPA	*National Environmental Policy Act: The NEPA requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet NEPA requirements federal agencies prepare a detailed statement known as an Environmental Assessments and Environmental Impact Statements (EIS). EPA reviews and comments on EISs prepared by other federal agencies, maintains a national filing system for all EISs, and assures that its own actions comply with NEPA. (U.S Environmental Protection Agency, 2014).*
NM	*Nautical Mile: 6,076.1 feet.*
NOAA	*National Oceanic and Atmospheric Administration: An American scientific agency within the United States Department of Commerce that focuses on the conditions of the oceans, major waterways, and the atmosphere.*
Noise Contour	*A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.*

Non-Movement Area	*The areas of an airport that are used for taxiing or hover taxiing, or air taxiing aircraft including helicopters and tiltrotors, but are not part of the movement area (i.e., the loading aprons and aircraft parking areas).*
Non-Precision Instrument	*NAVAIDs and instrument procedures enabling only lateral guidance of aircraft, compared to precision instrument, which provides lateral and vertical guidance. During periods of visibility below three statute miles, and when the cloud ceiling is below 1,000 feet above ground level, aircraft, airports, and pilots must be equipped and trained to fly non-precision instrument procedures, otherwise the airport must close until visibility improves.*
NOTAM	*Notice to Airmen: Federally issued notice pertaining to deviations from standard operating procedures in the national airspace system. NOTAMs typically pertain to airspace and runway closures, and special events, such as air shows. Pilots are responsible for reviewing applicable NOTAMs in the airspace and airports within which they operate.*
NPA	*Non-Precision Approach: A straight-in instrument approach procedure that provides course guidance, with or without vertical path guidance, with visibility minimums not lower than 3/4 mile (4000 RVR).*
NPDES	*National Pollutant Discharge Elimination System.*
NPIAS	*National Plan of Integrated Airport Systems: The NPIAS identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and thus eligible to receive Federal grants under the Airport Improvement Program (AIP). It also includes estimates of the amount of AIP money needed to fund infrastructure development projects that will bring these airports up to current design standards and add capacity to congested airports. The FAA is required to provide Congress with a 5-year estimate of AIP eligible development every two years. The NPIAS contains all commercial service airports, all reliever airports, and selected general aviation airports. (Federal Aviation Administration, 2014).*
NPRM	*Notice of Proposed Rulemaking.*
NRI	*Natural Resource Inventory: A statistical survey of land use and natural resource conditions and trends on U.S. non-Federal lands, maintained by the US Department of Agriculture.*

O

Obstacle	*An existing object at a fixed geographical location, or which may be expected at a fixed location within a prescribed area with reference to which vertical clearance is or must be provided during flight operation.*
OCS	*Obstacle Clearance Surface: An evaluation surface that defines the minimum required obstruction clearance for approach or departure procedures.*
ODALS	*Omni-Directional Approach Lighting System.*
OE/AAA	*Obstacle Evaluation / Airport Airspace Analysis: FAA OE/AAA evaluates cases related to airspace in the U.S. Structures built within 20,000 feet of public airports, or exceeding 200 feet above ground level, must go through OE/AAA review. OE/AAA issues a determination on whether the proposed construction is or is not a hazard to air navigation.*
OFA	*Object Free Area: The area centered about the runway or taxiway centerline. The OFA clearing standard requires clearing the OFA of above-ground objects protruding above the nearest point of the safety area, except those fixed by function. Buildings and parked aircraft are not permitted in the OFA. (Federal Aviation Administration, 2012).*
OFZ	*Obstacle Free Zone: The OFZ clearing standard precludes aircraft and other object penetrations, except for frangible NAVAIDs that need to be located in the OFZ because of their function. Its shape is dependent on the approach minimums for the runway end and the aircraft on approach and, thus, the OFZ for a particular operation may not be the same shape as that used for design purposes. (Federal Aviation Administration, 2012).*
OM	*Outer Marker: An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline, indicating to the pilot that he/she is passing over the facility and can begin final approach.*
One-Engine Inoperable Surface	*A surface emanating from the runway end at a slope ratio of 62.5:1. Air carrier airports are required to maintain a technical drawing of this surface depicting any object penetrations by January 1, 2010.*
Operation	*Data showing how many times aircraft have taken off, landed, or performed a touch-and-go at an airport. One visit to an airport counts as two operations (landing and takeoff).*

P

PAC	*Planning Advisory Committee.*
PAPI	*Precision Approach Path Indicator: A series of lights that indicate to a pilot whether they are on, above, or below the prescribed glide path to a runway end. These devices have either two or four lights that alternate between white and red to indicate the pilot's position.*
PCI	*Pavement Condition Index: A numerical index used in transportation civil engineering between 0 and 100, which is used to indicate the general condition of a pavement.*
PFC	*Passenger Facility Charge.*
Pilot Controlled Lighting	*Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.*
PIW	*Public Information Workshop.*
PLASI	*Pulsating Visual Approach Slope Indicator.*
POFA	*Precision Object Free Area: An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard, which requires the POFA to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than ¾ mile visibility.*
Precision Approach	*A standard instrument approach procedure, which provides runway alignment and glide slope (descent) information. It is categorized as follows:* 1. *CATEGORY I (CAT I): A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.* 2. *CATEGORY II (CAT II): A precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.* 3. *CATEGORY III (CAT III): A precision approach which provides for approaches with minima less than Category II.*

Precision Approach Radar	*A radar facility in the terminal air traffic control system used to detect and display with a high degree of accuracy the direction, range, and elevation of an aircraft on the final approach to a runway.*
Precision Instrument	*NAVAIDs and instrument procedures enabling both lateral and vertical guidance of aircraft. During periods of visibility below 1/2 a statute mile, and when the cloud ceiling is below 200 feet above ground level, aircraft, airports, and pilots must be equipped and trained to fly precision instrument procedures, otherwise the airport must close until visibility improves.*
Primary Airport	*A commercial service airport that enplanes at least 10,000 annual passengers.*
Primary Surface	*An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.*
Prohibited Area	*See Special-Use Airspace.*
PVACI	*Pulsating | Steady Visual Approach Slope Indicator.*
PVC	*Poor Visibility and Ceiling: Used in determining Annual Service Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one statute mile.*

R

Radial	*A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.*
RCO	*Remote Communications Outlet: An unstaffed transmitter receiver/facility remotely controlled by air traffic personnel. RCOs serve flight service stations (FSSs). RCOs were established to provide ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times.*
RDC	*Runway Design Code: A combination of the AAC and ADG. These two elements combined set the design standards, setbacks, and dimensions, pavement width, safety areas, object free areas, and runway protection zones for a single runway. (Federal Aviation Administration, 2012).*

Real GDP	*Real Gross Domestic Product: GDP measures the value of all goods and services produced within a geographic area. Real GDP measures economic output in inflation-adjusted dollars.*
Real GRP	*Real Gross Regional Product: The value of goods and services produced in the region that serves as a health index for the overall economy.*
Regression Analysis	*Using projected change of one variable to forecast the change of another. Regression analysis typically identifies correlation between two variables historically, indicating whether these variables change in a similar fashion to each other, or inversely. Correlation and regression do not determine causation.*
REIL	*Runway End Identifier Lights: Lights that provide rapid and positive identification of the approach end of a runway. The system consists of a pair of synchronized flashing lights located laterally on each side of the runway threshold.*
Reliever Airport	*An airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.*
Remain Overnight Apron (RON)	*Apron area where air carriers can park aircraft overnight.*
Restricted Area	*See Special-Use Airspace.*
RNAV	*Area Navigation: A method of instrument flight rules (IFR) navigation that allows an aircraft to choose any course within a network of navigation beacons, rather than navigate directly to and from the beacons. Typically, GPS system navigation.*
ROFA	*Runway Object Free Area: This is an object free area centered on the runway. Also see the definition of OFA.*
RPZ	*Runway Protection Zone: A trapezoidal feature whose function is to enhance the protection of people and property on the ground by keeping the area clear of incompatible land uses. These land uses generally include noise sensitive land uses, land uses that are characterized by high concentrations of people, and fuel and hazardous material storage.*
RSA	*Runway Safety Area: A safety area that is centered longitudinally on the runway. It must be clear of all objects, graded, drained, and capable of supporting snow removal equipment, firefighting equipment, and the passage of aircraft without damage to the aircraft. (Federal Aviation Administration, 2012).*
RTR	*Remote Transmitter/Receiver: RTRs serve ARTCCs. Also see Remote Communications Outlet (RCO).*

Runway	*A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of aircraft. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. For example, a runway with a magnetic heading of 180 would be designated Runway 18. The runway heading on the opposite end of the runway is 180 degrees from that runway end. For example, the opposite runway heading for Runway 18 would be Runway 36 (magnetic heading of 360). Aircraft can takeoff or land from either end of a runway, depending upon wind direction.*
Runway Alignment Indicator Light	*A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.*
Runway Gradient	*The average slope, measured in percent, between the two ends of a runway.*
Runway Incursion	*Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft.*
RVR	*Runway Visibility Range: An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.*
RVZ	*Runway Visibility Zone: An area on the airport to be kept clear of permanent objects so that there is an unobstructed line of site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.*

S

SALS	*Short Approach Lighting System.*
SASO	*Specialized Aviation Service Operator: A single-service provider, or special Fixed Based Operator, performing less than full services.*
SASP	*State Aviation System Plan.*
Scope	*The document that identifies and defines the tasks, emphasis, and level of effort associated with a project or study.*
Segmented Circle	*A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.*
SEL	*Sound Exposure Level.*

SEP	*Single Engine Piston: SEP have one piston-powered engine. These aircraft are generally smaller and are often used for flight training and recreational flying.*
Shoulder	*An area adjacent to the defined edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft and emergency vehicles deviating from the full-strength pavement; enhanced drainage; and blast protection.*
SID	*Standard Instrument Departure: A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.*
Slant-Range Distance	*The distance between an aircraft and a point on the ground.*
SM	*Statute Mile: 5,280 feet.*
Small Aircraft	*An aircraft with a maximum certificated takeoff weight of 12,500 lbs. (5670 kg) or less.*
Special-Use Airspace	*Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:* • *ALERT AREA: Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.* • *CONTROLLED FIRING AREA: Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.* • *MILITARY OPERATIONS AREA (MOA): Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.* • *PROHIBITED AREA: Designated airspace within which the flight of aircraft is prohibited.* • *RESTRICTED AREA: Airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.* • *WARNING AREA: Airspace which may contain hazards to nonparticipating aircraft.*

SSALF	*Simplified Short Approach Lighting System with Runway Alignment Indicator Lights.*
Stakeholder Working Group (SWG)	*The SWG is made up of community stakeholders, including airport tenants, land use planning bodies, and economic development agencies. SWG members are tasked with reviewing Master Plan materials and providing comment from the perspective of the organizations of which they are a member.*
Standard Instrument Departure Procedures	*A published standard flight procedure to be utilized following takeoff to provide a transition between the airport and the terminal area or en route airspace.*
STAR	*Standard Terminal Arrival Route: A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.*
Stop-and-Go	*A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A Stop-and-Go is recorded as two operations: one operation for the landing and one operation for the takeoff.*
Stopway	*An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff. A blast pad is not a stopway.*
Straight-in Landing/Approach	*A landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.*
SWL	*Single-Wheel Landing Gear: Runway Weight Bearing Capacity for Aircraft with Single-Wheel Tandem Type Landing Gear.*

T

TAC	*A Technical Advisory Committee consists of aviation industry professionals who are airport stakeholders that provide a technical perspective on key Master Plan elements. For example, a group like this may have representatives from the airport, airlines, businesses on the airport, military (if serving military operations), etc.*
TACAN	*Tactical Air Navigation: An ultrahigh frequency electronic air navigation system which provides suitably equipped aircraft a continuous indication of bearing and distance to the TACAN station.*

TAF	*Terminal Area Forecast: The annual FAA forecast of passengers, aircraft operations, and based aircraft for the National airspace system. This is a top down forecast, starting from the FAA national aerospace forecast and being distributed to the different airports. It is used as a basis for comparison for Master Plan generated forecasts.*
Taxilane	*A taxiway designed for low speed and precise taxiing. Taxilanes are usually, but not always, located outside the movement area, providing access from taxiways (usually an apron taxiway) to aircraft parking positions and other terminal areas.*
Taxiway	*A defined path established for the taxiing of aircraft from one part of an airport to another.*
TDG	*Taxiway Design Group: Relates to the undercarriage dimensions of the aircraft. Taxiway/taxilane width and fillet standards, and in some cases, runway to taxiway and taxiway/taxilane separation standards are determined by TDG.*
TDZ	*Touchdown Zone: The first 3,000 feet of the runway beginning at the threshold.*
TDZE	*Touchdown Zone Elevation: The highest elevation in the touchdown zone.*
Terminal Instrument Procedures	*Published flight procedures for conducting instrument approaches to runways under instrument meteorological conditions.*
Terminal Radar Approach Control	*An element of the air traffic control system responsible for monitoring the en route and terminal segment of air traffic in the airspace surrounding airports with moderate to high levels of air traffic.*
TESM	*Taxiway Edge Safety Margin: The distance between the outer edge of the landing gear of an airplane with its nose gear on the taxiway centerline and the edge of the taxiway pavement.*
Tetrahedron	*A device used as a landing direction indicator. The small end of the tetrahedron points in the direction of landing.*
TFMSC	*Traffic Flow Management System Traffic Counts: The data collected from flight plans. These operations are categorized by aircraft type and used to identify trends in the airport fleet mix.*
THC	*Threshold Crossing Height: The theoretical height above the runway threshold at which the aircraft's glideslope (GS) antenna would be if the aircraft maintains the trajectory established by the Instrument Landing System (ILS) GS, or the height of the pilot's eye above the runway threshold, based on a visual guidance system.*

Threshold	*The beginning of that portion of the runway available for landing. In some instances, the threshold may be displaced. Threshold always refers to landing, not the start of takeoff.*
Tiedown	*Located on aircraft parking aprons and used to secure parked aircraft so that they do not move in high winds.*
TODA	*Takeoff Distance Available: The Takeoff Run Available (TORA) plus the length of any remaining runway or clearway beyond the far end of the TORA. Also see Declared Distances.*
TOFA	*Taxiway Object Free Area: This is an object free area centered on the taxiway. Also see the definition of OFA.*
TORA	*Takeoff Runway Available: The runway length declared available and suitable for the ground run of an aircraft taking off. Also see Declared Distances.*
Touch-and-Go	*An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A Touch-and Go is recorded as two operations: one operation for the landing and one operation for the takeoff.*
Touchdown	*The point at which a landing aircraft contacts the runway surface.*
Touchdown Zone Lighting	*Two rows of transverse light bars located symmetrically about the runway centerline normally at 100-foot intervals. The basic system extends 3,000 feet along the runway.*
TRACON	*Terminal Radar Approach Control.*
Traffic Pattern	*The traffic flow that is prescribed for aircraft landing at, or taking off from, an airport. The components of a typical Traffic Pattern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.*
Transitional Surface	*A surface extending outward and upward, at right angles to the runway centerline and runway centerline extended, from the sides of the Primary Surface and the Approach Surfaces.*
TSA	*Taxiway Safety Area: A safety area that is centered longitudinally on the taxiway. It must be clear of all objects, graded, drained, and capable of supporting snow removal equipment, firefighting equipment, and the passage of aircraft without damage to the aircraft. (Federal Aviation Administration, 2012).*

TSC	*Technical Steering Committee: A committee made up of airport staff, members of the Airport Advisory Board, and others with an in-depth understanding of aviation. TSC members are tasked with becoming familiar with how the airport operates, and what facilities pilots and aviation-related businesses require.*
Turboprop	*Aircraft that uses gas turbine engines to drive a propeller. These aircraft tend to be slower than jets. Turboprops are used as small commuter aircraft due to lower fuel and maintenance costs.*

U

UAS	*Unmanned Aircraft (Arial) System: The combination of a pilotless vehicle and pilot that flies the vehicle remotely. This acronym is often used interchangeably with Unmanned Aerial Vehicle (UAV); however, UAS refers to the vehicle and the pilot.*
UAV	*Unmanned Aerial Vehicle: A pilotless vehicle. This acronym is often used interchangeably with Unmanned Aircraft (Arial) System (UAS); however, UAV refers to the vehicle itself, and not the pilot.*
UGB	*Urban Growth Boundary: A regional boundary, set by the local jurisdiction by mandating that the area inside the boundary be used for higher density urban development and the area outside be used for lower density development, with the hope of controlling urban sprawl.*
Uncontrolled Airport	*An airport without an air traffic control tower at which the control of Visual Flight Rules (VFR) traffic is not exercised.*
Uncontrolled Airspace	*Airspace within which aircraft are not subject to air traffic control.*
UNICOM	*Universal Communication: A non-government communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.*
Upwind Leg	*A flight path parallel to the landing runway in the direction of landing. Also see Traffic Pattern.*
USACE	*U.S. Army Corps of Engineers: The USACE has regulatory over navigable waterways in the U.S. They manage river hydrology, flood prevention, and emergency response.*

USC	*United States Code: A consolidation and codification by subject matter of the general and permanent laws of the United States. It is prepared by the Office of the Law Revision Counsel of the United States House of Representatives. (United States House of Representatives, 2014).*
USFS	*United States Forest Service: An agency of the U.S. Department of Agriculture that administers the nation's national forests and national grasslands.*
USFWS	*U.S. Fish and Wildlife Service: USFWS is tasked with enforcing federal wildlife laws, protecting endangered birds and species, managing bird migrations and fisheries, restoring wetlands, and collecting excise taxes on fishing and hunting. (U.S. Fish and Wildlife Service, 2014).*

V

VASI	*Visual Approach Slope Indicator: An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/white, above path if white/white, and below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.*
Vector	*A heading issued to an aircraft to provide navigational guidance by radar.*
VFR	*Visual Flight Rules: Under visual flight rules, pilots must be able to maintain separation from aircraft and objects visually, without the use of navigational aids (NAVAIDS). When weather reduces visibility below three statue miles then pilots may not operate under Visual Flight Rules (VFR) and must instead use Instrument Flight Rules (IFR). (FAR Part 91).*
VHF	*Very High Frequency.*
Victory Airway	*A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.*
Visual Approach	*An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.*
Visual Meteorological Conditions	*Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.*

VOR	*Very High Frequency (VHR) Omni-Directional Range (VOR): VOR NAVAIDS convey position and course (relative to the VOR) information to aircraft in flight. These NAVAIDs are used to establish airways across the U.S.*
VORTAC	*Very High Frequency Omni-Directional Range | Tactile Air Navigation: A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.*

W

WAAS	*Wide Area Augmentation System: A ground-based global positioning system (GPS) signal augmentation service. WAAS antennas boost strength and reliability of satellite GPS signals, enabling aircraft to use GPS to fly instrument approach procedures.*
Warning Area	*See Special-Use Airspace.*
Weight Bearing Capacity	*The amount of weight a piece of pavement is capable of bearing under normal circumstances, without resulting in excessive wear. Aircraft that weigh more than a pavement's weight bearing capacity may still use the pavement; however, frequent use by such aircraft will cause premature wear of the pavement, requiring earlier replacement.*
WHMP	*A Wildlife Hazard Management Plan is a strategy document created after risk assessment of wildlife hazards at an airport. The document helps airports plan development to reduce the risk that wildlife hazards present to safe operations.*
Wingspan	*The maximum horizontal distance from one wingtip to the other wingtip, including the horizontal component of any extensions, such as winglets or raked wingtips.*

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APPENDIX B
AIRPORT RECYCLING, REUSE, AND WASTE REDUCTION PLAN

Executive Summary

The Phoenix-Mesa Gateway Airport Authority (PMGAA), owner and operator of Phoenix-Mesa Gateway Airport (IWA), is committed to environmentally responsible operations. As part of IWA's Master Plan Update, PMGAA evaluated solid waste management planning (per FAA Modernization and Reform Act of 2012 (FMRA) requirements). The purpose of this task was to assess IWA's existing waste and recycling program and provide recommendations for ways to increase landfill diversion through waste reduction, reuse, and recycling.

Informal interviews with IWA staff and a facility walk-through informed the baseline inventory and helped to identify areas of opportunity to divert waste from the landfill. Using these data, recommendations specific to IWA's waste stream were developed to improve waste diversion at the Airport.
Recommendations include:

- ✓ Establishing goals and objectives
- ✓ Tracking progress and reporting regularly
- ✓ Continuing to promote emptying of water bottles pre-security and refilling post-security
- ✓ Collecting and donating food, beverages, and toiletries
- ✓ Continuing paper, plastic, plastic bottle, aluminum can, cardboard, and glass recycling and expanding to other areas, including deplaned waste
- ✓ Improving education and outreach for passengers, employees, tenants, and contractors
- ✓ Supplementing, right sizing, co-locating, and standardizing recycling stations and garbage cans
- ✓ Updating contracts/leases and establishing a purchasing policy.

This range of recommendations will allow IWA the flexibility to implement specific actions that are compatible with changing conditions and available resources, while providing the opportunity increase landfill diversion over time through a phased, comprehensive program.

INTRODUCTION

Regulatory Background and Project Purpose

Section 132(b) of the FMRA expanded the definition of airport planning to include "developing a plan for recycling and minimizing the generation of airport solid waste." FMRA Section 133 added a requirement

that airports that are preparing or updating a master plan and that receive funding from the Federal Aviation Administration (FAA) Airport Improvement Program (AIP) must include analysis that addresses issues related to solid waste recycling. These issues include:

1) The feasibility of solid waste recycling
2) Minimizing the generation of solid waste
3) Operation and maintenance requirements
4) Review of waste management contracts
5) The potential for cost savings or revenue generation.

In September 2014, the FAA released a memorandum titled, "Guidance on Airport Recycling, Reuse, and Waste Reduction Plans." This memo details the FAA's expectations and suggestions for an airport's waste plan. To comply with FMRA and according to the FAA's guidance memo, PMGAA has prepared this waste reduction plan for IWA. The purpose of this plan is to document and assess IWA's existing waste program based on the issues listed above and to recommend improvements.

An airport's waste and recycling program and documented plan depend on several factors including:

- ✓ The size, location, and layout of the airport
- ✓ The amount and type of waste generated
- ✓ Markets for recyclable commodities
- ✓ Costs for recycling
- ✓ Available local infrastructure
- ✓ The willingness of an airport and its tenants to implement recycling and other strategies.

The extent and accuracy of available information governed the content of this plan.

Airport Description

IWA is located in the City of Mesa (the City), within Maricopa County, Arizona, and is owned and operated by PMGAA. PMGAA consists of members from the City of Mesa, the City of Phoenix, the Gila River Indian Community, the Town of Gilbert, the Town of Queen Creek, and the City of Apache Junction. The Airport Executive Director reports to and advises PMGAA on IWA matters. IWA employees are responsible for the day to day operations.

IWA, a primary, public-use, small hub airport, which is included in the FAA National Plan of Integrated Airport System (NPIAS) is an FAA Class I Part 139 facility, with facilities and services to accommodate scheduled passenger aircraft with 30 or more passenger seats. The Arizona Department of Transportation (ADOT) classifies IWA as a Primary Commercial Service Airport.

IWA serves commercial, general aviation (GA), and military activity. In fiscal year 2017, IWA served approximately 1,503,712 total passengers (751,856 enplanements), 12,505 total operations, and had 116 based aircraft. Three air carriers serve IWA: Allegiant Airlines, Swoop Airlines, and WestJet. Allegiant reaches 49 domestic destinations, while Swoop and WestJet reach three international destinations in Canada. Additional background and activity information is available in the Airport Master Plan.

Waste Definitions and Plan Focus

Municipal Solid Waste (MSW) consists of everyday items that are used and then discarded. There are five primary types of MSW generated at airports:

1) General MSW consists of common inorganic waste, such as product packaging, disposable utensils, plates, cups, bottles, and newspaper. Less common items, such as furniture and clothing, are also considered general MSW.
2) Food waste is either food that is not consumed or the waste generated and discarded during food preparation. Food waste and green waste make up a waste stream known as "compostable" waste.
3) Green waste consists of tree, shrub, and grass clippings, leaves, weeds, small branches, seeds, pods and similar debris generated by landscape maintenance activities. Green waste and food waste together may be referred to as "compostables."
4) Deplaned waste is a specific type of MSW that is removed from passenger aircraft. These materials include bottles and cans, newspaper and mixed paper, plastic cups, service ware, food waste, food soiled paper, and paper towels. It is included separately from overall MSW in this categorization because it is often a focal point of airport efforts.
5) Construction and Demolition Waste (C&D) is generally categorized as MSW and is any non-hazardous solid waste from land clearing, excavation, and/or the construction, demolition, renovation or repair of structures, roads, and utilities. C&D waste commonly includes concrete, wood, metals, drywall, carpet, plastic, pipes, land clearing debris, cardboard, and salvaged building components.

This plan focuses on the management of MSW and other materials that can be recycled or disposed of in a landfill. This plan does not address the management of other types of waste, specifically:

- ✓ Hazardous waste
- ✓ Universal waste
- ✓ Industrial waste
- ✓ Waste from international flights
- ✓ C&D waste that is subject to special requirements or requires special handling (asbestos, lead, etc.).

The handling, recycling, and disposal of these materials are regulated by federal, state, and local laws.

Key Airport Buildings

IWA's buildings include terminal facilities, PMGAA Administration Building, airport support facilities, GA facilities and Fixed-Base Operator (FBO) facilities, a cargo facility, the air traffic control tower (ATCT), and Lynn Kusy Park.

Terminal Facilities

The Charles L. Williams Terminal. The Charles L. Williams Terminal (the terminal) serves air carrier passengers and provides space for air carrier-related services. The terminal comprises four separate single-story buildings and two outdoor courtyard areas. Within the terminal, there are 10 gate positions. The terminal buildings include the ticketing terminal, the West Terminal A, the West Terminal B, and the terminal annex and south courtyard.

Ticketing Terminal. The Ticketing Terminal contains the air carrier counter and offices. There are 32 ticketing counters that are used by Allegiant Air, WestJet, and Swoop. The air carrier offices are located opposite the ticketing counters.

West Terminals (A and B). The West Terminal A is north of the ticketing terminal and includes the Transportation Security Administration (TSA) checkpoint. There are three rental car service counters within this location. West Terminal A includes four gates and four air carrier service counters. This terminal also has holding areas for each gate (**Figure B-1**).

Figure B-1: Holding Area within Terminal

Several restaurants and gift shops are located within the West Terminal A, including Paradise Bakery and Café (**Figure B-2**), the Phoenix store, and the Copper Plate Bar and Grill.

Figure B-2: Paradise Bakery and Cafe

West Terminal B is accessed through the outside courtyard, which originates from the West Terminal A. This area includes holding areas for passengers at each gate. An AZ Highways Kiosk is located within this terminal.

Terminal Annex and South Courtyard. The Terminal Annex and South Courtyard are located in the secure areas of the terminal. The Terminal Annex consists of four gates, four air carrier service counters, and two holding areas. The AZ Highways Gift shop is located within the Terminal Annex.

PMGAA Administration Building

The PMGAA Administration building is located adjacent to the Lynn Kusy Park. This building contains a reception area, several offices, restrooms, and a breakroom with a kitchenette, conference rooms, and a copy room.

Airport Support Facilities

Fuel Facilities. Two above ground 50,000-gallon Jet A fuel tanks, six aboveground 25,000-gallon Jet A fuel tanks, and one aboveground 12,000-gallon Avgas fuel tank are located in the fuel farm south of the terminal and apron.

Aircraft Rescue and Firefighting (ARFF). The ARFF station is located southeast of the cargo ramp. The ARFF station is serviced by the City of Mesa Fire Station 215. The ARFF equipment and supplies are contained within the bays of the facility, which PMGAA owns.

Airport Maintenance Facilities. The PMGAA Maintenance and Operations building is located west of the ATCT and includes offices, a repair shop, and storage space. Several other maintenance buildings are located throughout the property. Janitorial supplies are stored in these buildings.

The Car Care facility is dedicated to the rental car companies. This area consists of a restroom, open bay space, and a car wash.

General Aviation Facilities and Fixed Base Operator (FBO) Facilities

FBO Facility. One FBO, Gateway Aviation Services, offers services including fueling, aircraft parking, hangar rental, courtesy cars, and ground power units. The FBO facility includes a planning room and pilot's lounge within the General Aviation Center. Rental car services within the FBO are provided by Enterprise Car Rental.

General Aviation Center. The General Aviation Center (GA Center) is located north of the terminal building and adjacent to the north apron. Several other businesses are located within the GA Center, such as the Barrio Brewing Company (the restaurant), the U.S. Customs Border Protection (CBP), the Phoenix Mesa Gateway Traffic Survival School, Denise Riden Family Law, and Factory Direct Models.

Hangar 24. Hangar 24 is located south of the ticketing terminal. This facility is composed of open box hangar space for aircraft storage, office space, and restrooms.

T- Hangars. Three T-Hangar buildings are located west of Taxiway Y.

Cessna Citation Service Center. The Cessna Citation Service Center is located west of Runway 12R. The service center includes a hangar, office, warehouse areas, and maintenance areas.

Southwest Jet Center. Southwest Jet Center is located northwest of the T-hangars. This center contains office space, restrooms, and two bay hangars (west and east hangars).

Embraer Executive Jet Services. Embraer Executive Jet Services is located adjacent to the Southwest Jet Center. This facility has restrooms, offices, and hangar space.

Air Methods. Air Methods is located in the southwest portion of the Airport.

Arizona State University Polytechnic Campus/Airline Transport Professionals Flight Schools. The flight schools are located south of the T-hangars.

Chandler-Gilbert Community College (CGCC)/University of North Dakota Aerospace (UND). The CGCC/UND facilities are located north of the terminal facilities.

Aviation Performance Solutions. Aviation Performance Solutions shares space with the CGCC/UND facilities.

Top Aces. Top Aces uses a hangar to provide the Canadian Armed Forces with combat airborne training services.

Cargo Facility

The cargo building is located west of Runway 30L. The building contains restrooms and office spaces. The office spaces are utilized by U.S. Immigration and Customs Enforcement (ICE) and U.S. Forest Service.

Air Traffic Control Tower (ATCT)

The ATCT is located northwest of the cargo facility. PMGAA owns the tower and Serco employees operate the tower as a part of the FAA Contract Tower Program.

Lynn Kusy Park

The park is located between the GA Center and PMGAA administration building. This park has a walking path and two gazebos available for onlookers of aircraft activity occurring at IWA.

Plan Scope

The facilities described above include buildings and areas over which IWA has direct control of waste management and others over which IWA has influence, but not direct control. According to FAA guidance, areas over which IWA has "direct control" or "influence" should be included in the Recycling, Reuse, and Waste Reduction Plan; areas outside Airport control or influence may be excluded.

IWA has direct control over operations and activities related to waste management in the following areas:

- ✓ Charles L Williams Terminal (Terminal Areas)
  - Public use spaces (including the South and North courtyard, waiting areas, baggage claim, curb areas, and restrooms)
- ✓ PMGAA Administration Building
- ✓ Airport Support Facilities
  - Airport Maintenance Facilities
  - PMGAA Maintenance and Operations Building
- ✓ Lynn Kusy Park

In addition, IWA can influence the management of waste and recyclables in tenant spaces through lease agreements and contracts at IWA, including:

- ✓ Terminal Areas
  - TSA spaces
  - Air carrier leased areas (including ticketing counters, offices, breakrooms, and deplaned waste)
  - Rental car tenant areas
  - Retail areas and bar/restaurant
- ✓ General Aviation Areas
  - Non-aeronautical tenant and development areas on the property

PMGAA does not have control or influence over waste management in the FAA ATCT, the ARFF facilities, the U.S. CBP Inspection Services facilities, nor areas adjacent to IWA property that neighboring businesses and property owners' control; therefore, those areas are excluded from this plan.

EXISTING PROGRAM

Drivers

PMGAA established its recycling program at IWA to reduce the quantity of material disposed of in the landfill and to conserve resources, including financial resources. IWA's staff's commitment and practices drive the program; it is supported by local recycling infrastructure.

Alignment with Local Programs

PMGAA contracts with the City of Mesa's Environmental Management and Sustainability Department for trash and recycling services. The City of Mesa's Environmental Management and Sustainability Department (the City) provides collection services to businesses, residents, and multi-unit communities within the City of Mesa. IWA's program aligns with the City's efforts. IWA recycles all the material types collected by the City's contractor. These materials include paper, plastic, aluminum, glass, and cardboard.

Infrastructure

Employees, tenants, and passengers have access to a network of trash cans throughout the terminals, courtyards, and offices. Several recycling stations are located within the offices and breakrooms of the Administration Building (**Figure B-3**) and Maintenance and Operations building. Several trash cans are located outdoors, near the terminal entrances (**Figure B-4**).

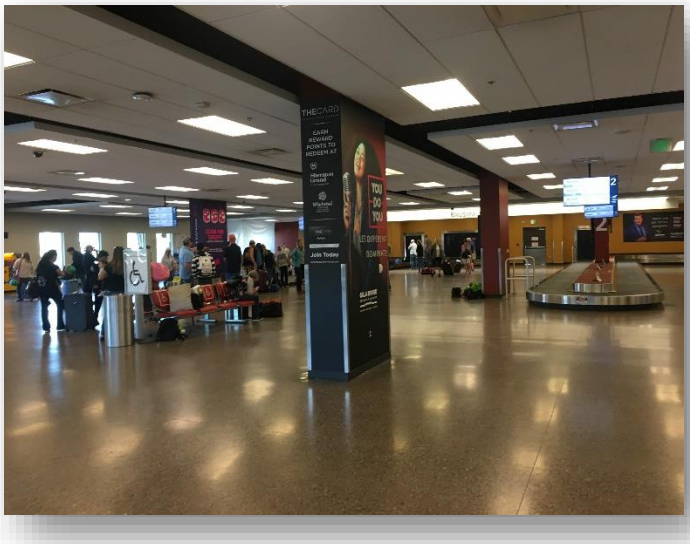
Figure B-3: Recycling containers in the Administration Building's breakroom

Figure B-4: Trash cans located outside the terminal entrance

Tall round, metal trash cans with round openings are located in the baggage claim area and near the restrooms (**Figures B-5 and B-6**).

Figure B-5: Trash can near restrooms

Figure B-6: Trash cans in the baggage claim area



Liquid and container dispensing areas are located pre-security checkpoint, as well as within the security line (**Figures B-7** and **B-8**).

Figure B-7: Liquid and container collection bins at TSA checkpoint

Figure B-8: Liquid and container collection bin at TSA checkpoint

Within the terminal, several air hand-dryers and paper towel dispensers are located within the restrooms (**Figure B-9**). Water bottle filling stations are located within the Airport Administration Building for employee use (**Figure B-10**).

Figure B-9: Air hand-dryers in restrooms

Figure B-10: Water bottle filling stations within terminal building

A recycling paper bin (**Figure B-11**) is located in the copy room within the Administration Building. Recycling bins are located within the administration offices (**Figure B-12**).

Figure B-11: Paper collection bin in copy room

Figure B-12: Recycling bins under desks in administration offices

Recycling bins and paper shredding bins are located within the Maintenance and Operations building (**Figure B-13**). Terminal garbage and recycling dumpsters are located near the terminal building, as well as the Maintenance and Operations building (**Figure B-14**).

Figure B-13: Shredder and recycling bins in the Maintenance and Operations building

Figure B-14: Cardboard and garbage dumpsters located by the Maintenance and Operations building

Recycling carts and dumpsters are located throughout IWA property (**Figures B-15** and **B-16**).

Figure B-15: Recycling carts

Figure B-16: Dumpsters

GA tenants have access to recycling and garbage dumpsters (**Figure B-17**). Lynn Kusy park has two trash receptacles on the property.

Figure B-17: Recycling and garbage dumpsters near GA tenant areas

Waste materials (food waste and other MSW) are collected from the dumpster weekly. These materials are transported for disposal at Salt River Landfill (the landfill). This landfill is operated by the Salt River Pima-Maricopa Indian Community, who has an agreement with River Recycling. River Recycling operates the landfill as a Materials Recovery Facility. The recyclable materials (comingled paper, plastic, glass, and aluminum, as well as segregated cardboard) are collected weekly and transported to a recycling facility at the landfill where they are sorted, compressed into bales, marketed, and sold.

Operation and Maintenance Requirements/Roles and Responsibilities

The PMGAA Operations and Maintenance director is primarily responsible for the waste program, including directing housekeeping activities, adjusting the program, and purchasing janitorial supplies. IWA's waste program is maintained by facilities staff, airport management personnel, and contracted janitorial staff, Flagship Facility Services, Inc (Flagship).

PMGAA staff are responsible for discarding their paper recycling bins in their cubicles and offices into the 10-gallon paper recycling barrels that Flagship empties. Flagship is responsible for custodial activities in specific buildings and areas, including collecting waste and recyclables from cans and bins and transferring these materials to the appropriate dumpsters.

IWA's terminal tenants (restaurants, shops, rental car companies, and air carriers) and some GA tenants in outlying buildings (Cessna, Embraer, etc.) are responsible for custodial activities in their areas including transferring waste to the appropriate dumpsters. The operators of the ARFF building are responsible for securing their own waste and recycling services.

The City is the primary waste and recycling hauling contractor for IWA. The City collects garbage and recycling from IWA's dumpsters and transports this material to the landfill. The landfill is approximately 27 miles northwest of the Airport in Scottsdale, Arizona.

Current Waste Reduction, Reuse, and Recycling Efforts

Waste Reduction

Also called "waste minimization," waste reduction refers to reducing the volume of waste produced at its source. Changing habits and current practices, such as printing and purchasing, can be an effective way to accomplish this. IWA staff currently employ the following practices to reduce the total amount of waste generated:

- ✓ Double-sided printing in administration offices
- ✓ Email and internal websites for inter-office communication
- ✓ Shared drives for storage of documents
- ✓ Computer software to receive fax messages
- ✓ Outsourcing large print jobs.

Reuse

In a waste management context, reuse refers to using materials and items more than once and as many times as possible before disposal. Reuse can include using items and materials for the original purpose or repurposing something for a different use. Reuse can require purchasing durable materials and items instead of disposable or single use options.

IWA currently reuses:

- ✓ Ceramic coffee mugs and durable silverware, plates, bowls, and cups (instead of plastic, paper, or Styrofoam) in breakrooms
- ✓ Office supplies, including inter-office envelopes
- ✓ Towels/rags in maintenance areas
- ✓ Office furniture.

Recycling

Using the infrastructure and resources described above, IWA currently recycles two streams: (1) cardboard and (2) glass, comingled paper, plastic bottles, and aluminum cans.

Terminal tenants generate most of the cardboard in the form of shipping boxes. The paper stream includes printer paper, mail, envelopes, and other paper from the offices of the Airport Administration Building as well as paper items, such as newspapers and magazines, collected in the public areas of the terminal facilities. The plastic, aluminum, and glass streams are primarily made up of beverage containers, collected from the public areas of the terminal, the administration offices, and food and beverage concessions.

Construction and Demolition Debris, Green Waste, and Other Waste

IWA currently reuses and recycles the waste generated during construction projects, where possible. For example, IWA used recycled concrete as the basecourse for the North Apron Project.

Tenant Efforts

In addition to the recycling program operated by IWA, tenants may be recycling on their own. In some instances, these tenants may be using IWA's bins, carts, and dumpsters.

Tracking and Performance

IWA maintains an inventory of dumpsters, recycling barrels, and cardboard bins collected by the City. Trash and cardboard recycling costs are tracked by IWA and are regarded as utility expenses. Typically, the costs of collection services provided are consistent, unless special dumpsters, such as roll-offs or recycling bins, are requested. Additional non-scheduled collection services may also affect normal monthly expenses. IWA does not currently track overall waste generation or recycled material volume. At present, IWA does not have specific waste or recycling objectives, targets, or goals.

Waste Audit

The consultant evaluated Airport information and records, as well as aviation industry waste and recycling trends, to identify the source, composition, and quantity of waste generated at IWA, including areas under IWA's direct control or influence. The consultant then used this information to identify opportunities to improve and monitor program effectiveness.

IWA provided information regarding:

- ✓ Airport buildings and facilities
- ✓ Areas that generate waste
- ✓ The types of waste generated in each area
- ✓ The materials that can be recycled under the current program.

IWA staff have informally observed passenger and employee waste and recycling related behaviors and, for this document, described generally how waste flows through the facility. The staff also described waste and recycling collection and hauling practices.

Quantity and Sources

According to invoices provided by IWA staff, the City collects nine 8-yard dumpsters, three times a week; four 8-yard dumpsters, once a week; two 6-yard dumpsters, twice a week; and twenty 6-yard dumpsters, once a week. Using conversion factors from the United States Environmental Protection Agency (EPA), approximately 138 pounds per cubic yard of garbage are collected. Assuming a load factor of 75 percent for each dumpster, the City collects approximately 5,000 pounds of garbage each week from the Airport, equating to 130 tons[1] each year.

There are twelve 6-yard cardboard dumpsters and five 8-yard dumpsters, which are each collected weekly. According to conversion factors from the EPA, uncompacted cardboard equates to 100 pounds per cubic yard. Assuming that each dumpster has a load factor of 75 percent, approximately 8,000 pounds of cardboard are collected each week, equating to an estimated 218 tons[2] of cardboard each year.

Due to the fluctuation in recycling roll-off carts provided by the Blue Barrel Recycling program, the exact quantity of the recyclable materials is not known. Assuming IWA rents six 40-gallon carts each month, with a load factor of 75 percent, and including conversion factors from the EPA, each cart is estimated to contain 230 pounds of recyclable material each week. If these carts are serviced weekly, then approximately 6 tons[3] of recyclable material is collected each year.

Together, the recyclable materials generated equates to approximately 224 tons each year. A total of 354 tons[4] of waste (recyclable material and garbage) is generated each year at IWA. Based on the waste and recycling data presented above, IWA's current recycling rate is about 60 percent.

Using the IWA estimated annual waste generation of 354 tons, the overall distribution of waste and recyclables from various areas and activities is likely similar to the distribution shown in **Table B-1**. The waste distribution percentages are based on industry averages for aviation facilities of similar sizes.

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1 According to the EPA, one cubic yard of municipal solid waste is equivalent to 138 lbs. 138 lbs. x 8-yard dumpster = 1104 lbs. x 75 %= 828 lbs. for each 8-yard dumpster. (828 lbs. x 3 pickups/week) = 2484 lbs./ week. (828 lbs. x 1 pickup/week) = 828 lbs./week. (621lbs x 2 pickups/week) = 1242 lbs./week. (621lbs. x 1 pickup/week) = 621 lbs./week. (2482+8282+1242+621=5175 lbs./week) x 52 weeks= 269,100 lbs./year. (130 tons/year)

2 According to the EPA, one cubic yard of uncompacted cardboard is equivalent to 100 lbs. 100 lbs. x 8-yards= 800 lbs. x 75%= 600. 5 dumpsters x 600 lbs.= 3,000 lbs. 100 lbs. x 6-yard dumpsters = 600 lbs. x 75%= 450 x 12 dumpsters= 5400 lbs. 5400 lbs.+3000 lbs.=8400 lbs. x 52 weeks =436800 lbs. (218 tons each year)

3 According to the EPA, one gallon of comingled recyclables is equivalent to 1.30 lbs. Multiply the 1.30 lbs. 40 gallons=51 lbs. x75%= 39 pounds x 6 carts= 234 lbs. each week. 234 lbs. x 52 weeks= 12,168 lbs/year (6.08 tons)

4 Based on the assumption that IWA rents six 40-gallon recycling carts each week.

Table B-1: Estimated Generation at IWA by Area/Activity

IWA Area/Activity	Estimated Percent (%)	Estimated Weight
Deplaned Waste	20	71 tons
Other Air Carrier Areas	24	85 tons
Administration	3	10 tons
Public Terminal Areas	35	124 tons
Tenant Areas/Concessions	18	64 tons
Total	100	354 tons

Note: "Other airline areas" includes breakrooms, ticketing counters, post-security and other air carrier specific use areas.

Based on this distribution, programs that focus on the air carrier and public areas may represent the best opportunities to reduce waste generation and increase landfill diversion. A physical waste sort could provide more detailed information about the amount and proportion of waste generated in total and by each area, activity, tenant, etc.

Composition

Based on the activities taking place at IWA, a varied waste stream can be expected. According to industry case studies and previous waste planning projects, an airport's waste stream is approximately 40 percent recyclable, 35 percent compostable, and 25 percent waste that cannot be recycled or composted due to current technologies and, as a result, must be placed in a landfill.

Table B-2 lists each area included in the scope of this plan and the type(s) of waste likely generated there, based on use and activity.

Table B-2: Phoenix-Mesa Gateway Airport Waste by Area and Material

Area | Material	Office Paper	Newspapers	Magazines	Plastic	Aluminum	Cardboard	Glass	Food Waste	Paper Products	Liquids	Toiletries	Packaging	Styrofoam	Metals	Deplaned Waste	Green / Yard Waste	Construction and	Other Waste
Public Terminal Areas Curbs, ticketing lobby, restrooms, security screening queuing area, sterile gate areas, public "meet and greet" spaces, baggage claim area, courtyards		x	x	x	x			x	x	x	x	x						x
Tenant Areas/Concessions Shops, food/beverage concession areas, and associated activities	x	x	x	x	x	x	x	x	x	x		x						x
Airline Areas/Deplaned Waste Offices, ticketing counters, gate stations, breakrooms, and underwing services	x	x	x	x	x	x		x	x	x		x			x			x
Rental Car Areas Offices, counters, return areas, service areas, breakrooms	x			x	x			x	x	x								x
TSA Spaces	x	x	x	x	x			x	x	x	x	x						x
PMGAA Administration Offices	x	x	x	x	x	x		x	x			x						x
PMGAA Maintenance and Operations Building	x							x	x			x		x	x	x	x	x
General Aviation Center Barrio Brewery, Tenant Facilities	x	x	x	x	x	x	x	x	x			x						x
Air Traffic Control Tower	x							x	x			x						x
Lynn Kusy Park					x			x	x	x						x		x

A physical waste sort could provide more detailed information about the specific composition of waste at IWA. This information may include:

- ✓ The types of items included in each general category
- ✓ The contamination rate of the recycling stream (items that are not recyclable in the recycling bins)
- ✓ The recovery rate for recycling (the proportion of recyclable items that are segregated properly).

The data from a waste audit can also be used to identify opportunities to improve the composition of the waste stream (by item substitution, by improving recycling to reduce the volume of waste, etc.).

The following sections describe in more detail some of the waste and recyclable materials generated at an airport like IWA: toiletries, food and beverages at security screening, and liquids throughout the facility.

Toiletries, Food, and Beverages – TSA Restrictions

The TSA restricts the volume of liquids, gels, and aerosols that can be carried onto an aircraft. Passengers are allowed 3-ounce containers of toiletries in one 1-quart baggie (3-1-1) in their carry-on luggage. Even though these restrictions have been in place for longer than 10 years, toiletries, beverages, and food items that do not meet the requirements are regularly found in passenger luggage during security screening.

When these items are found, the TSA gives passengers three options: pack the item in a checked bag, give the item to a non-traveling family member or friend, or forfeit the item. By law, the TSA cannot retain any items removed from passenger luggage, so items that are not repacked or handed off end up in the trash. In addition, when a restricted item is discovered in a passenger's carry-on or bag, the passenger may be subject to additional screening, which requires extra time and can interrupt the flow at a security screening checkpoint.

Some problematic items that end up in the trash at security checkpoints include: bottled water, other bottled or canned beverages, toothpaste (larger than travel size), shampoo and/or conditioner (larger than 3 ounces), sunscreen, and aloe gel. Some other, less obvious unallowable items are peanut butter, yogurt, applesauce, and maple syrup.

Liquids

Liquids contaminate and degrade other materials within the recycling stream and add weight to recycling or waste streams where they are found. In some cases, liquids are thrown away in their containers, which means the recyclable material found in water bottles, aluminum soda cans, and plastic beverage containers is not captured for recycling.

Purchases

IWA does not currently track the quantity and type of disposable items and supplies purchased for the facility. This information could provide insight on some of the materials coming into IWA, which will go back out as waste (other materials are brought on-site by passengers, employees, and vendors).

IWA provided a list of reoccurring purchases that includes:

- ✓ Limited orders of paper products including napkins, paper towels, paper plates
- ✓ Toilet paper, paper towels, and scented urinal screens for restroom facilities
- ✓ Office/printer/plotter paper of varying sizes
- ✓ Printer toner cartridges
- ✓ Plastic liners for all trash receptacles
- ✓ Bathroom air fresheners
- ✓ Plastic water bottles provided for guests and meetings.

REVIEW OF WASTE MANAGEMENT CONTRACTS

As mentioned previously, the FMRA lists the review of waste management contracts as an element of addressing solid waste recycling at an airport. The FAA memorandum titled "Guidance on Airport Recycling, Reuse, and Waste Reduction Plans" explains that the purpose of reviewing these contracts is to "identify opportunities for improving (waste) program scope and efficiency, as well as identify constraints."

In general, the IWA contracts and leases address housekeeping requirements and related expectations for managing trash and provide limited information about recycling. These contracts and leases do not necessarily impede recycling or other waste management strategies; however, they do not explicitly require conformance with or support of IWA's recycling and related efforts. The following sections describe the content of various contracts related to waste and recycling at IWA.

Custodial and Waste Hauling Contracts

As mentioned in "Operations and Maintenance/Roles and Responsibilities" (above), IWA contracts with Flagship for janitorial services for the areas under airport control. This is a contract to "complete janitorial cleaning services required to maintain a clean, sanitary, and safe environment" at IWA.

IWA is responsible for supplying expendable supplies, such as toilet tissue, paper towels, soap, trash liners, and other similar items for the janitorial services. The janitorial contractor is responsible for providing the labor, equipment, cleaning supplies, and any other materials needed to maintain a sanitary environment at IWA.

This agreement references basic requirements pertaining to trash removal and janitorial activities at IWA. The daily duties include cleaning the public areas, and the emptying of trash and recycling bins in the restrooms, general seating areas, walkways, courtyards, and curbside areas. The specific buildings included in this contract include:

- ✓ GA Center
- ✓ Terminal Areas (both terminals, courtyards, and annex)
- ✓ GA Center-U.S. Customs Office
- ✓ GA Center-Badging Office
- ✓ Airport Administration Building (public area and secure area)
- ✓ ATCT
- ✓ Maintenance Building
- ✓ Fuel Storage Facility
- ✓ Hangar 46 (GA area)
- ✓ Lynn Kusy Park
- ✓ Car Care Facility

The contract states that the terminal areas, the GA Center, and the ATCT and portions of the Airport Administration Building, Operations & Maintenance Building, Fuel Storage Facility, and Hangar 46 are cleaned daily. This contract requires the Tenant to provide the supplies for the janitorial services. This agreement requires the contents of the recycling containers to not be comingled. It also requires for each paper recycling container to be emptied on the days that the cleaning tasks are scheduled to be performed. Flagship is responsible for emptying the trash receptacles and paper recycling containers in all contracted facilities except Hangar 46. Flagship is only contracted to provide restroom maintenance and restock supplies in Hangar 24 and the Rental Car Care Facility. There are two trash receptacles in Lynn Kusy Park that Flagship is contracted to empty daily. There are no paper recycling containers located in Lynn Kusy Park.

IWA has a contract with the City for trash and recycling services at IWA. The City of Mesa offers several services, including compactor services. This agreement was not provided to the Consultant for review. The City is responsible for collecting the trash and recycling from the outside dumpsters.

Tenant Leases and Service Contracts

- ✓ An example of a land lease was provided. Section 8 "Maintenance" in the lease agreement requires the Lessee to "keep the Premises in a neat, clean, safe, sanitary and orderly condition and shall keep such area free of all trash and debris. Lessee shall be responsible for all trash removal from the Premises and Lessee shall deposit all trash and debris only at collection stations located on or in proximity to the Premises, in accordance with City Code." This agreement also requires the Lessee to pay for all utilities, including trash collection, used at IWA.
- ✓ A second example agreement of a facility lease requires the Lessee to keep the area clean and free of all trash and debris. It also states that the Lessee is responsible for all trash removal from the Premises and that trash be disposed of no less than weekly at IWA. This agreement also requires the Lessee to pay for all utilities, including the trash collection, used in its operations on Airport property.

Language in both IWA leases requires tenants to comply with the *Airport Minimum Standards* and *Airport Authority Rules and Regulations.* The *Airport Authority Rules and Regulations* encourages tenants to participate in recycling trash. The rules and regulations document goes on to refer tenants to the City of Mesa's Blue Barrel Recycling Program for a list of recyclable trash items, and requires tenants to:

1) Keep hangars, shops, offices, other buildings, and areas adjacent thereto free of waste material, rubbish, junk, landscaping litter and flammable material.
2) Place and maintain trash receptacles in the public areas of their premises, and other areas where necessary to promote and encourage the proper disposal of trash.

Expiring Leases and Contracts

The janitorial contract between IWA and Flagship is in effect until September 2020. Facility leases are binding for a maximum of 5 years. Ground leases are binding for a mandatory 25 years. There are currently no expiring leases or contracts.

An expiring lease or contract, as outlined in the FAA guidance memo, "can signal IWA's next opportunity to add recycling, reuse, and waste reduction objectives to existing leases and contracts." To pursue implementation of waste reduction requirements or a program, IWA reserves the right to amend the current leases and contracts.

Funding

IWA's operating budget provides funds for waste and recycling collection within facilities. PMGAA provides funds for the waste and recycling collection from airport facilities and the transmittal of collected waste and recycling to outside airport dumpsters and recycling barrels. PMGAA also provides funds for the collection and removal services for all waste and recyclable material by the City. As part of a tenant's lease, many tenants are financially responsible for their trash collection. IWA does not currently receive payment or rebates for recycled materials.

RECYCLING FEASIBILITY

Many factors impact the feasibility of recycling at IWA; some are universal, and others are specific to the facility. The following sections describe the more influential of these factors.

Commitment and Support

The willingness of IWA and its contractors and tenants to commit to and support the facility's recycling program is critical to the success of such a program. Without the commitment of resources such as funding, labor, time, space, and access to secure areas, a waste management program could struggle.

Airport Policy and Contractor Dedication

PMGAA has supported the recycling program in the past, and it is expected that this will continue in the foreseeable future.

The City of Mesa Environmental Management and Sustainability Department is dedicated to "building a sustainable community." The City's commitments and goals align with continued support of PMGAA and IWA's waste program.

Airline Policies

According to WestJet's website, WestJet Airlines is "committed to growing responsibly and ensuring that [WestJet is] an environmentally sustainable airline." WestJet completed a Corporate Social Responsibility report that included an environment section detailing the sustainability efforts, which include waste management practices. The report states that WestJet Airlines takes "care of the environment by committing to meet the requirements of environmental regulations, implement environmental management processes that control and minimize [their] environmental impacts and continuously improve [their] environmental performance through regular reviews and evaluations following [their] environmental policy."

WestJet is headquartered in Calgary, Canada, and has a materials management program that includes a principle to "minimize the use of materials and creation of waste." Recycling bins are located throughout the Calgary Campus including the hangar. Paper, cardboard, metal, plastic, and alkaline batteries are recycled at the campus. The food facilities further participate in waste management efforts by collecting and composting organic waste.

Within WestJet's Corporate Social Responsibility report, WestJet acknowledges recycling at airports is managed by the respective airport authority. The document states, "WestJet continues to work with airport authorities, other air carriers and government in support of recycling initiatives at the local level and for the industry as a whole." Swoop is a subsidiary of WestJet and may adhere to the WestJet's practices, though no public information on sustainability practices was identified for Swoop.

No public information was found detailing waste management practices for Allegiant or Swoop, however Swoop is a subsidiary of WestJet Airlines, Inc. Though no information was found for Allegiant, during information interviews Allegiant staff described the process for separating recyclables in flight and during cabin cleaning activities. Currently, Allegiant collects and recycles cans. Per the Airport's inventory of waste and recycling infrastructure, Allegiant pays for the collection of a cardboard recycling receptacle.

Offering recycling for deplaned waste at IWA aligns the Airport with its air carrier partners.

Technical and Economic Factors

Local Markets and Infrastructure

Markets for recycled materials fluctuate widely based on many factors and interactions. Local waste haulers typically accept materials that can be recycled cost-effectively in the area. Manufacturers purchasing recycled material want it to be predictable and ready for use; therefore, recycling facilities are particular about what materials they accept and prefer materials that are of high value, clean, and easy to separate.

The materials listed in **Table B-3** are currently accepted under the City's commercial recycling program. As noted above, inclusion in such programs typically indicates that the market and/or infrastructure for these materials is strong. IWA currently recycles all the materials that the City's commercial recycling program accepts. Material markets have recently been impacted by international trade restrictions; IWA should confirm acceptable materials with the City of Mesa on a regular basis.

Table B-3: Materials Accepted for Commercial Recycling in the City of Mesa

Material	Description
Paper	Mail, envelopes, computer/writing paper, magazines, newspapers, telephone books, catalogs, cardboard, paperboard (file folders)
Plastics	Cups, disposable plastic cups, "clamshell" food containers (produce, baked goods, etc.) No Styrofoam, plastic bags, or film
Glass	Bottles and jars containing a food or beverage when purchased
Metal	Cans containing a food or beverage when purchased
Source: City of Mesa Blue Barrel Recycling for Businesses ***https://www.mesaaz.gov/business/trash-recycling-for-business/recycle-service***	

Maricopa County operates nine landfills, thirteen transfer stations, and two transfer station recycling centers. There is only one transfer station in the Mesa area.

Logistical Considerations and Constraints

To maintain a waste program at IWA, certain elements must be in place. These include:

- ✓ A proactive and engaged janitorial staff
- ✓ A willing and affordable hauling contractor
- ✓ Space for bins, dumpsters, and compactors
- ✓ Access to secure areas of the facility (including airside ramps and sterile terminal areas).

At this time, these elements appear unconstrained. Additional resources including custodial labor, waste hauling services, space, and airport access are anticipated to be available to support the continuation and/or expansion of the waste program at IWA.

Contractual Issues

Any major contractual issues with maintaining and improving the recycling program at IWA are not anticipated. IWA and the City will need to continue to collaborate to support the facility's waste program.

Recycling, Landfill, and Energy-from-Waste Facility Requirements

The Materials Recovery Facility/landfill that accepts waste from IWA has specific acceptance criteria and requirements. Adherence to these specifications protects the safety of employees handling these materials; the integrity and operation of the equipment and infrastructure used to transfer, sort, and convert these materials; and the value of the recyclable stream. Components that seem recyclable (plastic, glass, or metal parts) comprise some items generated at IWA; however, the recycling facility has specific material standards, so it is important that non-recyclable items are not included in the facility's recycling stream.

Waste items that may be generated at IWA, but are prohibited at the recycling facility or prohibited from the City's recycling program include:

- ✓ Styrofoam
- ✓ Plastic bags
- ✓ Saran™ wrap
- ✓ Paper/plastic plates
- ✓ Paper napkins
- ✓ Paper/plastic cups
- ✓ Waxed cardboard
- ✓ Liquid in container
- ✓ Lightbulbs
- ✓ Other garbage

Some waste items cannot be recycled or landfilled, for example hazardous waste and chemicals, paint, and C&D waste. These items must be managed through hazardous waste or universal waste programs or disposed of at a specialized landfill. Salt River Landfill requires any waste that is not typical of household waste, including petroleum contaminated soil, industrial waste, and agricultural waste, to be preapproved prior to acceptance at the landfill.

Costs

IWA strives to be as self-sustaining as feasible; therefore, it is imperative that programs implemented and maintained at the facility, including recycling, are as cost-effective as possible.

Guidelines and Policies

To evaluate IWA's existing recycling plan in the context of local, state, and national requirements, the consultant reviewed federal, State of Arizona, and local waste and recycling regulations and policies/factors.

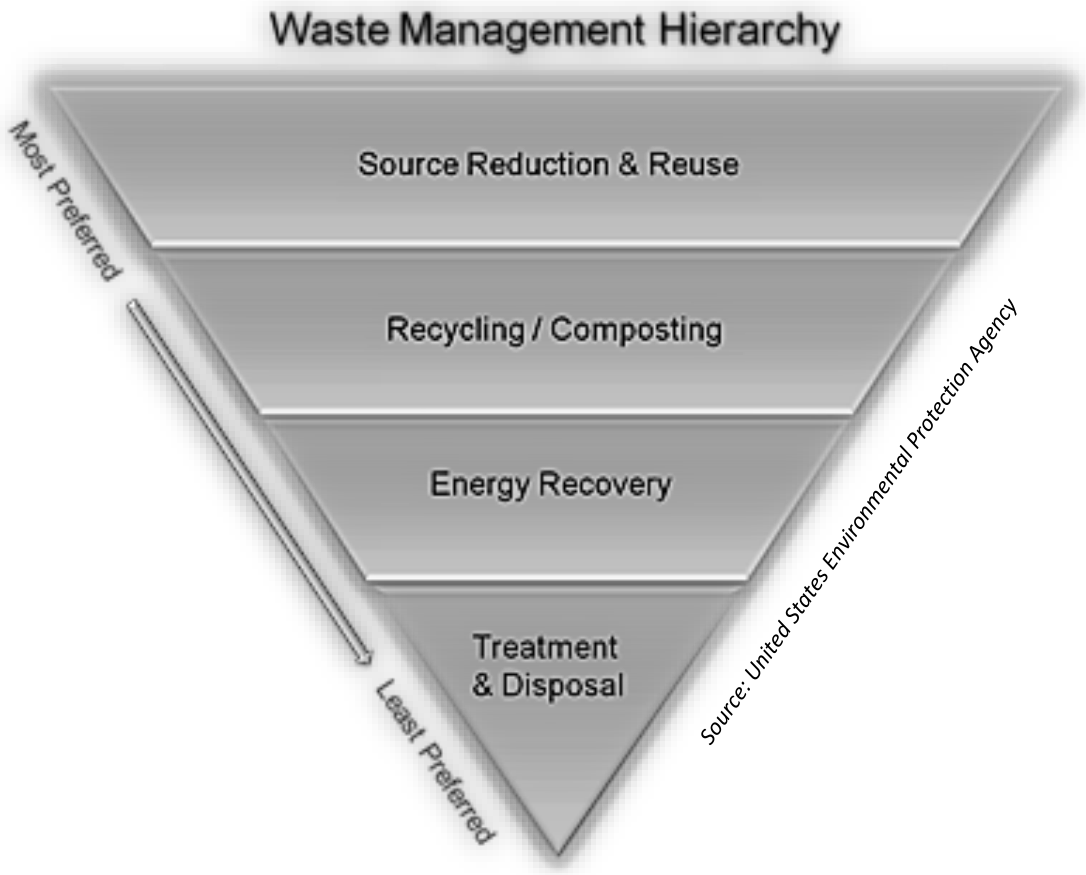
Federal

At the federal level, the EPA is responsible for developing a solid waste management program under the Resource Conservation and Recovery Act (RCRA) and related policies and guidance. RCRA provides the framework for management of hazardous and non-hazardous waste. All generators of hazardous waste, including airports, are required to comply with RCRA and all other federal waste laws and regulations.

As described previously, the FAA's definition of airport planning was updated in 2012 through FMRA to include planning for recycling and waste minimization. The Airport is required to address solid waste as part of airport master planning. The FAA provides guidance on airport waste and recycling in the September 2014 memo on the topic as well as in a synthesis document prepared in 2013 (both available on the FAA's website).

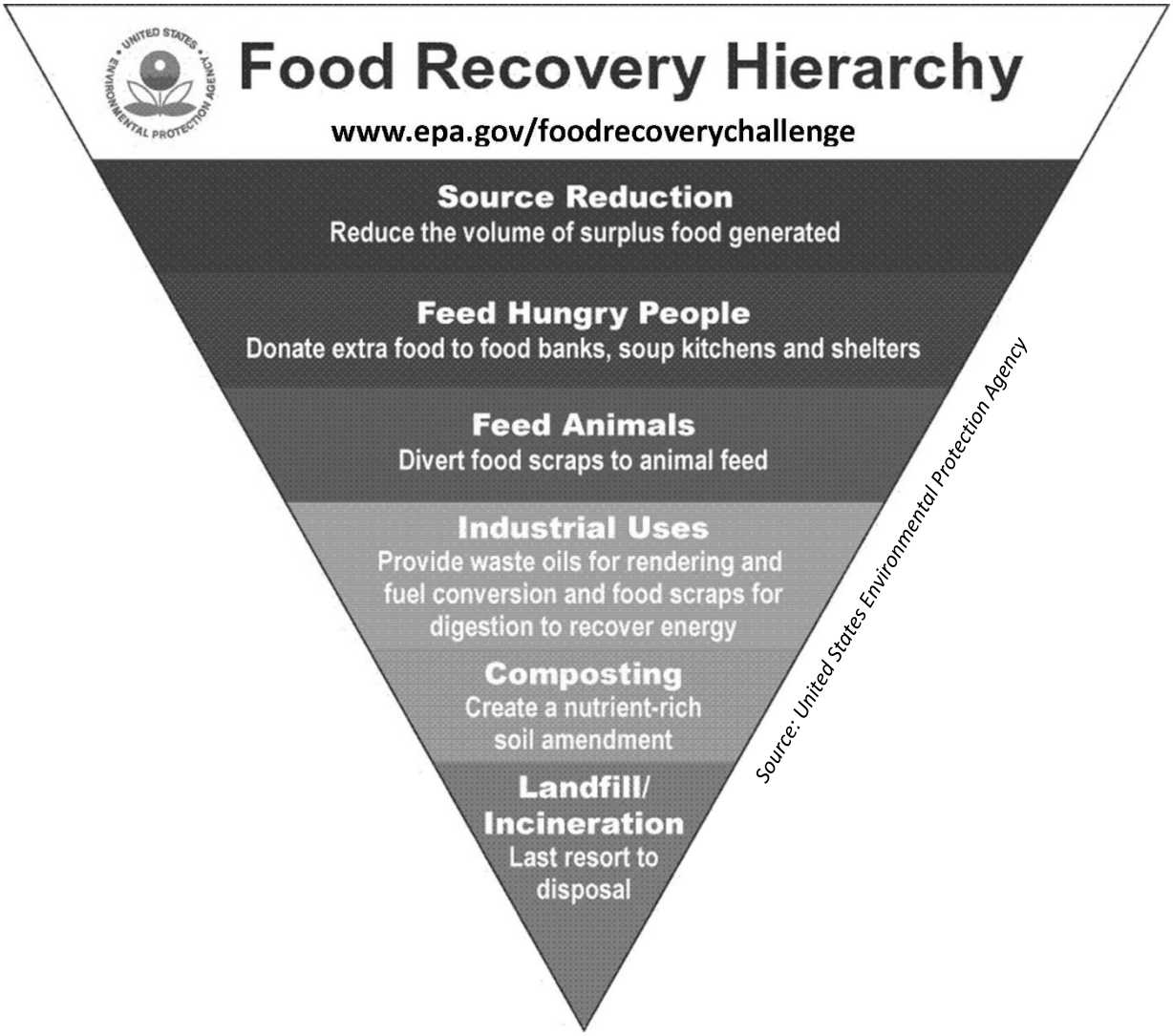
The EPA has developed a hierarchy of waste management strategies. This hierarchy ranks these strategies from most- to least-environmentally preferred and places emphasis on reducing, reusing, and recycling (**Figure B-18**).

Figure B-18: Waste Management Hierarchy



In addition to the general waste management hierarchy, the EPA has also developed a preference ranking of management strategies for food waste (**Figure B-19**).

Figure B-19: Food Recovery Hierarchy



State

The State of Arizona does not currently require cities nor counties to recycle, reduce, or reuse material unless the business is a "consumer of newsprint." According to Arizona § 49-831, a consumer of newsprint is "a person who uses newsprint in a commercial printing operation or in a commercial publishing operation."

Arizona § 49.834, *Use of Recycled Newsprint*, requires a consumer of newsprint to "ensure that the newsprint purchased by that consumer in a fiscal year contains an average of at least forty percent recycled-content newsprint if all of the following apply:

1) Recycled-content newsprint is available at a comparable price to that of newsprint made from virgin material.

2) The recycled-content newsprint meets the reasonable quality requirements of the consumer of newsprint.
3) The recycled-content newsprint is available within a reasonable period of time."

Though there are no recycling, reduction, or reuse requirements, Arizona §49-833, requires the Department of Environmental Quality (the Department) to "implement and conduct a program of public education and provide information to increase awareness of individual responsibility for properly reducing and disposing of solid waste and to encourage participation in recycling, reuse and source reduction." Arizona § 49-835 requires the Department to develop and administer educational materials to encourage the recycling and proper disposal of plastics. No waste reduction goals were identified within Arizona statutes.

Local

Maricopa County operates nine landfills. The city of Mesa uses the Salt River landfill, which is expected to have capacity until 2032 based on the utilization of bioreactor technology. According to the landfill's website, "In January 2008, the construction of the gas pipeline connecting [the] facility's landfill gas collection system to the Tri-Cities Generating Plant was completed. This [allowed] the landfill gas to be beneficially converted into power, and greatly reduce or eliminate the need to burn off the gas. In addition, on March 19, 2009, the landfill received EPA approval of its Research Development and Demonstration Project to operate the landfill's Phase VI as a Bioreactor. This process speeds up the decomposition of waste thereby reducing the time period the landfill generates gas and leachate. It will also allow for additional waste placement. As the existing waste decomposes, it will reduce in volume freeing up space."

Title 3, Chapter 8 of the *Mesa City Code*, *Solid Waste,* (the ordinance or Mesa City Code) discusses solid waste and recycling. The ordinance requires every person, owner, tenant, or occupant within city limits to properly control and dispose of all solid waste produced at any and all premises. The ordinance lists the collection agency of solid waste within city limits as the city of Mesa or a certified private hauler. The City is responsible for furnishing containers for solid waste to residential and commercial customers. Residential recycling is detailed within the ordinance under Article III, Residential Recycling Program, and Article IV, Residential Green Waste Recycling Program. Neither residential recycling practice is required of residents. The ordinance does not discuss commercial recycling, and therefore, recycling is also not required of commercial tenants. Though commercial recycling is not addressed, the ordinance notes that the Residential Recycling Program uses the Blue Barrel Recycling Program that is also used by the Airport for commercial recycling. There are no differences in acceptable recyclable material. No waste reduction goals were identified within the Mesa City Code.

The City of Mesa's General Plan states several goals regarding sustainability and environmental protection. A continued goal is "…to reduce solid waste from residences and businesses as well as construction waste through recycling and other strategies." The City recycled over 269,000 tons in fiscal year 2012-2013 of commercial and residential waste.

Based on the availability of residential and commercial recycling, the project team assumes the residents of the communities surrounding the airport, and therefore, the employees and passengers, have been exposed to recycling, receive on-going messaging about its importance, and are generally supportive of recycling efforts.

Other Incentives

The City receives revenue for every ton of material recycled. The generated revenue is deposited into the City's general fund that helps supports services and infrastructure provided including parks, libraries, street maintenance, and emergency response. By continuing to align with the City's recycling efforts, IWA supports the local community.

Cost Savings or Revenue Generation

The costs associated with a recycling program depend on available infrastructure, material markets, and the type of waste generated at a facility. These costs sometimes include capital costs for containers, landfill tipping fees, hauling costs, material rebates, and labor. An evaluation of the potential cost savings and revenue generation opportunities is required for an Airport Recycling, Reuse, and Waste Reduction Plan according to FMRA.

IWA staff provided garbage collection invoices and a trash container inventory list for review under this project. The invoices included costs for solid waste pick-up each month. Additional fees are included in the invoices, such as the State Environmental Mandate Fee of approximately $7. Based on information provided, cardboard pick-up costs approximately $75 each month, equating to $900 each year. The collection of the garbage dumpsters costs approximately $3,000 each month, equating to $36,000 each year. Fluctuation in monthly waste collection charges at IWA is due to the procurement of roll-off carts. During the six-month span presented in the invoices, 30-yard and 40-gallon roll-off carts were acquired for the recyclable material, some of which are used for green waste, and ranged approximately $230 to $345 for the collection of each roll-off cart. Additional information would be required in order to provide IWA with the estimated cost savings that would be generated from increasing their recycling rate.

After supplementing the information compiled and analyzed in this document, IWA can make informed solid waste management decisions over time. Using the information provided in this plan and cost information available, IWA can begin to analyze the program's financials, evaluate costs, and determine if enhancements should be implemented. If expansion of the program is not technically or economically feasible at this time, this information will help IWA determine when improvements might be feasible.

RECOMMENDATIONS

This section documents recommendations for IWA, including waste reduction, reuse, and recycling strategies, based on the information presented earlier, specifically the waste audit and feasibility discussion.

Objectives and Targets

It is recommended that IWA set specific, measurable, achievable, realistic, and time-bound (SMART) goals for its waste program. Having an established set of objectives and targets provides a basis and foundation for subsequent activities and actions. Progress toward such goals does require tracking, but can also provide information on progress and improvements, which can be a valuable marketing and education tool.

The waste source, quantity, and composition information in prior sections provides baseline data for establishing objectives and targets, and the *State* section describes the goal and target established by the State of Arizona. The objectives and targets derived from this information can be used to calculate target levels for IWA. A physical material sort would further inform goal-setting efforts.

These are potential objectives and targets IWA might adopt or use as inspiration for other goals:

- ✓ 100 percent of tenant leases include recycling provisions
- ✓ 100 percent of IWA employees complete simple training on recycling program (more details later in this section).

In the absence of established specific objectives and targets, the following sections present general, universal recommendations for increasing recycling and reducing waste generation at an airport like IWA.

Tracking and Reporting

IWA does not currently track metrics associated with the waste management program. It is recommended that IWA begin to regularly estimate and track the volume of waste sent to the landfill and the volume of material collected for recycling as well as the costs associated with these services. IWA should request actual weight data from the recycling and waste haulers. If this data is not available, IWA should estimate and record the approximate fill level (0%, 25%, 50%, 75% or 100%) of each container just before pick-up. Then, on a monthly or quarterly basis, the fill levels should be multiplied by the capacity of the dumpster or cart and by the material conversion factors (available from the EPA) to get an estimated volume and weight for each pick up and a monthly grand total. Using this information, trends associated with waste generation, landfill, recycling, and cost can be assessed for issues or opportunities for improvement.

IWA's waste and recycling performance is not currently reported to stakeholders. It is recommended that IWA proactively provide this information to management, employees, tenants, and interested external stakeholders on a regular basis.

The purposes of this reporting are:

- ✓ To remind management employees, tenants, and contractors about the waste program
- ✓ To communicate IWA's commitment to its waste program and its broader commitment to sustainability
- ✓ To solicit feedback and suggestions for improving the recycling program.

The frequency of reporting is up to IWA, but it is recommended that reporting be completed at least annually. The reporting schedule should also be updated as needed to accommodate changes to the program. The schedule is expected to initially increase in frequency as the program evolves and new strategies are implemented, and then potentially return to a lesser frequency as the program is maintained.

Reduce and Reuse

To reduce the facility's environmental impacts, IWA should focus on moving materials up the waste management hierarchy. Waste reduction is the most preferred waste management strategy as determined by the EPA. Waste reduction can be accomplished in many ways, including reusing items.

It is recommended that IWA evaluate the following reduction and reuse strategies to determine which, if any, are feasible and prudent for implantation.

- ✓ Substituting disposable items with durable alternatives in the administration office and other staff work areas
- ✓ Reusing items and materials where possible
- ✓ Working with the restaurant tenant to donate edible food to a community food security organization
- ✓ Collecting and donating unopened food, beverage, and toiletry items subject to TSA restrictions
- ✓ Encouraging reuse by passengers, tenants, and contractors.

Liquids

IWA currently has a liquid collection station as well as a bottle collection station. These stations have colorful, graphic signs to encourage passengers to recycle disposable water bottles if they do not wish to refill them. It is recommended that IWA continue this process pre-security and throughout the terminal in order to decrease the amount of liquids in recycling or trash containers.

Donation of Food, Beverages, and Toiletries

It is recommended that IWA work with the food and beverage concessionaire to assess the possibility of donating edible food to a local food bank, soup kitchen, or shelter for distribution to the populations they serve. Feeding people is the second preferred strategy for addressing food waste according to the EPA. Federal and state laws protect organizations that donate food in good faith from liability. Some organizations will pick up food at the source, which reduces the demand on IWA and the concessionaire.

It is recommended that IWA investigate the feasibility of collecting unopened bottles of water, other beverages, food and toiletries that are restricted from carry-on luggage and donating them to a local charity or other organization. These items can be very heavy and add weight to the waste stream.

In compliance with TSA requirements, these items may need to be collected prior to the security checkpoint queuing area. IWA would collect these items by locating a container at the security checkpoint and managing storage of the items until the receiving organization could collect them. To implement this recommendation, coordination between IWA, the designated receiving organization, and the TSA would be needed. An example of an Airport with such a program is McCarran International Airport in Las Vegas, Nevada (**Figure B-20**).

Recycle and Compost

Recycling is the second preferred waste management strategy, according to the EPA, after waste reduction/reuse. Recycling allows waste items to be processed into raw materials to make new products. The FAA guidance expects an airport's recycling, reuse, and waste reduction plan to document, at a minimum, the facility's existing program to recycle paper, plastic bottles, aluminum cans, and plastic cups. The Airport recycles most of these materials as well as cardboard and glass. Note: In light of recent changes to international waste export restrictions, It is recommended that IWA coordinate with the City of Mesa on a regular basis to maintain alignment with the City program's accepted and priority materials.

Figure B-20: Example Donation Collection at McCarran International Airport (LAS)

Paper

IWA is currently recycling paper (printer paper, mail, envelopes, and other items) collected from the administration offices as well as from the terminal areas (newspapers and magazines). Paper is also recycled from the other Airport buildings (the GA Center, ATCT, Maintenance and Operations Building, and fuel storage facilities). These paper streams are comingled with other recyclables.

Managing recyclable paper separately from plastic bottles and aluminum cans protects the value of the paper stream and increases its recycling potential by minimizing contamination from liquids and creating a stream that may not need to be sorted. It is recommended that IWA ask the City about adding non-shredded office paper, newspapers, or magazines to the shredded paper collection.

It is also recommended that IWA expand the program to additional areas, including the air carrier and rental car company offices, and encourage increased recycling of paper by employees, tenants, and passengers. Doing so reduces the environmental impacts associated with landfilling this material and manufacturing virgin paper.

Waste magazines and newspapers are generated aboard commercial flights and when they expire on the newsstand; it is recommended that IWA collaborate and coordinate with the air carriers and concession tenant serving IWA to evaluate adding paper items from deplaned waste and newsstands to this program.

Plastic Bottles and Aluminum Cans

IWA is currently recycling plastic bottles and aluminum cans collected in the terminal, administration offices, GA Center, ATCT, Maintenance and Operations Building, and fuel storage facilities.

It is recommended that IWA continue the current program and expand to additional areas.

Plastic bottles are also generated aboard commercial flights; it is recommended that IWA collaborate and coordinate with the airlines serving IWA to evaluate adding plastic bottles from deplaned waste to this program.

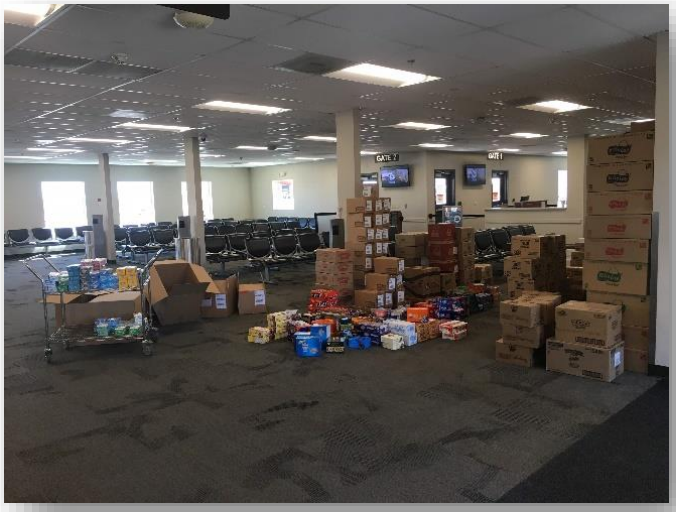
Plastic cups

Plastic cups are typically generated aboard commercial flights and in the concession areas. It is recommended that IWA collaborate and coordinate with the air carriers serving IWA and the restaurant tenants to evaluate adding plastic cups from deplaned waste to the recycling program.

Cardboard

IWA currently recycles cardboard collected from the terminal food and beverage tenants (**Figure B-21**), administration offices, GA Center, ATCT, Maintenance and Operations Building, and fuel storage facilities. This material is collected and managed separately from the comingled recyclables; this protects the value of the cardboard material by creating a single material stream (more desirable because it reduced contamination from liquids and requires less processing after collection). It is recommended that IWA continue to recycle cardboard. It is also recommended that IWA provide feedback to the tenants on the progress and performance of this program and solicit their feedback regarding improvements that could be made to increase or support their participation. Marketing this program to all the terminal tenants could result in additional participation and remind existing participants of the program's specific requirements.

Figure B-21: Cardboard boxes for food and beverage tenants



Glass

IWA currently recycles glass collected from the terminal restaurant tenant, administration offices, GA Center, ATCT, Maintenance and Operations Building, and fuel storage facilities. This material is collected and comingled with the metal and plastic streams. It is recommended that IWA separate the glass from other recycling streams. This will help reduce the contamination of the other recyclable materials and protect the value of other material by reducing contamination glass. It is also recommended that IWA provide feedback to the tenants on the progress and performance of this program and solicit their feedback regarding improvements that could be made to increase or support their participation.

Other Recyclables

As other recyclable materials are identified in IWA's waste stream, it is recommended that IWA work with the waste hauling contractor to design and implement strategies to separate, collect, and process these materials.

Green Waste

Roll-off carts have been acquired by IWA in the past for the disposal of green waste. For normal landscaping operations, green waste is the responsibility of the landscaping contractor for IWA. It is recommended that IWA continue to evaluate how green waste is managed by contractors and explore opportunities to align the facility's practices with the waste hierarchy. For example, green waste can be managed by reducing the generation of this material at the source (mulching lawnmowers), reusing material where possible (chipped branches as mulch), composting (via the local facility), and disposing of the material on or off site as a last resort.

Food Waste Composting

According to industry case studies, food waste is typically a major component of the waste stream at an Airport (on average, 35 percent). The EPA's food recovery hierarchy assigns priority to composting of food waste over landfill of this material (after using it to feed people as discussed under Reduce and Reuse). Composting is the process of decomposing food and other waste into a nutritious soil additive.

Composting of food waste at IWA is largely dependent on the availability of a local composting facility interested in accepting this material. There does not appear to be a commercial composting facility in the area.

If a composting facility is found or established in the area, IWA should evaluate whether to implement composting. In a terminal, pre-consumer food waste (waste generated by food preparation activities) is generally easier to compost because restaurant employees are at a facility more frequently and more regularly than passengers, so they are easier to train and educate on composting practices and requirements. The specific items accepted by a composting facility are dependent on that facility's design and the process used to break down the waste; some facilities accept all food waste (including meat and bones and breads) while others accept only vegetables and fruit.

One option for easing into composting gradually is to first implement a composting program for coffee grounds generated by restaurants in the terminal. Coffee grounds have a pleasant odor, are easily identifiable (therefore easy to separate), are typically uncontaminated by other materials, and are generated in a predictable manner and quantity. Once tenants are comfortable composting coffee grounds, other materials can be added by name (banana peels, apple cores, etc.) and/or by type (fruits, vegetables, etc.) until all food waste appropriate for composting is included.

Paper Products

Once a commercial composting facility is available in the area, IWA may wish to collect paper towels and other paper products (napkins and tissues) for composting. Composting is environmentally preferred over landfilling this material.

Because IWA's restrooms are equipped with paper towel dispensers and nearby garbage cans, the waste stream collected in these cans will primarily consist of paper towel. This stream can be expected to contain low contamination and a steady volume of material, making it an attractive material for composting.

No modifications to the paper towel dispensers or garbage bins would be needed to implement paper towel composting. Alternative bins would need to be conveniently located and clearly labeled to accept other waste generated in the restrooms that is not paper towel, and the bins reserved for paper towel should be labeled "Paper Towel Only – Collected for Composting" (or similar) to instruct use and explain how this material is managed. IWA would also need a dedicated cart for this material and a procedure to collect and store it separately until it was collected by the waste hauling contractor for delivery to the composting facility.

Education and Outreach

Under the existing program, education of and outreach to IWA employees, tenants, contractors and passengers is primarily accomplished through container signage in the terminal.

To supplement these efforts, it is recommended that IWA improve the in-terminal messaging for passengers and provide brief, clear instructions for recycling. Providing clear, instructional signage at the recycling stations or recycling bins can improve passenger participation and reduce contamination. See the section below for information about signage.

It is recommended that IWA provide simple, on-going training for employees, tenants, and contractors that explains the recycling program, including its purpose and requirements. Such a training program will promote program participation and compliance, resulting in increased recycling and reduced contamination. In addition, training can designate a contact and a mechanism to receive feedback and ideas for improvement.

The format of employee training could take any number of forms, including emails, meetings, posters, etc. The content of such training should include:

- ✓ Reminders about the materials that are accepted for recycling at the Airport and the location of the containers to be used for the program
- ✓ Information about purchasing requirements
- ✓ Information about the positive effect the program is having on IWA's environmental impact.

Information and participation from the waste collection contractor should also be incorporated into the training program. In addition, different stakeholders and organizations involved in collection, housekeeping, recycling, composting, and other waste activities could also be asked to provide content or to be present during training.

It is recommended that IWA include a brief overview of the recycling program during employee on-boarding training and recurrent refresher training at regular intervals. To use employee time as effectively as possible, waste training could be combined with other trainings or meetings.

IWA should consider providing introductory level information to new tenants and provide training materials such as postings, postcards, etc. to existing tenants for use with their employees. As some airport tenants may experience significant employee turnover, providing this information on a regular basis (for example, annually) will help keep everyone up to date on the program.

Once a training and education program is implemented, it is recommended that IWA actively maintain such a program to facilitate its continued success. The content of trainings should be updated as the program changes and grows.

Containers and Bins

There are few recycling bins in the terminal of which none are conjoined or collocated with garbage cans. Conjoined containers ensure a consistent format at every recycling station location; top facing signage and restrictive lids have also been shown to educate and instruct passengers to separate materials appropriately. Collocation of recycling containers with garbage cans has been shown to decrease contamination and increase recycling participation. It is recommended that IWA install additional recycling stations in high traffic areas of the terminal, as resources allow.

IWA should consider removing some of the stand-alone garbage cans inside the public areas of the terminal. There are many garbage cans in the terminal, and they are typically closer/more available than a recycling station; therefore, in many cases, it is more convenient for passengers, employees, and tenants to locate and use a garbage can for all materials than to find and use a recycling station. These containers could be repurposed as recycling containers in other spaces for comingled or single stream recyclables (in offices for paper, in breakrooms for bottles and cans, etc.). For remaining garbage cans, it is recommended that IWA move garbage cans next to recycling containers that do not currently have one paired with it, as space allows.

The recycling containers in other areas at IWA are typically blue and have varying sizes and designs. No major changes are recommended to the design of these bins other than to ensure they and their service schedule are right sized for the existing and future volume of material collected under the program and future improvements.

Because the janitorial staff conduct the day to day waste activities, their insight is valuable in improving and maintaining the recycling program at IWA. Particularly, asking staff which containers are underused or undersized can help inform changes to the location and size of existing and future recycling stations, recycling containers, and garbage cans.

Signage and Labeling

IWA's recycling signage could be expanded and improved. Signage and labeling for recycling bins in other areas of IWA is inconsistent or absent and could be improved with color, images, and short, clear, instructive text to improve understanding of which items are recyclable and which should be thrown away. IWA should consider providing signage adjacent to recycling bins in the terminal and other airport buildings that elaborates on IWA's waste program and provides direction.

Other Recommendations

Contracts and Leases

Contracts are a vehicle through which IWA can influence tenant behavior, including recycling. As contracts and leases expire, extend, or renew, it is recommended that IWA consider revising the new contract language to include waste management requirements or preferences, for example, support of the recycling program. This could be a general clause stating a preference that tenants reduce, reuse, and recycle where practicable or specific information about recycling, reuse, or waste reduction objectives and requirements.

Purchasing Policies and Requirements

IWA's existing purchases may create waste; specific purchase information was not available for this project. It is recommended that IWA (or PMGAA) consider adopting a purchasing policy that prioritizes items that are durable (versus disposable), reusable, recyclable, compostable, and/or made from recycled content. Once established, this policy could be shared with IWA's tenants to encourage their own adoption of sustainability-minded purchasing practices.

Additional Facilities and New Development

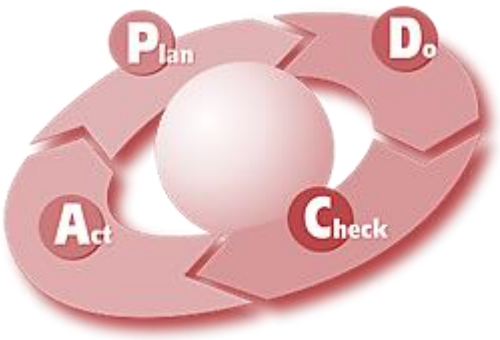
IWA may wish to consider expanding the recycling program to additional areas, for example, in the buildings and activities that were excluded from this plan. Expanding recycling and waste reduction to areas outside IWA's control or influence will require cooperation and collaboration with the operators of those areas as well as with their housekeeping and waste hauling contractors. Expansion could be as simple as encouraging these areas to recycle and acting as a resource for their questions or as complex as assisting these areas with an evaluation of their facility and/or container selection and signage design.

As IWA continues to grow, it is recommended that recycling and waste management be considered as a part of designing and constructing new development projects. This could be accomplished by establishing construction specifications that outline waste management requirements or preferences for projects (for example, any landfill diversion rate requirements or recycled-content material preferences) and involving the waste collection contractor in the design and planning of new facilities. The operation and maintenance of new facilities under the control or influence of IWA, once constructed, should be included in the waste program (for example new hangar development).

Any expansions of the existing program should be designed with care to maintain consistency and compatibility with the program in the terminal, administration offices, and other established areas.

Continuous Improvement

Figure B-22: Plan Do Check Act Cycle



It is recommended that IWA maintains and implements improvements to the recycling program by following the Plan Do Check Act Cycle (**Figure B-22**).

Plan

The recommended strategies and supporting references make up the "plan" portion of the process. Defining success, establishing materials and areas of focus, collecting baseline information (waste audit, surveys, etc.), identifying sub-goals, and identifying strategies are all part of planning. In the future, additional areas of focus, baseline measurements, and goals will likely be needed.

Do

Implementation of strategies included in this plan represents the "do" portion of the process. This involves implementing the recommendations in this plan and making progress toward achieving the goals. In "doing," IWA will continue developing a culture of awareness for waste management and will begin to shape the practices and processes for improving and optimizing its activities associated with reduction, reuse, recycling, composting, and other waste management elements at the facility.

Check

As strategies are implemented, the "check" portion of the process involves reporting that requires regularly tracking and checking the progress toward meeting the goals. IWA has finite resources (financial, staffing, capital, etc.); therefore, the management and tracking of the plan must not be unnecessarily arduous. If tracking and checking become too difficult or time consuming, the entire plan may suffer. Checking may require IWA to develop and use tools for measuring success and identifying areas for improvement, including a mechanism for feedback and process for reviewing suggestions.

The following scenarios may trigger re-evaluation of the program and/or the constraints described in this document:

- ✓ New state recycling laws, requirements, or goals
- ✓ New IWA programs or goals
- ✓ New City of Mesa programs or goals
- ✓ New Maricopa County programs or goals
- ✓ New local infrastructure, for example, composting facility
- ✓ Changes within or expiration of franchise agreement with waste hauling contractor(s).

Act

The "act" portion of the process encompasses taking what has been learned in the previous stages and actively responding. It can be helpful to ask, "What did we learn?" and "How can we do better next time?" By re-evaluating the strategies, activities, goals, and metrics, adjustments can be identified and put into action.

It is recommended that meetings on waste and recycling be held on a regular basis to drive the continuous improvement cycle (review the recycling program and plan and implement improvements/adjustments). It is further recommended that these meetings include a representative from each of the following areas: the waste hauling company, the air carriers serving IWA, the restaurant tenants, other terminal tenants, hangar tenants, the Mesa community, and the traveling public.

Recommendations Summary

The recommendations outlined in this document do not require major capital improvements and were designed to be compatible with IWA's in-progress master plan, the existing recycling program, and other airport requirements.

Table B-4 summarizes recommendations for IWA waste and recycling program.

Table B-4: Recommendations Summary

<table>
<tr><th colspan="2">IWA Waste and Recycling Program Recommendations</th></tr>
<tr><td>Objectives and Targets
- Set SMART goals.</td><td>Green Waste
- Evaluate how this material is managed and explore opportunities to align with the EPA hierarchy.</td></tr>
<tr><td rowspan="2">Tracking and Reporting
- Regularly estimate and track volume of waste to landfill, volume of material collected for recycling, recycling rate, and costs for waste and recycling services.
- Assess waste generation, landfill, recycling, and cost trends for issues or opportunities for improvement.
- Establish a regular reporting schedule; proactively provide information about the program.</td><td>Food Waste
- If a composting facility is established in the area, evaluate composting at IWA.
- Start with coffee grounds, then expand to other pre-consumer food waste.</td></tr>
<tr><td>Signage and Labeling
- Expand and improve signage to elaborate on the program and provide direction, specifically, in the checkpoint queuing area.</td></tr>
<tr><td rowspan="2">Reduce and Reuse
- Substitute disposable items with durable alternatives.
- Reuse items and materials.
- Continue to promote emptying of water bottles in the liquid collection stations.
- Work with the food and beverage tenants to donate edible food.
- Collect and donate unopened food, beverage, and toiletry items.
- Encourage reuse by passengers, tenants, and contractors.</td><td>Education and Outreach
- Improve in-terminal messaging for passengers.
- Provide clear, instructional signage at recycling stations.
- Provide simple, on-going training for employees, tenants, and contractors.</td></tr>
<tr><td>Contracts and Leases
- Revise or update new contract language to include waste management requirements/preferences.</td></tr>
<tr><td>Paper
- Continue the paper recycling program.
- Ask about adding non-shredded office paper, newspapers, and magazines to the shredded paper collection.
- Expand paper recycling program to additional areas, specifically airline deplaned newspapers and magazines and expired items from the newsstand.</td><td rowspan="2">Containers and Bins
- Install additional recycling stations in high traffic areas of the terminal.
- Right-size recycling bins and the service schedule in other areas.
- Collocate recycling bins and garbage cans.
- Remove stand-alone garbage cans in public areas of terminal.
- Standardize recycling bins and garbage cans as they are retired/replaced.
- Install additional recycling bins and garbage cans in other areas, as they are added to program.</td></tr>
<tr><td>Plastic Bottles and Aluminum Cans, Plastic Cups
- Continue the plastic bottle and aluminum can recycling program.
- Expand the program to additional areas, specifically airline deplaned beverage containers.
- Coordinate plastic cup recycling with the airlines serving IWA.</td></tr>
<tr><td>Cardboard
- Continue the cardboard recycling program.
- Provide feedback to tenants on the progress and performance of this program, solicit their feedback, and market the program to all tenants.</td><td>Purchasing Policies and Requirements
- Adopt a purchasing policy that prioritizes materials that are durable, reusable, recyclable, compostable, and/or made from recycled content.
- Share with tenants to encourage them to adopt their own similar practices.</td></tr>
</table>

Glass - Continue the glass recycling program. - Work to address contamination in this material stream. - Provide feedback to tenants on the progress and performance of this program and solicit their feedback.	Additional Facilities and New Development - Collaborate with operators of areas excluded from this plan to expand the program. - Consider recycling and waste management as part of designing and constructing new development.
Other Recyclables - Work with the waste hauling contractor to design and implement strategies for other materials as they are identified in the waste stream.	Continuous Improvement - Maintain and improve the recycling and waste program according to Plan Do Check Act cycle.
Paper Products - If a composting facility is established in the area, evaluate composting at IWA.	

CONCLUSION

IWA currently has a simple recycling program in place that includes basic elements and has the potential to be expanded in phases to further reduce the facility's environmental impact. This document has described the existing program and outlined recommended improvements that will allow IWA to potentially increase both landfill diversion and recycling volumes. In addition, this plan documents and supports IWA's compliance with the FMRA of 2012 and FAA guidance for recycling, reuse, and waste reduction.

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Phoenix-Mesa Gateway Airport

October 03, 2018

Mr. Kyler Erhard
Lead Program Manager
Federal Aviation Administration
Phoenix Airports District Office
3800 North Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

Subject: Phoenix-Mesa Gateway Airport Master Plan Update – Request for FAA Aviation Forecast Review and Approval

Dear Mr. Erhard:

The aviation activity forecasts prepared for the Phoenix-Mesa Gateway Airport (IWA) Master Plan Update (MPU) have been completed and are ready for Federal Aviation Administration (FAA) review and consideration for approval. The Master Plan forecasts include commercial aviation activity, consisting only of commercial passenger traffic, and non-commercial aviation activity, consisting of general aviation and military operations. Appendix A provides a summary of the methodologies used to develop forecasts for these two components of aviation activity at IWA. Appendix B summarizes the IWA MPU forecasts and Appendix C compares the IWA MPU forecasts with the Terminal Area Forecast (TAF) published in January 2018. Since the IWA MPU activity forecasts are on a calendar year basis, it was necessary to convert them TAF federal fiscal year figures to calendar year figures for a consistent comparison.

The IWA MPU forecasts for total passenger enplanements, aircraft operations, and based aircraft are all within the allowable tolerances identified in FAA Advisory Circular 150/5070-6B. They all differ from the TAF by approximately 10 percent for the first five-year forecast period, or by no more than 15 percent for the first 10-year forecast period. These percentages are considered to be consistent with the TAF.

Please initiate a FAA review of the IWA Draft Master Plan aviation activity forecasts and direct all questions and comments to Tony Bianchi at tbianchi@gatewayairport.com. Thank you for your prompt review.

Sincerely,

J. Brian O'Neill, A.A.E.
Executive Director/CEO
Phoenix-Mesa Gateway Airport Authority

Attachments (3): Appendix A – Summary of Forecast Methodologies
Appendix B – Template for Summarizing and Documenting Airport Planning Forecasts
Appendix C – Comparison of the IWA Master Plan Forecasts and the FAA TAF Forecasts

Appendix A
SUMMARY OF FORECAST METHODOLOGIES

Passenger Commercial Aviation Activity

The forecast of commercial passenger activity for 2018 reflects actual performance through August 2018. The forecasts for the remainder of 2018 and for 2019 are supply-driven, based primarily on published air carrier flight schedules. Given that air carriers plan their schedules in consideration of passenger bookings, the schedules reflect near-term market demand. The published airline schedules also establish the baseline data on commercial aircraft operations and fleet mix.

Beyond 2019, forecasts are demand-driven. Multivariate regression analysis links growth in enplanements to trends in market demand factors. Regression analysis provides a systematic framework for quantifying how different factors contribute to growth in enplanements and for generating enplanement forecasts based on the projected trends in key market demand factors. The Consultant takes regression analysis a step further by performing Monte Carlo simulation to produce a range of forecast enplanements with corresponding probability estimates. Forecast enplanements serve as the basis for projecting aircraft operations and corresponding landed weight, along with assumptions on trends in boarding load factors and changes in aircraft fleet mix.

Since IWA is one of two commercial service airports within the air service area, the Consultant approached long-term forecast development for IWA from a regional demand perspective. The Consultant performed multivariate regression analysis of regional demand measured as total Origin-and-Destination (O&D) enplanements at the Phoenix Metropolitan Statistical Area (MSA) commercial service airports (IWA and Phoenix Sky Harbor International Airport (PHX)) and initially developed forecasts of O&D enplanements for the entire region. The Consultant then developed forecasts of annual enplanements at IWA assuming that passenger traffic growth at IWA would proceed according to forecast regional demand growth under selected forecast scenarios.

Noncommercial Aviation Activity

Noncommercial aviation activity at IWA includes the Airport's General Aviation (GA) and military aircraft operations. GA operations are projected to follow regional trends. For the Master Plan forecast, the Consultant developed a regression model to estimate the relationship between GA traffic drivers and regional GA operations. Itinerant and local GA operations are forecast separately for IWA and regional airports with GA activity. Then, based on assumptions about IWA's share of the region's GA traffic, future GA activity levels at the Airport are estimated.

In the Master Plan forecast, IWA is assumed to maintain its current share of the region's local GA traffic (20 percent) and itinerant GA traffic (18 percent). Consistent with recent trends, local operations are forecast to grow at a faster rate than itinerant operations. Military operations are held constant at their 2017 level, while the growth in the number of based aircraft is projected to keep pace with the growth in GA operations.

Appendix B
Template for Summarizing and Documenting Airport Planning Forecasts
Phoenix-Mesa Gateway Airport Master Plan Forecasts

A. Forecast Levels and Growth Rates

	Level						CAGR from 2018 (base year)		
	Actual	Estimate		Forecast			2018	2018	2018
	2017	2018[1]	2019[2]	2023	2028	2033	to 2023	to 2028	to 2033
Passenger Enplanements									
Master Plan Forecast	681,892	759,033	850,292	924,667	1,022,420	1,129,660	4.0%	3.0%	2.7%
Operations									
Air Carrier	10,372	10,840	11,390	12,368	13,784	15,317	2.7%	2.4%	2.3%
Commuter (under 60 seats)	0	80	604	585	286	0	48.9%	13.6%	NA
Subtotal Commercial Operations	10,372	10,920	11,994	12,953	14,070	15,317	3.5%	2.6%	2.3%
General Aviation	271,446	282,596	287,518	296,256	311,455	326,734	0.9%	1.0%	1.0%
Military	7,503	7,503	7,503	7,503	7,503	7,503	0.0%	0.0%	0.0%
Subtotal Noncommercial Operations	278,949	290,099	295,021	303,759	318,958	334,237	0.9%	1.0%	0.9%
TOTAL OPERATIONS	289,321	301,019	307,015	316,712	333,028	349,555	1.0%	1.0%	1.0%
PMAD Peak Hour Commercal Passenger Aircraft Operations									
Passenger	7	7	8	8	9	10			
Based Aircraft									
TOTAL	109	116	118	121	126	132			

[1] Reflects (1) growth in actual enplanements at IWA through August 2018 and (2) growth in airline scheduled seat capacity at IWA through December 2018.

[2] Reflects partial growth in airline scheduled seat capacity in the January-April 2019 period.

B. Operational Factors

	Actual	Estimate		Forecast		
	2017	2018	2019	2023	2028	2033
Commercial Passenger Operations						
Average aircraft size (seats)	156	164	168	168	171	173
Average enplaning load factor	84.0%	84.6%	84.5%	84.8%	85.1%	85.5%
GA operations per GA based aircraft	2,490	2,436	2,441	2,450	2,464	2,477

Appendix C
Comparison of the IWA Master Plan Forecasts and the FAA TAF Forecasts

	Calendar Year (CY)	Airport Forecast (AF)	Published TAF[3] CY Basis	AF/Published TAF % Difference
Passenger Enplanements				
Base year	2018[1]	759,033	751,856	0.95%
Base year + 1 year	2019[2]	850,292	771,352	10.2%
Base year + 5 years	2023	924,667	838,428	10.3%
Base year + 10 years	2028	1,022,420	923,717	10.7%
Base year + 15 years	2033	1,129,660	1,018,981	10.9%
Commercial Operations (Air Carrier and Commuter)				
Base year	2018[1]	10,920	12,505	-12.7%
Base year + 1 year	2019[2]	11,994	12,819	-6.4%
Base year + 5 years	2023	12,953	13,899	-6.8%
Base year + 10 years	2028	14,070	15,273	-7.9%
Base year + 15 years	2033	15,317	16,804	-8.8%
Noncommercial Operations (General Aviation and Military)				
Base year	2018	290,099	290,430	-0.1%
Base year + 1 year	2019	295,021	291,893	1.1%
Base year + 5 years	2023	303,759	297,839	2.0%
Base year + 10 years	2028	318,958	305,468	4.4%
Base year + 15 years	2033	334,237	313,329	6.7%
Total Operations (Air carrier, Commuter, GA and Military)				
Base year	2018	301,019	302,935	-0.6%
Base year + 1 year	2019	307,015	304,711	0.8%
Base year + 5 years	2023	316,712	311,738	1.6%
Base year + 10 years	2028	333,028	320,741	3.8%
Base year + 15 years	2033	349,555	330,132	5.9%

[1] Reflects (1) growth in actual enplanements at IWA through August 2018 and (2) growth in airline scheduled seat capacity at IWA through December 2018.

[2] Reflects partial growth in airline scheduled seat capacity in the January-April 2019 period.

[3] For a valid comparison between the Master Plan forecasts and the TAF, it is necessary to adjust the TAF to reflect calendar year (CY) figures for IWA aviation activity.

Phoenix-Mesa Gateway Airport

October 3, 2018

Mr. Kyler Erhard
Lead Program Manager
Federal Aviation Administration
Phoenix Airports District Office
3800 North Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

Subject: **Phoenix-Mesa Gateway Airport Master Plan Update –**
Technical Memorandum - Critical Aircraft

Dear Mr. Erhard:

Determining the existing and future critical aircraft, and the Airport Reference Code (ARC) is paramount during the master plan process. The ARC is based on the operational and design characteristics of a critical aircraft and is utilized to evaluate current facilities and plan for future development needs. Advisory Circular (AC) 150/5000-17, *Critical Aircraft and Regular Use Determination,* defines critical aircraft as the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport. Regular use translates to 500 annual operations (takeoffs and landings) excluding touch-and-go operations.

Due to the array of aircraft regularly conducting and predicted to conduct operations at Phoenix-Mesa Gateway Airport (IWA or the Airport) for flight training, flight testing, aerial firefighting, and commercial service purposes, including cargo operations, the Airport has chosen to utilize the most demanding group of aircraft with similar characteristics to determine a critical ARC. AC 150/5000-7 defines similar characteristics as the practice of grouping aircraft by comparable operational performance and/or physical dimensions. Both operational performance and physical dimensions are characterized by the two components of an ARC: Aircraft Approach Category (AAC) and Airplane Design Group (ADG). Represented by a letter ranging from A-E as seen in **Table 1A,** AAC refers to aircraft approach speed to a runway, the operational characteristic. Characterized by a roman numeral ranging from I-VI, as seen in **Table 1B,** ADG refers to two physical design components of an aircraft, tail height and wingspan.

Table 1A: Aircraft Approach Category (AAC)

AAC	VREF/Approach Speed
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

Source: AC 150/5300 – 13A, *Airport Design*

Table 1B: Airplane Design Group (ADG)

Group #	Tail Height (ft)	Wingspan (ft)
I	Less than 20 ft	Less than 49 ft
II	20' - < 30'	49' - < 79
III	30' - < 45'	79' - < 118'
IV	45' - < 60'	118' - < 171'
V	60' - < 66'	171' - < 214'
VI	66' - < 80'	214' - < 262'

Source: AC 150/5300 – 13A, *Airport Design*

To determine regular usage of IWA facilities, the AAC and ADG of the most demanding aircraft that regularly use the Airport were chosen referencing the following:

- Traffic Flow Management System Counts (TFMSC)
- 2016 Noise Exposure and Potential Noise Policy Revisions
- Aviation Activity Forecast Chapter
- 2018 and 2019 air carrier flight schedules

Traffic Flow Management System Counts (TFMSC). The guiding AC for critical aircraft determination requires the most recent 12-month period of aircraft activity be used as a basis for critical aircraft selection. The TFMSC provides a database of arrivals to and departures from an airport based on radar-recognition of an aircraft while enroute or filed flight plans. Typically, the radar is located at an airport and has a detection range of 60 miles. The database is accessible by the public and is broken into operations by aircraft type and ARC.

According to the TFMSC summary of arriving flights, approximately 6,022 category C aircraft and 647 category D aircraft conducted landing operations at IWA over the most recent 12-month period. ADG-III aircraft proved to be the most demanding with an arrival count exceeding 5,320. The following non-military C and D category aircraft reportedly operated at the Airport in 2017:

- Airbus 319
- Airbus 320
- Embraer ERJ-145 EX
- Boeing 737-700
- Boeing 737-400
- Boeing 757-200
- Gulfstream IV/G400
- Bombardier Learjet 55
- Boeing 737-800
- MD-83 and 88

2016 Noise Exposure and Potential Noise Policy Revisions. The Aviation Environmental Design Tool (AEDT), Version 2.0(c), used in the production of updating the 2016 IWA noise contours, is software used to estimate environmental impacts including noise. For the software to output noise information specific to the Airport, an input of aircraft fleet projected to operate at the Airport is required. The input itinerant aircraft fleet consisted of 33 non-military aircraft types, and the input local aircraft fleet consisted of 13 non-military aircraft types. Aircraft within the study were chosen based on the following assumptions:

- Future commercial service at the Airport would mirror current service, in terms of markets served and the size of aircraft providing service.
- Older aircraft types (MD-80, B737-300, and B757), noisy business jets, and older military aircraft would be retired from the domestic fleet and would be replaced by quieter aircraft of similar size and range.

Accounting for a surplus of 32,000 annual operations, C and D aircraft heavily populated the projected fleet mix used. Though conducted in 2016, the projected aircraft fleet has proven to operate, and to do so continuously, at the Airport as indicated in a comparison between the projected fleet mix to the 2017 TFMSC. A comparison between the two indicates the aircraft fleet projected has operated at the Airport within the last year since aircraft listed as a projection was also within the 2017 TFMSC IWA aircraft arrival database. The following is a list of C and D aircraft used in the aircraft fleet projection:

- Boeing 767-300
- Boeing 737-800
- Boeing 737-700
- Airbus 320
- Airbus 319
- Embraer EMB-190
- Embraer EMB-145

2018 and 2019 Air Carrier Flight Schedules. During the development of the Aviation Activity Forecast Chapter, air carrier flight schedules for the remainder of 2018 and beginning months of 2019 were obtained. Throughout the Aviation Activity Forecast Chapter planning process, new air carrier service to and from IWA was announced resulting in a new addition of aircraft to the current fleet. Allegiant Air has been the Airport's primary air carrier service provider since 2007 and typically, if air carrier service is projected to continue, the most demanding aircraft flown by the air carrier that regularly operates at the Airport acts as the critical aircraft. This will not be the case for IWA due to the new addition of air carrier and cargo service, which will be regularly flown by more demanding aircraft. The following C and D aircraft with an ADG-II or ADG-III classification are projected to operate at IWA for the remainder of 2018 and beginning months of 2019:

- Airbus 319 and 320
- Boeing Douglas MD-80
- Embraer RJ-135/140/145

- Boeing 737-600 (passenger)
- Boeing 737-400
- Boeing 737-700 (winglets; passenger)
- Boeing 737-800 (scimitar winglets; passenger)
- Boeing 737-800 (winglets)

Introduction of Cargo Operations. Beginning in 2020, a major cargo operator, SkyBridge Arizona, will begin operating at IWA once infrastructure is developed. SkyBridge Arizona will reportedly base and regularly operate a fleet of Boeing 747-400 and Boeing 767-300 freighters at the Airport with 354 landing operations in 2020 alone. Assuming, takeoffs and landing are equal, the Boeing 747-400 and Boeing 767-300 fleet will account for 708 operations, surpassing the 500 critical aircraft/ARC annual operation threshold. The Boeing 747-400 has an approach speed of 157 knots and a tail height of 64 feet, deeming it not only a D AAC, but an ADG-V aircraft.

Conclusion. Considering the specific safety and operation needs of all the aircraft that regularly use the airfield, as required by the AC, the current and future critical ARC has been determined to remain at D-V. A D-V ARC has been used as the ARC for the past two master plans and is representative of all C, D, and ADG-III through ADG-V aircraft that regularly operated at IWA in the past, and are expected to operate in the future.

Sincerely,

J Brian O'Neill, A.A.E.
Executive Director/CEO
Phoenix-Mesa Gateway Airport Authority

U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Administration
Phoenix Airports District Office

3800 N Central Ave
Suite 1025
Phoenix, AZ 85012

December 7, 2018

Tony Bianchi
Phoenix Mesa gateway Airport Authority
5835 South Sossaman Rd
Mesa, AZ 85212

Dear Mr. Bianchi:

Phoenix Mesa Gateway (IWA)
Aviation Activity Forecast Approval

The Federal Aviation Administration (FAA) has reviewed the aviation forecast for the Phoenix Mesa Gateway Airport (IWA) dated November 28, 2018. The FAA approves both this forecast and the use of C-III for the existing and D-V for the future critical design aircrafts.

The forecast was developed using current data, appropriate methodologies, and is within the acceptable range for TAF tolerance and therefore is approved for planning purposes, to include Airport Layout Plan development at IWA. It is important to note that the approval of this forecast doesn't guarantee funding for large scale capital improvements as future projects will need to be justified by current activity levels at the time the projects are proposed for implementation.

If you have any questions about this forecast approval, please call me at 602-792-1073.

Sincerely,

Kyler Erhard
Lead Program Manager

PHOENIX-MESA GATEWAY AIRPORT AUTHORITY
5835 SOUTH SOSSAMAN ROAD
MESA, ARIZONA 85212-6014

PHONE (480) 988 7600
FAX (480) 988 2315

April 14, 2020

Mr. Kyler Erhard
Lead Program Manager, PHX-609
Federal Aviation Administration
Phoenix Airports District Office
3800 North Central Ave.
Suite 1025, 10th Floor
Phoenix, AZ 85012

Subject: Phoenix-Mesa Gateway Airport Master Plan Update: Airport Layout Plan for FAA Approval

Dear Mr. Erhard,

Included for the Federal Aviation Administration's (FAA) approval is the revised Phoenix-Mesa Gateway Airport's (IWA) Airport Layout Plan (ALP) based upon comments received by the FAA. The preliminary ALP was reviewed by your office in February 2020. Comments from both the Arizona Department of Transportation – Aeronautics Division (ADOT) and the Federal Aviation Administration (FAA) have been identified and our Team's responses to those comments are documented in Attachments A and B.

The ALP was updated in accordance with FAA Airport Design Advisory Circular (AC 150/5300-13A – Change 1) and Standard Operating Procedure (SOP) 2.00 (Review and Approval of Airport Layout Plans) and SOP 3.00 (Review of Exhibit 'A' Airport Property Inventory Maps).

A total of twelve signed and bound ALP document sets consisting of 22 sheets have been included in this submission for final FAA approval. After the ALP has been approved and signed by the FAA, we will arrange for the pick-up of the remaining ALP sets.

Please initiate the final review and approval process for the ALP. You may direct any questions and pick-up arrangements to Tony Bianchi, Planning Manager at tbianchi@gatewayairport.com. Thank you again for your prompt review and ultimate approval.

Sincerely,

J. Brian O'Neill, A.A.E.
Executive Director/CEO
Phoenix-Mesa Gateway Airport Authority

Attachments (3): Airport Layout Plan – Final Set (12)
Attachment A – Response to ADOT Comments
Attachment B – Response to FAA Comments

cc: Scott Brownlee - Phoenix-Mesa Gateway Airport Authority
Bob Draper - Phoenix-Mesa Gateway Airport Authority
Tony Bianchi - Phoenix-Mesa Gateway Airport Authority
Mark McFarland - Mead & Hunt, Inc.
Christopher Hacker - Mead & Hunt, Inc.
James Bullard - Mead & Hunt, Inc.

RESPONSES TO ARIZONA DEPARTMENT OF TRANSPORTATION – AERONAUTICS DIVISION (ADOT) COMMENTS TO CHANGES/CORRECTIONS TO THE PRELIMINARY AIRPORT LAYOUT PLAN (ALP), PHOENIX-MESA GATEWAY AIRPORT.

GENERAL COMMENTS

ADOT did not have any comments on the preliminary ALP.

RESPONSES TO FEDERAL AVIATION ADMINISTRATION COMMENTS TO CHANGES/CORRECTIONS TO THE PRELIMINARY AIRPORT LAYOUT PLAN, PHOENIX-MESA GATEWAY AIRPORT.

GENERAL COMMENTS

Ref. No.	Comment	Response
1-1	Double check the approaches and associated minimums for each runway end and correct as needed on applicable sheets.	• Checked and revised. • Runway 30L correct • Runway 30C correct. • Updated Runway 30R to ¾-mile visibility minimum instrument approach. • Corrected Runway 30R to non-precision approach. • Corrected the existing and future Runway 12L approaches. Identified future as a non-precision approach. • Corrected Runway 12C to be non-precision (C). The inner width of the approach increased to 1,000' to meet primary surface width due to the precision approach on Runway 30C. • Runway 12R correct. • Checked and revised subsequent changes in the airspace, inner approach sheets, and all other sheets where surfaces are identified.

SHEET 2 – AIRPORT DATA SHEET

Ref. No.	Comment	Response
2-1	Double check the RDC for the following runway ends as they appear to be incorrect.	• Checked and revised RDC for Runway 30R to match the ¾-mile approach.
2-2	RWY 30R Existing – Has a GPS approach so won't be visual (*There is a verified & published RNAV approach for 30R*).	• APRC for Runway 30R reflects ¾-mile visibility: D-V-4000.

2-3	RWY 12C Existing – Visibility Minimums are 1-mile so the visibility component is incorrect.	• D-V-5000.
2-4	RWY 30C Existing – Visibility Minimums are ¾-mile so the visibility component is incorrect.	• D-V-4000.
2-5	The RRC code is no longer used. It has been replaced by the APRC and DPRC. Please update accordingly.	• Added line item to Runway Table.
2-6	Part 77 Approach for RWY 12L/30R appears to be incorrect due to the instrument approach to the runway.	• Revised, per Comment 1-1.
2-7	RWY 30R should be TYPE 4 TSS Surface because it has an approach.	• Revised, Runway 30R is now correct on data sheet.
2-8	Instrument Approach Aids box- list the appropriate approach for RWY 30R (*RNAV (GPS)*).	• Added.
2-9	Check the existing numbers for T/W E as it appears we used the taxilane numbers. (*Looks like T/W E runs until the intersection points w/ T/W G. This hotspot was mitigated with new geometry. Project As-Built plans were checked and the table updated to accommodate Group 3 aircraft).*	• Revised.

SHEET 4 – FUTURE AIRPORT LAYOUT PLAN

Ref. No.	Comment	Response
4-1	Shift Taxiway G to cross the threshold of RWY 12L. Similar to how TWY G crosses RWY 12C. It appears the current configuration could lead to TWY G being a "lead in Taxiway" which isn't recommended. TWY G could probably connect directly to the future bypass taxiway north of RWY 12L. *(A runway extension is recommended for 12L/30R to accommodate the future critical D-V group aircraft and has been cleared up to better illustrate).*	• Added threshold marking to runway end to show runway extension and taxiway entrance.
4-2	Show where TWY A turns/transitions into TWY P by having a rounded edge.	• Added pavement removal hatch.
4-3	Why doesn't the new center parallel taxiway maintain the same RWY-TWY separation starting from TWY P and continuing to TWY G? (*This is due to maintaining the separation/clear zone for the VOR, which plans to remain for the time being. Checked with FAA ADO and indicated they are okay with it as is, and if the VOR was phased out we could do a pen & ink update to show that alignment).*	• To remain.

4-4	If the airport service road goes through the future RSA on the extended RWY 30L the service road should be rerouted around and shown.	• Added future relocated service road.
4-5	There appears to be two RSA lines beyond the RWY 12L threshold. (*The 200' recommended runway extension is the reason for the two RSA & RPZ lines. But line work was cleaned up to better illustrate*).	• To remain showing future runway extension.
4-6	Will need to include the 2 added buildings adjacent to the ATCT in the updated set.	• Buildings have been added.

SHEET 19 – FACILITIES DRAWINGS – WEST FACILITIES

Ref. No.	Comment	Response
19-1	Clarify what the white boxes in the Future Run-up/Holding Apron area represent? (*Those are the future run-up areas, in discussion w/ Mead & Hunt we removed to reduce confusion).*	• White boxes have been removed on the future run-up/holding apron area.

SHEET 20 – FACILITIES DRAWINGS – EAST FACILITIES

Ref. No.	Comment	Response
20-1	Eastside concept: Future taxiway and taxilane should be designed as Group III if that is what the terminal taxilanes are designed to, and because the larger cargo aircraft will be located on the opposite side of the airport. (*This is for Group IV gate accommodation that came out of the EA process and PMGAA preference was for Group IV standards fronting the terminal and Group III on the taxiway sides of the concept. This was discussed with the ADO and was determined to be acceptable to be left as illustrated*).	• To remain as shown per FAA ADO/IWA direction.

U.S. Department
of Transportation
Federal Aviation Administration

Western-Pacific Region
Office of Airports
Phoenix Airports District Office

3800 N. Central Ave
Suite 1025
Phoenix, AZ 85012

JUN 0 5 2020

J. Brian O'Neill
Executive Director/CEO
Phoenix-Mesa Gateway Airport Authority
5835 S Sossaman Rd
Mesa, AZ 85212

Dear Mr. O'Neill,

The Phoenix-Mesa Gateway Airport Layout Plan (ALP), prepared by Mead & Hunt, and bearing your signature, is approved and the master plan is accepted. A signed copy of the approved ALP is enclosed.

An aeronautical study (no.2020-AWP-577-NRA) was conducted on the proposed development. This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making this determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal.

The FAA has only limited means to prevent the construction of structures near an airport. The airport sponsor has the primary responsibility to protect the airport environs through such means as local zoning ordinances, property acquisition, avigation easements, letters of agreement or other means.

Approval of the plan does not indicate that the United States will participate in the cost of any development proposed. Additionally, the United States will only participate in the cost of projects that meet the standards for which that airport is designed. Associated costs for any projects that exceed the appropriate airport design standard will be the responsibility of the airport sponsor.

This ALP approval is conditioned on acknowledgement that any development on airport property requiring Federal environmental approval must receive such written approval from FAA prior to commencement of the subject development. This ALP approval is also conditioned on acceptance of the plan under local land use laws. We

encourage appropriate agencies to adopt land use and height restrictive zoning based on the plan.

AIP funding requires evidence of eligibility and justification at the time a funding request is ripe for consideration. When construction of any proposed structure or development indicated on the plan is undertaken, such construction requires normal 45-day advance notification to FAA for review in accordance with applicable Federal Aviation Regulations (i.e., Parts 77, 157, 152, etc.). More notice is generally beneficial to ensure that all statutory, regulatory, technical and operational issues can be addressed in a timely manner. Additionally, any future development that will require amendments to instrument flight procedures must be coordinated by the airport district office and the airport manager to ensure those changes are made in a timely manner.

Please attach this letter to the Airport Layout Plan and retain it in the airport. We wish you great success in your plans for the development of the airport. If we can be of further assistance, please do not hesitate to call Mr. Kyler Erhard, Lead Program Manager, at 602-792-1073.

Sincerely,

Mike N Williams
Manager, Phoenix Airports District Office

cc: ADOT

Enclosure: Airport Layout Plan

APPENDIX D
PUBLIC INVOLVEMENT

This appendix documents the coordination and outreach efforts throughout the Master Plan process. This introduction notes the organizations involved, dates of meetings, and other outreach methods. The documents included in this appendix are described at the end of the introduction.

Stakeholder Working Group

A Stakeholder Working Group (SWG) was established to engage its members for input and review of working papers, materials, and alternatives early in the planning process. The SWG consisted of invited members from these organizations:

- ✓ City of Mesa (City Representative)
- ✓ City of Mesa (Resident)
- ✓ Town of Gilbert (Town Representative)
- ✓ Town of Gilbert (Resident)
- ✓ City of Phoenix - Sky Harbor Airport
- ✓ Gila River Indian Community
- ✓ Arizona State University
- ✓ Chandler - Gilbert Community College East Valley Partnership
- ✓ Town of Queen Creek (Town Representative)
- ✓ Town of Queen Creek (Resident)
- ✓ City of Apache Junction
- ✓ Aircraft Owners and Pilots Association
- ✓ Chandler Airport (CHD)
- ✓ Mesa Falcon Field (FFZ)
- ✓ East Valley Chambers of Commerce Alliance
- ✓ National Association of Industrial and Office Properties
- ✓ Home Builders Association of Central Arizona

SWG Meetings and Dates

SWG meetings were held on these dates:

- ✓ SWG Meeting #1 – July 31, 2018
- ✓ SWG Meeting #2 – January 16, 2019
- ✓ SWG Meeting #3 – June 25, 2019
- ✓ SWG Meeting #4 – October 23, 2019

Technical Advisory Committee

A Technical Advisory Committee (TAC) was established to engage its members for input and review of working papers, materials, and alternatives early in the planning process. The TAC provided more detailed feedback on operational plan elements due to its familiarity with the Airport. The TAC consisted of invited members from these organizations:

- ✓ Worldwide Flight Services
- ✓ University of North Dakota
- ✓ ATP Flight School
- ✓ Able Engineering
- ✓ Cessna
- ✓ Embraer
- ✓ Constant Aviation
- ✓ Native Air (Air Methods)
- ✓ International Air Response
- ✓ Intel - Air Shuttle
- ✓ US Forest Service
- ✓ Allegiant
- ✓ WestJet
- ✓ Federal Aviation Administration
- ✓ Serco
- ✓ Boeing
- ✓ Arizona Department of Transportation
- ✓ Skybridge Arizona
- ✓ Arizona Air National Guard
- ✓ Arizona Army Air National Guard
- ✓ Transportation Security Administration - Homeland Security

TAC Meetings and Dates

TAC meetings were held on these dates:

- ✓ TAC Meeting #1 – July 31, 2018
- ✓ TAC Meeting #2 – January 15, 2019
- ✓ TAC Meeting #3 – June 26, 2019
- ✓ TAC Meeting #4 – October 23, 2019

Public Open Houses

Members of the public were invited to contribute to the planning process at two open house opportunities.

Meetings and Dates

The following public open houses were held:

- ✓ Public Open House Meeting #1 – January 16, 2019
- ✓ Public Open House Meeting #2 – June 26, 2019

Phoenix-Mesa Gateway Airport Authority Board Meetings

As a public entity and governing body of the Phoenix-Mesa Gateway Airport, the Phoenix-Mesa Gateway Airport Authority holds regular meetings on the third Tuesday of each month on matters concerning the Airport. The Board consists of members from the City of Mesa, the City of Phoenix, the Gila River Indian Community, the Town of Gilbert, the Town of Queen Creek, and the City of Apache Junction.

Meetings and Dates

Airport Master Plan documents, informational briefs, and updates were presented to the Phoenix-Mesa Gateway Airport Authority Board on these dates:

- ✓ Phoenix-Mesa Gateway Airport Authority Board Meeting – May 15, 2018
- ✓ Phoenix-Mesa Gateway Airport Authority Board Meeting – September 18, 2018
- ✓ Phoenix-Mesa Gateway Airport Authority Board Meeting – October 16, 2018
- ✓ Phoenix-Mesa Gateway Airport Authority Board Meeting – April 16, 2019
- ✓ Phoenix-Mesa Gateway Airport Authority Board Meeting – November 19, 2019
- ✓ Phoenix-Mesa Gateway Airport Authority Board Meeting – June 16, 2020

Website, Presentations, Surveys, and Advertisements

This Appendix contains subsequent information, including the project website, project presentations, informational boards, public survey instruments, survey results, and associated advertisements to support the Master Plan public involvement efforts.

Phoenix-Mesa Gateway Airport (PMGAA) Master Plan
Airport Master Plan Stakeholder Meeting
July 31, 2018 9:00 AM – 11:00 AM
Phoenix-Mesa Gateway Airport Saguaro A/B Conference Room

Attendees	
Name	**Organization**
Christine Zielonka	City of Mesa
Brent Nadler	City of Phoenix – Sky Harbor
Brett Burningham	Town of Queen Creek
Chris Andres	Chandler Airport
Scott Brownlee	Phoenix-Mesa Gateway Airport Authority
Corrine Nystrom	City of Mesa – Falcon Field
Brian Sexton	Phoenix-Mesa Gateway Airport Authority
Rudy Esquivias	City of Apache Junction
Eric Emmert	Dorn Policy Group- East Valley Chambers of Commerce Alliance
Margi Evanson	Phoenix-Mesa Gateway Airport Authority
Bob Draper	Phoenix-Mesa Gateway Airport Authority
Mike Hutchinson	East Valley Partnership
Jackson Moll	Home Builders Association of Central Arizona
Kyle Mieras	Town of Gilbert
Gordon Bluth	Town of Queen Creek – Blucor Contracting
Cindy Barnes	Chandler-Gilbert Community College
Tony Bianchi	Phoenix-Mesa Gateway Airport Authority
Suzanne Kinney	Arizona Chapter of National Association of Industrial Offices and Properties

Consultant Team	
Name	**Organization**
Mark McFarland	Mead & Hunt, Inc.
Chris Hacker	Mead & Hunt, Inc.
Eunique Jackson	Mead & Hunt, Inc.
Sharon Sarmiento	Unison Consulting
Paulos Lakew	Unison Consulting
Carissa Valdez	PSM^2

Below are the interests or area of opportunities identified by the stakeholders regarding the Master Plan:

- Industrial development
- Compatible land use
- Grow aviation in the East Valley
- Economic development potential in the East Valley
- Aviation training/education
- Transportation networks to/from the Airport
- Airport growth and community involvement
- Evolution of airlines
- UAV impact on airports and remote towers
- Future ADOT SR202 – South Mountain Freeway
    - Reduction of trip time to/from the Airport in West Valley
    - Potential access to price sensitive passengers
    - Increase range of 30-minute drive-time exhibits
- East valley growth fueling airlines that serve the Airport
- Pilot shortage impact on mainline/commuter airlines and impact on the Airport
- GA operations
- New air service at the Airport
- Factor Regional Transportation Plan (RTP) 2025 into Activity Forecast Chapter

Committee Member, Cindy Barnes (Chandler-Gilbert Community College) Requested that there is a need for more information to be relayed to homeowners or buyers within the area of growth surrounding the Airport. She stressed that they cannot be a deterrent for growth.

Committee Member, Jackson Moll (Home Builders Association of Central Arizona) Stated that homeowners are the reason to allow for the growth of the airport. Also stating that all municipalities require builders to post signs, to have additional disclosures for home buyers. There is not a lack of trying to inform them.

Committee Member, Cindy Barnes (Chandler-Gilbert Community College) Responded that she knows that buyers just don't pay attention until it's happening. Doesn't hurt to remind them, and working with the airport to publicize.

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) Past meetings related to land use compatibility have had good turnouts. However, when the question was asked, "How does this project impact planes flying over owner houses?" When they were informed this was not the focus of the meetings they became disinterested.

Committee Member, Corrine Nystrom (City of Mesa – Falcon Field) Passenger service has been the airline marker over the past 30 years. The airline industry is going to change with the growth of unmanned aerial vehicles. I don't think that you can assume that the passenger airline industry is going to be the same moving forward. It is clear that unmanned systems will impact the industry and how to incorporate this into the industry by having a remote tower remains to be seen.

Forecast

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) How do we factor in future roadways construction if the model forecasts 20 years out? And how roadway projects that could expand the service market, how do we capture that?

Consultant Rep. Sarmiento We cannot account for that but can be factored in the high scenario.

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) Is it important for context as far as number of passengers, 1.4 million passengers this year puts us at about 100 nationally ranked for passengers traffic. What is Sky Harbor at?

Committee Member, Brent Nadler *(City of Phoenix – Sky Harbor*) 47 million annual passengers. Making it 11th busiest in the country.

Committee Member, Suzanne Kinney (Arizona Chapter of National Association of Industrial Offices and Properties) In terms of operations, how many are passengers? Cargo vs private?

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) A large majority of our aircraft operational activity are flight schools, corporate jets/GA (over 80%), military is about 5% or less, with the remainder being commercial passenger traffic (under 10%).

Committee Member, Brian Sexton (Phoenix-Mesa Gateway Airport Authority) There is very limited intermittent cargo activity, there may be regular service with the SkyBridge Arizona in the future, but currently not.

In 2016 half of the Allegiant fleet was MD80 and half Airbus 319 aircraft. Gateway was one of the first major Allegiant markets to convert completely to the Airbus 319. Great for communities since they are quieter, newer and more reliable aircraft. Does have 10 less seats than the MD80, making for a capacity reduction with some trouble with aircraft deliveries. What is interesting is that we've gone quickly from MD 80 to Airbus 319, now moving to Airbus 320.

Committee Member, Corrine Nystrom (City of Mesa – Falcon Field) Have you factored the shortage of pilots?

Consultant Rep. Sarmiento This change has been occurring and effecting smaller regional carriers, and should not apply to this airport.

Committee Member, Christine Zielonka (City of Mesa) Do you anticipate a slowdown in the economy looking at a regular growth rate of 20%?

Consultant Rep. Lakew We are factoring a slowdown in the early 2020's, the business cycle is factored into our current model.

Conclusion

Committee Member, Suzanne Kinney (Arizona Chapter of National Association of Industrial Offices and Properties) This has all been great information, but if there are specific areas that you want feedback on it would be best if you could send that in advance. Certainly, those of us with associations will need to ask our members for their thoughts.

Consultant Rep. Mark McFarland The next steps that we are going to work on include forecast revisions and submittal of the forecasts to the FAA for approval. We will also begin work on the second working paper which focuses on facility needs determination. We will have our second working group meeting and have the public workshop which are all about 3-4 months out but anticipate sometime in November to come together. We appreciate your participation. Any additional communication should go through Tony and he will pass it along to us.

Phoenix-Mesa Gateway Airport Authority (PMGAA) Master Plan
Airport Master Plan Stakeholder Committee Meeting #2
January 16, 2019 / 1:30 PM – 3:30 PM
Phoenix-Mesa Gateway Airport Saguaro A/B Conference Room

Attendees	
Name	**Organization**
Amy Temes	Town of Gilbert
Brian Sexton	Phoenix-Mesa Gateway Airport Authority
Rudy Esquivias	City of Apache Junction
J. Brian O'Neill	Phoenix-Mesa Gateway Airport Authority
Brett Burningham	Town of Queen Creek
Aric Bopp	City of Mesa
Kyler Erhard	Federal Aviation Administration (FAA)
Chris Andres	City of Chandler - Chandler Municipal Airport (CHD)
Ryan Smith	Phoenix-Mesa Gateway Airport Authority
Eric Emmert	East Valley Chambers of Commerce Alliance
Corinne Nystrom	City of Mesa - Falcon Field Airport (FFZ)
Patrick Panetta	Arizona State University
Rustyn Sherer	APS (Town of Gilbert)
Mark Gaspers	Boeing
Tony Bianchi	Phoenix-Mesa Gateway Airport Authority
Scott Brownlee	Phoenix-Mesa Gateway Airport Authority
Brett Nadler	City of Phoenix – Sky Harbor
Suzanne Kinney	Arizona Chapter - National Association of Industrial and Office Properties (NAIOP)
Gordon Bluth	Blucor (Town of Queen Creek)
Ken Hall	Federal Aviation Association (FAA)

Consultant Team	
Name	**Organization**
Mark McFarland	Mead & Hunt, Inc.
Chris Hacker	Mead & Hunt, Inc.
Eunique Jackson	Mead & Hunt, Inc.
Carissa Valdez	PSM^2

General comments from the Airport Master Plan Stakeholder Committee Meeting have been summarized below.

Committee Member, Eric Emmert (East Valley Chambers of Commerce Alliance) – Asked whether any thought was given to the changes we are going to see in driving behavior from Transportation Network Companies (TNC) (ie. Uber and Lyft) when the vehicle parking and roadway calculation was analyzed?

Response: Yes, however, the impact of TNCs on airport traffic and parking facilities is not fully known at this point. Parking occupancy and revenue reports looked at performance over the past two years to account for recent trends & impacts, and recent terminal curb front improvements were made to better accommodate TNC activity.

Committee Member, Corrine Nystrom (FFZ) – Asked how flight training was factored into future airport design considerations.

Response: Flight training will remain an important component of the total operational activity at Phoenix-Mesa Gateway Airport (IWA) as reflected in the forecasts and will be an important master planning component. There are around 80 aircraft parking positions on the North Apron currently dedicated to the flight schools. The area that has been designated for flight school use is not going to change in the ongoing master plan.

Committee Member, Brett Nadler (City of Phoenix – Sky Harbor) – Asked about runway usage and available weight-bearing capacity, and whether they should stay in the same area?

Response: This is an important question that will be examined in the upcoming alternatives analysis. It is envisioned that the inside (western) runway will continue to serve GA traffic, the middle runway contains the instrument landing system, and the outside (eastern runway) runway with the highest weight-bearing capacity is envisioned for commercial and cargo operations to support those weights.

*Committee Member, Brian O'Neill (Phoenix-Mesa Gateway Airport Authori*ty*)* – Commented on SkyBridge's aeronautical and non-aeronautical development, and the investment in horizonal and vertical infrastructure to support their master plan. SkyBridge will need to get FAA approval before they can start with many of those projects. The PMGAA Board is currently reviewing their documents.

Committee Member, Chris Andres (CHD) – Asked whether the schematic design shown reflects a 20-year planning cycle, or whether it assumes a 40 to 50-year horizon. This is brought up as a precaution to not box yourself in.

Response: The master plan has a 20-year planning horizon; however, it is recognized that decisions made during the planning process will affect the physical layout of facilities for a much longer period of time. We all need to guard against painting PMGAA into a corner with development planning for the very long term.

*Committee Member, Brian O'Neill (Phoenix-Mesa Gateway Airport Authori*ty*)* – Commented that if you look at the 700 acres on the east side, there are two different uses and time tables. You must have a plan to reserve enough space for the future terminal, parking, and others. What may happen in the near term is commercial development along Sossaman Road. In the future, an area of land for a future terminal project should be reserved.

Committee Member, Eric Emmert (East Valley Chambers of Commerce Alliance) – Commented on the use of multi-modal transportation in the planning horizon, and to give some thought to the heavy rail

line that exists approximately a mile to the southwest of IWA. Cooley station in Gilbert which, in the future, is going to house a planned passenger rail terminal, goes directly through downtown Gilbert, Sky Harbor International Airport, and Downtown Phoenix. As a seamless use of transportation to common areas, the ability is there, it would be a wonderful opportunity.

Committee Member, Corrinne Nystrom (FFZ) – Will SkyBridge incorporate domestic cargo? If not, what are the domestic plans for cargo?

Response: At this point, Skybridge is not programming domestic cargo activity. The master plan will address the potential for domestic cargo activity and facility needs, however there is not the population base to warrant separate cargo service from Sky Harbor.

Committee Member, Chris Andres (CHD) – Asked whether there is adequate airspace protection? We recently had an issue regarding Terminal Instrument Procedures (TERPS) surfaces at CHD.

Response: IWA's airspace is well protected, and we have an internal application that we can model vertical development against our airspace and procedures. A thorough analysis of potential airspace issues is a component of the master plan.

Committee Member, Corinne Nystrom (FFZ) – Asked whether there are any thoughts about future direction with landing aids and navigational aids, Instrument Landing Systems (ILS)?

Response: At this juncture, IWA is well served by existing instrument approach capabilities and navigation aids. The potential for improved instrument approach capabilities will be examined in the alternative analysis. Factors that would be considered include traffic impacts and additional real estate needed if additional instrument systems were added.

Committee Member, Kyler Erhard (FAA) – Asked, whether the ultimate solution will be somewhere between Alternatives 1 and 2 in the airfield layout exhibits? Was Alternative 2 included in the last master plan?

Response: Yes, that is correct on both questions.

Consultant Rep. Mark McFarland (Mead & Hunt, Inc.) – The next steps that we are going to work on include the development of the development alternatives analysis and the Conceptual Development Plan for IWA and Working Paper 3. We will have our third Working Group meeting in late April or early May 2019 time frame. We appreciate your participation. Any additional communication or comments for consideration should go through Tony Bianchi.

Phoenix-Mesa Gateway Airport Authority (PMGAA) Master Plan
Airport Master Plan Stakeholder Committee Meeting #3
June 25, 2019 / 2:00 PM – 3:00 PM
Phoenix-Mesa Gateway Airport Saguaro A/B Conference Room

Attendees	
Name	**Organization**
Josh Rodgers	Planning – Town of Gilbert
Eva Cutro	Planning Manager – Town of Gilbert
Brett Nadler	Phoenix Sky Harbor International Airport
Chris Andres	City of Chandler - Chandler Municipal Airport (CHD)
Aric Bopp	Economic Development - City of Mesa
Erik Swanson	Town of Queen Creek
Rustyn Sherer	Arizona Public Service
Rudy Equivias	Senior Planner – City of Apache Junction
Mark Gaspers	Boeing
Brian Sexton	Communications Manager/PIO, Phoenix-Mesa Gateway Airport Authority
Bob Draper	Engineering & Facilities Director, Phoenix-Mesa Gateway Airport Authority
Brian O'Neill	Executive Director/CEO, Phoenix-Mesa Gateway Airport Authority
Ryan Smith	Director of Communications/Community Relations, Phoenix-Mesa Gateway Airport Authority
Scott Brownlee	Deputy Director/COO, Phoenix-Mesa Gateway Airport Authority
Tony Bianchi	Airport Planning Manager, Phoenix-Mesa Gateway Airport Authority

Consultant Team	
Name	**Organization**
Mark McFarland	Mead & Hunt, Inc.
Chris Hacker	Mead & Hunt, Inc.
Kelly Phelps	PSM^2
Carissa Valdez	PSM^2

Introductions and Opening Remarks

Airport Representative Tony Bianchi, (PMGAA) opened the meeting by welcoming the committee to the third stakeholder meeting. He provided the update that, since the last meeting, the Facility Requirements chapter has been finalized, and a series of discussions regarding some of the alternatives has occurred.

Mark McFarland, Mead & Hunt, Inc. (Consultant Rep. McFarland) reminded the committee that the Airport Master Plan is a planning document, and it incorporates what we think will happen at the airport over the next 20 years.

Airport Master Planning Advisory Meeting Agenda

Consultant Rep. McFarland provided an overview of the meeting agenda:

- ✓ Introductory Remarks
- ✓ Project Approach and Schedule
- ✓ Forecasts of Aviation Activity Review
- ✓ Facility Requirements Review
- ✓ Airfield Alternatives
- ✓ Landside Alternative – West Side
- ✓ Landside Alternative – East Side
- ✓ Conceptual Development Plan
- ✓ Next Steps

Project Approach and Schedule

Consultant Rep. McFarland introduced the section by stating that the Federal Aviation Administration (FAA) funded a lot of the study and provides guidance on how the master plan will be prepared. In developing a master plan, it is a building block process that ultimately results in a final Master Plan document. The project team presented completed sections a few months ago to this group (Stakeholder Committee) and others. The project team received comments before moving on to the next section. The Facility Needs Determination was published and feedback was received. We are now in the process of developing alternatives and once a preferred development concept is agreed upon, we will complete a financial plan based upon the approved concept.

Consultant Rep. McFarland introduced the Project Schedule, explaining schedule milestones and that there will be one more Stakeholder Committee meeting likely in September of 2019.

Consultant Rep. McFarland discussed the online public and stakeholder surveys remain open for comments, and he encouraged the committee to participate. The public survey has received 177 responses to date with these results:

- 34 percent of respondents indicate they have used Gateway five or more times in the past five years.
- 70 percent of respondents indicated low cost parking was important (more important than proximity to terminal).
- 42 percent indicated airline destinations are a critical factor in utilizing Gateway.
- 35 percent indicated proximity to home is a critical factor in utilizing Gateway.

Airport Representative Tony Bianchi indicated that one of the interesting results to the public survey on how passengers travel to/from IWA when traveling is that rideshare (Lyft/Uber/Shuttle) has been on airport a couple of years, and Phoenix-Mesa Gateway Airport recently signed a user agreement with Uber. Over 25 percent respondents answered that they use this service. Brett (Nadler) was asked if Sky Harbor tracks the utilization of ride-shares verses self-parking.

Committee Member Brett Nadler (Sky Harbor International Airport) stated they do but the data was not with him.

Airport Representative Tony Bianchi requested data be shared with him to see what the statistics are for a large airport.

Chris Hacker, Mead & Hunt, Inc. (Consultant Rep. Hacker) stated that one of the key things would be that the links to the survey will remain open for a few more days and encouraged the committee to participate.

Airport Representative Tony Bianchi shared that the committee's survey is a little different than the public survey, because it will include the alternatives.

Consultant Rep. McFarland reminded the committee that Tony (Bianchi) is the client representative, and all comments should go through him.

Forecasts Aviation Activity Review

Consultant Rep. McFarland presented that there is a substantial increase in the number of enplanements forecasted for the 20-year plan. While enplanements are not going to double, the increase is significant. The total operations go from 316,000 to 369,000 during the next 20 years. A lot of those numbers will be generated by flight training activity. Total based aircraft all over the United States are not growing like they used to, because general aviation for smaller aircraft is not growing. Some growth at the airport is anticipated to still occur.

Consultant Rep. McFarland presented the layout of existing facilities. The East runway, farthest from the existing terminal is 9,300 feet long. Although the shortest, it does have the greatest pavement strength. The lowest minimum approach is on the south end of the center runway. On the south end of the west side runway are the SkyBridge Arizona facilities. SkyBridge Arizona has their own master plan and the Airport will incorporate those improvements in their document.

Facility Requirements Review

Consultant Rep. McFarland summarized the needs and considerations for facility requirements related to the runway system. The consulting team examined the potential for extending Runway 12L/30R, Runway 12R/30L, a parallel taxiway to Runway 12C/30C, other taxiway crossings to facilitate aircraft movements, and improved instrument approach capabilities to the runways. There is also a short-term focus to make improvements to the existing passenger terminal on the west side of the airport to ensure that it accommodates short-term demand. In the long term, it is anticipated that the passenger terminal will relocate to the east side. General aviation and industrial aviation will continue to be demand driven, and development parcels will be identified.

Airside Alternatives

Consultant Rep. McFarland presented two airside alternatives. The alternatives represented study of the runway length considerations, instrument approach capability, parallel taxiway improvement considerations, and exit and connecting taxiway improvements. In consideration of the ILS (Instrument Landing System) approach to the center runway, it should have a full taxiway system. The alternatives primarily examined the placement of that parallel taxiway system on the west side of the center runway.

Consultant Rep. Hacker commented that the alternative that placed the parallel taxiway on the west side of the center runway has a jog to avoid the existing VOR (Very High Frequency Omni-Directional Range).

Committee Member Erik Swanson (Town of Queen Creek) asked how many airports in the United States have three or more 10,000-foot runways.

Consultant Rep. McFarland responded not many, but Sea-TAC (Port of Seattle) does.

Consultant Rep. Hacker added that LAX (Los Angeles International Airport) also does.

Committee Member Erik Swanson commented probably less than 20 airports in the United States have three or more runways at that length.

Consultant Rep. McFarland responded that it is likely true that you would have more than three parallel runways at any of the large hub airports.

Airport Representative Scott Brownlee, Phoenix-Mesa Gateway Airport Authority responded large hubs might have at least three runways, however they might not all be parallel.

Consultant Rep. McFarland commented that one of the things that the consulting team looked at was capacity, which showed the importance for this airport to have three runways. The consulting team also looked at the question, what if we put the parallel runway on the east side of the center runway rather than the west side? The taxiway was most effective on the west side. Locating the parallel runway on the west side was proposed in anticipation of more aircraft operations on the west side than the east side. This alternative also included vast improvement to instrument approach capability to both the center and east runways, which is required at this airport. Since the airport experiences good weather almost all the time, the need for improved approaches is mitigated.

Consultant Rep. Hacker stated as we progress through defining each of these alternatives in developing the Preferred Conceptual Development Plan, viable projects outside of each alternative can be chosen in the development of the Conceptual Development Plan. It is not just one or the other, it can be customized.

Consultant Rep. McFarland On the Airside, the consulting team looked at run-up areas at the far north end of the west runway. Air Traffic Control specifically stated that smaller general aviation aircraft are doing run-ups in the operational area for the taxiway or the taxiway system. Air Traffic Control expressed the need for an area outside of the aircraft movement area where run-ups can be done. In addition, we have a larger demand for the industrial aviation users and for maintenance operators doing repairs and requiring engine runs. The alternative suggested that the run-up area will be located adjacent to Taxiway Yankee for general aviation, with a separate maintenance run-up area. Also, the current Compass Calibration Pad is adjacent to the SkyBridge leasehold. Both the Airport and SkyBridge Arizona would have an interest in relocating this function. Alternative locations were discussed.

Airport Representative Tony Bianchi shared that one of the needs that has emerged is this run-up pad. What we want to consider is, based on the orientation of the run-up location, noise is generated and impacts land uses surrounding the Airport. Where is the best place on the airfield for run-ups to occur? Can we put in any noise mitigation, so communities are not negatively impacted?

Landside Alternative – West Side

Consultant Rep. McFarland shared that in examining the existing terminal and its functional areas, passenger check-in and ticketing has capacity through 2038. There are other areas of the terminal buildings that will need to be improved. This includes Gates 1 through 4 in the terminal annex. These gates have met their useful life as they were built in 2006 and are essentially modular trailers.

Consultant Rep. Hacker stated that a key consideration for developing the new footprint for the terminal annex area was the recent improvements to the baggage makeup area. This would allow the existing passenger facilities to stay on the east side for a while longer.

Consultant Rep. McFarland stated that when the time comes to expand the passenger terminal on the east side, it will be done in separate phases as demand warrants. This will help the Airport to repurpose the west side terminal buildings, likely as general aviation uses, when the passenger terminal moves to the east side.

Landside Alternatives – East Side

Consultant Rep. McFarland stated Airport staff has been planning for development on the east side. This plan includes a "spine road" through the development area that would connect at Hawes Road and Ellsworth Road. The Airport is also requesting a passenger terminal development reserve area large enough to meet potential demand, but not in excess, to maximize the amount of development area for non-aeronautical use. The most prized non-aeronautical area is along Ellsworth Road. The best place for the new passenger terminal is at the far north end of the east side development area. Concepts that can ultimately accommodate about 30 gates are being recommended. The initial construction of 10 gates has already been environmentally approved.

Airport Representative Tony Bianchi asked from an industry standpoint, which design is recommended, or what is the industry standard for TSA and security requirements and other industry standards? Looking at Sky Harbor (International Airport), they took the first concept with a more linear design at Terminal 3.

Consultant Rep. McFarland responded that the pier/finger is an efficient use of space, but the site selected will dictate the configuration.

Consultant Rep. Hacker stated each of the terminal designs has its own advantages or disadvantages. With the pier/finger there is less walk distance for connecting passengers which is similar to Phoenix-Sky Harbor Terminal 4. The curvilinear is more of a hybrid model that has advantages of one finger being able to double up on the concourse, yet passengers will still experience a longer walking distance. The linear terminal equates with longer distance and walking between gates for connections. When looking at the proposed IWA site, the linear terminal option offers the shortest walking distance from passenger vehicle, through security, and to the aircraft.

Airport Representative Tony Bianchi stated that the current airport layout plan has 60 total gates that take up nearly all of the east side of the airport. The Airport is never going to need that many gates. This master plan has more efficient infrastructure, demands less roadway and less circulation, and keeps the cost down while at the same time opening 400 acres for non-aeronautical development or other additional development capable of generating revenue.

Airport Representative Brian O'Neill, *Phoenix-Mesa Gateway Airport Authority* stated it is important to segregate the two, because the passenger terminal is demand driven. It may be a decade away, but the non-aeronautical development should start happening now. Connectivity through the roadway is necessary, but separate the terminal development from the non-aeronautical. There are two distinct areas you can preserve in that area for future development needs. The people of Queen Creek say that 52,000 people a day use Ellsworth Road. There must be some opportunity to have non-aeronautical development to meet some of their needs.

Airport Representative Tony Bianchi stated that this provides us with more flexibility.

Airport Representative Tony Bianchi asked if there was any preference regarding the east side alternatives shown?

Committee Member Mark Gaspers, Boeing asked if the green area is accessible for non-aeronautical?

Airport Representative Tony Bianchi responded yes, all non-aeronautical, but revenue producing for the airport.

Consultant Rep. McFarland stated that the most valuable land on the airport is the area adjacent to the taxiway system. The project team did not identify that the green area would go all the way to the building restriction line. The team did leave a significant depth for aeronautical development to mirror the aeronautical depth similar to the west side.

Committee Member Chris Andres, City of Chandler - Chandler Municipal Airport stated a preference for the linear pier, because operations can start from the center and keep running. If additional operations are needed, there is a lot of flexibility without completely disrupting ongoing operations. Plus, it can always be widened for concession opportunities.

Committee Member Erik Swanson, Town of Queen Creek asked if alternative one provides extra expansion capabilities. It seems that there is opportunity on either end to come at a 45 (degree angle) and add an additional 10 gates on either side. Is that a possibility with alternative one?

Consultant Rep. McFarland responded yes.

Committee Member Chris Andres, City of Chandler - Chandler Municipal Airport (CHD) stated that for alternative three, options are limited unless selecting a perpendicular configuration.

Consultant Rep. McFarland stated that was an interesting concept. Internally the conversation was you have the gates in the back, and what if we did more of a linear? From an engineering standpoint, that is a lot of concrete. What are the costs associated with that? What are the options of extending the hammer head design?

Committee Member Chris Andres, City of Chandler - Chandler Municipal Airport (CHD) stated one of the challenges of the linear pier is that longer taxi distances if pilots must maneuver around the ends of the terminal to get to the airfield.

Consultant Rep. McFarland stated a double loaded concourse is much less expensive. Again, the consulting team will identify a concept and that will go in the Master Plan.

Airport Representative Tony Bianchi stated that goes back to Eric's point of view that the first alternative provides a little expansion opportunity. But the first initial phase, it doesn't seem optimal to have all your gates and support facilities at one far end.

Consultant Rep. McFarland responded keeping the geometry at the airports simple helps you avoid costing yourself money by wasting space.

Committee Member Erik Swanson, Town of Queen Creek asked about the "spine road" drop to the west. Wouldn't it make more sense to have the spine road further up and in to allow for future airport use? That is a primary road.

Airport Representative Tony Bianchi stated just take advantage of the existing crossing, because that is what was done with this design. The project team tried to take advantage of where the existing crossings are located especially with Williams Field Road alignment.

Airport Representative Bob Draper, Phoenix-Mesa Gateway Airport Authority stated it gives you more flexibility between aeronautical and non-aeronautical.

Committee Member Chris Andres, City of Chandler - Chandler Municipal Airport (CHD) stated that gives you a lot more flexibility, because, for example, at Sky Harbor the roadways determine the actual configuration.

Airport Representative Brian O'Neill responded to Mark (McFarland) by moving the main arterial road (spine road) to the north, outside of the ASR-8 critical area, there is a section of non-developed land that can be used as flex space for either aeronautical on non-aeronautical based on development needs.

Committee Member Chris Andres, City of Chandler - Chandler Municipal Airport (CHD) stated that way 100 years from now the Airport can expand as far east as you want (on airport property).

Conceptual Development Plan

Consultant Rep. McFarland stated, if we look at all these considerations, we did use alternative one airside in that we do have the parallel taxiways system for the center runway being on the west side of the center runway. We are recommending that the airport should have non-precision approaches on the east runway. No changes to runway protection zones, or safety and object free areas. Just provide some instrumentation guidance for the east side runway, which is hopefully going to be the air carrier runway. It is the strongest runway associated with larger aircraft and SkyBridge Arizona.

Airport Representative Tony Bianchi stated hopefully the future air traffic control tower can be built in the coming years.

Committee Member Erik Swanson, Town of Queen Creek asked will having the air traffic control tower on the west side work well enough for the east terminal?

Airport Representative Tony Bianchi responded yes, when you look at the old layout plan, a couple sites were identified on the east side, but when working with the FAA, the FAA said it was to remain on the west side because the entire airport was developed based on the existing tower site. So, they said we will find a good location on the west side and will adjust to what the height needs to be to manage air

traffic safely and successfully to the east side. We did do a siting study through the FAA, and they determined that it would stay on the west side.

Next Steps

Consultant Rep. McFarland stated that tomorrow we will next have a Technical Committee meeting, as well as a public information meeting. The Facilities Implementation Plan and Financial Feasibility Analysis working document will be the focus of the next meeting. The next step is that once the airfield configuration is decided, and the Airport approves, the project team will proceed with the Airport Layout Plan Drawing Set. The project team anticipates that our final committee meetings for both the Stakeholder and Technical Committees will be in September or October of 2019. Following that the project team will compile all the working papers into one draft final document, and that will be provided to the Airport Authority for review and approval. The project team will then submit the Airport Layout Plan to the FAA after the Airport Authority has given approval.

Phoenix-Mesa Gateway Airport Authority (PMGAA) Master Plan
Airport Master Plan Stakeholder Working Group Committee Meeting #4
October 23, 2019 / 9:00 AM – 11:00 AM
Phoenix-Mesa Gateway Airport Saguaro A/B Conference Room

Attendees	
Name	**Organization**
Bob Draper	Director of Engineering - Phoenix-Mesa Gateway Airport Authority
Brett Burningham	City of Queen Creek Representative
Brian O'Neill	Executive Director - Phoenix-Mesa Gateway Airport Authority
Brian Sexton	Community Relations Manager - Phoenix-Mesa Gateway Airport Authority
Chris Andres	City of Chandler Airport Representative
Chuck Odom	CFO Phoenix-Mesa Gateway Airport Authority
Josh Rogers	Town of Gilbert Representative
Kyle Mieras	Town of Gilbert Representative
Larry Kirch	City of Apache Junction Representative
Nana Appiah	City of Mesa Representative
Corinne Nystrom	Falcon Field Airport Representative
Ryan Smith	Director of Communications - Phoenix-Mesa Gateway Airport Authority
Scott Brownlee	Deputy Director - Phoenix-Mesa Gateway Airport Authority
Tony Bianchi	Planning Manager - Phoenix-Mesa Gateway Airport Authority

Consultant Team	
Name	**Organization**
Mark McFarland	Mead & Hunt, Inc.
Chris Hacker	Mead & Hunt, Inc.
Cameron Thomas	Mead & Hunt, Inc.
Kelly Phelps	PSM^2
Carissa Valdez	PSM^2
Dawn Arthur	Unison Consulting, Inc.
Brian Drake	Unison Consulting, Inc.

Introductions and Opening Remarks

Tony Bianchi, Phoenix-Mesa Gateway Airport Authority (PMGAA Rep. Bianchi) opened the meeting by welcoming the committee to the fourth Stakeholders Working Group (SWG) Committee meeting.

Review of Public Survey Input

PMGAA Rep. Bianchi presented the results of the Master Plan Survey to the group. The seven-question survey was distributed in mid-June 2019 to gain feedback from SWG committee members and the general public regarding Airport utilization, user preferences, outreach and related feedback. The survey was housed on the project website, sent to SWG committee members, publicized to the general public and yielded around 200 responses. Survey questions and results are as follows:

1. *How many times have you, or members of your household, used Gateway for air travel in the last 5 years?* The highest percentage of respondents utilize Gateway often or have not yet used Gateway.

2. *What would be the largest factor in why you utilized, or would utilize, Gateway for your air travel?* The largest factors identified in responses were airline destinations and proximity to one's home. Surprisingly, affordability came in last of the three choices.

3. *In regard to airport parking, which is more important to you?* Survey results showed that respondents valued low cost parking over proximity to terminal. Results of this answer differ from the previous question where affordability did not rank as high. These results help to inform the airport on how to best expand parking options for users.

4. *How do you travel to/from the airport when departing or arriving on a flight?* The highest number of respondents use their personal vehicle, which also indicates users are utilizing airport parking. Results also showed that 25% of responders use a Ride Share option. Airports across the county are showing a decline in parking utilization and an increase in the use of Ride Share. With Ride Share being available at Gateway only for a couple of years thus far, it is something to keep an eye on to be able to accurately measure and accommodate parking and curbside needs.

5. *How do you typically follow news and events related to Gateway Airport?* The largest number of respondents follow Gateway via social media outlets, which is on trend with the way people are currently gaining information in general. Additionally, 25% of respondents are not following Gateway at all for updates.

6. *In general, can you share your overall impression of Gateway?* Most respondents commented positively to this answer. The largest specific request received through this question was for additional destinations and airlines. Some concerns raised by respondents include:
    - Lines and crowds during peak times
    - Baggage claim wait times
    - Lack of concession space
    - Additional overflight noise from continued growth

7. *Looking into the future, what would you like to see accomplished at Gateway over the next 10-20 years?* The most popular responses include expansion of airlines service and destinations, new or expanded terminal facilities and enhanced parking options and circulation. Additionally, 14% of respondents preferred little to no additional growth due to concerns regarding noise.

Airport Master Planning Advisory Meeting Agenda

Mark McFarland, Mead & Hunt, Inc. (Consultant Rep. McFarland) provided an overview of the meeting agenda that consisted of:

- Introductory Remarks
- Review of Public Survey Input
- Project Approach and Schedule
- Review of Forecasts of Aviation Activity and Critical Facility Needs
- Conceptual Development Plan
- 20-year Capital Improvement Project List
- Airport Layout Plan Drawing Set
- Next Steps

Consultant Rep. McFarland reminded the SWG committee members that the Airport Master Plan is a document that, at completion, we want to anticipate what we think will happen at the airport over the next 20 years as well as influence what we want to happen during that same period. Stakeholders will help to influence what we want to have happen.

Project Approach and Schedule

Consultant Rep. McFarland reviewed the project approach stating that the Federal Aviation Administration (FAA), provides guidance on how the Master Plan will be prepared. It is a building block process where the inventory, forecasts, facilities needs determination, development plan formulation and the financial plan are prepared. One of the final steps, the Financial Plan has been prepared and will be reviewed with the group today. The project has been a 16-month process that began in March 2018 and is approaching substantial completion.

Review of Forecasts of Aviation Activity and Critical Facility Needs

Consultant Rep. McFarland stated the forecast has been approved by the FAA and reviewed components of the forecast with the group. The forecast projects increase in anticipated enplanements, total operations and based aircraft. The numbers shown below reflect that all the current available runways at Gateway are needed to accommodate forecasted activity.

Forecast Category	Present	2023	2028	2038
Enplanements	763,542 (2018)	924,667	1,022,420	1,245,211
Total Operations	288,921 (2018)	316,712	333,028	369,744
Total Base Aircraft	109 (2017)	121	126	139

Consultant Rep. McFarland summarized the critical facility needs considerations that included:

- Identify potential needs and benefits for runway extension(s)
- Identify benefits for placement of parallel taxiway improvements
- Consider the benefits of improved instrument approach capabilities
- Passenger terminal
    - Short-term focus on demand driven improvements for existing terminal building
    - Long-term focus on relocated terminal
- Vehicular access and parking
    - Short-term focus on demand driven improvements for existing terminal area
    - Long-term focus on relocated terminal including support facilities
- SkyBridge Arizona – incorporate adopted recommendations into master plan
- General aviation and industrial aviation – continue to program for demand driven facility expansion and improvements

In reviewing the passenger terminal requirements, existing functional areas are currently meeting the demand, and will continue to do so. Forecasts for the short-term indicate that, due to increased activity around 10 years and beyond, some existing terminal functional areas will be deficient. This shows a need to plan for a future east side terminal to fully meet growing activity demands at Gateway in the long term.

Conceptual Development Plan

Consultant Rep. McFarland presented the preferred conceptual development plan to the group. The preferred conceptual development plan shows both airside improvements (runway, taxiway, instrument, approach capabilities, etc.) and landside improvements (terminal, general, aviation, industrial aviation, etc.).

Corinne Nystrom, Falcon Field Airport (Falcon Field Airport Rep, Nystrom) asked if the land had been approved by the FAA for nonaeronautical usage, or will the airport have to go through the process to get it released? *Consultant Rep. McFarland* stated an environmental assessment has been done on the land, but the land has not been officially released for nonaeronautical use. An Airport Master Plan is an instrument to get these subjects on the table with the FAA. The property map and land use map identify potential uses, which lays the groundwork for the release. *PMGAA Rep. Bianchi* added that environmental assessment gave us the environmental clearance of all 700 acres. When we talked about the terminal complex. The airport does have clearance up to 300,000 square feet, but 160,000 square feet will likely be the first phase. The initial clearance was for 10 jet bridge gates, and 4 hardstands for the first phase. *Brian O'Neill, Phoenix-Mesa Gateway Airport Authority (PMGAA Rep. O'Neill)* stated that, in the earlier Airport Master Plans and other long-range planning documents, what was the Sky Bridge Arizona area has always been listed as aero and nonaero development opportunities. *Consultant Rep. McFarland* added that there will likely be a process involved in the release of the land, and the Master Plan should lay the foundation for that process.

PMGAA Rep. Bianchi shared that the existing ASR (Airport Surveillance Radar) on the east side that has been called out has a perpetual easement. We know if we are going to develop the east side of the airport, we will need to take some planning actions to address this. *PMGAA Rep. O'Neill* responded that the airport has taken some of the preliminary steps because they have identified at Rittenhouse Auxiliary Airfield a new site where the ASR-8 could be relocated. *Consultant Rep. McFarland* clarified that the location of the ASR-8 on the east side of the airport and the critical area around it will be left undeveloped as long as that ASR-8 remains. *PMGAA Rep. O'Neill* responded that the radar system is not a fixed by function, so it could be anywhere. As the City of Mesa continues to develop, there are concerns with developers obtaining FAA 7460-1 with concerns about impacts to the ASR-8. The City of Mesa and the airport are collaborating with partners at the FAA to explore options to address the ASR issues. *PMGAA Rep. Bianchi* added that there has been so much development on the north side of the airport, especially with the industrial buildings that some of the 7460s have come back with possible interference with the ASR signal. *Bob Draper, Phoenix-Mesa Gateway Airport Authority (PMGAA Rep. Draper)* added that when we laid out the terminal, we could technically build on initial phase of the terminal and second phase without impacting the 1,500-foot radius. *PMGAA Rep. O'Neill* stated that there can be development of substantial amount of area without relocating the ASR-8, and that with the technological advances that are happening, ASR technology may not still be used in the long term.

Consultant Rep. McFarland stated the future east side spine roadway development is proposed, which will connect access to the east side via Ray Road/Hawes Road and Ellsworth Road on the south. This same road will also support access to the proposed nonaeronautical development area.

PMGAA Rep. O'Neill added the spine road does a good job at delineating the land as we move towards developing the aero and nonaeronautical land.

Consultant Rep. McFarland noted the future air traffic control tower (ATCT) location.

PMGAA Rep. Bianchi added you will not see the ATCT in the Airport Capital Plan, because we hope that it will be addressed in the very near term.

PMGAA Rep. O'Neill stated the engineering team has reached 100% design of the new ATCT and received the new tower design grant from the FAA. We are currently working with the FAA on a construction grant to proceed with the development of the new ATCT within the next couple of years.

20-year Capital Improvement Project List

Consultant Rep. McFarland advised the group that Chapter 6 identifies the proposed capital improvement projects, when they are anticipated to take place, and estimated pricing based on 2019 estimated costs. Pricing inflation is added in the financial plan presented in Chapter 7. The capital improvement plan is most defined during the first five years. The plan also includes project lists for the 6- to 10-year timeframe, 11- to 20-year timeframe and beyond 20 years. *Consultant Rep. McFarland* also presented a phasing plan map showing location of the projects along with color coding for the time frame in which they are planned to take place.

PMGAA Rep. Bianchi added that if you look at the initial phase, the focus will be on the west side, and the initial planning on the east side. You see as the phases progress the focus moves from the west side to the east side.

Don Arthur, Unison Consulting, Inc. (Consultant Rep. Arthur) presented the financial analysis framework which is developed to identify the likely funding sources for the planned capital improvement projects. To complete the financial analysis, the team reviewed Gateway's financial framework, airline rates and charges, conducted an analysis of historical trends in revenues and expenses, and projections of future revenues, expenses and cash flow. Once all information is collected, a funding plan is developed for the capital improvement program (CIP). The financial information collected from Gateway includes:

- Audited financial reports for Fiscal Year (FY) 2014 – FY 2018
- Revenue and expense budgets for FY 2019 and FY 2020
- Electronic files showing airline rates and charges calculations
- Current Airports CIP on file with the FAA
- Passenger Facility Charge (PFC) applications, FAA PFC Final Agency Decisions, and PFC reports
- Information on airport tenants
- Development and lease agreements
- Additional information in response to follow-up requests

From this information, the team developed the CIP funding plan for the first 10 years of planned projects. The process included evaluating the eligibility of each project for the various funding sources and the estimated availability of these sources. The top funding sources identified include the FAA Airport Improvement Program (AIP) grants, PFCs and ADOT funding. Member Government contributions were also considered. The member governments collectively provide $4.06 million a year. Of this amount, $2.1 million is allotted to maintenance type projects not included in the CIP such as pavement management. This leaves $1.9 million a year for capital projects. The team also evaluated potential

funding sources for projects projected to take place beyond 10 years. Sources included the operating fund (revenues received minus the expenses), rental car customer facility charges and lease revenues.

Brian Drake, Unison Consulting, Inc. (Consultant Rep. Drake) continued the presentation of the funding plan with presentation of the plan sheet detailing each project cost and funding source estimate. Project costs differ than those included on the capital improvement plan, in Chapter 6, as a 2% escalation for each year was applied to the project costs. For all AIP-eligible projects, the team assumed 91.06% of the project cost will be funded by AIP entitlement and discretionary funds except for the Terminal Annex Redevelopment Design and Construction (A8). Additionally, the project funding is estimated to receive 4.47% in ADOT grants and 4.47% in member government contributions. The summary also shows that runway and taxiway projects are the highest use of funds at 60% of the total.

PMGAA Rep. Bianchi stated when we talk about AIP or grant assurances that the airport must meet, under one of those assurances the airport is required to address land use compatibility concerns. We want to ensure that we are consistently meeting all grant assurances, since much of our ability to implement improvements is based off of FAA grant funding.

Consultant Rep. Drake added that the AIP grant combined totals about 59% of the total funding plan.

Falcon Field Airport Rep, Nystrom asked if the $10 million in the first 4 years of the member contribution is that they contribute about $4 million a year. So, is the $4 million included in that $10 million, or is that $10 million in addition to the $4 million? *Consultant Rep. Drake* responded that $4.06 million per year minus about $2.1 million is used for the life cycle replacement and other capital costs.

Consultant Rep. Drake continued stating the projected breakdown of the airport's operating fund, which will also be a large funding source for the projects. Projections were based on the year 2020 budget and projected out to the year 2030, which shows growth in aeronautical and non-aeronautical revenue. Overall the projected revenue is anticipated to grow 2.6% per year. The operating fund breakdown also shows a modest cost per enplanement due to landing fees growing by only 3% every other year and the terminal fee remaining the same.

Consultant Rep. Arthur added that the airline cost per enplanement is using how the airlines are currently charged. Noted that this cost could change over time.

Airport Layout Plan Drawing Set

Consultant Rep. McFarland informed the group that the project team is nearing the completion of the Airport Layout Plan (ALP) drawing set. The Future Conditions ALP was presented to the group.

Next Steps

Consultant Rep. McFarland presented the next steps in the Master Plan process:

- Comments on draft work products due by October 30, 2019
- Presentation of Master Plan Recommendation to Senior Staff –November 12, 2019
- Materials (Including Executive Summary) Ready for Distribution to PMGAA
- Presentation of Master Plan Recommendations to PMGAA Board November 19, 2019
- Finalization of Master Plan Draft Final Report (compilation of all working documents)
- Finalization of ALP Drawing Set
- Submittal of ALP to FAA for Review and Approval

Phoenix-Mesa Gateway Airport (PMGAA) Master Plan
Airport Master Plan Technical Advisory Committee Meeting
July 31, 2018 1:30 PM – 3:30 PM
Phoenix-Mesa Gateway Airport Saguaro A/B Conference Room

Attendees	
Name	**Organization**
Dave Guthrie	Boeing
Jason Bagley	Intel
Margi Evanson	Phoenix-Mesa Gateway Airport Authority
Larry Randle	Textron Aviation
Brian Sexton	Phoenix-Mesa Gateway Airport Authority
Don Kriz	ADOT
Ethan McQuain	ATP
Jose Martinez	Sky Bridge
Greg Blank	NATCA
Scott Brownlee	Phoenix-Mesa Gateway Airport Authority
Brian Towle	TSA
Greg Hartvigsen	AZ National Guard
Gabriel Massey	Able Engineering
Rex Ginder	UND Aerospace
Dan Mesaros (via phone)	WestJet
Tony Bianchi	Phoenix-Mesa Gateway Airport Authority

Consultant Team	
Name	**Organization**
Mark McFarland	Mead & Hunt, Inc.
Chris Hacker	Mead & Hunt, Inc.
Eunique Jackson	Mead & Hunt, Inc.
Sharon Sarmiento	Unison Consulting
Paulos Lakew	Unison Consulting
Carissa Valdez	PSM^2

Below are the interests or area of opportunities identified by the stakeholders regarding the Master Plan:

- Better use of space

- More exit taxiways
- SkyBridge Arizona and compass rose development or relocation
- Intel based fleet at the Airport
    a. Long-term strategy of the Airport
    b. Impacts to Intel Operations
- Urban growth and noise abatement
- Role of military training at the Airport
- Growth by TSA and impacts at the Airport
- Interest in how the airport will grow and continue to maintain businesses
- Impact of the Airport on aviation in Arizona
- CH47 impacts to the runway and dust control
- Evolving safety and security requirements
- Pilot shortage and double-digit growth in student enrollment [domestic]
- UAV systems program
- Airspace constraint – 20-mile radius
    a. Capacity, tower availability and designated training areas
- Potential cargo operations
- Based MD80's were phased out last year

Consultant Rep. Mark McFarland Asked if there were any key planning issues that are perceived from your perspective that haven't been identified?

Committee Member Rex Ginder (UND Aerospace) Pilot shortages are real. There is 15% of growth from domestic students and the demand from Eastern Asia, China specifically, we will never meet their demands. Last fall we had 85 enrollments, and this fall 100 domestic enrollments were seen, on top of 150 Chinese students enrolled. This year we budgeted 38-39 thousand miles, in 3 to 4 years it's up to 50,000 miles. While we view this airport is nearing capacity for flight training hours, we are not imagining it to get smaller. We are starting an unmanned aircraft program that will attract a lot more people to aviation. Opportunity to step out of community college and within 18 months of employment will then be in the right seat of regional airline from anywhere from $60,000 to $70,000 per year. Flight training is very robust here and we want to make sure the airport can keep place with everything. Comes down to air traffic control services in the end.

Consultant Rep. Mark McFarland When you say reach capacity, can you please elaborate?

Committee Member Rex Ginder (UND Aerospace) Only so much airspace within 20 to 25 miles that is usable for practice area. Only so many machines in that space at one time. Limited on airports that are considered "reliever airports" for takeoff and landing operations. Capacity does not really come down to waiting to take off or pattern work.

Committee Member Jason Bagley (Intel) What type of consideration has been done with Sky Harbor and regional airports? It's my understanding that there is strategic direction to move cargo out of Sky Harbor to Mesa Gateway. If that is the intent, there needs to be a bigger point of discussion in this plan.

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) Sky Harbor is currently undertaking their Master Plan same as Falcon Field. We believe there is a benefit in three Master Plans going on simultaneously. Through this process we will strive to understand their forecasts & future

facility plans as it will help define where we are going. We want to collaborate with these other airports.

Consultant Rep. Mark McFarland We have several representative from other airports on the Stakeholders Working Group committee.

Committee Member, Jose Martinez (SkyBridge) SkyBridge will also share our Master Plan as part of this effort.

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) If available, we will look to coordinate with ASU regarding their additional land being developed adjacent to Gateway.

Forecast

Consultant Rep. Paulos Lakew As incomes increase enplanements also increase, a decrease in incomes will also translate to a decrease in lower enplanement growth. We also recognize the visitor make up for Gateway and Phoenix Sky Harbor. We look at national economic trends; goods and services how planes can be impacted at Gateway. A rise in GDP, will increase the enplanements at Gateway. Consumer demand theory expects that if there is a higher price on goods, that demands for that service goes down for example airfare.

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) Does it benefit to have the lower fare air carriers here, when talking about passenger yield?

Consultant Rep. Paulos Lakew No, not necessarily. The yields that you have here verses the ones at Sky Harbor would benefit Gateway.

Consultant Rep. Sharon Sarmiento If those yields and airfares continue to decrease in the future that will also promote growth in demand for services at this airport.

Consultant Rep. Paulos Lakew We are looking at both airfare from Gateway as well as Sky Harbor.

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) That per capita per income is a better indicator for passenger totals than the population growth that we had showed earlier?

Consultant Rep. Paulos Lakew Correct We have tested population, employment, per capita income, & GDP.

Consultant Rep. Sharon Sarmiento Population if we are to model different airports and included population it will be a strong predictor. But within an area. Here the population changes they are captured by historical growth trends that we have seen as well as in the model.

Committee Member, Greg Blank *(NATCA)* Your forecast for 2018, is that based on the MD80 usage? Allegiant is no longer flying the MD80 regularly.

Consultant Rep. Sharon Sarmiento We are using the actual schedules and they have mostly A319s; that is the reason there was a slight decrease in their schedules this year because that A319s have fewer seats than the MD80. When the A320s come in they have 177 seaters, the A319s have approximately 150± seats, MD80 have 166 seats. And for the forecast no MD80s were factored.

Consultant Rep. Paulos Lakew When did the MD80s stop flying?

Committee Member, Margi Evanson *(Phoenix-Mesa Gateway Airport Authority)* Currently, there are no MD80s in the flight schedule. If they do they are coming in as rescue flights, but they are not scheduled. They are only scheduling A319s and A320s.

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) From the Boeing perspective do you expect any increased activity?

Committee Member, Dave Guthrie (Boeing) Not at this point. We have some engineering items coming up next year, also training.

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) I am curious to see if the flight school and cargo have been factored into this. Especially cargo since it hasn't really been captured in the past.

Consultant Rep. Paulos Lakew If its charted cargo than it wouldn't be on the commercial side. It would be captured here, but we wouldn't be able to know if its cargo or not.

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) How impactful are rising fuel prices to flight schools, and potentially military activity? I am curious to see the fluctuation of fuel prices, how that compares with the other economic trends? If they correlate?

Committee Member, Greg Hartvigsen (AZ National Guard) The military amount of flying and fuel price is not directly correlated.

Committee Member, Gabriel Massey (Able) Half of the world's helicopter operations are involved with the exploration for oil and gas. In 2014 and 2015 when oil prices dropped helicopter operations dropped significantly. We don't have that here at Gateway in terms of direct impact on operations, but it does affect our business because we support oil and gas customers.

Consultant Rep. Paulos Lakew That's key with fuel prices, it mostly impacts on the supply side, but fuel prices are going to affect demand.

Conclusion

Consultant Rep. Mark McFarland Are there any specific questions that you would like to ask before we end? We would love to have your input now, or if you want to think about it more and further review the documents, please forward your comments to Tony within two weeks.

Committee Member, Gabriel Massey (Able) It seems that a lot of the forecast is dependent on Allegiant.

Consultant Rep. Sharon Sarmiento Yes, for example our base model that we would recommend to the FAA is the one that assumes that the Allegiant service will remain similar to what it is today with reasonable growth. The low scenario depicts a cutback, the high scenario anticipates other carrier(s), expanding service, and/or Allegiant expanding its service.

Committee Member, Gabriel Massey (ABLE) I'm assuming the SkyBridge inputs also.

Consultant Rep. Sharon Sarmiento We did not include forecast for cargo, because we will be relying on SkyBridge to provide their forecasts, and once we have their numbers we will add them to our projections.

Consultant Rep. Mark McFarland The next steps that we are going to work on include forecast revisions and submittal of the forecasts to the FAA for approval. We will also work on the second working paper which focuses on facility needs determination. We will have our second Technical Advisory Committee and Stakeholders working group meeting and have the public workshop which are all about 3-4 months out but anticipate early November to come together. We appreciate your participation. All the communication should go through Tony and he will pass it along to us.

Phoenix-Mesa Gateway Airport Authority (PMGAA) Master Plan
Airport Master Plan Technical Advisory Committee Meeting #2
January 15, 2019 / 1:30 PM – 3:30 PM
Phoenix-Mesa Gateway Airport Saguaro A/B Conference Room

Attendees	
Name	**Organization**
Matt Nebgen	Gateway Aviation Services FBO/PMGAA
Col. Matt Stubbs	Arizona Army National Guard- Dept of Emergency & Military Affairs
Jose Martinez	SkyBridge Arizona (SkyBridge)
Scott Brownlee	Phoenix-Mesa Gateway Airport Authority
Rex Grinder	UND/CGCC Aerospace (UND/CGCC)
Doug Mack	Air Traffic Control- SERCO
Brian Sexton	Phoenix-Mesa Gateway Airport Authority
Larry Randle, Jr.	Textron Aviation
Don Kriz	Arizona Department of Transportation (ADOT) – Aeronautics Division
Margie Evanson	Phoenix-Mesa Gateway Airport Authority
Scott Tinnesand	Boeing
J. Brian O'Neill	Phoenix-Mesa Gateway Airport Authority
Tony Bianchi	Phoenix-Mesa Gateway Airport Authority

Consultant Team	
Name	**Organization**
Mark McFarland	Mead & Hunt, Inc.
Chris Hacker	Mead & Hunt, Inc.
Eunique Jackson	Mead & Hunt, Inc.
Carissa Valdez	PSM^2

General comments from the Airport Master Plan Technical Advisory Committee meeting have been summarized below.

Committee Member, Don Kriz (ADOT) – The runway length shown on slide #10, *Runway Length and Pavement Strength Requirement for B747-400 operations*, indicates there are two runways, Runway 12R/30L and Runway 12C/30C, that are currently longer than the 9,500 feet recommended by your analysis. Airside Development Alternative 2 depicts a runway extension for Runway 12R/30L. What is the disconnect?

Response: The east parallel runway (Runway 12L/30R) was designed and constructed to provide the greatest pavement strength for more demanding aircraft. The runway lengths identified for Airside

Development Alternative #2 were from the prior master plan, and it is only a preliminary alternative. Based on the facility requirements analysis and design aircraft, it could warrant a runway extension to accommodate a fully loaded heavier aircraft.

Committee Member, Larry Randle, Jr. (Textron Aviation) – The SkyBridge development is due to take place on land west of Runway 12R/30L, including land where the present-day compass rose is located. Has discussion been had, or has a decision been made, regarding relocating the compass rose to an area where space is available?

Response: The alternatives analysis will look closely at this issue and accommodating a possible relocation as SkyBridge has expressed interest in possibly relocating the compass rose, however, it is currently excluded from their lease with PMGAA.

Committee Member, Jose Martinez (SkyBridge) – The taxiway leading west from Taxiway A, as shown in Alternative 1, appears to be a taxiway connector to the SkyBridge development area. Is this being constructed? Is Taxiway L going to be relocated, as shown?

Response: The alternatives analysis will also look at these issues. Those exhibits shown on the Airport Layout Plan (ALP) and preliminary alternatives presented do not mean they will all be constructed but are shown for runway, taxiway connectivity options. Any offset between taxiways is based on FAA design guidance.

Committee Member, Rex Grinder (UND/CGCC) – Commented regarding the 2008 plan, IWA put forth a plan that if a new terminal didn't happen in 10 years that it would still be okay. Is there talk about moving to the east side in your ongoing planning? Any thoughts given to operators and taking that equipment and moving it out to the east runway? Also, what about taxi times and reducing runway occupancy times?

Response: The alternative analysis will look closely at these issues, but the facility requirements analysis and approved forecasts indicated that an east side facility should continue to be planned for in the longer term of the planning horizon. There is no immediate plan to relocate the ILS.

Committee Member, Rex Grinder (UND/CGCC) – Construction of terminal facilities on the east side of airport property as well as Airport Surveillance Radar (ASR) removal have been discussed. If nether has happened in the last 10 years, what is the tipping point?

Response: The tipping point would be when inadequacies with the terminal and/or support facilities on the west side of the airport (access, parking, terminal building ability to accommodate demand even with improvements) drive the need for a relocated passenger terminal.

Committee Member, Rex Grinder (UND/CGCC) – Has any thought been given to relocating the Instrument Landing System (ILS) equipment to the east runway? A precision GPS approach would be sufficient for operators. Is the purpose of retaining the ILS equipment and approaches to maintain and/or attract operations by older aircraft and operators?

Response: Good questions. This too will be addressed in the alternatives analysis. IWA is well served by existing instrument approach capabilities and navigation aids.

Committee Member, Rex Grinder (UND/CGCC) – Our students rarely use the ILS approach here. Our flight instructors understand commercial aircraft are operating in the airspace and that the ATCT (control tower) is working hard to get all aircraft in and out of Phoenix-Mesa Gateway Airport (IWA). Though we believe it is a great learning environment for our students here, we conduct Instrument Flight Rules (IFR) operations at nearby airports, unless unable to. A precision GPS approach would be best to replace the ILS. It is a bit costly, but is a fairly quick installation process. Obtaining a new Global Positioning System (GPS) approach is not a long process, but moving equipment from the center runway to another is a big deal and quite costly.

Committee Member, Brian O'Neill (Phoenix-Mesa Gateway Airport Authority) – Commented that there will be challenges associated with relocating commercial operations to the east side of the airport. Future development of a new commercial passenger terminal, access roadways, vehicle parking, and other necessary airport facilities will be demand-driven. Currently, Phoenix-Mesa Gateway Airport Authority cannot financially afford to undertake a project of that magnitude and the airlines may not be supportive of such a move. The goal is to identify and develop additional long-term funding sources and work with our airline partners on a transition plan to meet their long-term needs as they continue to grow.

Committee Member, Tony Bianchi (Phoenix-Mesa Gateway Airport Authority) – If we were to add or relocate instrumentation from Runway 12C/30C to the east runway, Runway 12L/30R, or pursue implementation of instrumentation for IFR operations, that would likely expand our Runway Protection Zones onto land that we do not own, or currently have an easement for?

Response: Yes, it could.

Committee Member, Scott Tinnesand (Boeing) – Indicated that during previous airspace meetings, discussions about removing the ASR on IWA's eastside were had. Due to the financial responsibility for removal, the ASR has remained. Is this still the case? It will need to be relocated for future airport development to ensue. Where will the airport relocate the ASR? What are future plans for the ASR?

Response: There was an ASR relocation study completed. The preferred location is at the Rittenhouse Auxiliary Field near Queen Creek. There is an agreement to site it, but it comes down to a funding issue to move it and addressing the perpetual easement with the FAA on the current ASR.

Committee Member, Matt Nebgen (Phoenix-Mesa Gateway Airport Association/FBO) – What is the expected time frame for construction of terminal facilities on the east side? When can we expect greater detail on this matter? I understand money is the driving factor. Have you considered modifying or further expanding the terminal facilities currently located west? What ideas have been explored to reduce the cost of constructing a new terminal east of Runway 12L/30R? Maybe reducing the number of gates?

Response: This will be more thoroughly addressed in alternatives analysis, including terminal location and required acreage, which could be reduced from what was first anticipated. The facility requirements analysis indicated that an east side facility should continue to be planned for in the longer term of the planning horizon. We would abide by the completed Environmental Assessment on the east side, which identified an initial 10-12 gate terminal.

Committee Member, Rex Grinder (UND/CGCC) - Officials have commented that Sossaman Road is going to face issues as a result of increase in airport operations. An increase in airport operations means an increase in vehicular traffic. To minimize airport impact to Sossaman Road, use of Ray Road should be considered.

Response: That is correct. Traffic counts related to passenger, employment, university and SkyBridge traffic are projected to increase. Initial analysis shows a decreased level of service approaching a failing level of service between 2030 and 2040 for Sossaman Road. This too will be addressed in the alternatives analysis.

Consultant Rep. Mark McFarland (Mead & Hunt, Inc.) – The next steps that we are going to work on include the development of the alternatives analysis and the Conceptual Development Plan for IWA along with Working Paper #3. We will have our third Working Group meeting in late April or early May 2019 time frame. We appreciate your participation. Any additional comments should go through Tony Bianchi for consideration.

Phoenix-Mesa Gateway Airport Authority (PMGAA) Airport Master Plan
Airport Master Plan Technical Advisory Committee Meeting #3
June 26, 2019 / 9:00 AM – 11:00 AM
Phoenix-Mesa Gateway Airport Saguaro A/B Conference Room

Attendees	
Name	**Organization**
James Gullet	Arizona Air National Guard
Brian Towle	Transportation Security Agency
Scott Sveinsson	Arizona Air National Guard/CFMD
Richard Handorf	Arizona Air National Guard/FMD
Suhani Schottenheimer	Allegiant Airlines
Larry Randle Jr.	Textron Aviation
Matt Nebgen	Director of Gateway Aviation Services, Phoenix-Mesa Gateway Airport Authority
Shea Joachim	Business Development Director, Phoenix-Mesa Gateway Airport Authority
Rex Girder	UND Aerospace
Chuck Odom	Chief Financial Officer, Phoenix-Mesa Gateway Airport Authority
Brian Sexton	Communications Manager/PIO, Phoenix-Mesa Gateway Airport Authority
Bob Draper	Engineering & Facilities Director, Phoenix-Mesa Gateway Airport Authority
Brian O'Neill	Executive Director/CEO, Phoenix-Mesa Gateway Airport Authority
Ryan Smith	Director of Communications/Community Relations, Phoenix-Mesa Gateway Airport Authority
Scott Brownlee	Deputy Director/COO, Phoenix-Mesa Gateway Airport Authority
Tony Bianchi	Airport Planning Manager, Phoenix-Mesa Gateway Airport Authority

Consultant Team	
Name	**Organization**
Mark McFarland	Mead & Hunt, Inc.
Chris Hacker	Mead & Hunt, Inc.
Kelly Phelps	PSM^2
Carissa Valdez	PSM^2

Introductions and Opening Remarks

Airport Representative Tony Bianchi, (PMGAA) opened the meeting by welcoming the committee to the third stakeholder meeting. He provided the update that, since the last meeting, the Facility

Requirements chapter has been finalized, and a series of discussions regarding some of the alternatives has occurred.

Mark McFarland, Mead & Hunt, Inc. (Consultant Rep. McFarland) reminded the committee that the Airport Master Plan is a planning document, and it incorporates what we think will happen at the airport over the next 20 years.

Airport Master Planning Advisory Meeting Agenda

Consultant Rep. McFarland provided an overview of the meeting agenda that consists of:

- ✓ Introductory Remarks
- ✓ Project Approach and Schedule
- ✓ Forecasts of Aviation Activity Review
- ✓ Facility Requirements Review
- ✓ Airfield Alternatives
- ✓ Landside Alternative – West Side
- ✓ Landside Alternative – East Side
- ✓ Conceptual Development Plan
- ✓ Next Steps

Project Approach and Schedule

Consultant Rep. McFarland introduced the section by stating that the Federal Aviation Administration (FAA) funded a lot of the study and provided guidance on how the master plan will be prepared. In developing a master plan, it is a building block process in completion of a final Master Plan document. The project team presented completed sections a few months ago to this group and others (Stakeholder Committee). The project team received comments before moving on to the next section. The Facility Requirements Determination was published, and feedback was received. We are now in The Development Plan, which includes Alternatives, and following this, we will complete a Financial Plan.

Consultant Rep. McFarland introduced the Project Schedule, explaining schedule milestones with one remaining Technical Advisory Committee meeting likely to be held in September of 2019.

Consultant Rep. McFarland discussed the online public and stakeholder surveys remain open for comments, and he encouraged the committee to participate. The public survey has received 177 responses to date with these results:

- 34 percent of respondents indicate they have used Gateway five or more times in the past five years.
- 70 percent of respondents indicated low cost parking was important (more important than proximity to terminal).
- 42 percent indicated airline destinations are a critical factor in utilizing Gateway.
- 35 percent indicated proximity to home is a critical factor in utilizing Gateway.

Airport Representative Tony Bianchi indicated that one of the interesting results to the public survey on how passengers travel to/from IWA when traveling is that rideshare (Lyft/Uber/Shuttle) has been on airport a couple of years, and Phoenix-Mesa Gateway Airport recently signed a user agreement with Uber. Over 25 percent respondents answered that they use this service.

Forecasts Aviation Activity Review

Consultant Rep. McFarland presented that there is a substantial increase in number of enplanements forecasted for the 20-year plan. While enplanements are not going to double, the increase is significant. The total operations goes from 316,000 to 369,000 during the next 20 years. A lot of those numbers will be generated by flight training activity. Total based aircraft all over the United States are not growing like they used to, because general aviation for smaller aircraft is not growing. Some growth at the airport is anticipated to still occur.

Consultant Rep. McFarland presented the layout of existing facilities. The East runway, farthest from the existing terminal is 9,300 feet long. Although the shortest, it does have the greatest pavement strength. The lowest minimum approach is on the south end of the center runway. On the south end of the west side runway are the SkyBridge Arizona facilities. SkyBridge Arizona has their own master plan and the Airport will incorporate those improvements in their document.

Facility Requirements Review

Consultant Rep. McFarland summarized the needs and considerations for facility requirements related to the runway system. The consulting team examined the potential for extending Runway 12L/30R, Runway 12R/30L, a parallel taxiway to Runway 12C/30C, other taxiway crossings to facilitate aircraft movements, and improved instrument approach capabilities to the runways. There is also a short-term focus to make improvements to the existing passenger terminal on the west side of the airport to ensure that it accommodates short-term demand. In the long term, it is anticipated that the passenger terminal will relocate to the east side. General aviation and industrial aviation will continue to be demand driven, and development parcels will be identified.

Airside Alternatives

Consultant Rep. McFarland presented two airside alternatives. The alternatives represented study of runway length considerations, instrument approach capability, parallel taxiway improvement considerations, and exit and connecting taxiway improvements. In consideration of the ILS (Instrument Landing System) approach to the center runway, it should have a full taxiway system. The alternatives primarily examined the placement of that parallel taxiway system on the west side of the center runway

Consultant Rep. McFarland commented that one of the things that the project team looked at was capacity, as it is important for IWA to have three runways. The project team also looked at putting the parallel taxiway on the east side of the center runway opposed to the west side. The taxiway was most effective on the west side. Location is a result of the anticipation of more aircraft operations on the west side than east side. This consideration also included vast improvements to instrument approach capability to both the center and east runways, which is required at this airport. With the good weather IWA experiences, the project team is looking at minimal instrumental approach aid capabilities to the east runway. This will not change any of the land use considerations.

Consultant Rep. Hacker stated as we progress through defining each of these alternatives in developing the Preferred Conceptual Development Plan, viable projects outside of each alternative can be chosen in the development of the Conceptual Development Plan. It is not just one or the other, it can be customized.

Airport Representative Tony Bianchi pointed out the existing Master Plan planned for an Air Traffic Control Tower, which is currently under design. The tower will have additional height to allow for visibility on the east side in anticipation for future development.

Airport Representative Scott Brownlee, Phoenix-Mesa Gateway Airport Authority asked about the reasoning behind the alignment of the parallel taxiway on Alternative 1.

Consultant Rep. McFarland stated the parallel taxiways were aligned around the Very High Frequency Omni-Directional Range (VOR). If the VOR is relocated, the parallel taxiway could then be straight.

Rex Girder, UND Aerospace asked if the runways were rated for freight in terms of concrete?

Consultant Rep. McFarland stated the west and center runway pavement was designed for 550,000 pounds, and the east runway pavement was designed for 850,000 pounds. Runway pavement strength must be designed for 740,000 pounds to withstand frequent heavy aircraft operations.

Consultant Rep. McFarland presented run-up area alternatives. On the Airside, the project team looked at run-up areas at the far north end of the west runway. Air Traffic Control specifically stated that smaller general aviation aircraft are doing run-ups in the operational area for the taxiway or the taxiway system. Air Traffic Control staff expressed the need for an area outside of the aircraft movement area where runups can be done. In addition, we have a larger demand for the industrial aviation users and for maintenance operators doing repairs and requiring engine runs. The alternative suggested the run-up area will be adjacent to Taxiway Yankee for general aviation, with a separate maintenance run-up area. Also, the current Compass Calibration Pad is adjacent to SkyBridge Arizona leasehold. Both the Airport and SkyBridge Arizona would have an interest in relocating this. One alternative is in the middle of the west side, adjacent to the terminal, which is not recommended because it removes a significant area with the potential for development.

Landside Alternative – West Side

Consultant Rep. McFarland shared that during terminal considerations, the project team looked at various functional aspects and check-in and ticketing has capacity through the Master Plan period (2038) without improvements. All other aspects need improvement to meet demand through the 20-year planning period. Also looking at parking, the Ray Road Economy lot is big enough to accommodate demand. The Express Lot is already short on capacity now. What should be done on the west side to the passenger terminal support facilities? The Annex, modular buildings housing Gates 1 through 4, has also reached its useful life, and it can be reconstructed or enlarged to some degree. All these potential near-term improvements can be taken into consideration in the Financial Plan. West Side Development was presented with two Alternatives, each having a short-term, mid-term and long-term phase. The alternatives also identify room for additional aircraft parking. With the additional RONs (Remain Over Night) being implemented, more gate space would be available and ultimately prolongs the use of the West Side Terminal.

Airport Representative Tony Bianchi pointed out the past terminal development was divided into phases/buildings that allow for easy repurposing when relocation to the new terminal occurs.

Shea Joachim, Phoenix-Mesa Gateway Airport Authority asked if, in the alternatives regarding the annex space, the spots identified are truly RON spots or, when repurposed, will be gate spots?

Consultant Rep. McFarland confirmed them as RON positions.

Landside Alternatives – East Side

Consultant Rep. McFarland stated that Phoenix-Mesa Getaway Airport has 36 acres that contains either terminal facilities or terminal support facilities and accommodates 10 aircraft parking positions. Airport staff has been planning for development on the east side, with a spine road through the development area that would connect at Hawes Road and Ellsworth Road. The Airport also is requesting a passenger terminal development reserve area to maximize the amount of non-aeronautical use development area. The most prized non-aeronautical area is along Ellsworth Road. The best place for the new passenger terminal is at the far north end of the east side development area. The concept being recommended is a pier/finger concourse, which can accommodate about 30 gates. The initial construction of 10 gates has already been environmentally approved. Other concepts presented were the linear and curvilinear.

Terminal Development

Consultant Rep. McFarland presented the three Terminal Development alternatives. All three alternatives show the terminal development on the east side end of the airport, with future non-aeronautical development to the southeast and a section of aeronautical development with airfield access west of the spine road. The three alternatives show three different terminal design options. The Pier-Finger Terminal Design with 28 gates for Alternative 1, the Curvilinear-Pier Design with 28 gates for Alternative 2, and the Linear-Pier Design with 28 gates for Alternative 3.

Airport Representative Tony Bianchi pointed out the alternatives developed through this study are adjusted from what is on the current ALP. These alternatives are a seismic shift and are resetting expectations regarding the number of gates with the future terminal development, west side development for non-aeronautical revenue, and locating the terminal closer to those using it via the Loop 202 and Hawes Road.

Scott Sveinsson, Arizona Air National Guard/CFMD stated the Air National Guard is currently planning to relocate their Papago Park operation within 10 years. A space of 100 acres would be needed to relocate this operation, and there is anticipated funding from the Air National Guard Bureau to facilitate this relocation and development. In the near term, the Air National Guard is looking for C-12 aircraft space to utilize.

James Gullet, Arizona Air National Guard added the Air National Guard is ultimately planning to locate the C-12 and Blackhawks at the same facility. The Air National Guard is interested in a hangar lease at Phoenix-Mesa Gateway Airport.

Bob Draper, Phoenix-Mesa Gateway Airport Authority suggested that the spine road that was being shown be further east as it would provide more flex space. The road should not determine how the land would be utilized.

James Gullet, Arizona Air National Guard asked about the size of the aeronautical development section east of the spine road.

Bob Draper, Phoenix-Mesa Gateway Airport Authority said the area is 57 acres.
Consultant Rep. McFarland asked if Air National Guard needed airfield access for their planned relocation and development.

Scott Sveinsson, Arizona Air National Guard/CFMD confirmed they do.

Scott Brownlee, Phoenix-Mesa Gateway Airport Authority informed the group that the alternatives are conceptual and can be modified to accommodate future development.

Brian O'Neill, Phoenix-Mesa Gateway Airport Authority stated that the Airport is reserving around 200 acres for the passenger terminal and is ready to begin development east of that location for non-aeronautical development. The best amount of land between the taxiway and the future spine road needs to be determined for the best use of the area. If the road is adjusted, the best approach is to identify the area as flex space on the ALP to accommodate the capability of aeronautical or non-aeronautical development.

Airport Representative Tony Bianchi asked *Brian Towle, TSA* if they had any preferences regarding the future terminal design.

Brian Towle, TSA indicated centralized screening for the security checkpoint is preferred over multiple checkpoint locations. The layout and location of the security checkpoint is of most interest to the TSA.

Conceptual Development Plan

Consultant Rep. McFarland stated, if we look at all these considerations, we did use alternative one airside in that we do have the parallel taxiways systems for the center runway being on the west side of the center runway. We are recommending that the airport has only visual approach aids on the east runway, and they be improved slightly to 1-mile minimums, no precision instrument approaches. No changes are proposed to runway protection zone, or safety, or object free areas. Just provide some instrumentation guidance for the east side runway, which is hopefully going to be the air carrier runway. It is the stronger runway pavement associated with larger aircraft and SkyBridge Arizona.

Airport Representative Tony Bianchi asked if there was any additional feedback from attendees.

Rex Girder, UND Aerospace stated that large freight companies are utilizing more modern aircraft that are lighter. Extension to the western most runway is vital to cargo operations. Users will not want to land on the east runway and taxi the length it requires to utilize facilities.

Larry Randle Jr., Textron Aviation stated the run-up areas are a vast improvement and will ensure less time back and forth.

Shea Joachim, Phoenix-Mesa Gateway Airport Authority asked what is the need for the dual parallel taxiway east of Taxiway Charlie?

Consultant Rep. McFarland explained with the future development on the east, the plan reserves the room for the taxiway system in anticipation for potential future use.

Shea Joachim, Phoenix-Mesa Gateway Airport Authority asked if this was best approach for the area, as it provided for future aeronautical development further from airfield, which is anticipated to be utilized sooner than the future terminal.
Bob Draper, Phoenix-Mesa Gateway Airport Authority explained the first parallel is to allow aircraft to exit the runway as soon as possible, and the second parallel is to enable aircraft to access locations as needed.

Rex Girder, UND Aerospace added that the dual parallel taxiways were an efficiency measure.
Brian O'Neill, Phoenix-Mesa Gateway Airport Authority asked how the aeronautical designated area shown on the alternatives can be developed, if a taxi lane for access would accommodate operational needs of the area and access to the airfield.

Consultant Rep. McFarland stated the dual parallel taxiway, aeronautical development, and airfield access will be looked at closer when the project moves towards the technical development of the ALP.

Bob Draper, Phoenix-Mesa Gateway Airport Authority commented another option is to provide a taxi lane on the outside of the taxiway that accesses the runway. This is a more cost-effective option as well due to pavement amount and costs.

Shea Joachim, Phoenix-Mesa Gateway Airport Authority asked if there were any airfield inefficiencies that resulted in aircraft stacking up and the need for a dual taxiway system on the west side.

Rex Girder, UND Aerospace answered there is not this situation as the volume of operations is not there, and the way the airfield is designed accommodates immediate access to and from the runways.

Brian O'Neill, Phoenix-Mesa Gateway Airport Authority commented that developments will need to be prioritized as financial planning moves forward. The aeronautical and non-aeronautical development on the east side is critical to support the future facilities and passenger terminal.

Next Steps

Consultant Rep. McFarland stated we will next have our final Stakeholders and Technical Committee Meetings. The Facilities Implementation Plan and Financial Feasibility Analysis, which is the next working document, will be prepared as a part of this process, and that is the last working document. Once the airfield configuration is finalized and approved by the Airport, the project team will proceed with developing the Airport Layout Plan. The project team anticipates our final Stakeholders and Technical Advisory Committee meetings in either September or October of 2019. Following that, we will compile all the working papers into a draft final document, and that will be provided to Phoenix-Mesa Gateway Airport Authority for review and approval. Once the Airport Layout Plan has been developed, we will submit it to the FAA upon Phoenix-Mesa Gateway Airport Authority approval.

Phoenix-Mesa Gateway Airport Authority (PMGAA) Master Plan
Airport Master Plan Technical Advisory Committee Meeting #4
October 23, 2019 / 1:30 PM – 3:30 PM
Phoenix-Mesa Gateway Airport Saguaro A/B Conference Room

Attendees	
Name	**Organization**
Bob Draper	Director of Engineering - Phoenix-Mesa Gateway Airport Authority
Brian O'Neill	Executive Director - Phoenix-Mesa Gateway Airport Authority
Brian Sexton	Community Relations Manager - Phoenix-Mesa Gateway Airport Authority
Chuck Odom	CFO Phoenix-Mesa Gateway Airport Authority
Don Kriz	Arizona Department of Transportation (ADOT) – Aeronautics Division
Doug Mack	Air Traffic Control Tower Manager- SERCO
Kyler Erhard	Federal Aviation Administration (FAA)
Ryan Smith	Director of Communications - Phoenix-Mesa Gateway Airport Authority
Scott Brownlee	Deputy Director - Phoenix-Mesa Gateway Airport Authority
Tony Bianchi	Planning Manager - Phoenix-Mesa Gateway Airport Authority

Consultant Team	
Name	**Organization**
Mark McFarland	Mead & Hunt, Inc.
Chris Hacker	Mead & Hunt, Inc.
Kelly Phelps	PSM^2
Carissa Valdez	PSM^2
Don Arthur	Unison Consulting, Inc.
Brian Drake	Unison Consulting, Inc.

Introductions and Opening Remarks

Tony Bianchi, Phoenix-Mesa Gateway Airport Authority (PMGAA Rep. Bianchi) opened the meeting by welcoming the committee to the fourth Technical Advisory Committee (TAC) meeting.

Review of Public Survey Input

PMGAA Rep. Bianchi presented the results of the Master Plan Survey to the group. The seven-question survey was distributed in mid-June 2019 to gain feedback from the TAC members and the general public regarding Airport utilization, user preferences, outreach and related feedback. The survey was housed on the project website, sent to TAC member members and publicized to the general public and yielded around 200 responses:

1. *How many times have you, or members of your household, utilized Gateway for air travel in the last 5 years?* The highest percentage of respondents utilize Gateway often or have not yet utilized Gateway for air travel.

   Don Kriz, Arizona Department of Transportation (ADOT) – Aeronautics Division (TAC Member Kriz) asked if survey results have been compared to any comparable survey or information gained by Phoenix Sky Harbor International Airport. *PMGAA Rep. Bianchi* stated this has not been done. *Brian O'Neill, Executive Director - Phoenix-Mesa Gateway Airport Authority (PMGAA Rep. O'Neill)* added that customer use is very different between the two airports. One serves a high number of business travel, and the other is utilized mainly for non-business travel. It would be difficult to compare this type of information from the two to gain useful insight.

2. *What would be the largest factor in why you utilized, or would utilize, Gateway for your air travel?* The largest factors identified in responses were airline destinations and proximity to one's home. Surprisingly, affordability came in last of the three choices.

3. *In regard to airport parking, which is more important to you?* Survey results showed that respondents valued low cost parking over proximity to terminal. Results of this answer differ from the previous question where affordability did not rank as high. These results help to inform the airport on how to best expand parking options for users.

4. *How do you travel to/from the airport when departing or arriving on a flight?* The highest number of respondents use their personal vehicle, which also indicates users are utilizing airport parking. Results also showed that 25% of responders use a Ride Share option. Airports across the county are showing a decline in parking utilization and an increase in the use of Ride Share. With Ride Share being available at Gateway only for a couple of years thus far, it is something to keep an eye on to be able to accurately measure and accommodate parking and curbside needs.

5. *How do you typically follow news and events related to Gateway Airport?* The largest number of respondents follow Gateway via social media outlets, which is on trend with the way people are currently gaining information in general. Additionally, 25% of respondents are not following Gateway at all for updates.

6. *In general, can you share your overall impression of Gateway?* Most respondents commented positively to this answer. The largest specific request received through this question was for additional destinations and airlines. Some concerns raised by respondents include:
   - Lines and crowds during peak times
   - Baggage claim wait times
   - Lack of concession space
   - Additional overflight noise from continued growth

7. *Looking into the future, what would you like to see accomplished at Gateway over the next 10-20 years?* The most popular responses include expansion of airlines service and destinations, new or expanded terminal facilities, and enhanced parking options and circulation. Additionally, 14% of respondents preferred little to no additional growth due to concerns regarding noise.

Airport Master Planning Advisory Meeting Agenda

Mark McFarland, Mead & Hunt, Inc. (Consultant Rep. McFarland) provided an overview of the meeting agenda that consisted of:

- Introductions and Opening Remarks
- Review of Public Survey Input
- Project Approach and Schedule
- Review of Forecasts of Aviation Activity and Critical Facility Needs
- Conceptual Development Plan
- 20-year Capital Improvement Project List
- Airport Layout Plan Drawing Set
- Next Steps

Consultant Rep. McFarland reminded the TAC members that the Airport Master Plan is a document that, at completion, we want to anticipate what we think will happen at the airport over the next 20 years. We want to influence what we want to happen during that same time period. Stakeholders will help to influence what we want to have happen.

Project Approach and Schedule

Consultant Rep. McFarland reviewed the project approach stating that the FAA provides guidance on how the Master Plan will be prepared. It is a building block process where the inventory, forecasts, facilities needs determination, development plan formulation and the financial plan are prepared. One of the final steps, the Financial Plan has been prepared and will be reviewed with the group today. The project has been a 16-month process that began in March 2018 and is approaching substantial completion.

Review of Forecasts of Aviation Activity and Critical Facility Needs

Consultant Rep. McFarland stated the forecast has been approved by the FAA and reviewed components of the forecast with the group. The forecast projects increase in anticipated enplanements, total operations and based aircraft. The numbers shown below reflect that all the current available runways at Gateway are needed to accommodate forecasted activity.

Forecast Category	Present	2023	2028	2038
Enplanement	763,542 (2018)	924,667	1,022,420	1,245,211
Total Operations	288,921 (2018)	316,712	333,028	369,744
Total Base Aircraft	109 (2017)	121	126	139

Consultant Rep. McFarland summarized the critical facility needs considerations that included:

- Identify potential needs and benefits for runway extension(s)
- Identify benefits for placement of parallel taxiway improvements
- Consider the benefits of improved instrument approach capabilities
- Passenger terminal
    - Short-term focus on demand driven improvements for existing terminal building
    - Long-term focus on relocated terminal
- Vehicular access and parking

    - Short-term focus on demand driven improvements for existing terminal area
    - Long-term focus on relocated terminal including support facilities
- SkyBridge Arizona - incorporate adopted recommendations into master plan
- General aviation and industrial aviation – continue to program for demand driven facility expansion and improvements

In reviewing the passenger terminal requirements, existing functional areas are currently meeting the demand, and will continue to do so for the short term. Forecasts indicate that, due to increased activity around 10 years and beyond, some existing terminal functional areas will be deficient. This shows a long-term need to plan for a future east side terminal to meet growing activity at Gateway.

Conceptual Development Plan

Consultant Rep. McFarland presented the preferred conceptual development plan to the group. The existing runways are adequate in length. The east runway, which has the strongest pavement, may require a short extension to accommodate SkyBridge forecasted aircraft usage. As shown on the previous plan documents, extension of the west runway will be necessary to clean up airfield geometry. Additional taxiways are also proposed to keep the airfield operating efficiently and safely. The east end runway is proposed to gain improvements of a 1-mile visual minimum approach. General aviation and industrial aviation will continue to be demand driven, and development parcels will be identified.

The preferred conceptual development plan shows the SkyBridge proposed development on the landside, west end. Additionally, some parcels have been identified on the landside, west end for development along with the terminal annex redevelopment and the future air traffic control tower. However, there is not a lot of area remaining on the landside, west end. On landside, east end, the preferred conceptual development plan shows a future 28-gate passenger terminal to accommodate future capacity needs that will be phased to be implemented 10 gates at a time. Landside access facilities were reviewed to determine how the terminal will be supported by known access points connecting with the regional roadway system. A spine roadway is proposed that will connect access to the east side via Ray Road/Hawes Road and Ellsworth Road. This roadway will also support access to the proposed non-aeronautical development area.

A section of area near the taxiway system has been identified for future aeronautical development. The ASR-8 is currently located in this area. Gateway continues coordination with the FAA to determine the potential of relocation of the ASR-8 to support airport and City of Mesa development in the area. A substantial amount of the proposed east side development can proceed without disruption to the ASR-8 critical area radius. *PMGAA Rep. O'Neill* informed the group that Gateway has had discussions with the FAA in the past about possible relocation of ASR-8. This will not only benefit airport development but also for future planned development for the City of Mesa. The Rittenhouse Auxiliary Airfield has been identified as a potential new location for the ASR-8. The possibly of raising the ASR-8 is also under discussion. However, the preferred action is to relocate ASR-8 away from the airport.

PMGAA Rep. Bianchi asked the TAC members if they have any input on the preferred conceptual development plan. *TAC Member Kriz* likes proposed taxiway improvements. *Doug Mack, Air Traffic Control- SERCO (TAC Member Mack)* supports additional exits off the runways along with the removal of the Taxiway Papa curve. *Kyler Erhard, FAA (TAC Member Erhard)* advised to move taxiway connector entrances outside the middle third of runways, exits are permissible in this area. *TAC Member Erhard* asked about the new center taxiway adjacent to the VOR. *Consultant Rep. McFarland* confirmed and pointed out the location of the VOR between the west and center runway causing the taxiway jog. If the

VOR is no longer needed and removed prior to construction of this taxiway, then the jog is not necessary. *Chris Hacker, Mead & Hunt, Inc. (Consultant Rep. Hacker)* added that the project team reviewed the list of facilities due for decommissioning, the VOR is still listed to remain active, and the jog shown on the preferred conceptual development plan satisfies the 250-foot safety area required for the taxiway.

20-year Capital Improvement Project List

Consultant Rep. McFarland advised the group that Chapter 6 identifies the proposed capital improvement projects, when they are anticipated to take place, and estimated pricing based on 2019 cost estimates. Pricing inflation was added in the financial plan presented later in Chapter 7. The capital improvement plan is most defined during the first five years. The plan also includes project lists for the 6- to 10-year timeframe, 11- to 20-year timeframe, and beyond 20 years. *Consultant Rep. McFarland* also presented a phasing plan map showing location of the projects along with color coding for the timeframe in which they are planned to take place.

TAC Member Mack commented the midfield taxiway around the VOR is much needed. *PMGAA Rep. Bianchi* added that this is identified as a Phase 1 project (within 5 years) with the other midfield taxiway anticipated to be implemented in Phase 2 (6 to 10 years).

Don Arthur, Unison Consulting, Inc. (Consultant Rep. Arthur) presented the financial analysis framework, which is developed to identify the likely funding sources for the planned capital improvement projects. To complete the financial analysis, the team reviewed Gateway's financial framework, airline rates and charges, and conducted an analysis of historical trends in revenues and expenses and projections of future revenues, expenses and cash flow. Once all information is collected, a funding plan is developed for the capital improvement program. The financial information collected from Gateway includes:

- Audited financial reports for Fiscal Year (FY) 2014 – FY 2018
- Revenue and expense budgets for FY 2019 and FY 2020
- Electronic files showing airline rates and charges calculations
- Current Airports Capital Improvement Program on file with the FAA
- Passenger Facility Charge (PFC) applications, FAA PFC Final Agency Decisions, and PFC reports
- Information on airport tenants
- Development and lease agreements
- Additional information in response to follow-up requests

From all this information the team developed the capital improvement program funding plan. The plan is for the first 10 years of planned projects. The process included evaluating the eligibility of each project for the various funding sources along with the estimated availability of these funding sources. The top funding sources identified include the FAA Airport Improvement Program (AIP) grants, PFCs and ADOT funding. Member government contributions were also considered. The member governments collectively provide $4.06 million a year. Of this amount, $2.1 million is allotted to maintenance type projects not included in the capital improvement plan such as pavement management. This leaves $1.9 million a year for capital projects. The team also evaluated potential funding sources for project projected to take place beyond 10 years, which included the operating fund (revenues received minus the expenses), rental car customer facility charges, and lease revenues.

Brian Drake, Unison Consulting, Inc. (Consultant Rep. Drake) continued the presentation of the funding plan with presentation of the plan sheet detailing each project cost and funding source estimate. Project

costs differ than those included in the capital improvement plan, in Chapter 6, as escalated project costs. For all AIP-eligible projects, the team assumed 91.06% of the project cost will be funded by AIP entitlement and discretionary funds except for the Terminal Annex Redevelopment Design and Construction (A8). Additionally, the project funding is estimated to receive 4.47% in ADOT grants and 4.47% in member government contributions.

Consultant Rep. Drake also presented the sources and uses of capital funding, which summarizes the funding plan. AIP funding is estimated to be roughly 59% of the total funding plan. The summary also shows that runway and taxiway projects are the highest use of funding at 60% of the total. *Scott Brownlee, Deputy Director - Phoenix-Mesa Gateway Airport Authority (PMGAA Rep. Brownlee)* asked if only 60% AIP funding is projected for the Terminal Annex Redevelopment Design and Construction (A8) because it is a terminal project. *Consultant Rep. Drake* confirmed. *Consultant Rep. Drake* presented a breakdown of the airport's operating fund. Projections were based on the year 2020 budget and projected out to the year 2030, which shows growth in aeronautical and non-aeronautical revenue. Overall the projected revenue is anticipated to grow 2.6% per year. The operating fund breakdown also shows a modest cost per enplanement due to landing fees growing by only 3% every other year and the terminal fee remaining the same.

TAC Member Rep. Kriz provided insight on how ADOT allots funding. *PMGAA Rep. Brownlee* verified no state local grants were considered to develop the funding numbers presented. *Chuck Odom, Phoenix-Mesa Gateway Airport Authority* added that the team took a conservative approach in developing the funding numbers for the plan. *TAC Member Kriz* confirmed ADOT programs to ensure to match all federal state local requests.

Airport Layout Plan Drawing Set

Consultant Rep. McFarland informed the group that the project team is nearing the completion of the Airport Layout Plan (ALP) drawing set. The Future Conditions ALP was presented to the group. *PMGAA Rep. Bianchi* asked *TAC Member Erhard* if the FAA will want to see the delineation between aeronautical and non-aeronautical use for SkyBridge on the ALP. *TAC Member Erhard* confirmed it should be included on the land use plan sheet.

Next Steps

Consultant Rep. McFarland presented the next steps in the Master Plan process:

- Comments on draft work products due by October 30, 2019
- Presentation of Master Plan Recommendation to Senior Staff – November 12, 2019
- Materials (Including Executive Summary) Ready for Distribution to PMGAA
- Presentation of Master Plan Recommendations to PMGAA Board November 19, 2019
- Finalization of Master Plan Draft Final Report (compilation of all working documents)
- Finalization of ALP Drawing Set
- Submittal of ALP to FAA for Review and Approval

SIGN-IN SHEET

Phoenix-Mesa Gateway Airport

Airport Master Plan Stakeholder Meeting
July 31, 218 (9:00 a.m. – 11:00 a.m.)
PMGAA Saguaro A/B Conference Rooms

NAME	COMPANY NAME	E-MAIL	PHONE
Eric Emmert	DPG	eric@dornpolicygroup.com	602-290-9998
MargiEvanson	PMGAA		
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Mike Hutchinson	EastValleyPartnership	mhutchinson@evpaz.org	602-363-5033
Jaeuson Moll	Home Builders Assn	mollj@hbaca.org	602 274 6545
Suzanne Kinney	NAIOP	suzanne@naiopaz.org	602-451-9326
Kyle Mieras	Gilbert	Kyle.Mieras@gilbertaz.gov	480 503 6705
Gordon Bluth	BLUCOR	gordon@blvcon.com	480 695 6971
Cindy Barnes	CGCC	Cindy.barnes@cgcc.edu	480-234-4935

SIGN-IN SHEET

Phoenix-Mesa Gateway Airport

Airport Master Plan Stakeholder Meeting
July 31, 218 (9:00 a.m. – 11:00 a.m.)
PMGAA Saguaro A/B Conference Rooms

NAME	COMPANY NAME	E-MAIL	PHONE
Christine Zielonka	City of Mesa,	CHRISTINE.ZIELONKA @MESAAZ.GOV	480-644-3833
Brett Burningham	Town of Queen Creek	brett.burningham@queencreek.org	480-358-3097
Brett Nadler	City of Phoenix Aviation department	brett.nadler@phoenix.gov	480-495-4715(C) 602 273 0094(O)
CHRIS ANDRES	CITY OF CHANDLER	CHRIS.ANDRES@CHANDLERAZ.GOV	480-782-3540
Scott Brownlee	PMGAA	Sbrownlee@gatewayairport.com	480-988-7604
Corinne Nystrom	City of Mesa – Falcon Field Airport	corinne.nystrom@mesaaz.gov	(480) 644-4045
Brian Sexton	PMGAA	bsexton@gatewayairport.com	(480) 988-7618
RUDY ESQUIVIAS	CITY OF APACHE JUNCTION	resquivias@ajcity.net	480-474-2645

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Master Plan – Stakeholder Working Group Meeting

July 31, 2018

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Acrojets – The Fighter School @ Williams AFB

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Agenda

- ✓ Introductions and Opening Comments
- ✓ Expected Outcomes for Master Planning Process
- ✓ Project Approach and Schedule
- ✓ Role of the Stakeholder Working Group
- ✓ Inventory of Existing Conditions
- ✓ Key Planning Issues Identification
- ✓ Forecasts of Aviation Activity
- ✓ Questions & Comments
- ✓ Next Steps

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Project Team

- ✓ Phoenix-Mesa Gateway Airport Authority and Staff
- ✓ Federal Aviation Administration/Arizona Department of Transportation
- ✓ Consultants
  - Mead & Hunt
  - PSM^2
  - Unison Consulting
  - Intervistas

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Master Plan

- ✓ **Statement of Policy**
  - **Anticipate What We Think Will Happen**
  - **Influence What We Want to Happen**

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Expected Outcomes

- ✓ Comprehensive Recommendations for Layout of Future Airport Facilities
- ✓ Reasonable Long-Term Capital Improvement Plan
- ✓ Appropriate Documentation of Considerations and Influences
- ✓ FAA Approved Airport Layout Plan

Public Outreach

- ✓ Airport Authority Briefings (as requested)
- ✓ Stakeholder Committee Meetings
- ✓ Technical Committee Meetings
- ✓ Public Outreach Workshops

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Project Approach

- ✓ Follow FAA Guidance
- ✓ Building Block Process
  - Inventory
  - Forecasts
  - Facilities Needs Determination
  - Alternatives and Development Plan Formulation
  - Financial Plan

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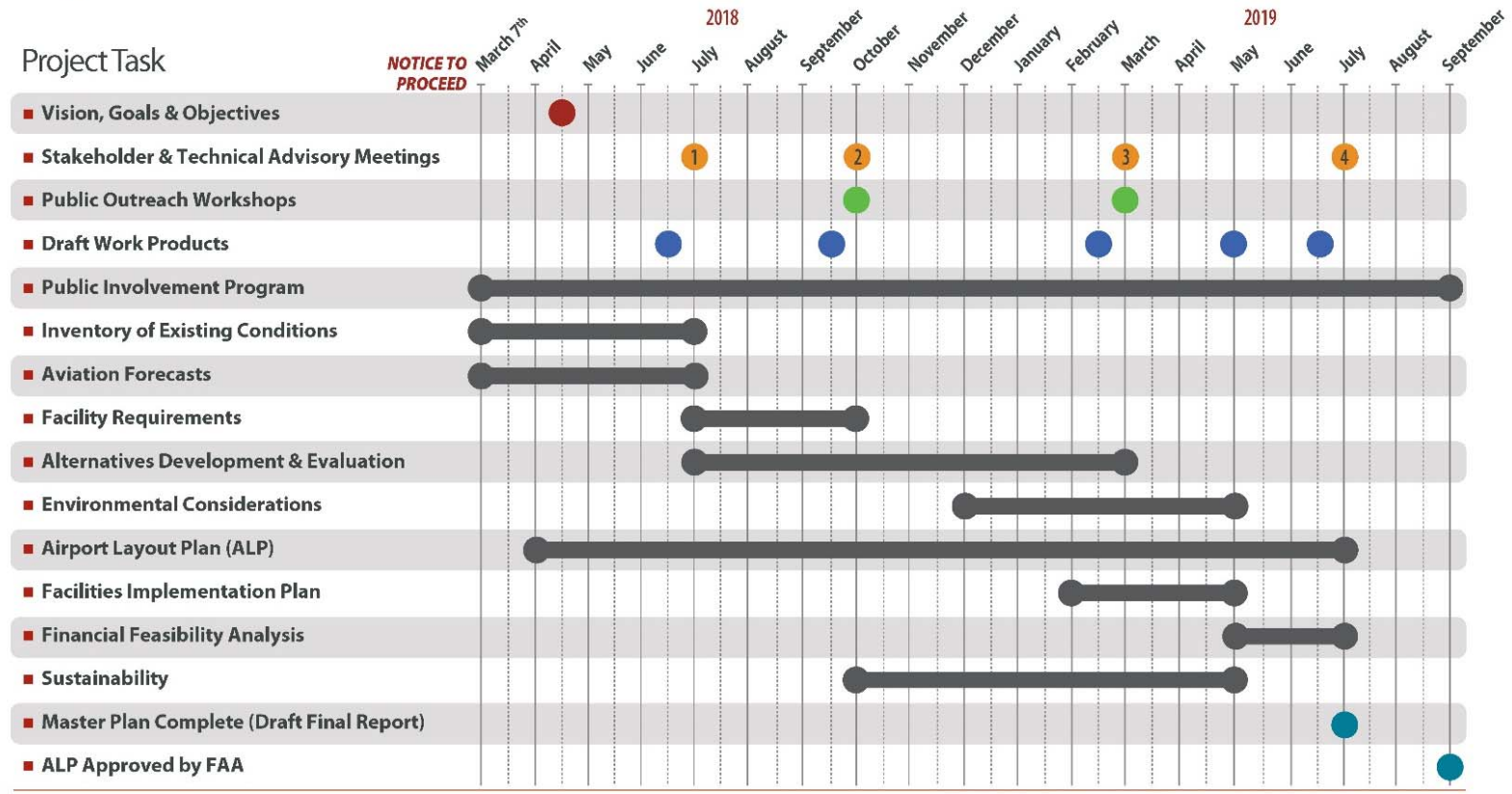
Project Schedule Airport Master Plan



NOTE: Schedule updated February 2, 2018. Subject to change.

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Role of Stakeholder Working Group

- ✓ Committee is made up of a variety of interest groups with interests in local and regional influences associated with the airport, many with government expertise and knowledge which will help to direct the airport's future development
- ✓ Provide feedback on draft work products from your perspective
- ✓ Not a voting group, consensus is not required, but your INPUT is CRITICAL !

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Inventory of Existing Conditions

- ✓ Airport Role
- ✓ Airport Background
- ✓ Airport Facilities Inventory
  - Airside Facilities
  - Landside Facilities
  - Airspace System and Naviads
- ✓ Airport Environs
- ✓ Issues Summary

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Airport Role – Location

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Gateway
Airport Master Plan

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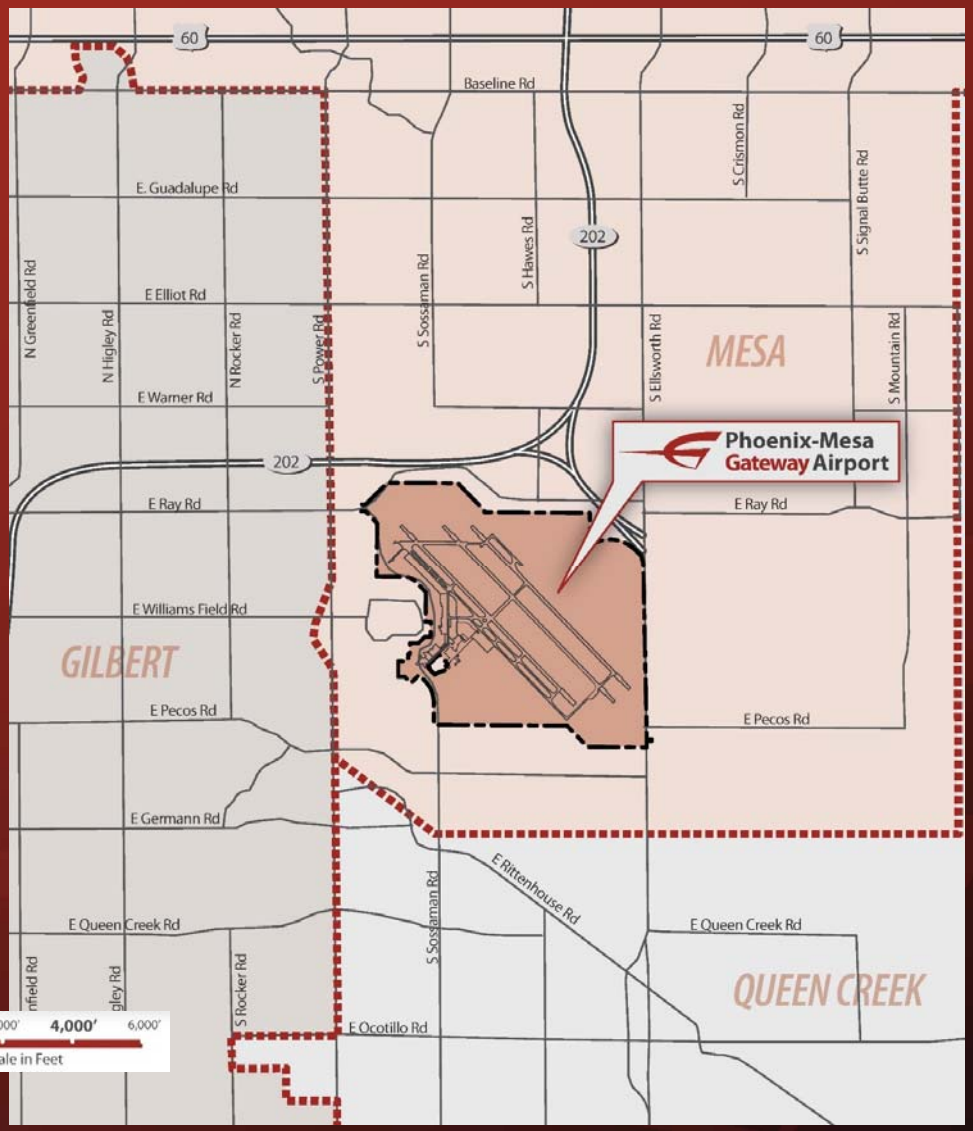
Airport Role – Local Government Relationships



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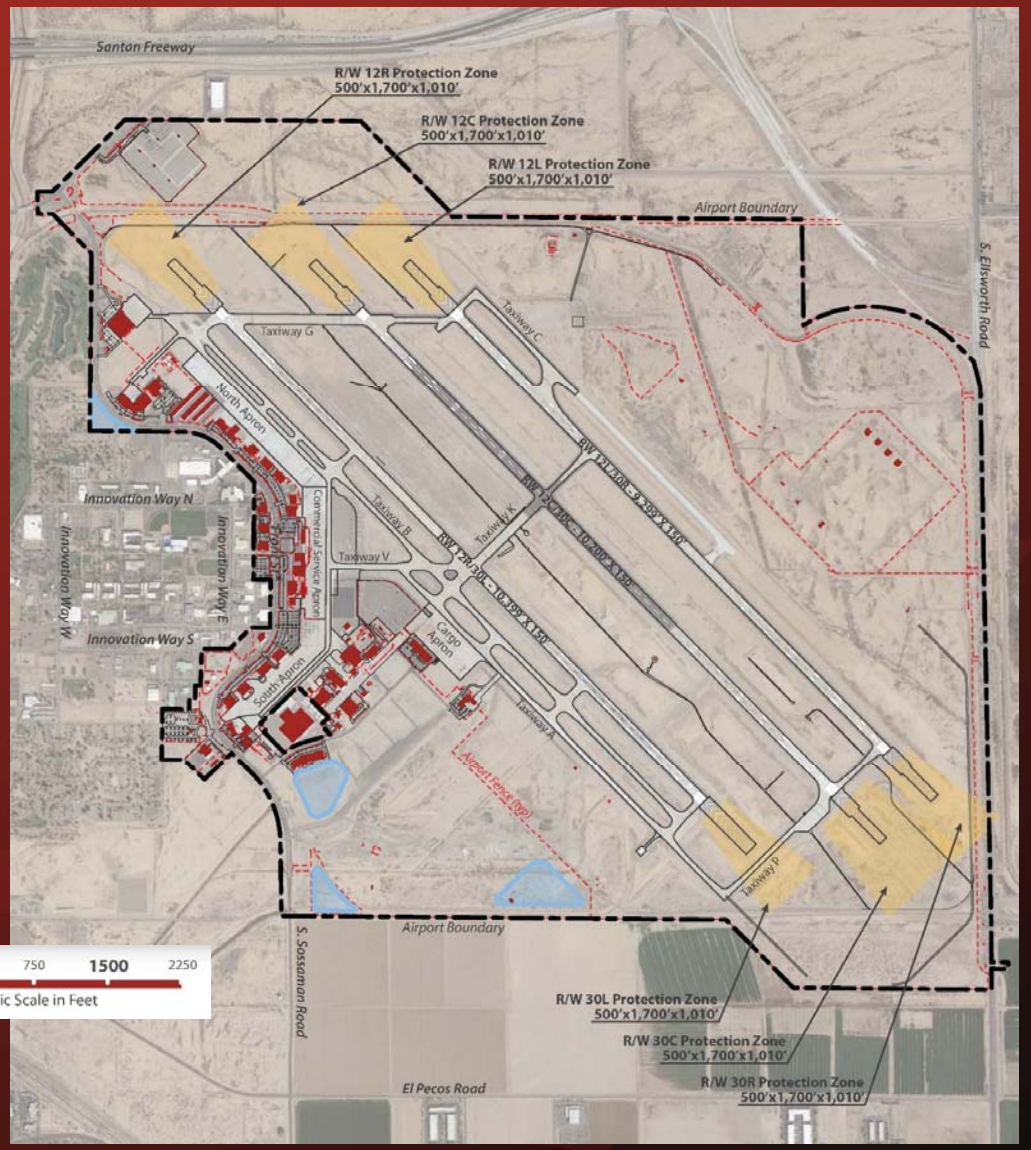
Airport Role – Airport Facilities



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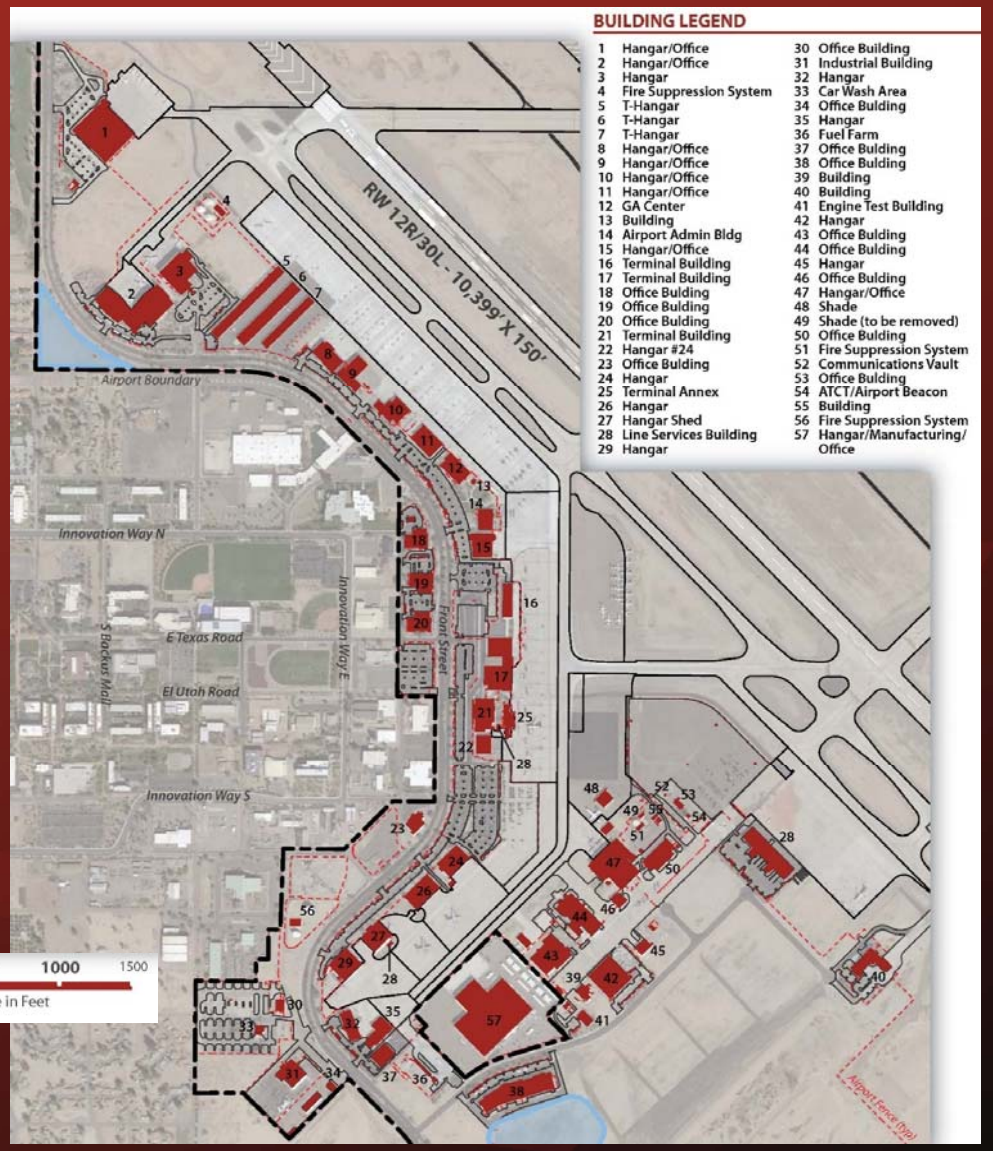
Airport Role – Terminal Area Facilities



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Airport Role

- ✓ Within National System Plan (3,400 airports)
- ✓ Within State System Plan (83 airports)
- ✓ Commercial passenger activity center
- ✓ General aviation operational center
- ✓ Flight training operational center
- ✓ Military activity operational center
- ✓ Regional economic development support center

Key Planning Issues Discussion

- ✓ Maximize safety and efficiency in layout of airport facilities.
- ✓ Consideration of the significant amount of marketable airport property.
- ✓ Consideration of demand by future critical aircraft types.
- ✓ Base recommendations for future passenger terminal facilities on reasonable expectation of demand, with scalable improvements associated with defined trigger points.
- ✓ Comprehensive landside improvement recommendation (ATCT, ARFF, fuel storage and delivery, storage hangars, air cargo facilities, etc.).
- ✓ Continue working with surrounding communities to support land use compatibility initiatives.
- ✓ Promote financially sustainable Capital Improvement Plan.
- ✓ Consider all passenger transportation modes in development of terminal improvement recommendations.
- ✓ Recognize environmental constraints.

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Aviation Activity Forecast Development

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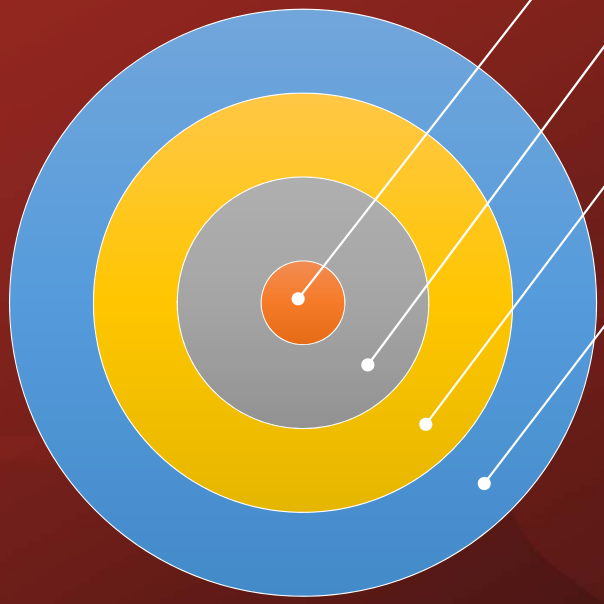
Comprehensive Forecast Development Process

- ✓ Analysis of the airport's business environment
- ✓ Analysis of the airport's historical activity trends
- ✓ Assessment of future air service development possibilities
- ✓ Forecast development and risk assessment

The Airport Business Environment



Airport Activity

Regional Economy

Aviation Industry

National / Global Economy

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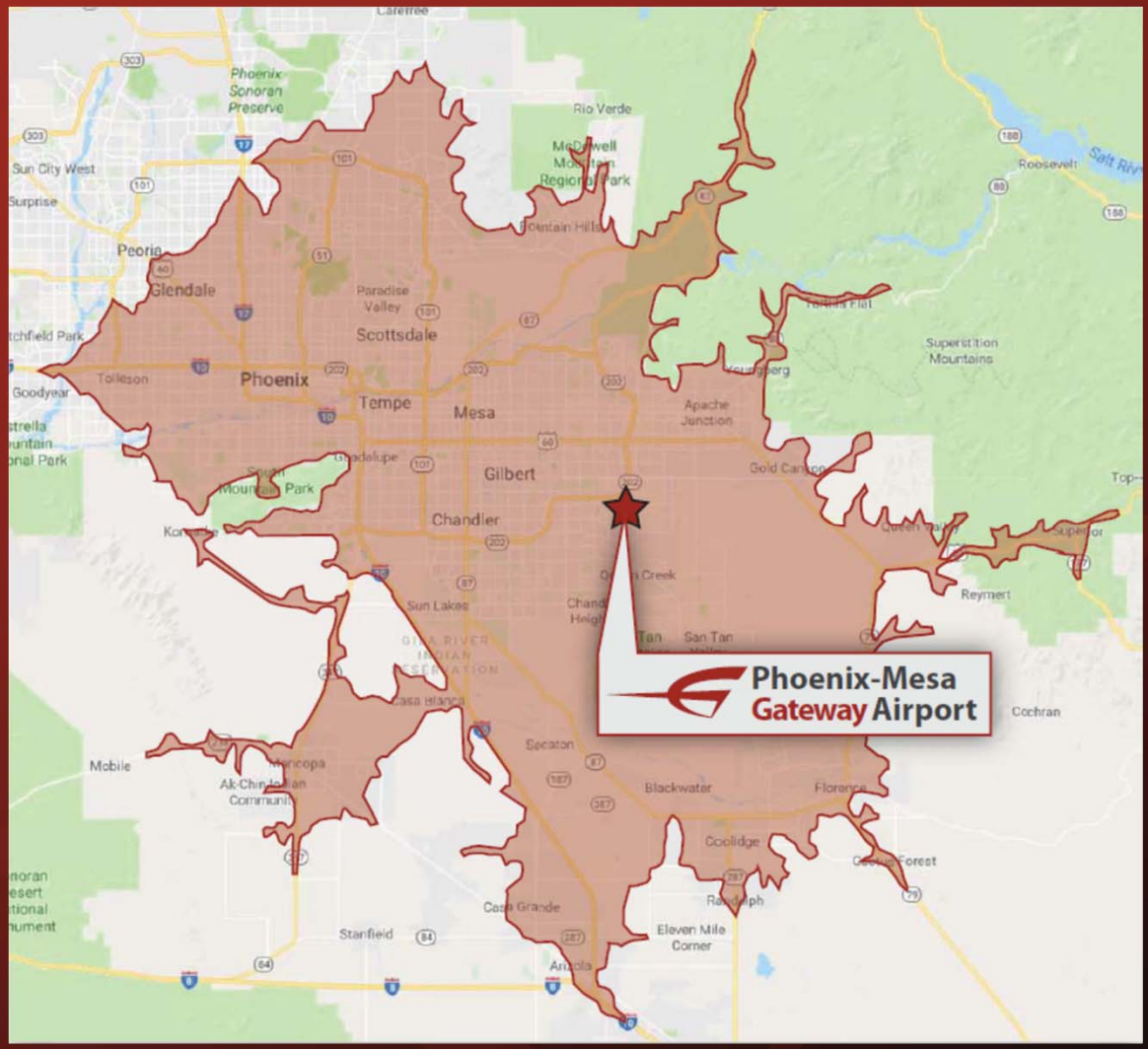
Airport Service Area

- 1-hour drive area covering most of the Phoenix-Mesa-Scottsdale, AZ, MSA



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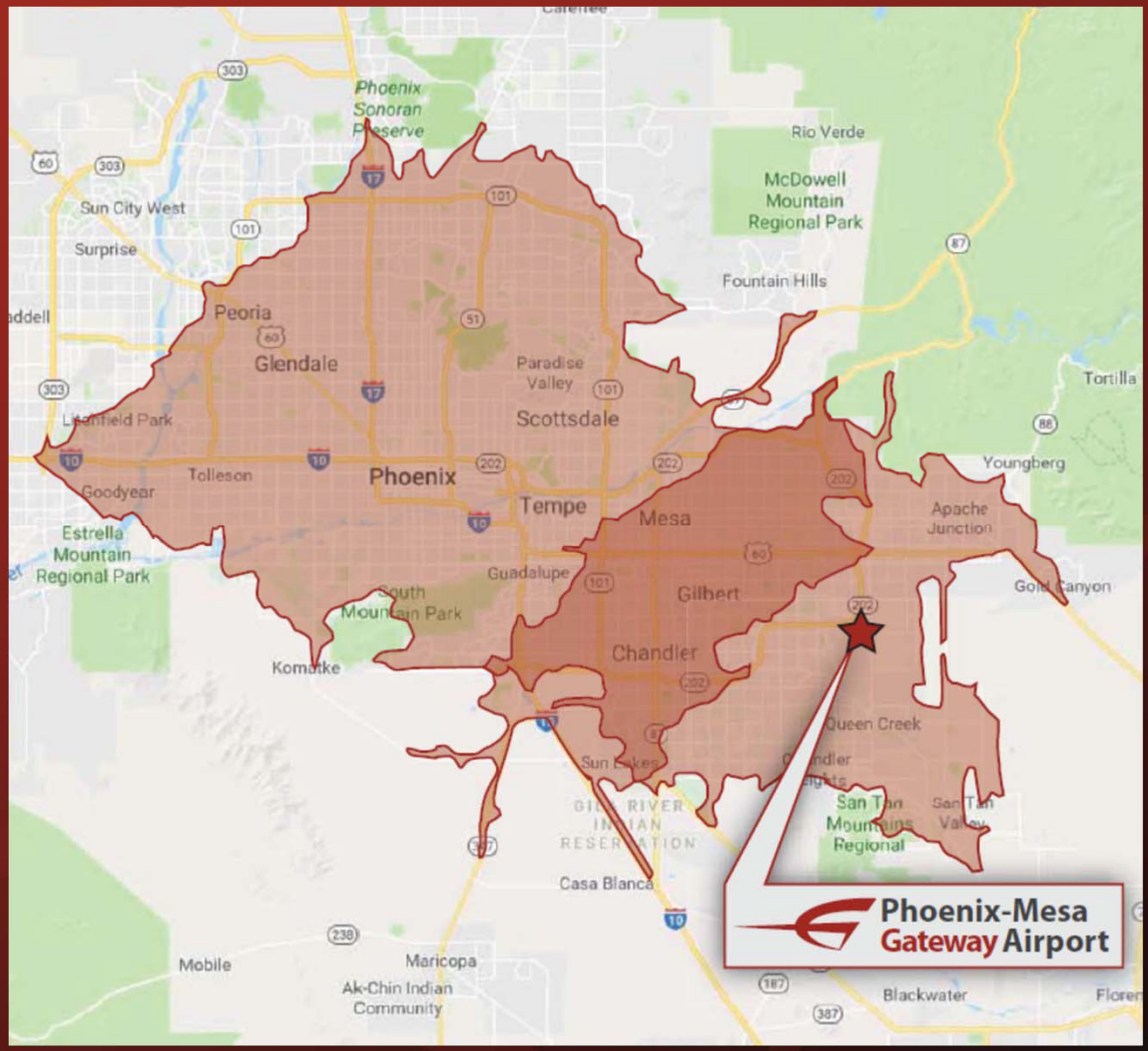
A Shared Airport Service Area

- **30-minute drive areas from IWA and PHX**



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Socio-Economic Trends

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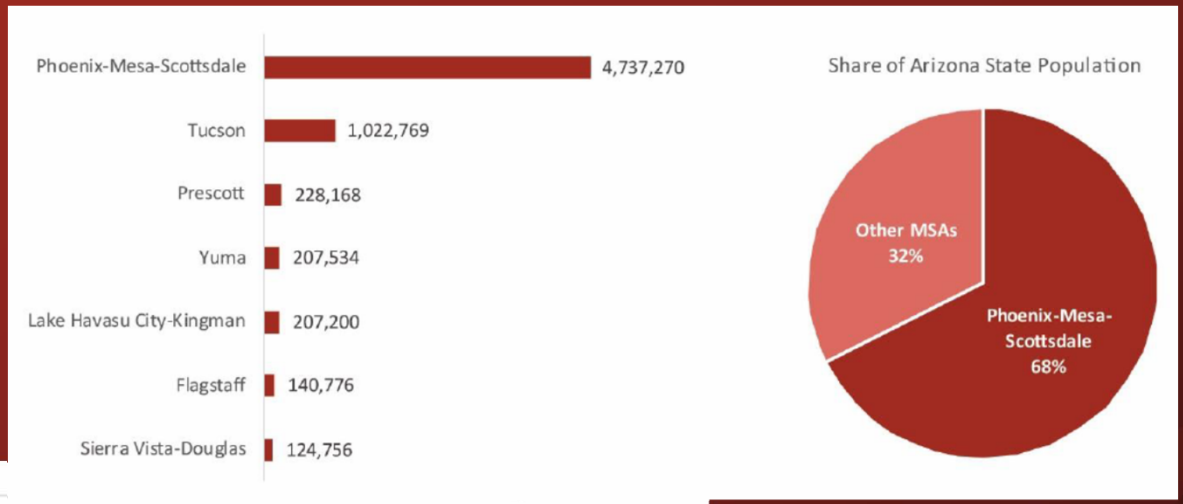
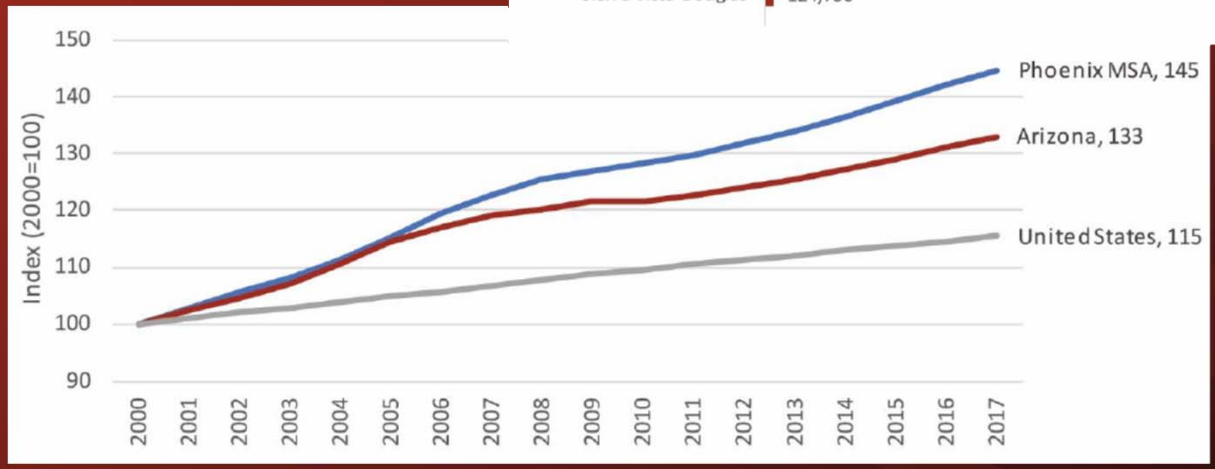
Phoenix MSA Population





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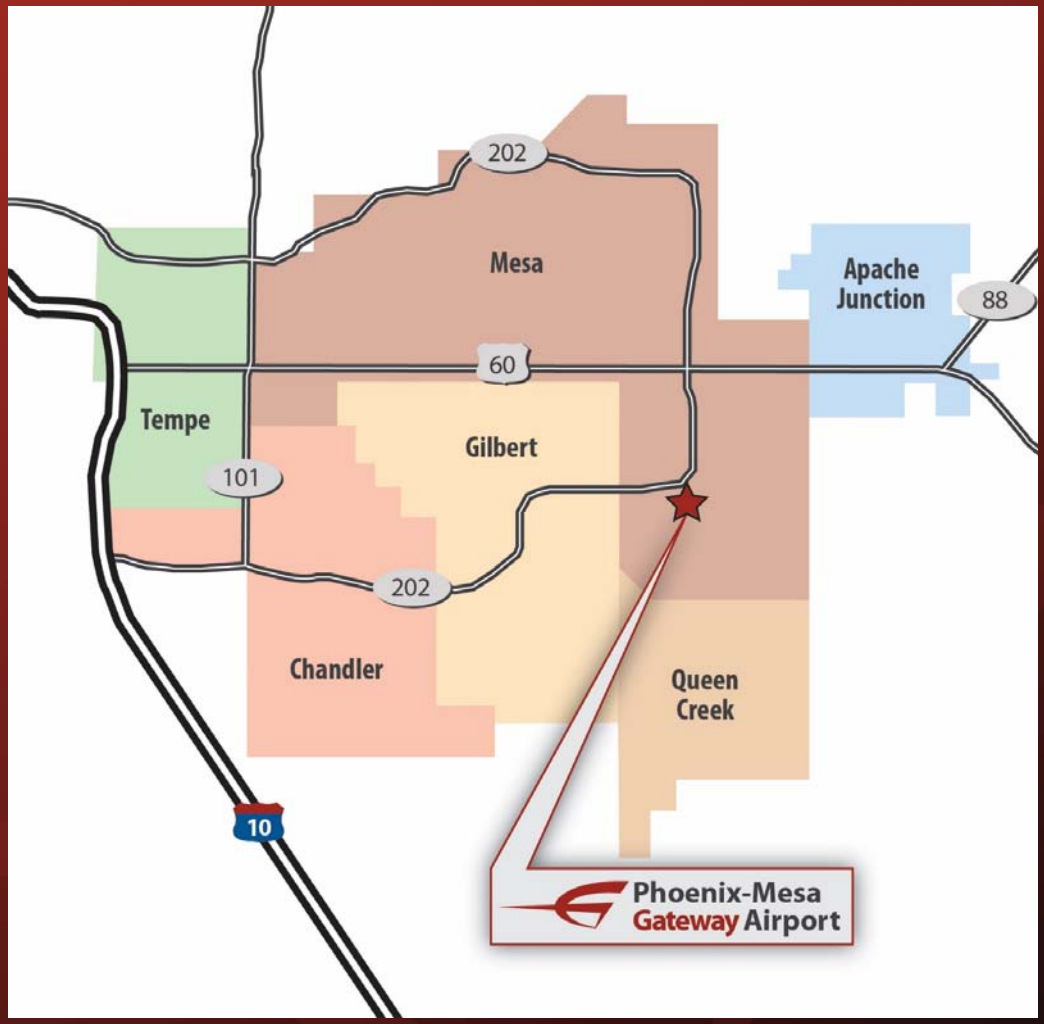
East Valley

- Rapidly growing area
- 1.3 million population in 2017
- >26% of Phoenix MSA population



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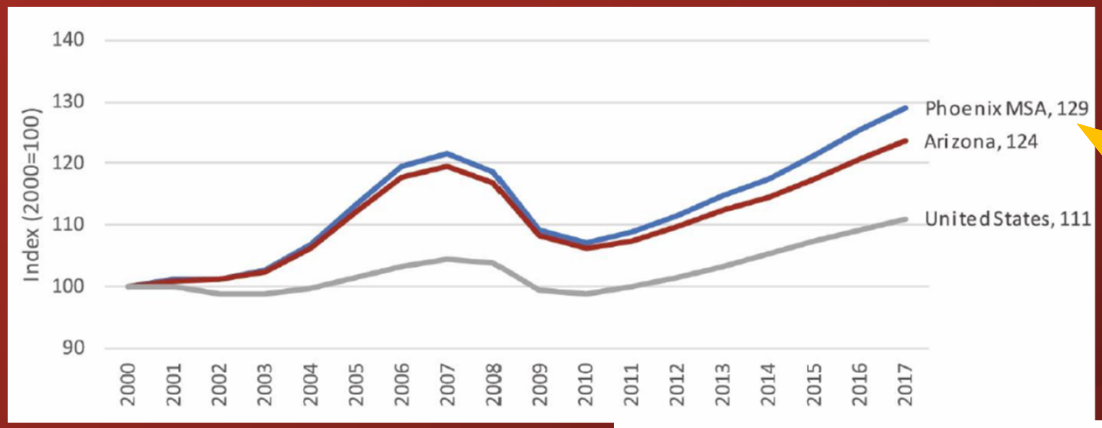
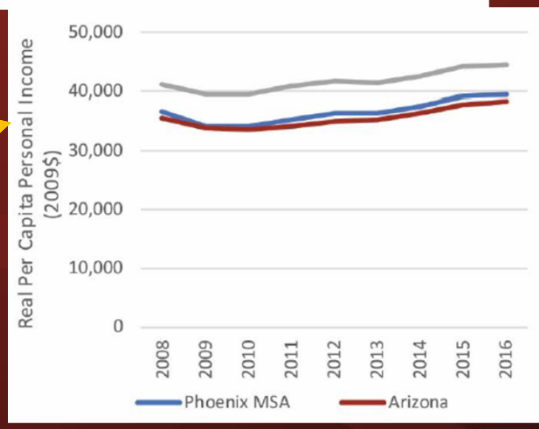
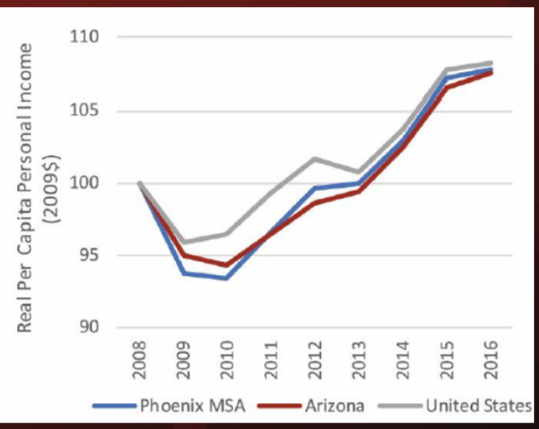
Employment and Income Growth Trends



The Phoenix MSA is creating jobs faster than the nation.

The Phoenix MSA is catching up with the nation in income growth.





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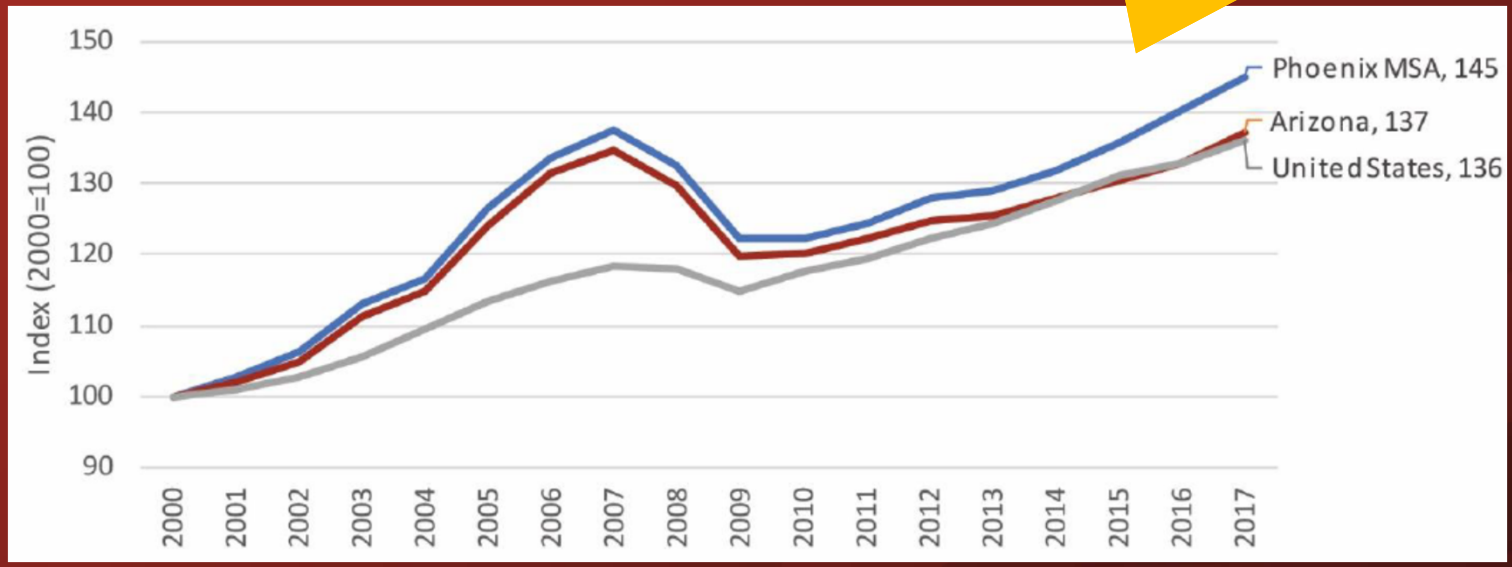
GDP Growth Trends

The Phoenix MSA economy outperforms the U.S. economy.



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Commercial Passenger Traffic

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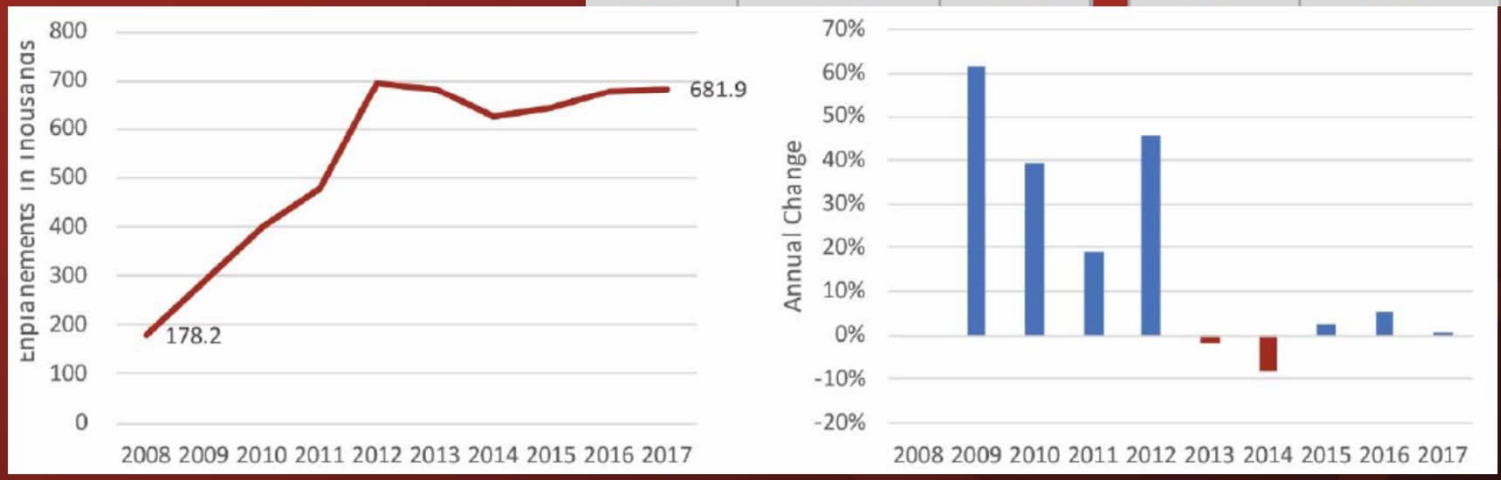
IWA Enplanement Trends

CY	EP (1,000s)	AGR	CY	EP (1,000s)	AGR
2008	178.2	626.1%	2013	680.2	-2.0%
2009	287.8	61.5%	2014	625.3	-8.1%
2010	401.4	39.4%	2015	641.3	2.5%
2011	477.5	19.0%	2016	677.1	5.6%
2012	694.3	45.4%	2017	681.9	0.7%



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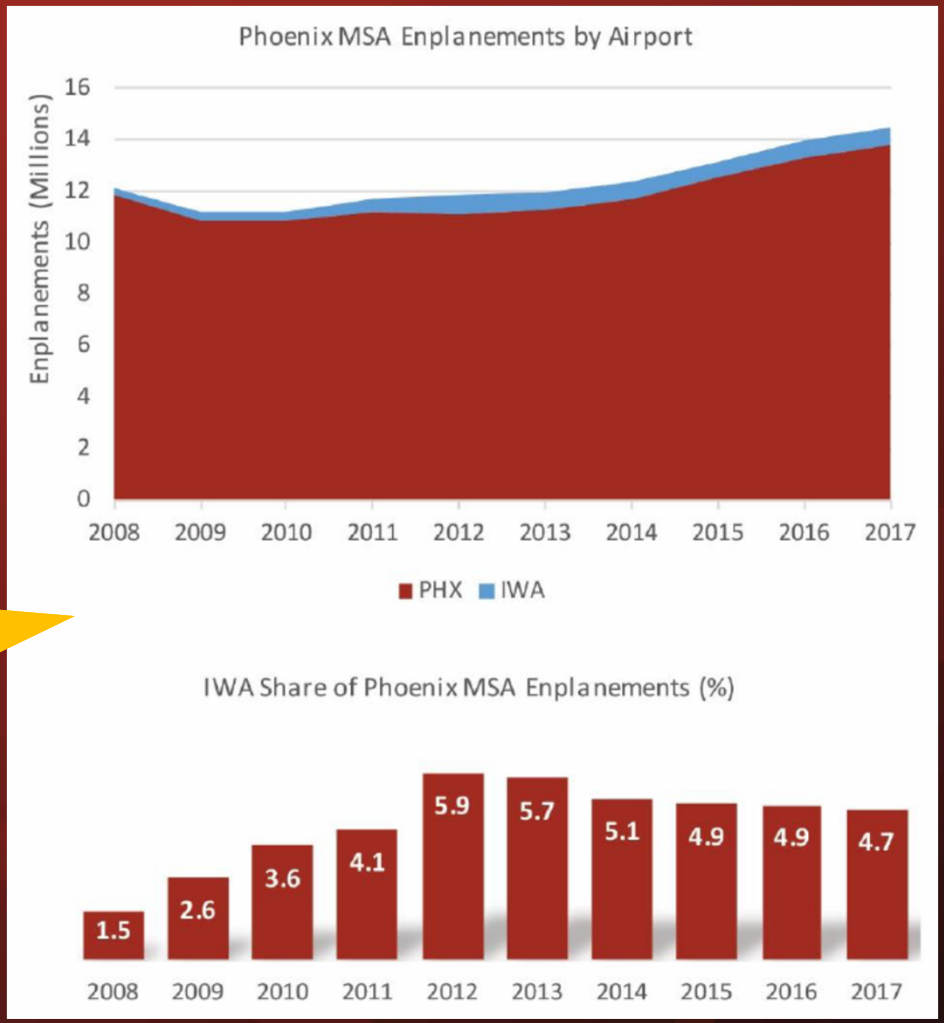
A Regional Demand Perspective



IWA captures a share of just under 5% in recent years.

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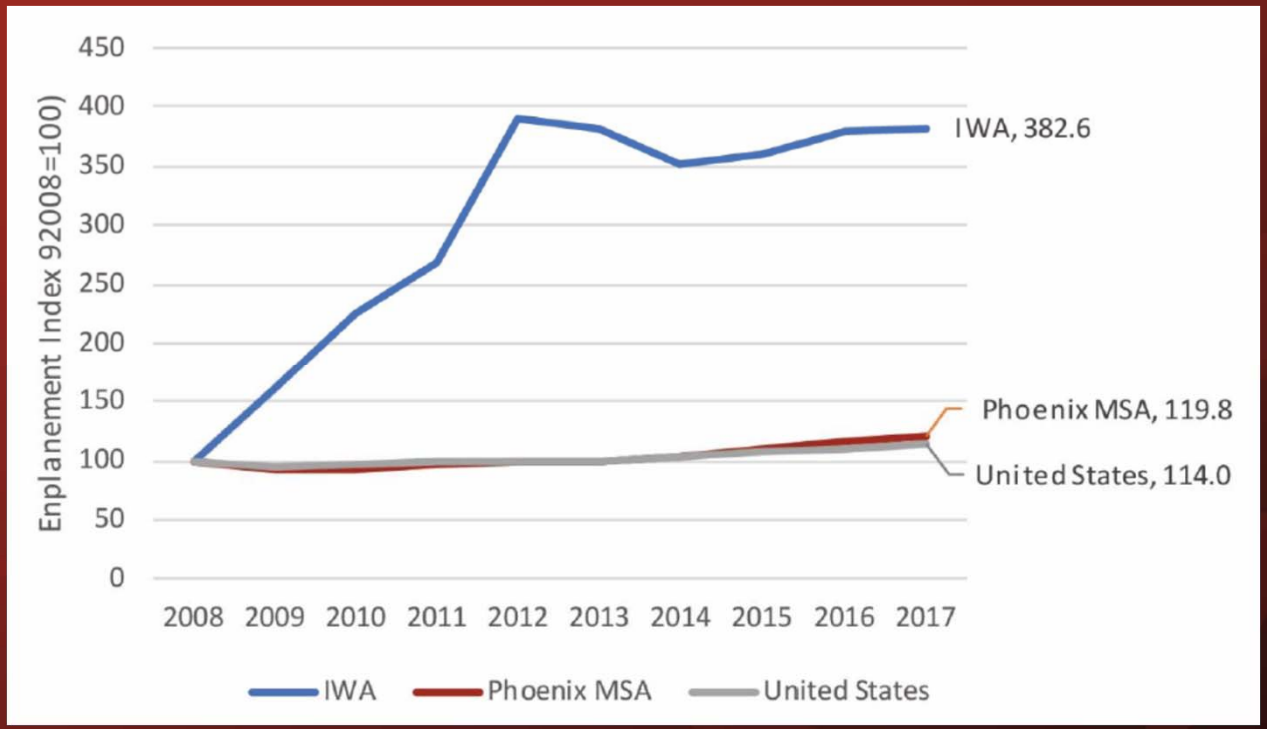
IWA's Enplanement Growth Relative to Regional and National Trends



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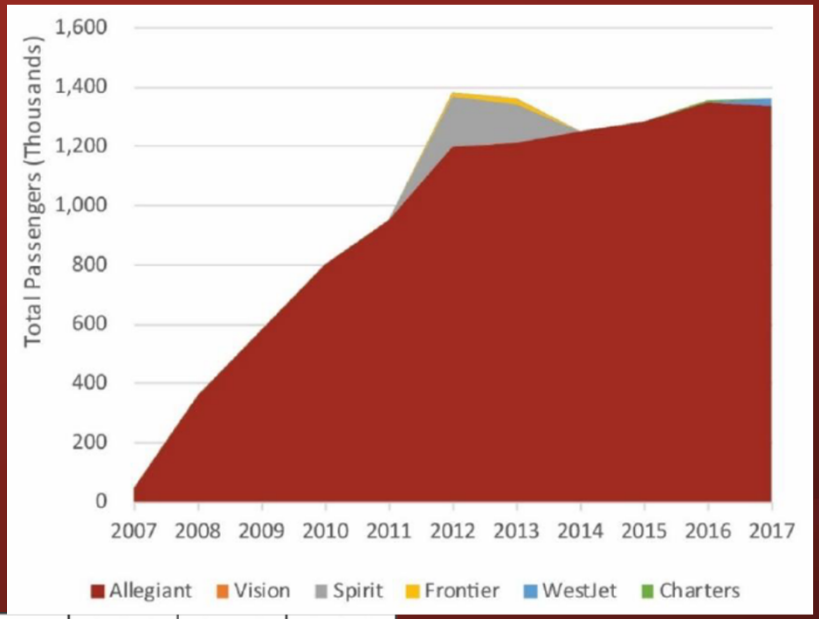
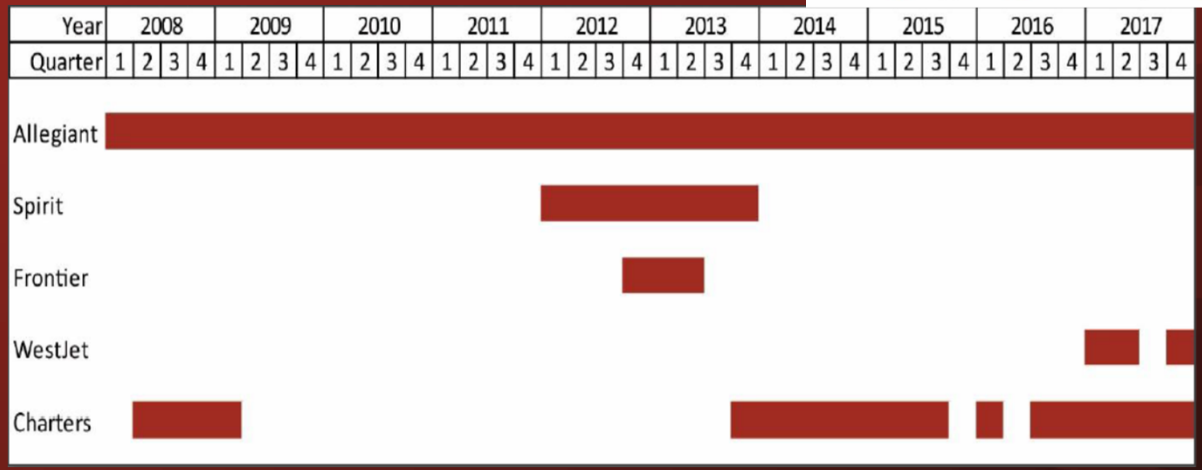
Air Carriers That Have Served IWA





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Hybrid Forecast Development Framework

NEAR TERM: *Bottom-Up*

- Airline schedules for IWA

LONG-TERM: *Top-Down*

- Regional demand

- Market drivers

- Multivariate time series regression

- Share analysis

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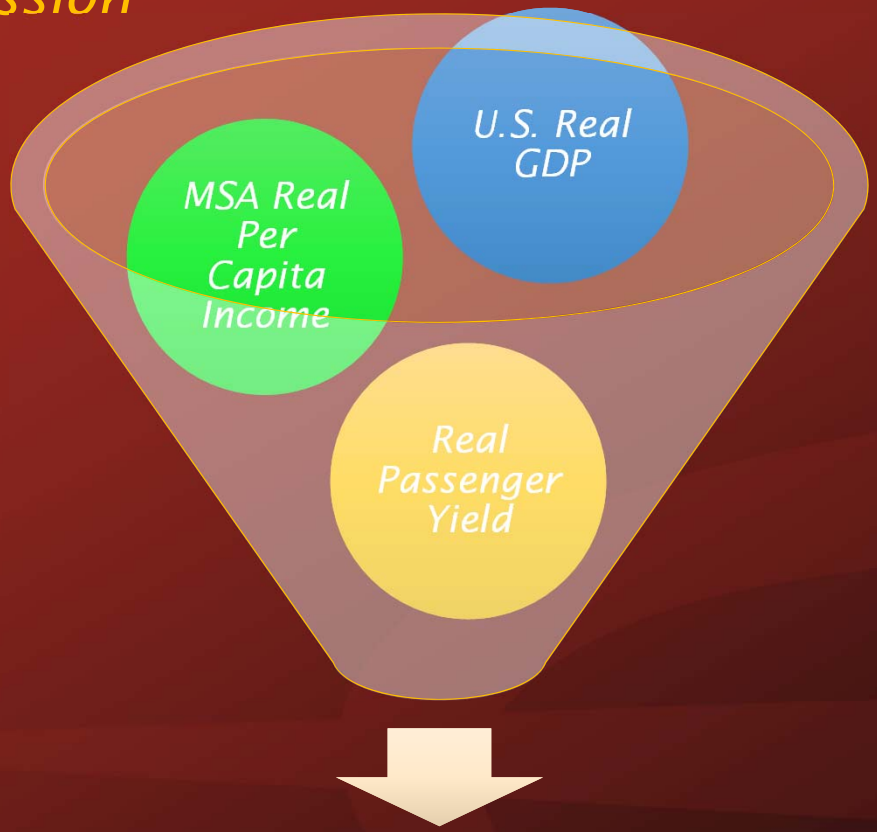
Multivariate Regression Model Variables



Regional Enplanements

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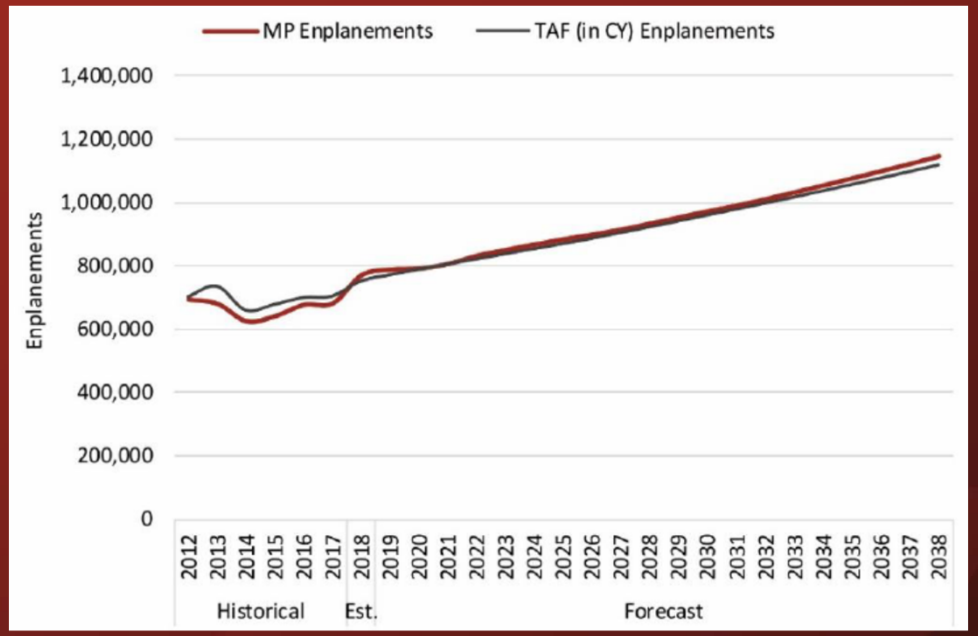
Forecast Enplanements at IWA



	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
Master Plan (MP)	681,892	770,526	849,894	933,157	1,145,806	13.0%	2.0%	1.9%	2.1%
TAF	690,071	746,858	834,370	919,037	1,115,554	8.2%	2.2%	2.0%	2.0%
TAF (in CY)	704,268	751,856	838,428	923,717	1,120,895	6.8%	2.2%	2.0%	2.0%
Ratio MP - TAF (in CY)	0.97	1.02	1.01	1.01	1.02				

Forecast Commercial Passenger Aircraft Operations

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
Master Plan (MP)	10,372	11,670	12,704	13,867	16,908	12.5%	1.7%	1.8%	2.0%
TAF	11,365	12,424	13,834	15,198	18,353	9.3%	2.2%	1.9%	1.9%
TAF (in CY)	11,630	12,505	13,899	15,273	18,439	7.5%	2.1%	1.9%	1.9%
Ratio MP - TAF (in CY)	0.89	0.93	0.91	0.91	0.92				

Forecast Commercial Passenger Aircraft Landed Weight In 1,000 lbs.

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
Master Plan (MP)	698,565	786,738	857,167	935,753	1,141,333	12.6%	1.7%	1.8%	2.0%

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Airport Master Plan

Non-Commercial Aviation Activity

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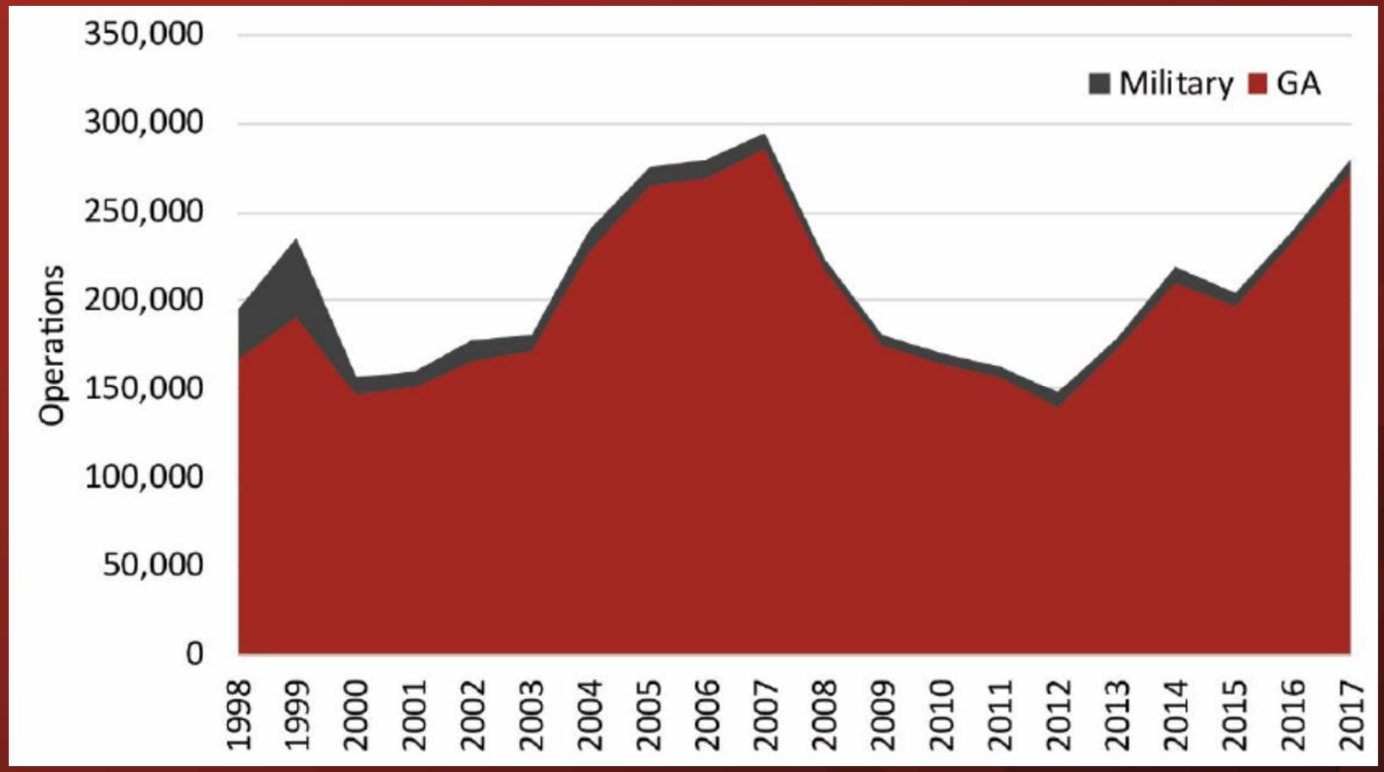
Trends in Noncommercial Aviation Activity at IWA



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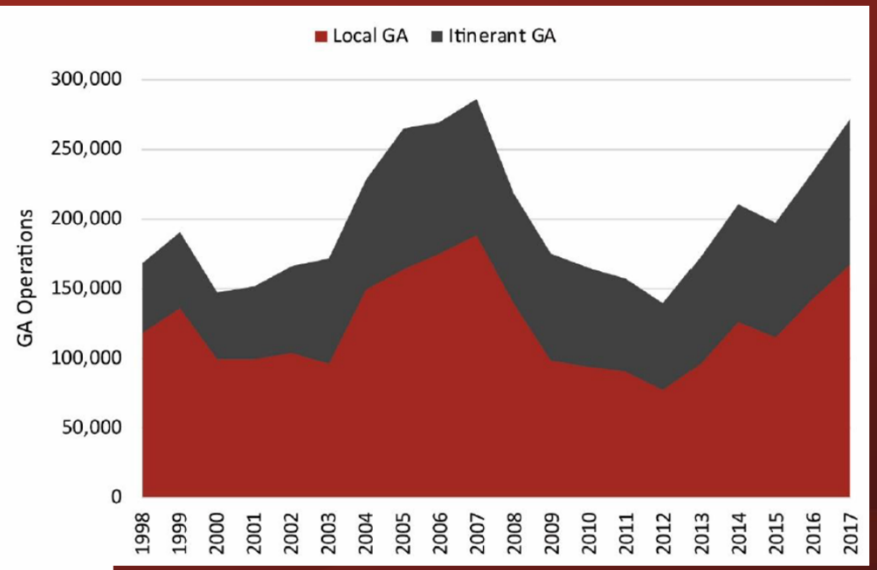
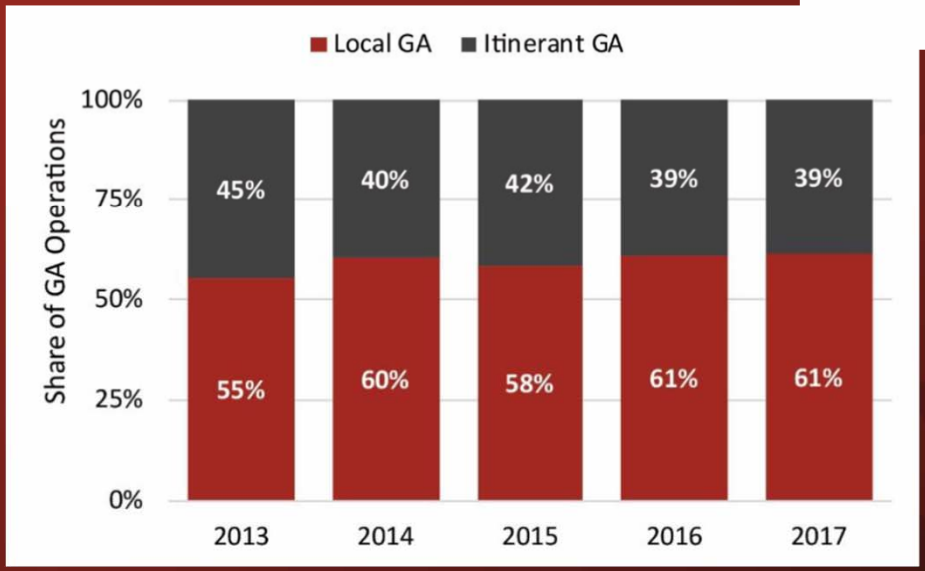
Local and Itinerant GA Operations at IWA





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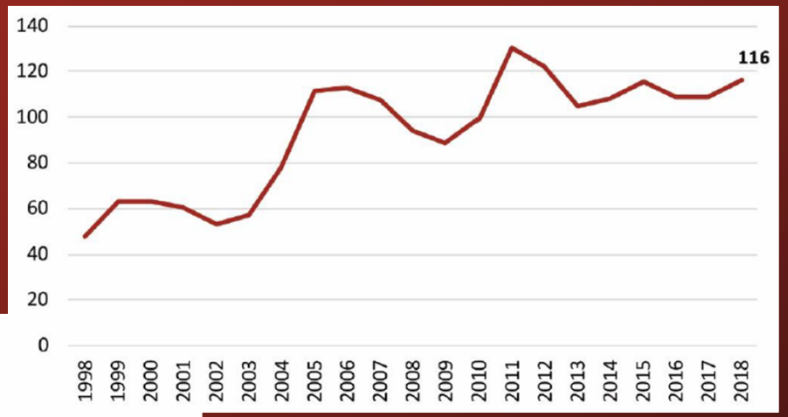
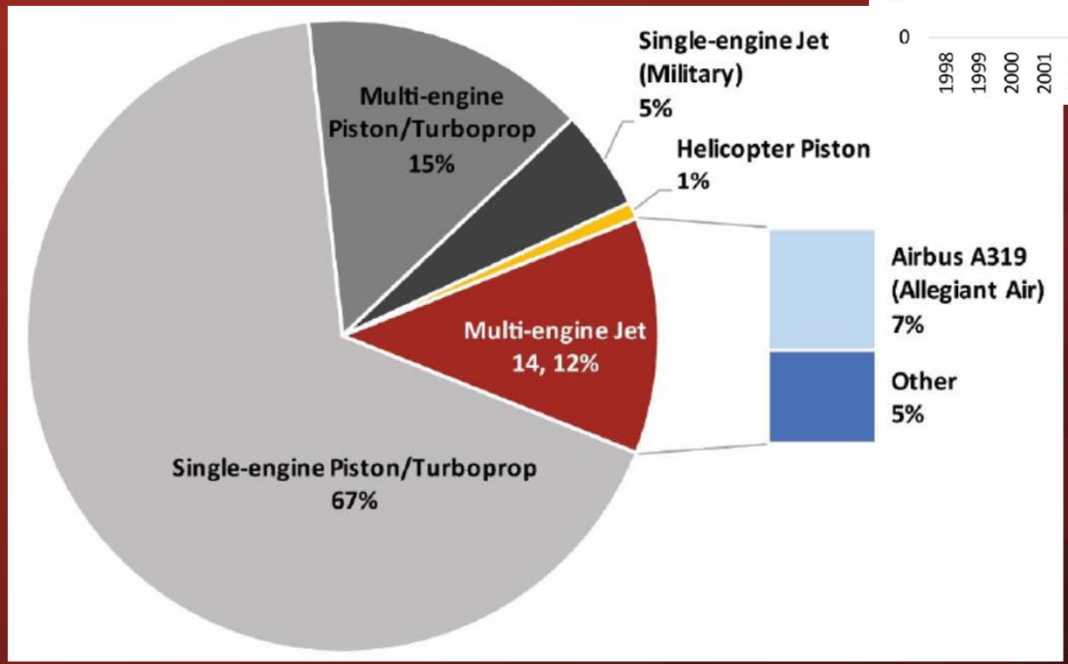
Based Aircraft at IWA





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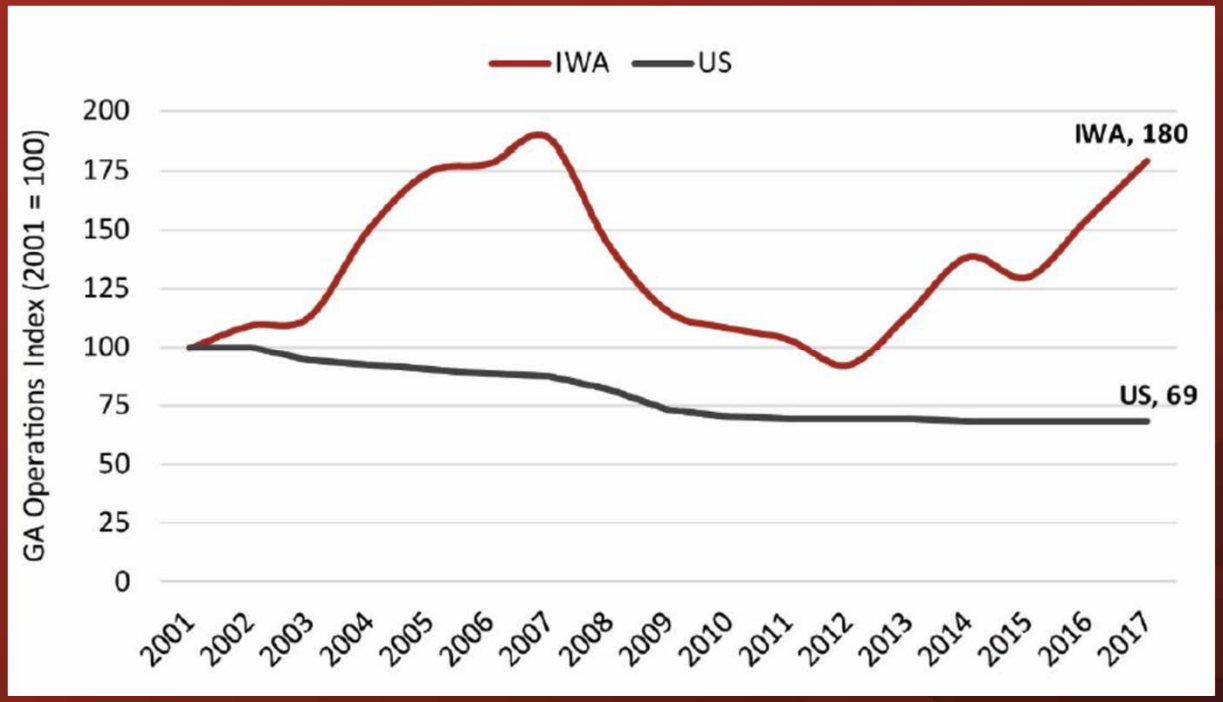
Trends in GA Operations at IWA and the U.S.



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The Region's GA Airports

Airport	GA	Military	Based Aircraft	Market Share of Based Aircraft
DVT	378,631	134	934	38%
FFZ	287,374	4,074	635	26%
IWA	271,446	7,503	116	5%
CHD	193,859	348	154	6%
SDL	167,482	639	378	15%
GYR	107,567	3,397	192	8%
PHX	49,761	2,296	78	3%

Top-Down Approach to GA Forecast Development

Regional GA Operations

IWA GA Operations

- **Regional GA Operations:** *Multivariate Time Series Regression Analysis*
- **IWA GA Operations:** *Share Analysis*

Separate Models for Local & Itinerant Operations

- ✓ **Drivers of Local GA Operations**
  - **Phoenix MSA population**
  - **Phoenix MSA nonfarm employment**
- ✓ **Drivers of Itinerant GA Operations**
  - **Phoenix MSA real per capita GDP**
  - **Jet fuel price**

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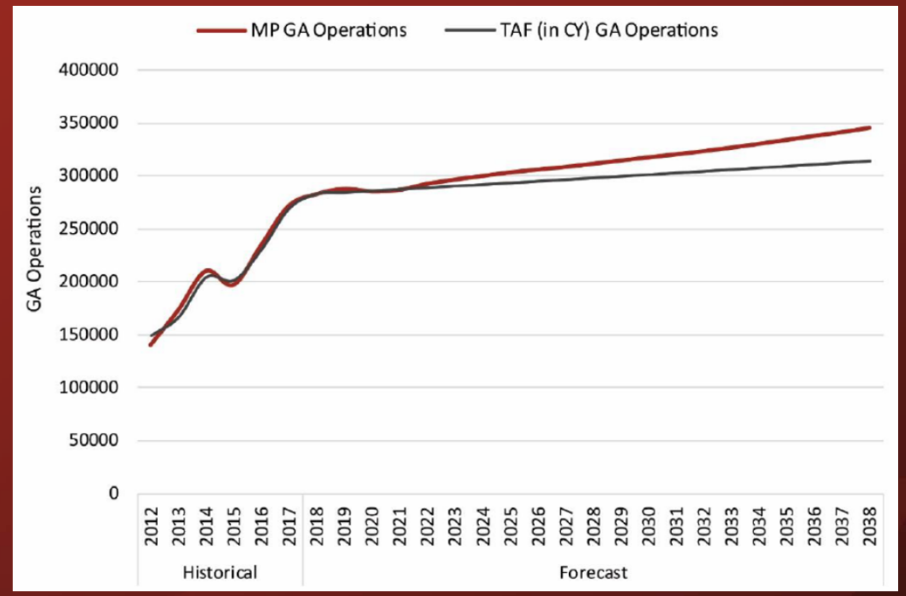
Forecast Non-Commercial Aviation Activity at IWA

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
General Aviation	271,446	282,596	296,256	311,455	345,401	4.1%	0.9%	1.0%	1.0%
Itinerant	104,927	114,236	115,835	119,407	128,625	8.9%	0.3%	0.6%	0.7%
Local	166,519	168,360	180,421	192,048	216,776	1.1%	1.4%	1.3%	1.2%
Military	7,503	7,503	7,503	7,503	7,503	0.0%	0.0%	0.0%	0.0%
Based Aircraft	109	116	121	126	139	6.4%	0.8%	0.9%	0.9%

Forecast GA Operations Compared with the TAF



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Local	166,519	168,360	180,421	192,048	216,776	1.1%	1.4%	1.3%	1.2%
TAF (in CY)	269,167	282,758	290,167	297,796	313,757	5.0%	0.5%	0.5%	0.5%
Ratio GA Total-TAF (in CY)	1.01	1.00	1.02	1.05	1.10				

Next Steps: Quantitative Forecast Risk Analysis

- ✓ **Monte Carlo simulation**
- ✓ **Scenario analysis**

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24 Miles Up, Felix Baumgartner Jumps!

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Master Plan = Spin Control

- ✓ **Anticipate What We Think Will Happen**
- ✓ **Influence What We Want to Happen**

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Questions & Comments

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Next Steps

- ✓ Monte Carlo forecast simulation analysis
- ✓ Forecast revisions
- ✓ Submission of forecasts to FAA for approval
- ✓ Facility needs documentation
- ✓ Identification of preliminary airport development alternatives
- ✓ Publication of Working Paper Two
- ✓ Technical Advisory Committee Meeting #2
- ✓ Stakeholder Working Group Meeting #2
- ✓ Public Outreach Workshop #1
- ✓ Next Meetings Late October or Early November 2018

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Airport Master Plan

Project Contact Information

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Thank You Partners and Goodbye for Now!

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Phoenix-Mesa Gateway Airport
Stakeholder Working Group Meeting
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, January 16, 2019

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Phoenix-Mesa Gateway Airport
Stakeholder Working Group Meeting
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, January 16, 2019

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Phoenix-Mesa Gateway Airport
Airport Master Planning Services

Phoenix-Mesa Gateway Airport

Master Plan – Stakeholders Working Group Meeting

January 16, 2019

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Gateway
Airport Master Plan

Agenda

- ✓ Introductory Remarks
- ✓ Airfield Configuration Facility Findings Summary
- ✓ Passenger Terminal Facility Findings
- ✓ Terminal Area Parking Findings
- ✓ Westside Parking Options
- ✓ Other Landside Facility Findings
- ✓ Airside Alternatives Considerations
- ✓ Landside Development Considerations
- ✓ Next Steps

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Airport Master Plan-
FAA Approved Forecast

Enplanement Forecast:
2018 Total= 763,542

2023	2028	2038
924,667	1,022,420	1,245,211

Total Operations Forecast:
2018 Total= 288,921

2023	2028	2038
316,712	333,028	369,744

Total Based Aircraft Forecast:
2017 Actual = 109

2023	2028	2038
121	126	139

Phoenix-Mesa Gateway Airport Master Plan

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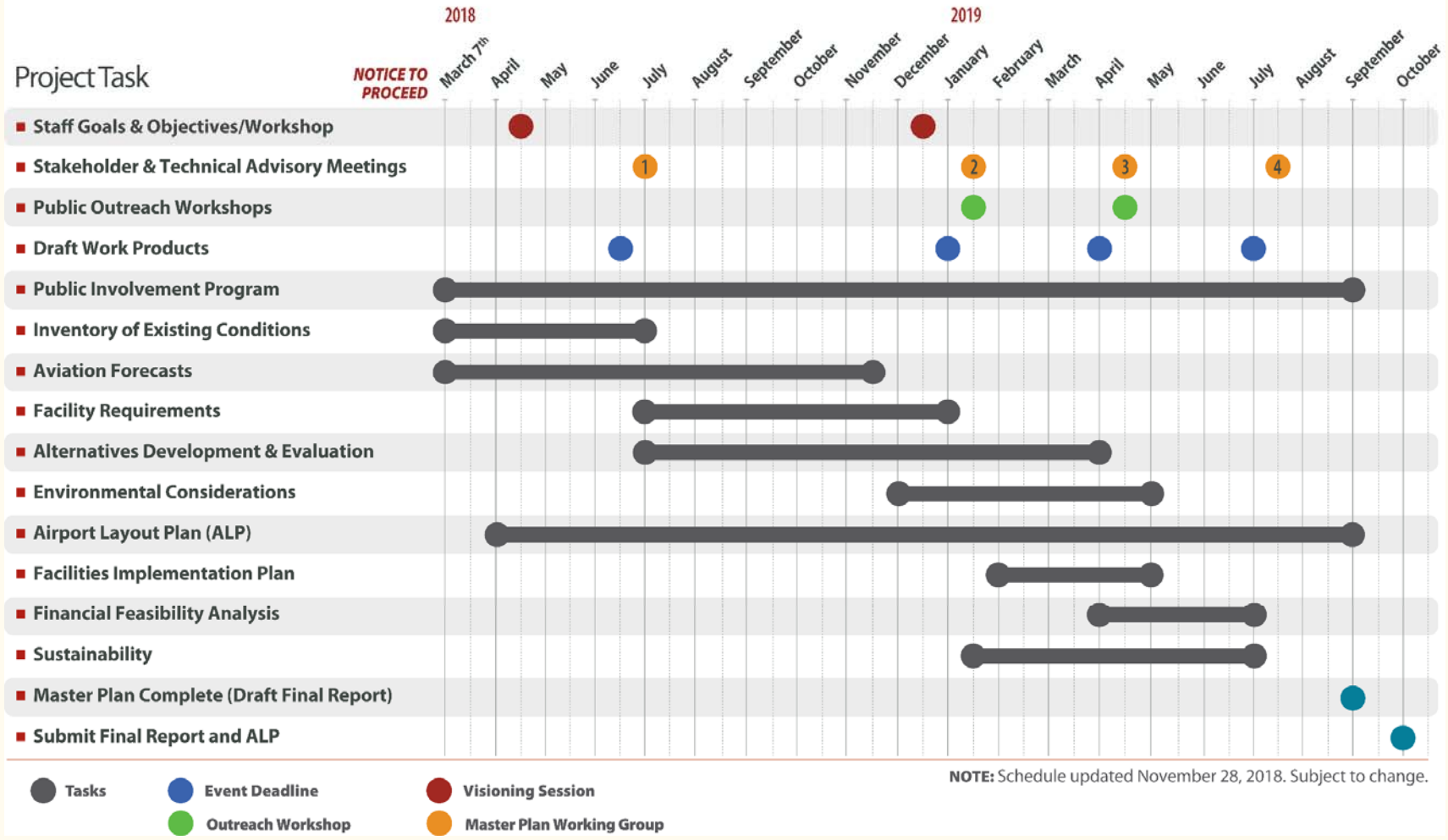
Master Plan Forecast Summary

	Actual	Estimate	Forecast			CAGR			
Measure/Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
Enplanements									
Master Plan	**681,892**	**759,033**	**924,667**	**1,022,420**	**1,245,211**	11.3%	4.0%	2.0%	2.0%
High Growth	681,892	759,033	1,037,426	1,168,589	1,451,202	11.3%	6.4%	2.4%	2.2%
Low Growth	681,892	759,033	903,617	984,846	1,180,070	11.3%	3.5%	1.7%	1.8%
Commercial Aircraft Operations									
Master Plan	**10,372**	**10,920**	**12,953**	**14,070**	**16,840**	5.3%	3.5%	1.7%	1.8%
High Growth	10,372	10,920	14,463	16,020	19,570	5.3%	5.8%	2.1%	2.0%
High Growth*	10,372	10,920	16,795	22,184	31,482	5.3%	9.0%	5.7%	3.6%
Low Growth	10,372	10,920	12,662	13,558	15,967	5.3%	3.0%	1.4%	1.6%
Noncommercial Aircraft Operations									
General Aviation	271,446	282,596	296,256	311,455	345,401	4.1%	0.9%	1.0%	1.0%
Military	7,503	7,503	7,503	7,503	7,503	0.0%	0.0%	0.0%	0.0%
Subtotal	278,949	290,099	303,759	318,958	352,904	4.0%	0.9%	1.0%	1.0%
Total Aircraft Operations									
Master Plan	**289,321**	**301,019**	**316,712**	**333,028**	**369,744**	4.0%	1.0%	1.0%	1.1%
High Growth	289,321	301,019	318,222	334,978	372,474	4.0%	1.1%	1.0%	1.1%
High Growth*	289,321	301,019	320,554	341,142	384,386	4.0%	1.3%	1.3%	1.2%
Low Growth	289,321	301,019	316,421	332,516	368,871	4.0%	1.0%	1.0%	1.0%

Project Approach

- ✓ Follow FAA Guidance
- ✓ Building Block Process
  - Inventory
  - Forecasts
  - Facilities Needs Determination
  - Development Plan Formulation
  - Financial Plan

Project Schedule Airport Master Plan



NOTE: Schedule updated November 28, 2018. Subject to change.

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Airport Master Plan

Master Plan = Policy Statement

- ✓ Anticipate What We Think Will Happen
- ✓ Influence What We Want to Happen

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Airfield Configuration

- ✓ Runway Orientation
- ✓ Airfield Operational Capacity
- ✓ Runway Length Analysis
- ✓ Runway Design and Dimensional Criteria
- ✓ Parallel Runway Separation
- ✓ Instrument Approach Capabilities
- ✓ Taxiway Design and Dimensional Criteria
- ✓ Parallel Taxiway Improvement Considerations
- ✓ Exit and ConnectingTaxiways

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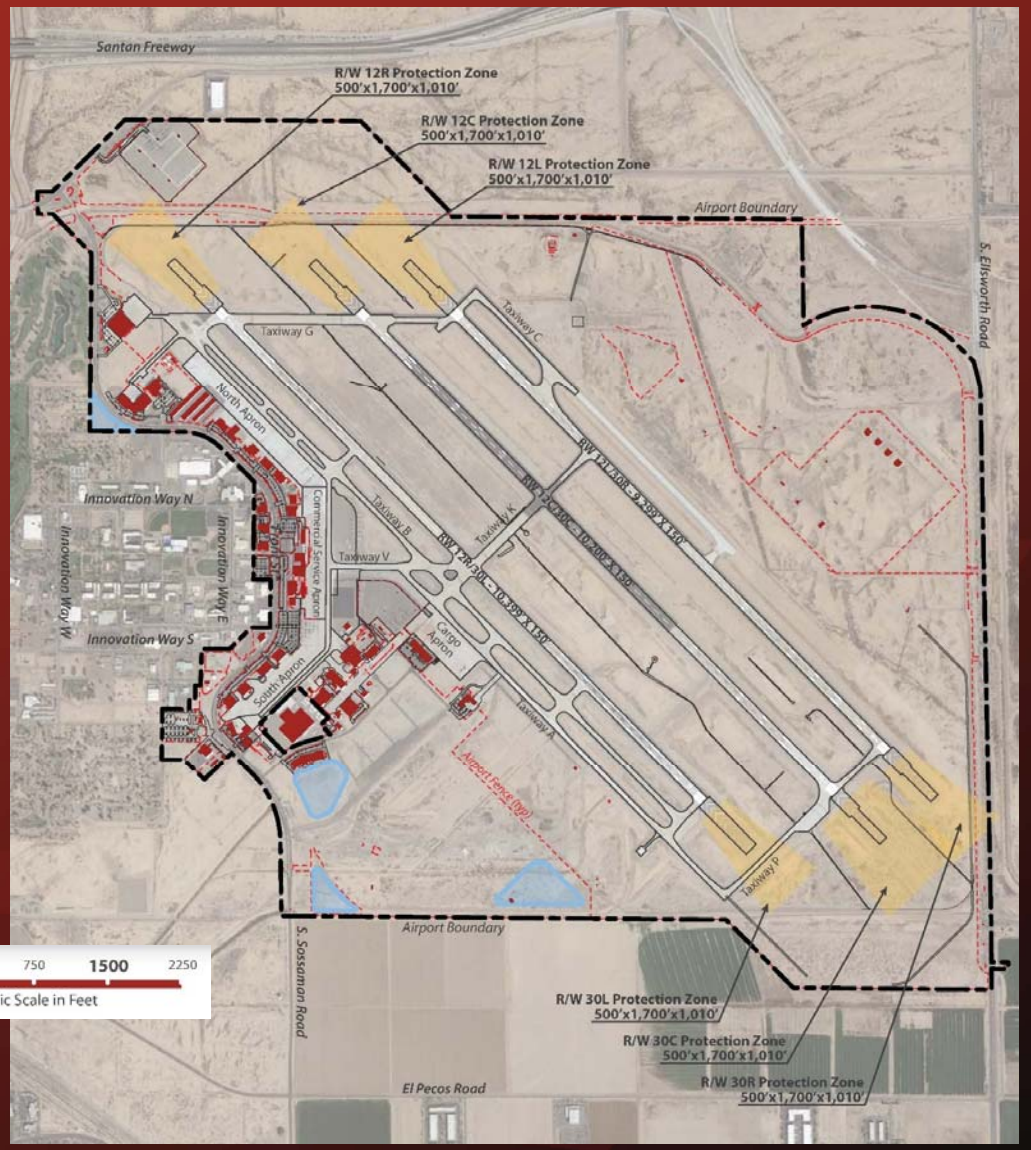
Runway Length and Pavement Strength Requirement for B747-400 Operations

	Required Runway Length	Existing Runway Length	Required Pavement Strength	Existing DDTW Pavement Strength
Runway 12R/30L	9,500 ft.	10,401 ft.	740,000 lbs.	550,000
Runway 12C/30C	9,500 ft.	10,201 ft.	740,000 lbs.	550,000
Runway 12L/30R	9,500 ft.	9,300 ft.	740,000 lbs.	850,000

Existing Airport Facilities



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Passenger Terminal Facilities

- ✓ Inbound and Outbound Baggage
- ✓ Concourse Holdroom
- ✓ Aircraft Parking
- ✓ Security Checkpoint
- ✓ Check-In Lobby

Terminal Requirements Summary

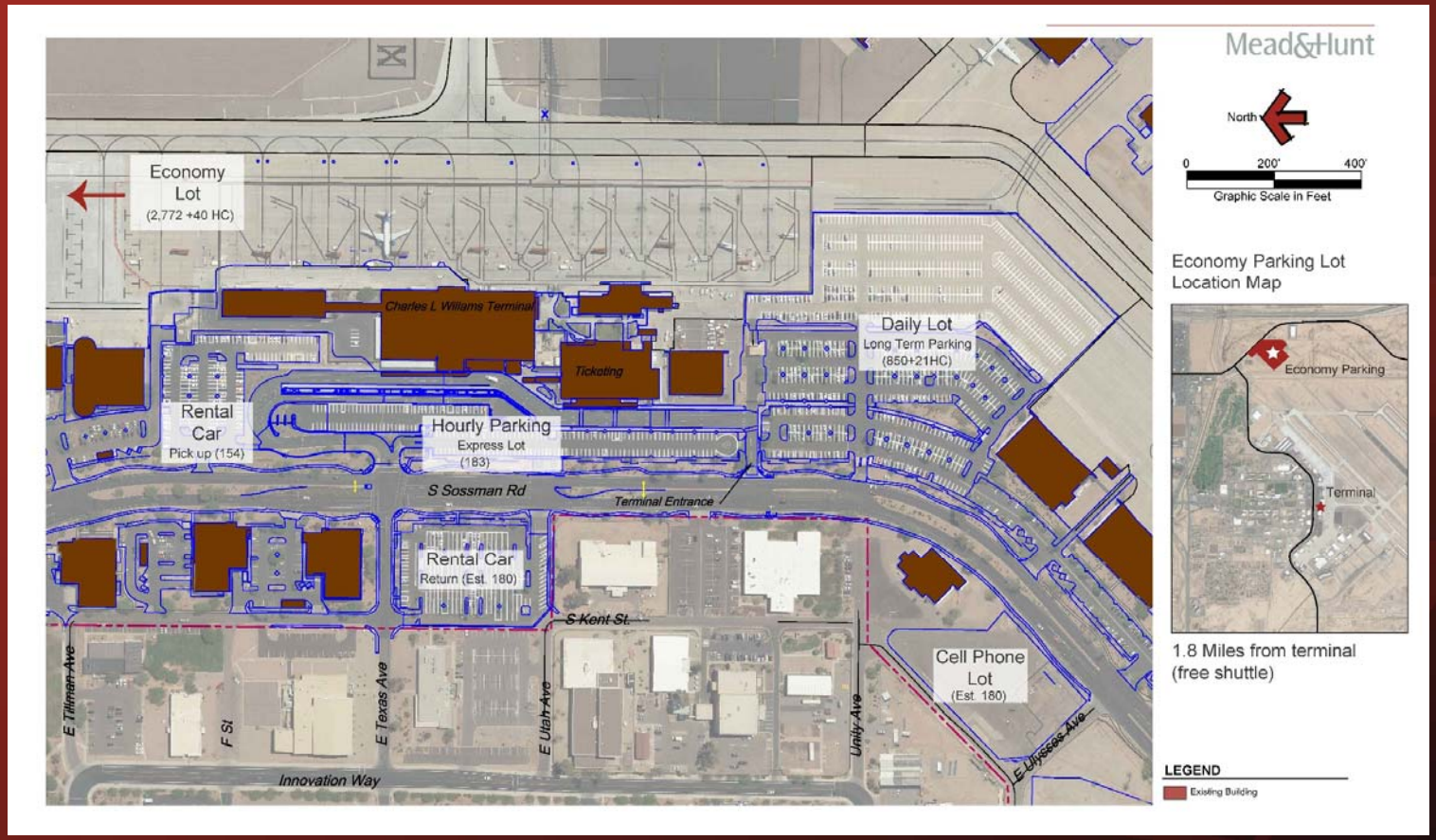
Functional Area	Existing (supply) *(a)*	PAL 1 (2023)	PAL 2 (2028)	PAL 3 (2038)
CHECK-IN (TICKETING)				
Queue (sf)	4,500	3,550	3,700	4,350
Counters/Bag drops	32	26	27	31
CHECKED BAGGAGE				
EDS machines *(b)*	2 CT-80	3 MS-EDS	4 MS-EDS	4 MS-EDS
Makeup area (sf)	11,500	11,400	12,800	15,700
SECURITY SCREENING CHECKPOINT				
Queue (sf)	1,725	1,700	1,900	2,625
Lanes	5	5	5	5
PASSENGER HOLDROOM				
Holdroom (sf)	15,260	13,000	15,300	19,700
Podium, queueing, egress (sf)	3,950	3,150	3,675	4,725
APRON (GATES)	6 ADG III, 4 B757	8 ADG III	9 ADG III	11 ADG III
BAGGAGE CLAIM (DEVICES)	2	2	3	3

(a) Existing queues are estimated based on terminal drawings
(b) Requirement, which is based on a hypothetical medium speed inline system (MS-EDS), includes one EDS machine for redundancy

Passenger Terminal Support Facilities

- ✓ Access Roadway System
- ✓ Passenger Parking System
- ✓ Rental Car Parking
- ✓ Employee Parking
- ✓ Temporary Parking (Cell Phone Lot)

Existing Parking Facilities



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Public Parking Demand Forecasts

(Master Plan Projected Growth Rate)

Lot		FY 2018 Peak	Short – Term	Mid – Term	Long – Term
Hourly Express Lot	Supply	183	183	183	183
	Effective Supply	156	156	156	156
	Demand	194	242	265	326
	Surplus/Deficit	**-38**	**-86**	**-109**	**-170**
Daily Lot	Supply	871	871	871	871
	Effective Supply	740	740	740	740
	Demand	717	894	982	1,205
	Surplus/Deficit	**23**	**-154**	**-241**	**-465**
Ray Road Economy Lot	Supply	2,812	2,812	2,812	2,812
	Effective Supply	2,390	2,390	2,390	2,390
	Demand	747	931	1022	1255
	Surplus/Deficit	**1643**	**1459**	**1368**	**1135**
Grand Total	Supply	3,866	3,866	3,866	3,866
	Effective Supply	3,286	3,286	3,286	3,286
	Demand	1,658	2,067	2,270	2,787
	Surplus/Deficit	**1,628**	**1,219**	**1,017**	**499**

- ✓ **Effective Supply**
  - **Best practices for managing parking supply suggest that parking supply is at capacity when the demand reaches 85% utilization**
- ✓ **Deficits**
  - **Immediate**
    - Hourly Lot, based on observed condition. Lot should be considered at or near capacity.
  - **Short, Mid, Long-Term**
    - Hourly Express Lot
    - Daily Lot
- ✓ **Surplus**
  - **Immediate, Short, Mid, Long-Term**
    - Significant surplus in Economy Lot throughout planning horizon

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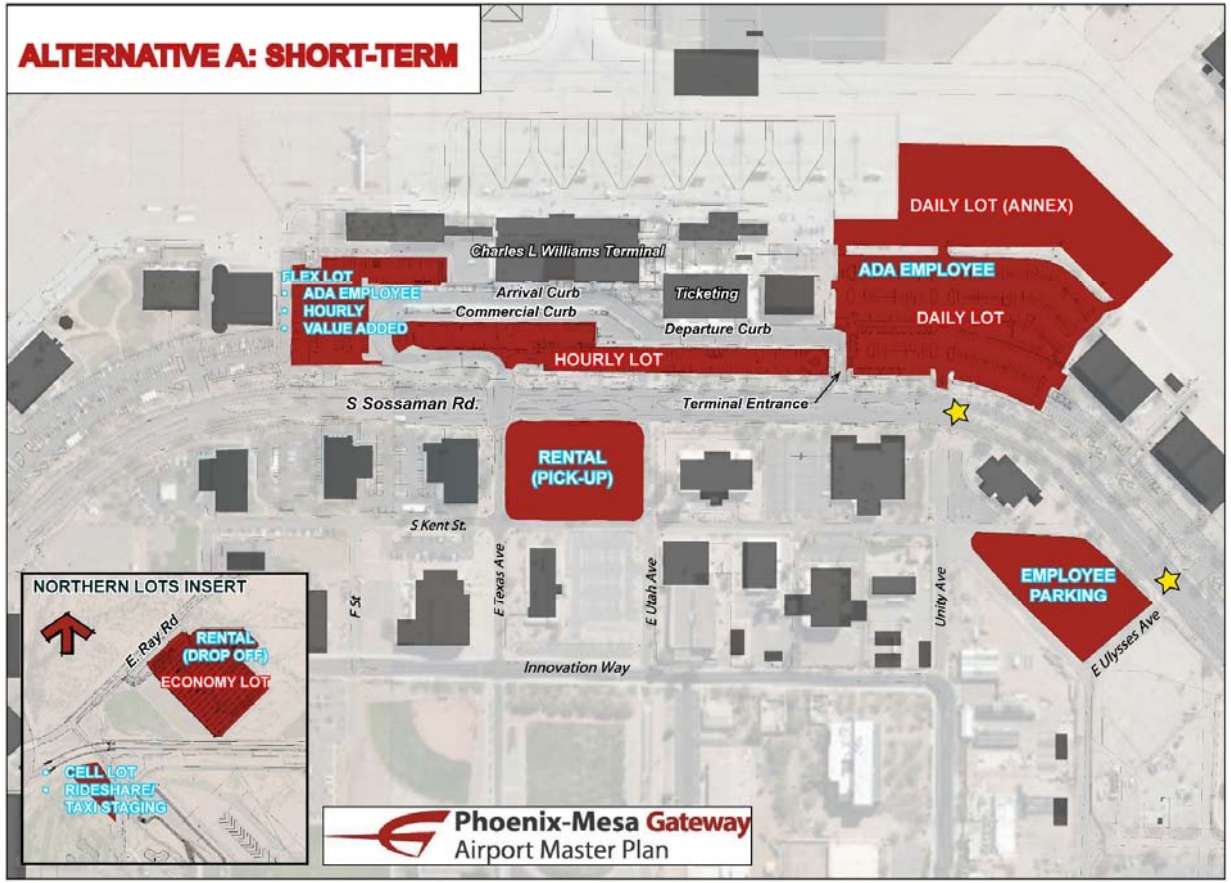
Westside Parking Improvement Options



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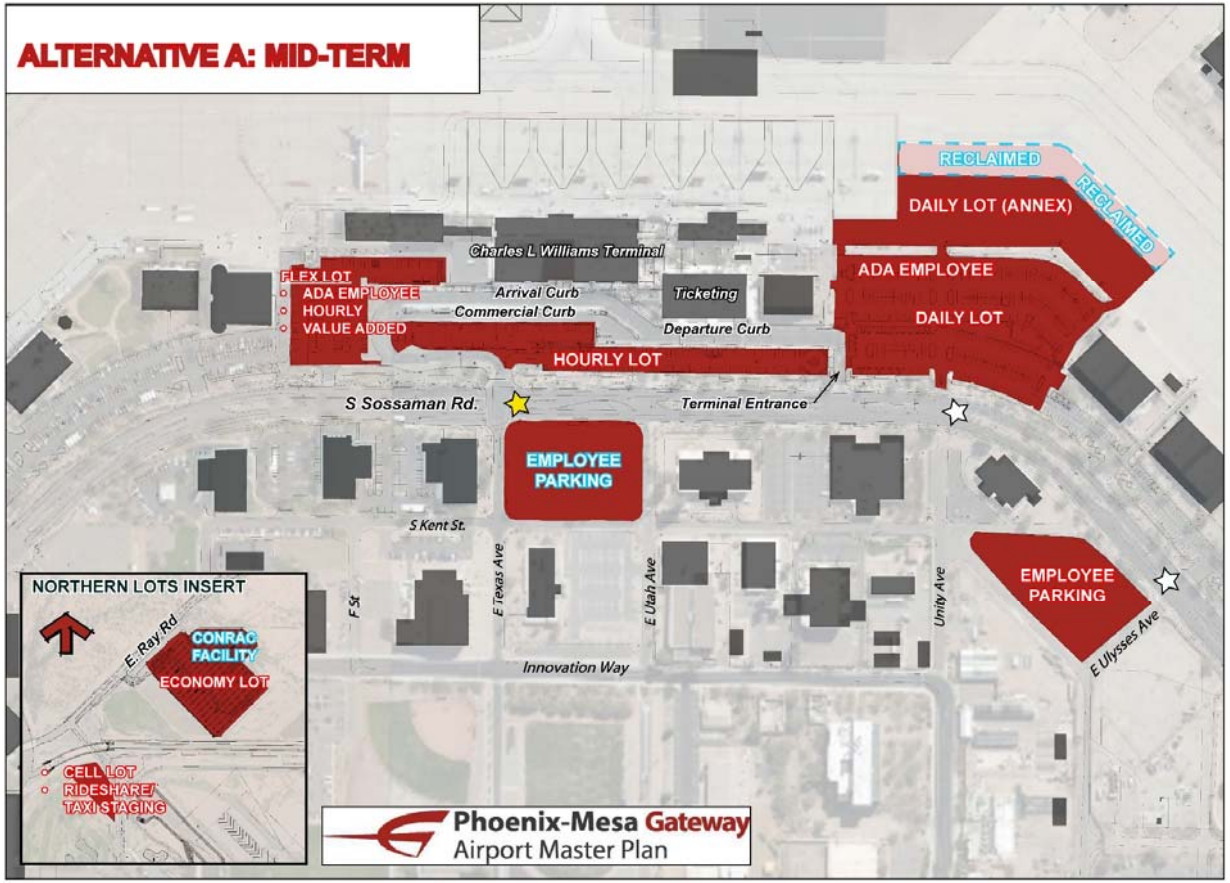
Westside Parking Improvement Options



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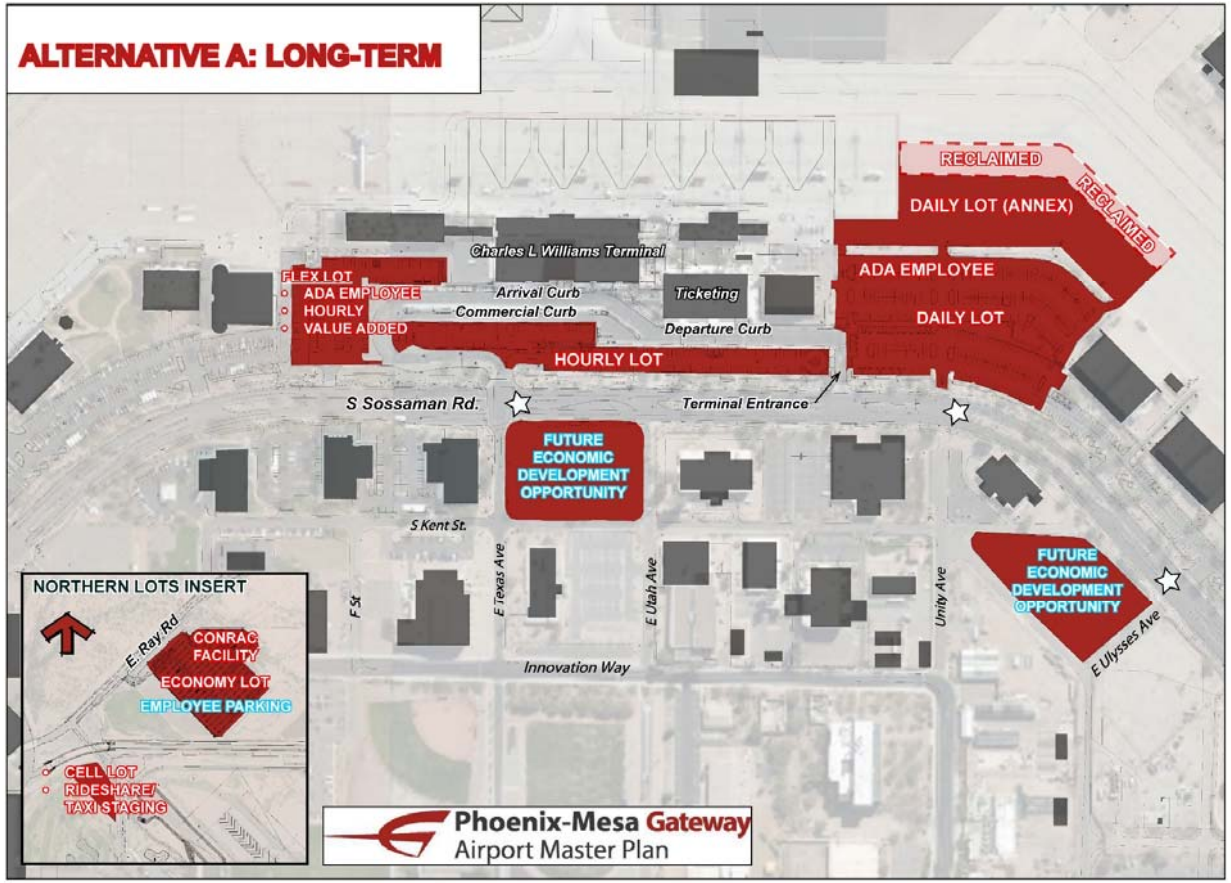
Westside Parking Improvement Options



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Passenger Terminal Area Acres Comparison

- ✓ IWA Existing - 36 Acres/680 K Enplaned Pax 2017 (1.2 M Forecast)/10 aircraft parking positions
- ✓ Northwest Arkansas Regional Airport - 124 Acres/725 K Enplaned Pax 2017/15 aircraft parking positions
- ✓ Tulsa International Airport – 103 Acres/1.4 M Pax 2017/22 Aircraft Parking Positions

Other Landside Facilities

- ✓ General Aviation Storage Facilities
- ✓ Corporate/MRO Facilities
- ✓ Fixed Base Operator Facilities
- ✓ Air Cargo Facilities
- ✓ SRE/ARFF/Airport Maintenance
- ✓ Airport Traffic Control Tower
- ✓ Fuel Storage

Summary of Critical Facility Requirement Considerations

- ✓ Identify potential needs and benefits for runway extension(s)
- ✓ Identify benefits for placement of parallel taxiway improvements
- ✓ Consideration of benefits of improved instrument approach capabilities
- ✓ Passenger terminal
  - Short-term focus on demand driven improvements for existing terminal building
  - Long-term focus on relocated terminal
- ✓ Vehicular access and parking
  - Short-term focus on demand driven improvements for existing terminal area
  - Long-term focus on relocated terminal including support facilities
- ✓ SkyBridge Arizona - incorporate adopted recommendations into master plan
- ✓ General aviation and industrial aviation - continue to program for demand driven facility expansion and improvements

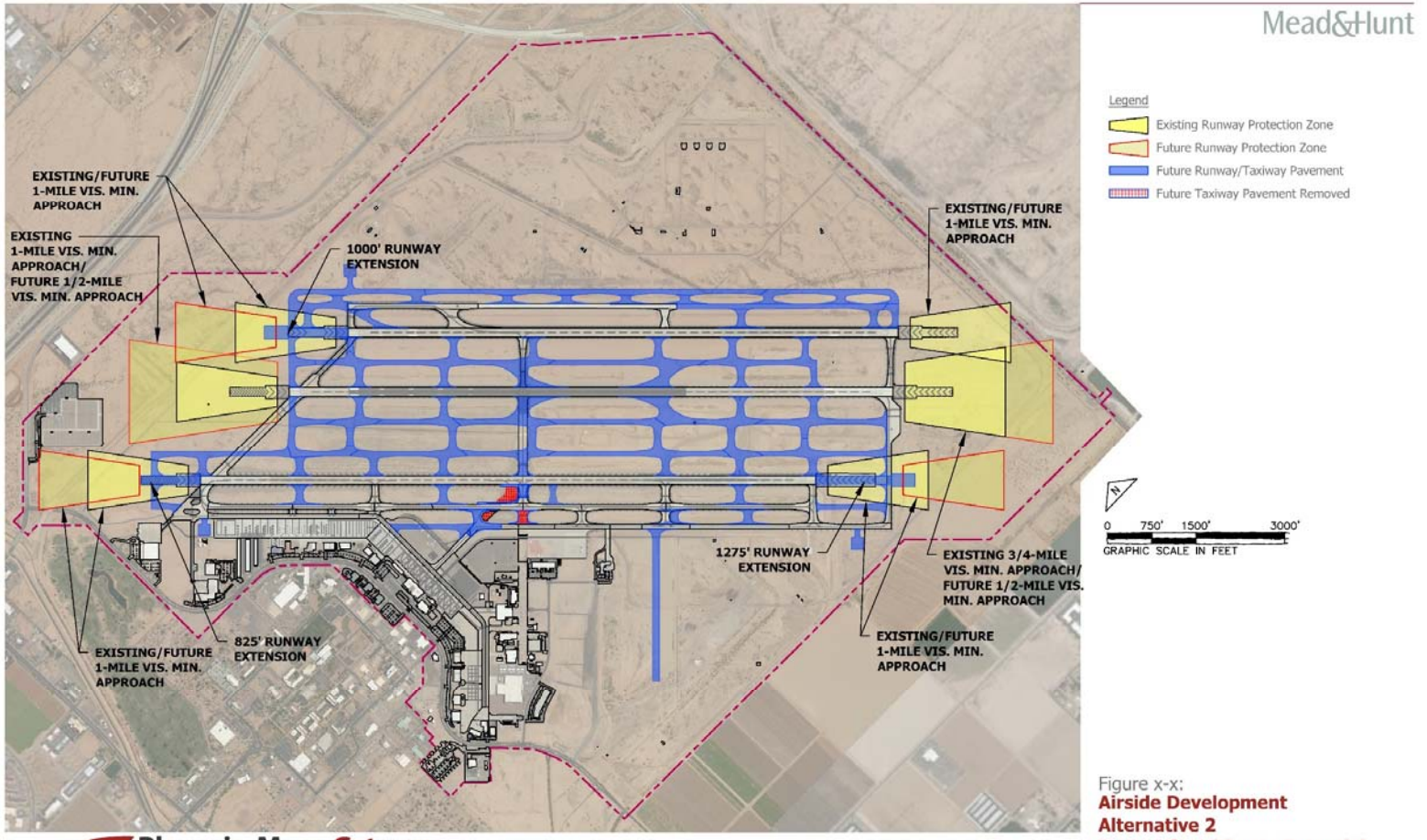
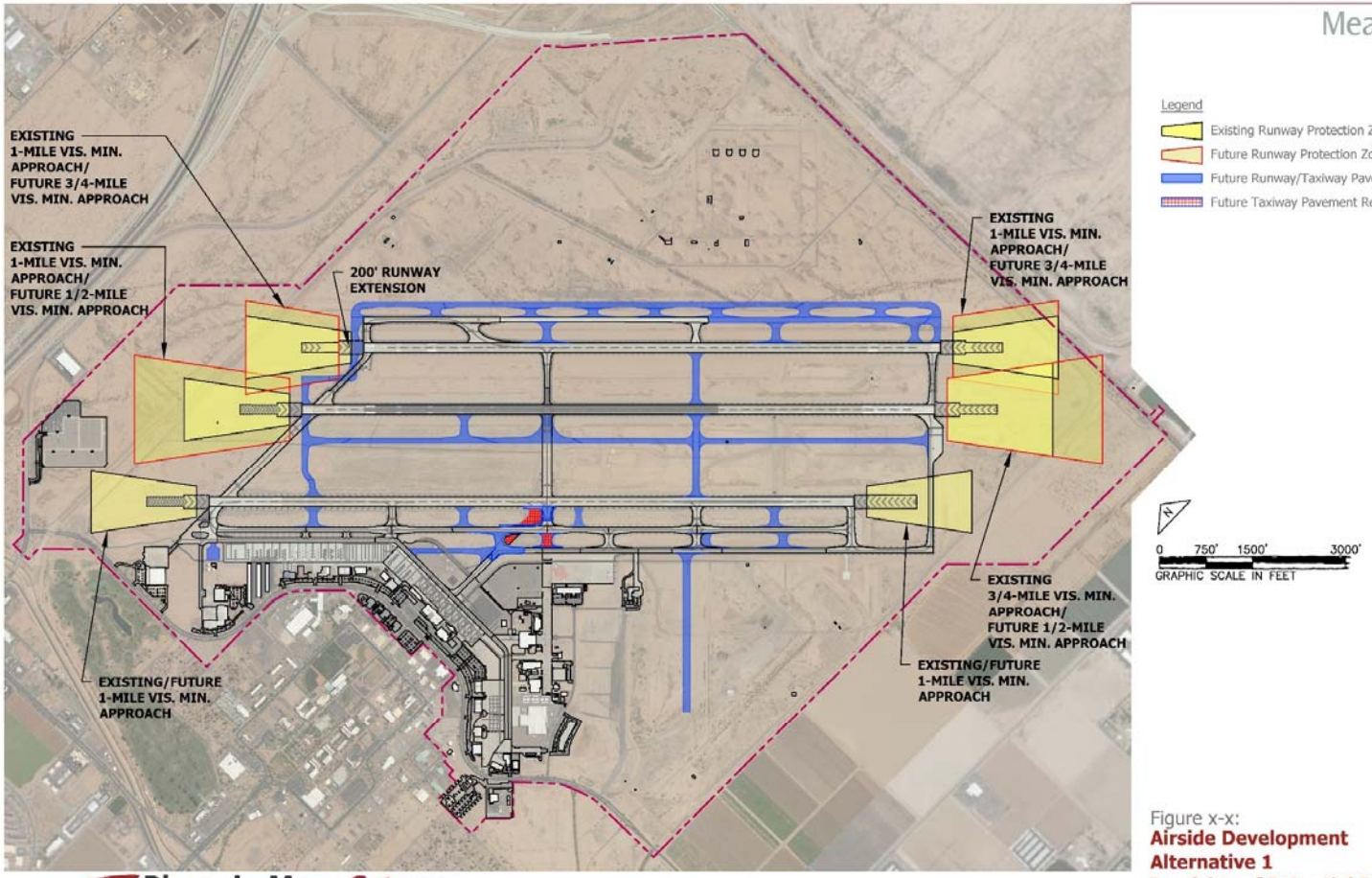


Figure x-x:
Airside Development Alternative 2
Protect for Ultimate Potential Airside Configuration



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Airport Master Plan

Figure x-x:
Airside Development
Alternative 1
Provision of Potential Demand
Driven Improvements

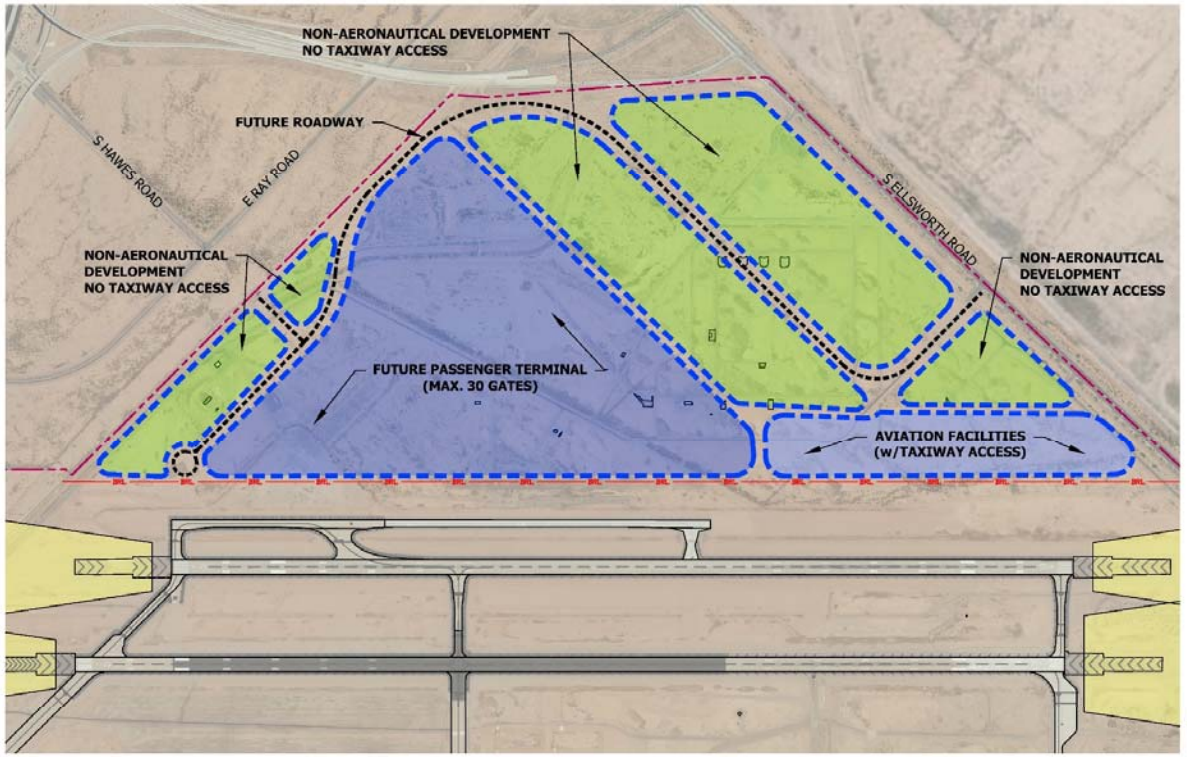

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Figure x-x:
Landside Development
Eastside

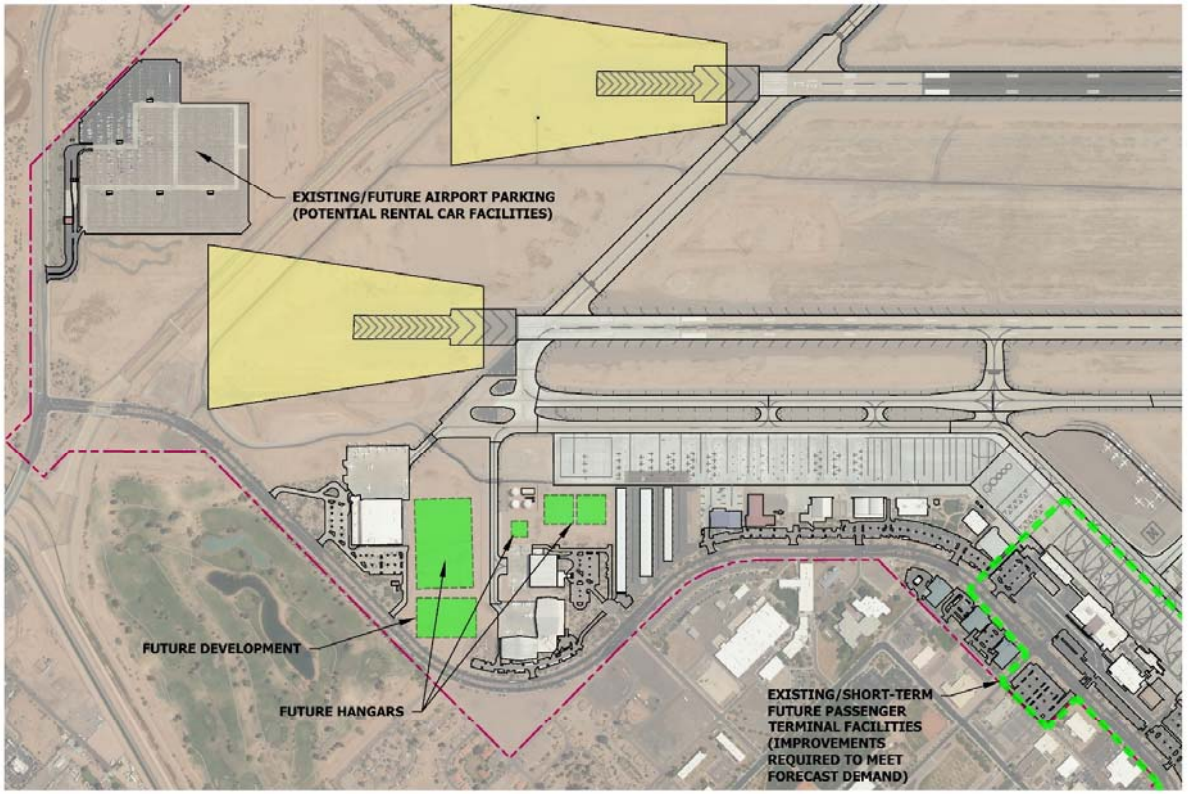

Figure x-x:
Landside Development
Westside (North)

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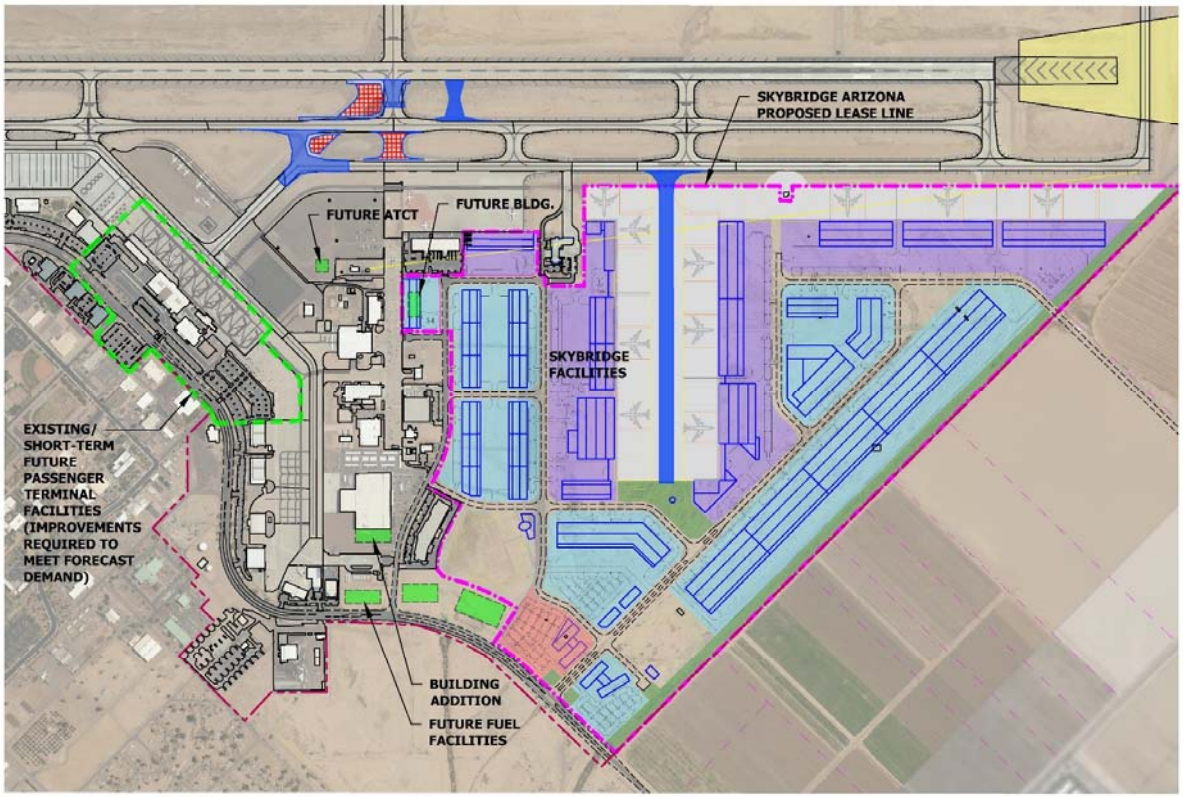

Legend
- Existing Runway Protection Zone
- Future Buildings/Development
- Future Taxiway Pavement
- Future Taxiway Pavement Removed
- SkyBridge Arizona Aviation Facilities
- SkyBridge Arizona w/No Taxiway Access
- SkyBridge Arizona Proposed Lease Line

N

0 400' 800' 1600'
GRAPHIC SCALE IN FEET

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Airport Master Plan

Figure x-x:
Landside Development
Westside (South)

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Next Steps

- ✓ Study Committee Meetings #2 -January 15-16, 2019
- ✓ Public Information Meeting #1 - January 16, 2019
- ✓ Alternatives Evaluation and Development Plan Identification (Working Paper Three)
- ✓ Next Committee/Public Meetings April/May 2019

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Thank You Partners and Goodbye for Now!

Phoenix-Mesa Gateway Airport Master Plan

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Phoenix-Mesa Gateway Airport
Stakeholder Working Group Meeting #4
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Tuesday, June 25, 2019

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Phoenix-Mesa Gateway Airport
Stakeholder Working Group Meeting #4
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Tuesday, June 25, 2019

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Bob Draper	PMGAA			bdraper@GatewayAirport.com

Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport
Airport Master Planning Services

Phoenix-Mesa Gateway Airport

Master Plan – Stakeholders Working Group Meeting

June 25, 2019

Mead&Hunt

Phoenix-Mesa
Gateway
Airport Master Plan

Agenda

- ✓ Introductory Remarks
- ✓ Project Approach and Schedule
- ✓ Forecasts of Aviation Activity Review
- ✓ Facility Requirements Review
- ✓ Airfield Alternatives
- ✓ Landside Alternative – West Side
- ✓ Landside Alternative – East Side
- ✓ Conceptual Development Plan
- ✓ Next Steps

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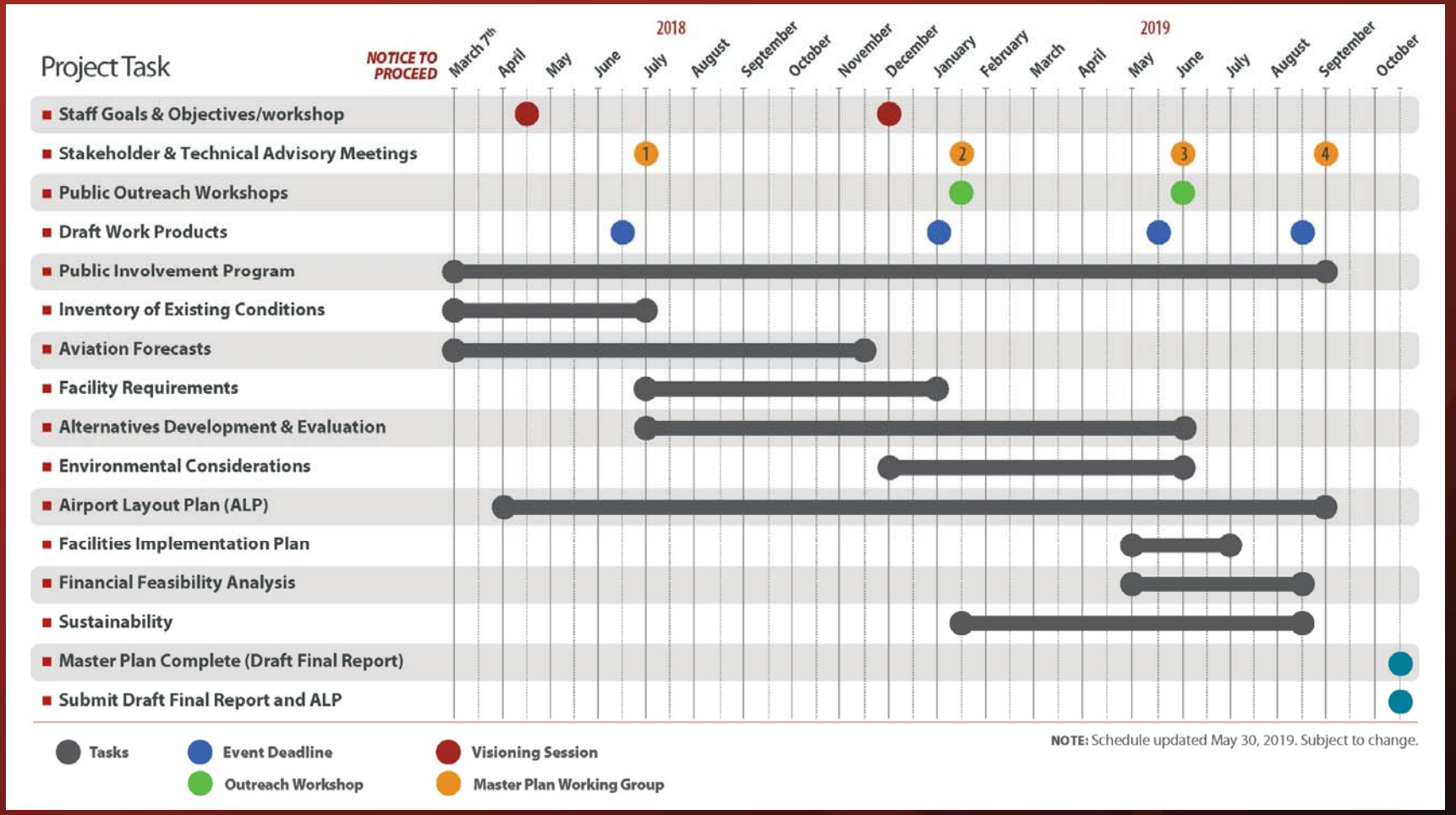
Project Approach

- ✓ Follow FAA Guidance
- ✓ Building Block Process
  - Inventory
  - Forecasts
  - Facilities Needs Determination
  - Development Plan Formulation
  - Financial Plan

Project Schedule Airport Master Plan



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Survey – Input to Facility Planning

Committee Surveys

✓ **Remains open for comments**

Public Surveys

✓ **173 responses since June 13, 2019**

- **Preliminary Results**
  - 34% of respondents indicate they have utilized Gateway 5 or more times in the past five years
  - 70% of respondents indicated low cost parking was important (more important than proximity to terminal)
  - 42% indicated airline destinations critical factor
  - 35% indicated proximity to home critical factor

Airport Master Plan-
FAA Approved Forecast

Enplanement Forecast:
2018 Total= 763,542

2023	2028	2038
924,667	1,022,420	1,245,211

Total Operations Forecast:
2018 Total= 288,921

2023	2028	2038
316,712	333,028	369,744

Total Based Aircraft Forecast:
2017 Actual = 109

2023	2028	2038
121	126	139

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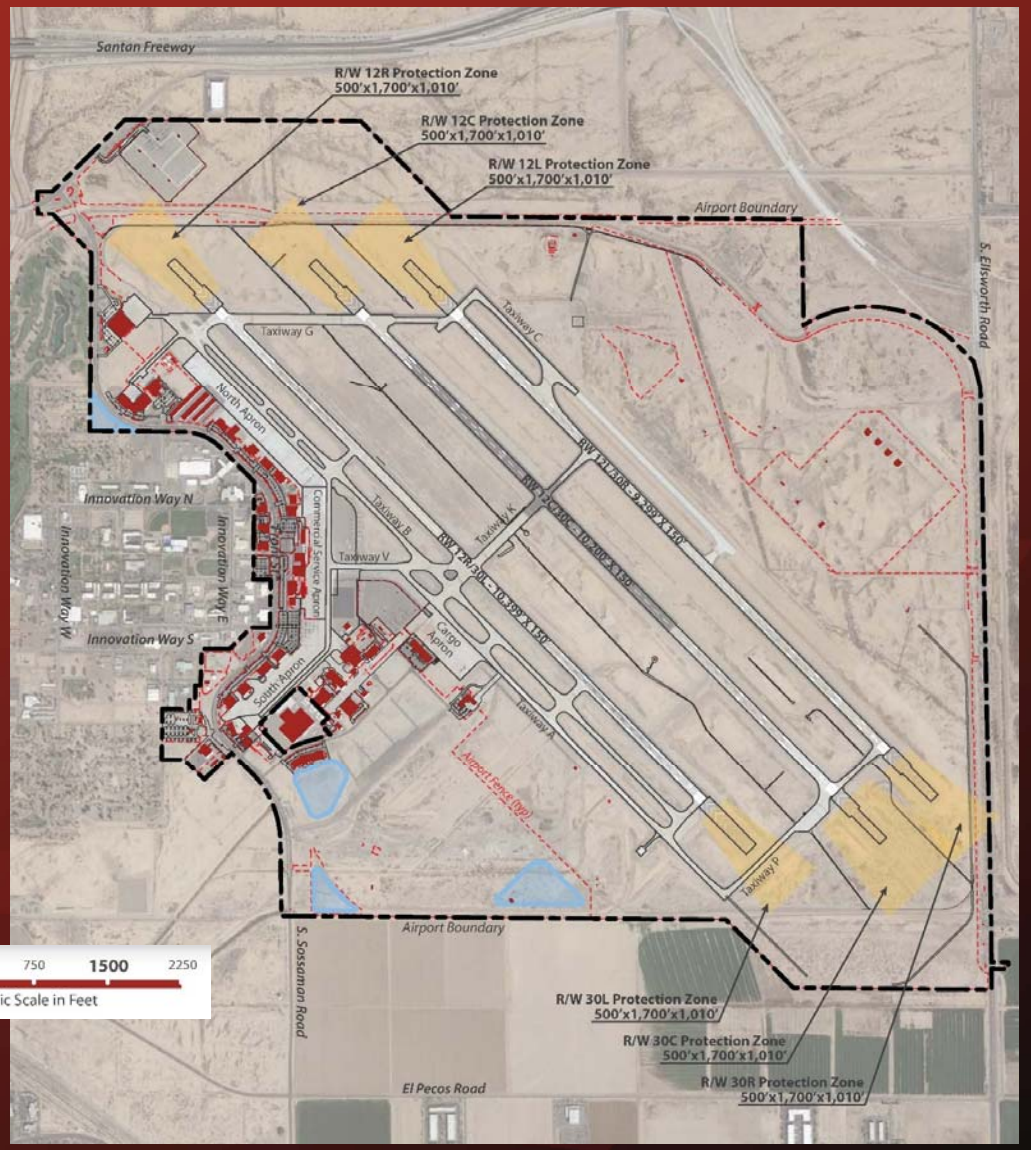
Existing Airport Facilities



Phoenix-Mesa
Gateway
Airport Master Plan

Summary of Critical Facility Requirement Considerations

- ✓ Identify potential needs and benefits for runway extension(s)
- ✓ Identify benefits for placement of parallel taxiway improvements
- ✓ Consideration of benefits of improved instrument approach capabilities
- ✓ Passenger terminal
  - Short-term focus on demand driven improvements for existing terminal building
  - Long-term focus on relocated terminal
- ✓ Vehicular access and parking
  - Short-term focus on demand driven improvements for existing terminal area
  - Long-term focus on relocated terminal including support facilities
- ✓ SkyBridge Arizona - incorporate adopted recommendations into master plan
- ✓ General aviation and industrial aviation - continue to program for demand driven facility expansion and improvements

Airside Alternatives

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Gateway
Airport Master Plan

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Airfield Configuration

- ✓ Runway Orientation
- ✓ Airfield Operational Capacity
- ✓ Runway Length Analysis
- ✓ Runway Design and Dimensional Criteria
- ✓ Parallel Runway Separation
- ✓ Instrument Approach Capabilities
- ✓ Taxiway Design and Dimensional Criteria
- ✓ Parallel Taxiway Improvement Considerations
- ✓ Exit and Connecting Taxiways

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Airfield Development: *ALTERNATIVE 1*

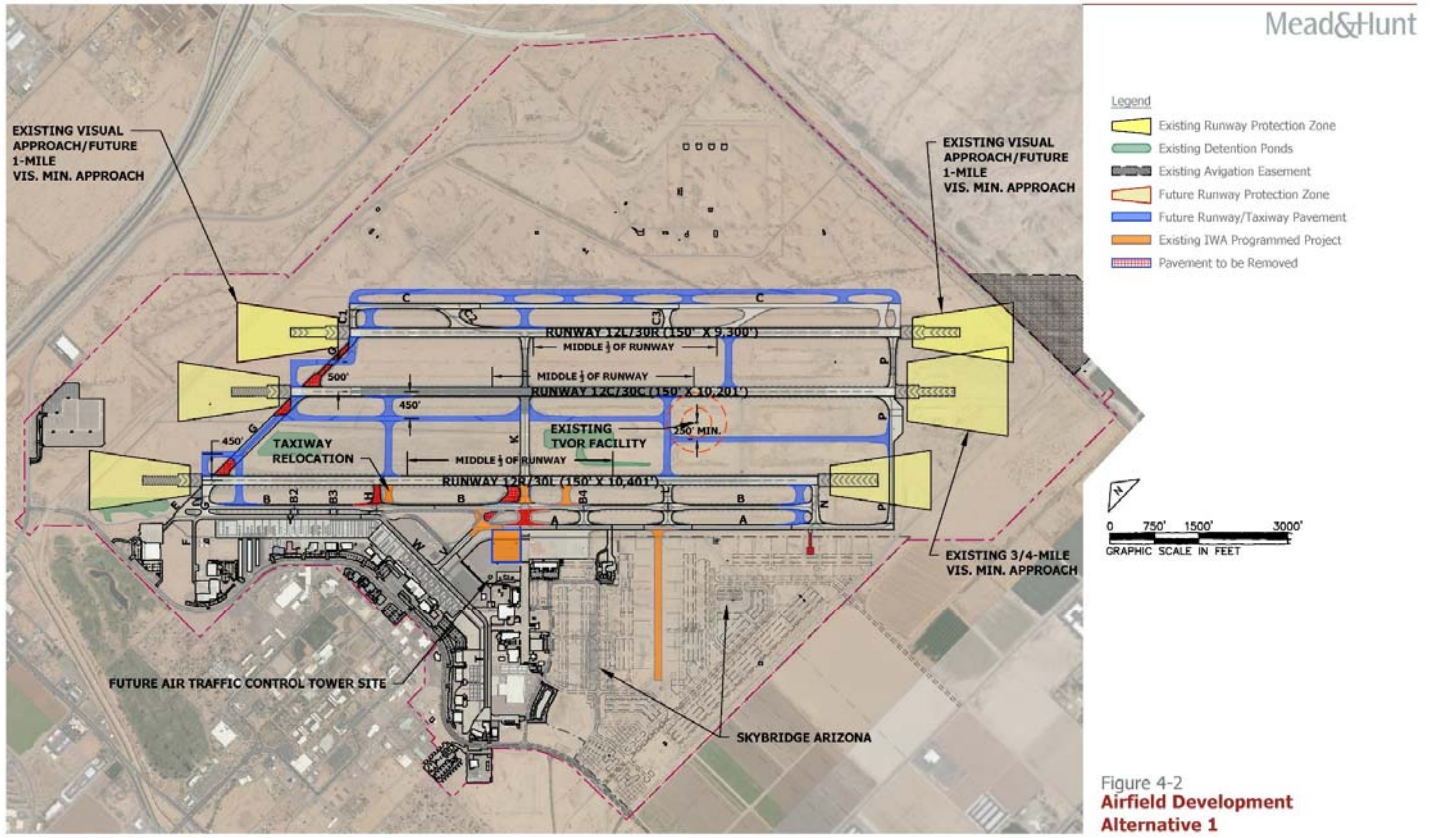

Figure 4-2
Airfield Development
Alternative 1

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Airfield Development: *ALTERNATIVE 2*

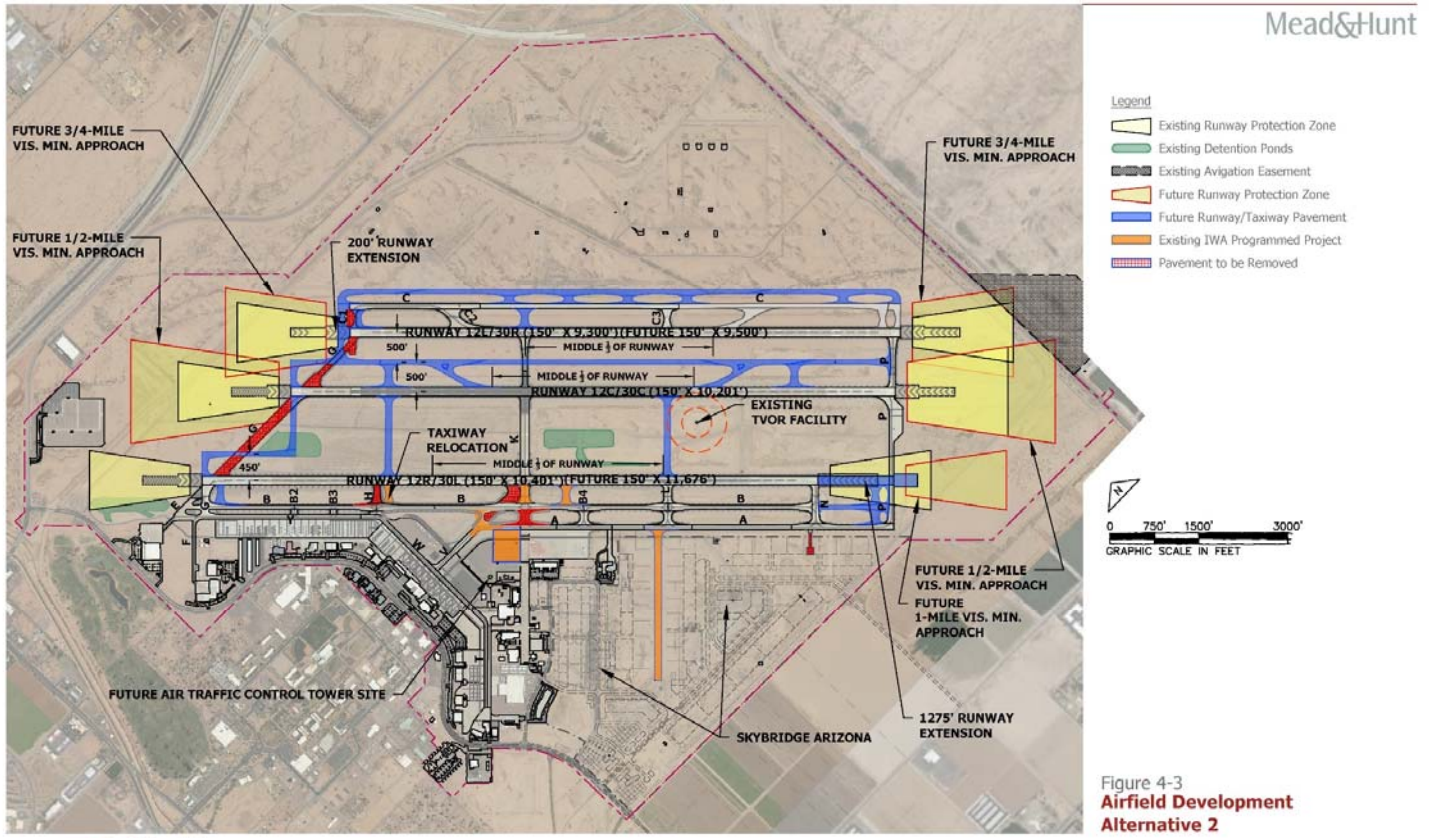

Figure 4-3
Airfield Development
Alternative 2

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Airport Master Plan Update

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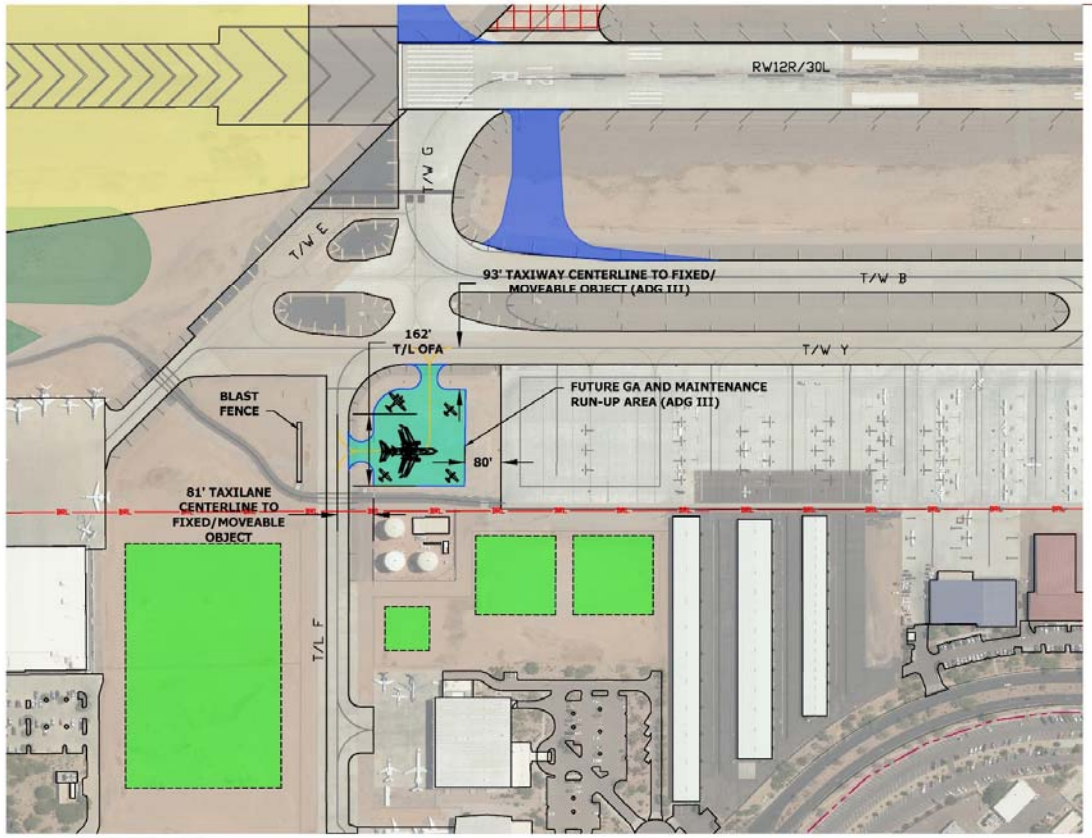
Run-Up Area: *ALTERNATIVE 1*



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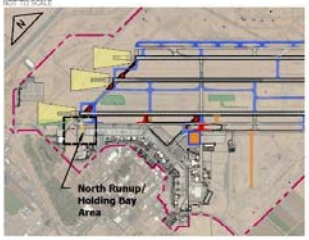
Key Map



Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Pavement to be Removed
- Future Buildings/Development

0 100' 200' 400'
GRAPHIC SCALE IN FEET

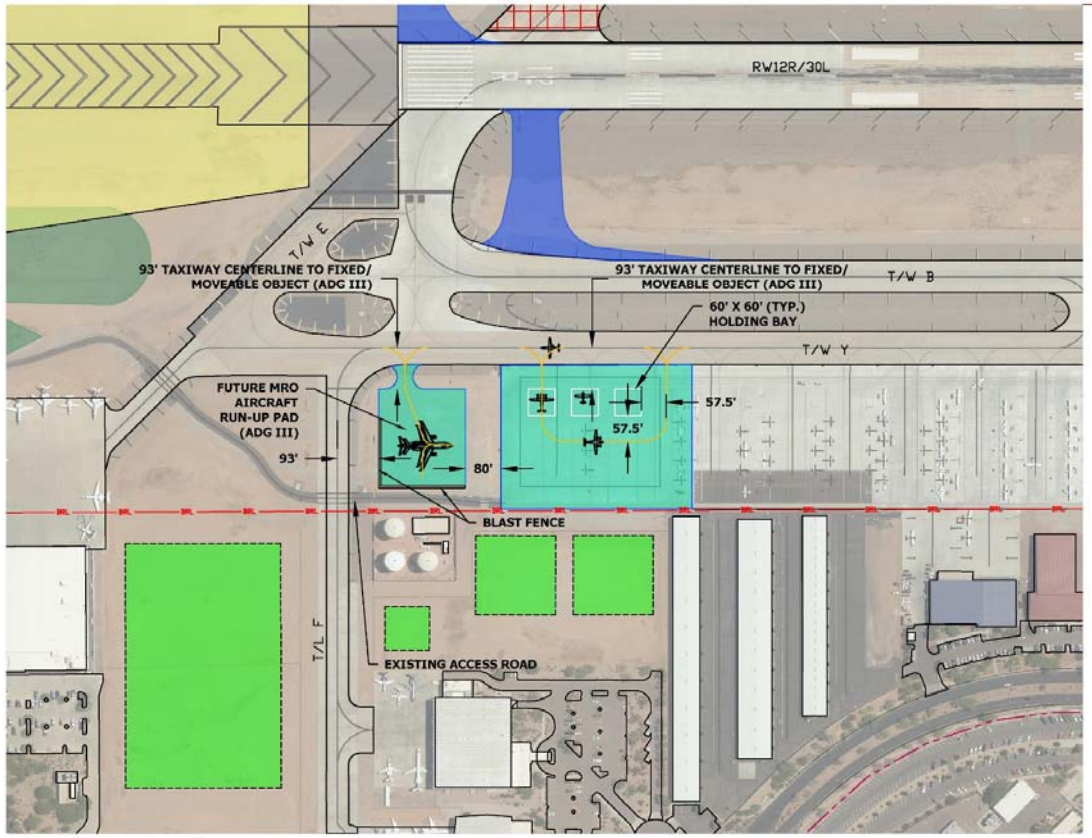
GA and Maintenance Run-up Area Design Criteria
- Illustrates ADG III TOFA Criteria

Figure 4-4
Dependent Aircraft Run-Up Area - ADG II/III
Alternative 1

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Run-Up : *ALTERNATIVE 2*



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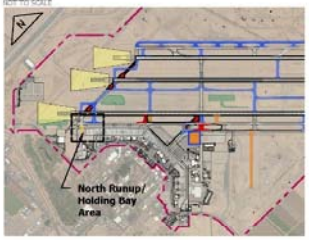
Key Map



Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Pavement to be Removed
- Future Buildings/Development

0 100' 200' 400'
GRAPHIC SCALE IN FEET

GA Run-up/Holding Bay Design Criteria
- Illustrates ADG II & III TOFA Criteria

MRO Run-up Pad Design Criteria
- Illustrates ADG III TOFA Criteria

Figure 4-5
North GA Run-up/Holding Bay & Maintenance Run-up Area Alternative 2

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Gateway
Airport Master Plan

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Compass Calibration Pad: *ALTERNATIVE 1*

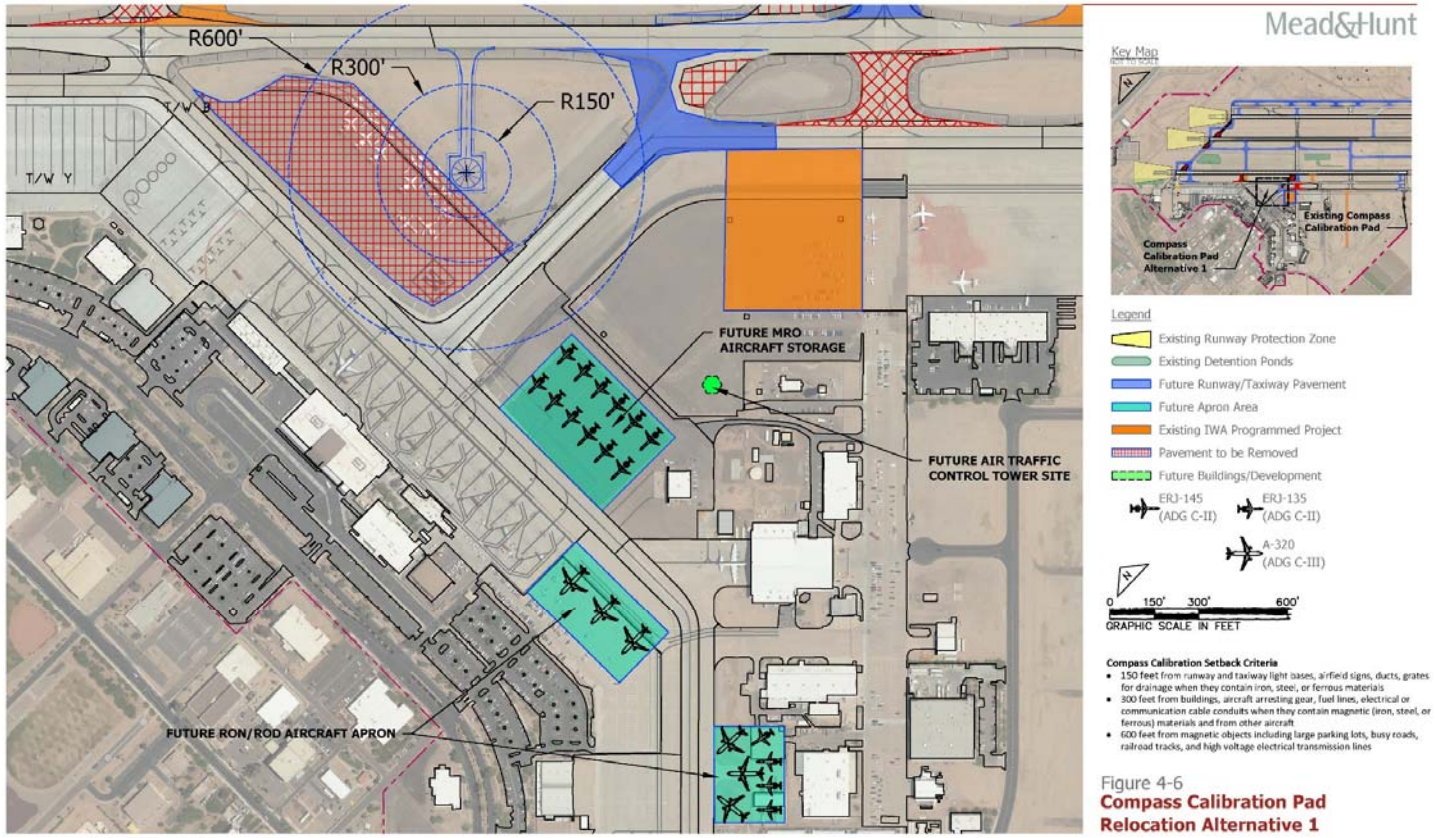

Figure 4-6
Compass Calibration Pad Relocation Alternative 1

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Phoenix-Mesa Gateway Airport Master Plan

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Compass Calibration Pad: *ALTERNATIVE 2*

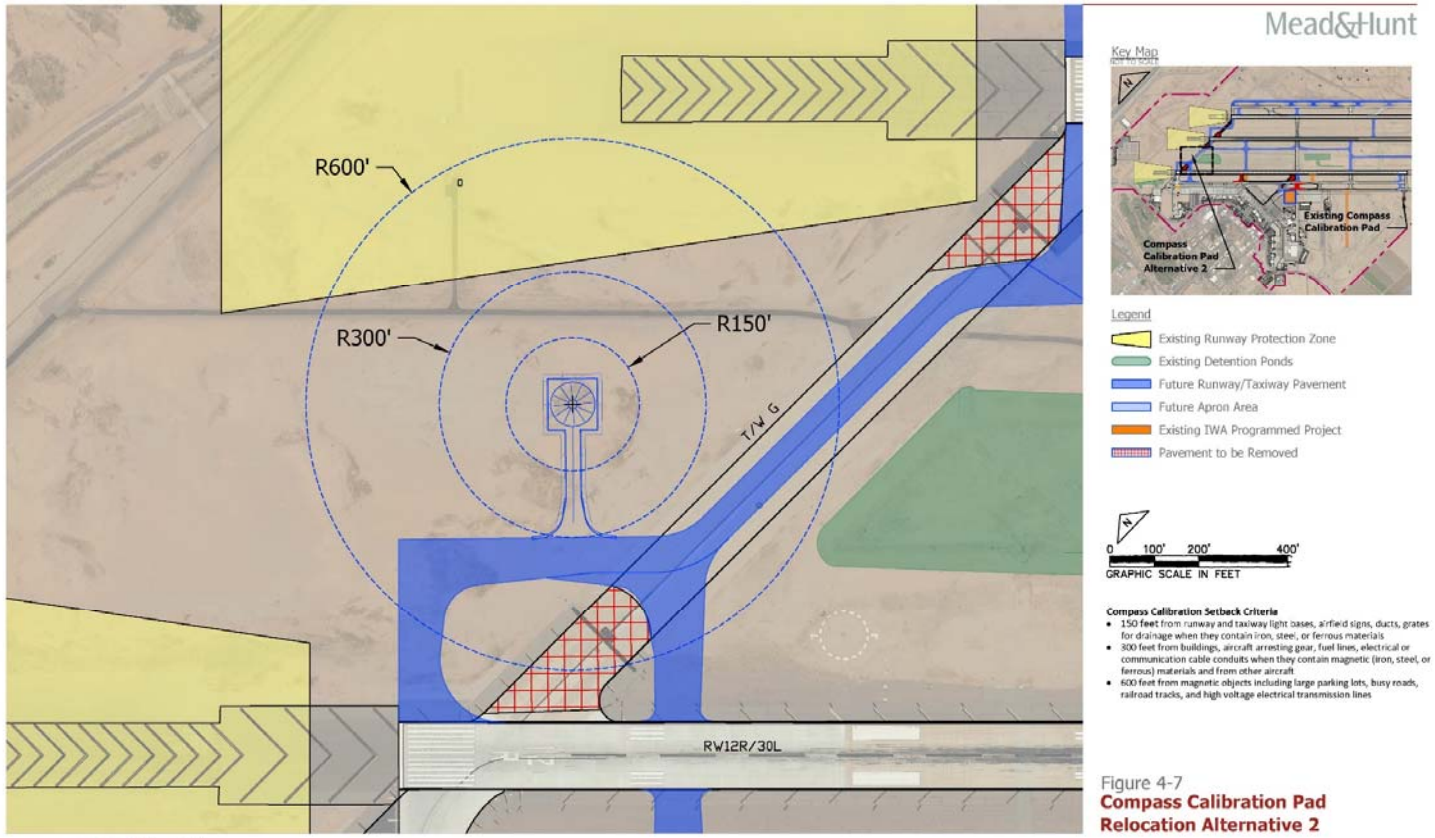

Figure 4-7
Compass Calibration Pad Relocation Alternative 2

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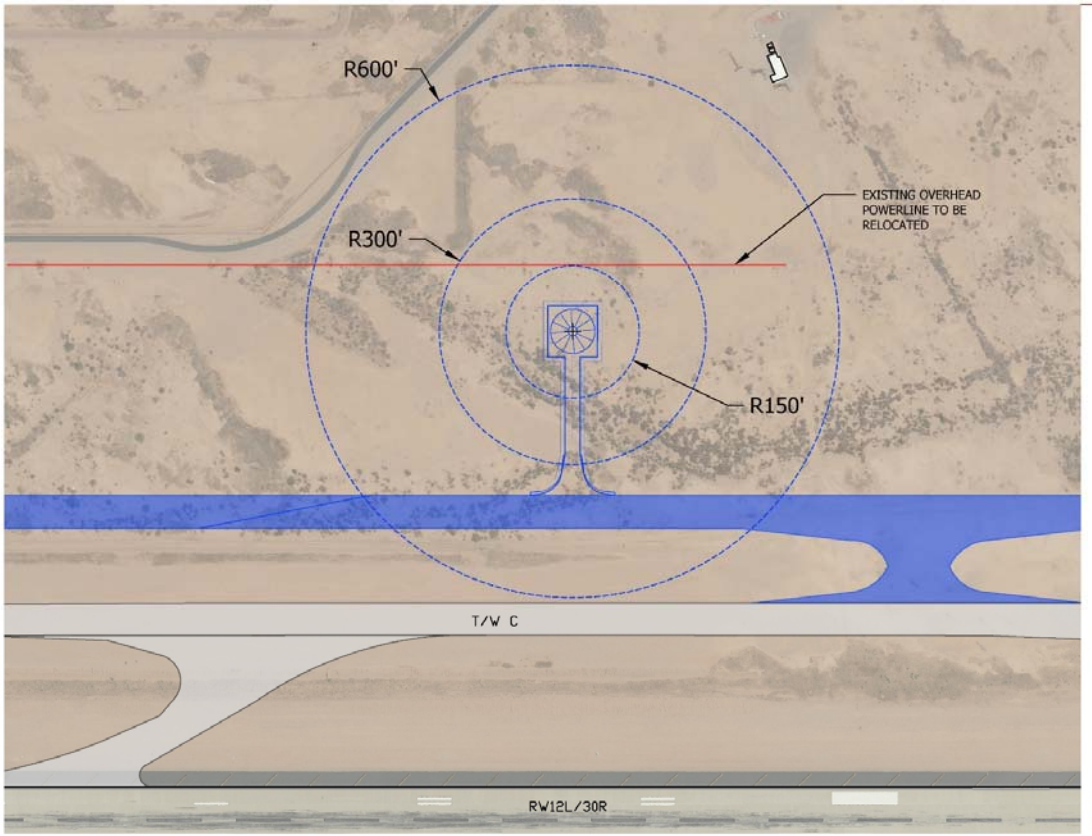
Compass Calibration Pad: *ALTERNATIVE 3*



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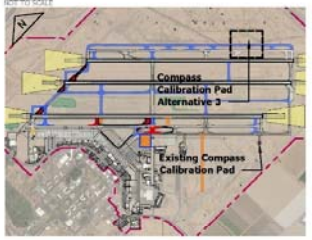
Key Map



Legend

- Existing Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Existing IWA Programmed Project
- Pavement to be Removed

0 100' 200' 400'
GRAPHIC SCALE IN FEET

Compass Calibration Setback Criteria

- 150 feet from runway and taxiway light bases, airfield signs, ducts, grates for drainage when they contain iron, steel, or ferrous materials
- 800 feet from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
- 600 feet from magnetic objects including large parking lots, busy roads, railroad tracks, and high voltage electrical transmission lines

Figure 4-8
Compass Calibration Pad Relocation Alternative 3

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Landside Alternatives - West Side

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Gateway
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Terminal Requirements Summary

Functional Area	Existing (supply) *(a)*	PAL 1 (2023)	PAL 2 (2028)	PAL 3 (2038)
CHECK-IN (TICKETING)				
Queue (sf)	4,500	3,550	3,700	4,350
Counters/Bag drops	32	26	27	31
CHECKED BAGGAGE				
EDS machines *(b)*	2 CT-80	3 MS-EDS	4 MS-EDS	4 MS-EDS
Makeup area (sf)	11,500	11,400	12,800	15,700
SECURITY SCREENING CHECKPOINT				
Queue (sf)	1,725	1,700	1,900	2,625
Lanes	5	5	5	5
PASSENGER HOLDROOM				
Holdroom (sf)	15,260	13,000	15,300	19,700
Podium, queueing, egress (sf)	3,950	3,150	3,675	4,725
APRON (GATES)	6 ADG III, 4 B757	8 ADG III	9 ADG III	11 ADG III
BAGGAGE CLAIM (DEVICES)	2	2	3	3

(a) Existing queues are estimated based on terminal drawings
(b) Requirement, which is based on a hypothetical medium speed inline system (MS-EDS), includes one EDS machine for redundancy

Public Parking Demand Forecasts

(Master Plan Projected Growth Rate)

Lot		FY 2018 Peak	Short – Term	Mid – Term	Long – Term
Hourly Express Lot	Supply	183	183	183	183
	Effective Supply	156	156	156	156
	Demand	194	242	265	326
	Surplus/Deficit	**-38**	**-86**	**-109**	**-170**
Daily Lot	Supply	871	871	871	871
	Effective Supply	740	740	740	740
	Demand	717	894	982	1,205
	Surplus/Deficit	**23**	**-154**	**-241**	**-465**
Ray Road Economy Lot	Supply	2,812	2,812	2,812	2,812
	Effective Supply	2,390	2,390	2,390	2,390
	Demand	747	931	1022	1255
	Surplus/Deficit	**1643**	**1459**	**1368**	**1135**
Grand Total	Supply	3,866	3,866	3,866	3,866
	Effective Supply	3,286	3,286	3,286	3,286
	Demand	1,658	2,067	2,270	2,787
	Surplus/Deficit	**1,628**	**1,219**	**1,017**	**499**

- ✓ **Effective Supply**
  - **Best practices for managing parking supply suggest that parking supply is at capacity when the demand reaches 85% utilization**
- ✓ **Deficits**
  - **Immediate**
    - Hourly Lot, based on observed condition. Lot should be considered at or near capacity.
  - **Short, Mid, Long-Term**
    - Hourly Express Lot
    - Daily Lot
- ✓ **Surplus**
  - **Immediate, Short, Mid, Long-Term**
    - Significant surplus in Economy Lot throughout planning horizon

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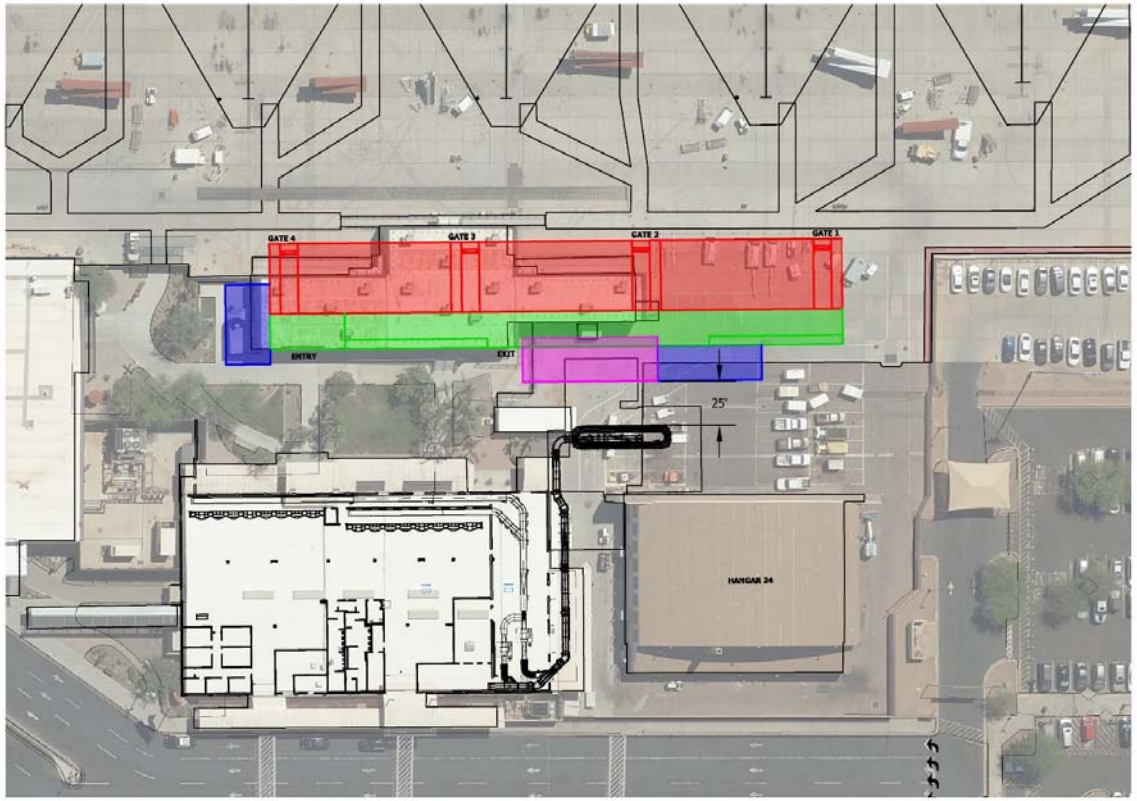
Terminal Annex Redevelopment Plan



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Legend
- Departure Lounges
- Food & Beverage
- Concourse
- Restroom

N
0 25' 50' 100'
GRAPHIC SCALE IN FEET

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Figure 4-9
Terminal Annex Redevelopment Plan

Airport Master Plan Update

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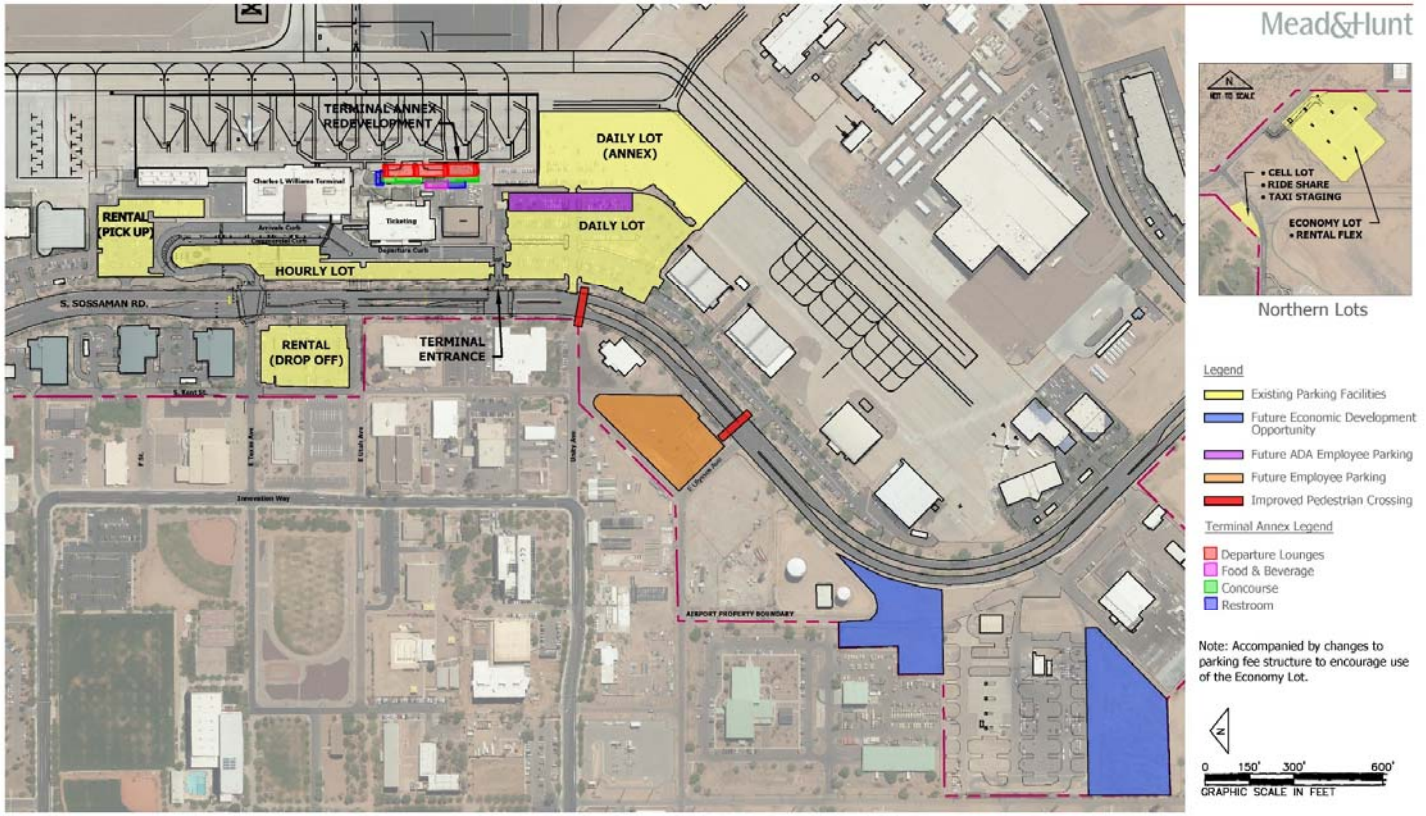
Passenger Terminal Support Facilities

- ✓ Access Roadway System
- ✓ Passenger Parking System
- ✓ Rental Car Parking
- ✓ Employee Parking
- ✓ Temporary Parking (Cell Phone Lot)

Westside Development: *ALTERNATIVE 1: Short Term*



Phoenix-Mesa Gateway Airport

Figure 4-10
Westside Development - Facility Improvement Alternative 1 Short Term
Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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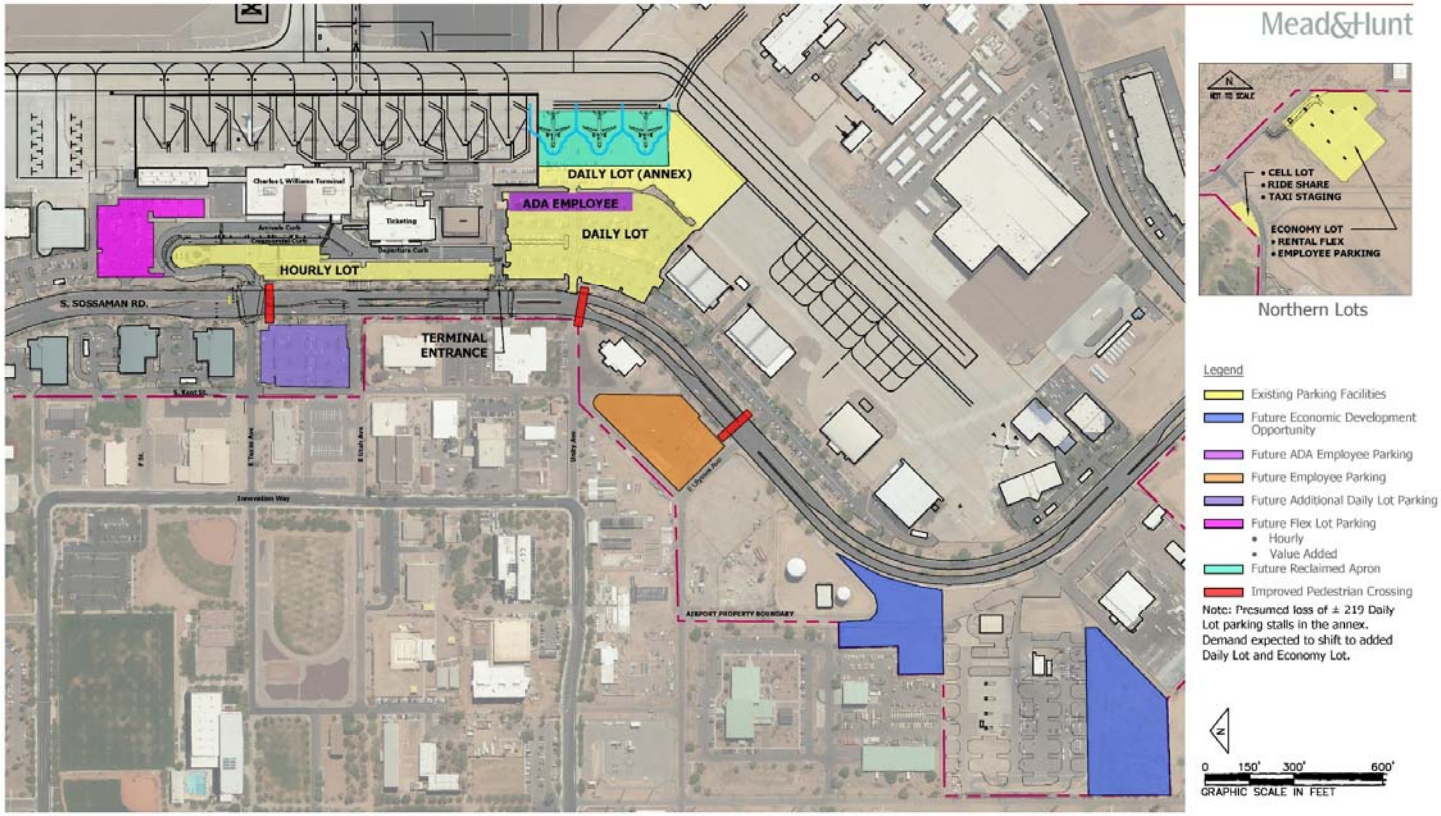
Westside Development: *ALTERNATIVE 1: Mid Term*



Phoenix-Mesa Gateway Airport

Figure 4-11
Westside Development - Facility Improvement Alternative 1 Mid Term
Airport Master Plan Update

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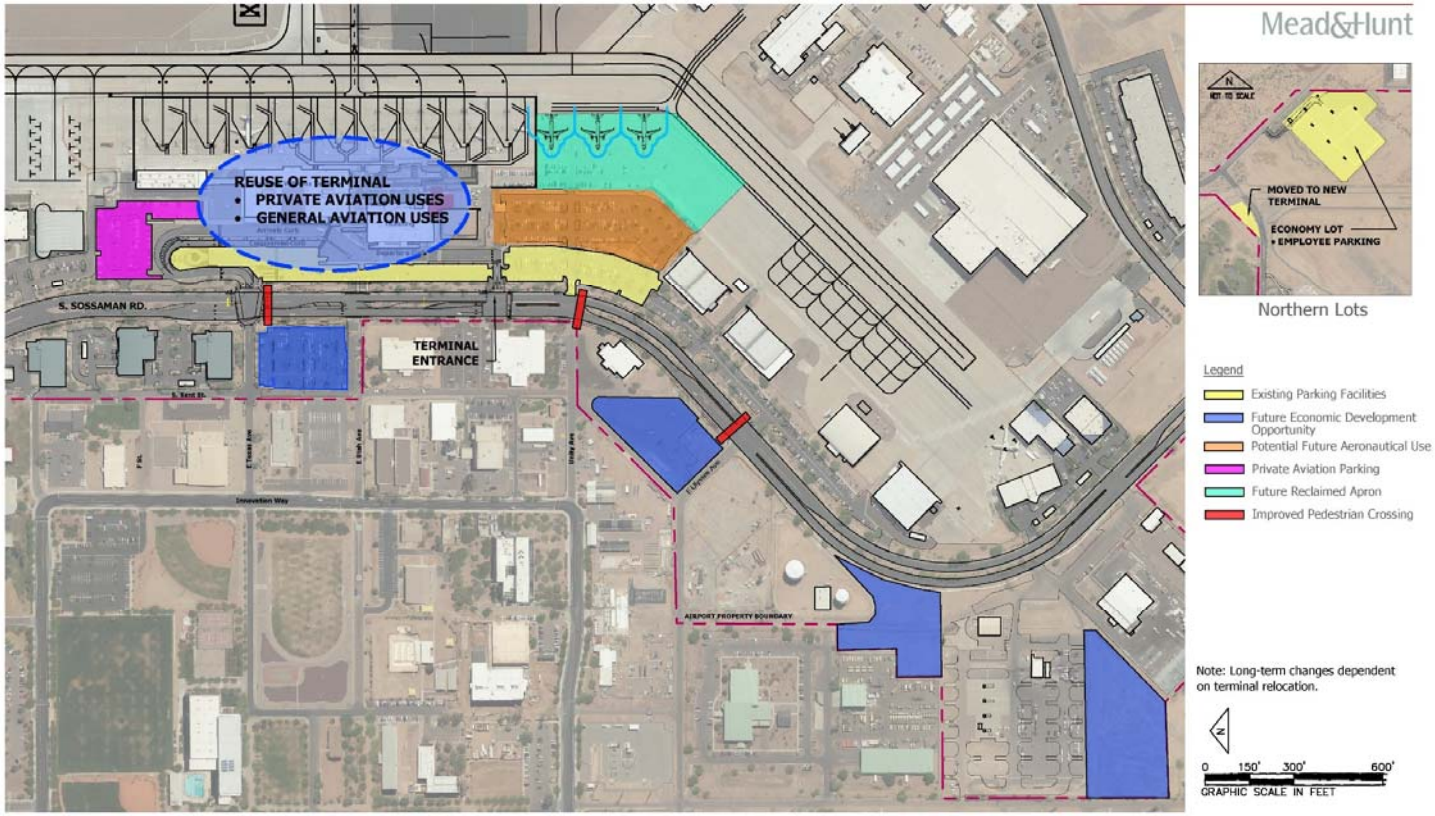
Westside Development: *ALTERNATIVE 1: Long Term*



Phoenix-Mesa Gateway Airport

Figure 4-12
Westside Development - Facility Improvement Alternative 1 Long Term
Airport Master Plan Update

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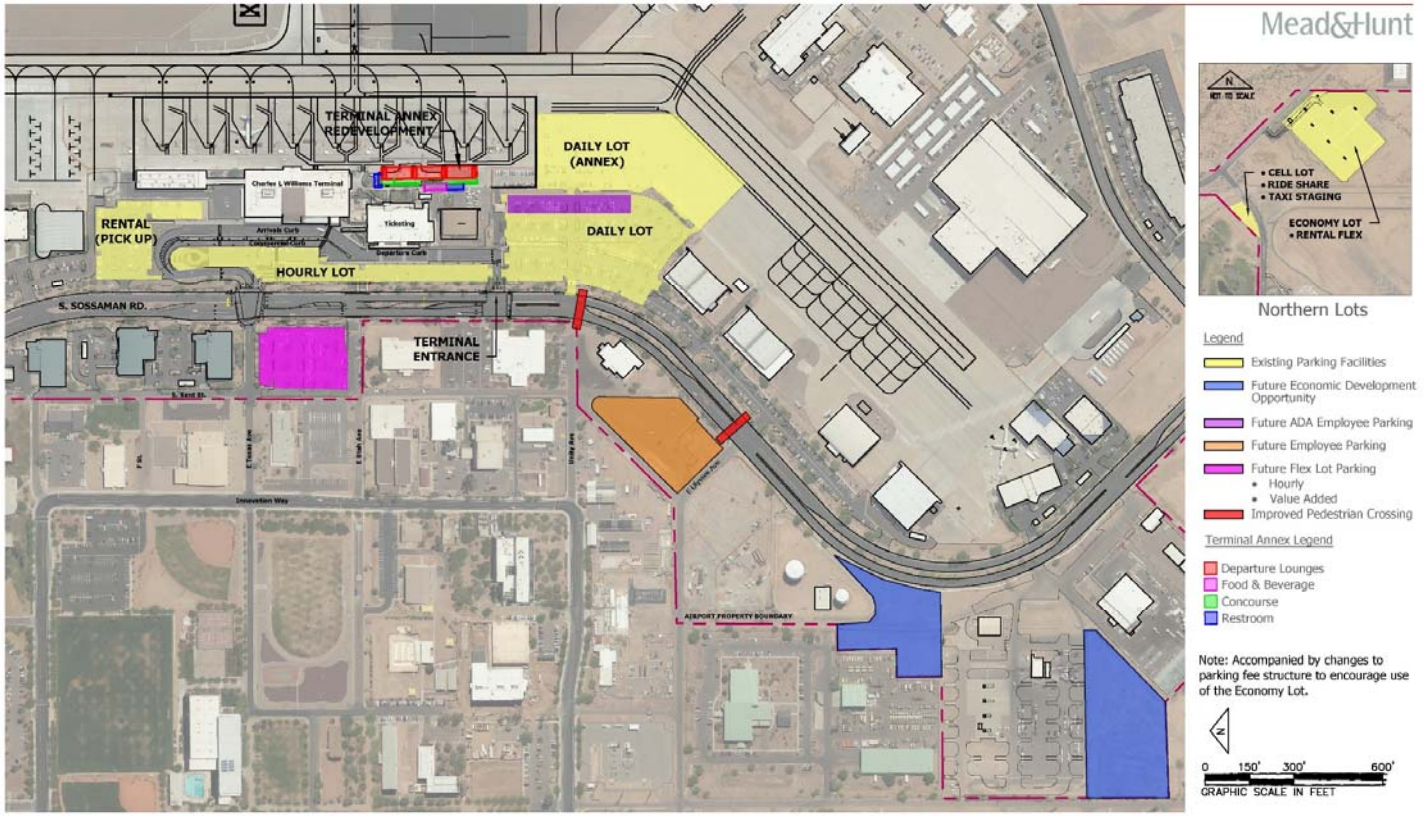
Westside Development: *ALTERNATIVE 2: Short Term*



Phoenix-Mesa Gateway Airport

Figure 4-13
Westside Development - Facility Improvement Alternative 2 Short Term
Airport Master Plan Update

Phoenix-Mesa **Gateway** Airport Master Plan

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Westside Development: *ALTERNATIVE 2: Mid Term*

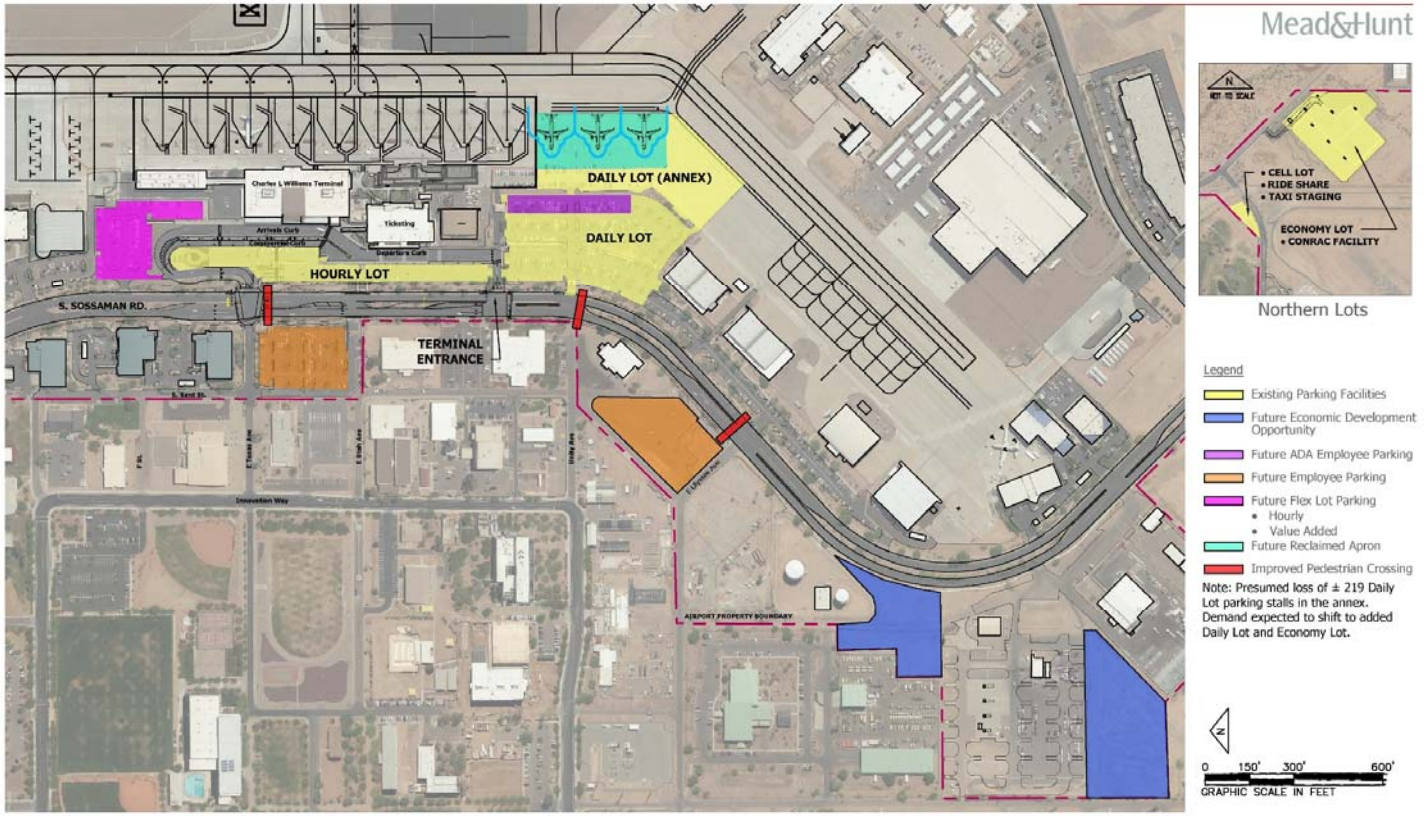

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Figure 4-14
Westside Development - Facility Improvement Alternative 2 Mid Term

Airport Master Plan Update

Westside Development: *ALTERNATIVE 2: Long Term*

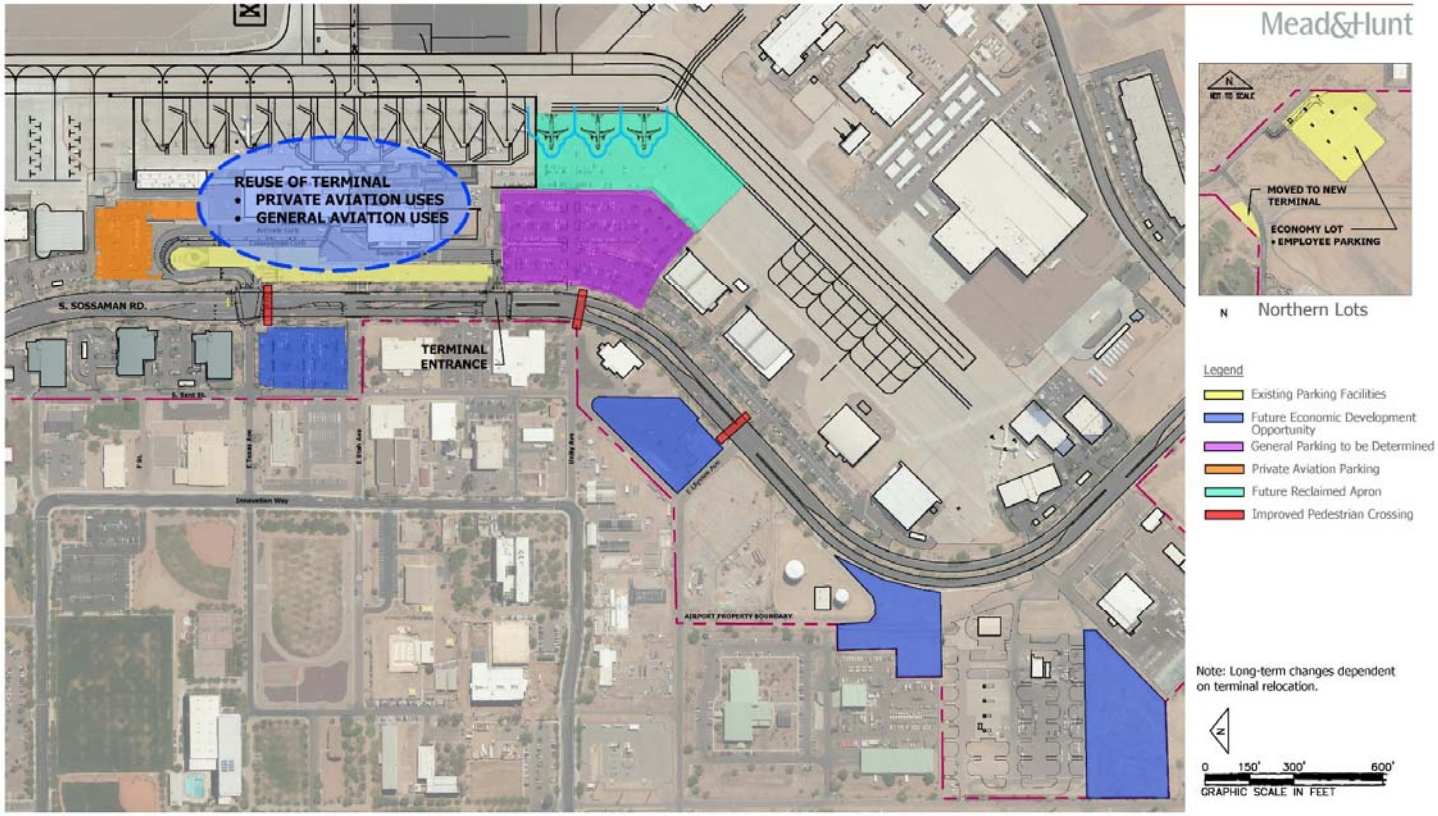

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Figure 4-15
Westside Development - Facility Improvement Alternative 2 Long Term
Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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Westside Terminal Break-Point Issues

Goal: Maintain "Just Plane Easy"

- ✓ Access Roadway - Sossaman Road (how much airport and non-airport traffic can be accommodated without experiencing unacceptable delay?)
- ✓ Size – area (acres) dedicated to passenger terminal facilities (how much stuff will the five pound bag hold before experiencing unacceptable delay)
- ✓ Passenger terminal buildings useful life
- ✓ Additional airlines and or addition service
- ✓ Desire for international facilities

Landside Alternatives - East Side

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Gateway
Airport Master Plan

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Passenger Terminal Area Acres Comparison

- ✓ IWA Existing - 36 Acres/763,542 K Enplaned PAX 2018 (1.2 M Forecast)/10 aircraft parking positions
- ✓ Northwest Arkansas Regional Airport - 124 Acres/725 K Enplaned PAX 2017/15 aircraft parking positions
- ✓ Tulsa International Airport – 103 Acres/1.4 M PAX 2017/22 Aircraft Parking Positions

Terminal Development: *ALTERNATIVE 1*

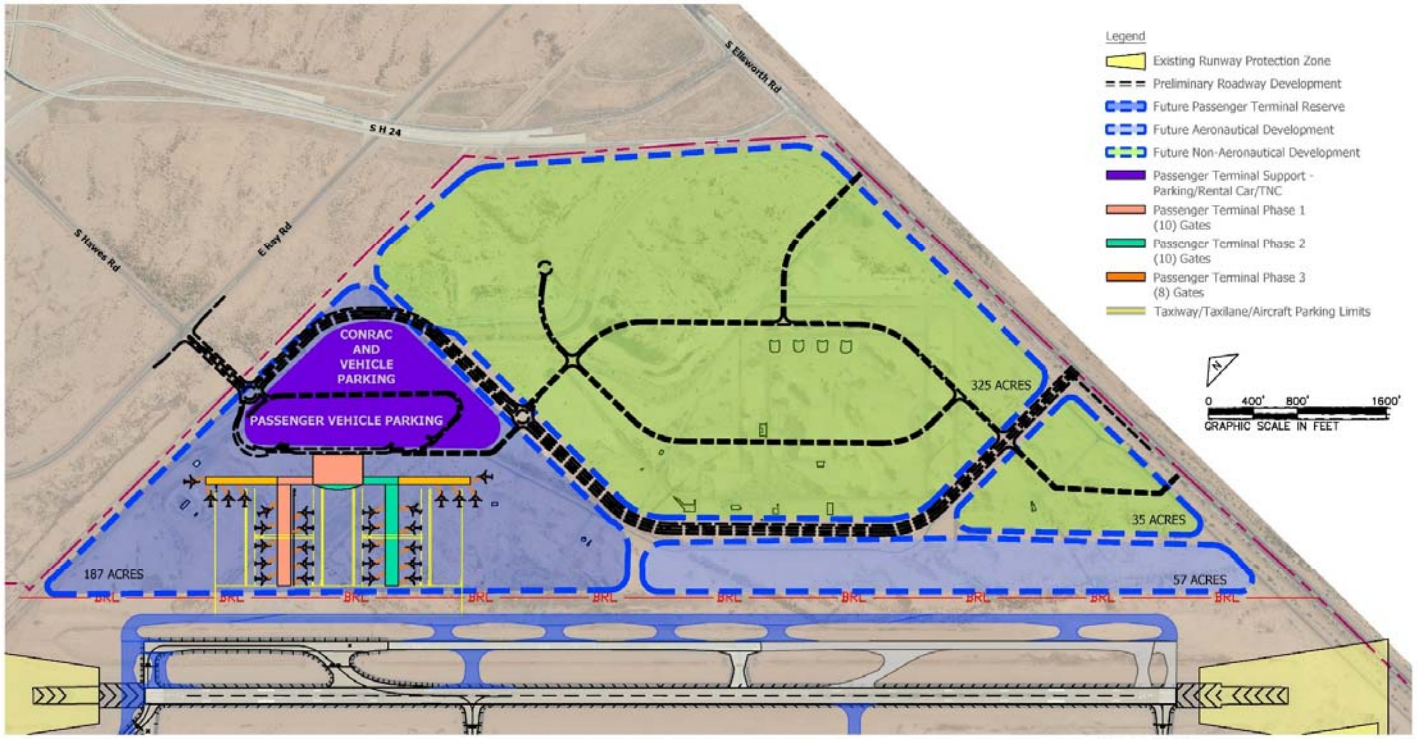

Figure 4-16
Terminal Development
Alternative 1
Pier-Finger Design - 28 Gates

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Airport Master Plan Update

Terminal Development: *ALTERNATIVE 2*

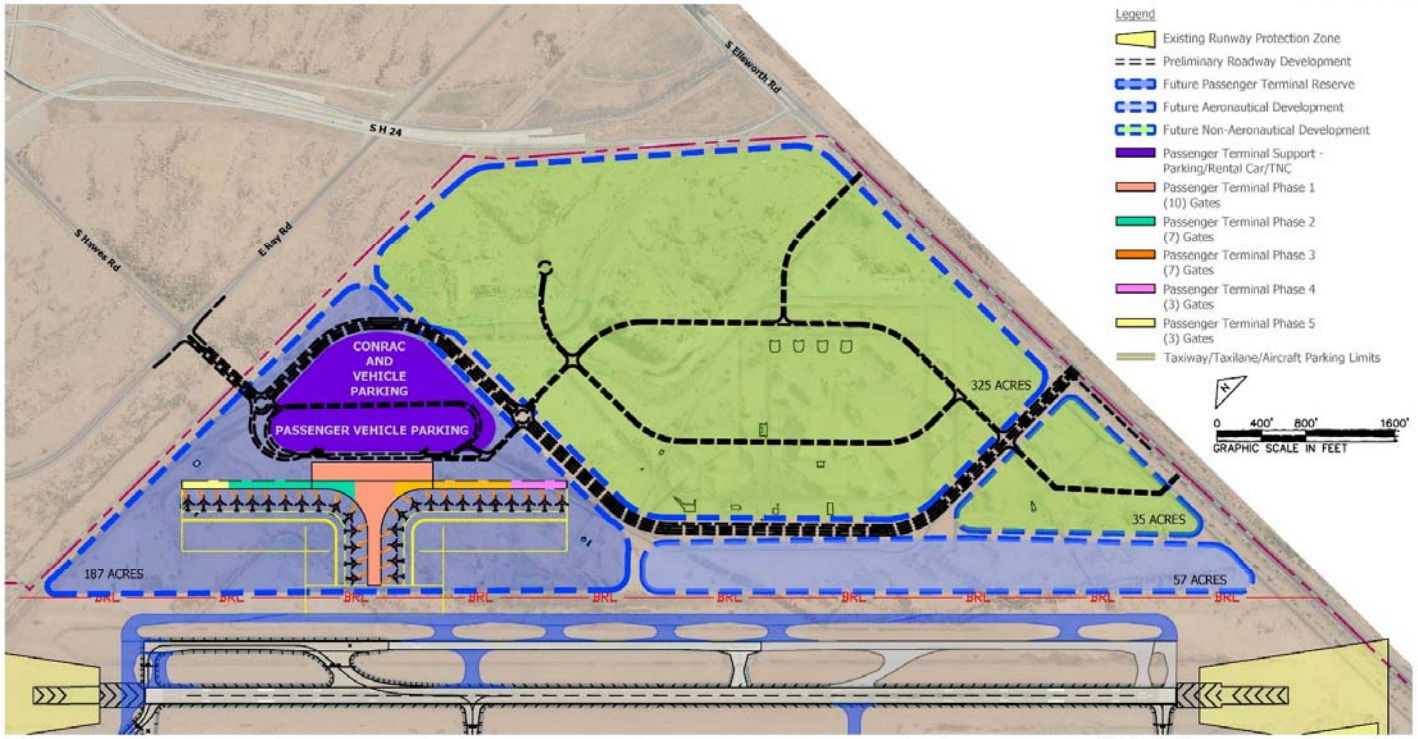

Figure 4-17
Terminal Development
Alternative 2
Curvilinear-Pier Design - 28 Gates

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Airport Master Plan Update

Terminal Development: *ALTERNATIVE 3*

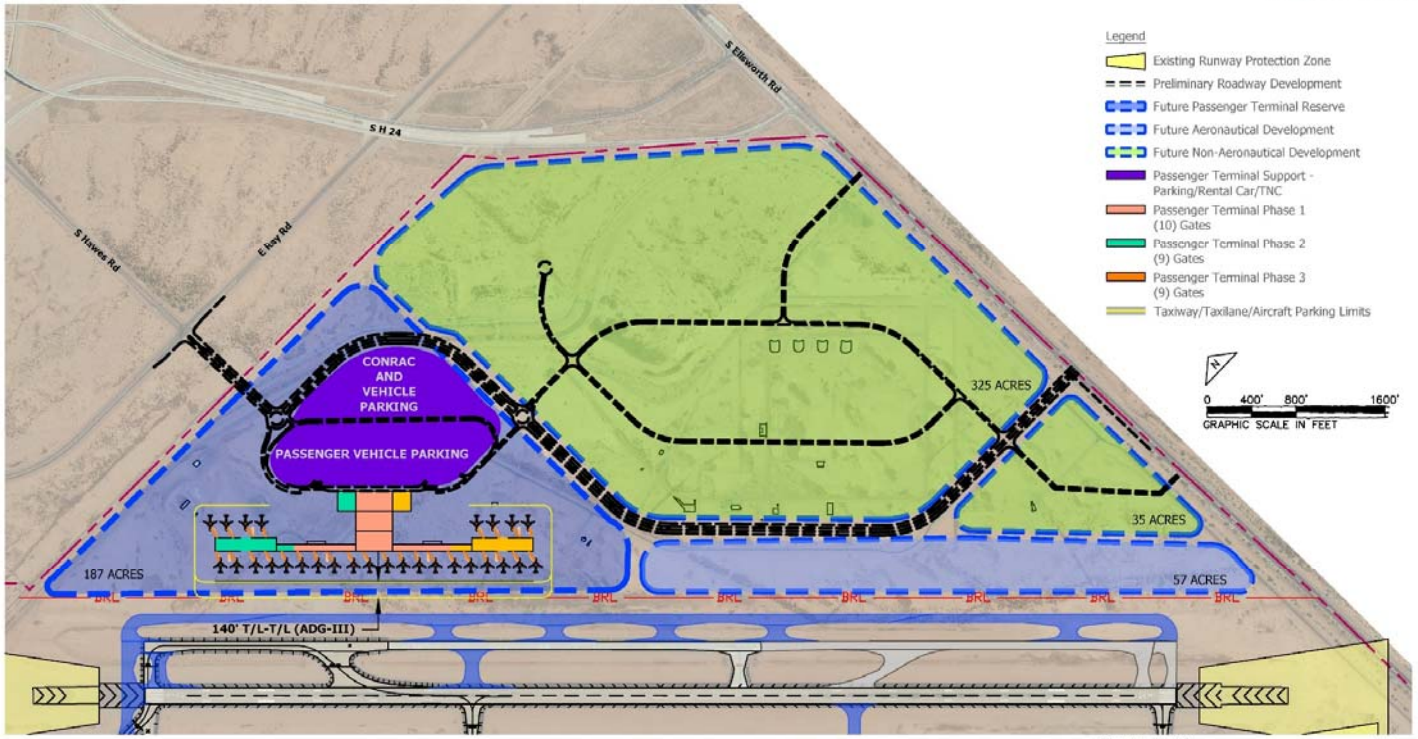

Figure 4-18
Terminal Development
Alternative 3
Linear-Pier Design - 28 Gates

Phoenix-Mesa Gateway Airport

Conceptual Development Plan

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Gateway
Airport Master Plan

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Preferred Conceptual Development Plan

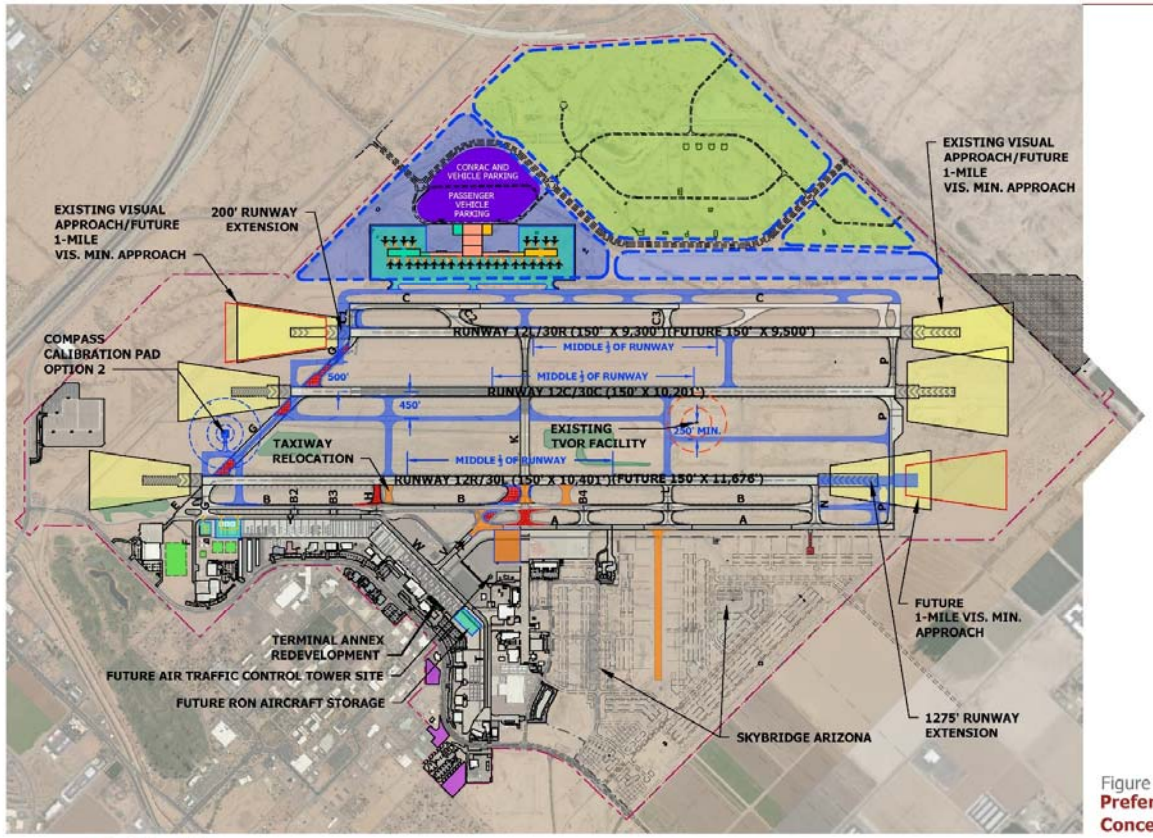

Figure 4-19
Preferred Airport Conceptual Development Plan

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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Next Steps

- ✓ Study Committee Meetings #3 -June 25-26, 2019
- ✓ Public Information Meeting #2 – June 26, 2019
- ✓ Facilities Implementation Plan and Financial Feasibility Analysis (Working Paper Four)
- ✓ Airport Layout Plan
- ✓ Final Committee Meetings September/October 2019
- ✓ Submitted to PMGAA Board for approval
- ✓ Airport Layout Plan Submitted to FAA for approval

Phoenix-Mesa Gateway Airport
Stakeholder Working Group Meeting #5
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, October 23, 2019

SIGN-IN SHEET – PLEASE PRINT

Name	Organization	Address	Phone Number	Email Address
Nana Appiah	City of Mesa			
Brian Sexton	PMGAA			
Brett Burningham	Queen Creek			
Corinne Nystrom	Falcon Field Airport - com			
Josh Rogers	Gilbert			
Margi Evanson	PMGAA			
Chuck Odom	PMGAA			
Scott Brownlee	PMGAA			

Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport
Airport Master Planning Services

Phoenix-Mesa Gateway Airport
Stakeholder Working Group Meeting #5
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, October 23, 2019

SIGN-IN SHEET – PLEASE PRINT

Name	Organization	Address	Phone Number	Email Address
LARRY KIRCH	CITY OF AJ	300 E. SUPERSTITION BLVD	480 474-5582	LKIRCH@AJCITY.NET
CHRIS ANDRES	CITY OF CHANDLER AIRPORT		480-782-3543	CHRIS.ANDRES@CHANDLERAZ.GOV

Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport
Airport Master Planning Services

Phoenix-Mesa Gateway Airport

Master Plan – Stakeholders Working Group Meeting

October 23, 2019

Mead&Hunt

Master Plan Survey

- ✓ **Survey created on Master Plan Project Website**
  - **Sent to committee members & publicized to general public**
- ✓ **Taken in mid-June 2019**
  - **7 questions**
    - Focus on Gateway utilization, user preferences, outreach, & related comments
- ✓ **200± responses**
  - **Results summary**

Phoenix-Mesa Gateway Airport Master Plan

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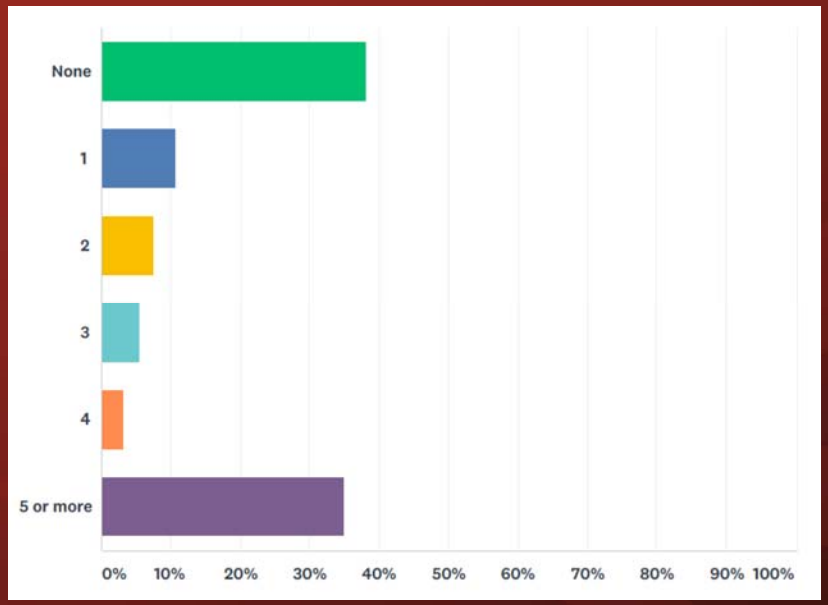
Master Plan Survey

How many times have you, or members of your household, utilized Gateway for air travel in the last 5 years?



- Highest % of respondents utilize Gateway often, or have not to date

Phoenix-Mesa Gateway Airport Master Plan

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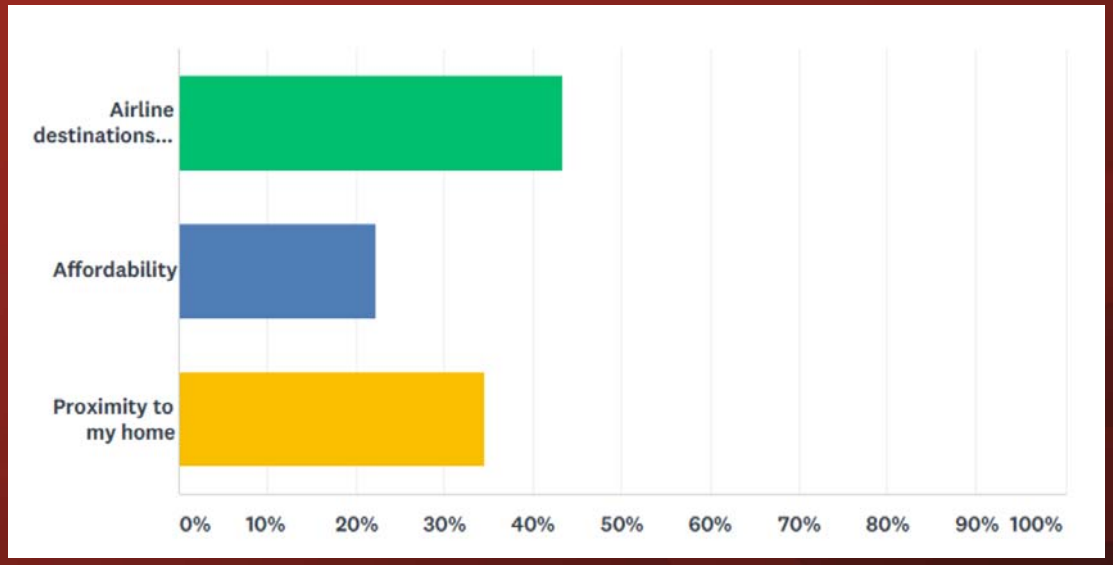
Master Plan Survey

What would be the largest factor in why you utilized, or would utilize, Gateway for your air travel?



- Airline destinations offered was largest factor

Phoenix-Mesa Gateway Airport Master Plan

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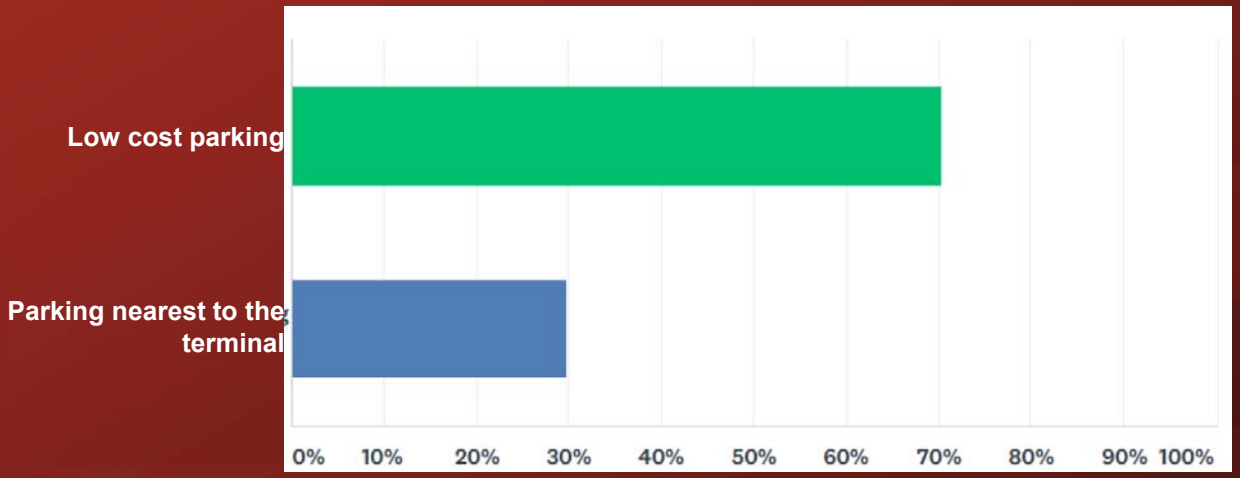
Master Plan Survey

In regard to airport parking, which is more important to you?



- Over a 2:1 margin, cost was more important
  - Differs from previous question on the affordability factor

Phoenix-Mesa Gateway Airport Master Plan

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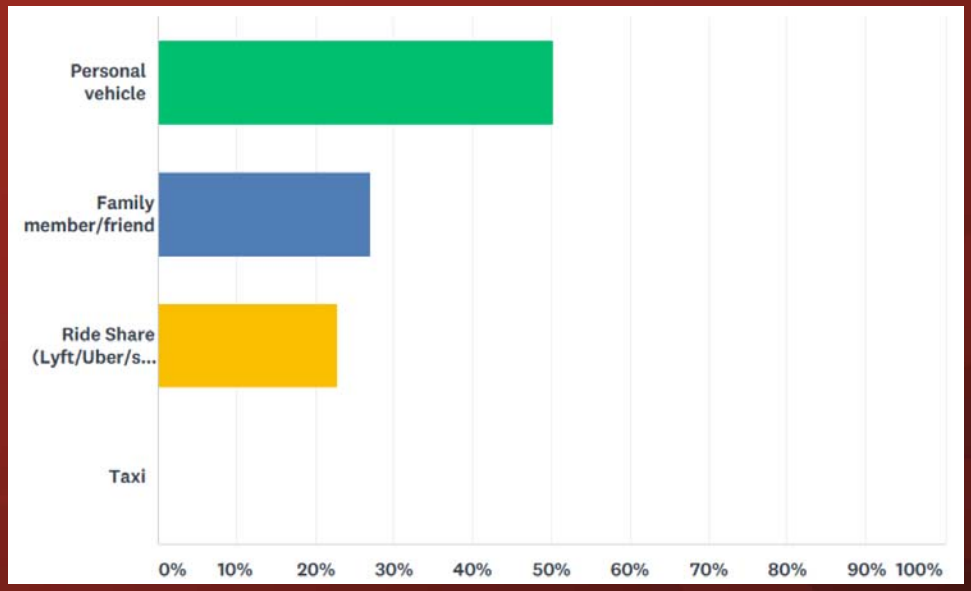
Master Plan Survey

How do you travel to/from the airport when departing or arriving on a flight?



- Indicates flyers are utilizing airport parking
- Ride Share/TNC represent 25% of airport travel options among responders

Phoenix-Mesa Gateway Airport Master Plan

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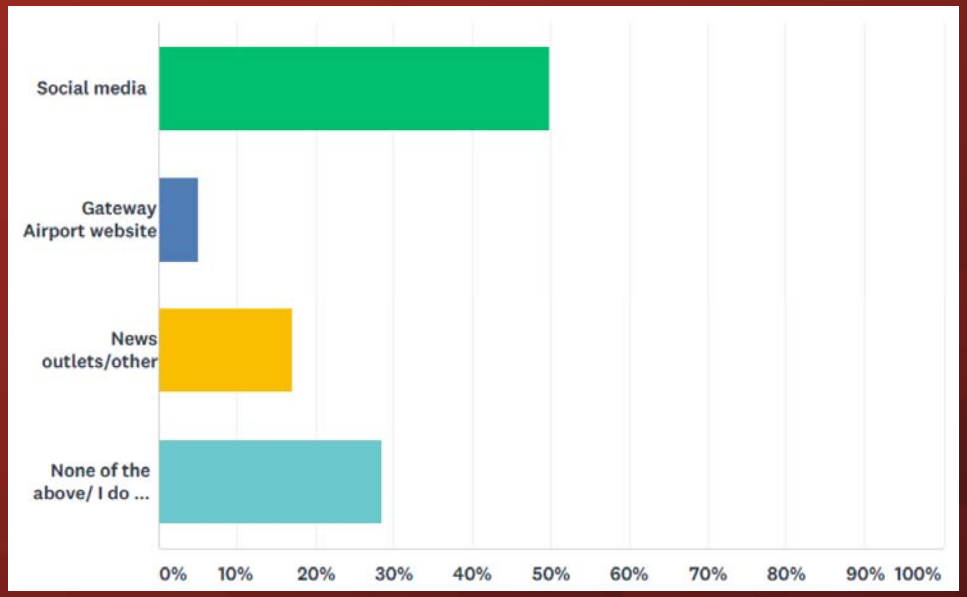
Master Plan Survey

How do you typically follow news & events related to Gateway Airport?



- Social media dominates how people keep up to date w/ Gateway
  - Reflects growing trend

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Master Plan Survey

In general, can you share your overall impression of Gateway?

- Majority (53%) of 162 comments rec'd were positive
- Largest specific request (30%) was for additional destinations & airlines

  - Negative comments related to:
    - Lines and crowds during peak times
    - Baggage claim wait times
    - Lack of concession space
    - Additional overflight noise from continued growth

Phoenix-Mesa Gateway Airport Master Plan

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Master Plan Survey

Looking into the future, what would you like to see accomplished at Gateway over the next 10-20 years?

- Most popular responses:
  1. Expanded airline service & destinations (53%)
  2. New or expanded terminal facilities (16%)
  3. Enhanced parking options & circulation (4%)

- 14% respondents preferred little to no additional growth
  - Noise concerns cited

Phoenix-Mesa Gateway Airport Master Plan

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Agenda

- ✓ Introductions and Opening Remarks
- ✓ Review of Public Survey Input
- ✓ Project Approach and Schedule
- ✓ Review of Forecasts of Aviation Activity and Critical Facility Needs
- ✓ Conceptual Development Plan
- ✓ 20-year Capital Improvement Project List
- ✓ Airport Layout Plan Drawing Set
- ✓ Next Steps

Phoenix-Mesa
Gateway
Airport Master Plan

Airport Master Plan

- ✓ Anticipate What We Think Will Happen
- ✓ Influence What We Want to Happen

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Project Approach

- ✓ Follow FAA Guidance
- ✓ Building Block Process
  - Inventory
  - Forecasts
  - Facilities Needs Determination
  - Development Plan Formulation
  - Financial Plan
- ✓ Project Schedule – 16 Months

Phoenix-Mesa
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Airport Master Plan

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Airport Master Plan- FAA Approved Forecast

Enplanement Forecast:
2018 Total= 763,542

2023	2028	2038
924,667	1,022,420	1,245,211

Total Operations Forecast:
2018 Total= 288,921

2023	2028	2038
316,712	333,028	369,744

Total Based Aircraft Forecast:
2017 Actual = 109

2023	2028	2038
121	126	139

Phoenix-Mesa Gateway Airport Master Plan

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Summary of Critical Facility Requirement Considerations

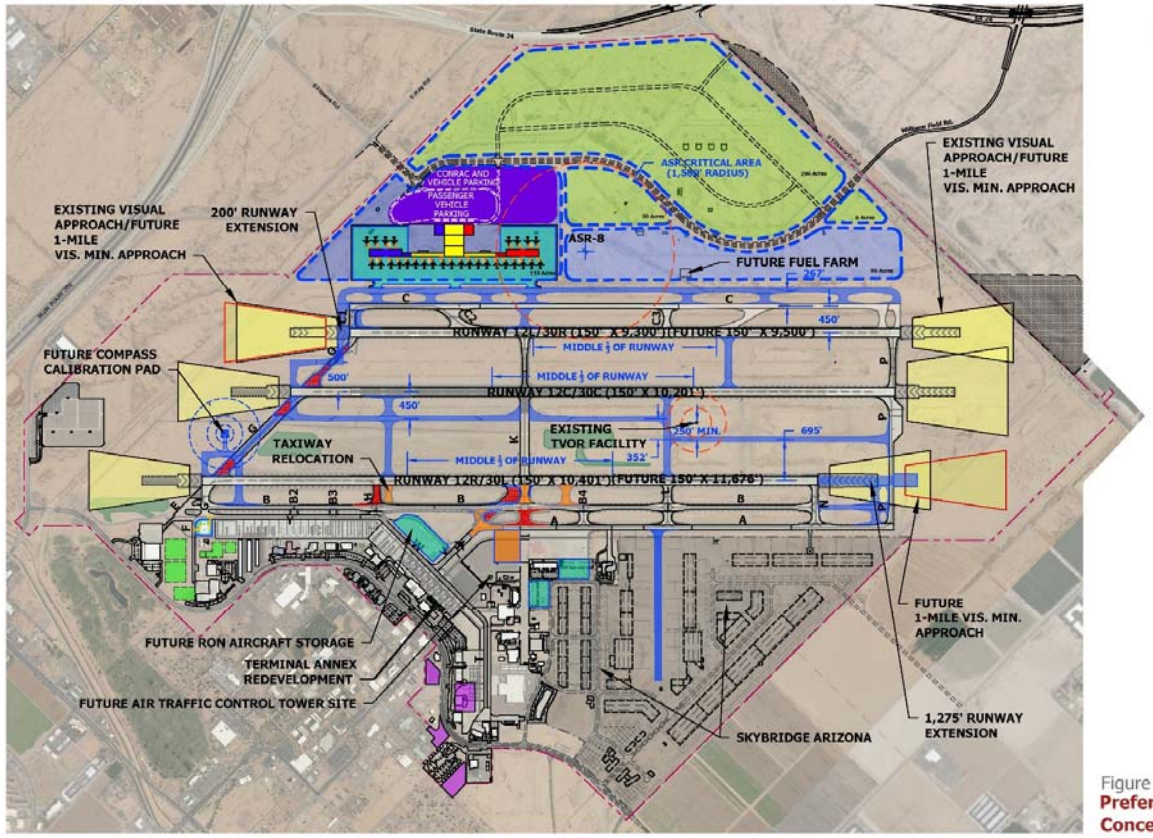
- ✓ Identify potential needs and benefits for runway extension(s)
- ✓ Identify benefits for placement of parallel taxiway improvements
- ✓ Consideration of benefits of improved instrument approach capabilities
- ✓ Passenger terminal
  - Short-term focus on demand driven improvements for existing terminal building
  - Long-term focus on relocated terminal
- ✓ Vehicular access and parking
  - Short-term focus on demand driven improvements for existing terminal area
  - Long-term focus on relocated terminal including support facilities
- ✓ SkyBridge Arizona - incorporate adopted recommendations into master plan
- ✓ General aviation and industrial aviation - continue to program for demand driven facility expansion and improvements

Terminal Requirements Summary

Functional Area	Existing (supply) *(a)*	PAL 1 (2023)	PAL 2 (2028)	PAL 3 (2038)
CHECK-IN (TICKETING)				
Queue (sf)	4,500	3,550	3,700	4,350
Counters/Bag drops	32	26	27	31
CHECKED BAGGAGE				
EDS machines *(b)*	2 CT-80	3 MS-EDS	4 MS-EDS	4 MS-EDS
Makeup area (sf)	11,500	11,400	12,800	15,700
SECURITY SCREENING CHECKPOINT				
Queue (sf)	1,725	1,700	1,900	2,625
Lanes	5	5	5	5
PASSENGER HOLDROOM				
Holdroom (sf)	15,260	13,000	15,300	19,700
Podium, queueing, egress (sf)	3,950	3,150	3,675	4,725
APRON (GATES)	6 ADG III, 4 B757	8 ADG III	9 ADG III	11 ADG III
BAGGAGE CLAIM (DEVICES)	2	2	3	3

(a) Existing queues are estimated based on terminal drawings
(b) Requirement, which is based on a hypothetical medium speed inline system (MS-EDS), includes one EDS machine for redundancy

Preferred Conceptual Development Plan



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Legend

- Existing Runway Protection Zone
- Preliminary Roadway Development
- Future Passenger Terminal Reserve
- Future Aeronautical Development
- Future Non-Aeronautical Development
- Passenger Terminal Support - Parking/Rental Car/TNC
- Existing Detention Ponds
- Existing Easement
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Future Apron Pavement
- Existing IWA Programmed Project
- Pavement to be Removed
- Future Buildings/Development
- Future Economic Development Opportunity
- Passenger Terminal Phase 1 (10) Gates
- Passenger Terminal Phase 2 (9) Gates
- Passenger Terminal Phase 3 (9) Gates

0 750' 1500' 3000'
GRAPHIC SCALE IN FEET

Figure 4-19
Preferred Airport Conceptual Development Plan

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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Master Plan CIP 2021to 2041

Federal FY	MH Project Number	Airport Project Number	Project Title	Estimated Total Project Cost 2019 Dollars
Proposed FY 2021 CIP Projects				
2021	A1	1067/1072	Reconstruct sections of Runway 12R/30L in Portland Cement Concrete Pavement (PCCP), LED Lighting Upgrade - Design/Construct	$ 24,000,000.00
	A2	744	Taxiway Whiskey (Reconstruct lowest PCI section in Portland Cement Concrete Pavement) - Design/Construct	$ 800,000.00
	A3	950	Ellsworth Channel Relocation - Construction	$ 11,440,000.00
	A4	-	Employee Parking Lot and Westside cell phone lot improvements - Design/Construct	$ 665,000.00
	A5	975	Safety Management System	$ 312,000.00
			2021 Annual Subtotal	**$ 37,217,000.00**
Proposed FY 2022 CIP Projects				
2022	A6	1092	Taxiway Golf Realignment (End of Runway 12R/30L w/ 90degree connector to Twy G)- Design/Construct	$ 11,580,000.00
	A7	397	Eastside Airport and Terminal Access Roads and Infrastructure (New Spine Road and Utility Infrastructure Extensions from Ellsworth Rd to Eastside Development Area) - Design/Construction	$ 17,122,425.00
			2022 Annual Subtotal	**$ 28,702,425.00**
Proposed FY 2023 CIP Projects				
2023	A8	1201	Terminal Annex Redevelopment (Gates 1 to 4) - Design/Construct	$ 14,007,825.00
	A9	1202	Center Runway Section 30 (South end) - Design/Construct	$ 8,630,000.00
			2023 Annual Subtotal	**$ 22,637,825.00**
Proposed FY 2024 CIP Projects				
2024	A10	1203	Parallel Taxiway West of Runway 12C/30C [including VOR jog segment] - Design/Construction	$ 18,316,000.00
			2024 Annual Subtotal	**$ 18,316,000.00**
Proposed FY 2025 CIP Projects				
2025	A11	-	Remain-Over-Day (ROD)/Remain Over Night (RON) Aircraft Storage Apron - Design/Construct	$ 539,000.00
			2025 Annual Subtotal	**$ 539,000.00**
			Total Phase-I (0-5 Years) Development Program Project Costs	**$ 107,412,250.00**
Proposed FY 2026 to 2030 CIP Projects				
6 to 10 Years	B1	-	Fuel Farm Expansion: (2) 50,000 USG fuel tanks - Design	$ 1,643,300.00
	B2	-	Extend Runway 12L/30R by 200' with Bypass Taxiway - Design/Construction	$ 7,197,000.00
	B3	1204	Mid-field Connectors Project - [Hotel, Lima, crossfield connectors] - Design/Construct	$ 9,313,000.00
	B4	-	Procure 1 new Oshkosh Aircraft Rescue Firefighting Truck - 1,500 USG; 200 USG of AFFF; and 450LB dry chem capacity	$ 900,000.00
	B5	-	Relocate Compass Calibration Pad - Design/Construct	$ 1,219,000.00
	B6	-	Reconstruct 1,000' of Runway 12C approach end/Reconstruct 2,000' of Runway 12C/30C in Portland Cement Concrete Pavement (PCCP) with LED Lighting Upgrade	$ 12,748,000.00
	B7	-	Fuel Farm Expansion: (2) 50,000 USG fuel tanks - Design/Construct	$ 1,643,000.00
	B8	-	East/West Airfield Electrical Lighting Vault Replacement/Generators with Runway 12L/30R Lighting Upgrade	$ 10,805,000.00
	B9	719	Alpha Apron Phase 3 - Design/Construction	$ 5,052,000.00
	B10	-	Increase tower height/relocate existing Airport Surveillance Radar Model 8 (ASR-8)	$ 13,000,000.00
	B11	-	Maintenance Run-Up Area with Blast Fence - Design/Construct	$ 1,295,000.00
	B12	-	Runway Magnetic Change - Markings/Signage [All Runways]	$ 300,000.00
			Total Phase-II (6-10 Years) Development Program Project Costs	**$ 65,115,300.00**

Phoenix-Mesa Gateway Airport Master Plan

Master Plan CIP 2021to 2041

Federal FY	MH Project Number	Airport Project Number	Project Title	Estimated Total Project Cost 2019 Dollars
11 to 20 Years	C1	-	Fuel Farm Expansion: (2) 50,000 USG fuel tanks - Design/Construct	$ 1,643,000.00
	C2	-	New Taxiway Bravo 1 connector to Runway 12R/30L - Design/Construct	$ 1,824,000.00
	C3	421	Eastside Apron Phase 1 - Design	$ 1,206,000.00
	C4	415	Eastside Apron Phase 1 - Construction	$ 11,910,000.00
	C5	181	Eastside Terminal Replacement (10 gates + 4 hard stand positions) Phase 1 - Design	$ 16,716,560.00
	C6	261	Eastside Terminal Replacement (10 gates + 4 hardstand positions) Phase 1 - Construction	$ 167,165,600.00
	C7	969	Passenger Boarding Bridges for Terminal Phase 1 - Design/Construct	$ 10,000,000.00
	C8	971/972	Eastside Terminal Parking Surface Lot - Design/Construct	$ 12,981,750.00
	C9	-	Eastside Consolidated Rental Car Facility w/ConRAC - Design/Construct	$ 16,602,430.00
	C10	-	Construct New Eastside Fuel Farm (Jet A, 450,000 gallons) to support Eastside Terminal	$ 7,393,500.00
	C11	-	Parallel Taxiway to Taxiway C Phase 1 - Design	$ 950,000.00
	C12	-	Parallel Taxiway to Taxiway C Phase 1 - Construct	$ 10,448,000.00
	C13	-	New Taxiway Connector South of existing C1 Connector - Design/Construct	$ 1,520,000.00
	C14	-	New Taxiway Connector South of existing C2 Connector - Design/Construct	$ 1,520,000.00
	C15	-	Parallel Taxiway to Taxiway C Phase 2 - Design	$ 965,000.00
	C16	-	Parallel Taxiway to Taxiway C Phase 2 - Construct	$ 12,710,000.00
			Total Phase-III (11-20 Years) Development Program Project Costs	**$ 275,555,840.00**
Proposed CIP Projects Beyond FY 2042				
20+ Years	D1	-	Eastside Apron Phase 2 - Design	$ 1,080,000.00
	D2	415	Eastside Apron Phase 2 - Construction	$ 10,700,000.00
	D3	181	Eastside Terminal Phase 2 Expansion (9 Gates) - Design	$ 12,660,200.00
	D4	261	Eastside Terminal Phase 2 Expansion (9 Gates) - Construction	$ 126,602,000.00
	D5	-	Passenger Boarding Bridges for Terminal Phase 2 - Design/Construct	$ 9,000,000.00
	D6	-	1,275' Extension to Runway 12R/30L, Taxiway B Extension and Bypass Taxiway in Portland Cement Concrete Pavement (PCCP) - Design/Construct	$ 12,630,000.00
	D7	-	Eastside Terminal Phase 3 Expansion (9 Gates) - Design	$ 12,555,970.00
	D8	-	Eastside Terminal Phase 3 Expansion (9 Gates) - Construction	$ 125,559,700.00
	D9	-	Passenger Boarding Bridges for Terminal Phase 3 - Design/Construct	$ 9,000,000.00
	D10	-	Eastside Apron Phase 3 - Design	$ 1,080,000.00
	D11	-	Eastside Apron Phase 3 - Construction	$ 10,700,000.00
			Total Phase-IV (20+ Years, Post Planning Period)	**$ 331,567,870.00**

Phasing Plan

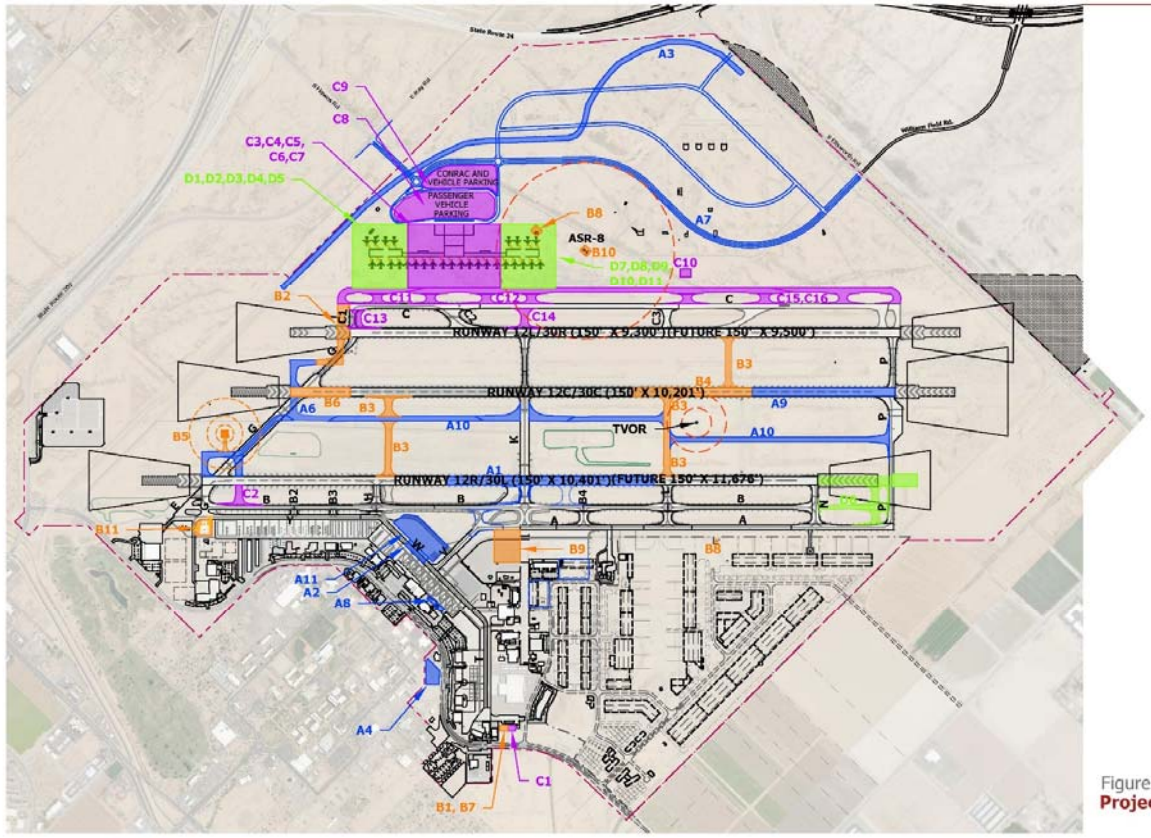

Figure 6-1
Project Phasing Plan

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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Financial Analysis Framework

- ✓ Financial analysis to support funding of CIP as presented in Facilities Implementation Plan
- ✓ Elements of financial analysis:
  - Analysis of PMGAA financial framework
  - Airline rates and charges
  - Analysis of historical trends in revenues and expenses
  - Projections of future revenues, expenses, cash flow
- ✓ CIP funding plan

Financial Information Collected from PMGAA

- ✓ Audited financial reports for FY 2014 – FY 2018
- ✓ Revenue and expense budgets for FY 2019 & FY 2020
- ✓ Electronic files showing airline rates and charges calculations
- ✓ Current ACIP on file with FAA
- ✓ PFC applications, FAA PFC Final Agency Decisions, and PFC reports
- ✓ Information on Airport tenants
- ✓ Development and lease agreements
- ✓ Additional information in response to follow-up requests

CIP Funding Plan

- ✓ Funding plan for Phases I and II
- ✓ Evaluation of eligibility and availability of:
  - FAA AIP grants
  - PFCs
  - ADOT funding
- ✓ Member Government contributions
- ✓ Other funds
- ✓ Potential funding sources for Phases III and IV
  - Operating Fund
  - Rental car CFCs
  - Lease revenues

Funding Plan

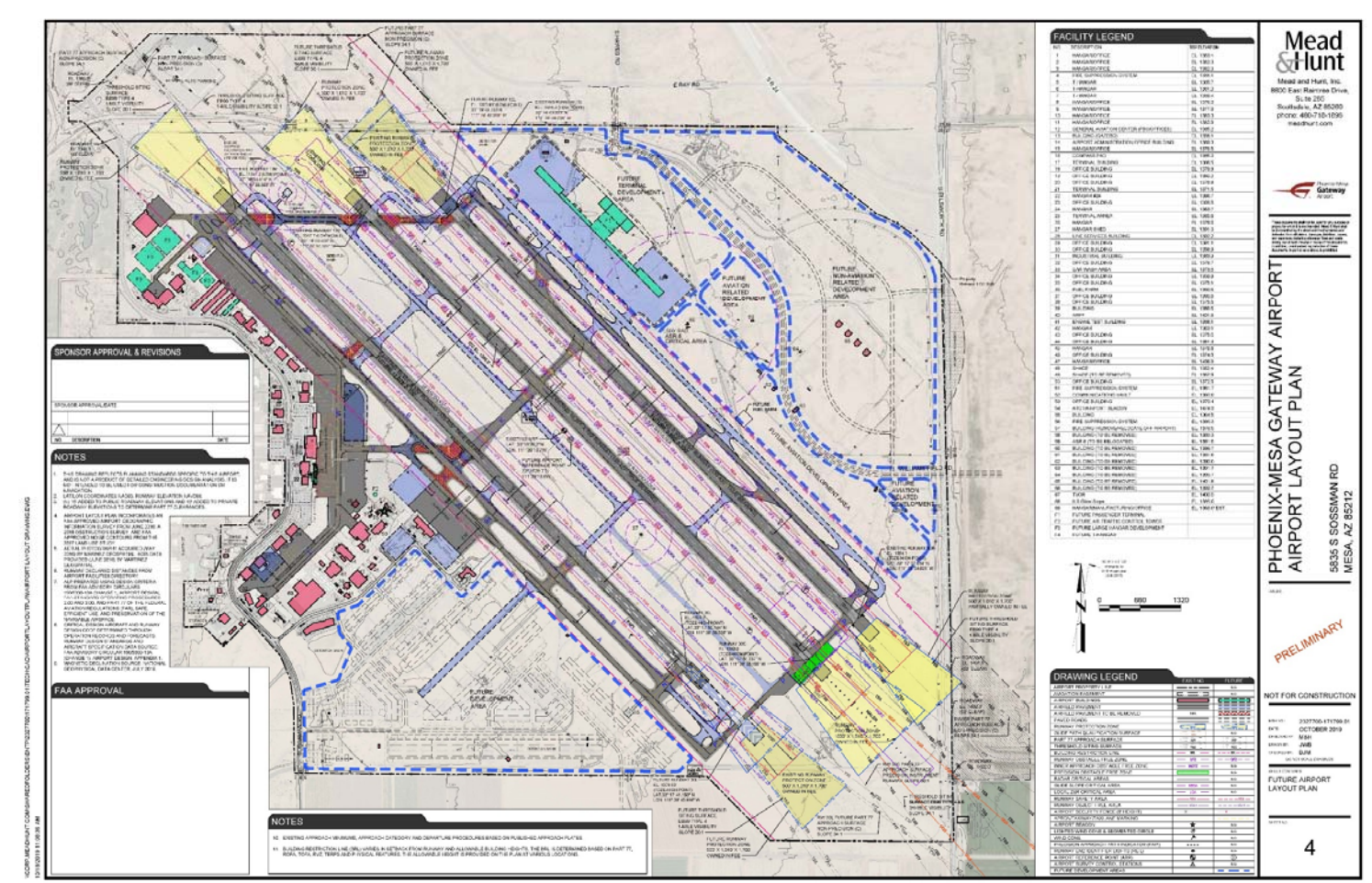
		Total	AIP		PFCs	ADOT Grants	Member Govt.	Other
			Entitlement	Discretionary				
Phase I - FYs 2021 - 2025								
A1	Reconstruct sections of Runway 12R/30L	$ 24,960,000	$ 3,636,000	$ 19,092,576	$ -	$ 1,115,712	$ 1,115,712	$ -
A2	Taxiway Whiskey-Design/Construct	832,000	-	-	-	748,800	83,200	-
A3	Ellsworth Channel Relocation-Construction	11,897,600	-	-	11,897,600	-	-	-
A4	Employee Parking Lot and Cell Phone Lot Improvements	691,600	-	-	-	-	691,600	-
A5	Safety Management System	324,480	-	-	324,480	-	-	-
A6	Taxiway Golf Realignment - Design/Construct	12,274,800	3,672,360	7,505,073	-	548,684	548,684	-
A7	Eastside Airport Terminal Access Roads - Design/Construct	18,149,771	-	-	10,000,000	709,362	-	7,440,409
A8	Terminal Annex Redevelopment - Design/Construct	15,128,451	-	8,954,379	-	400,260	5,773,812	-
A9	Center Runway Section 30	9,320,400	3,709,084	4,778,073	-	416,622	416,622	-
A10	Parallel Taxiway West of RW 12C/30C - Design/Construct	20,147,600	3,746,174	14,600,230	-	900,598	900,598	-
A11	Aircraft Storage Apron (RON/ROD) - Design/Construct	603,680	-	-	-	-	603,680	-
Total Projects for FYs 2020 - 2025		**$ 114,330,382**	**$ 14,763,618**	**$ 54,930,331**	**$ 22,222,080**	**$ 4,840,037**	**$ 10,133,907**	**$ 7,440,409**
Phase II - FYs 2026 - 2030								
B1	Fuel Farm Expansion - Design/Construct	$ 1,873,362	$ -	$ -	$ -	$ -	$ 1,873,362	$ -
B2	Extend Runway 12L/30R with Taxiway	9,600,640	3,783,636	4,958,707	-	429,149	429,149	-
B3	Mid-Field Connectors Project - Design/Construct	10,430,560	-	9,498,068	-	466,246	466,246	-
B4	ARFF Truck	1,026,000	-	-	1,026,000	-	-	-
B5	Relocate Compass Calibration Pad - Design/Construct	1,414,040	-	-	-	-	-	1,414,040
B6	Reconstruct Runway 12C/30C and LED Lighting Upgrade	14,532,720	3,821,473	9,412,022	-	649,613	649,613	-
B7	Fuel Farm Expansion - Design/Construct	1,938,740	-	-	-	-	1,938,740	-
B8	Electrical Lighting Vault Replacement/Generators & 12C/30R LED Upgrade	12,596,700	7,835,551	3,635,004	-	563,072	563,072	-
B9	Alpha Apron Phase 3 - Design/Construction	6,062,400	-	-	6,062,400	-	-	-
B10	Increase Tower Height/Relocate Existing ASR-8	15,860,000	-	-	-	-	-	15,860,000
B11	Maintenance Run-Up Area with Blast Fence - Design/Construct	1,579,900	-	-	-	-	1,579,900	-
B12	Runway Magnetic Change - Marking/Signage	336,000	-	305,962	-	15,019	15,019	-
Total Projects for FYs 2026 - 2030		**$ 77,251,062**	**$ 15,440,660**	**$ 27,809,762**	**$ 7,088,400**	**$ 2,123,099**	**$ 7,515,101**	**$ 17,274,040**
Total Projects for FYs 2021 - 2030		**$ 191,581,444**	**$ 30,204,278**	**$ 82,740,093**	**$ 29,310,480**	**$ 6,963,136**	**$ 17,649,008**	**$ 24,714,449**

Sources & Uses of Capital Funding

Sources of Capital Funding	Phase I 2021 - 2025	Phase II 2026 - 2030	Total
AIP Entitlements	$ 14,763,618	$ 15,440,660	$ 30,204,278
AIP Discretionary	54,930,331	27,809,762	82,740,093
PFC Paygo	22,222,080	7,088,400	29,310,480
ADOT Grants	4,840,037	2,123,099	6,963,136
Member Contributions	10,133,907	7,515,101	17,649,008
Other	7,440,409	17,274,040	24,714,449
Total Sources	**$ 114,330,382**	**$ 77,251,062**	**$ 191,581,444**

Uses of Capital Funding	Phase I 2021 - 2025	Phase II 2026 - 2030	Total
Runway/Taxiway Projects	$ 67,534,800	$ 47,496,620	$ 115,031,420
Terminal Improvements	15,128,451	-	15,128,451
Parking	691,600	-	691,600
Fuel Farm	-	3,812,102	3,812,102
Apron Rehabilitation	603,680	6,062,400	6,666,080
Access Roads	18,149,771	-	18,149,771
ARFF	-	1,026,000	1,026,000
Other Projects	12,222,080	18,853,940	31,076,020
Total Uses	**$ 114,330,382**	**$ 77,251,062**	**$ 191,581,444**

Future Conditions Airport Layout Plan



Phoenix-Mesa Gateway Airport Master Plan

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Next Steps

- ✓ Comments on draft work products due by October 30, 2019
- ✓ Presentation of Master Plan Recommendation to Senior Staff – November 12, 2019
- ✓ Materials (Including Executive Summary) Ready for Distribution to PMGAA
- ✓ Presentation of Master Plan Recommendations to PMGAA Board November 19, 2019
- ✓ Finalization of Master Plan Draft Final Report (compilation of all working documents)
- ✓ Finalization of Airport Layout Plan Drawing Set
- ✓ Submittal Of Airport Layout Plan to FAA for Review and Approval

SIGN-IN SHEET

Phoenix-Mesa Gateway Airport

Airport Master Plan Technical Advisor Meeting
July 31, 218 (9:00 a.m. – 11:00 a.m.)
PMGAA Saguaro A/B Conference Rooms

NAME	COMPANY NAME	E-MAIL	PHONE
DAVE GUTHRIE	BOEING	DAVID.T.GUTHRIE-II@BOEING.COM	480 252 0249
JASON BAGLEY	JACOBS	jason.bagley@intl.com	480 552 6832
Margi Evanson	PMGAA		
Larry Randle Jr	Textron Aviation	lrandle@txtav.com	316 285 4526
Brian Sexton	PMGAA		

SIGN-IN SHEET

Phoenix-Mesa Gateway Airport

Airport Master Plan Technical Advisor Meeting
July 31, 218 (9:00 a.m. – 11:00 a.m.)
PMGAA Saguaro A/B Conference Rooms

NAME	COMPANY NAME	E-MAIL	PHONE
Brian Towle	TSA	Brian.Towle@Dhs.gov	480-375-2523
Greg Hartrigsen	AZ National Guard	gregory.b.hartrigsen.mil@mail.mil	602-267-2005
Gabriel Massey	Able	gmassey01@txtav.com	316-213-0609
Rex Grider	UND Aerospace	rgrider@undaerospace.com	480-201-5859

SIGN-IN SHEET

Phoenix-Mesa Gateway Airport

Airport Master Plan Technical Advisor Meeting
July 31, 218 (9:00 a.m. – 11:00 a.m.)
PMGAA Saguaro A/B Conference Rooms

NAME	COMPANY NAME	E-MAIL	PHONE
DON KRIZ	ADOT	DKRIZ@AZDOT.GOV	602 712-8333
Ethan McQuinn	ATP	iwa-training-support@alluaps.com	623-888-6851
Jose Martinez	SkyBridge	pmartinez@skybridgedevelopment.com	
Greg Blank	NATCA/SCASD	IWA.NATCA@gmail.com	480-406-0335
Scott Brownlee	PMGAA	SBrownlee@gatewayairport.com	480-988-7604

Phoenix-Mesa Gateway Airport

Master Plan – Technical Advisory Committee Meeting

July 31, 2018

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Acrojets – The Fighter School @ Williams AFB

Phoenix-Mesa
Gateway
Airport Master Plan

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Phoenix-Mesa
Gateway
Airport Master Plan

Agenda

- ✓ Introductions and Opening Comments
- ✓ Expected Outcomes for Master Planning Process
- ✓ Project Approach and Schedule
- ✓ Role of the Technical Advisory Committee
- ✓ Inventory of Existing Conditions
- ✓ Key Planning Issues Identification
- ✓ Forecasts of Aviation Activity
- ✓ Questions & Comments
- ✓ Next Steps

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Project Team

- ✓ Phoenix-Mesa Gateway Airport Authority and Staff
- ✓ Federal Aviation Administration/Arizona Department of Transportation
- ✓ Consultants
  - Mead & Hunt
  - PSM^2
  - Unison Consulting
  - Intervistas

Phoenix-Mesa Gateway Airport Master Plan

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Master Plan

- ✓ **Statement of Policy**
  - **Anticipate What We Think Will Happen**
  - **Influence What We Want to Happen**

Phoenix-Mesa
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Airport Master Plan

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Expected Outcomes

- ✓ Comprehensive Recommendations for Layout of Future Airport Facilities
- ✓ Reasonable Long-Term Capital Improvement Plan
- ✓ Appropriate Documentation of Considerations and Influences
- ✓ FAA Approved Airport Layout Plan

Public Outreach

- ✓ Airport Authority Briefings (as requested)
- ✓ Stakeholder Committee Meetings
- ✓ Technical Committee Meetings
- ✓ Public Outreach Workshops

Phoenix-Mesa
Gateway
Airport Master Plan

Project Approach

- ✓ Follow FAA Guidance
- ✓ Building Block Process
  - Inventory
  - Forecasts
  - Facilities Needs Determination
  - Alternatives and Development Plan Formulation
  - Financial Plan

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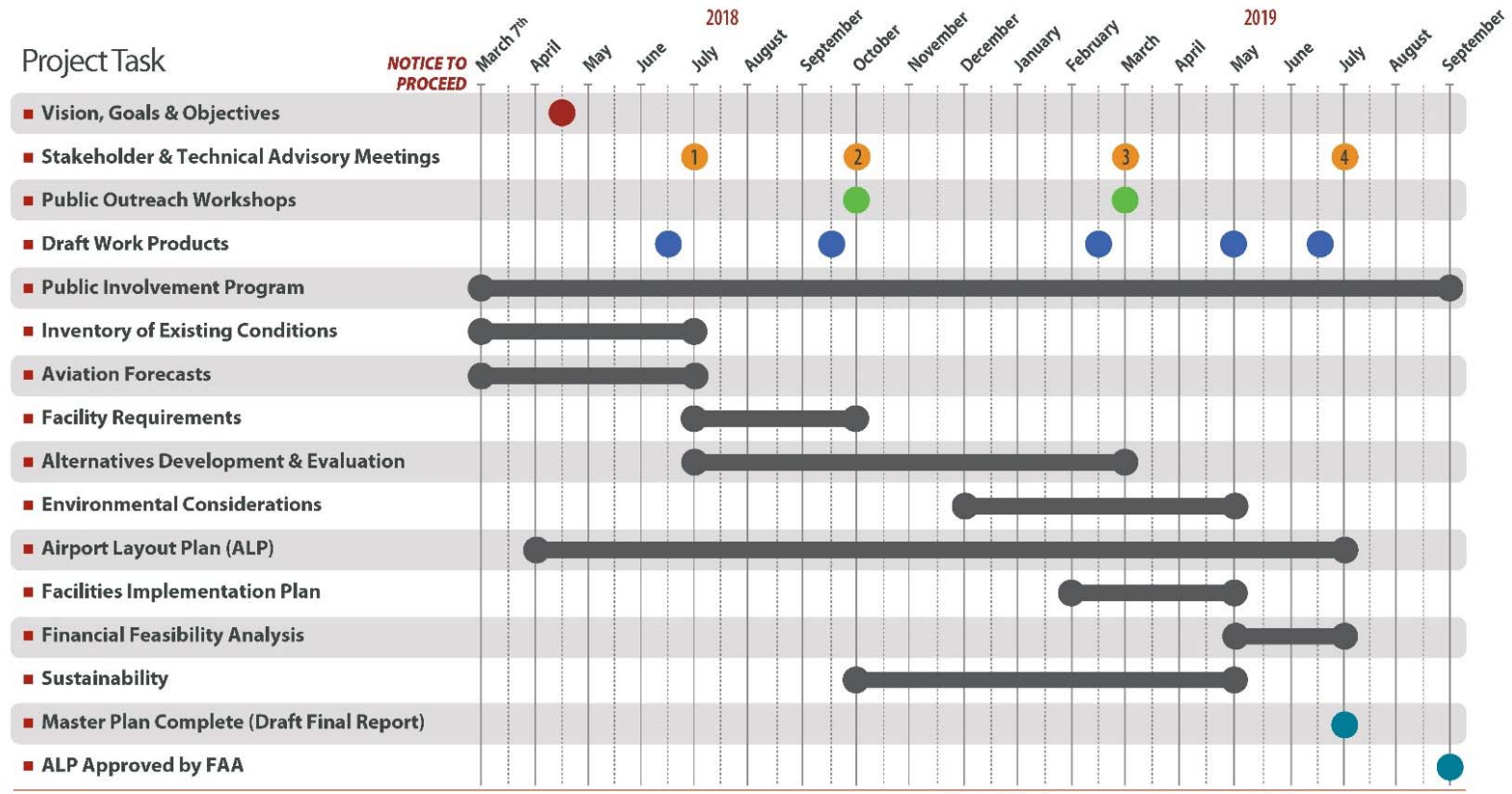
Project Schedule Airport Master Plan



NOTE: Schedule updated February 2, 2018. Subject to change.

Phoenix-Mesa Gateway

Phoenix-Mesa Gateway Airport Master Plan

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Role of Technical Advisory Committee

- ✓ Committee is made up of a variety of stakeholders with on-airport and/or airport operational interests, many holding technical knowledge which could influence the direction of the Master Plan
- ✓ Provide feedback on draft work products from your perspective
- ✓ Not a voting group, consensus is not required, but your INPUT is CRITICAL !

Phoenix-Mesa Gateway Airport Master Plan

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Inventory of Existing Conditions

- ✓ Airport Role
- ✓ Airport Background
- ✓ Airport Facilities Inventory
  - Airside Facilities
  - Landside Facilities
  - Airspace System and Naviads
- ✓ Airport Environs
- ✓ Issues Summary

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Airport Role – Location

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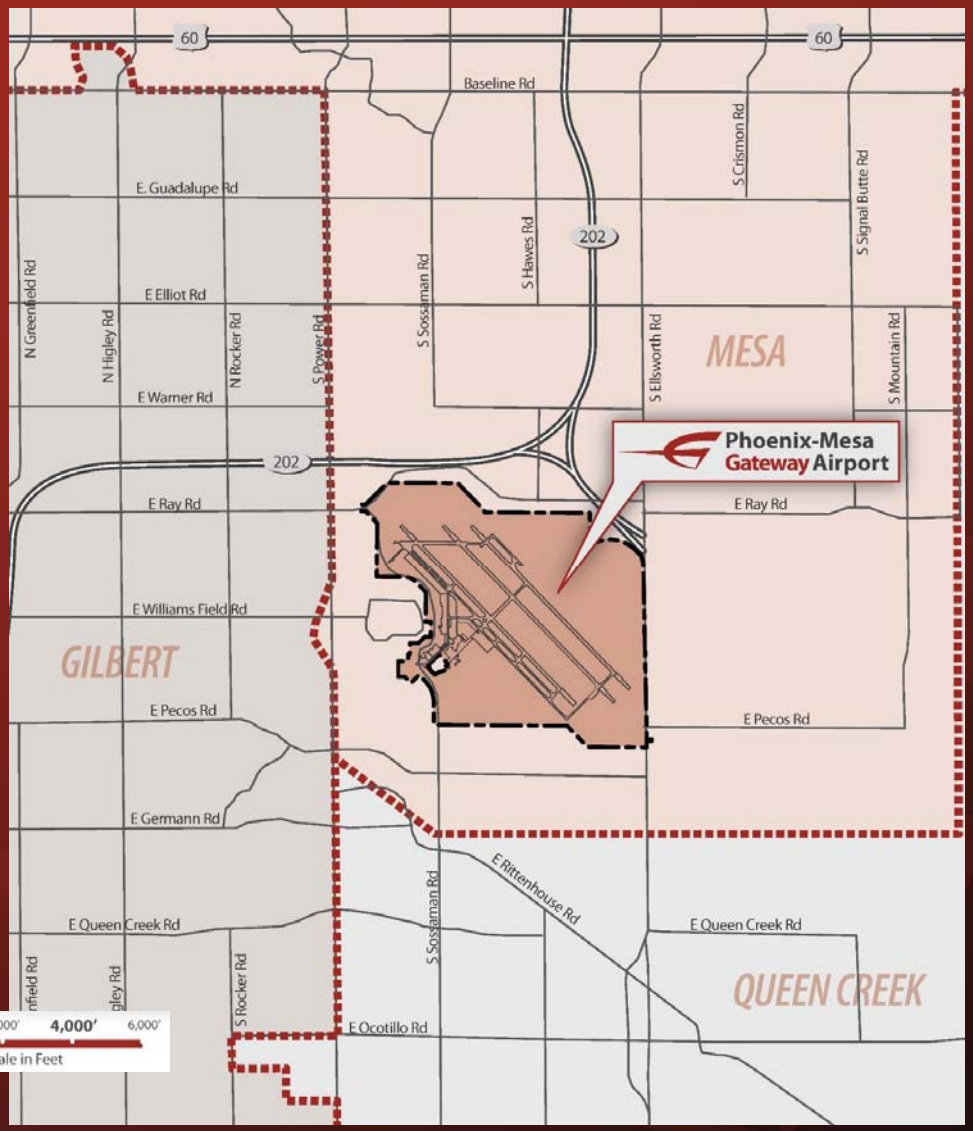
Airport Role – Local Government Relationships



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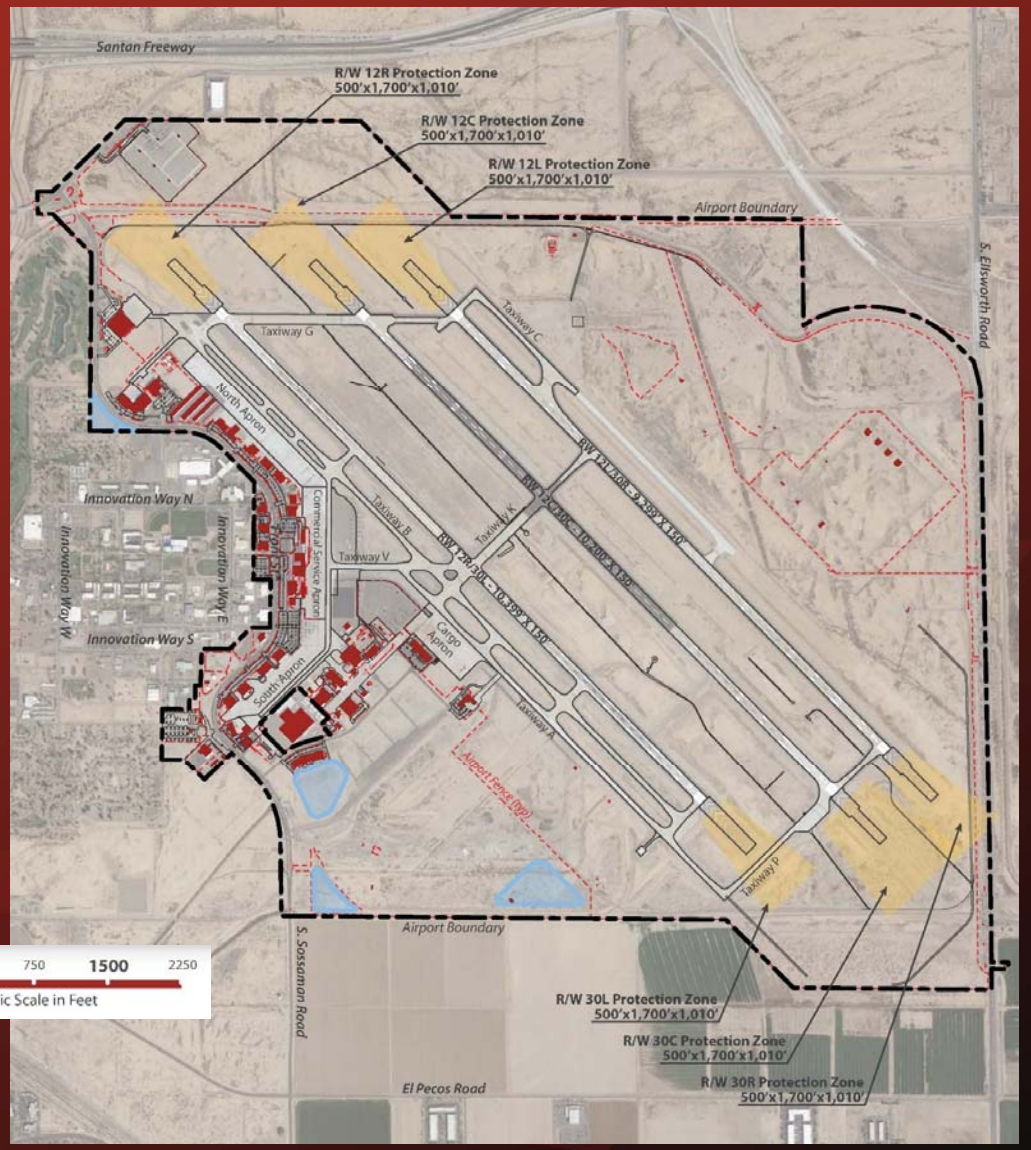
Airport Role – Airport Facilities



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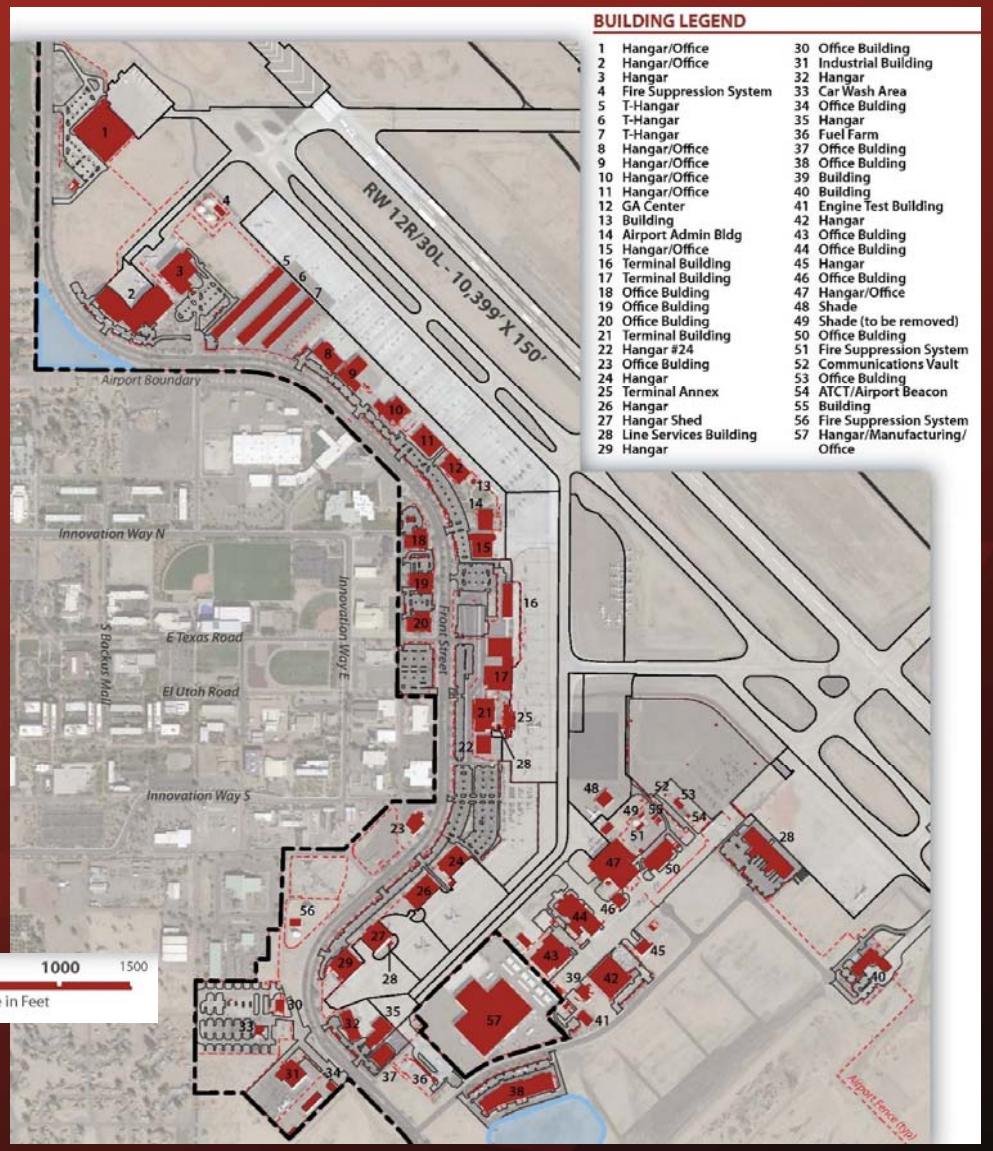
Airport Role – Terminal Area Facilities



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Airport Role

- ✓ Within National System Plan (3,400 airports)
- ✓ Within State System Plan (83 airports)
- ✓ Commercial passenger activity center
- ✓ General aviation operational center
- ✓ Flight training operational center
- ✓ Military activity operational center
- ✓ Regional economic development support center

Key Planning Issues Discussion

- ✓ Maximize safety and efficiency in layout of airport facilities.
- ✓ Consideration of the significant amount of marketable airport property.
- ✓ Consideration of demand by future critical aircraft types.
- ✓ Base recommendations for future passenger terminal facilities on reasonable expectation of demand, with scalable improvements associated with defined trigger points.
- ✓ Comprehensive landside improvement recommendation (ATCT, ARFF, fuel storage and delivery, storage hangars, air cargo facilities, etc.).
- ✓ Continue working with surrounding communities to support land use compatibility initiatives.
- ✓ Promote financially sustainable Capital Improvement Plan.
- ✓ Consider all passenger transportation modes in development of terminal improvement recommendations.
- ✓ Recognize environmental constraints.

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Aviation Activity Forecast Development

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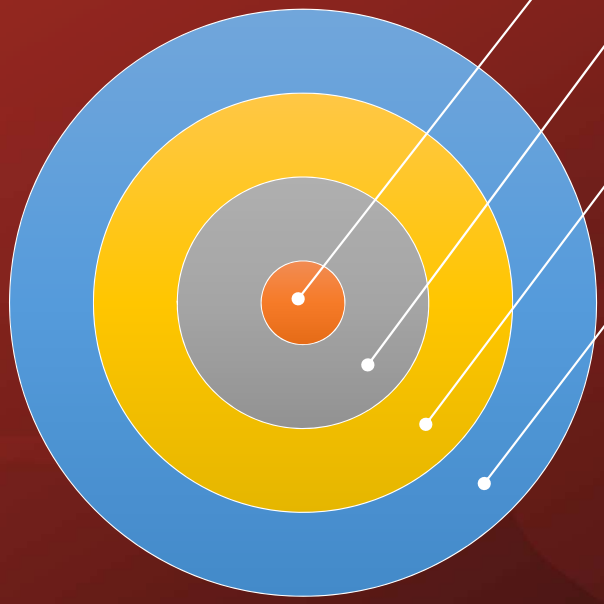
Comprehensive Forecast Development Process

- ✓ Analysis of the airport's business environment
- ✓ Analysis of the airport's historical activity trends
- ✓ Assessment of future air service development possibilities
- ✓ Forecast development and risk assessment

The Airport Business Environment



Airport Activity

Regional Economy

Aviation Industry

National / Global Economy

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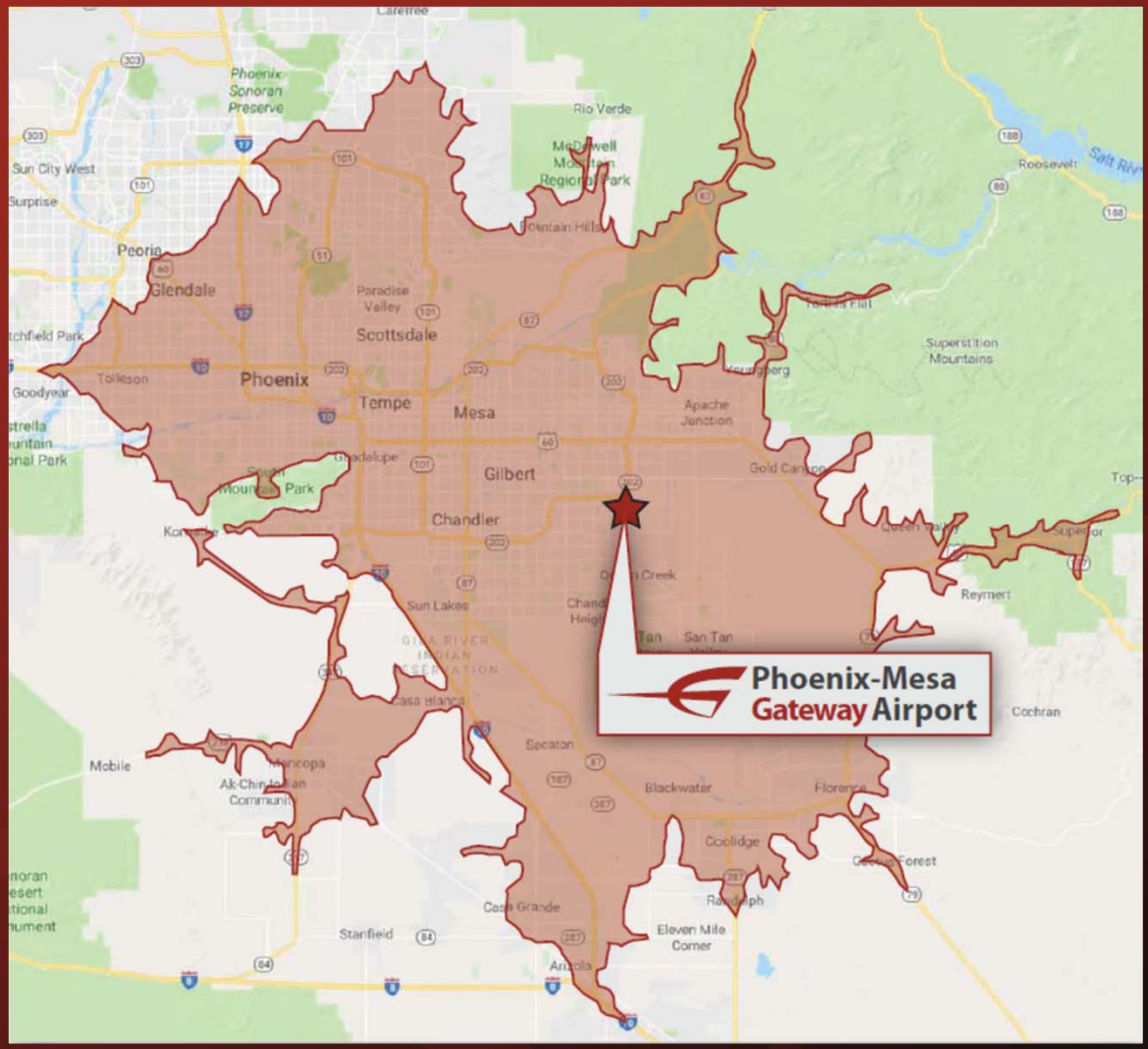
Airport Service Area

- 1-hour drive area covering most of the Phoenix-Mesa-Scottsdale, AZ, MSA



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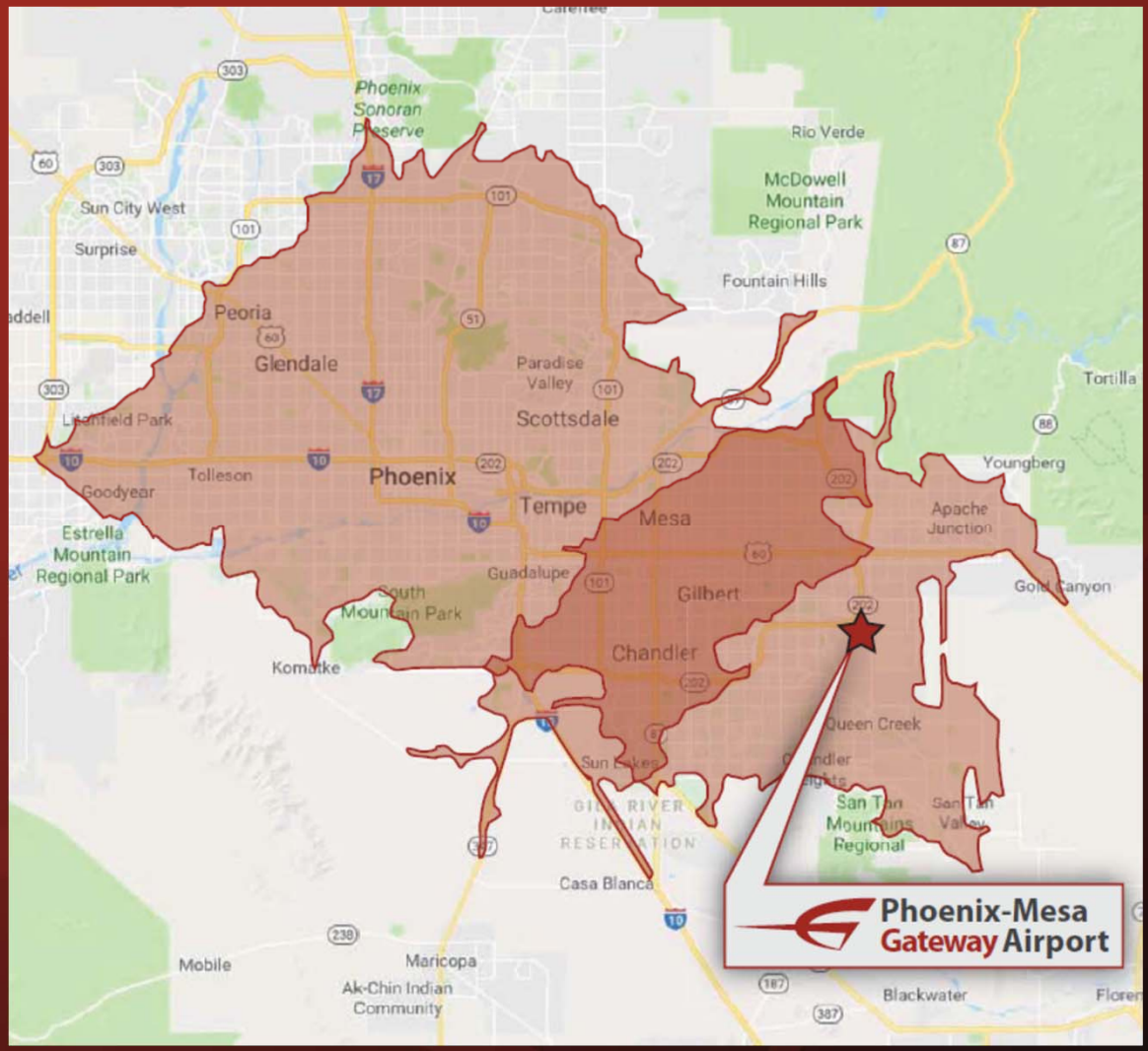
A Shared Airport Service Area

- **30-minute drive areas from IWA and PHX**



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Socio-Economic Trends

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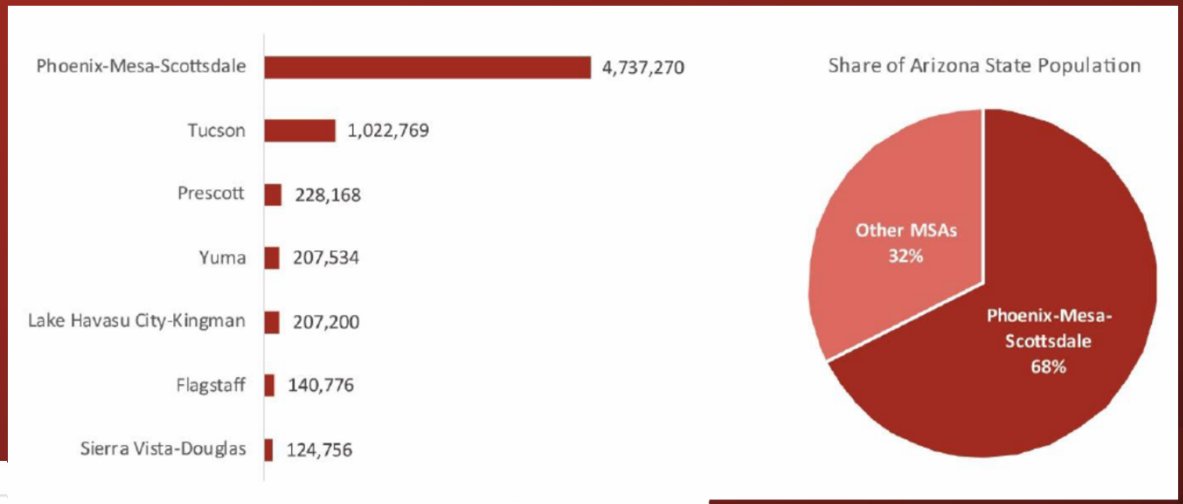
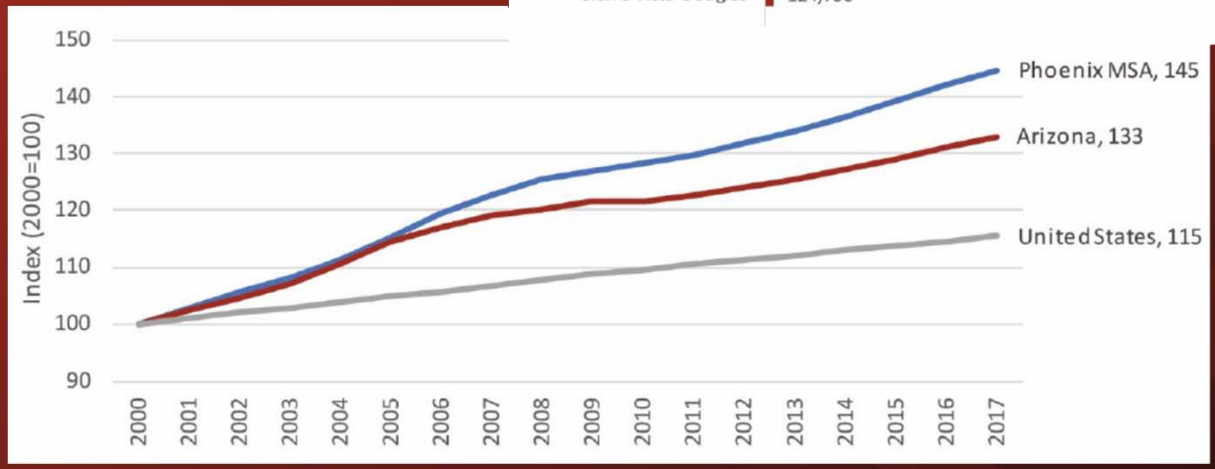
Phoenix MSA Population





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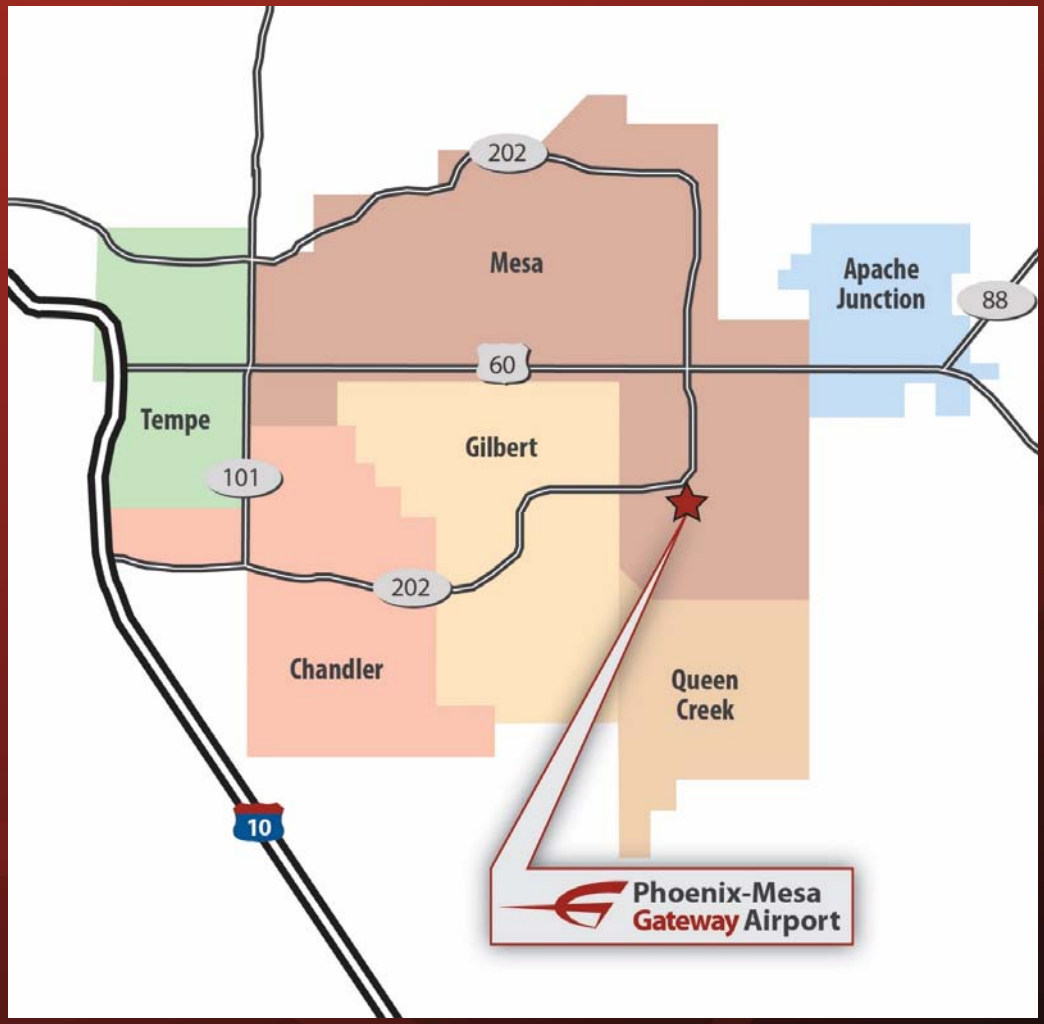
East Valley

- Rapidly growing area
- 1.3 million population in 2017
- >26% of Phoenix MSA population



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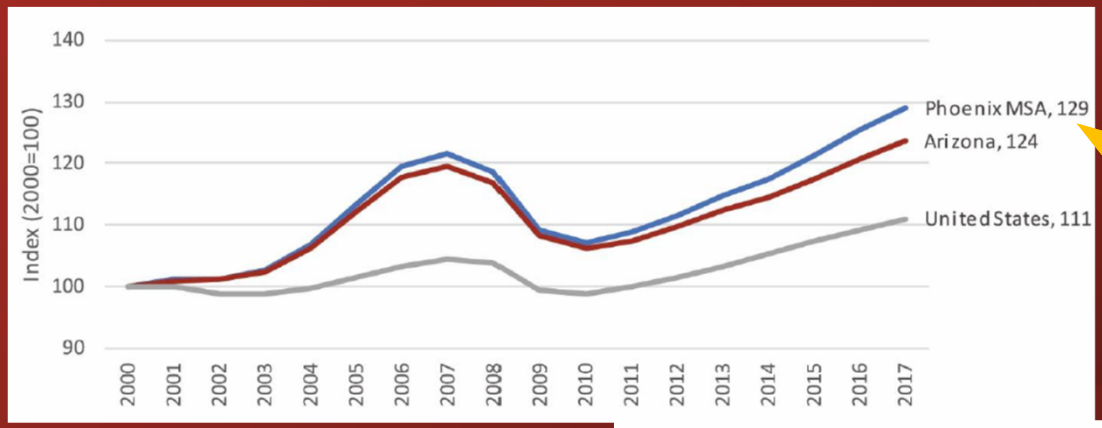
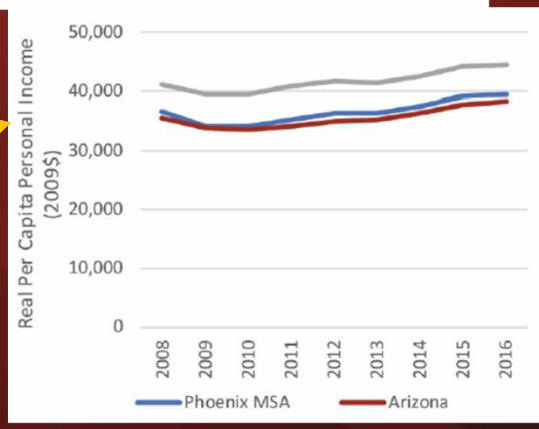
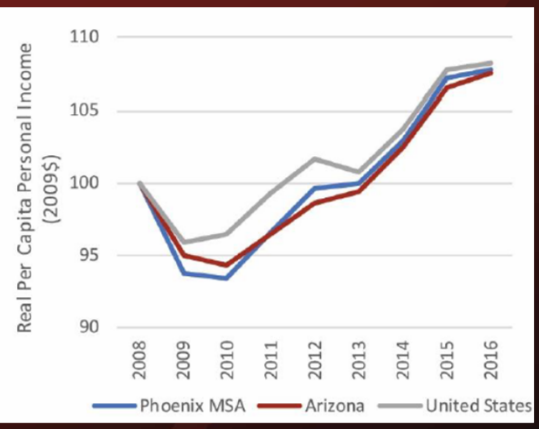
Employment and Income Growth Trends



The Phoenix MSA is creating jobs faster than the nation.

The Phoenix MSA is catching up with the nation in income growth.





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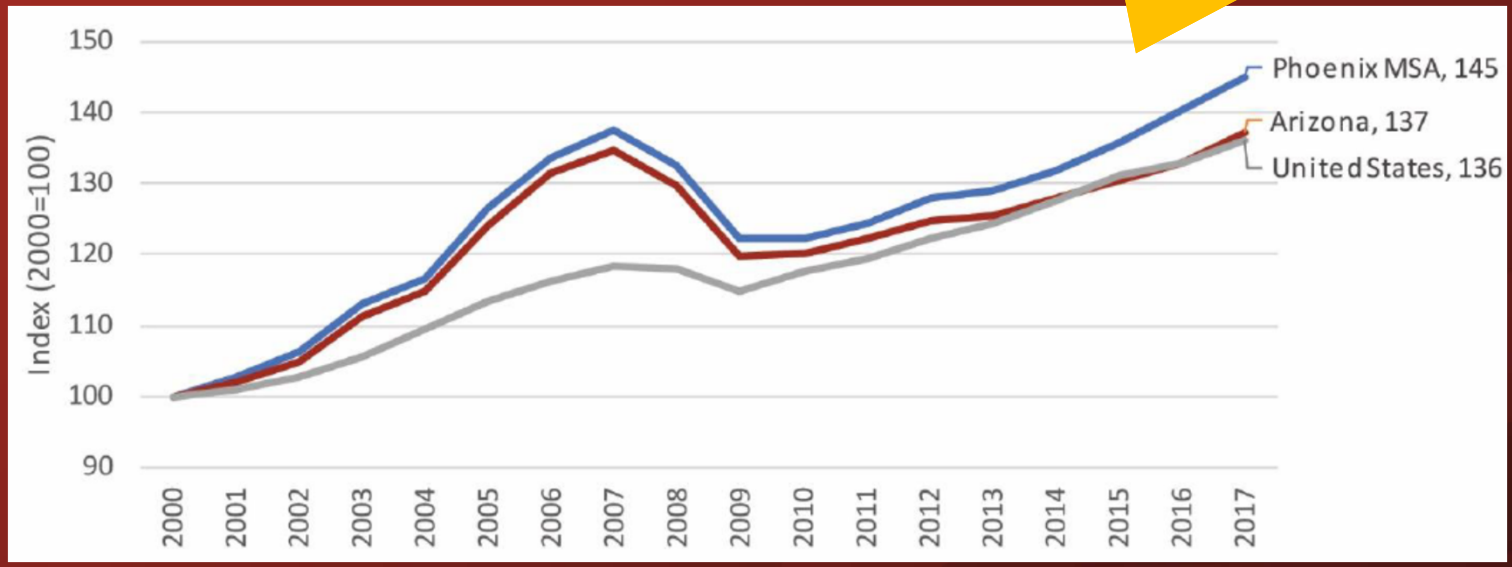
GDP Growth Trends

The Phoenix MSA economy outperforms the U.S. economy.



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Commercial Passenger Traffic

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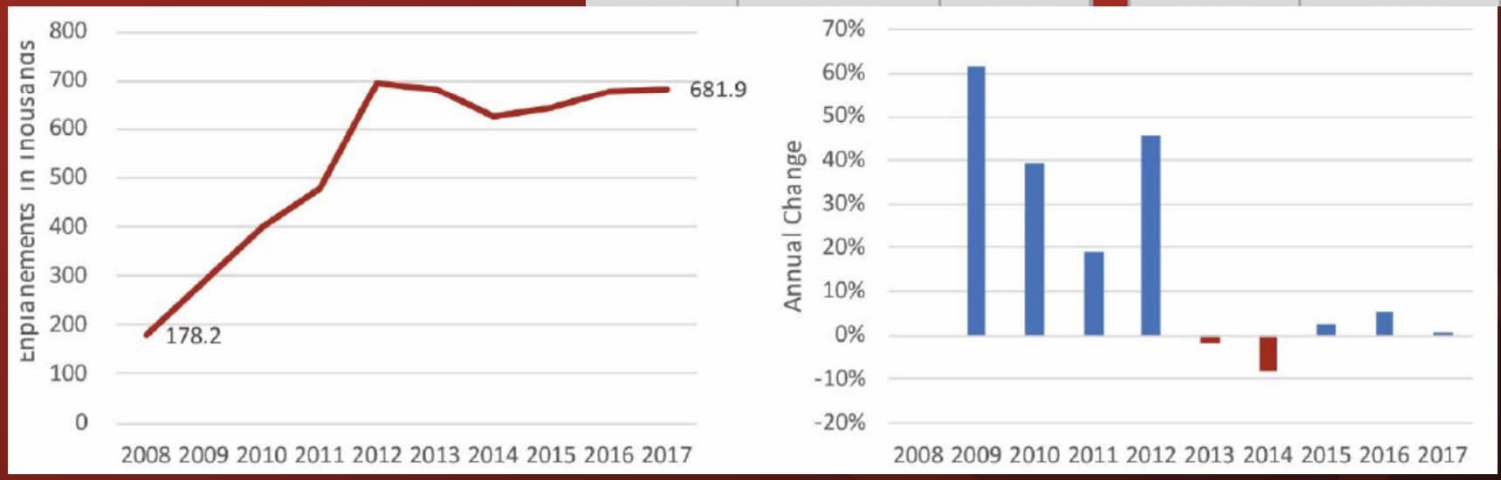
IWA Enplanement Trends

CY	EP (1,000s)	AGR	CY	EP (1,000s)	AGR
2008	178.2	626.1%	2013	680.2	-2.0%
2009	287.8	61.5%	2014	625.3	-8.1%
2010	401.4	39.4%	2015	641.3	2.5%
2011	477.5	19.0%	2016	677.1	5.6%
2012	694.3	45.4%	2017	681.9	0.7%



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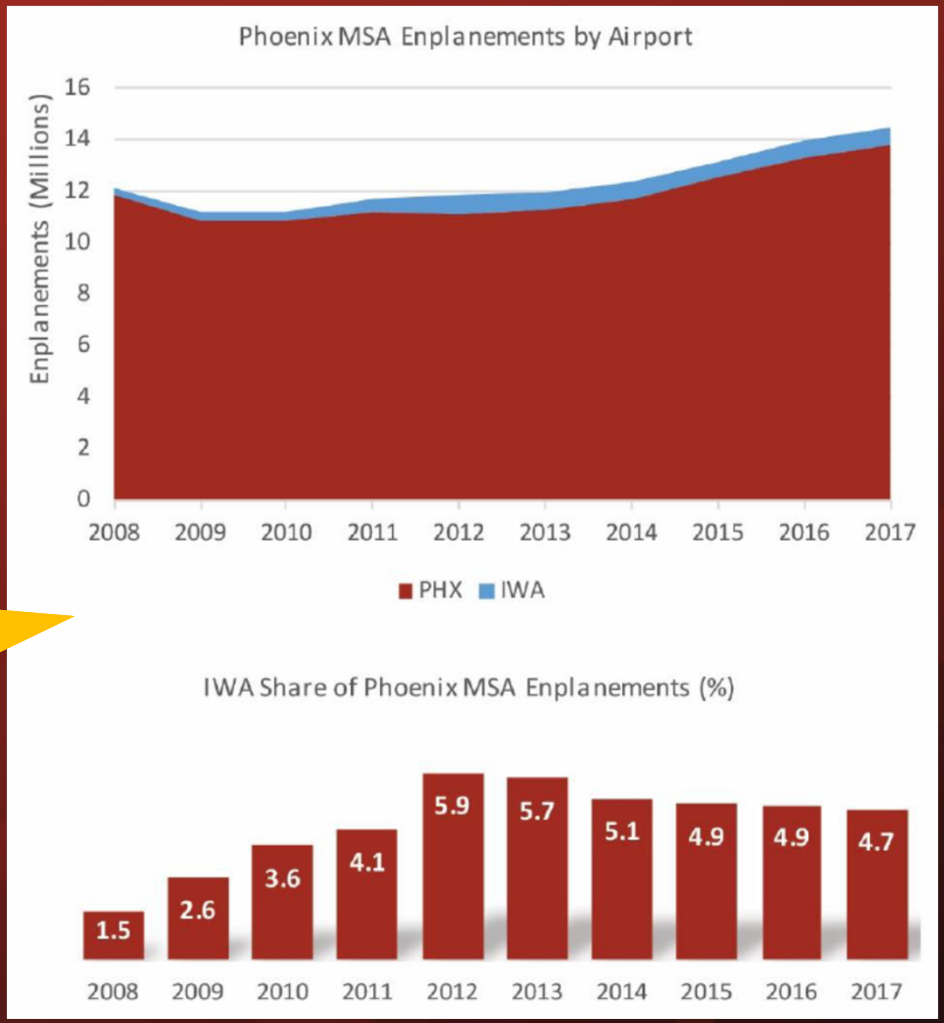
A Regional Demand Perspective



IWA captures a share of just under 5% in recent years.

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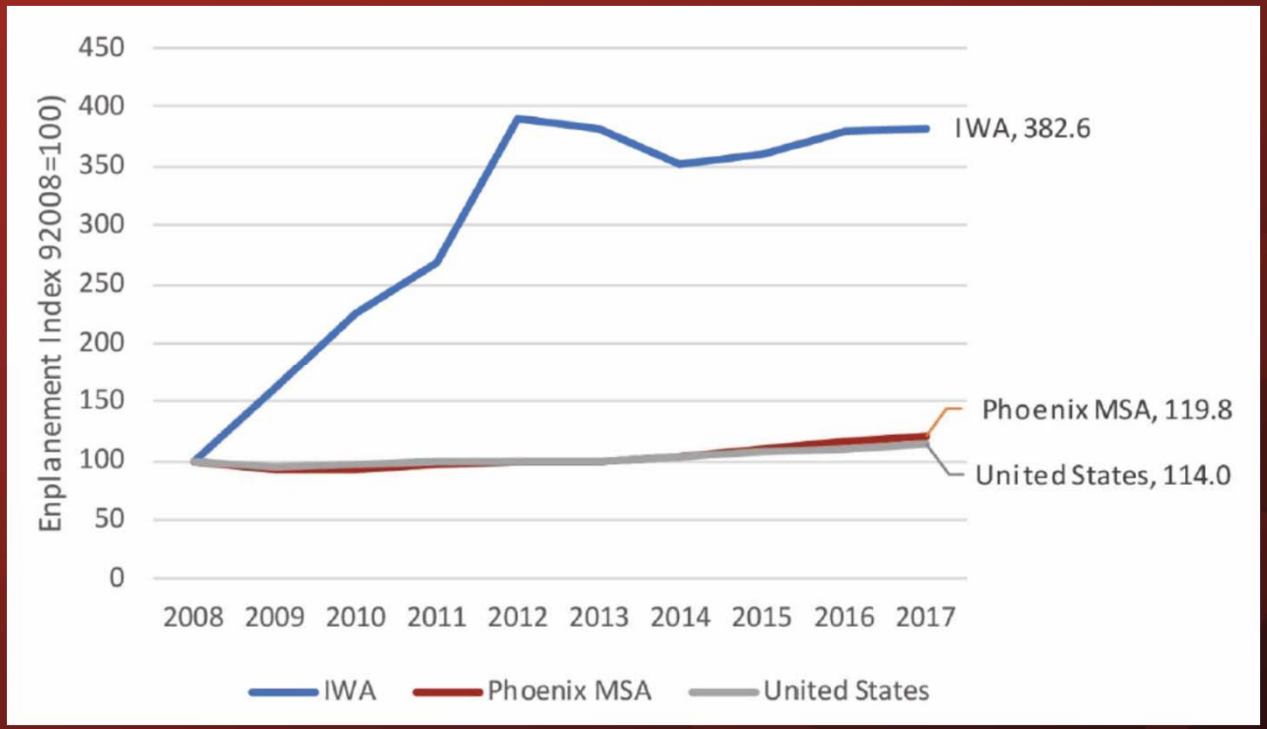
IWA's Enplanement Growth Relative to Regional and National Trends



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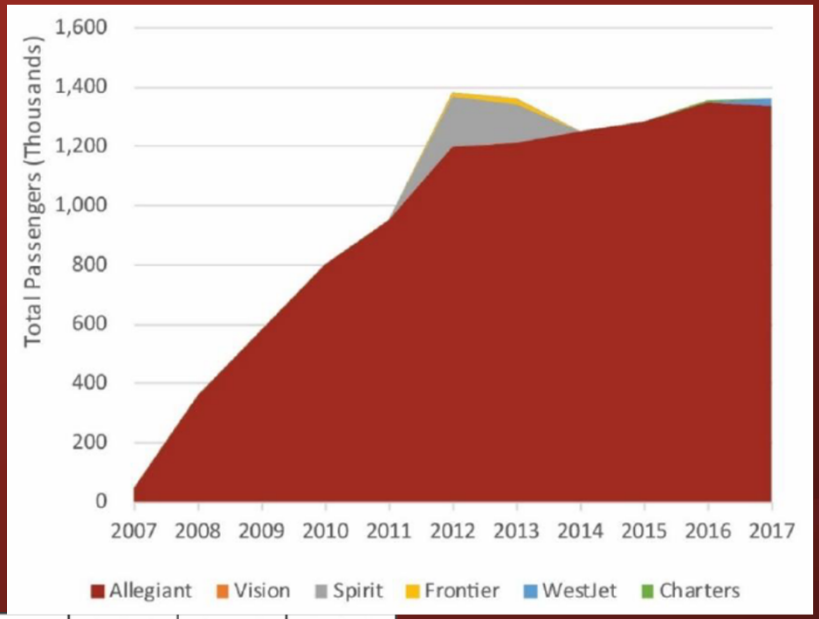
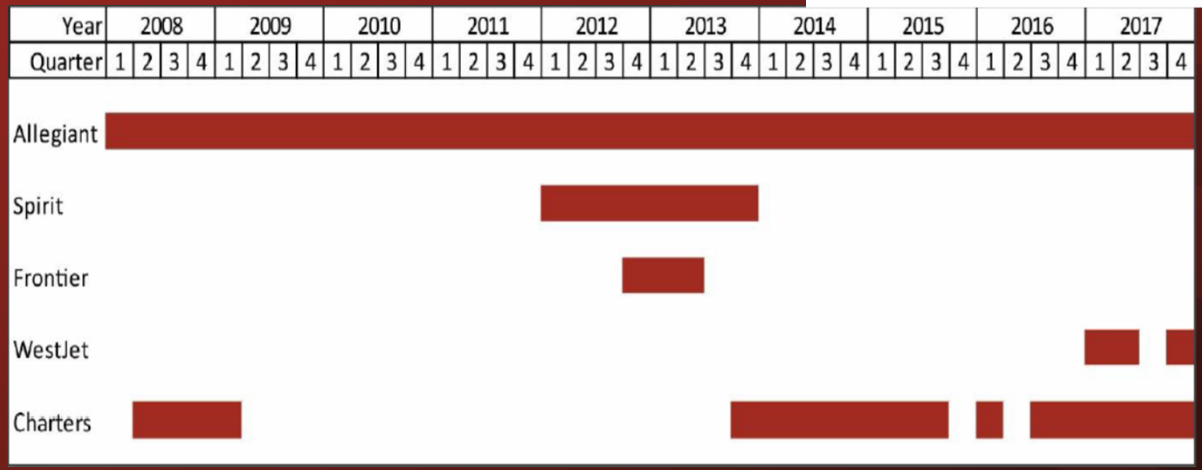
Air Carriers That Have Served IWA





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Hybrid Forecast Development Framework

NEAR TERM: *Bottom-Up*

- Airline schedules for IWA

LONG-TERM: *Top-Down*

- Regional demand

- Market drivers

- Multivariate time series regression

- Share analysis

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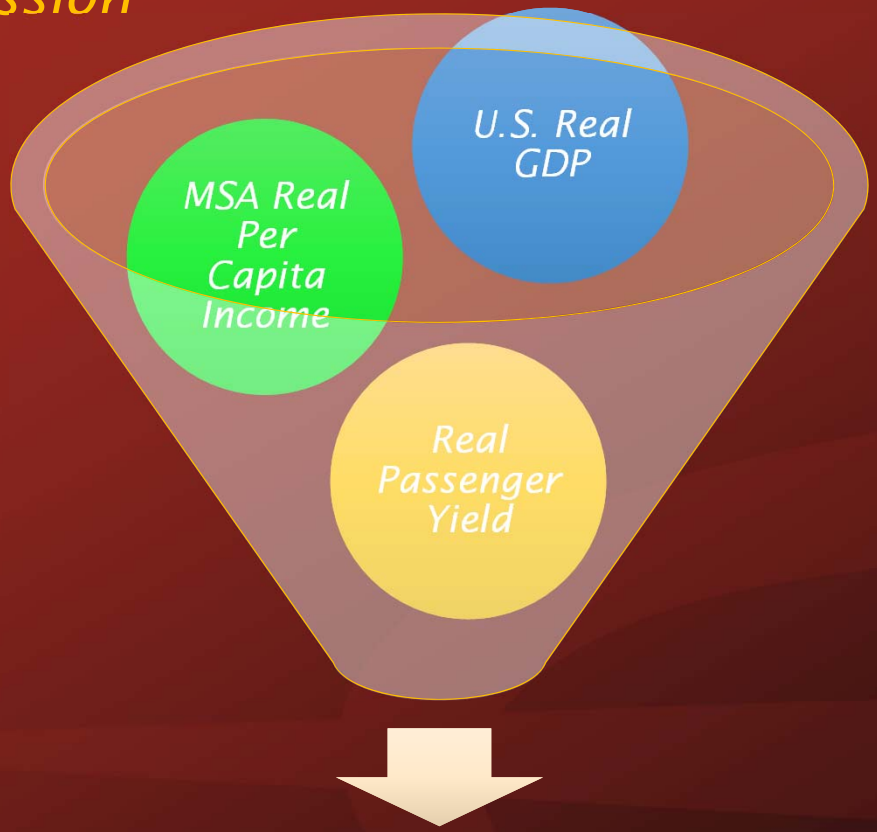
Multivariate Regression Model Variables



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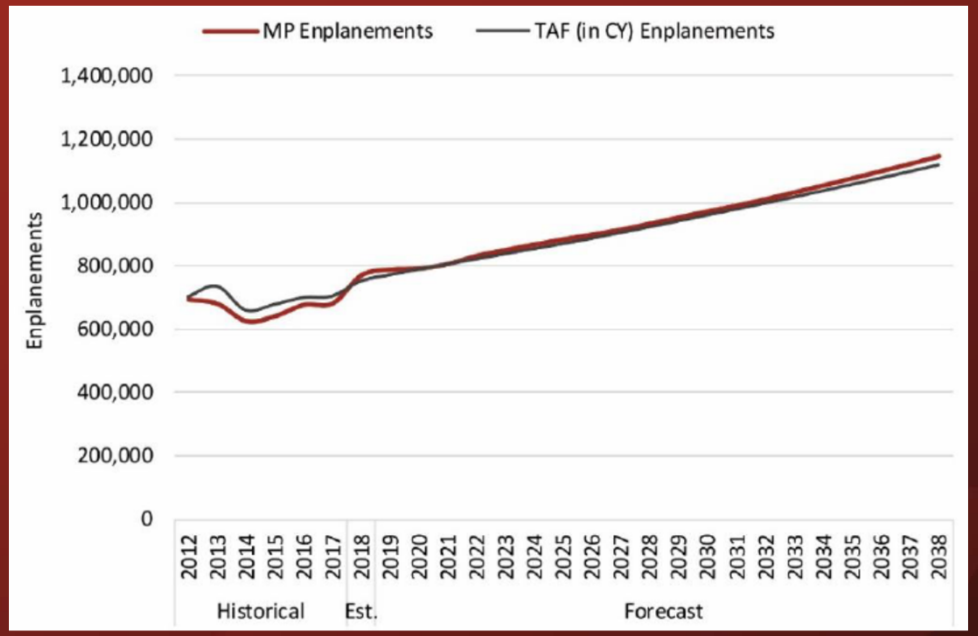
Forecast Enplanements at IWA



	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
Master Plan (MP)	681,892	770,526	849,894	933,157	1,145,806	13.0%	2.0%	1.9%	2.1%
TAF	690,071	746,858	834,370	919,037	1,115,554	8.2%	2.2%	2.0%	2.0%
TAF (in CY)	704,268	751,856	838,428	923,717	1,120,895	6.8%	2.2%	2.0%	2.0%
Ratio MP - TAF (in CY)	0.97	1.02	1.01	1.01	1.02				

Forecast Commercial Passenger Aircraft Operations

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
Master Plan (MP)	10,372	11,670	12,704	13,867	16,908	12.5%	1.7%	1.8%	2.0%
TAF	11,365	12,424	13,834	15,198	18,353	9.3%	2.2%	1.9%	1.9%
TAF (in CY)	11,630	12,505	13,899	15,273	18,439	7.5%	2.1%	1.9%	1.9%
Ratio MP - TAF (in CY)	0.89	0.93	0.91	0.91	0.92				

Forecast Commercial Passenger Aircraft Landed Weight In 1,000 lbs.

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
Master Plan (MP)	698,565	786,738	857,167	935,753	1,141,333	12.6%	1.7%	1.8%	2.0%

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Non-Commercial Aviation Activity

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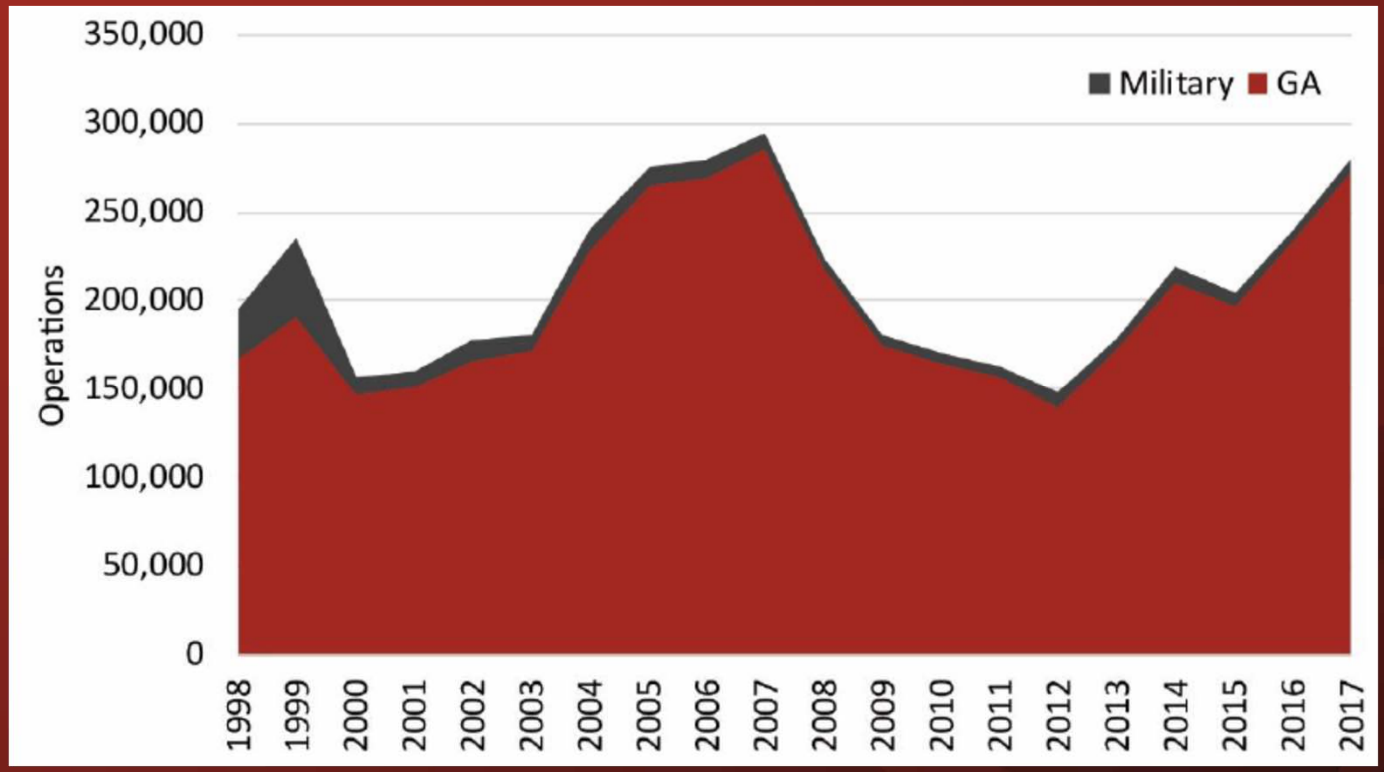
Trends in Noncommercial Aviation Activity at IWA



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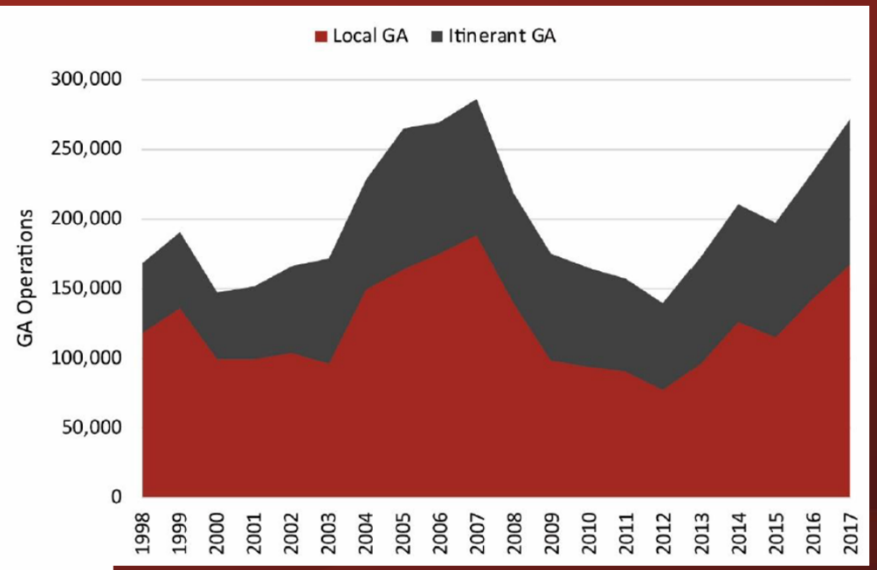
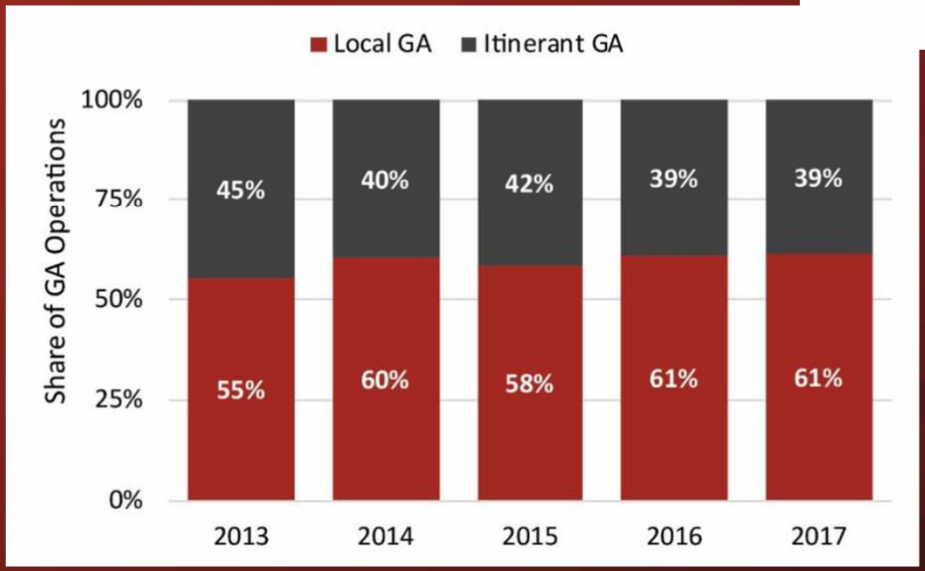
Local and Itinerant GA Operations at IWA





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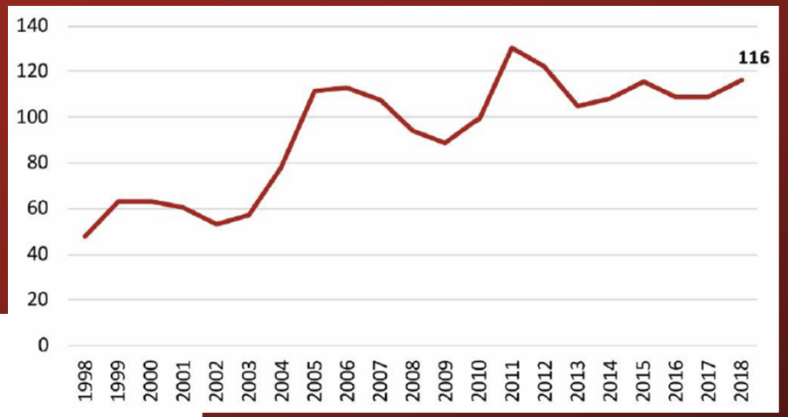
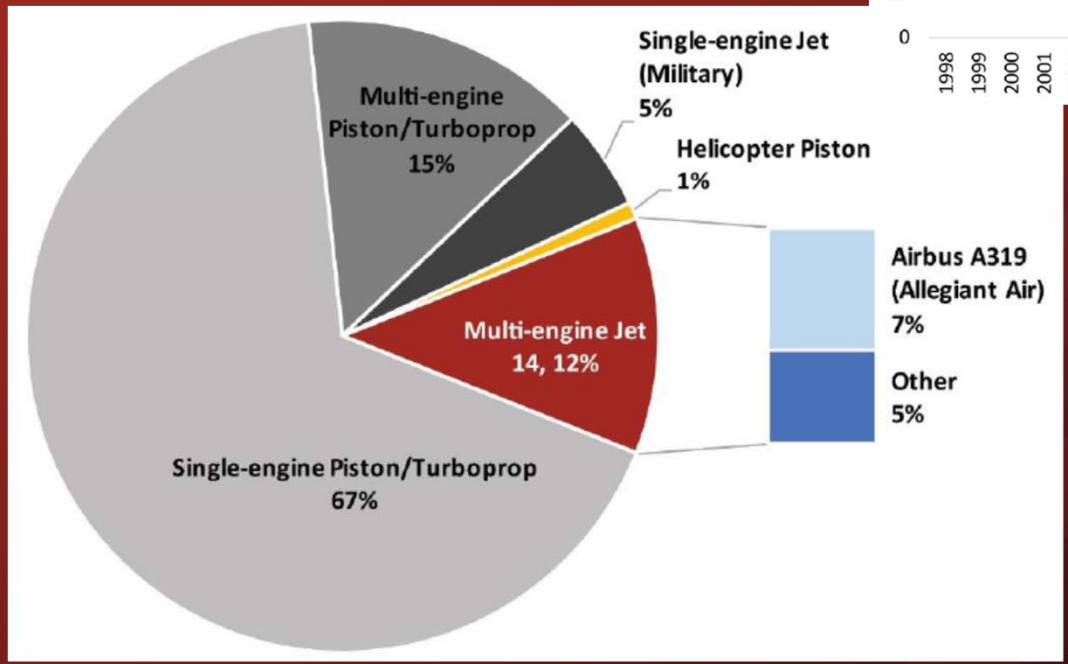
Based Aircraft at IWA





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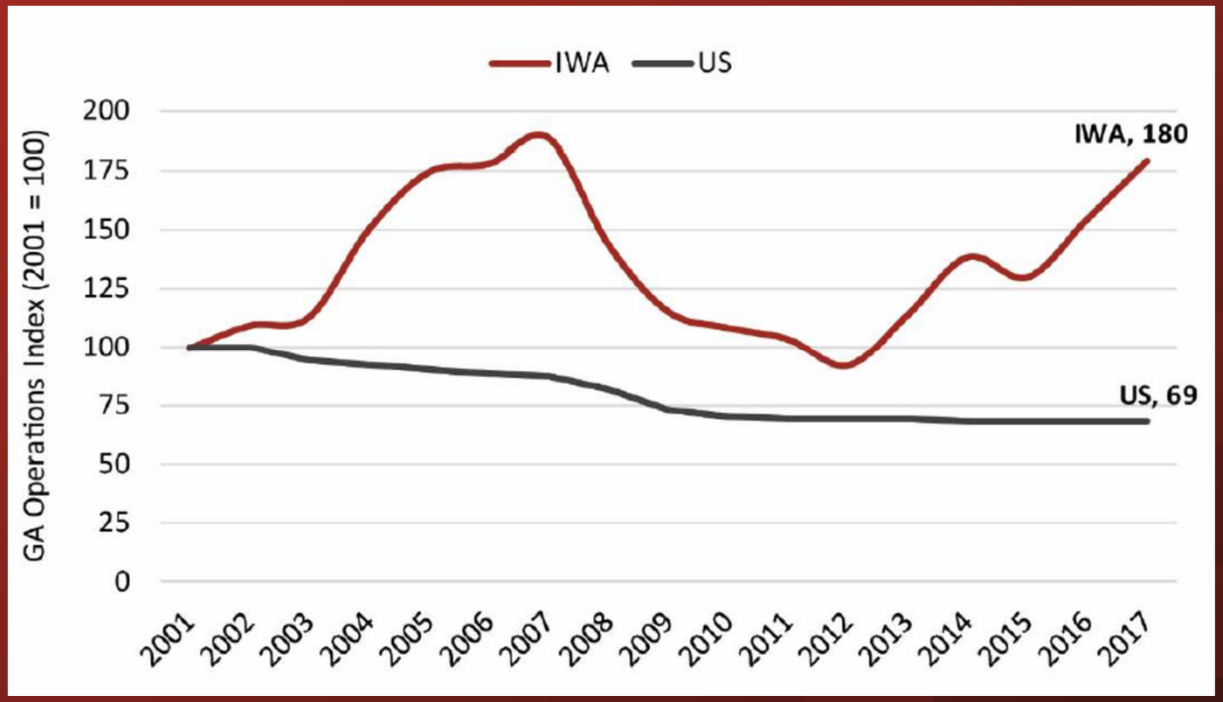
Trends in GA Operations at IWA and the U.S.



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The Region's GA Airports

Airport	GA	Military	Based Aircraft	Market Share of Based Aircraft
DVT	378,631	134	934	38%
FFZ	287,374	4,074	635	26%
IWA	271,446	7,503	116	5%
CHD	193,859	348	154	6%
SDL	167,482	639	378	15%
GYR	107,567	3,397	192	8%
PHX	49,761	2,296	78	3%

Top-Down Approach to GA Forecast Development

Regional GA Operations

IWA GA Operations

- **Regional GA Operations:** *Multivariate Time Series Regression Analysis*
- **IWA GA Operations:** *Share Analysis*

Separate Models for Local & Itinerant Operations

- ✓ **Drivers of Local GA Operations**
  - **Phoenix MSA population**
  - **Phoenix MSA nonfarm employment**
- ✓ **Drivers of Itinerant GA Operations**
  - **Phoenix MSA real per capita GDP**
  - **Jet fuel price**

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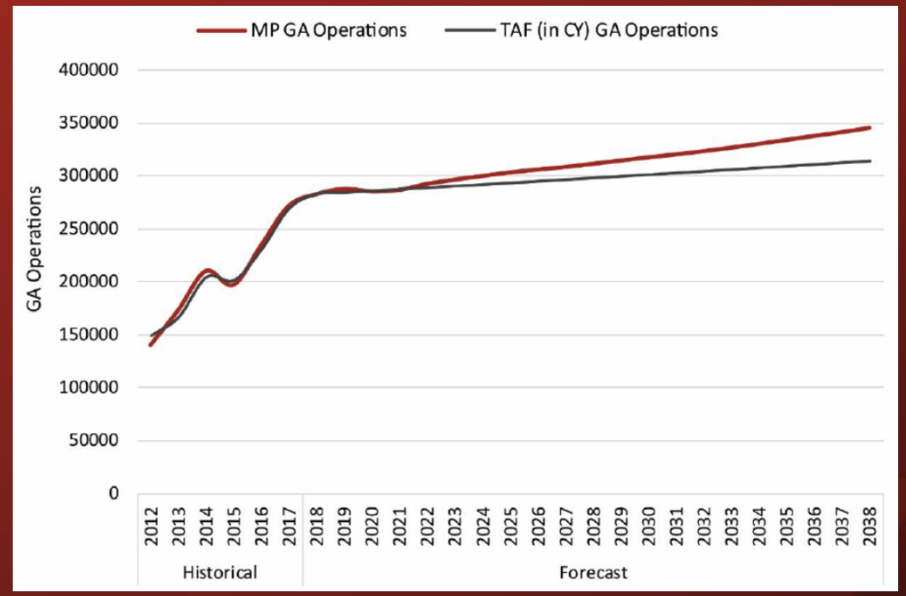
Forecast Non-Commercial Aviation Activity at IWA

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
General Aviation	271,446	282,596	296,256	311,455	345,401	4.1%	0.9%	1.0%	1.0%
Itinerant	104,927	114,236	115,835	119,407	128,625	8.9%	0.3%	0.6%	0.7%
Local	166,519	168,360	180,421	192,048	216,776	1.1%	1.4%	1.3%	1.2%
Military	7,503	7,503	7,503	7,503	7,503	0.0%	0.0%	0.0%	0.0%
Based Aircraft	109	116	121	126	139	6.4%	0.8%	0.9%	0.9%

Forecast GA Operations Compared with the TAF



	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
GA Total	271,446	282,596	296,256	311,455	345,401	4.1%	0.9%	1.0%	1.0%
Itinerant	104,927	114,236	115,835	119,407	128,625	8.9%	0.3%	0.6%	0.7%
Local	166,519	168,360	180,421	192,048	216,776	1.1%	1.4%	1.3%	1.2%
TAF (in CY)	269,167	282,758	290,167	297,796	313,757	5.0%	0.5%	0.5%	0.5%
Ratio GA Total-TAF (in CY)	1.01	1.00	1.02	1.05	1.10				

Next Steps: Quantitative Forecast Risk Analysis

- ✓ **Monte Carlo simulation**
- ✓ **Scenario analysis**

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24 Miles Up, Felix Baumgartner Jumps!

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Master Plan = Spin Control

- ✓ **Anticipate What We Think Will Happen**
- ✓ **Influence What We Want to Happen**

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Questions & Comments

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Next Steps

- ✓ Monte Carlo forecast simulation analysis
- ✓ Forecast revisions
- ✓ Submission of forecasts to FAA for approval
- ✓ Facility needs documentation
- ✓ Identification of preliminary airport development alternatives
- ✓ Publication of Working Paper Two
- ✓ Technical Advisory Committee Meeting #2
- ✓ Stakeholder Working Group Meeting #2
- ✓ Public Outreach Workshop #1
- ✓ Next Meetings Late October or Early November 2018

Phoenix-Mesa
Gateway
Airport Master Plan

Project Contact Information

- ✓ **Phoenix-Mesa Gateway Airport Planner (Master Plan Project Manager)**
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- ✓ **Mead & Hunt Deputy Project Manager**
  - **Chris Hacker**
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    - *480-718-1909*

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Thank You Partners and Goodbye for Now!

Phoenix-Mesa Gateway Airport Master Plan

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Phoenix-Mesa Gateway Airport
Technical Advisory Committee Meeting
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Tuesday, January 15, 2019

SIGN-IN SHEET – PLEASE PRINT

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Phoenix-Mesa Gateway Airport
Technical Advisory Committee Meeting
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Tuesday, January 15, 2019

SIGN-IN SHEET – PLEASE PRINT

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Larry Randle Jr.	Textron Aviation	5533 S. Sossaman	3162854526	lrandle@txtav.com

Phoenix-Mesa Gateway Airport

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Master Plan – Technical Advisory Committee Meeting

January 15, 2019

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Phoenix-Mesa
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Airport Master Plan

Agenda

- ✓ Introductory Remarks and Agenda Review
- ✓ Airfield Configuration Facility Findings Summary
- ✓ Passenger Terminal Facility Findings
- ✓ Terminal Area Parking Findings
- ✓ Westside Parking Options
- ✓ Other Landside Facility Findings
- ✓ Airside Alternatives Considerations
- ✓ Landside Development Considerations
- ✓ Next Steps

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Master Plan Forecast Summary

	Actual	Estimate	Forecast			CAGR			
Measure/Scenario	2017	2018	2023	2028	2038	2017-2018	2018-2023	2023-2028	2028-2038
Enplanements									
Master Plan	**681,892**	**759,033**	**924,667**	**1,022,420**	**1,245,211**	11.3%	4.0%	2.0%	2.0%
High Growth	681,892	759,033	1,037,426	1,168,589	1,451,202	11.3%	6.4%	2.4%	2.2%
Low Growth	681,892	759,033	903,617	984,846	1,180,070	11.3%	3.5%	1.7%	1.8%
Commercial Aircraft Operations									
Master Plan	**10,372**	**10,920**	**12,953**	**14,070**	**16,840**	5.3%	3.5%	1.7%	1.8%
High Growth	10,372	10,920	14,463	16,020	19,570	5.3%	5.8%	2.1%	2.0%
High Growth*	10,372	10,920	16,795	22,184	31,482	5.3%	9.0%	5.7%	3.6%
Low Growth	10,372	10,920	12,662	13,558	15,967	5.3%	3.0%	1.4%	1.6%
Noncommercial Aircraft Operations									
General Aviation	271,446	282,596	296,256	311,455	345,401	4.1%	0.9%	1.0%	1.0%
Military	7,503	7,503	7,503	7,503	7,503	0.0%	0.0%	0.0%	0.0%
Subtotal	278,949	290,099	303,759	318,958	352,904	4.0%	0.9%	1.0%	1.0%
Total Aircraft Operations									
Master Plan	**289,321**	**301,019**	**316,712**	**333,028**	**369,744**	4.0%	1.0%	1.0%	1.1%
High Growth	289,321	301,019	318,222	334,978	372,474	4.0%	1.1%	1.0%	1.1%
High Growth*	289,321	301,019	320,554	341,142	384,386	4.0%	1.3%	1.3%	1.2%
Low Growth	289,321	301,019	316,421	332,516	368,871	4.0%	1.0%	1.0%	1.0%

Airport Master Plan-
FAA Approved Forecast

Enplanement Forecast:
2018 Total= 763,000±

2023	2028	2038
924,667	1,022,420	1,245,211

Total Operations Forecast:
2018 Total= 288,921

2023	2028	2038
316,712	333,028	369,744

Total Based Aircraft Forecast:
2017 Actual = 109

2023	2028	2038
121	126	139

Phoenix-Mesa Gateway Airport Master Plan

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Project Approach

- ✓ Follow FAA Guidance
- ✓ Building Block Process
  - Inventory
  - Forecasts
  - Facilities Needs Determination
  - Development Plan Formulation
  - Financial Plan

Phoenix-Mesa Gateway Airport Master Plan

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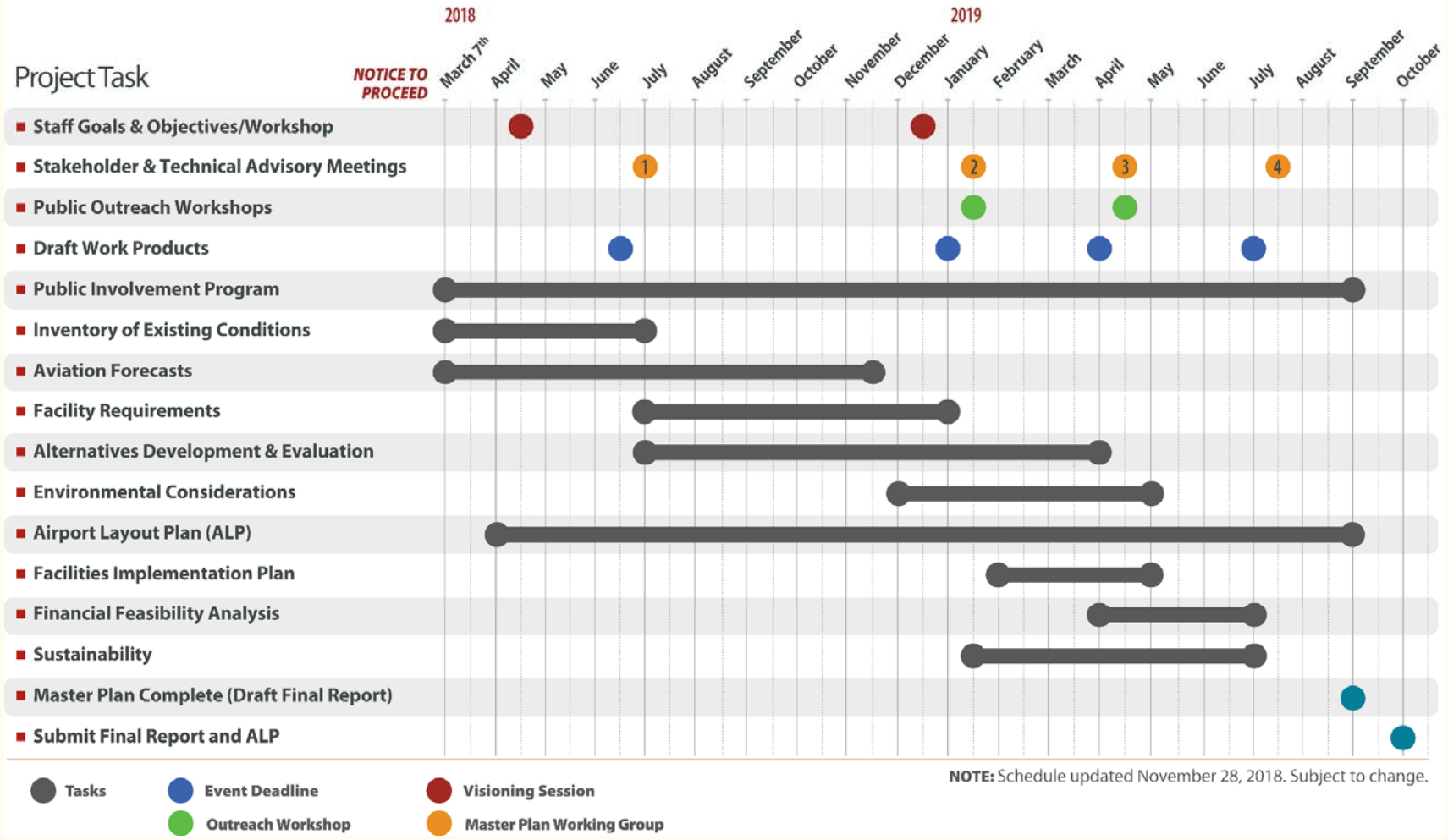
Project Schedule Airport Master Plan



NOTE: Schedule updated November 28, 2018. Subject to change.

Phoenix-Mesa
Gateway
Airport Master Plan

Master Plan- Statement of Policy

- ✓ Anticipate What We Think Will Happen
- ✓ Influence What We Want to Happen

Phoenix-Mesa Gateway Airport Master Plan

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Airfield Configuration

- ✓ Runway Orientation
- ✓ Airfield Operational Capacity
- ✓ Runway Length Analysis
- ✓ Runway Design and Dimensional Criteria
- ✓ Parallel Runway Separation
- ✓ Instrument Approach Capabilities
- ✓ Taxiway Design and Dimensional Criteria
- ✓ Parallel Taxiway Improvement Considerations
- ✓ Exit Taxiways

Phoenix-Mesa Gateway Airport Master Plan

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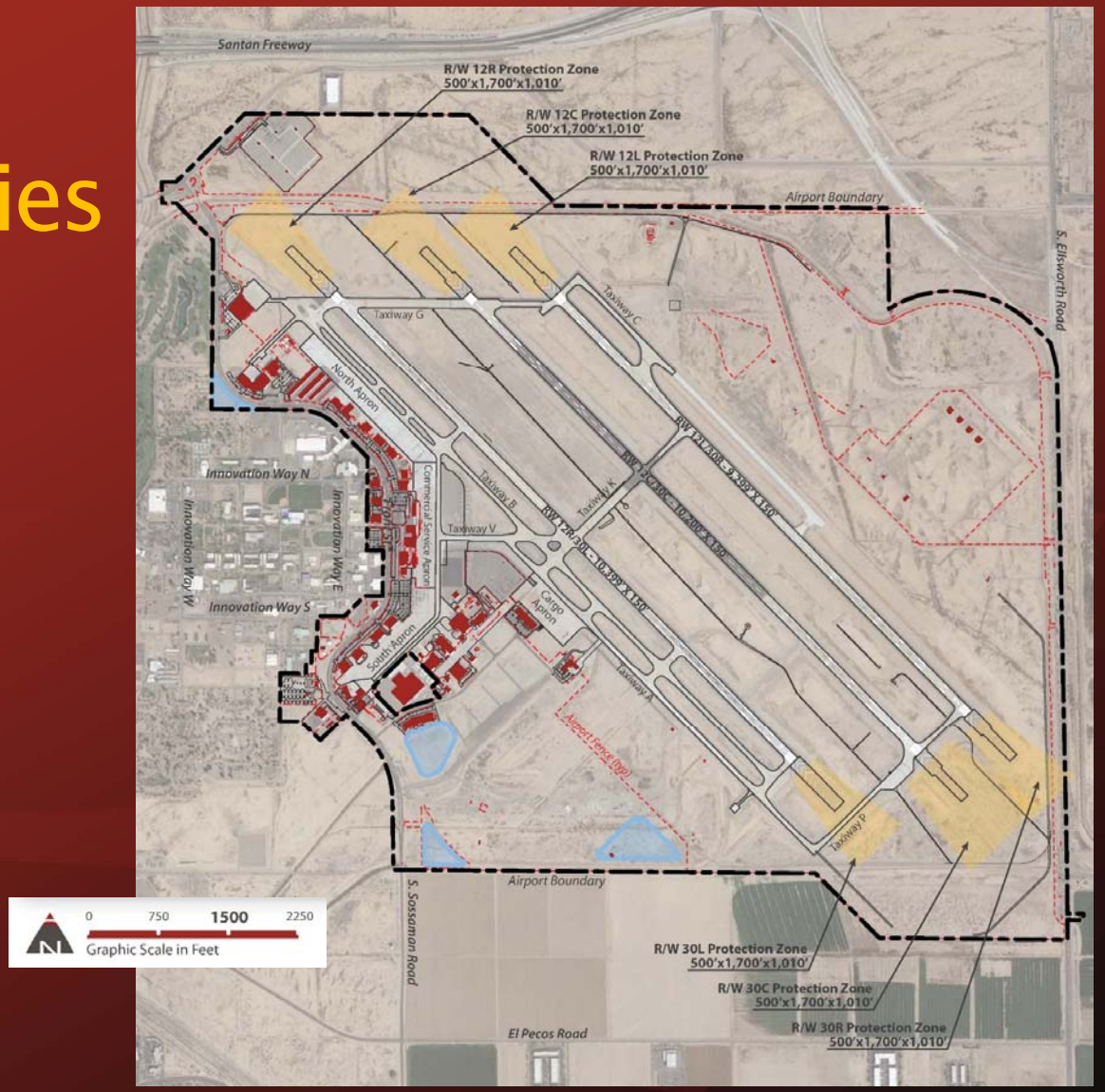
Existing Airport Facilities



Phoenix-Mesa
Gateway
Airport Master Plan

Runway Length and Pavement Strength Requirement for B747-400 Operations

	Required Runway Length	Existing Runway Length	Required Pavement Strength	Existing DDTW Pavement Strength
Runway 12R/30L	9,500 ft.	10,401 ft.	740,000 lbs.	550,000
Runway 12C/30C	9,500 ft.	10,201 ft.	740,000 lbs.	550,000
Runway 12L/30R	9,500 ft.	**9,300 ft.**	740,000 lbs.	850,000

Passenger Terminal Facilities

- ✓ Inbound and Outbound Baggage
- ✓ Concourse Holdroom (Gates)
- ✓ Aircraft Parking
- ✓ Security Checkpoint
- ✓ Check-In Lobby (Ticketing)

Facility Requirements- Passenger Terminal

Functional Area	Existing (supply)	PAL 1 (2023)	PAL 2 (2028)	PAL 3 (2038)
CHECK-IN (TICKETING)				
Queue (sf)	4,500	3,550	3,700	4,350
Counters/Bag drops	32	26	27	31
CHECKED BAGGAGE				
EDS machines	2 CT-80	3 MS-EDS	4 MS-EDS	4 MS-EDS
Makeup area (sf)	11,500	11,400	12,800	15,700
SECURITY SCREENING CHECKPOINT				
Queue (sf)	1,725	1,700	1,900	2,625
Lanes	5	5	5	5
PASSENGER HOLDROOM				
Holdroom (sf)	15,260	13,000	15,300	19,700
Podium, queueing, egress (sf)	3,950	3,150	3,675	4,725
APRON (GATES)	10	8 (ADG III)	9	11
BAGGAGE CLAIM (DEVICES)	2	2	3	3

PAL = Planning Activity Level (tied to forecast)

Phoenix-Mesa Gateway Airport Master Plan

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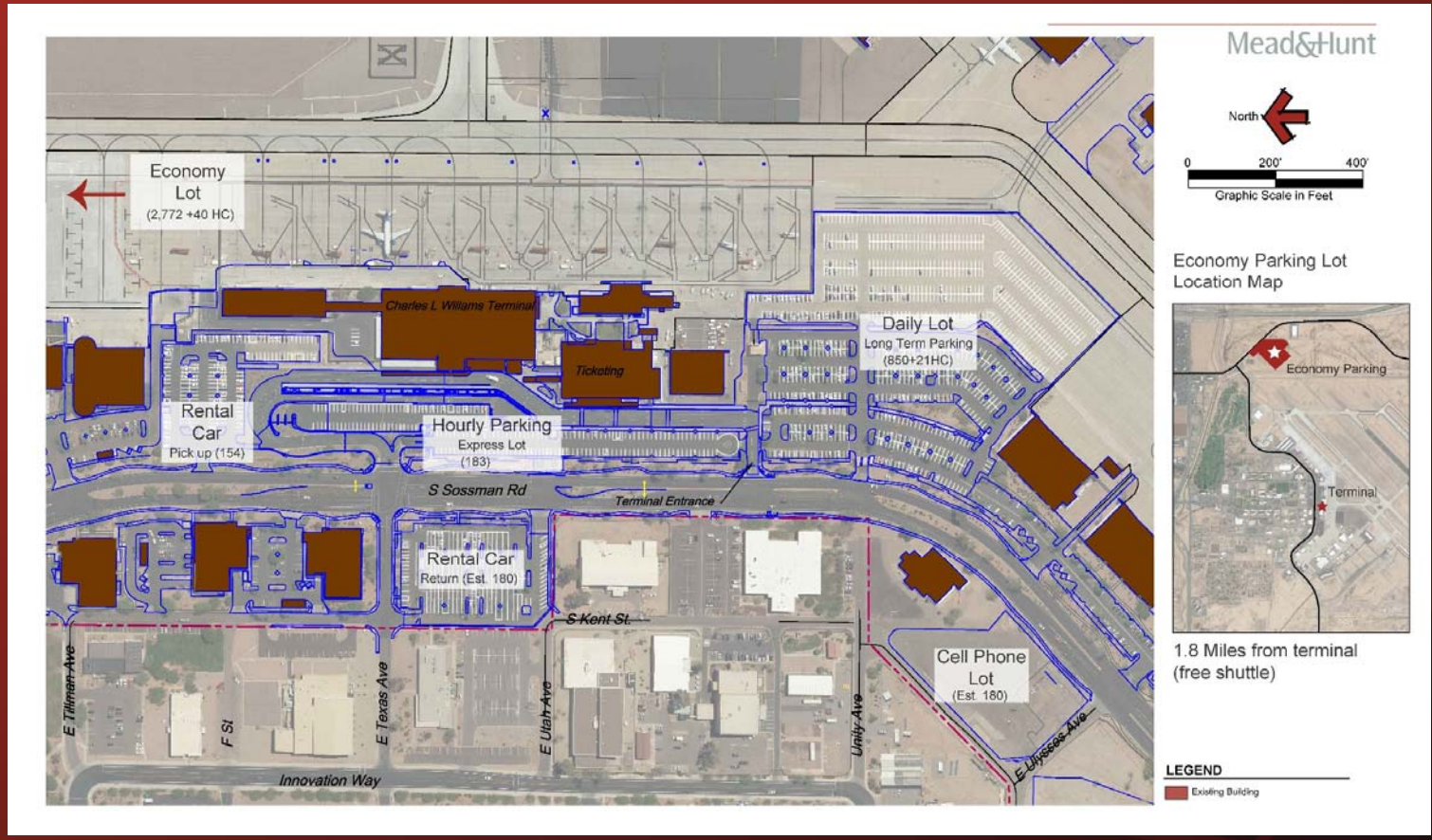
Passenger Terminal Support Facilities

- ✓ Access Roadway System
- ✓ Passenger Parking System
- ✓ Rental Car Parking
- ✓ Employee Parking
- ✓ Temporary Parking (Cell Phone Lot)

Existing Parking Facilities



Phoenix-Mesa Gateway Airport Master Plan

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Public Parking Demand Forecasts (25)

(Master Plan Projected Growth Rate)

Lot		FY 2018 Peak	Short – Term	Mid – Term	Long – Term
Hourly Express Lot	Supply	183	183	183	183
	Effective Supply	156	156	156	156
	Demand	194	242	265	326
	Surplus/Deficit	**-38**	**-86**	**-109**	**-170**
Daily Lot	Supply	871	871	871	871
	Effective Supply	740	740	740	740
	Demand	717	894	982	1,205
	Surplus/Deficit	**23**	**-154**	**-241**	**-465**
Ray Road Economy Lot	Supply	2,812	2,812	2,812	2,812
	Effective Supply	2,390	2,390	2,390	2,390
	Demand	747	931	1022	1255
	Surplus/Deficit	**1643**	**1459**	**1368**	**1135**
Grand Total	Supply	3,866	3,866	3,866	3,866
	Effective Supply	3,286	3,286	3,286	3,286
	Demand	1,658	2,067	2,270	2,787
	Surplus/Deficit	**1,628**	**1,219**	**1,017**	**499**

- ✓ **Effective Supply**
  - **Best practices for managing parking supply suggest that parking supply is at capacity when the demand reaches 85% utilization**
- ✓ **Deficits**
  - **Immediate**
    - Hourly Lot, based on observed condition. Lot should be considered at or near capacity.
  - **Short, Mid, Long-Term**
    - Hourly Express Lot
    - Daily Lot
- ✓ **Surplus**
  - **Immediate, Short, Mid, Long-Term**
    - Significant surplus in Economy Lot throughout planning horizon

Phoenix-Mesa Gateway Airport Master Plan

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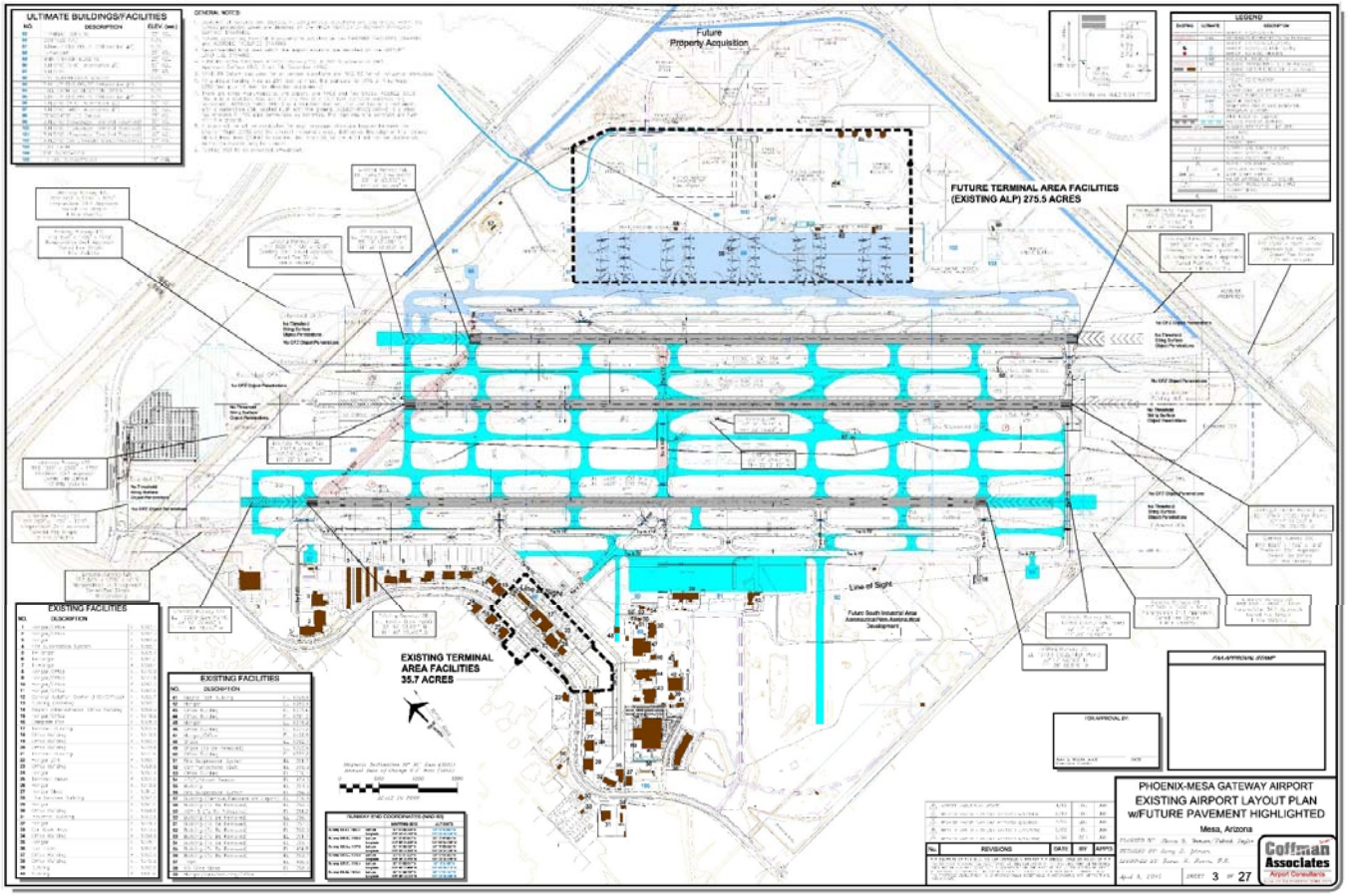
Terminal Area Acres



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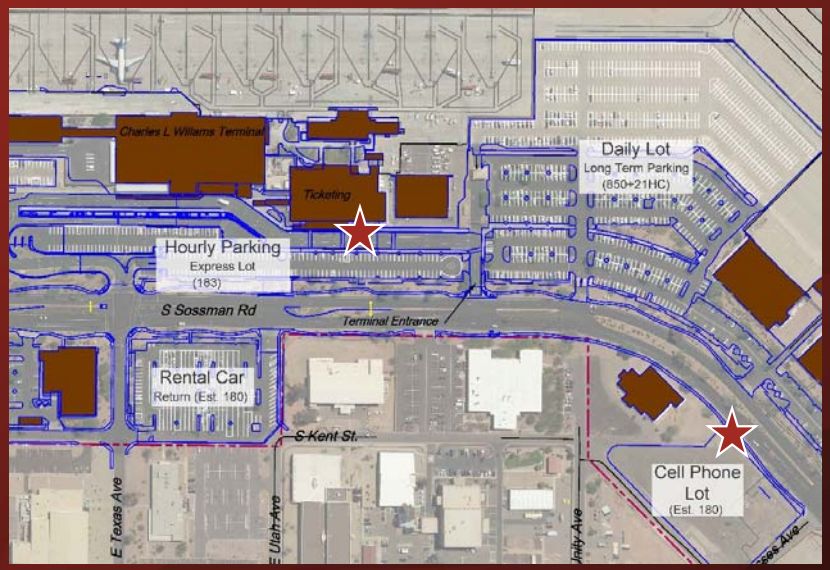
Passenger Terminal Area Acres Comparison

- ✓ IWA Existing - 36 Acres/680 K Enplaned Pax 2017 (1.2 M Forecast)/10 aircraft parking positions
- ✓ IWA Future (existing ALP) - 275 Acres/60 aircraft parking positions
- ✓ Northwest Arkansas Regional Airport - 124 Acres/725 K Enplaned Pax 2017/15 aircraft parking positions
- ✓ Tulsa International Airport – 103 Acres/1.4 M Pax 2017/22 Aircraft Parking Positions

Temporary Parking (Cell Phone Lot)

- ✓ **Proximity to Terminal**
  - **Should not be within walking distance of terminal**
    - According to Guidance documents for the evaluation of parking facilities at airports
  - **Approximately 1/4 mile from terminal**
- ✓ **Max (60) Spaces Needed**
  - **At 180 spaces, the Cell Phone Lot is out of scale with needs for the airport. If visitors intend to stay longer than one-hour, other parking facilities are provided by the airport**
    - According to Guidance documents for the evaluation of parking facilities at airports
- ✓ **Surplus**
  - **Functionally has surplus of 120 spaces**



Phoenix-Mesa Gateway Airport Master Plan

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Summary Peak Parking Surplus/Deficit

(Master Plan Projected Growth Rate)

Lot	FY 2018 Peak	Short – Term	Mid – Term	Long – Term
Public Parking Total	**1,628**	**1,219**	**1,017**	**499**
Hourly Express Lot	**-38**	**-86**	**-109**	**-170**
Daily Lot	**23**	**-154**	**-241**	**-465**
Ray Road Economy Lot	**1643**	**1459**	**1368**	**1135**
Rental Parking	0	**-38**	**-57**	**-105**
Employee Parking	0	**-41**	**-62**	**-114**
Temporary Parking	120	**120**	**120**	**120**

✓ **Deficits**

- **Immediate**
  - Hourly Lot, based on observed condition. Lot should be considered at or near capacity
  - Employee Parking will continue to impact revenues and supply
- **Short, Mid, Long-Term**
  - Hourly Express Lot
  - Daily Lot
  - Rental Parking Ready Lot

✓ **Surplus**

- **Immediate**
  - Small surplus in Daily Lot
- **Short, Mid, Long-Term**
  - Significant surplus in Economy Lot throughout planning horizon
  - Temporary (Cell Phone) Parking Lot

Phoenix-Mesa Gateway Airport Master Plan

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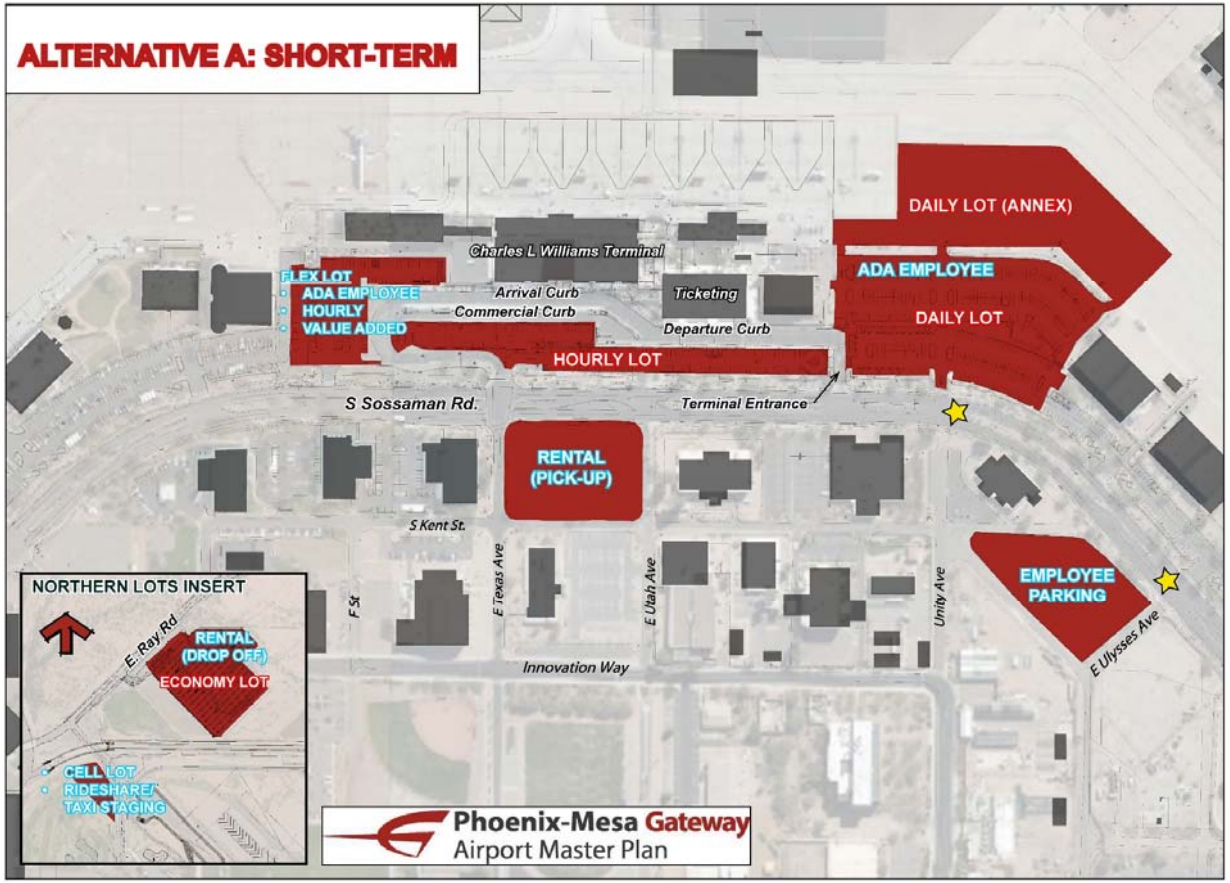
Westside Parking Improvement Options



Phoenix-Mesa Gateway Airport Master Plan

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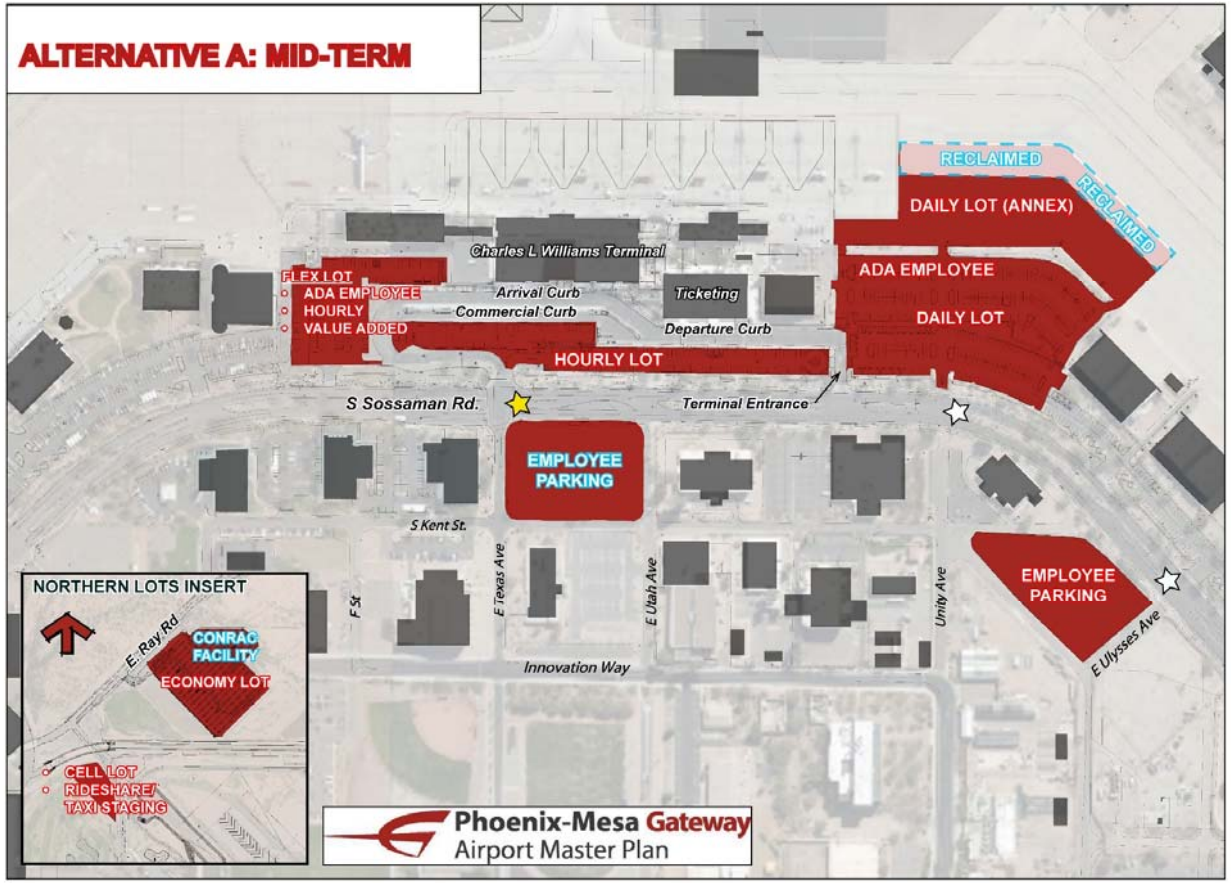
Westside Parking Improvement Options



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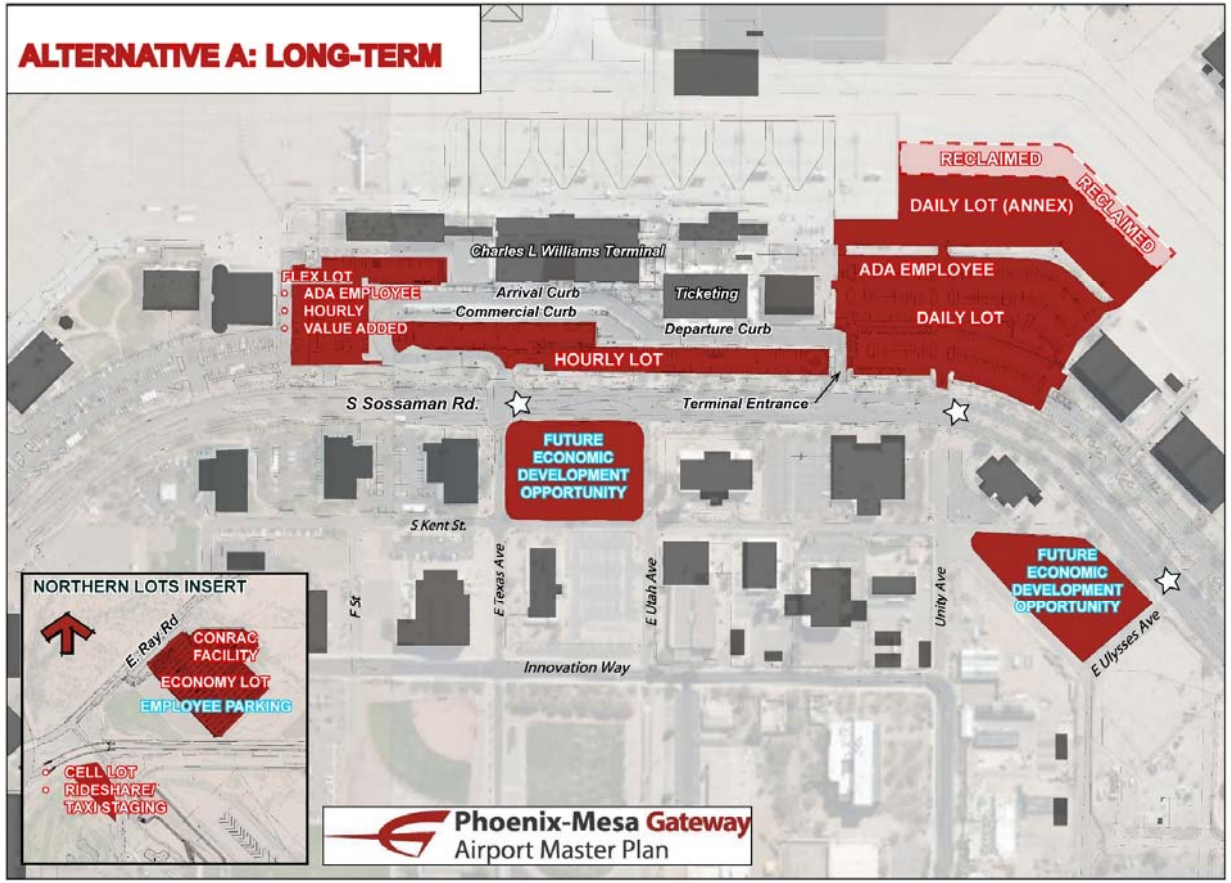
Westside Parking Improvement Options



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Other Landside Facilities

- ✓ General Aviation Storage Facilities
- ✓ Corporate/MRO Facilities
- ✓ Fixed Base Operator Facilities
- ✓ Air Cargo Facilities
- ✓ ARFF (Fire Fighting)/Airport Maintenance
- ✓ Airport Traffic Control Tower
- ✓ Fuel Storage

Summary of Critical Facility Requirement Considerations

- ✓ Identify potential needs and benefits for runway extension(s)
- ✓ Identify benefits for placement of parallel taxiway improvements
- ✓ Consideration of benefits of improved instrument approach capabilities
- ✓ Passenger terminal
  - Short-term focus on demand driven improvements for existing terminal building
  - Long-term focus on relocated terminal
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- ✓ SkyBridge Arizona - incorporate adopted recommendations into master plan
- ✓ General aviation and industrial aviation - continue to program for demand driven facility expansion and improvements

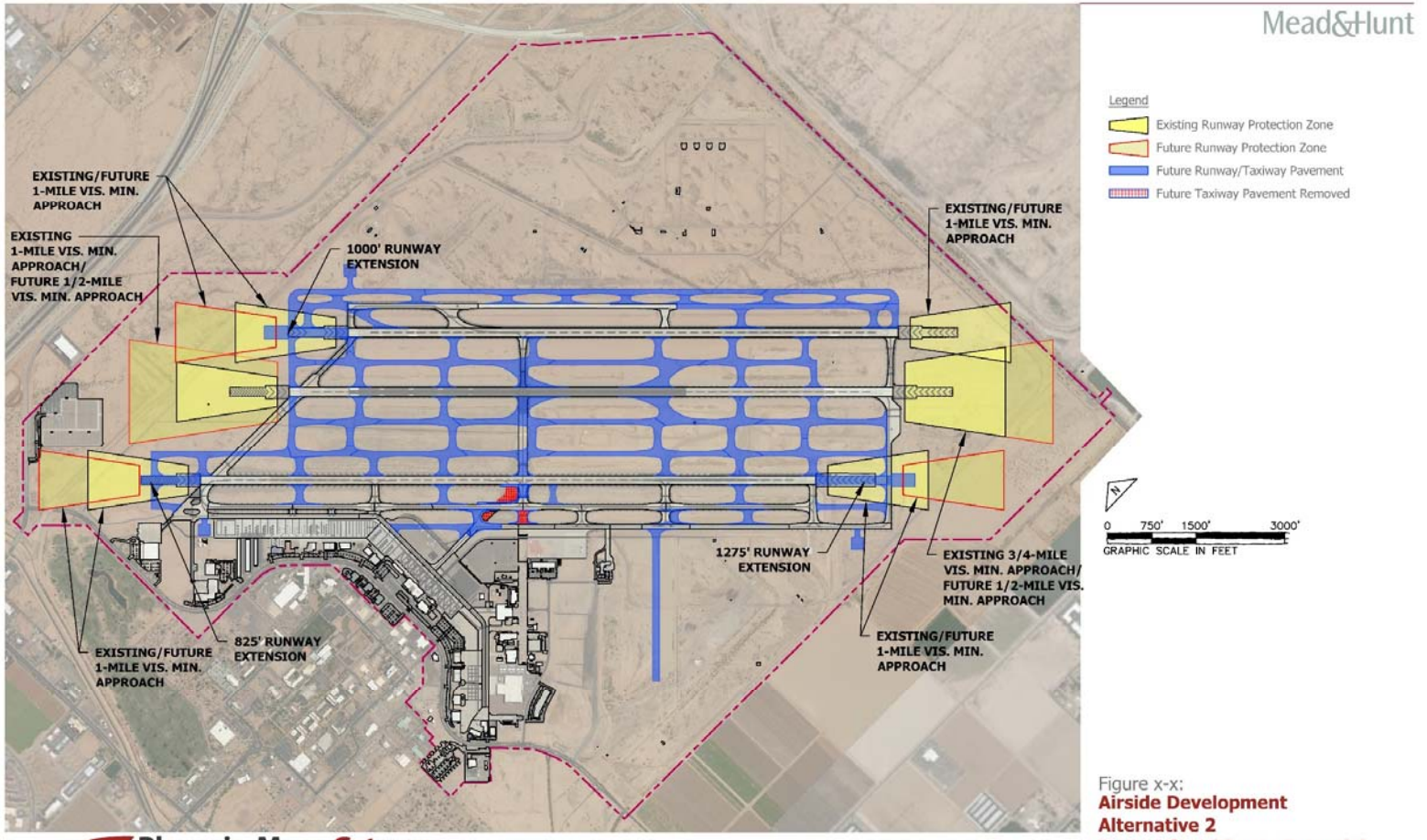
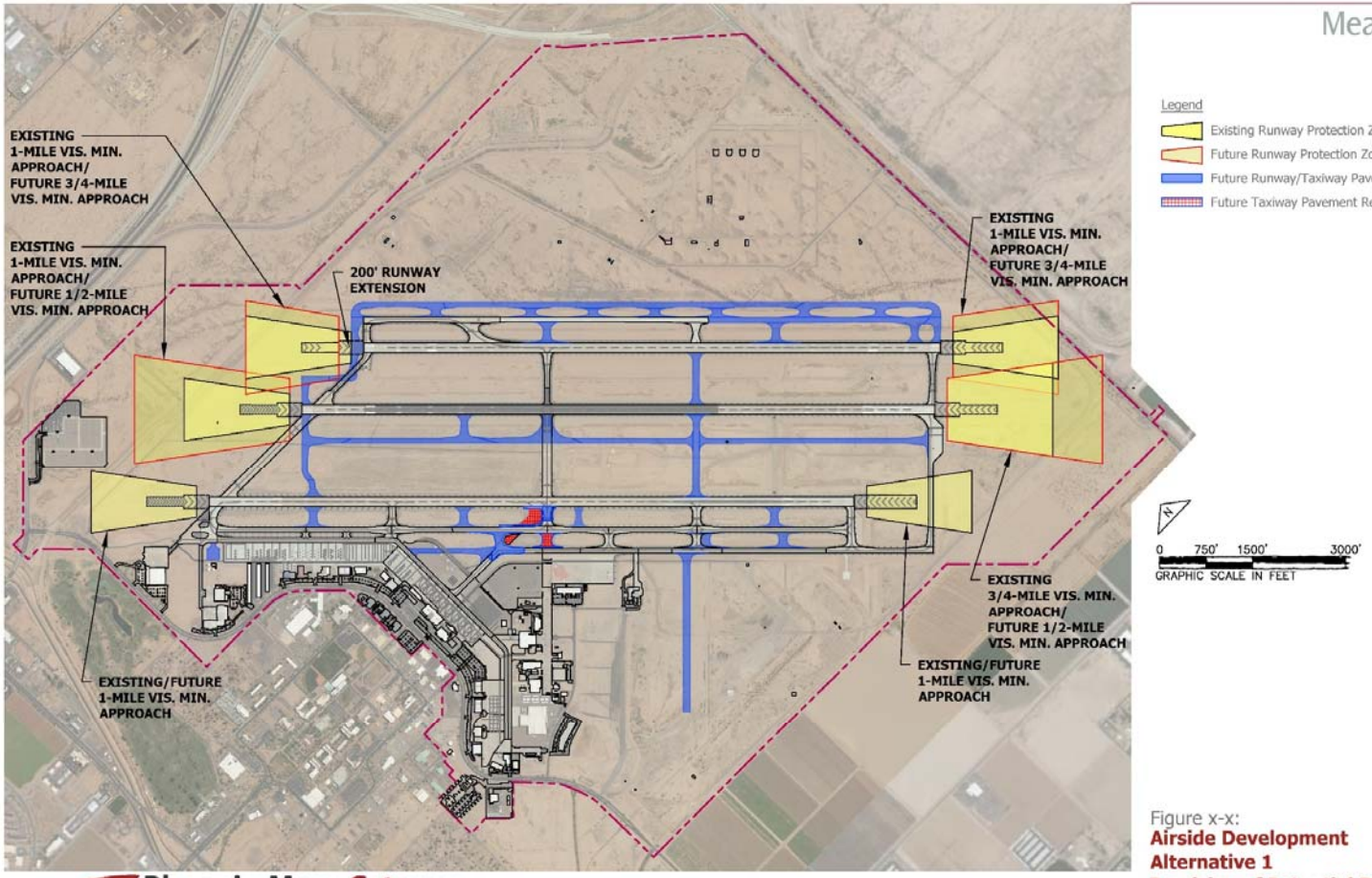


Figure x-x:
Airside Development Alternative 2
Protect for Ultimate Potential Airside Configuration



Phoenix-Mesa Gateway
Airport Master Plan

Figure x-x:
Airside Development Alternative 1
Provision of Potential Demand Driven Improvements

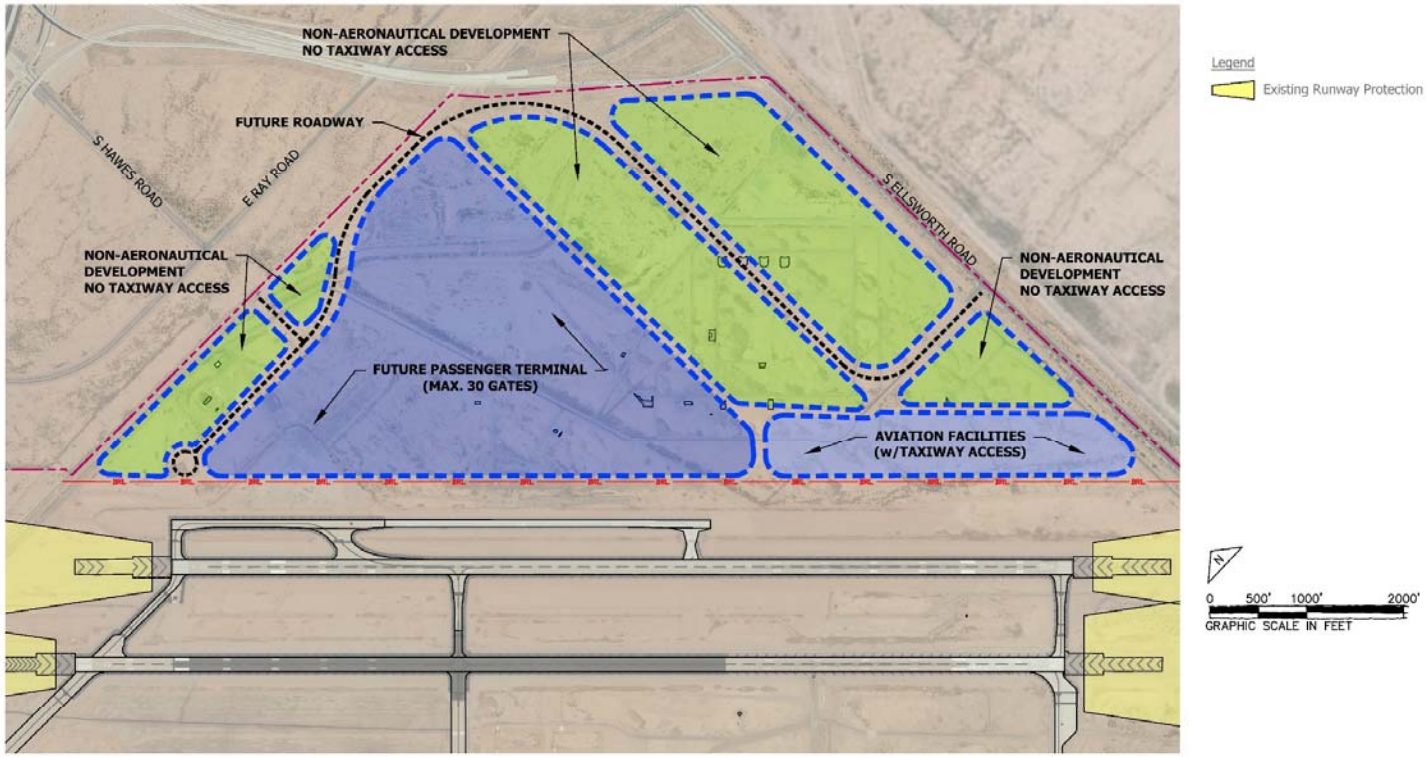


Figure x-x:
Landside Development
Eastside

Phoenix-Mesa
Gateway
Airport Master Plan

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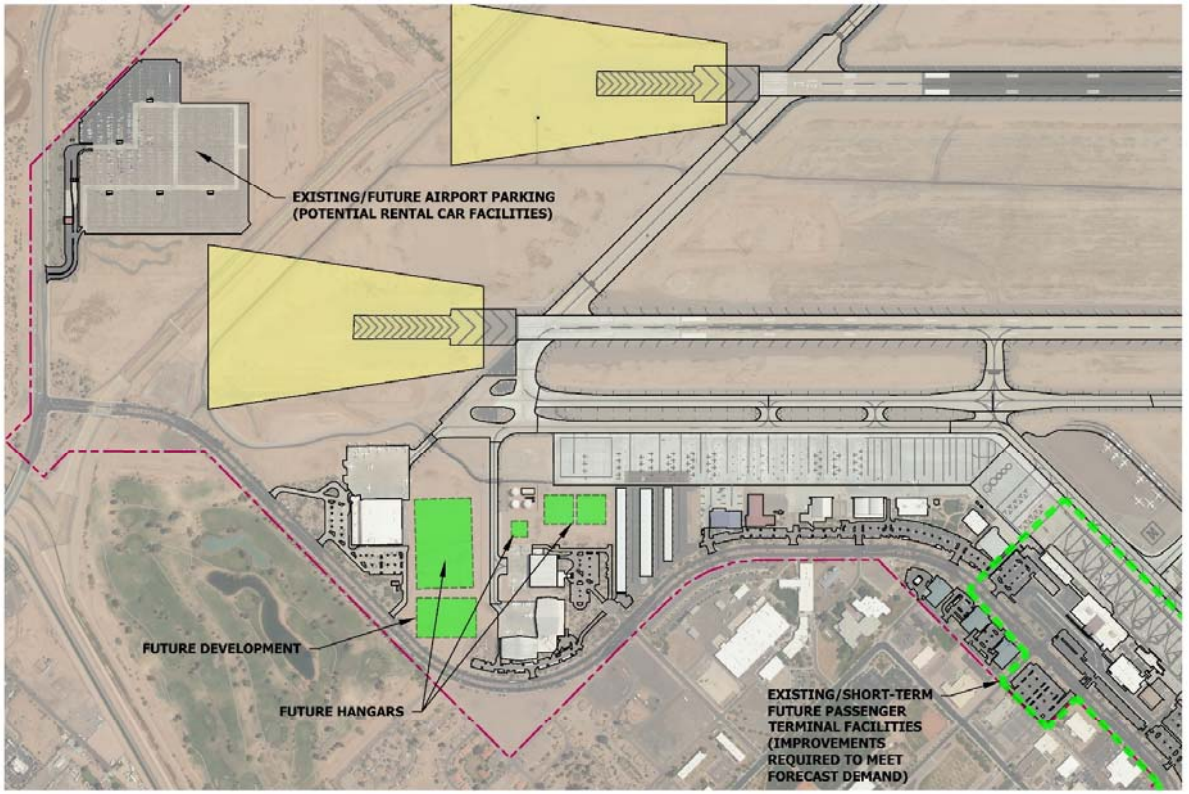

Phoenix-Mesa Gateway
Airport Master Plan

Figure x-x:
Landside Development
Westside (North)

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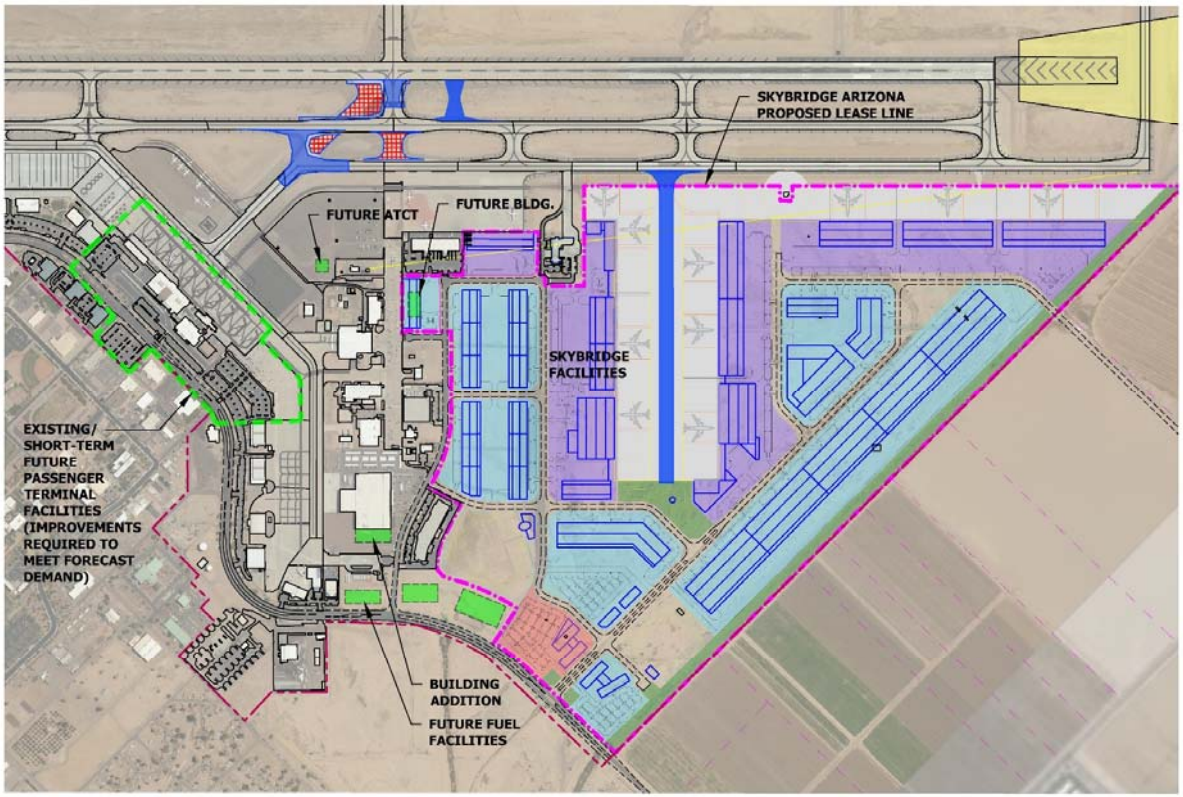

Legend
- Existing Runway Protection Zone
- Future Buildings/Development
- Future Taxiway Pavement
- Future Taxiway Pavement Removed
- SkyBridge Arizona Aviation Facilities
- SkyBridge Arizona w/No Taxiway Access
- SkyBridge Arizona Proposed Lease Line

N

0 400' 800' 1600'
GRAPHIC SCALE IN FEET

Phoenix-Mesa Gateway
Airport Master Plan

Figure x-x:
Landside Development
Westside (South)

Phoenix-Mesa
Gateway
Airport Master Plan

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Next Steps

- ✓ Advisory Committee Meetings #2 -January 15-16, 2019
- ✓ Public Information Meeting #1 - January 16, 2019
- ✓ Alternatives Evaluation and Development Plan Identification (Working Paper Three)
- ✓ Next Committee/Public Meetings April/May 2019

Phoenix-Mesa Gateway Airport Master Plan

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Phoenix-Mesa Gateway Airport
Technical Advisory Committee Meeting #4
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, June 26, 2019

SIGN-IN SHEET – PLEASE PRINT

Name	Organization	Address	Phone Number	Email Address
CW5 James Gullett	AZANG	5636 E McDowell RD	3348066057	James.S.gullett.mil@mail.mil
Brian Towle	TSA	410 N. 44th St.	6022066405	Brian.Towle@TSA.DHS.gov
Scott Sveinsson	AZARNG/CFMO	5636 E. McDowell Rd	602 629 4696	scott.sveinsson@gmail.com
Chuck Odom	PMGAA	5335 S Sossaman	480-988-7316	codom@gatewayairport.com
Richard Handorf	AZ.ARNG FMO	5636 E. McDowell Rd.	602 629 4009	richard.b.handorf.nfg@mail.mil
SUHANI SCHOTTENHEIMER	ALLEGIANT			suhanischottenheimer@allegiantair.com
Larry Randle Jr.	Textron Aviation	5533 S. Sossaman	3162854526	lrandle@txtav.com
MATT NEGGEN	PMGAA	5803 S. Sossaman	4809387704	mneggen@gatewayairport.com
J. Brian O'Neill	PMGAA	5835 So. Sossaman	480-988-7609	jboneill@gatewayairport.com
B. Sexton	PMGAA	" "	988-7608	bsexton@gatewayairport.com

Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport
Airport Master Planning Services

Phoenix-Mesa Gateway Airport
Technical Advisory Committee Meeting #4
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, June 26, 2019

SIGN-IN SHEET – PLEASE PRINT

Name	Organization	Address	Phone Number	Email Address
Rex Ginter	UND Aerospace	5865 S. Sossaman	480-988-8281	rginter@undaerospace.com
Scott Brownlee	PMGAA	5835 S Sossaman Rd	480-988-7604	SBrownlee@gatewayairport.com
Bob Draper	PMGAA	"	" 7705	bdraper@gatewayairport.com
Shea J.	PMGAA	"	7605	sjachim@gatewayairport.com
Ryan Smith	PMGAA			rsmith@gateway.com

Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport
Airport Master Planning Services

Phoenix-Mesa Gateway Airport

Master Plan – Technical Advisory Committee Meeting

June 26, 2019

Phoenix-Mesa
Gateway
Airport Master Plan

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Phoenix-Mesa
Gateway
Airport Master Plan

Agenda

- ✓ Introductory Remarks
- ✓ Project Approach and Schedule
- ✓ Forecasts of Aviation Activity Review
- ✓ Facility Requirements Review
- ✓ Airfield Alternatives
- ✓ Landside Alternative – West Side
- ✓ Landside Alternative – East Side
- ✓ Conceptual Development Plan
- ✓ Next Steps

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Project Approach

- ✓ Follow FAA Guidance
- ✓ Building Block Process
  - Inventory
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  - Facilities Needs Determination
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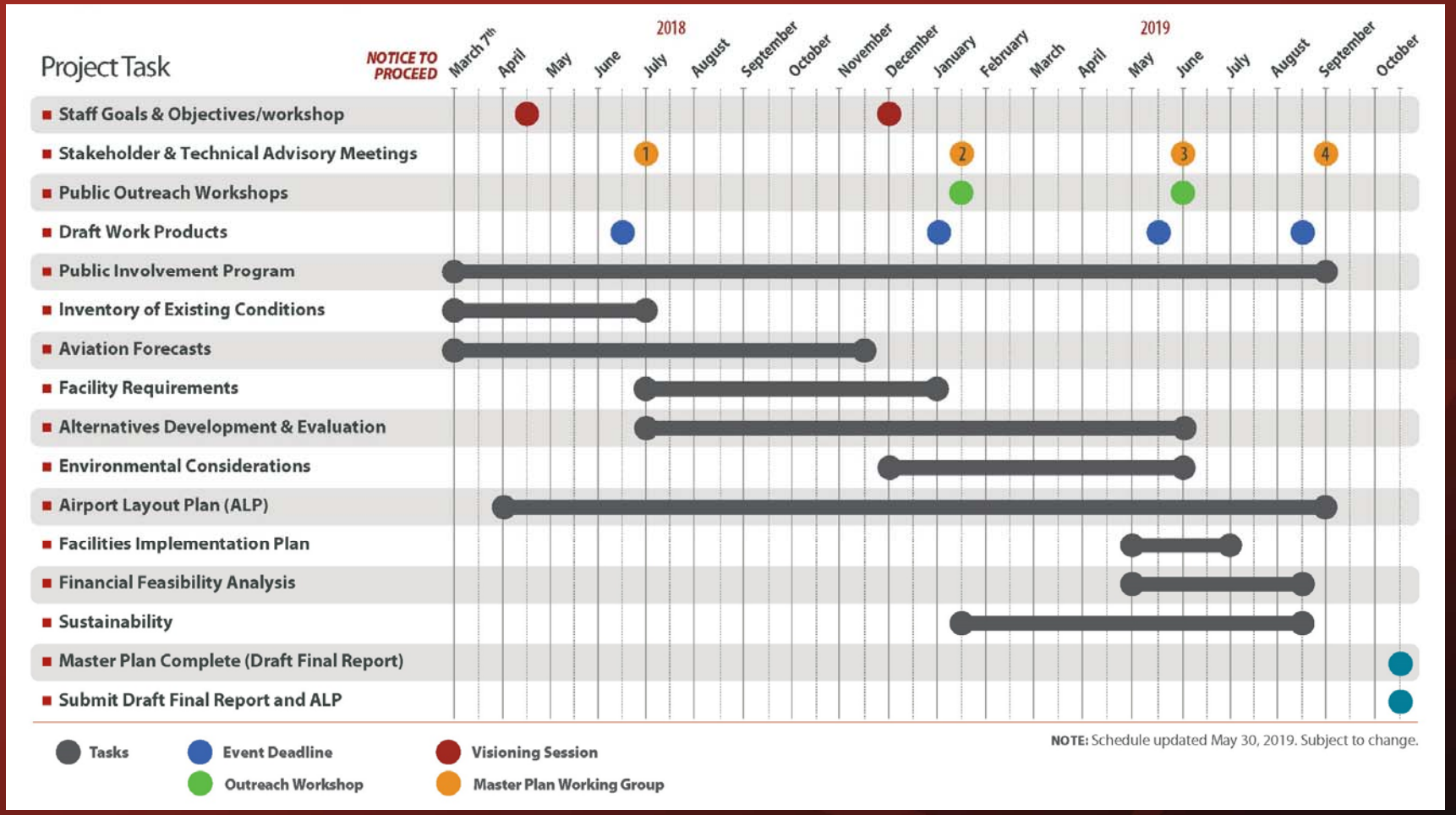
Project Schedule Airport Master Plan



Phoenix-Mesa Gateway Airport Master Plan

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Survey – Input to Facility Planning

Committee Surveys

✓ **Remains open for comments**

Public Surveys

✓ **173 responses since June 13, 2019**

- **Preliminary Results**
  - 34% of respondents indicate they have utilized Gateway 5 or more times in the past five years
  - 70% of respondents indicated low cost parking was important (more important than proximity to terminal)
  - 42% indicated airline destinations critical factor
  - 35% indicated proximity to home critical factor

Airport Master Plan-
FAA Approved Forecast

Enplanement Forecast:
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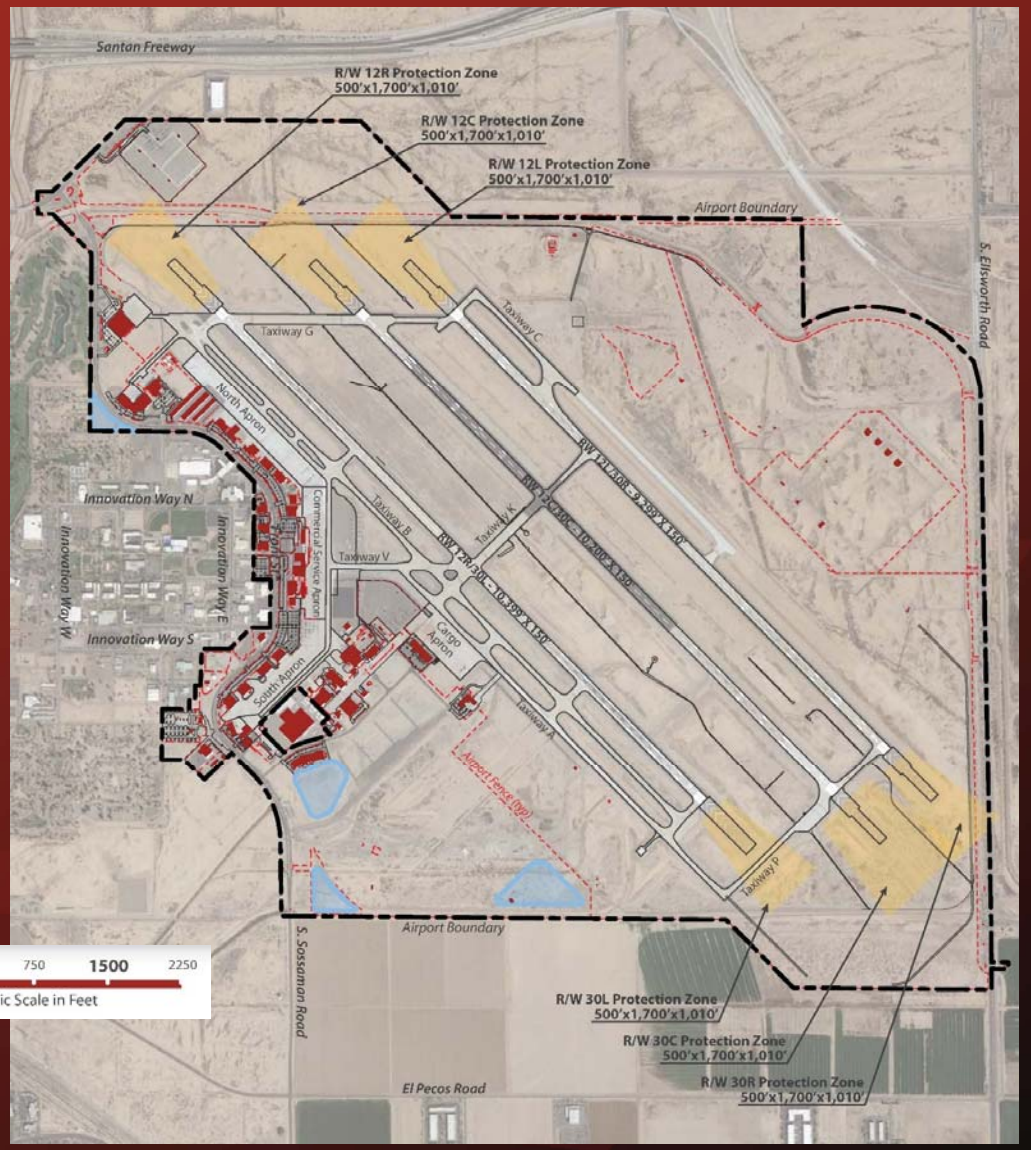
Existing Airport Facilities



Phoenix-Mesa
Gateway
Airport Master Plan

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Airside Alternatives

Phoenix-Mesa
Gateway
Airport Master Plan

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Airfield Configuration

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- ✓ Exit and Connecting Taxiways

Phoenix-Mesa Gateway Airport Master Plan

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Airfield Development: *ALTERNATIVE 1*

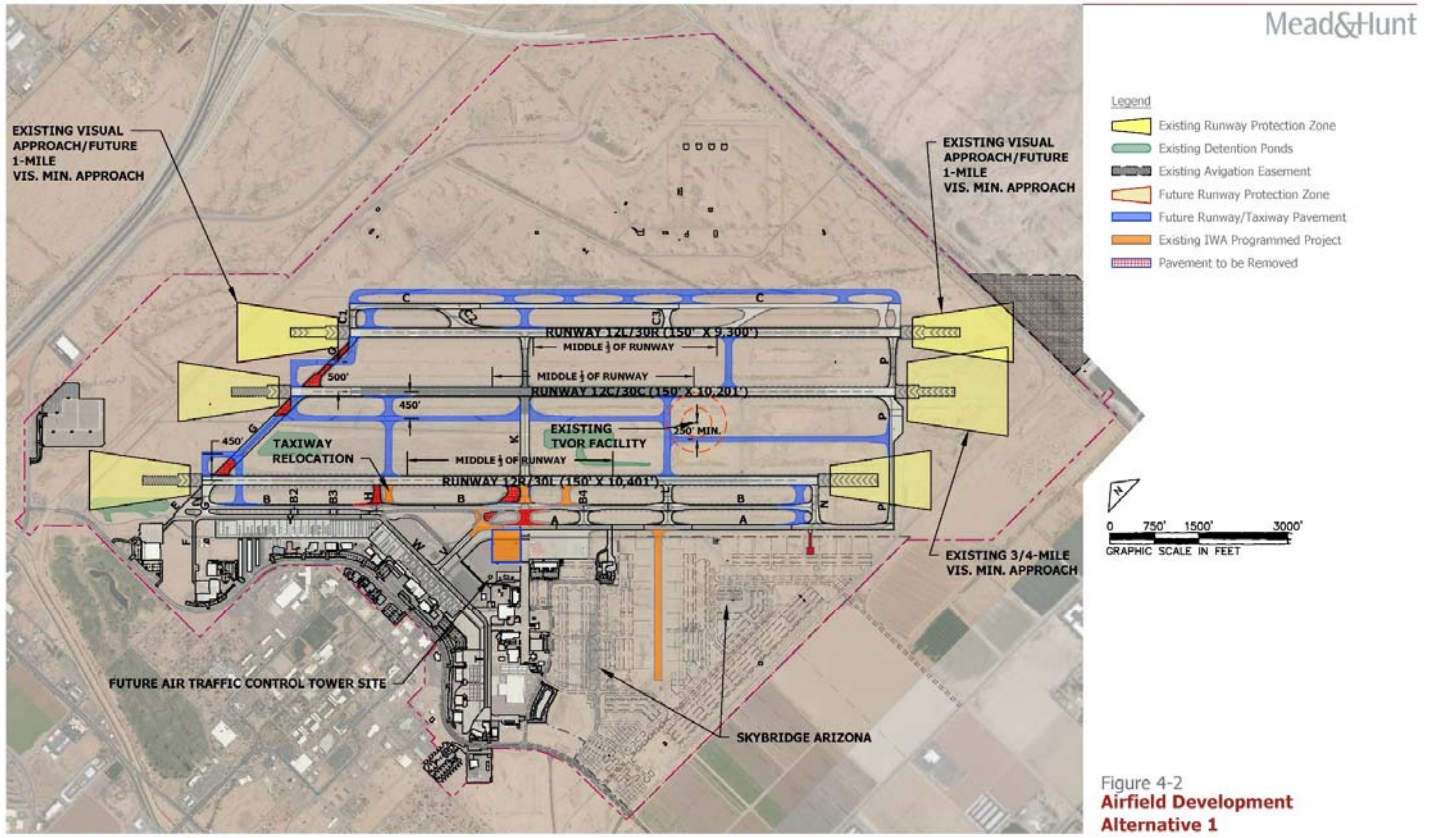

Figure 4-2
Airfield Development
Alternative 1

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Airfield Development: *ALTERNATIVE 2*

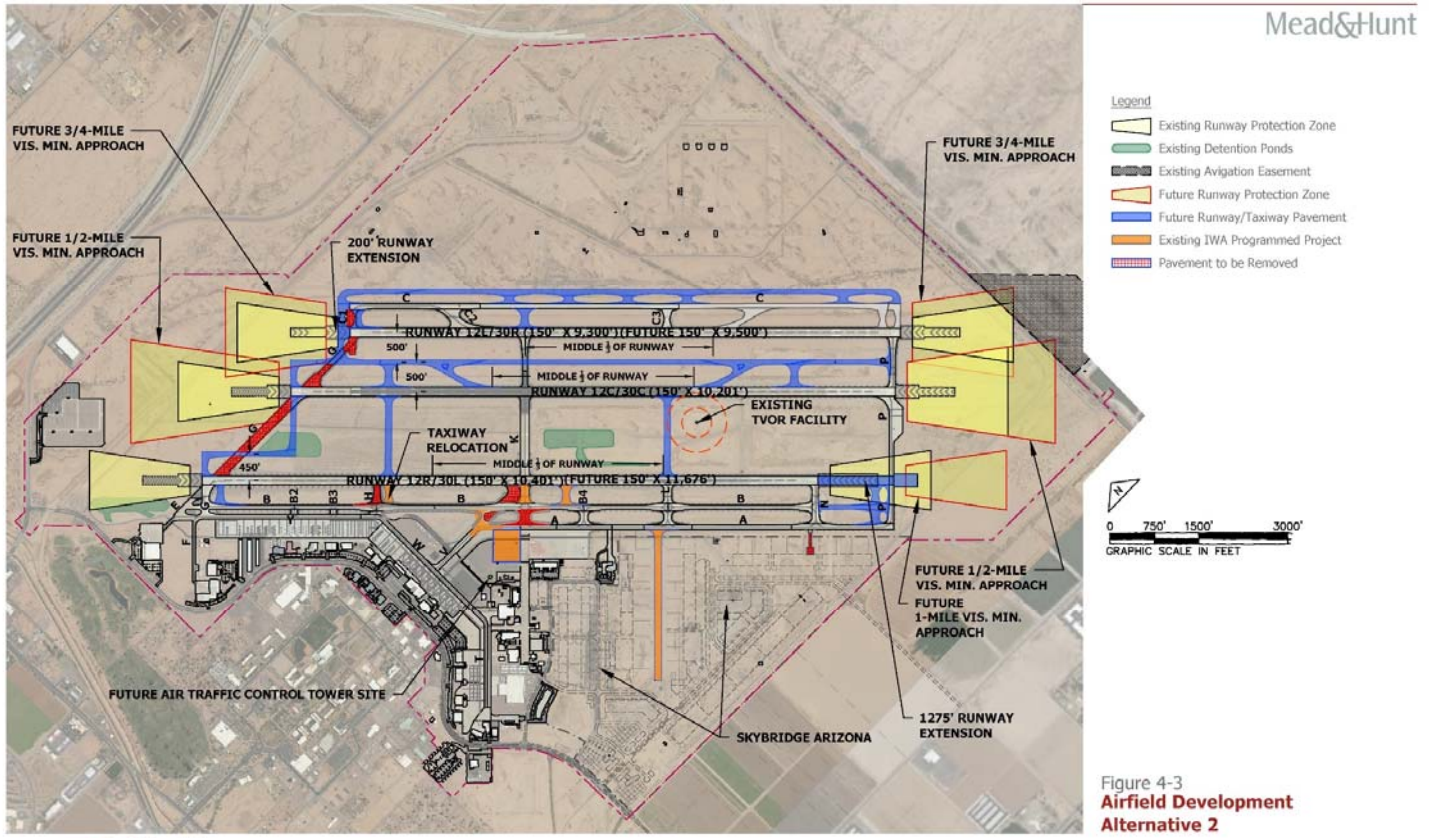

Figure 4-3
Airfield Development
Alternative 2

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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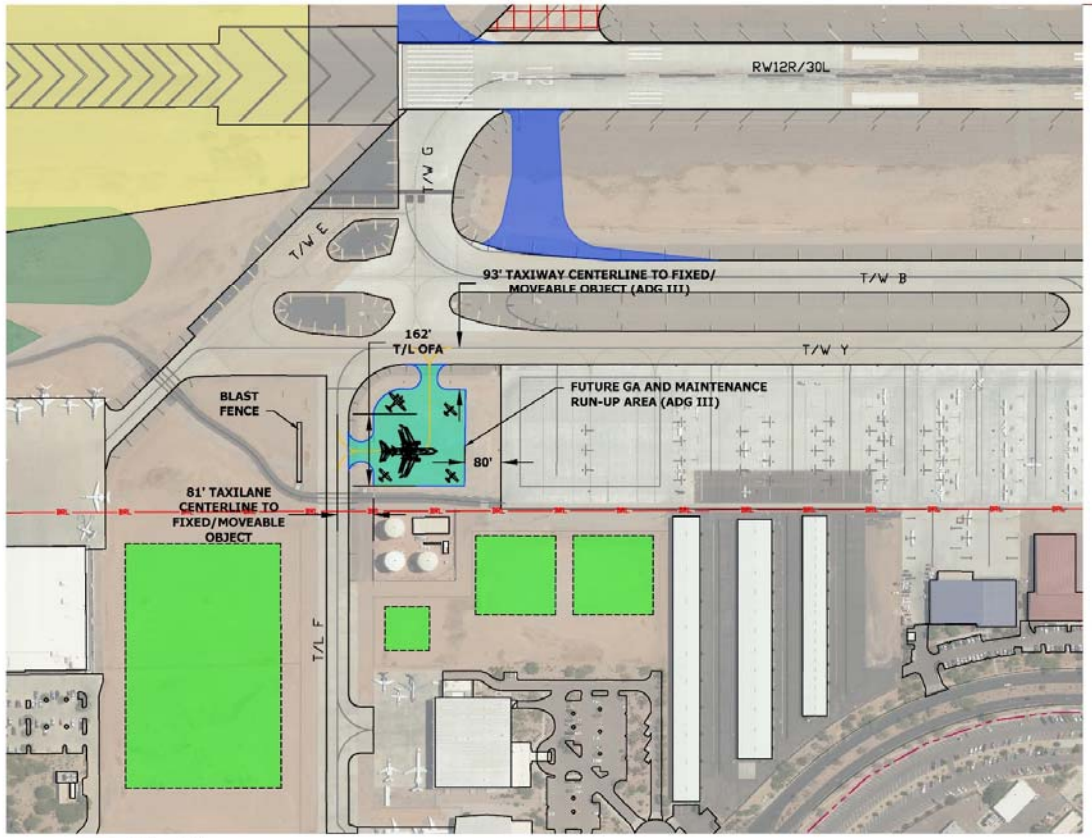
Run-Up Area: *ALTERNATIVE 1*



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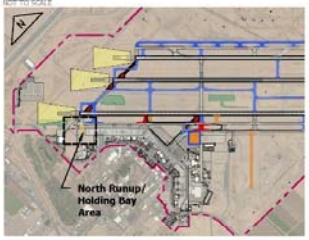
Key Map



Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Pavement to be Removed
- Future Buildings/Development

0 100' 200' 400'
GRAPHIC SCALE IN FEET

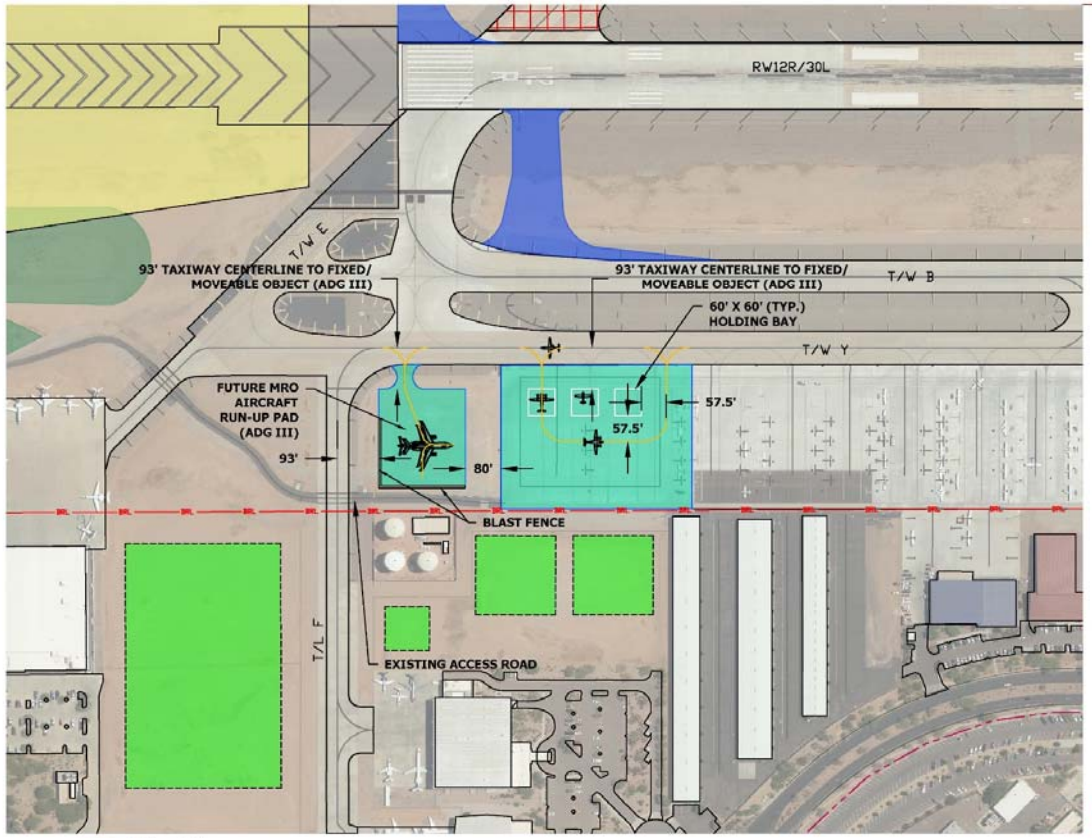
GA and Maintenance Run-up Area Design Criteria
- Illustrates ADG III TOFA Criteria

Figure 4-4
Dependent Aircraft Run-Up Area - ADG II/III
Alternative 1

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Run-Up : *ALTERNATIVE 2*



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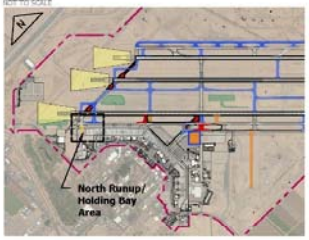
Key Map



Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Pavement to be Removed
- Future Buildings/Development

0 100' 200' 400'
GRAPHIC SCALE IN FEET

GA Run-up/Holding Bay Design Criteria
- Illustrates ADG II & III TOFA Criteria

MRO Run-up Pad Design Criteria
- Illustrates ADG III TOFA Criteria

Figure 4-5
North GA Run-up/Holding Bay & Maintenance Run-up Area Alternative 2

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Phoenix-Mesa
Gateway
Airport Master Plan

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Compass Calibration Pad: *ALTERNATIVE 1*

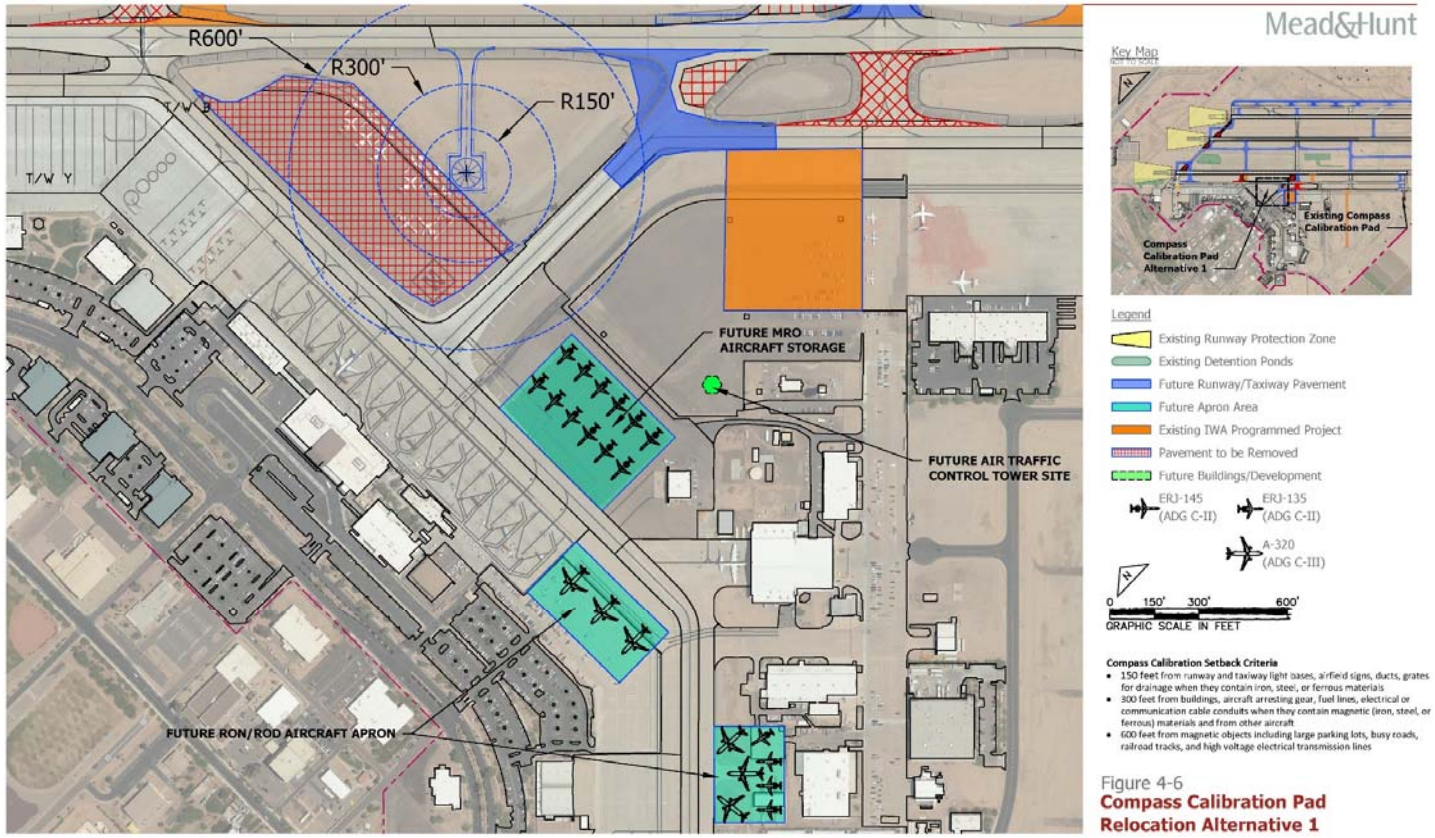

Figure 4-6
Compass Calibration Pad Relocation Alternative 1

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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Compass Calibration Pad: *ALTERNATIVE 2*

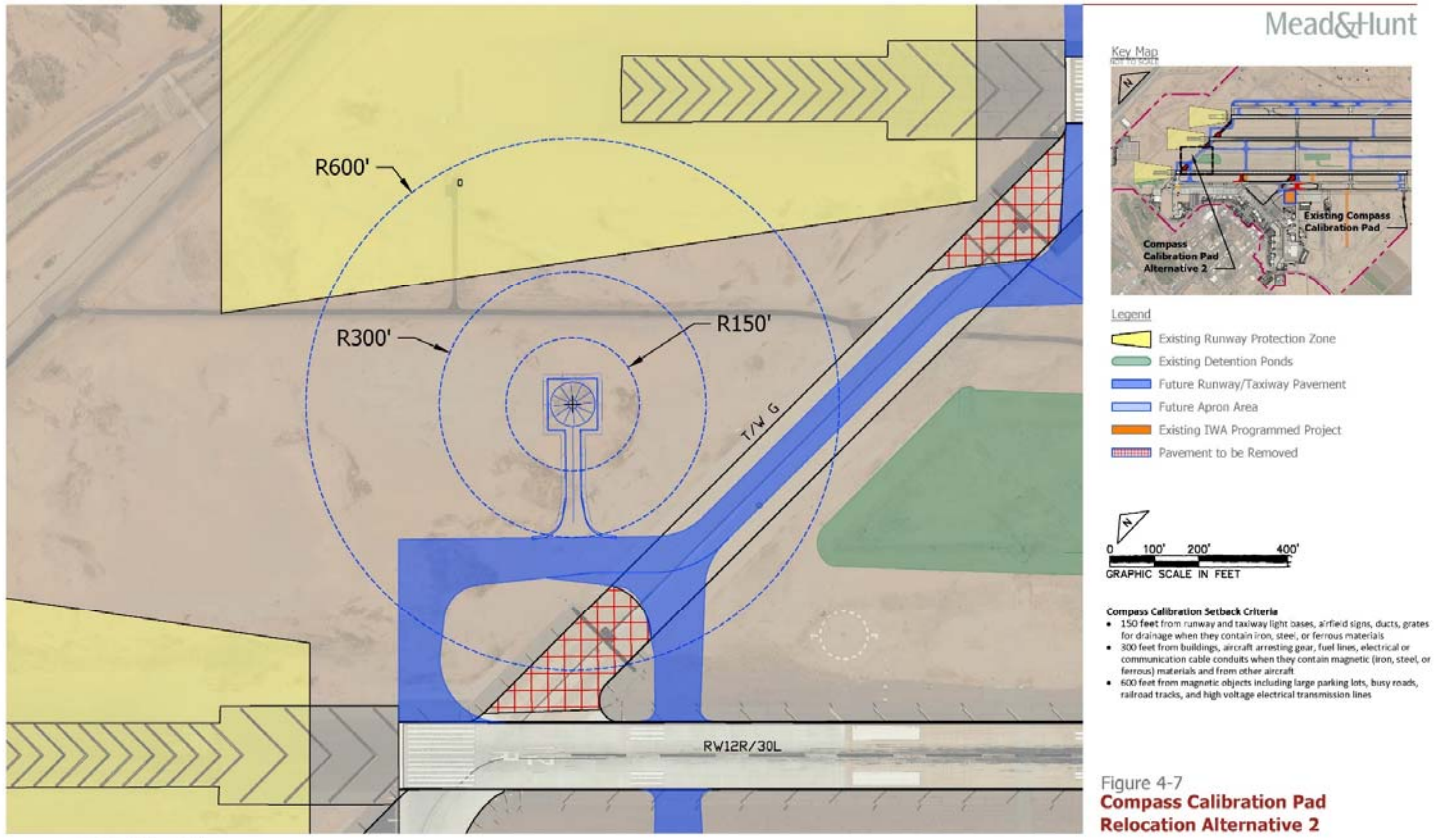

Figure 4-7
Compass Calibration Pad Relocation Alternative 2

Phoenix-Mesa Gateway Airport

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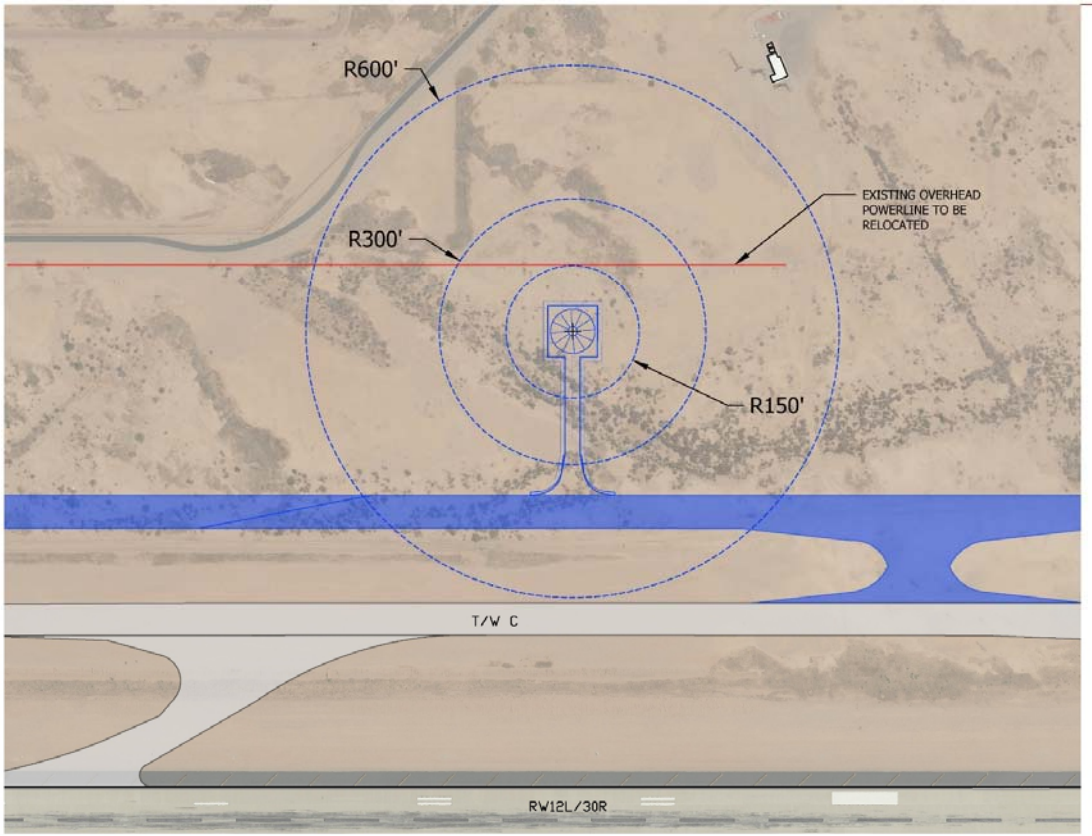
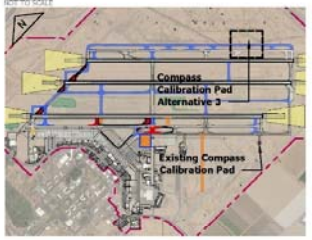
Compass Calibration Pad: *ALTERNATIVE 3*



Mead&Hunt

Key Map



Legend

- Existing Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Existing IWA Programmed Project
- Pavement to be Removed

0 100' 200' 400'
GRAPHIC SCALE IN FEET

Compass Calibration Setback Criteria

- 150 feet from runway and taxiway light bases, airfield signs, ducts, grates for drainage when they contain iron, steel, or ferrous materials
- 800 feet from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
- 600 feet from magnetic objects including large parking lots, busy roads, railroad tracks, and high voltage electrical transmission lines

Figure 4-8
Compass Calibration Pad Relocation Alternative 3

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Airport Master Plan Update

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Landside Alternatives - West Side

Phoenix-Mesa
Gateway
Airport Master Plan

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Terminal Requirements Summary

Functional Area	Existing (supply) *(a)*	PAL 1 (2023)	PAL 2 (2028)	PAL 3 (2038)
CHECK-IN (TICKETING)				
Queue (sf)	4,500	3,550	3,700	4,350
Counters/Bag drops	32	26	27	31
CHECKED BAGGAGE				
EDS machines *(b)*	2 CT-80	3 MS-EDS	4 MS-EDS	4 MS-EDS
Makeup area (sf)	11,500	11,400	12,800	15,700
SECURITY SCREENING CHECKPOINT				
Queue (sf)	1,725	1,700	1,900	2,625
Lanes	5	5	5	5
PASSENGER HOLDROOM				
Holdroom (sf)	15,260	13,000	15,300	19,700
Podium, queueing, egress (sf)	3,950	3,150	3,675	4,725
APRON (GATES)	6 ADG III, 4 B757	8 ADG III	9 ADG III	11 ADG III
BAGGAGE CLAIM (DEVICES)	2	2	3	3

(a) Existing queues are estimated based on terminal drawings
(b) Requirement, which is based on a hypothetical medium speed inline system (MS-EDS), includes one EDS machine for redundancy

Public Parking Demand Forecasts

(Master Plan Projected Growth Rate)

Lot		FY 2018 Peak	Short – Term	Mid – Term	Long – Term
Hourly Express Lot	Supply	183	183	183	183
	Effective Supply	156	156	156	156
	Demand	194	242	265	326
	Surplus/Deficit	**-38**	**-86**	**-109**	**-170**
Daily Lot	Supply	871	871	871	871
	Effective Supply	740	740	740	740
	Demand	717	894	982	1,205
	Surplus/Deficit	**23**	**-154**	**-241**	**-465**
Ray Road Economy Lot	Supply	2,812	2,812	2,812	2,812
	Effective Supply	2,390	2,390	2,390	2,390
	Demand	747	931	1022	1255
	Surplus/Deficit	**1643**	**1459**	**1368**	**1135**
Grand Total	Supply	3,866	3,866	3,866	3,866
	Effective Supply	3,286	3,286	3,286	3,286
	Demand	1,658	2,067	2,270	2,787
	Surplus/Deficit	**1,628**	**1,219**	**1,017**	**499**

- ✓ **Effective Supply**
  - **Best practices for managing parking supply suggest that parking supply is at capacity when the demand reaches 85% utilization**
- ✓ **Deficits**
  - **Immediate**
    - Hourly Lot, based on observed condition. Lot should be considered at or near capacity.
  - **Short, Mid, Long-Term**
    - Hourly Express Lot
    - Daily Lot
- ✓ **Surplus**
  - **Immediate, Short, Mid, Long-Term**
    - Significant surplus in Economy Lot throughout planning horizon

Phoenix-Mesa Gateway Airport Master Plan

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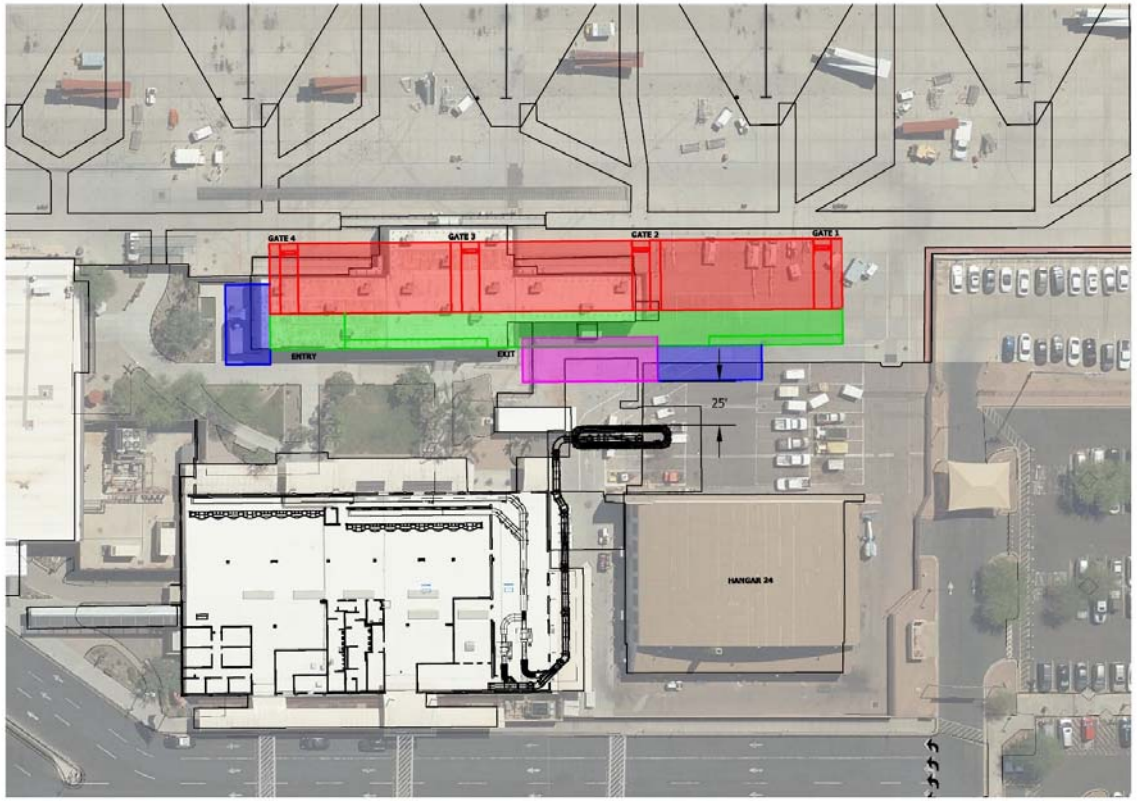
Terminal Annex Redevelopment Plan



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Legend
- Departure Lounges
- Food & Beverage
- Concourse
- Restroom

N
0 25' 50' 100'
GRAPHIC SCALE IN FEET

Phoenix-Mesa Gateway Airport

Figure 4-9
Terminal Annex Redevelopment Plan

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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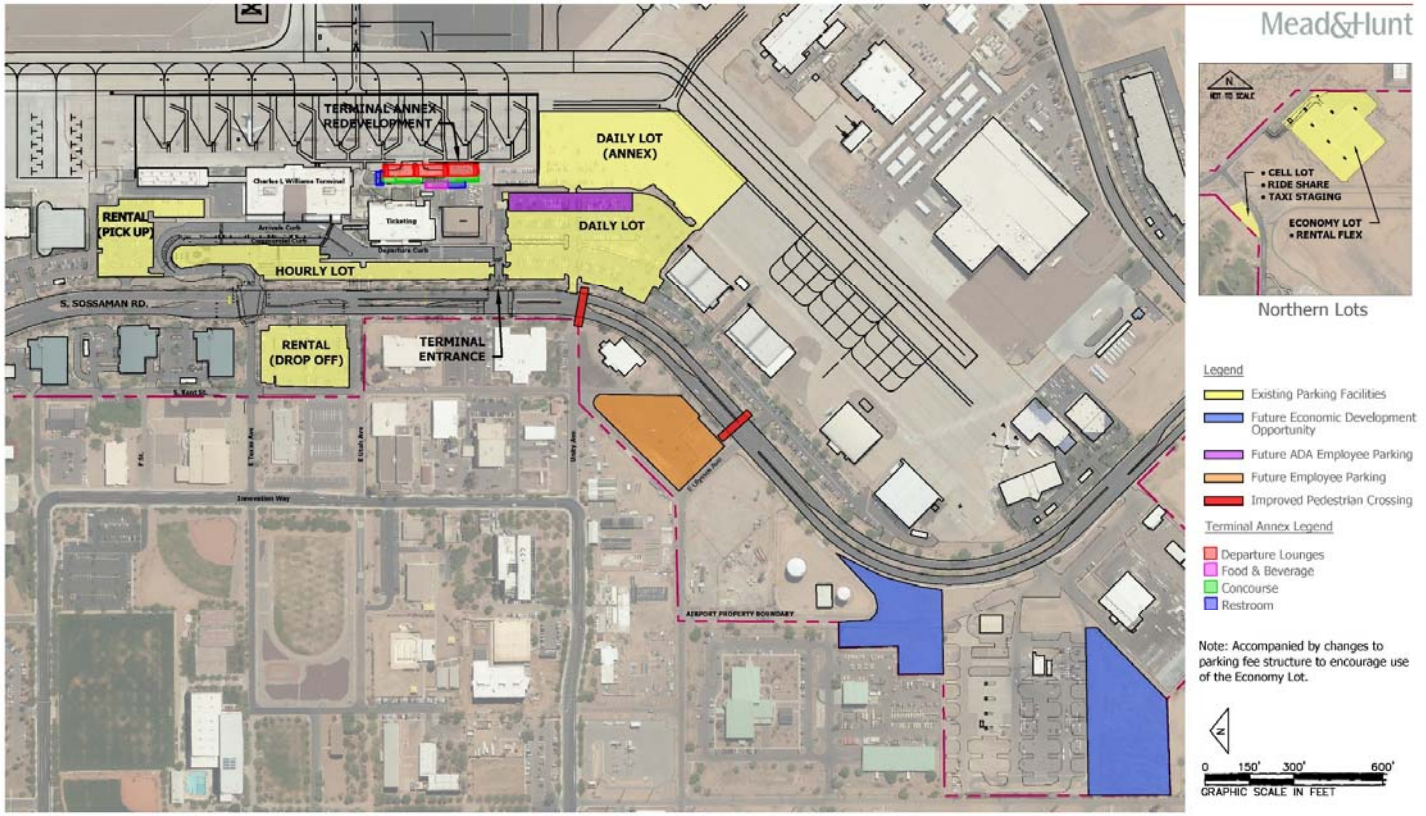
Passenger Terminal Support Facilities

- ✓ Access Roadway System
- ✓ Passenger Parking System
- ✓ Rental Car Parking
- ✓ Employee Parking
- ✓ Temporary Parking (Cell Phone Lot)

Westside Development: *ALTERNATIVE 1: Short Term*



Phoenix-Mesa Gateway Airport

Figure 4-10
Westside Development - Facility Improvement Alternative 1 Short Term
Airport Master Plan Update

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Westside Development: *ALTERNATIVE 1: Mid Term*

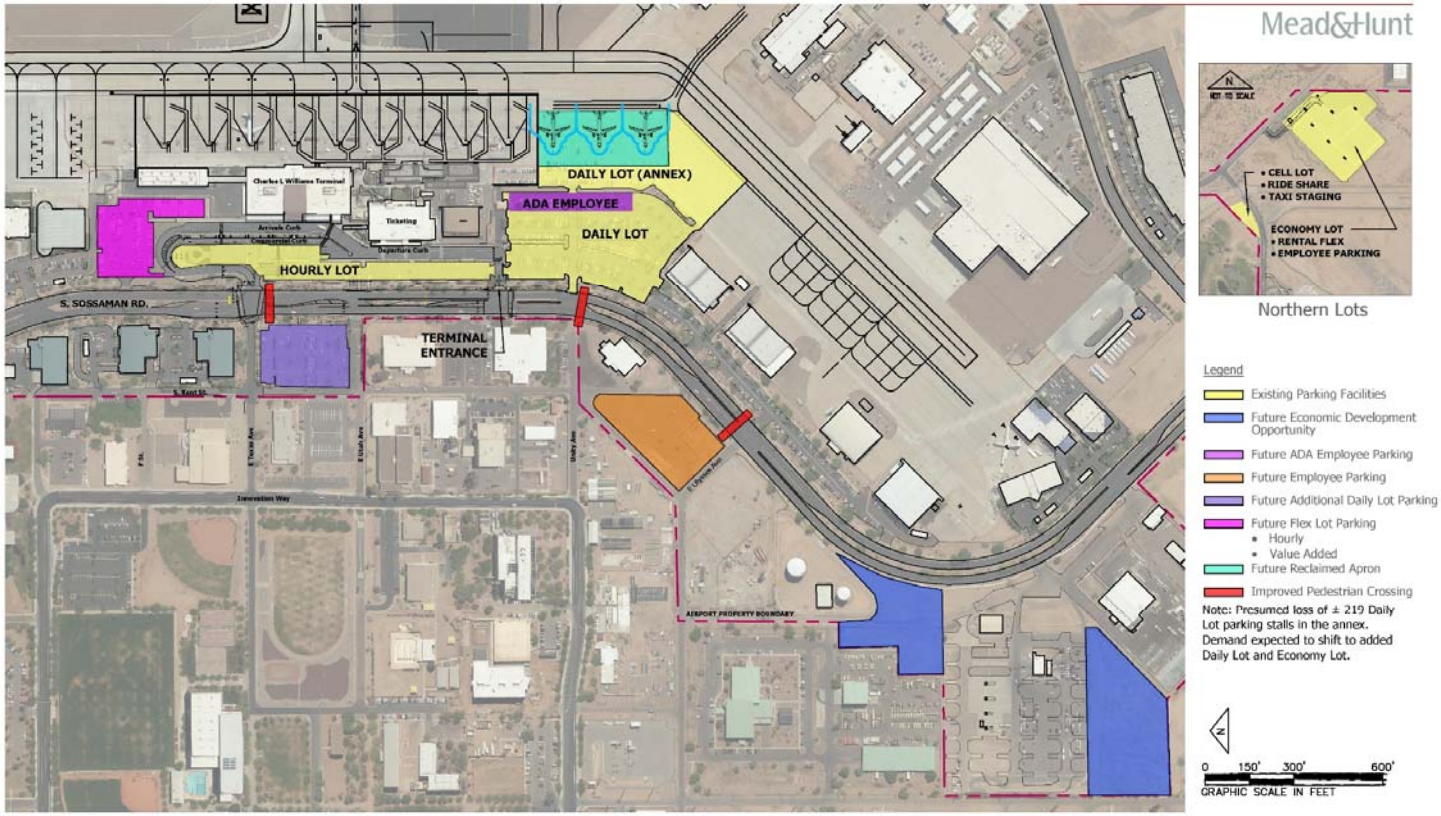

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Figure 4-11
Westside Development - Facility Improvement Alternative 1 Mid Term
Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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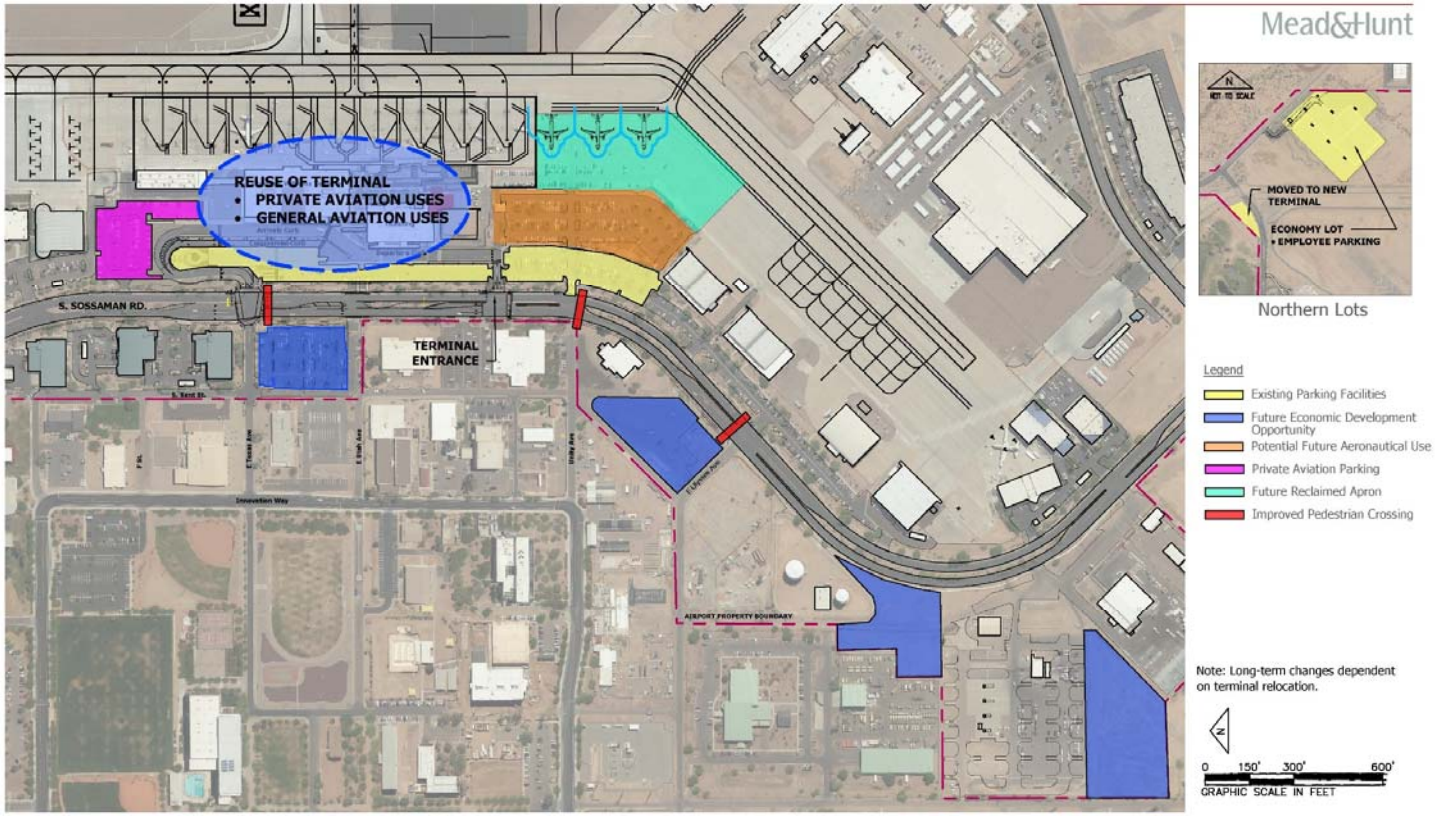
Westside Development: *ALTERNATIVE 1: Long Term*



Phoenix-Mesa Gateway Airport

Figure 4-12
Westside Development - Facility Improvement Alternative 1 Long Term
Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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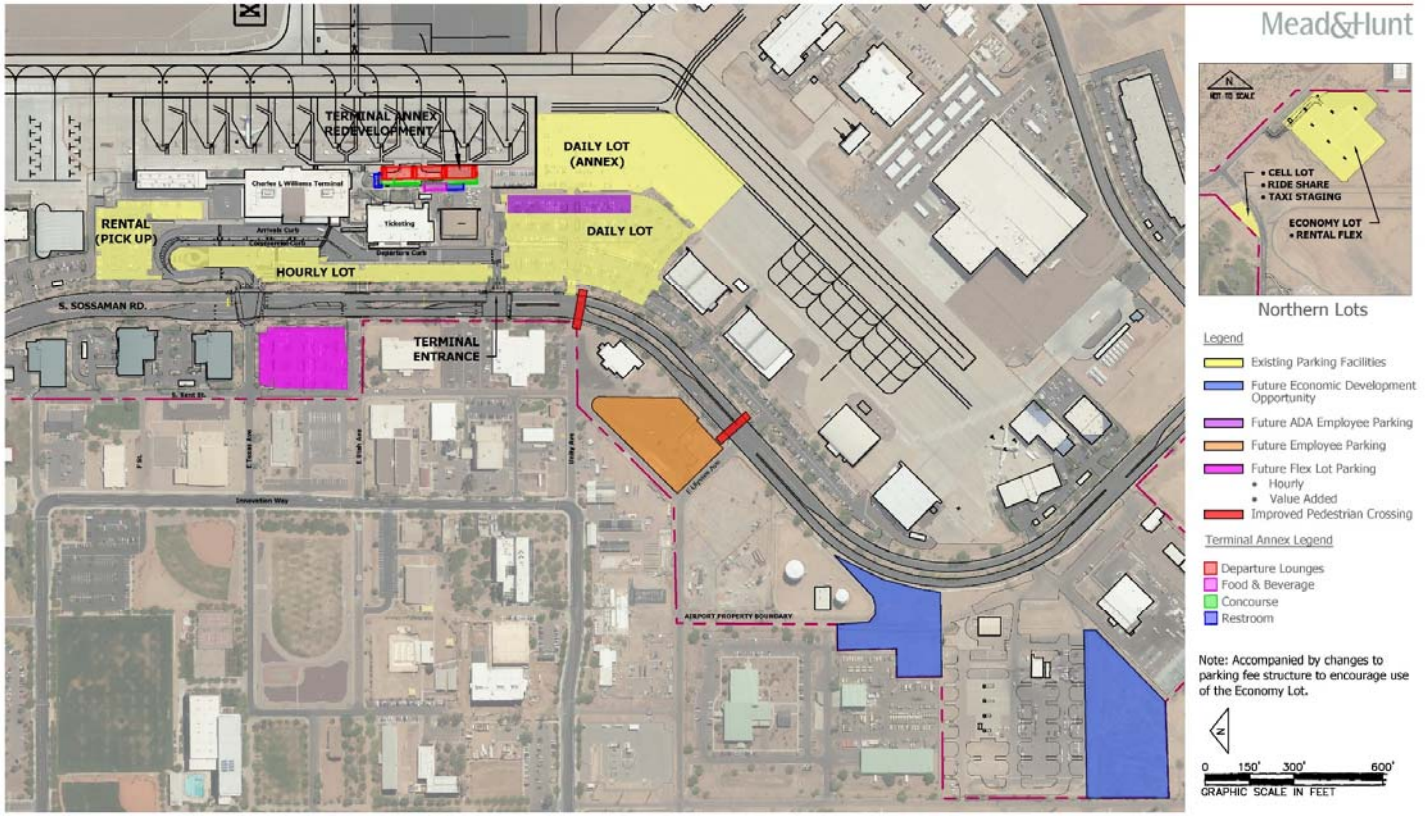
Westside Development: *ALTERNATIVE 2: Short Term*



Phoenix-Mesa Gateway Airport

Figure 4-13
Westside Development - Facility Improvement Alternative 2 Short Term
Airport Master Plan Update

Phoenix-Mesa **Gateway** Airport Master Plan

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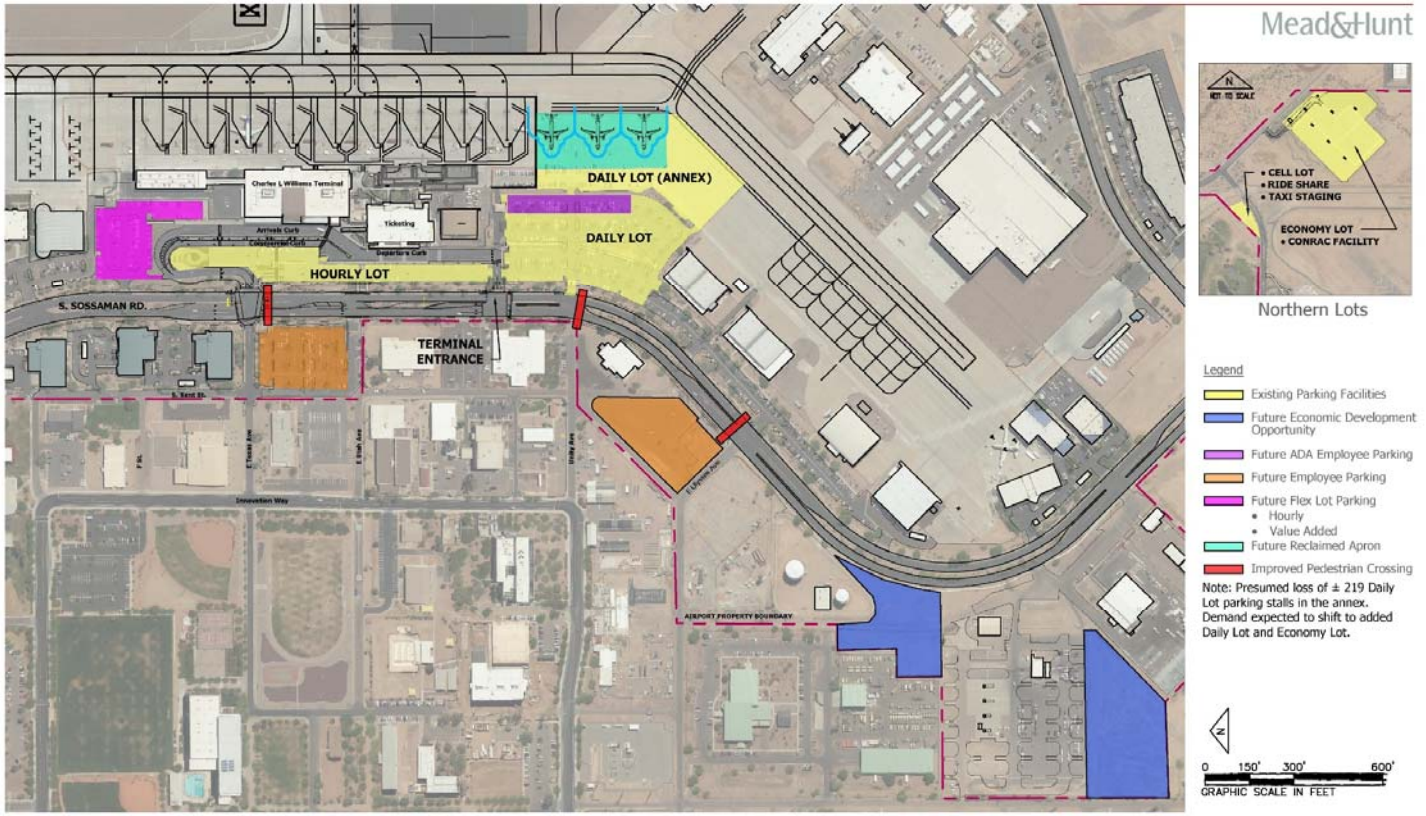
Westside Development: *ALTERNATIVE 2: Mid Term*

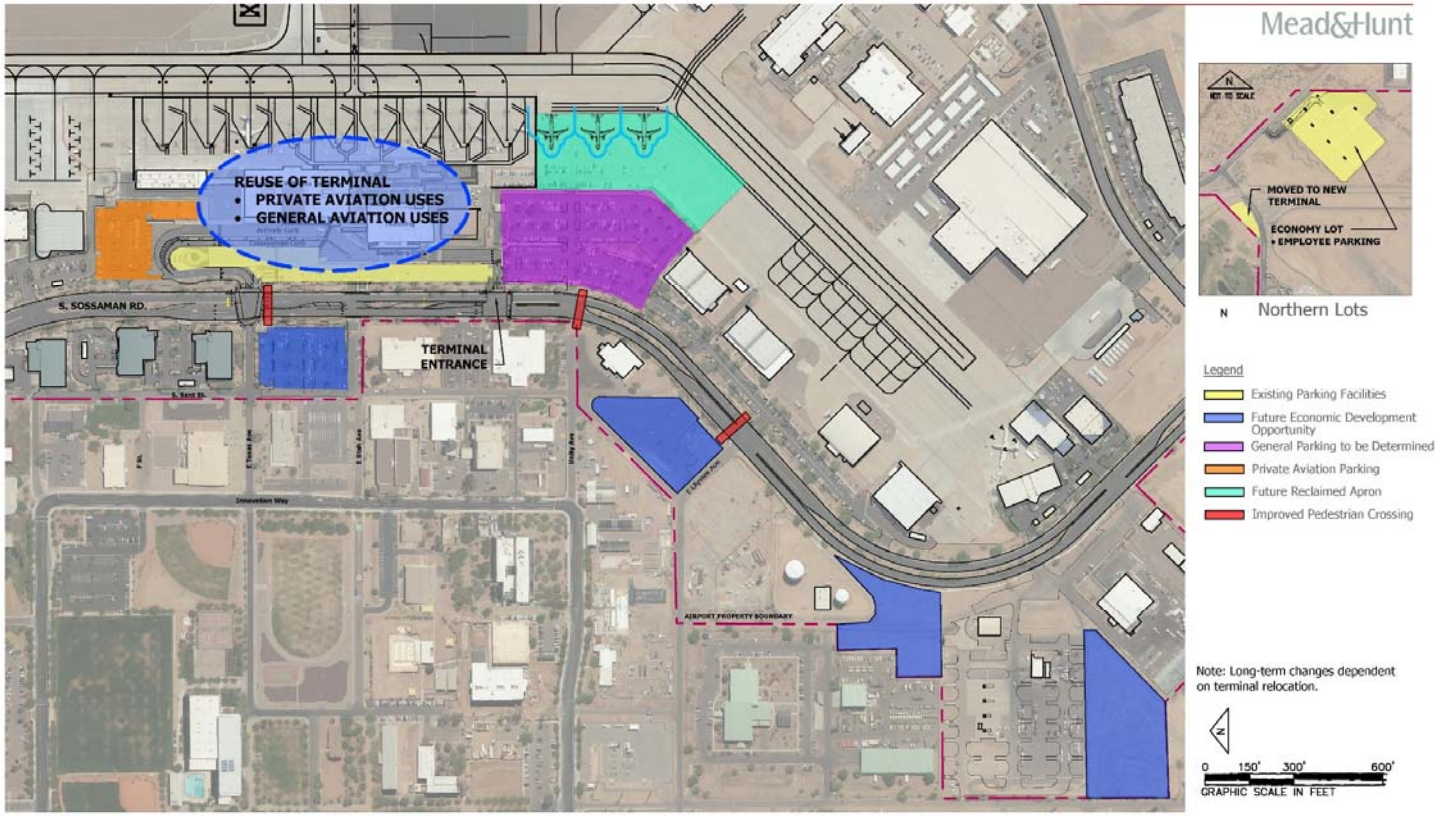


Phoenix-Mesa Gateway Airport

Figure 4-14
Westside Development - Facility Improvement Alternative 2 Mid Term

Airport Master Plan Update

Westside Development: *ALTERNATIVE 2: Long Term*



Phoenix-Mesa Gateway Airport

Figure 4-15
Westside Development - Facility Improvement Alternative 2 Long Term
Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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Westside Terminal Break-Point Issues

Goal: Maintain "Just Plane Easy"

- ✓ Access Roadway - Sossaman Road (how much airport and non-airport traffic can be accommodated without experiencing unacceptable delay?)
- ✓ Size – area (acres) dedicated to passenger terminal facilities (how much stuff will the five pound bag hold before experiencing unacceptable delay)
- ✓ Passenger terminal buildings useful life
- ✓ Additional airlines and or addition service
- ✓ Desire for international facilities

Landside Alternatives - East Side

Phoenix-Mesa
Gateway
Airport Master Plan

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Passenger Terminal Area Acres Comparison

- ✓ IWA Existing - 36 Acres/763,542 K Enplaned PAX 2018 (1.2 M Forecast)/10 aircraft parking positions
- ✓ Northwest Arkansas Regional Airport - 124 Acres/725 K Enplaned PAX 2017/15 aircraft parking positions
- ✓ Tulsa International Airport – 103 Acres/1.4 M PAX 2017/22 Aircraft Parking Positions

Terminal Development: *ALTERNATIVE 1*

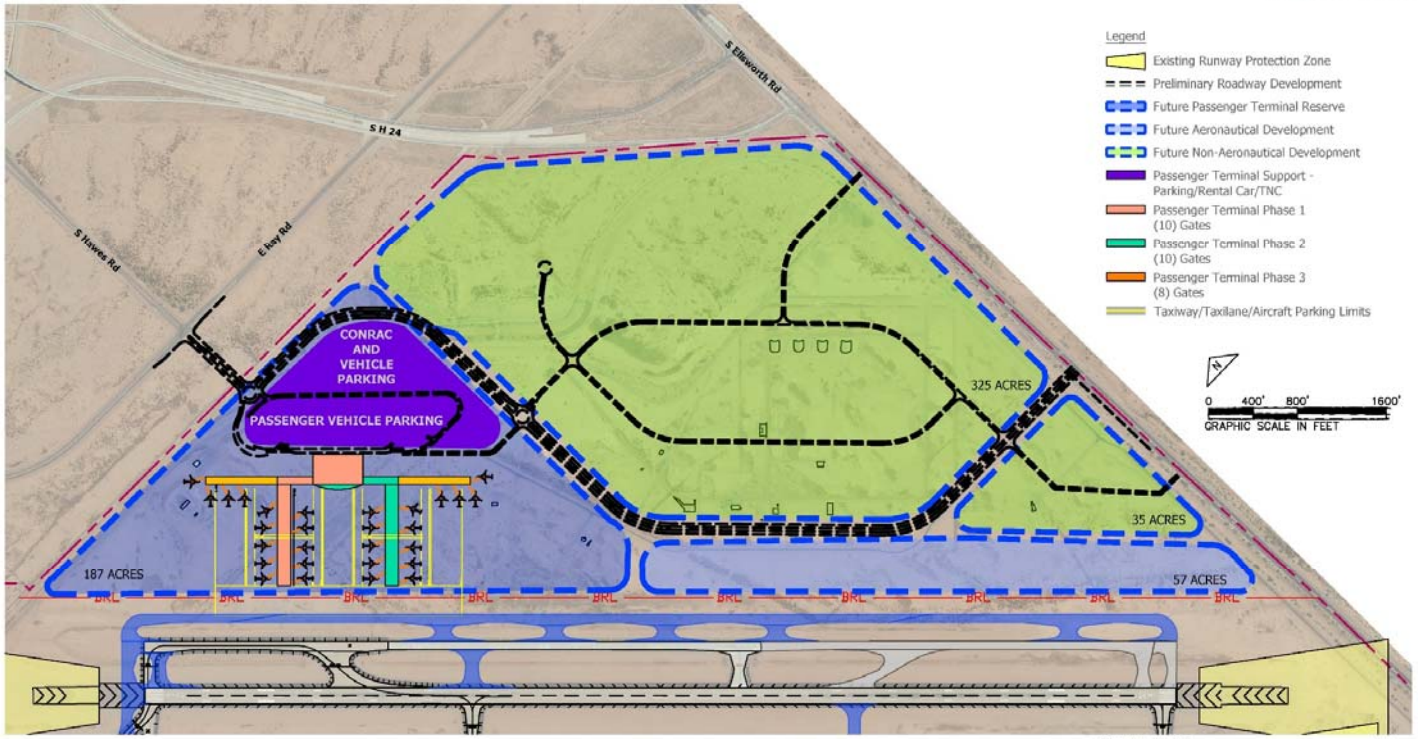

Figure 4-16
Terminal Development
Alternative 1
Pier-Finger Design - 28 Gates

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Terminal Development: *ALTERNATIVE 2*

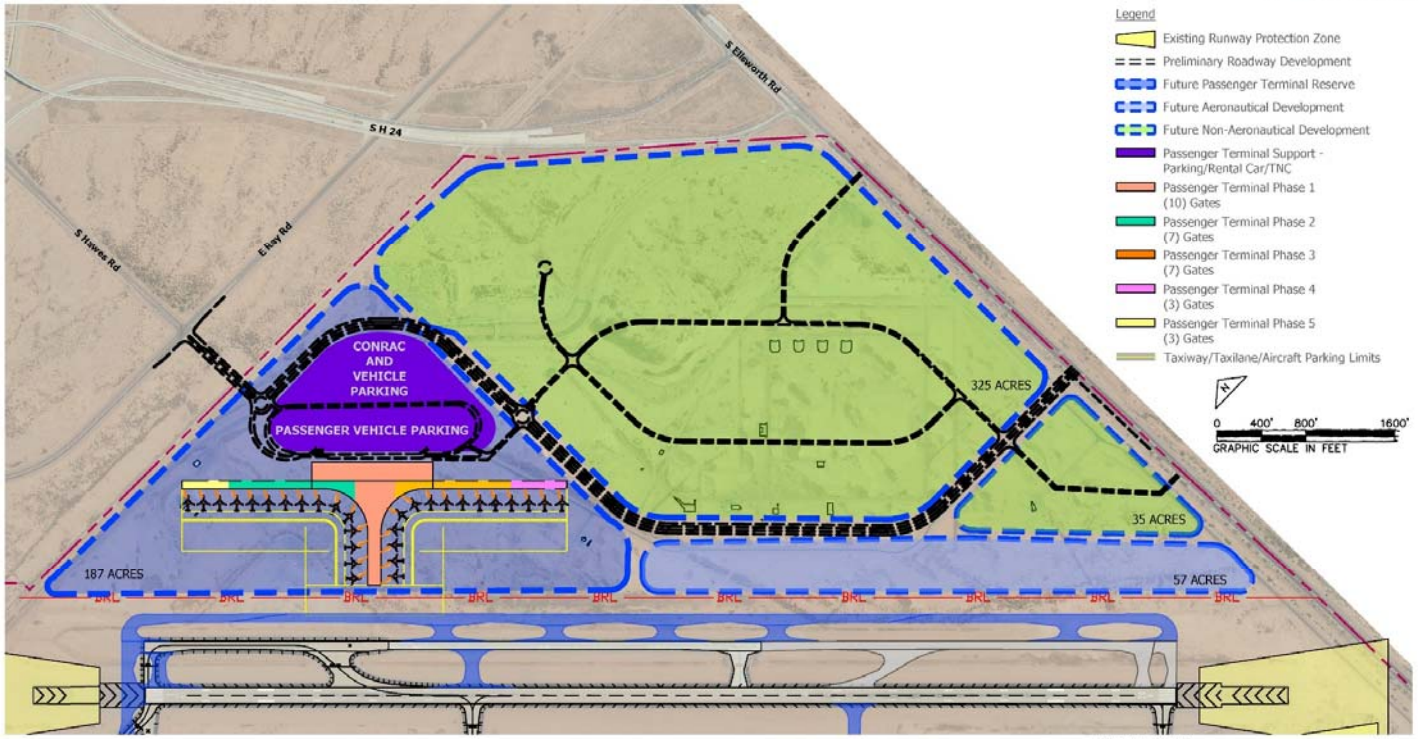

Figure 4-17
Terminal Development
Alternative 2
Curvilinear-Pier Design - 28 Gates

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Terminal Development: *ALTERNATIVE 3*

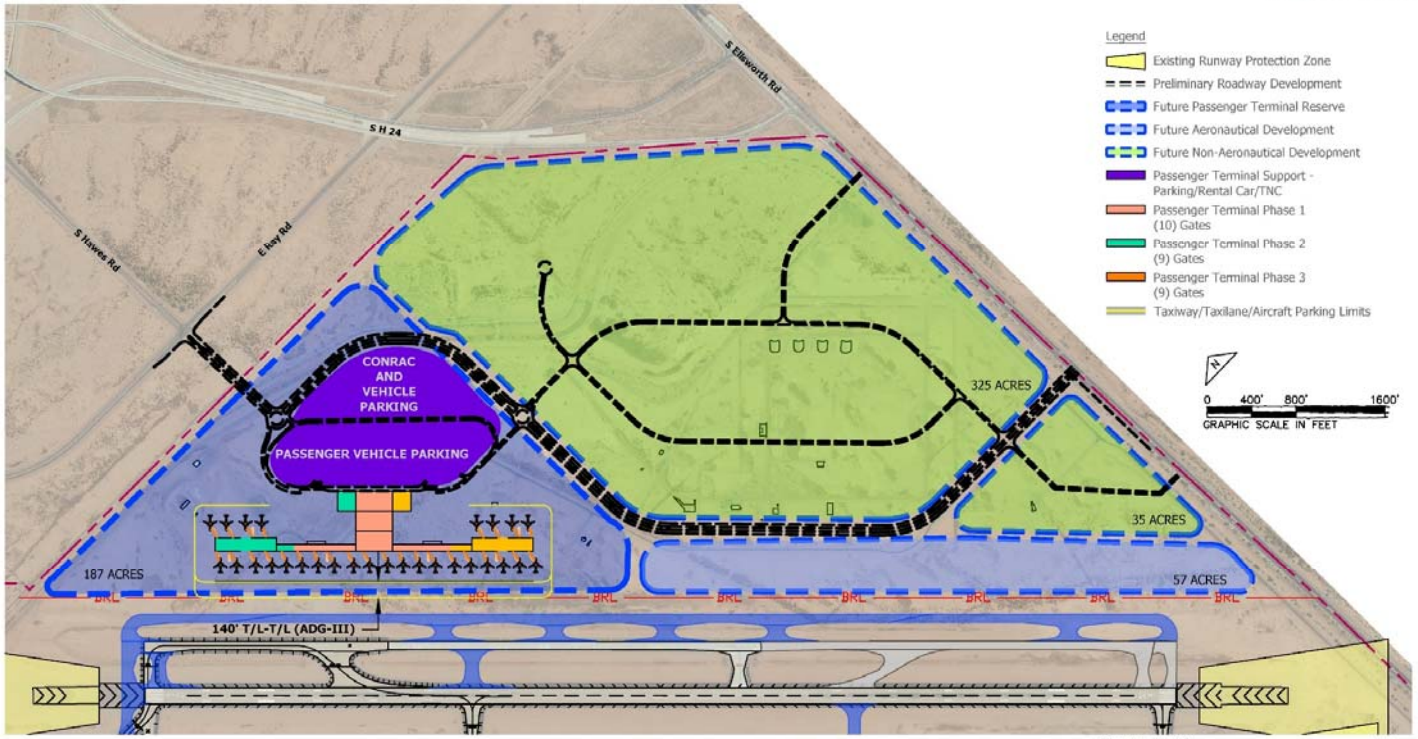

Figure 4-18
Terminal Development
Alternative 3
Linear-Pier Design - 28 Gates

Phoenix-Mesa Gateway Airport

Conceptual Development Plan

Phoenix-Mesa
Gateway
Airport Master Plan

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Preferred Conceptual Development Plan

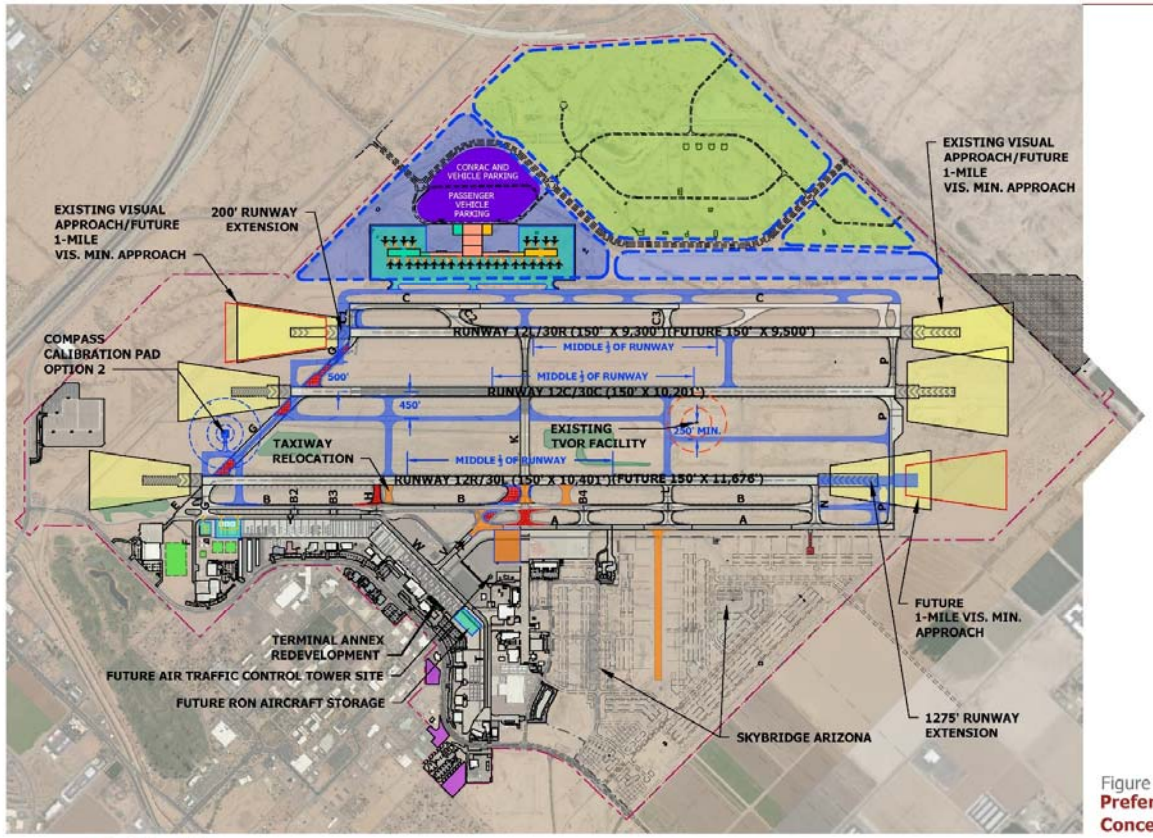

Figure 4-19
Preferred Airport Conceptual Development Plan

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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Next Steps

- ✓ Study Committee Meetings #3 -June 25-26, 2019
- ✓ Public Information Meeting #2 – June 26, 2019
- ✓ Facilities Implementation Plan and Financial Feasibility Analysis (Working Paper Four)
- ✓ Airport Layout Plan
- ✓ Final Committee Meetings September/October 2019
- ✓ Submitted to PMGAA Board for approval
- ✓ Airport Layout Plan Submitted to FAA for approval

Phoenix-Mesa Gateway Airport
Technical Advisory Committee Meeting #5
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, October 23, 2019

SIGN-IN SHEET – PLEASE PRINT

Name	Organization	Address	Phone Number	Email Address
Doug Mack	IWA ATCT	~~630~~ Tower	4809887678	~~dmackjr~~ douglas.mackii@serco-na.com
Brian Sexton	PMGAA			

Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport
Airport Master Planning Services

Phoenix-Mesa Gateway Airport
Technical Advisory Committee Meeting #5
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, October 23, 2019

SIGN-IN SHEET – PLEASE PRINT

Name	Organization	Address	Phone Number	Email Address
Chuck Odom	~~PMGAA~~			
Scott Brownlee	PMGAA			

Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport
Airport Master Planning Services

Phoenix-Mesa Gateway Airport

Master Plan – Technical Advisory Committee

October 23, 2019

Mead&Hunt

Master Plan Survey

- ✓ **Survey created on Master Plan Project Website**
  - **Sent to committee members & publicized to general public**
- ✓ **Taken in mid-June 2019**
  - **7 questions**
    - Focus on Gateway utilization, user preferences, outreach, & related comments
- ✓ **200± responses**
  - **Results summary**

Phoenix-Mesa Gateway Airport Master Plan

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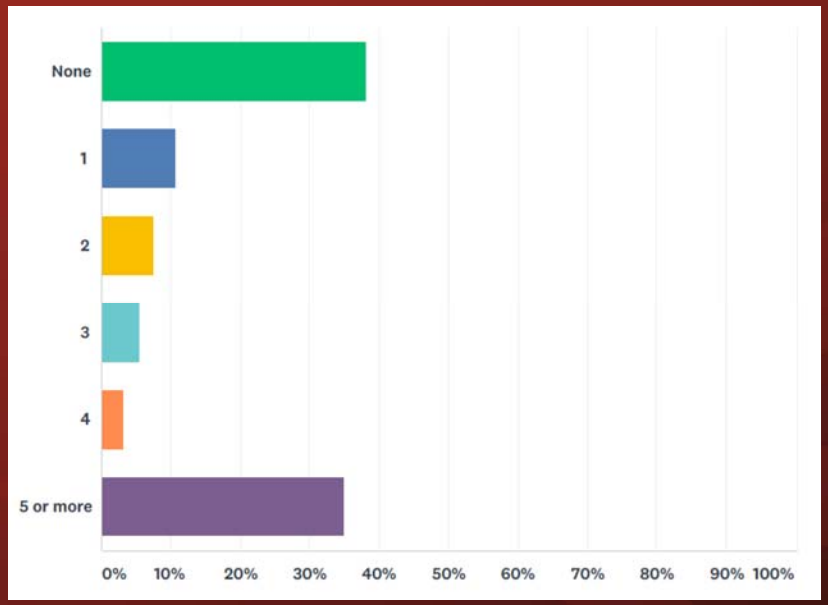
Master Plan Survey

How many times have you, or members of your household, utilized Gateway for air travel in the last 5 years?



- Highest % of respondents utilize Gateway often, or have not to date

Phoenix-Mesa Gateway Airport Master Plan

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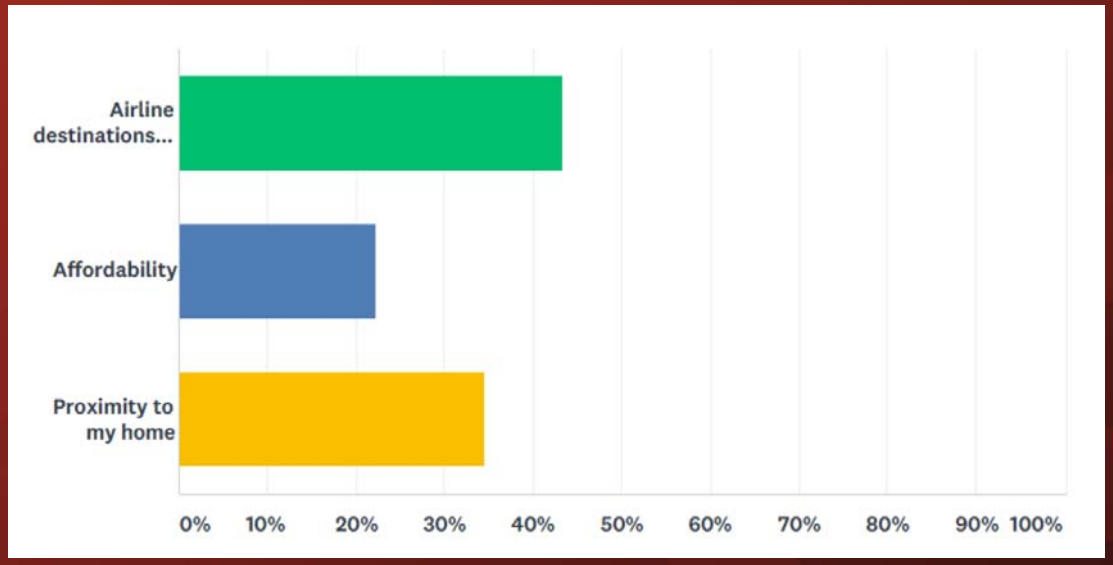
Master Plan Survey

What would be the largest factor in why you utilized, or would utilize, Gateway for your air travel?



- Airline destinations offered was largest factor

Phoenix-Mesa Gateway Airport Master Plan

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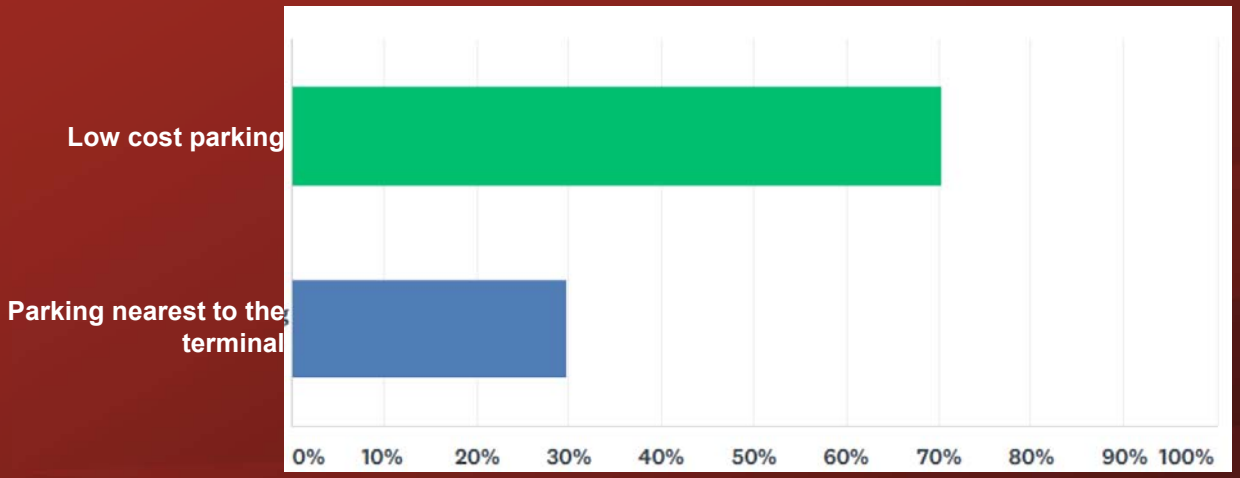
Master Plan Survey

In regard to airport parking, which is more important to you?



- Over a 2:1 margin, cost was more important
  - Differs from previous question on the affordability factor

Phoenix-Mesa Gateway Airport Master Plan

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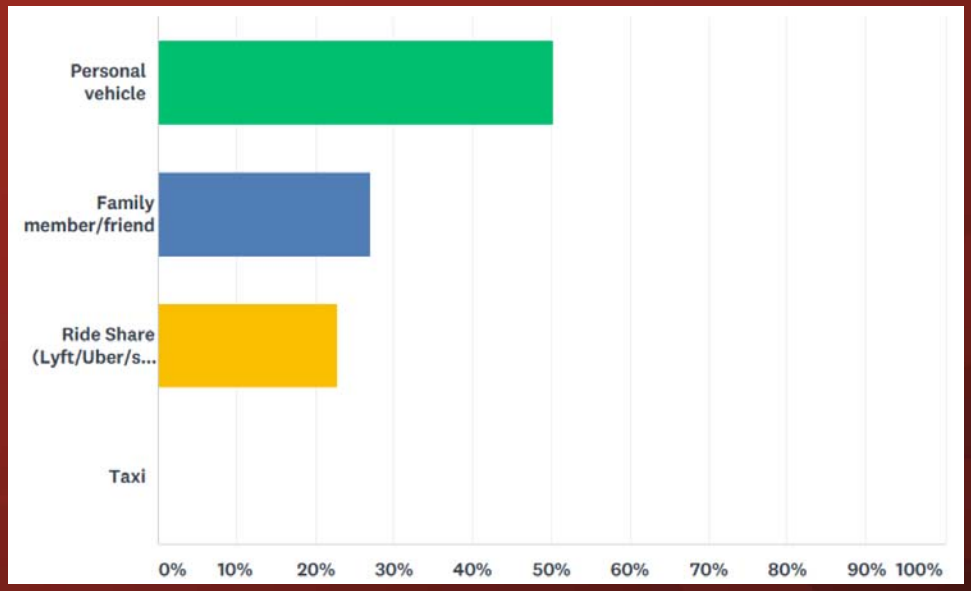
Master Plan Survey

How do you travel to/from the airport when departing or arriving on a flight?



- Indicates flyers are utilizing airport parking
- Ride Share/TNC represent 25% of airport travel options among responders

Phoenix-Mesa Gateway Airport Master Plan

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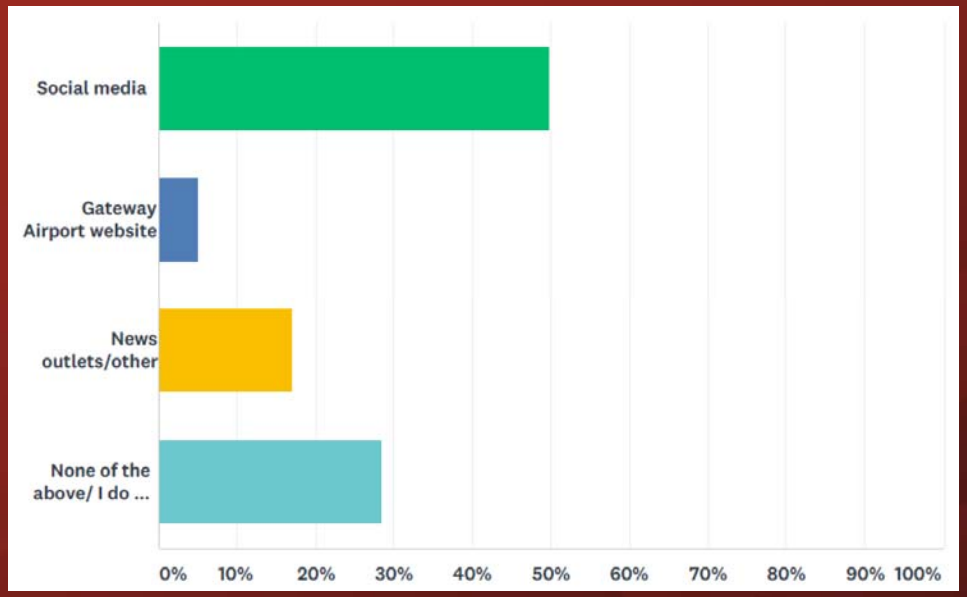
Master Plan Survey

How do you typically follow news & events related to Gateway Airport?



- Social media dominates how people keep up to date w/ Gateway
  - Reflects growing trend

Phoenix-Mesa Gateway Airport Master Plan

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Master Plan Survey

In general, can you share your overall impression of Gateway?

- Majority (53%) of 162 comments rec'd were positive
- Largest specific request (30%) was for additional destinations & airlines

  - Negative comments related to:
    - Lines and crowds during peak times
    - Baggage claim wait times
    - Lack of concession space
    - Additional overflight noise from continued growth

Phoenix-Mesa Gateway Airport Master Plan

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Master Plan Survey

Looking into the future, what would you like to see accomplished at Gateway over the next 10-20 years?

- Most popular responses:
  1. Expanded airline service & destinations (53%)
  2. New or expanded terminal facilities (16%)
  3. Enhanced parking options & circulation (4%)

- 14% respondents preferred little to no additional growth
  - Noise concerns cited

Phoenix-Mesa Gateway Airport Master Plan

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Agenda

- ✓ Introductions and Opening Remarks
- ✓ Review of Public Survey Input
- ✓ Project Approach and Schedule
- ✓ Review of Forecasts of Aviation Activity and Critical Facility Needs
- ✓ Conceptual Development Plan
- ✓ 20-year Capital Improvement Project List
- ✓ Airport Layout Plan Drawing Set
- ✓ Next Steps

Phoenix-Mesa
Gateway
Airport Master Plan

Airport Master Plan

- ✓ Anticipate What We Think Will Happen
- ✓ Influence What We Want to Happen

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Project Approach

- ✓ Follow FAA Guidance
- ✓ Building Block Process
  - Inventory
  - Forecasts
  - Facilities Needs Determination
  - Development Plan Formulation
  - Financial Plan
- ✓ Project Schedule – 16 Months

Phoenix-Mesa
Gateway
Airport Master Plan

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Airport Master Plan-
FAA Approved Forecast

Enplanement Forecast:
2018 Total= 763,542

2023	2028	2038
924,667	1,022,420	1,245,211

Total Operations Forecast:
2018 Total= 288,921

2023	2028	2038
316,712	333,028	369,744

Total Based Aircraft Forecast:
2017 Actual = 109

2023	2028	2038
121	126	139

Phoenix-Mesa Gateway Airport Master Plan

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Summary of Critical Facility Requirement Considerations

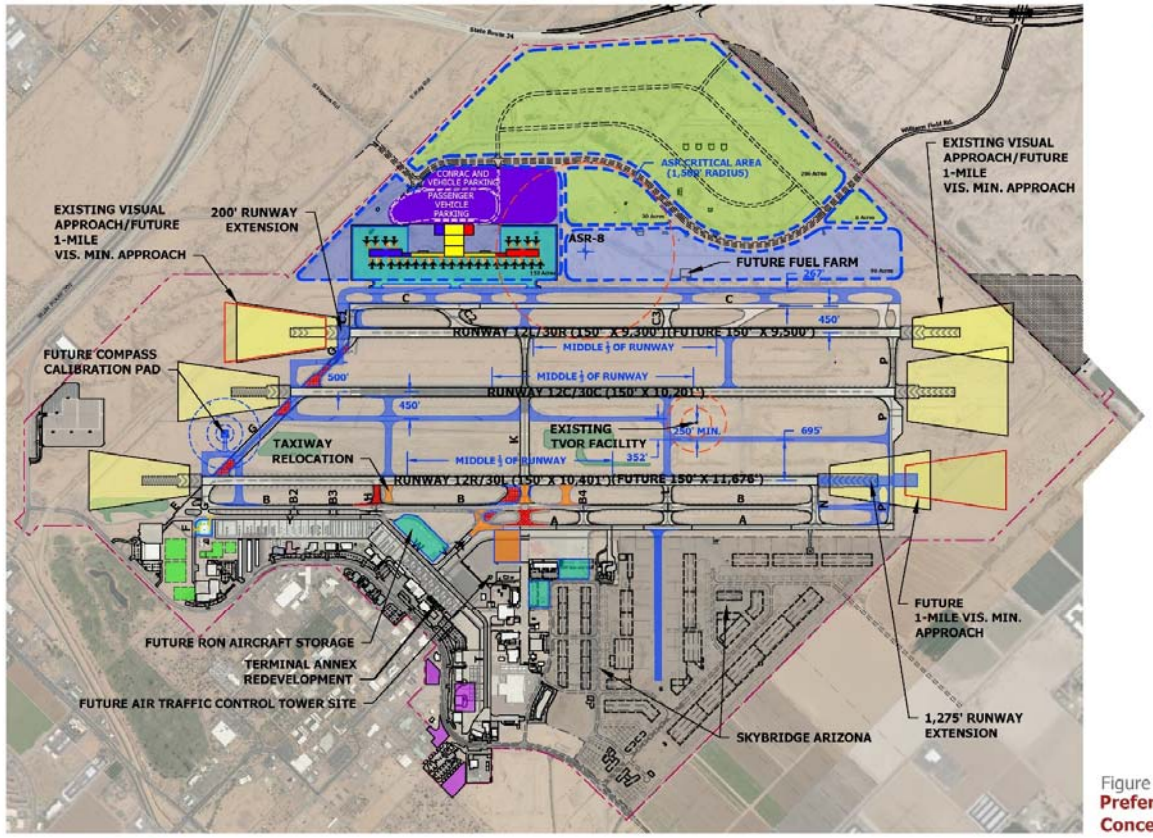
- ✓ Identify potential needs and benefits for runway extension(s)
- ✓ Identify benefits for placement of parallel taxiway improvements
- ✓ Consideration of benefits of improved instrument approach capabilities
- ✓ Passenger terminal
  - Short-term focus on demand driven improvements for existing terminal building
  - Long-term focus on relocated terminal
- ✓ Vehicular access and parking
  - Short-term focus on demand driven improvements for existing terminal area
  - Long-term focus on relocated terminal including support facilities
- ✓ SkyBridge Arizona - incorporate adopted recommendations into master plan
- ✓ General aviation and industrial aviation - continue to program for demand driven facility expansion and improvements

Terminal Requirements Summary

Functional Area	Existing (supply) *(a)*	PAL 1 (2023)	PAL 2 (2028)	PAL 3 (2038)
CHECK-IN (TICKETING)				
Queue (sf)	4,500	3,550	3,700	4,350
Counters/Bag drops	32	26	27	31
CHECKED BAGGAGE				
EDS machines *(b)*	2 CT-80	3 MS-EDS	4 MS-EDS	4 MS-EDS
Makeup area (sf)	11,500	11,400	12,800	15,700
SECURITY SCREENING CHECKPOINT				
Queue (sf)	1,725	1,700	1,900	2,625
Lanes	5	5	5	5
PASSENGER HOLDROOM				
Holdroom (sf)	15,260	13,000	15,300	19,700
Podium, queueing, egress (sf)	3,950	3,150	3,675	4,725
APRON (GATES)	6 ADG III, 4 B757	8 ADG III	9 ADG III	11 ADG III
BAGGAGE CLAIM (DEVICES)	2	2	3	3

(a) Existing queues are estimated based on terminal drawings
(b) Requirement, which is based on a hypothetical medium speed inline system (MS-EDS), includes one EDS machine for redundancy

Preferred Conceptual Development Plan



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Legend

- Existing Runway Protection Zone
- Preliminary Roadway Development
- Future Passenger Terminal Reserve
- Future Aeronautical Development
- Future Non-Aeronautical Development
- Passenger Terminal Support - Parking/Rental Car/TNC
- Existing Detention Ponds
- Existing Easement
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Future Apron Pavement
- Existing IWA Programmed Project
- Pavement to be Removed
- Future Buildings/Development
- Future Economic Development Opportunity
- Passenger Terminal Phase 1 (10) Gates
- Passenger Terminal Phase 2 (9) Gates
- Passenger Terminal Phase 3 (9) Gates

0 750' 1500' 3000'
GRAPHIC SCALE IN FEET

Figure 4-19
Preferred Airport Conceptual Development Plan

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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Master Plan CIP 2021to 2041

Federal FY	MH Project Number	Airport Project Number	Project Title	Estimated Total Project Cost 2019 Dollars
Proposed FY 2021 CIP Projects				
2021	A1	1067/1072	Reconstruct sections of Runway 12R/30L in Portland Cement Concrete Pavement (PCCP), LED Lighting Upgrade - Design/Construct	$ 24,000,000.00
	A2	744	Taxiway Whiskey (Reconstruct lowest PCI section in Portland Cement Concrete Pavement) - Design/Construct	$ 800,000.00
	A3	950	Ellsworth Channel Relocation - Construction	$ 11,440,000.00
	A4	-	Employee Parking Lot and Westside cell phone lot improvements - Design/Construct	$ 665,000.00
	A5	975	Safety Management System	$ 312,000.00
			2021 Annual Subtotal	**$ 37,217,000.00**
Proposed FY 2022 CIP Projects				
2022	A6	1092	Taxiway Golf Realignment (End of Runway 12R/30L w/ 90degree connector to Twy G)- Design/Construct	$ 11,580,000.00
	A7	397	Eastside Airport and Terminal Access Roads and Infrastructure (New Spine Road and Utility Infrastructure Extensions from Ellsworth Rd to Eastside Development Area) - Design/Construction	$ 17,122,425.00
			2022 Annual Subtotal	**$ 28,702,425.00**
Proposed FY 2023 CIP Projects				
2023	A8	1201	Terminal Annex Redevelopment (Gates 1 to 4) - Design/Construct	$ 14,007,825.00
	A9	1202	Center Runway Section 30 (South end) - Design/Construct	$ 8,630,000.00
			2023 Annual Subtotal	**$ 22,637,825.00**
Proposed FY 2024 CIP Projects				
2024	A10	1203	Parallel Taxiway West of Runway 12C/30C [including VOR jog segment] - Design/Construction	$ 18,316,000.00
			2024 Annual Subtotal	**$ 18,316,000.00**
Proposed FY 2025 CIP Projects				
2025	A11	-	Remain-Over-Day (ROD)/Remain Over Night (RON) Aircraft Storage Apron - Design/Construct	$ 539,000.00
			2025 Annual Subtotal	**$ 539,000.00**
			Total Phase-I (0-5 Years) Development Program Project Costs	**$ 107,412,250.00**
Proposed FY 2026 to 2030 CIP Projects				
6 to 10 Years	B1	-	Fuel Farm Expansion: (2) 50,000 USG fuel tanks - Design	$ 1,643,300.00
	B2	-	Extend Runway 12L/30R by 200' with Bypass Taxiway - Design/Construction	$ 7,197,000.00
	B3	1204	Mid-field Connectors Project - [Hotel, Lima, crossfield connectors] - Design/Construct	$ 9,313,000.00
	B4	-	Procure 1 new Oshkosh Aircraft Rescue Firefighting Truck - 1,500 USG; 200 USG of AFFF; and 450LB dry chem capacity	$ 900,000.00
	B5	-	Relocate Compass Calibration Pad - Design/Construct	$ 1,219,000.00
	B6	-	Reconstruct 1,000' of Runway 12C approach end/Reconstruct 2,000' of Runway 12C/30C in Portland Cement Concrete Pavement (PCCP) with LED Lighting Upgrade	$ 12,748,000.00
	B7	-	Fuel Farm Expansion: (2) 50,000 USG fuel tanks - Design/Construct	$ 1,643,000.00
	B8	-	East/West Airfield Electrical Lighting Vault Replacement/Generators with Runway 12L/30R Lighting Upgrade	$ 10,805,000.00
	B9	719	Alpha Apron Phase 3 - Design/Construction	$ 5,052,000.00
	B10	-	Increase tower height/relocate existing Airport Surveillance Radar Model 8 (ASR-8)	$ 13,000,000.00
	B11	-	Maintenance Run-Up Area with Blast Fence - Design/Construct	$ 1,295,000.00
	B12	-	Runway Magnetic Change - Markings/Signage [All Runways]	$ 300,000.00
			Total Phase-II (6-10 Years) Development Program Project Costs	**$ 65,115,300.00**

Phoenix-Mesa Gateway Airport Master Plan

Master Plan CIP 2021to 2041

Federal FY	MH Project Number	Airport Project Number	Project Title	Estimated Total Project Cost 2019 Dollars
11 to 20 Years	C1	-	Fuel Farm Expansion: (2) 50,000 USG fuel tanks - Design/Construct	$ 1,643,000.00
	C2	-	New Taxiway Bravo 1 connector to Runway 12R/30L - Design/Construct	$ 1,824,000.00
	C3	421	Eastside Apron Phase 1 - Design	$ 1,206,000.00
	C4	415	Eastside Apron Phase 1 - Construction	$ 11,910,000.00
	C5	181	Eastside Terminal Replacement (10 gates + 4 hard stand positions) Phase 1 - Design	$ 16,716,560.00
	C6	261	Eastside Terminal Replacement (10 gates + 4 hardstand positions) Phase 1 - Construction	$ 167,165,600.00
	C7	969	Passenger Boarding Bridges for Terminal Phase 1 - Design/Construct	$ 10,000,000.00
	C8	971/972	Eastside Terminal Parking Surface Lot - Design/Construct	$ 12,981,750.00
	C9	-	Eastside Consolidated Rental Car Facility w/ConRAC - Design/Construct	$ 16,602,430.00
	C10	-	Construct New Eastside Fuel Farm (Jet A, 450,000 gallons) to support Eastside Terminal	$ 7,393,500.00
	C11	-	Parallel Taxiway to Taxiway C Phase 1 - Design	$ 950,000.00
	C12	-	Parallel Taxiway to Taxiway C Phase 1 - Construct	$ 10,448,000.00
	C13	-	New Taxiway Connector South of existing C1 Connector - Design/Construct	$ 1,520,000.00
	C14	-	New Taxiway Connector South of existing C2 Connector - Design/Construct	$ 1,520,000.00
	C15	-	Parallel Taxiway to Taxiway C Phase 2 - Design	$ 965,000.00
	C16	-	Parallel Taxiway to Taxiway C Phase 2 - Construct	$ 12,710,000.00
			Total Phase-III (11-20 Years) Development Program Project Costs	**$ 275,555,840.00**
Proposed CIP Projects Beyond FY 2042				
20+ Years	D1	-	Eastside Apron Phase 2 - Design	$ 1,080,000.00
	D2	415	Eastside Apron Phase 2 - Construction	$ 10,700,000.00
	D3	181	Eastside Terminal Phase 2 Expansion (9 Gates) - Design	$ 12,660,200.00
	D4	261	Eastside Terminal Phase 2 Expansion (9 Gates) - Construction	$ 126,602,000.00
	D5	-	Passenger Boarding Bridges for Terminal Phase 2 - Design/Construct	$ 9,000,000.00
	D6	-	1,275' Extension to Runway 12R/30L, Taxiway B Extension and Bypass Taxiway in Portland Cement Concrete Pavement (PCCP) - Design/Construct	$ 12,630,000.00
	D7	-	Eastside Terminal Phase 3 Expansion (9 Gates) - Design	$ 12,555,970.00
	D8	-	Eastside Terminal Phase 3 Expansion (9 Gates) - Construction	$ 125,559,700.00
	D9	-	Passenger Boarding Bridges for Terminal Phase 3 - Design/Construct	$ 9,000,000.00
	D10	-	Eastside Apron Phase 3 - Design	$ 1,080,000.00
	D11	-	Eastside Apron Phase 3 - Construction	$ 10,700,000.00
			Total Phase-IV (20+ Years, Post Planning Period)	**$ 331,567,870.00**

Phasing Plan

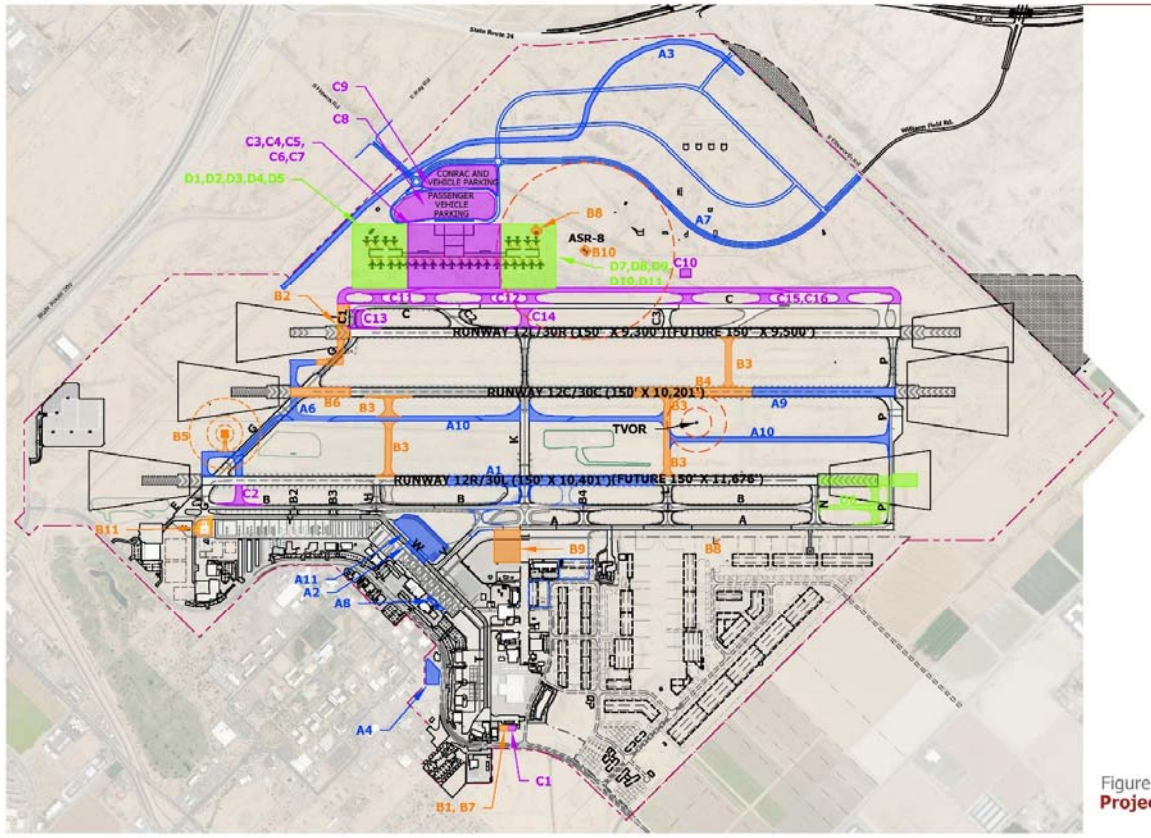

Figure 6-1
Project Phasing Plan

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

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Financial Analysis Framework

- ✓ Financial analysis to support funding of CIP as presented in Facilities Implementation Plan
- ✓ Elements of financial analysis:
  - Analysis of PMGAA financial framework
  - Airline rates and charges
  - Analysis of historical trends in revenues and expenses
  - Projections of future revenues, expenses, cash flow
- ✓ CIP funding plan

Financial Information Collected from PMGAA

- ✓ Audited financial reports for FY 2014 – FY 2018
- ✓ Revenue and expense budgets for FY 2019 & FY 2020
- ✓ Electronic files showing airline rates and charges calculations
- ✓ Current ACIP on file with FAA
- ✓ PFC applications, FAA PFC Final Agency Decisions, and PFC reports
- ✓ Information on Airport tenants
- ✓ Development and lease agreements
- ✓ Additional information in response to follow-up requests

CIP Funding Plan

- ✓ Funding plan for Phases I and II
- ✓ Evaluation of eligibility and availability of:
  - FAA AIP grants
  - PFCs
  - ADOT funding
- ✓ Member Government contributions
- ✓ Other funds
- ✓ Potential funding sources for Phases III and IV
  - Operating Fund
  - Rental car CFCs
  - Lease revenues

Funding Plan

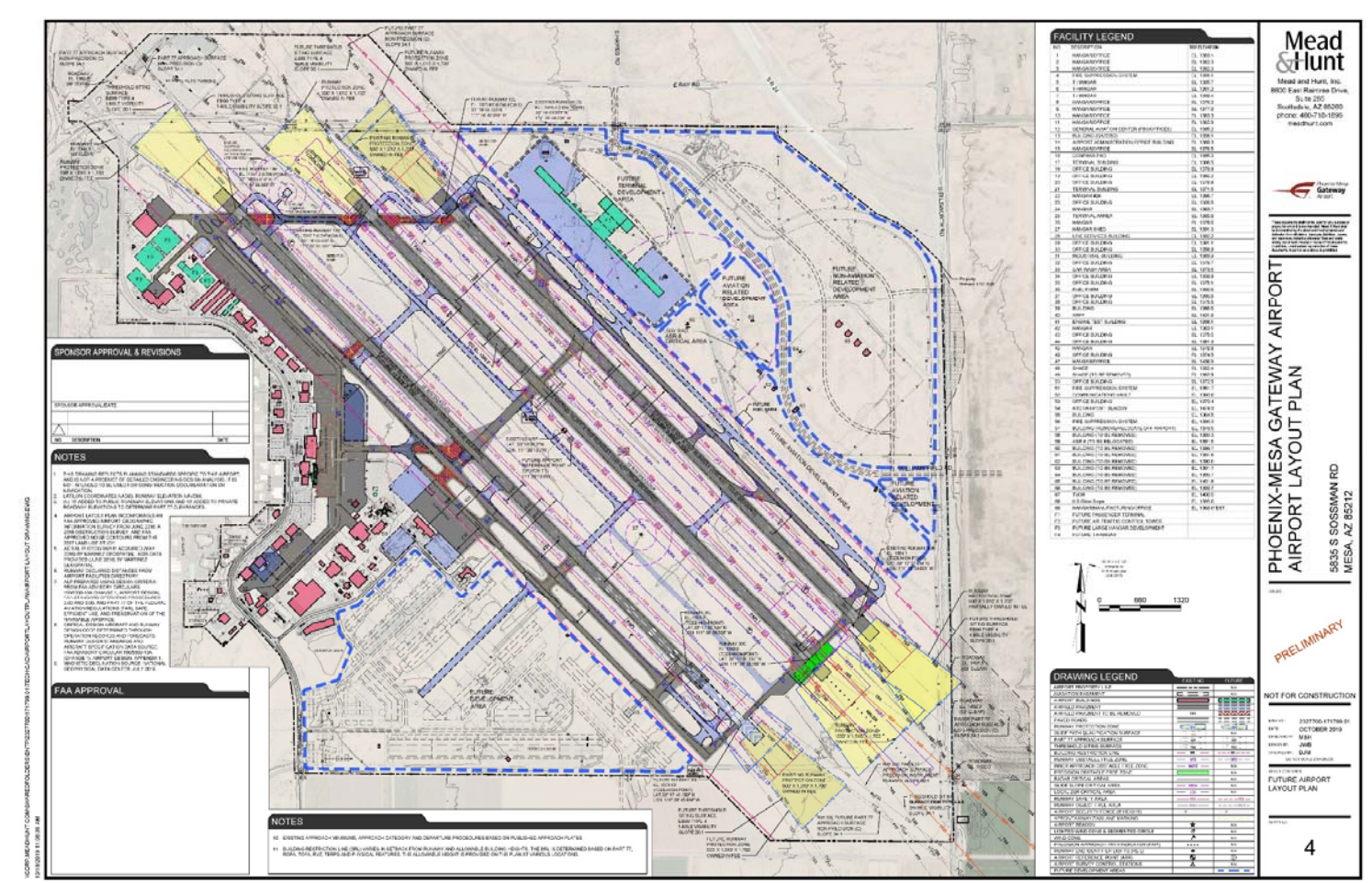
		Total	AIP		PFCs	ADOT Grants	Member Govt.	Other
			Entitlement	Discretionary				
Phase I - FYs 2021 - 2025								
A1	Reconstruct sections of Runway 12R/30L	$ 24,960,000	$ 3,636,000	$ 19,092,576	$ -	$ 1,115,712	$ 1,115,712	$ -
A2	Taxiway Whiskey-Design/Construct	832,000	-	-	-	748,800	83,200	-
A3	Ellsworth Channel Relocation-Construction	11,897,600	-	-	11,897,600	-	-	-
A4	Employee Parking Lot and Cell Phone Lot Improvements	691,600	-	-	-	-	691,600	-
A5	Safety Management System	324,480	-	-	324,480	-	-	-
A6	Taxiway Golf Realignment - Design/Construct	12,274,800	3,672,360	7,505,073	-	548,684	548,684	-
A7	Eastside Airport Terminal Access Roads - Design/Construct	18,149,771	-	-	10,000,000	709,362	-	7,440,409
A8	Terminal Annex Redevelopment - Design/Construct	15,128,451	-	8,954,379	-	400,260	5,773,812	-
A9	Center Runway Section 30	9,320,400	3,709,084	4,778,073	-	416,622	416,622	-
A10	Parallel Taxiway West of RW 12C/30C - Design/Construct	20,147,600	3,746,174	14,600,230	-	900,598	900,598	-
A11	Aircraft Storage Apron (RON/ROD) - Design/Construct	603,680	-	-	-	-	603,680	-
Total Projects for FYs 2020 - 2025		**$ 114,330,382**	**$ 14,763,618**	**$ 54,930,331**	**$ 22,222,080**	**$ 4,840,037**	**$ 10,133,907**	**$ 7,440,409**
Phase II - FYs 2026 - 2030								
B1	Fuel Farm Expansion - Design/Construct	$ 1,873,362	$ -	$ -	$ -	$ -	$ 1,873,362	$ -
B2	Extend Runway 12L/30R with Taxiway	9,600,640	3,783,636	4,958,707	-	429,149	429,149	-
B3	Mid-Field Connectors Project - Design/Construct	10,430,560	-	9,498,068	-	466,246	466,246	-
B4	ARFF Truck	1,026,000	-	-	1,026,000	-	-	-
B5	Relocate Compass Calibration Pad - Design/Construct	1,414,040	-	-	-	-	-	1,414,040
B6	Reconstruct Runway 12C/30C and LED Lighting Upgrade	14,532,720	3,821,473	9,412,022	-	649,613	649,613	-
B7	Fuel Farm Expansion - Design/Construct	1,938,740	-	-	-	-	1,938,740	-
B8	Electrical Lighting Vault Replacement/Generators & 12C/30R LED Upgrade	12,596,700	7,835,551	3,635,004	-	563,072	563,072	-
B9	Alpha Apron Phase 3 - Design/Construction	6,062,400	-	-	6,062,400	-	-	-
B10	Increase Tower Height/Relocate Existing ASR-8	15,860,000	-	-	-	-	-	15,860,000
B11	Maintenance Run-Up Area with Blast Fence - Design/Construct	1,579,900	-	-	-	-	1,579,900	-
B12	Runway Magnetic Change - Marking/Signage	336,000	-	305,962	-	15,019	15,019	-
Total Projects for FYs 2026 - 2030		**$ 77,251,062**	**$ 15,440,660**	**$ 27,809,762**	**$ 7,088,400**	**$ 2,123,099**	**$ 7,515,101**	**$ 17,274,040**
Total Projects for FYs 2021 - 2030		**$ 191,581,444**	**$ 30,204,278**	**$ 82,740,093**	**$ 29,310,480**	**$ 6,963,136**	**$ 17,649,008**	**$ 24,714,449**

Sources & Uses of Capital Funding

Sources of Capital Funding	Phase I 2021 - 2025	Phase II 2026 - 2030	Total
AIP Entitlements	$ 14,763,618	$ 15,440,660	$ 30,204,278
AIP Discretionary	54,930,331	27,809,762	82,740,093
PFC Paygo	22,222,080	7,088,400	29,310,480
ADOT Grants	4,840,037	2,123,099	6,963,136
Member Contributions	10,133,907	7,515,101	17,649,008
Other	7,440,409	17,274,040	24,714,449
Total Sources	**$ 114,330,382**	**$ 77,251,062**	**$ 191,581,444**

Uses of Capital Funding	Phase I 2021 - 2025	Phase II 2026 - 2030	Total
Runway/Taxiway Projects	$ 67,534,800	$ 47,496,620	$ 115,031,420
Terminal Improvements	15,128,451	-	15,128,451
Parking	691,600	-	691,600
Fuel Farm	-	3,812,102	3,812,102
Apron Rehabilitation	603,680	6,062,400	6,666,080
Access Roads	18,149,771	-	18,149,771
ARFF	-	1,026,000	1,026,000
Other Projects	12,222,080	18,853,940	31,076,020
Total Uses	**$ 114,330,382**	**$ 77,251,062**	**$ 191,581,444**

Future Conditions Airport Layout Plan



Phoenix-Mesa Gateway Airport Master Plan

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Next Steps

- ✓ Comments on draft work products due by October 30, 2019
- ✓ Presentation of Master Plan Recommendation to Senior Staff – November 12, 2019
- ✓ Materials (Including Executive Summary) Ready for Distribution to PMGAA
- ✓ Presentation of Master Plan Recommendations to PMGAA Board November 19, 2019
- ✓ Finalization of Master Plan Draft Final Report (compilation of all working documents)
- ✓ Finalization of Airport Layout Plan Drawing Set
- ✓ Submittal Of Airport Layout Plan to FAA for Review and Approval

Phoenix-Mesa Gateway Airport
Airport Master Plan - Open House
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, January 16, 2019

SIGN-IN SHEET – PLEASE PRINT

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Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport
Airport Master Planning Services

Phoenix-Mesa Gateway Airport
Airport Master Plan - Open House
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, January 16, 2019

SIGN-IN SHEET – PLEASE PRINT

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Phoenix-Mesa Gateway Airport

Phoenix-Mesa
Gateway
Airport Master Plan

Project Approach

- ✓ **Follow FAA Guidance**
- ✓ **Building Block Process**
  - **Inventory**
  - **Forecasts**
  - **Facilities Needs Determination**
  - **Development Plan Formulation**
  - **Financial Plan**

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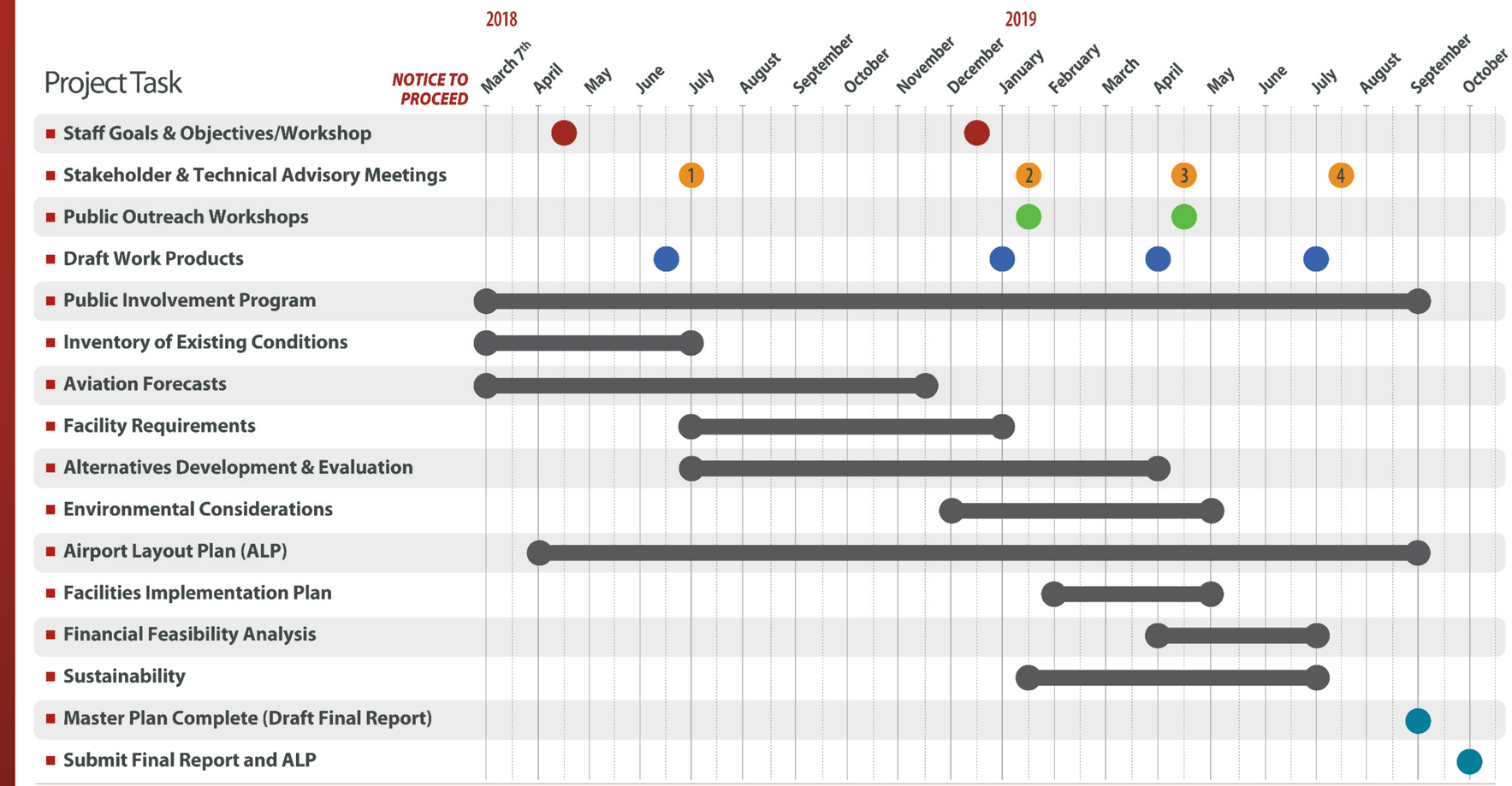
Phoenix-Mesa
Gateway
Airport Master Plan

Project Schedule Airport Master Plan



NOTE: Schedule updated November 28, 2018. Subject to change.

On-Airport Land Use Analysis

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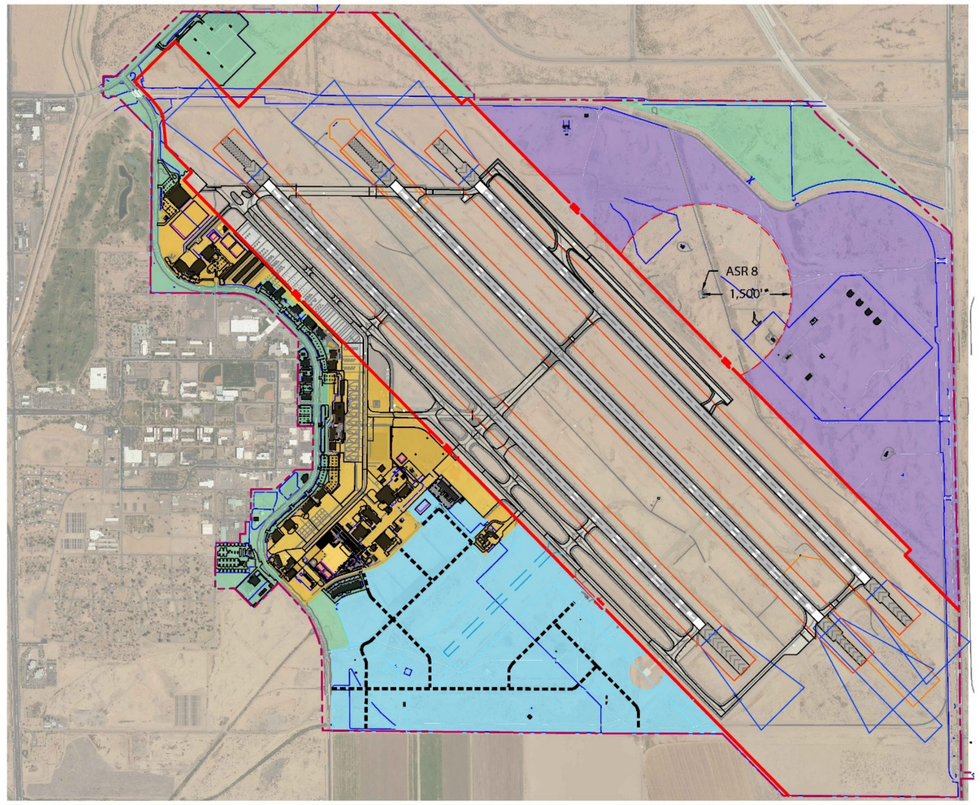

Legend
- EXISTING AIRFIELD ACCESS DEVELOPMENT AREA
- NO AIRFIELD ACCESS DEVELOPMENT AREA
- POTENTIAL AIRFIELD ACCESS DEVELOPMENT AREA
- SKYBRIDGE ARIZONA DEVELOPMENT AREA
- POTENTIAL ROADWAY DEVELOPMENT
- ASR 8 CRITICAL AREA
- BUILDING RESTRICTION LINE (BRL)

N

0 750' 1500' 3000' 4500'
GRAPHIC SCALE IN FEET

Phoenix-Mesa Gateway
Airport Master Plan

On-Airport Land Use Analysis

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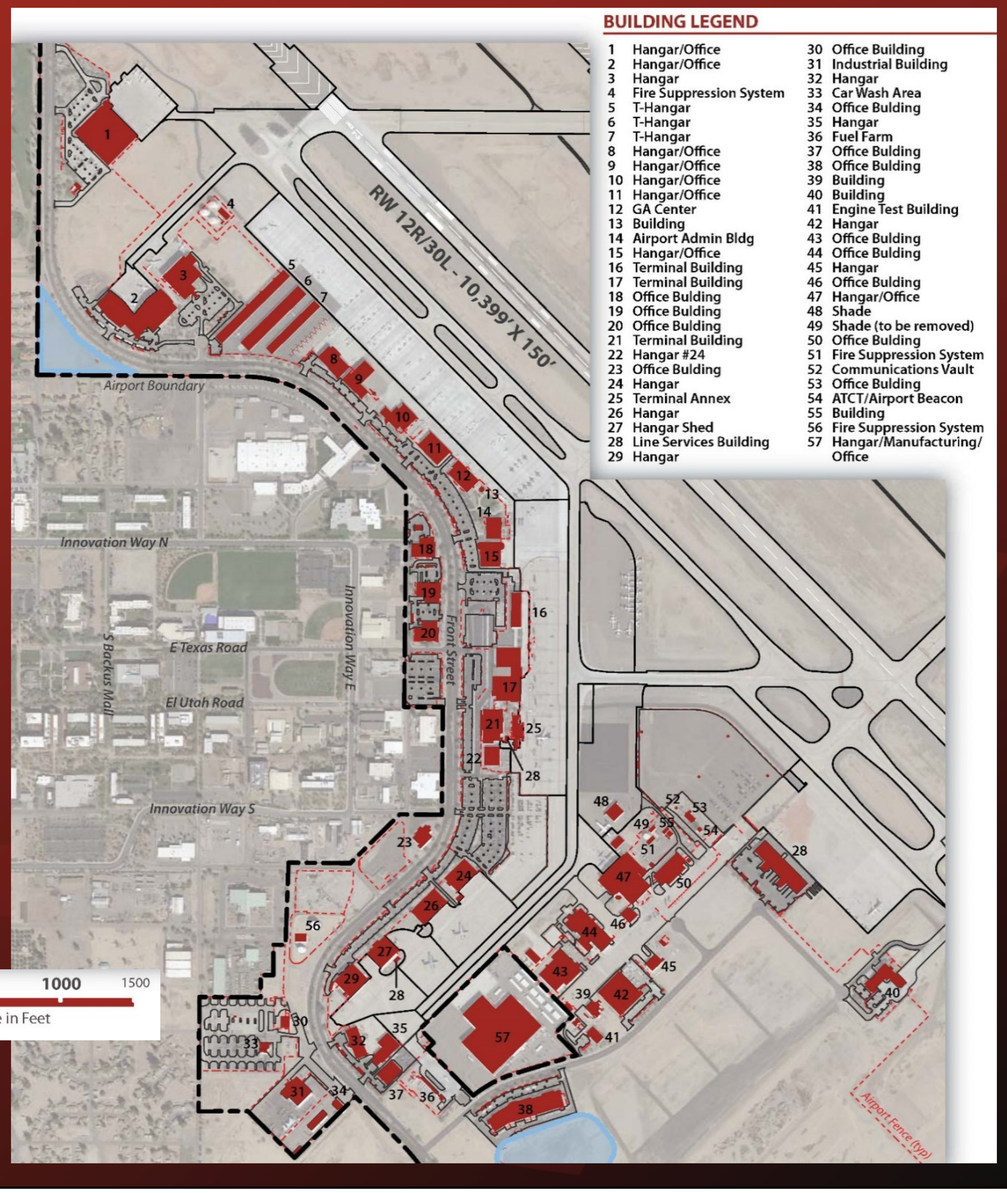
Phoenix-Mesa
Gateway
Airport Master Plan

Terminal Area Facilities

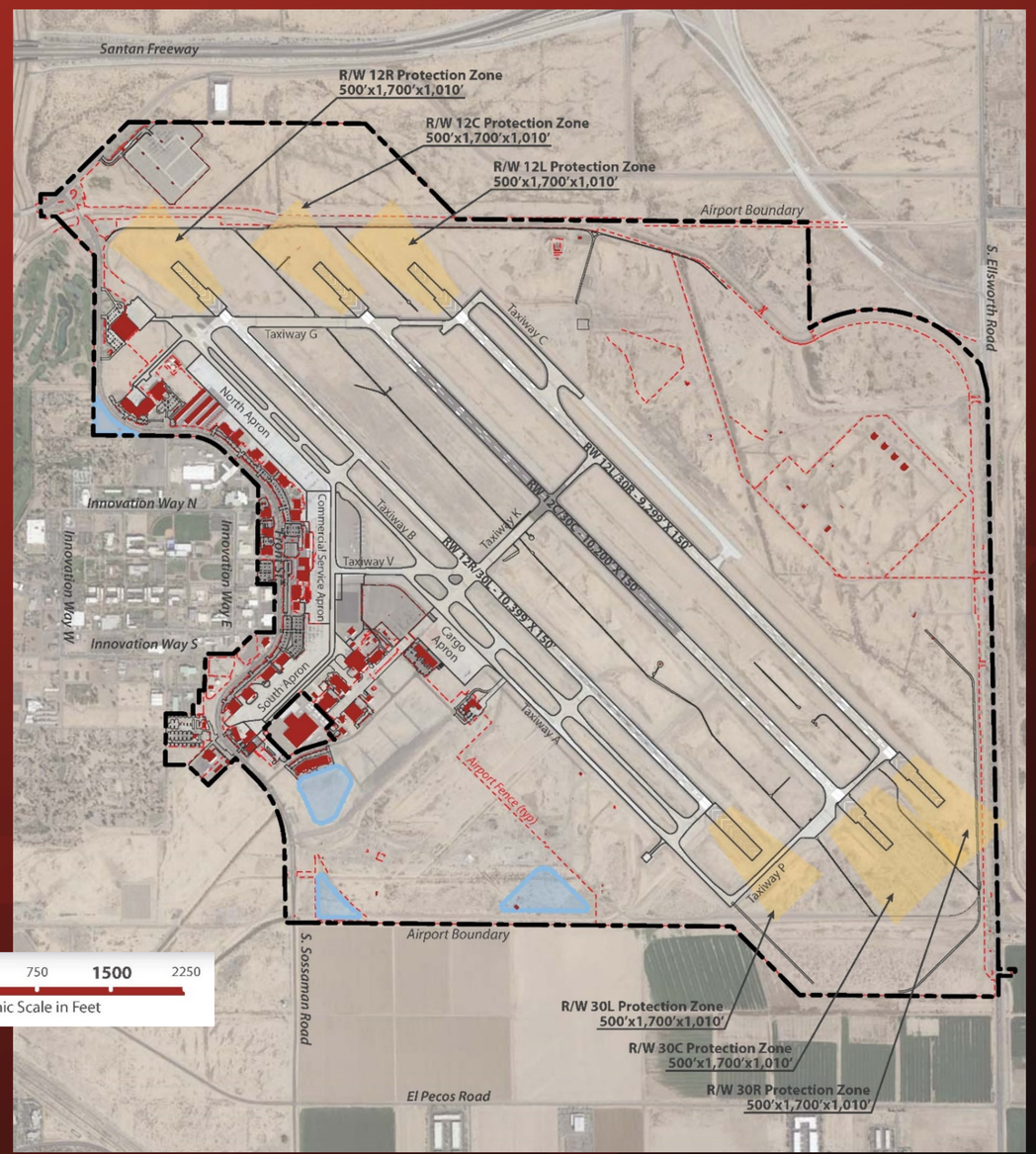


BUILDING LEGEND

1 Hangar/Office
2 Hangar/Office
3 Hangar
4 Fire Suppression System
5 T-Hangar
6 T-Hangar
7 T-Hangar
8 Hangar/Office
9 Hangar/Office
10 Hangar/Office
11 Hangar/Office
12 GA Center
13 Building
14 Airport Admin Bldg
15 Hangar/Office
16 Terminal Building
17 Terminal Building
18 Office Bulding
19 Office Bulding
20 Office Bulding
21 Terminal Building
22 Hangar #24
23 Office Bulding
24 Hangar
25 Terminal Annex
26 Hangar
27 Hangar Shed
28 Line Services Building
29 Hangar
30 Office Building
31 Industrial Building
32 Hangar
33 Car Wash Area
34 Office Bulding
35 Hangar
36 Fuel Farm
37 Office Bulding
38 Office Bulding
39 Building
40 Building
41 Engine Test Building
42 Hangar
43 Office Bulding
44 Office Bulding
45 Hangar
46 Office Bulding
47 Hangar/Office
48 Shade
49 Shade (to be removed)
50 Office Bulding
51 Fire Suppression System
52 Communications Vault
53 Office Bulding
54 ATCT/Airport Beacon
55 Building
56 Fire Suppression System
57 Hangar/Manufacturing/ Office

Phoenix-Mesa
Gateway
Airport Master Plan

Existing Airport Facilities



Phoenix-Mesa
Gateway
Airport Master Plan

Phoenix-Mesa
Gateway
Airport Master Plan

Summary of Critical Facility Requirement Considerations

- ✓ Identify potential needs and benefits for runway extension(s)
- ✓ Identify benefits for placement of parallel taxiway improvements
- ✓ Consideration of benefits of improved instrument approach capabilities
- ✓ Passenger terminal
  - Short-term focus on demand driven improvements for existing terminal building
  - Long-term focus on relocated terminal
- ✓ Vehicular access and parking
  - Short-term focus on demand driven improvements for existing terminal area
  - Long-term focus on relocated terminal including support facilities
- ✓ SkyBridge Arizona - incorporate adopted recommendations into master plan
- ✓ General aviation and industrial aviation - continue to program for demand driven facility expansion and improvements

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Phoenix-Mesa
Gateway
Airport Master Plan

Airport Master Plan-
Forecast Review

Enplanement Forecast:

2018 Total= 765,325±

2023	2028	2038
924,667	1,022,420	1,245,211

Total Operations Forecast:

2018 Total= 288,921

2023	2028	2038
316,712	333,028	369,744

Total Based Aircraft Forecast:

2017 Actual = 109

2023	2028	2038
121	126	139

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Phoenix-Mesa
Gateway
Airport Master Plan

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Edmonton
Calgary
Winnipeg
WA
OR
CA
NV
ID
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
ME
VT
NH
MA
CT
RI
NJ
DC
DE
MD

Phoenix-Mesa **Gateway**
Airport Master Plan

Nonstop Destinations
from IWA for the 12-Month
Period Ended November 2018

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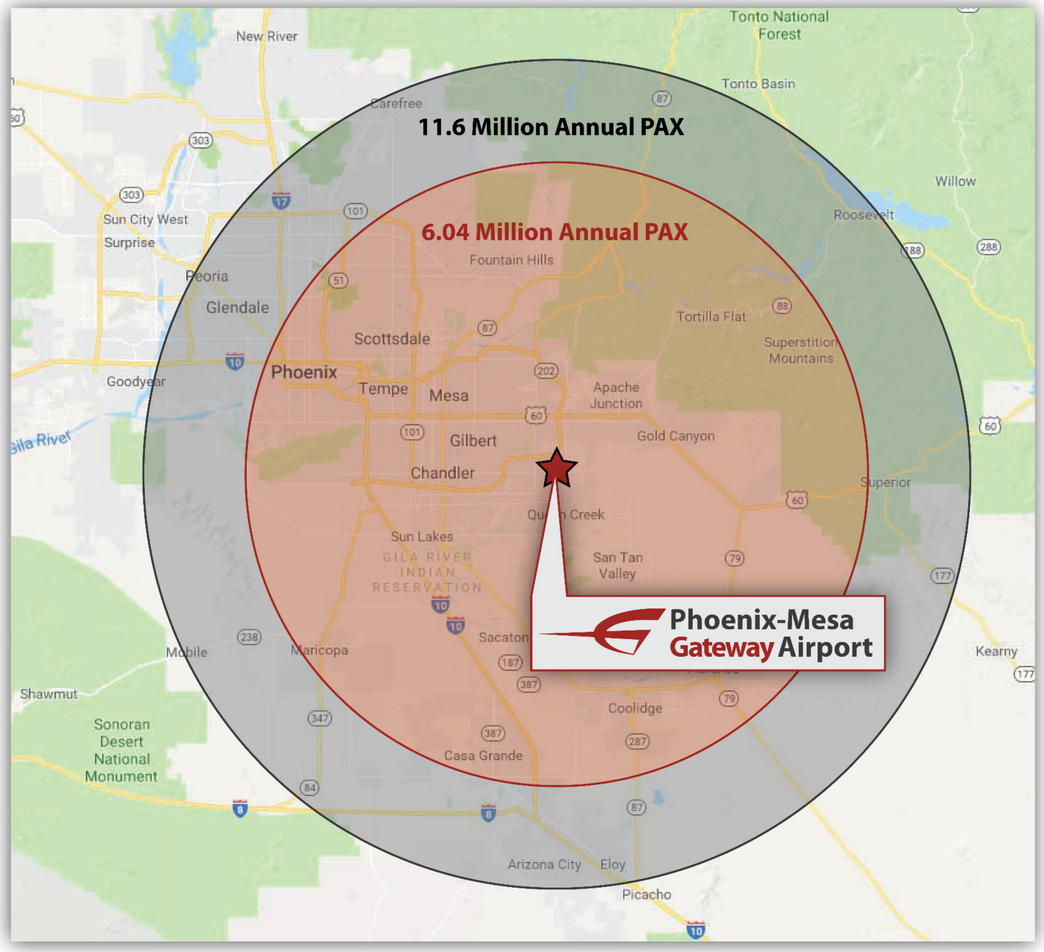

30-Mile Radius
50-Mile Radius

0 9 18 27
Graphic Scale in Miles

Source: *Google Maps, 2018*

Catchment Area

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Phoenix-Mesa Gateway Airport Master Plan

Phoenix-Mesa Gateway Airport Master Plan

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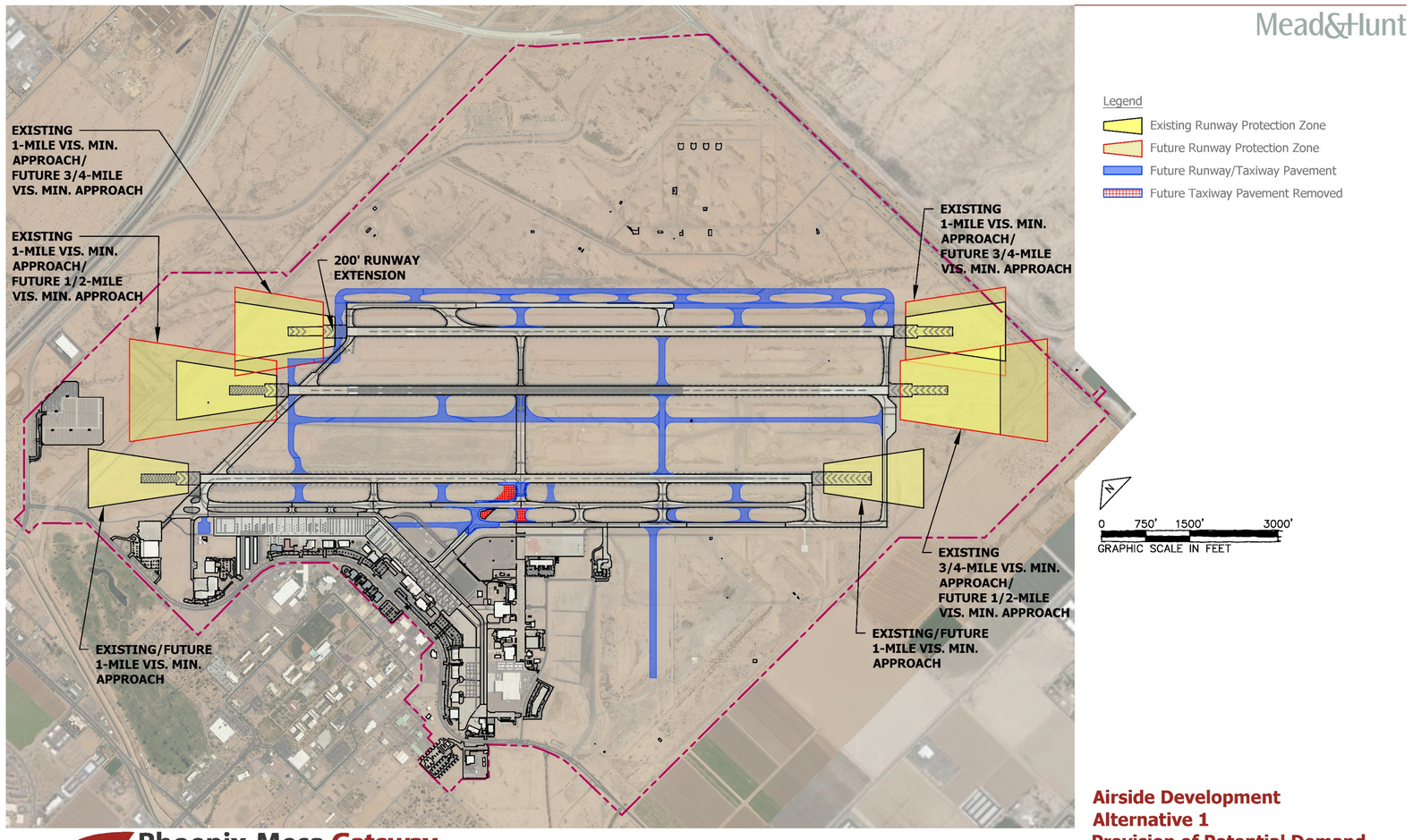

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Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Future Taxiway Pavement Removed

N

0 750' 1500' 3000'

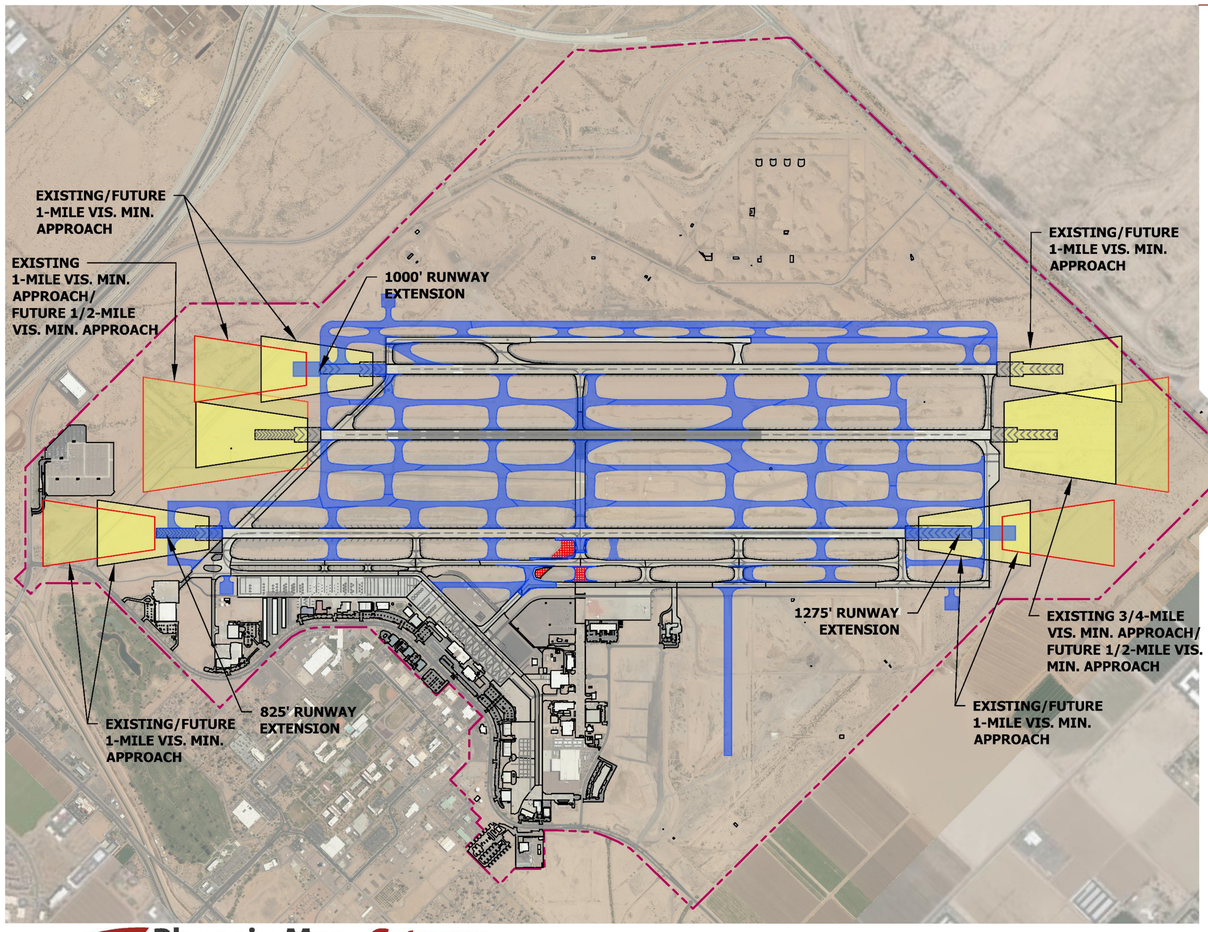
GRAPHIC SCALE IN FEET

Airside Development
Alternative 1
Provision of Potential Demand
Driven Improvements

Phoenix-Mesa **Gateway**
Airport Master Plan

Phoenix-Mesa
Gateway
Airport Master Plan

Mead&Hunt



Mead&Hunt

Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Future Taxiway Pavement Removed

N

0 750' 1500' 3000'

GRAPHIC SCALE IN FEET

Phoenix-Mesa Gateway
Airport Master Plan

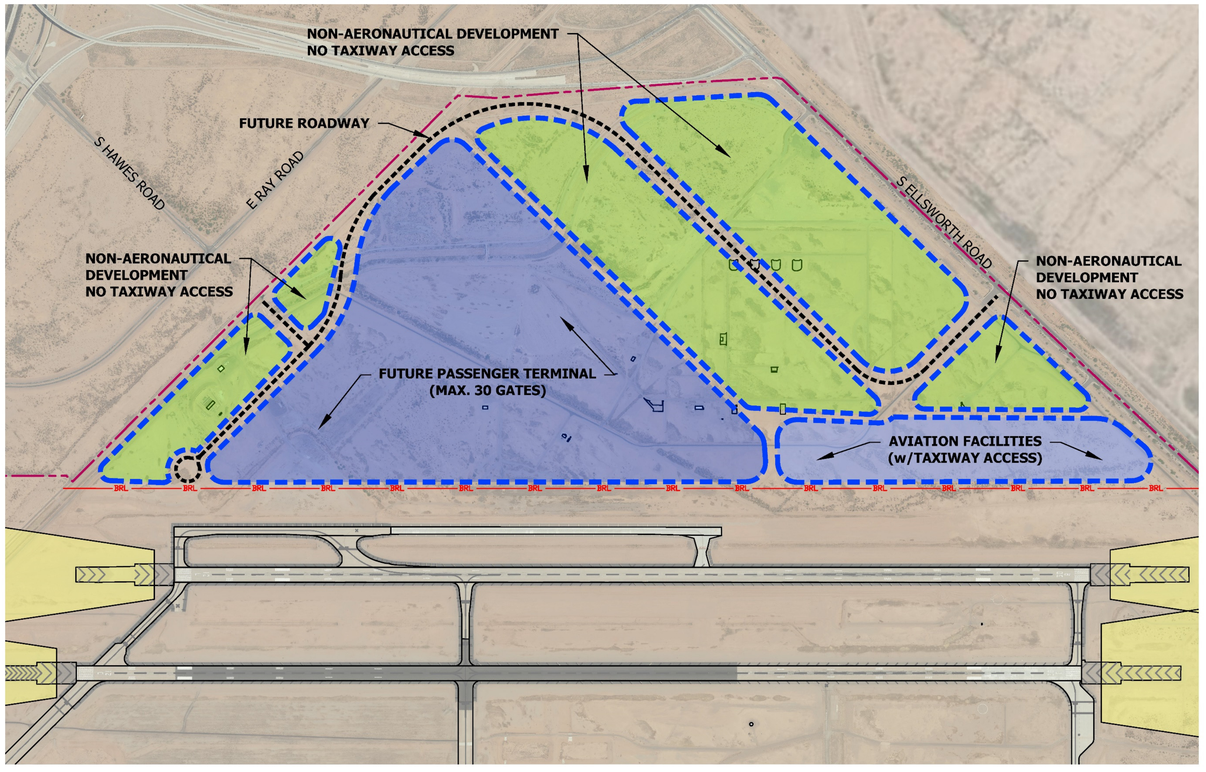
Airside Development
Alternative 2
Protect for Ultimate Potential
Airside Configuration

Mead&Hunt

Phoenix-Mesa
Gateway
Airport Master Plan

Phoenix-Mesa
Gateway
Airport Master Plan

Mead&Hunt



Legend

Existing Runway Protection Zone

N

0 500' 1000' 2000'

GRAPHIC SCALE IN FEET

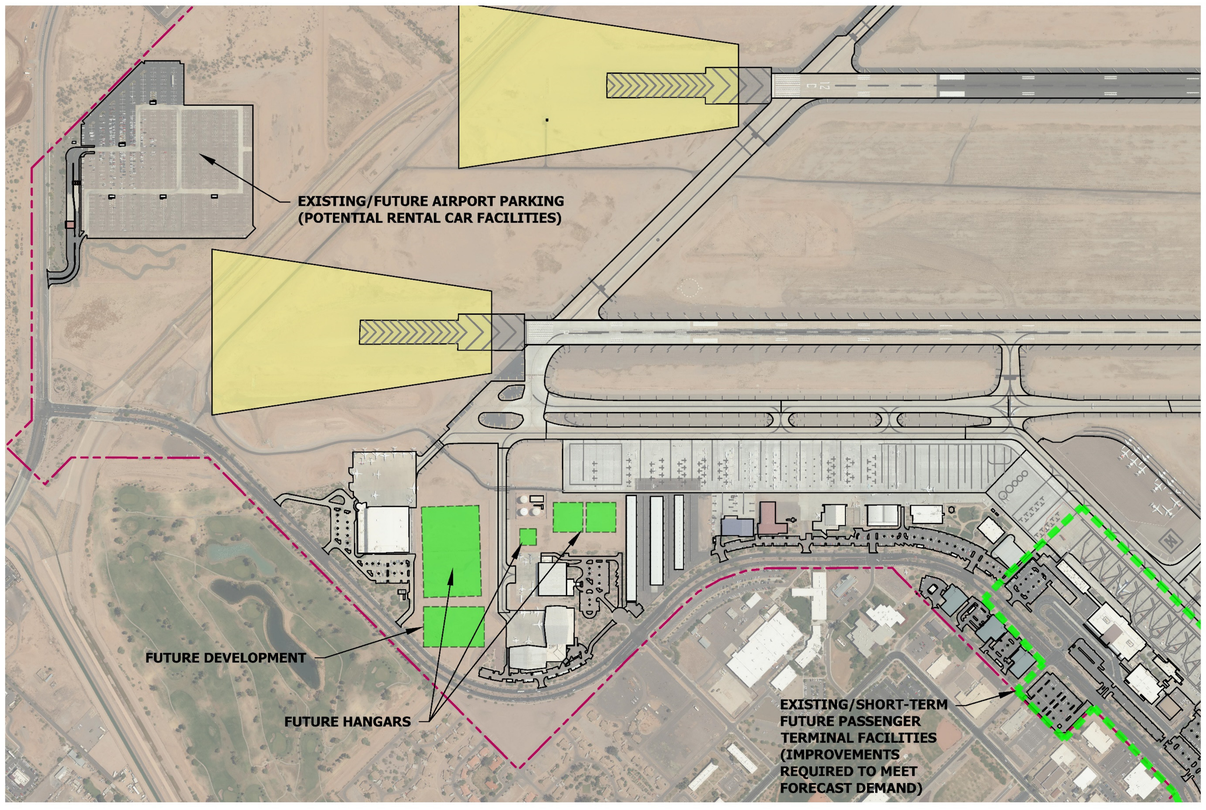
Phoenix-Mesa Gateway
Airport Master Plan

Landside Development
Eastside

Mead&Hunt

Phoenix-Mesa
Gateway
Airport Master Plan

Mead&Hunt



Legend

- Existing Runway Protection Zone
- Future Buildings/Development

N

0 400' 800' 1600'

GRAPHIC SCALE IN FEET

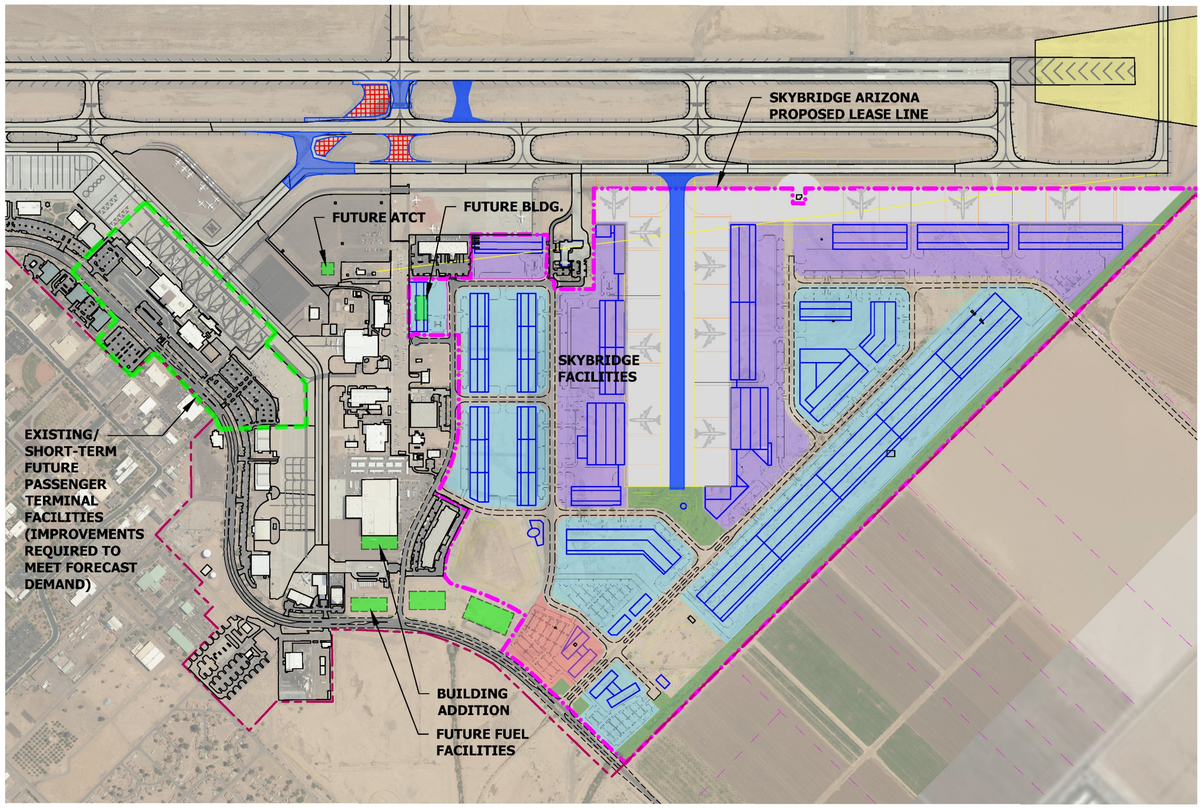
Phoenix-Mesa Gateway
Airport Master Plan

Landside Development
Westside (North)

Mead&Hunt

Phoenix-Mesa
Gateway
Airport Master Plan

Mead&Hunt



Legend

- Existing Runway Protection Zone
- Future Buildings/Development
- Future Taxiway Pavement
- Future Taxiway Pavement Removed
- SkyBridge Arizona Aviation Facilities
- SkyBridge Arizona w/No Taxiway Access
- SkyBridge Arizona Proposed Lease Line

N

0 400' 800' 1600'
GRAPHIC SCALE IN FEET

Phoenix-Mesa Gateway
Airport Master Plan

Landside Development
Westside (South)

Mead&Hunt

Phoenix-Mesa Gateway Airport
Airport Master Plan - Open House
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, June 26, 2019

SIGN-IN SHEET – PLEASE PRINT

Name	Organization	Address	Phone Number	Email Address
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Charlie McDermitt	Dibble			charlie.McDermitt@dibblecorp.com
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Bob Draper	PMGAA			bdraper@ " " "
Jon Faucher	M+H			jon.faucher@meadhunt.com
J. Brian O'Neill	PMGAA			
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Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport
Airport Master Planning Services

Phoenix-Mesa Gateway Airport
Airport Master Plan - Open House
Phoenix-Mesa Gateway Airport Authority Administration Building - Boardroom
Wednesday, June 26, 2019

SIGN-IN SHEET – PLEASE PRINT

Name	Organization	Address	Phone Number	Email Address
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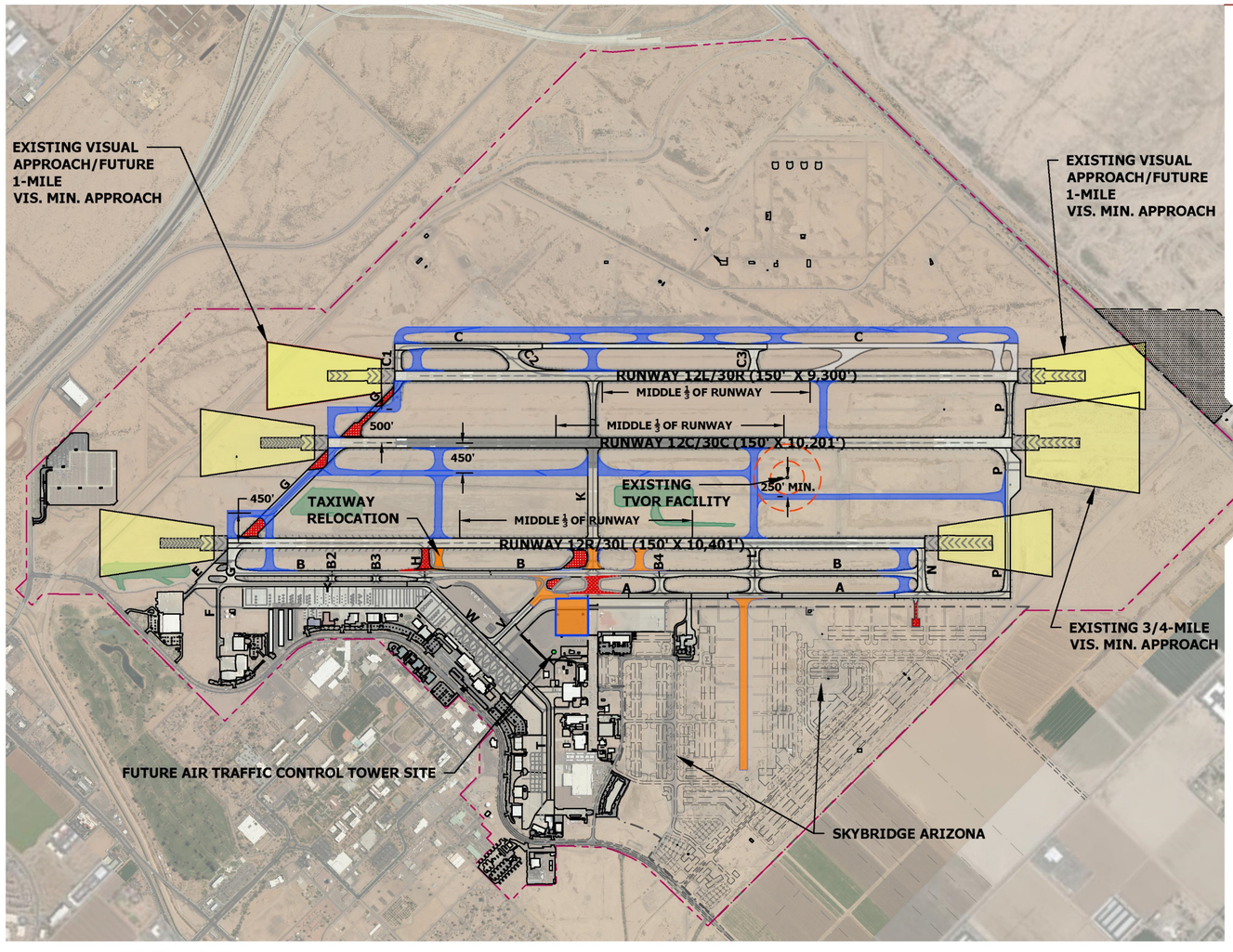
Alex Smith	PMGAA			
Scott Brownlee	PMGAA			SBrownlee@gatewayairport.com

Phoenix-Mesa Gateway Airport

Airfield Development: *ALTERNATIVE 1*



Mead&Hunt

Legend

- Existing Runway Protection Zone
- Existing Detention Ponds
- Existing Avigation Easement
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Existing IWA Programmed Project
- Pavement to be Removed

N

0 750' 1500' 3000'

GRAPHIC SCALE IN FEET

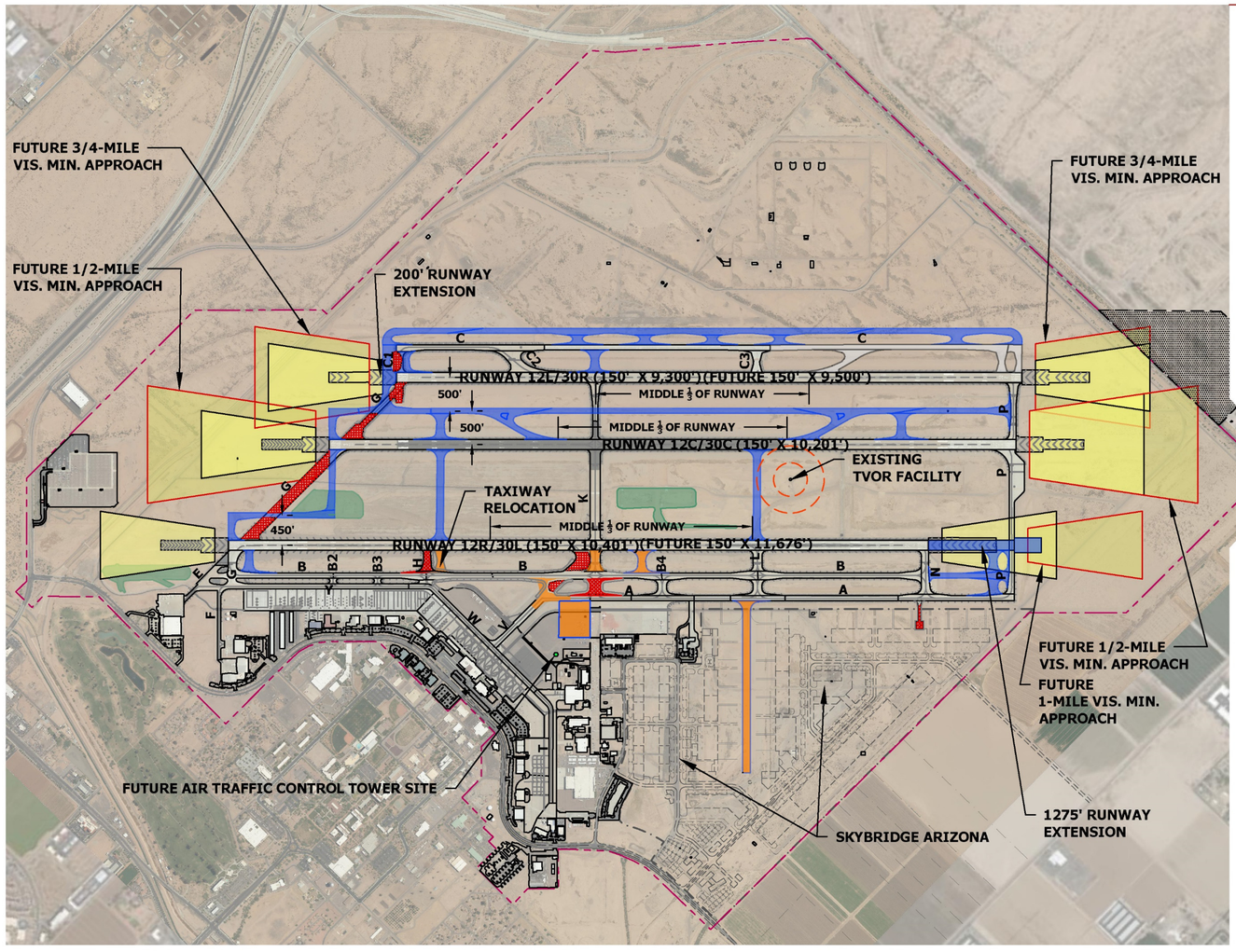
Figure 4-2
Airfield Development Alternative 1

Phoenix-Mesa Gateway Airport

Mead&Hunt

Phoenix-Mesa Gateway Airport Master Plan

Airfield Development: *ALTERNATIVE 2*



Mead&Hunt

Legend

- Existing Runway Protection Zone
- Existing Detention Ponds
- Existing Avigation Easement
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Existing IWA Programmed Project
- Pavement to be Removed

N

0 750' 1500' 3000'

GRAPHIC SCALE IN FEET

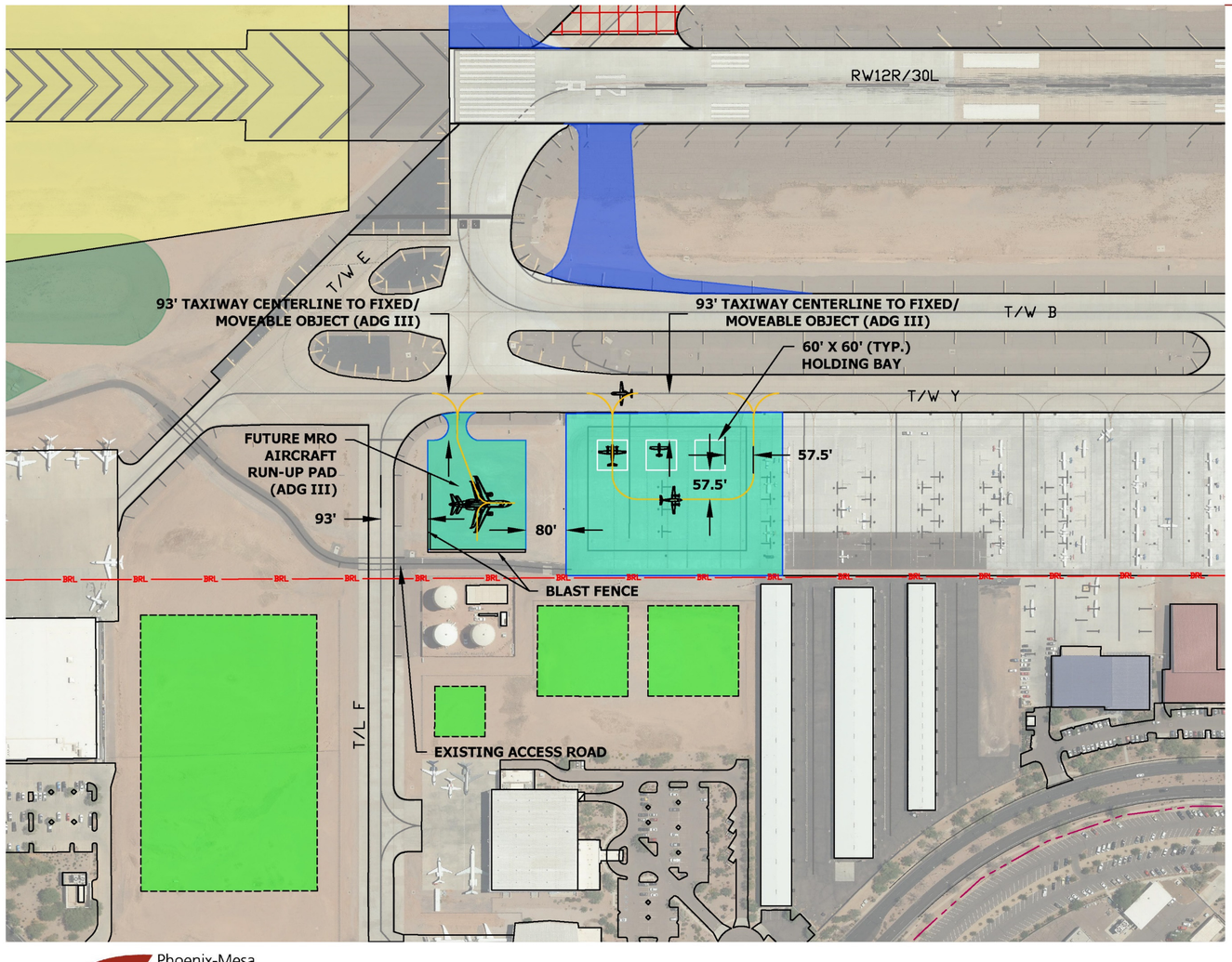
Figure 4-3
Airfield Development Alternative 2

Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport Master Plan

Mead&Hunt

Run-Up : *ALTERNATIVE 2*



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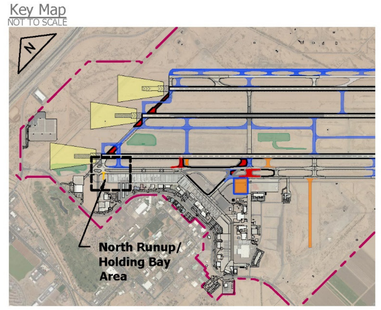
Key Map
NOT TO SCALE



Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Pavement to be Removed
- Future Buildings/Development

0 100' 200' 400'
GRAPHIC SCALE IN FEET

GA Run-up/Holding Bay Design Criteria
- Illustrates ADG II & III TOFA Criteria

MRO Run-up Pad Design Criteria
- Illustrates ADG III TOFA Criteria

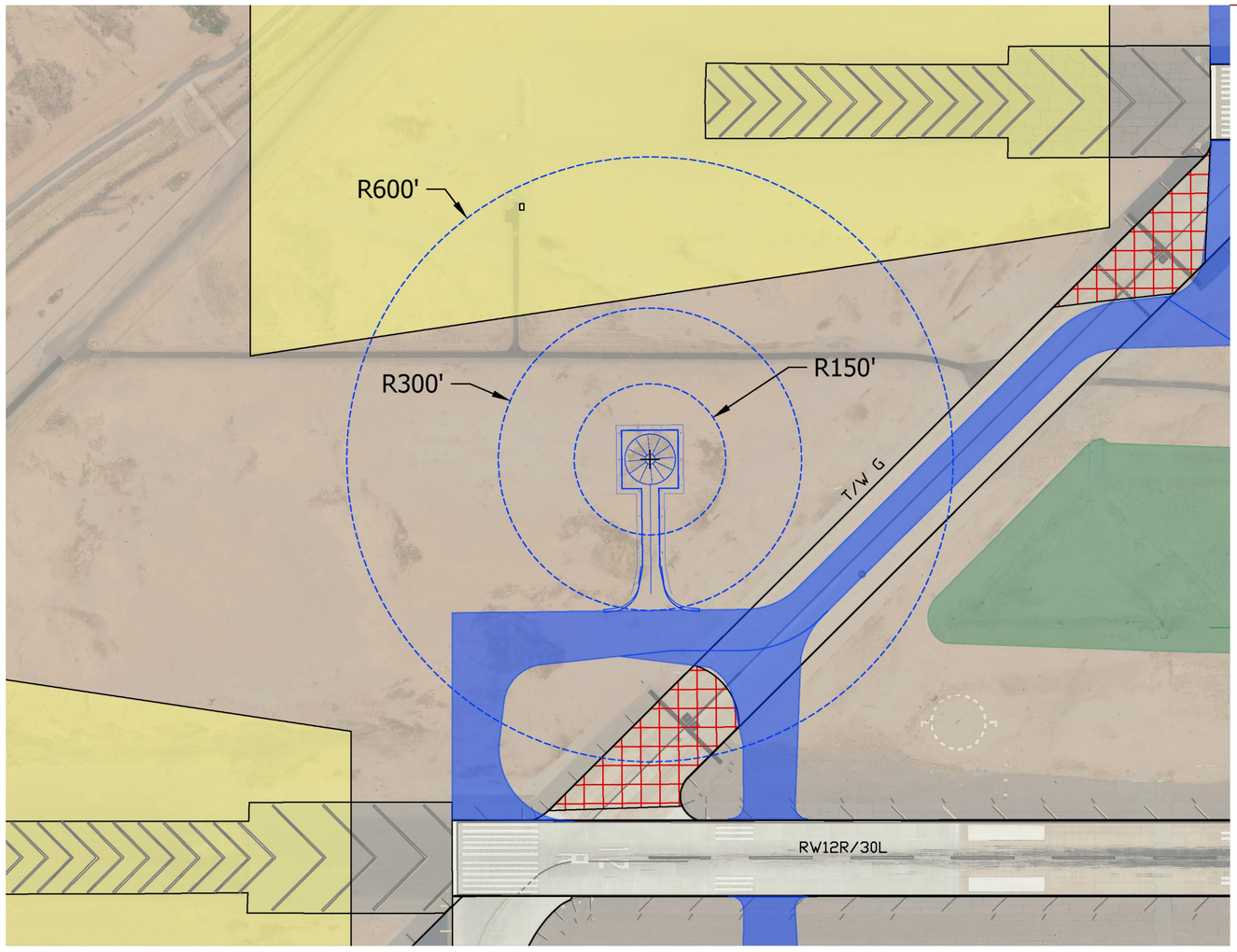
Figure 4-5
North GA Run-up/Holding Bay & Maintenance Run-up Area Alternative 2

Phoenix-Mesa Gateway Airport

Phoenix-Mesa
Gateway
Airport Master Plan

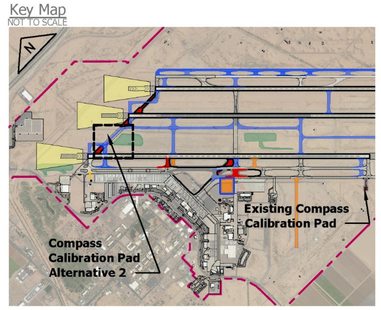
Mead&Hunt

Compass Calibration Pad: *ALTERNATIVE 2*



Mead&Hunt

Key Map
NOT TO SCALE



Legend

- Existing Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Existing IWA Programmed Project
- Pavement to be Removed

N
0 100' 200' 400'
GRAPHIC SCALE IN FEET

Compass Calibration Setback Criteria

- **150 feet** from runway and taxiway light bases, airfield signs, ducts, grates for drainage when they contain iron, steel, or ferrous materials
- 300 feet from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
- 600 feet from magnetic objects including large parking lots, busy roads, railroad tracks, and high voltage electrical transmission lines

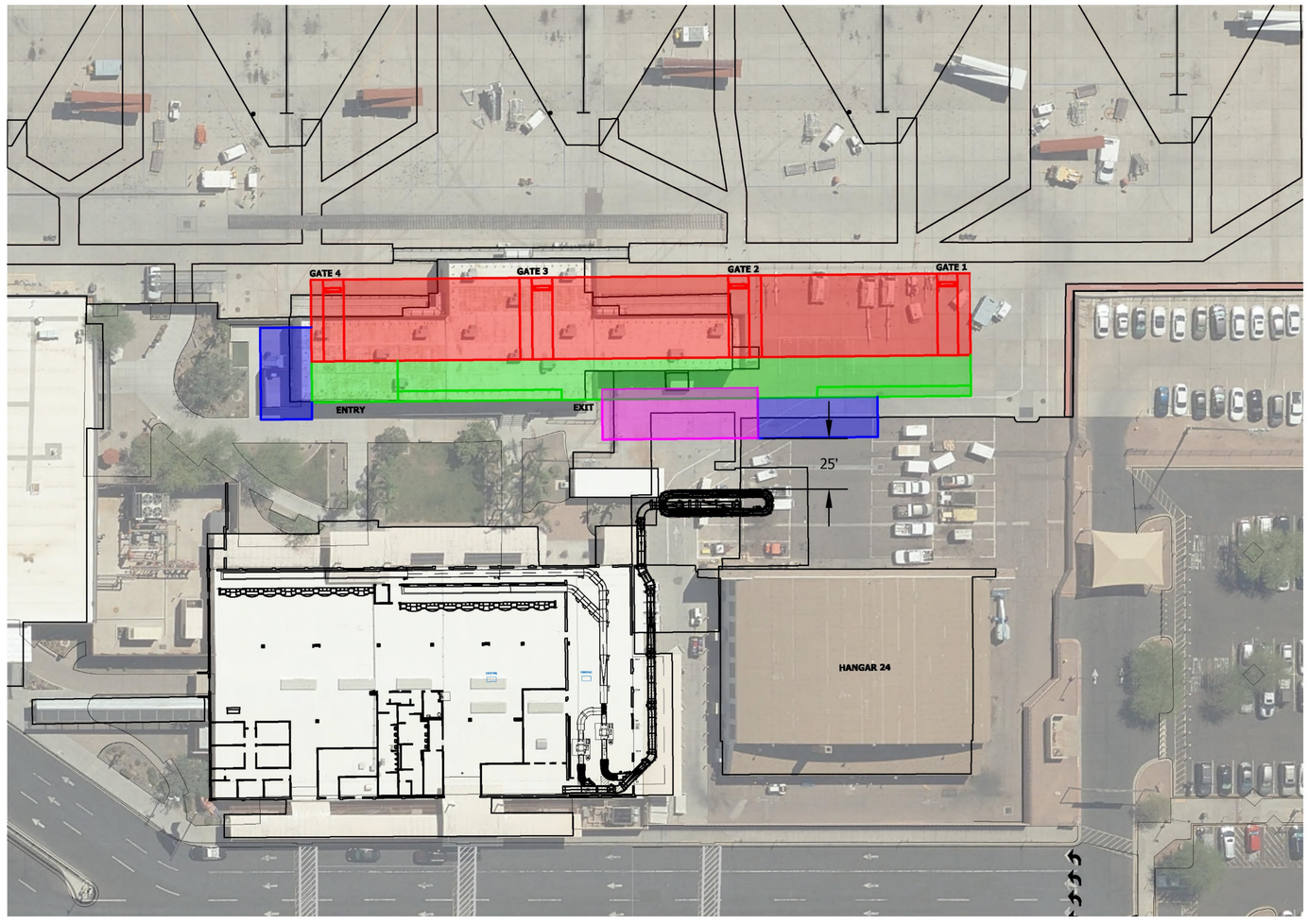
Figure 4-7
Compass Calibration Pad Relocation Alternative 2

Phoenix-Mesa Gateway Airport

Mead&Hunt

Phoenix-Mesa Gateway Airport Master Plan

Terminal Annex Redevelopment Plan



Mead&Hunt

Legend

- Departure Lounges
- Food & Beverage
- Concourse
- Restroom

N

0 25' 50' 100'

GRAPHIC SCALE IN FEET

Figure 4-9
Terminal Annex Redevelopment Plan

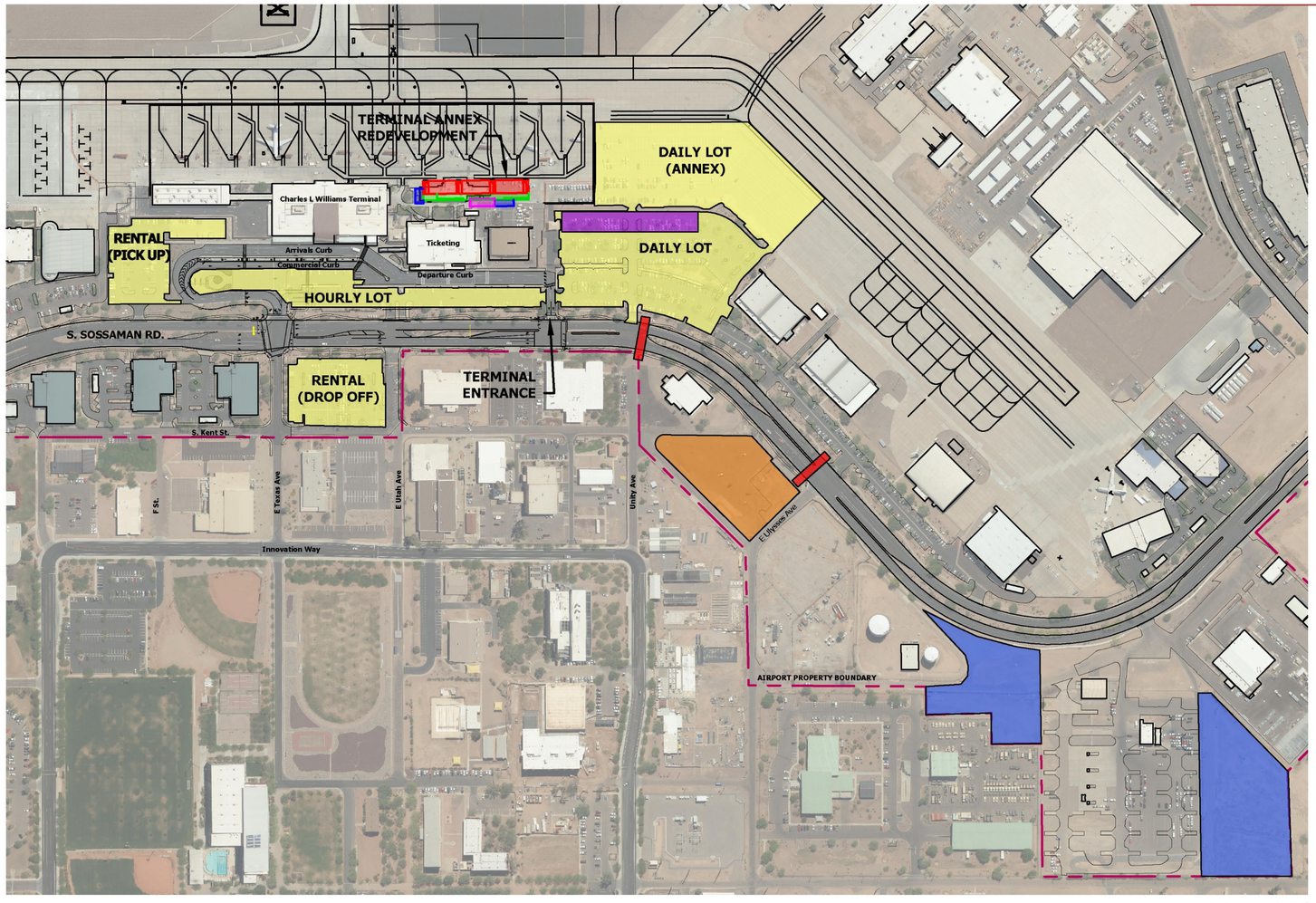
Phoenix-Mesa Gateway Airport

Airport Master Plan Update

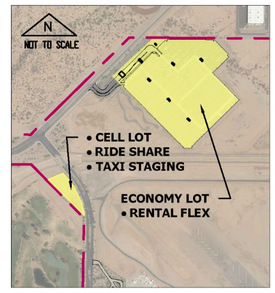
Phoenix-Mesa Gateway Airport Master Plan

Mead&Hunt

Westside Development: *ALTERNATIVE 1: Short Term*



Mead&Hunt



Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Future ADA Employee Parking
- Future Employee Parking
- Improved Pedestrian Crossing

Terminal Annex Legend

- Departure Lounges
- Food & Beverage
- Concourse
- Restroom

Note: Accompanied by changes to parking fee structure to encourage use of the Economy Lot.

N

0 150' 300' 600'

GRAPHIC SCALE IN FEET

Phoenix-Mesa Gateway Airport

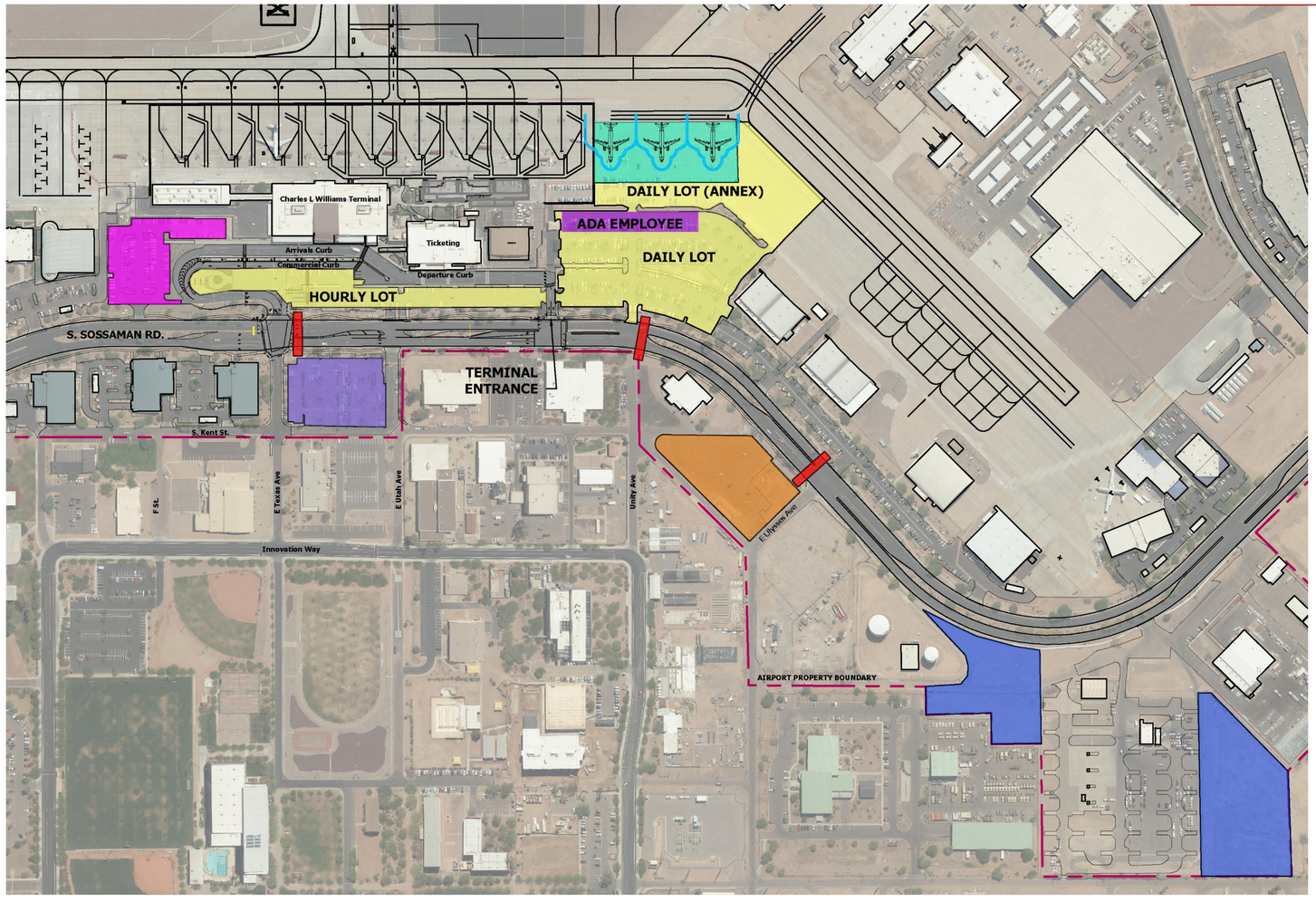
Figure 4-10
Westside Development - Facility Improvement Alternative 1 Short Term

Airport Master Plan Update

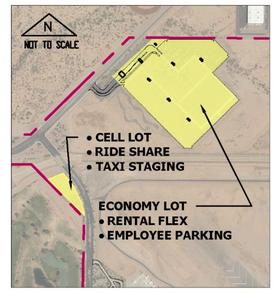
Phoenix-Mesa **Gateway** Airport Master Plan

Mead&Hunt

Westside Development: *ALTERNATIVE 1: Mid Term*



Mead&Hunt



Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Future ADA Employee Parking
- Future Employee Parking
- Future Additional Daily Lot Parking
- Future Flex Lot Parking
  - Hourly
  - Value Added
- Future Reclaimed Apron
- Improved Pedestrian Crossing

Note: Presumed loss of ± 219 Daily Lot parking stalls in the annex. Demand expected to shift to added Daily Lot and Economy Lot.

N

0 150' 300' 600'

GRAPHIC SCALE IN FEET

Phoenix-Mesa Gateway Airport

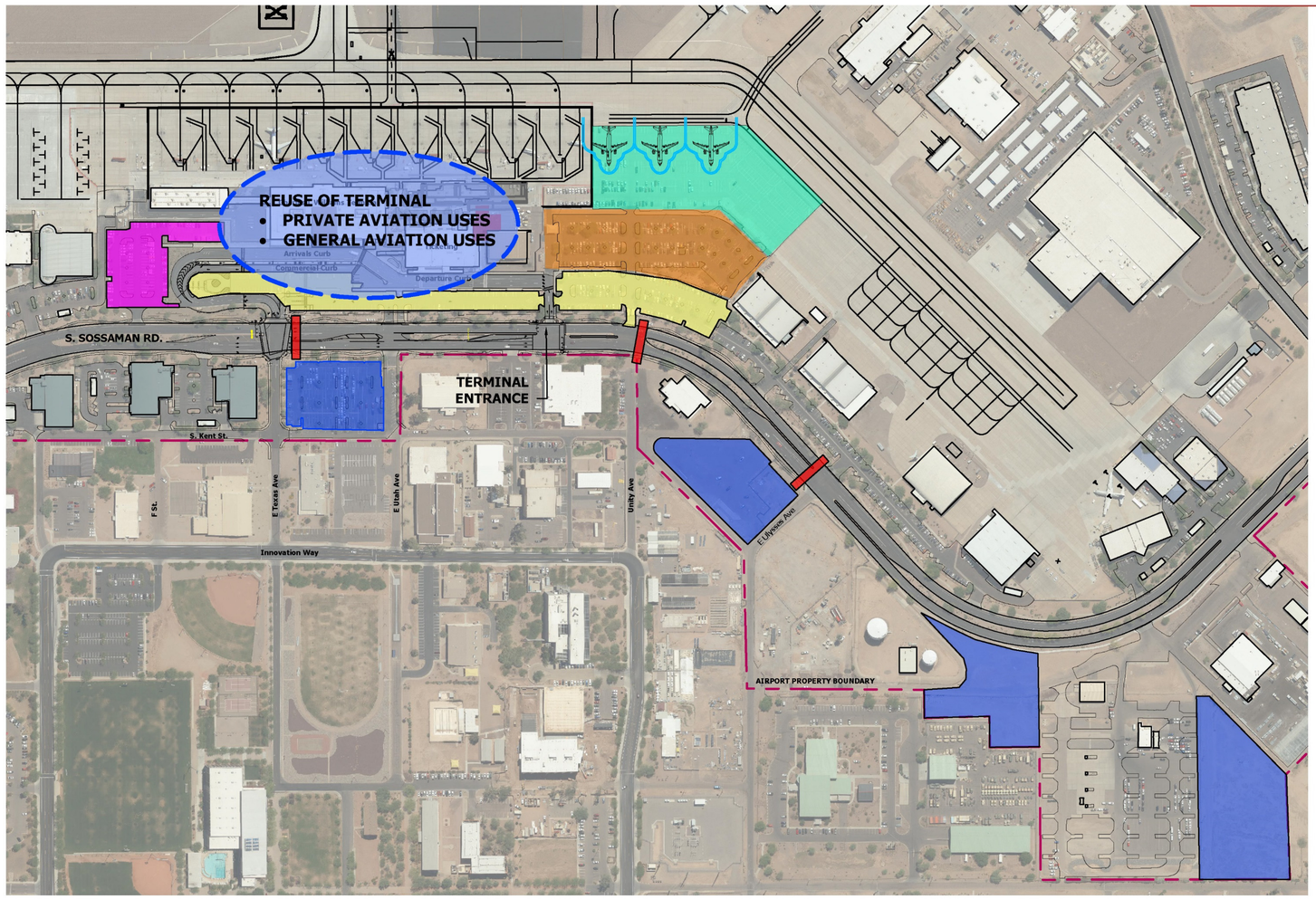
Figure 4-11
Westside Development - Facility Improvement Alternative 1 Mid Term

Airport Master Plan Update

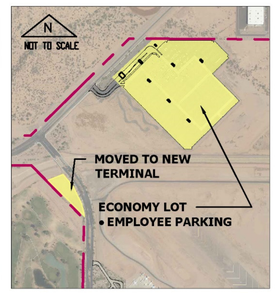
Phoenix-Mesa **Gateway** Airport Master Plan

Mead&Hunt

Westside Development: *ALTERNATIVE 1: Long Term*



Mead&Hunt



Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Potential Future Aeronautical Use
- Private Aviation Parking
- Future Reclaimed Apron
- Improved Pedestrian Crossing

Note: Long-term changes dependent on terminal relocation.

N

0 150' 300' 600'

GRAPHIC SCALE IN FEET

Phoenix-Mesa Gateway Airport

Figure 4-12
Westside Development - Facility Improvement Alternative 1 Long Term

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

Mead&Hunt

Terminal Development: *ALTERNATIVE 1*

Mead&Hunt

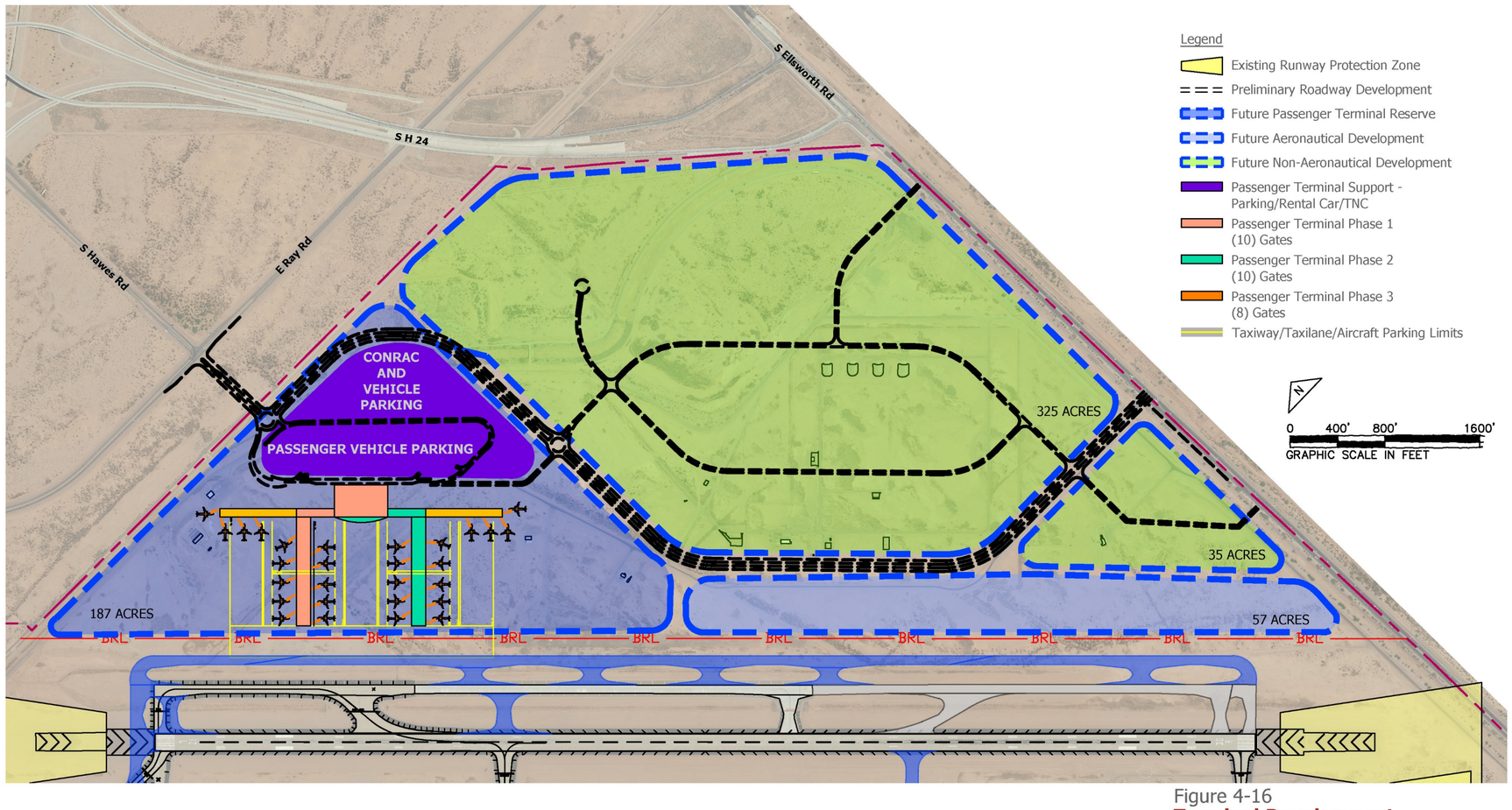


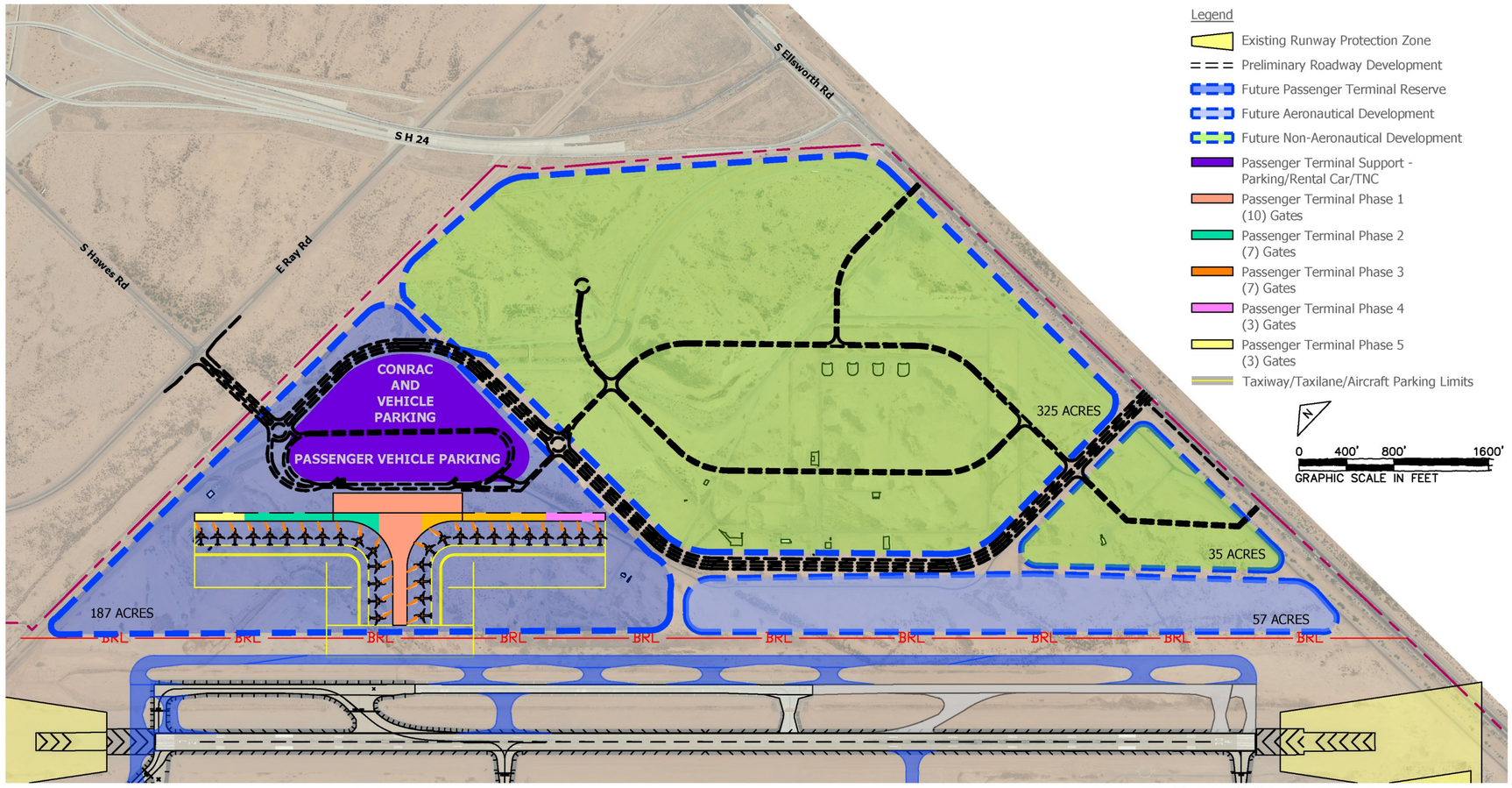
Figure 4-16
Terminal Development
Alternative 1
Pier-Finger Design - 28 Gates

Phoenix-Mesa Gateway Airport

Mead&Hunt

Phoenix-Mesa
Gateway
Airport Master Plan

Terminal Development: *ALTERNATIVE 2*



Mead&Hunt

Legend

- Existing Runway Protection Zone
- Preliminary Roadway Development
- Future Passenger Terminal Reserve
- Future Aeronautical Development
- Future Non-Aeronautical Development
- Passenger Terminal Support - Parking/Rental Car/TNC
- Passenger Terminal Phase 1 (10) Gates
- Passenger Terminal Phase 2 (7) Gates
- Passenger Terminal Phase 3 (7) Gates
- Passenger Terminal Phase 4 (3) Gates
- Passenger Terminal Phase 5 (3) Gates
- Taxiway/Taxilane/Aircraft Parking Limits

N

0 400' 800' 1600'

GRAPHIC SCALE IN FEET

Figure 4-17
Terminal Development
Alternative 2
Curvilinear-Pier Design - 28 Gates

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

Phoenix-Mesa Gateway Airport Master Plan

Mead&Hunt

Terminal Development: *ALTERNATIVE 3*

Mead&Hunt

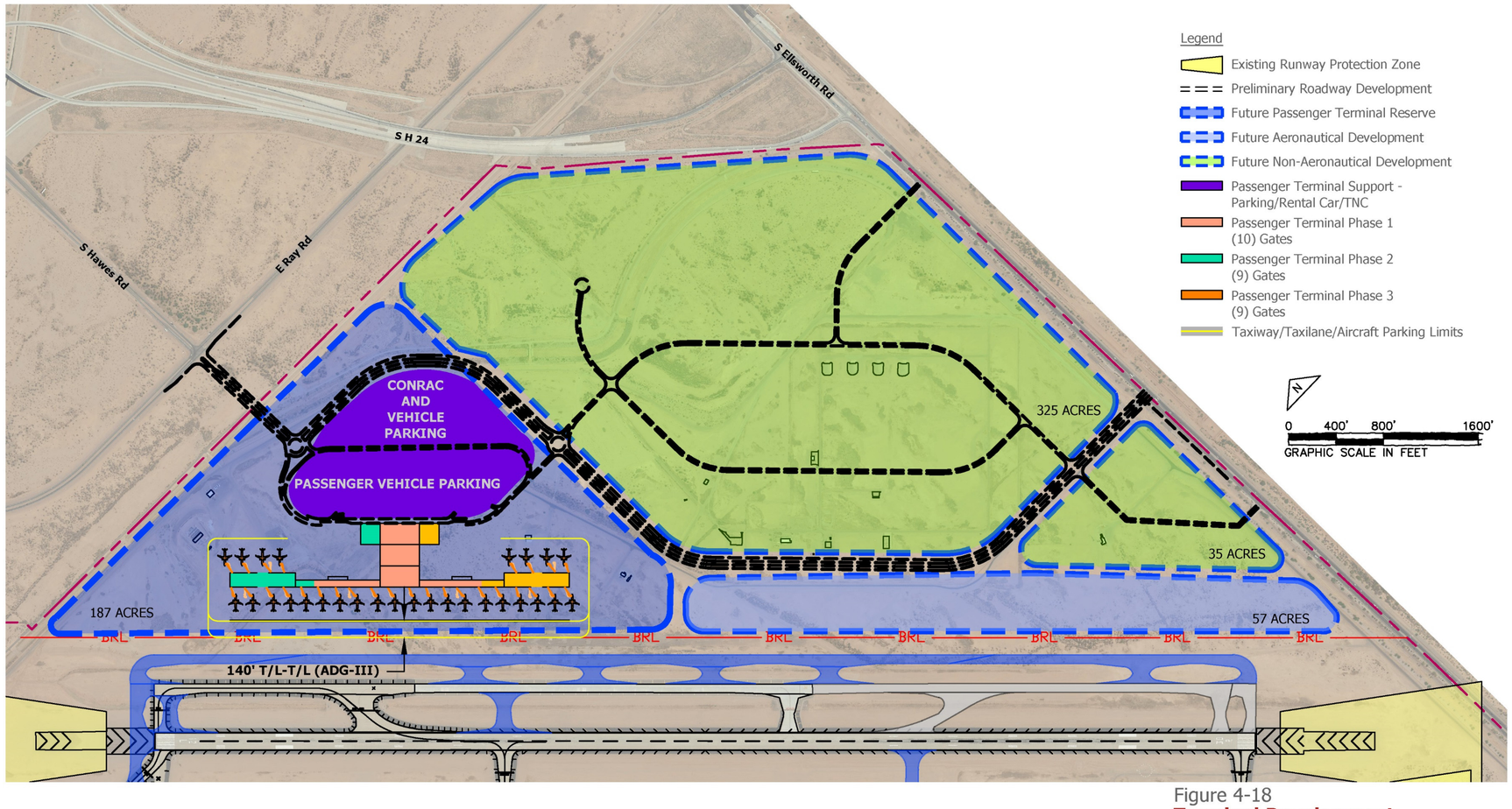


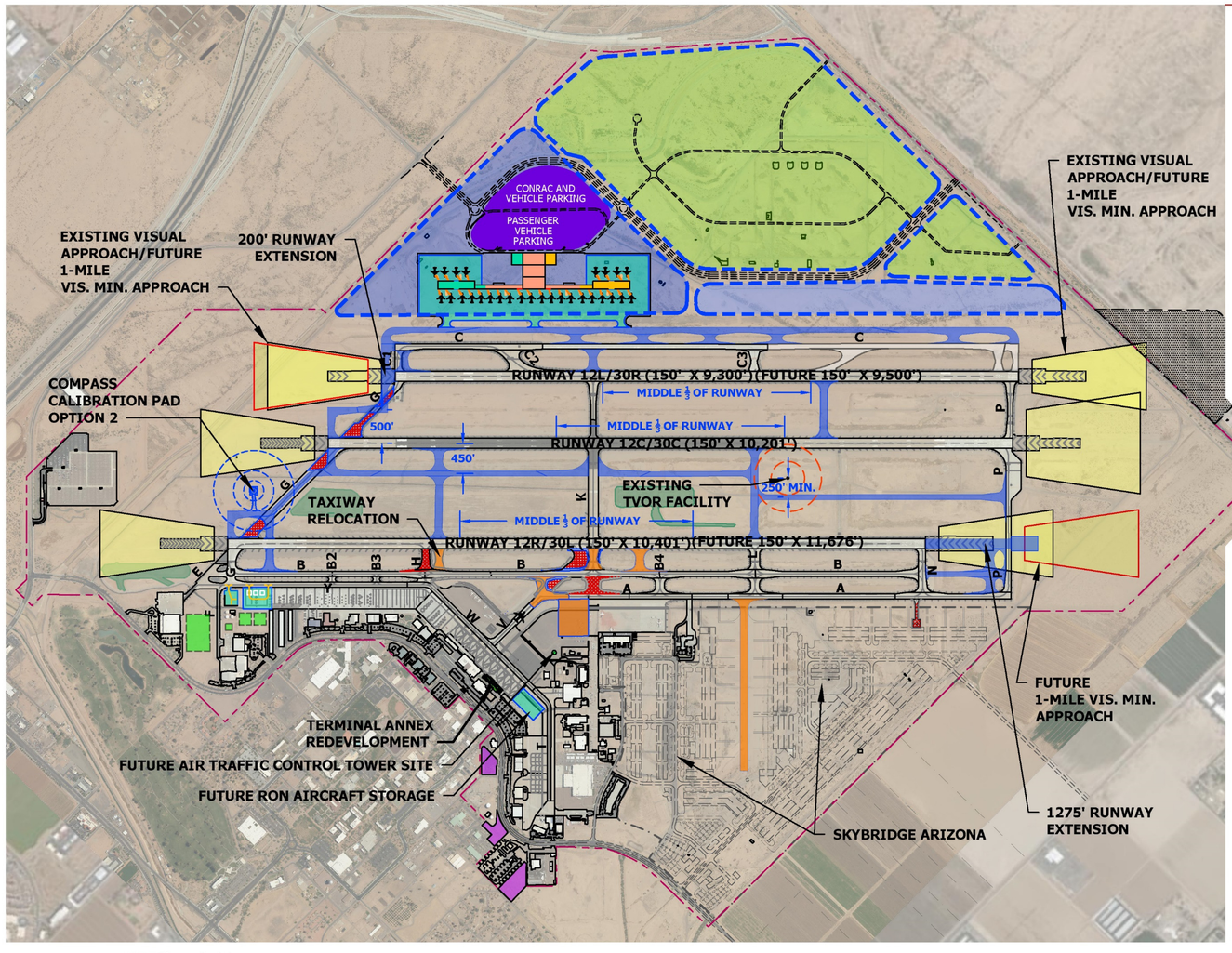
Figure 4-18
Terminal Development
Alternative 3
Linear-Pier Design - 28 Gates

Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport Master Plan

Mead&Hunt

Preferred Conceptual Development Plan



Mead&Hunt

Legend

- Existing Runway Protection Zone
- Preliminary Roadway Development
- Future Passenger Terminal Reserve
- Future Aeronautical Development
- Future Non-Aeronautical Development
- Passenger Terminal Support - Parking/Rental Car/TNC
- Existing Detention Ponds
- Existing Avigation Easement
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Future Apron Pavement
- Existing IWA Programmed Project
- Pavement to be Removed
- Future Buildings/Development
- Future Economic Development Opportunity
- Passenger Terminal Phase 1 (10) Gates
- Passenger Terminal Phase 2 (9) Gates
- Passenger Terminal Phase 3 (9) Gates

N

0 750' 1500' 3000'

GRAPHIC SCALE IN FEET

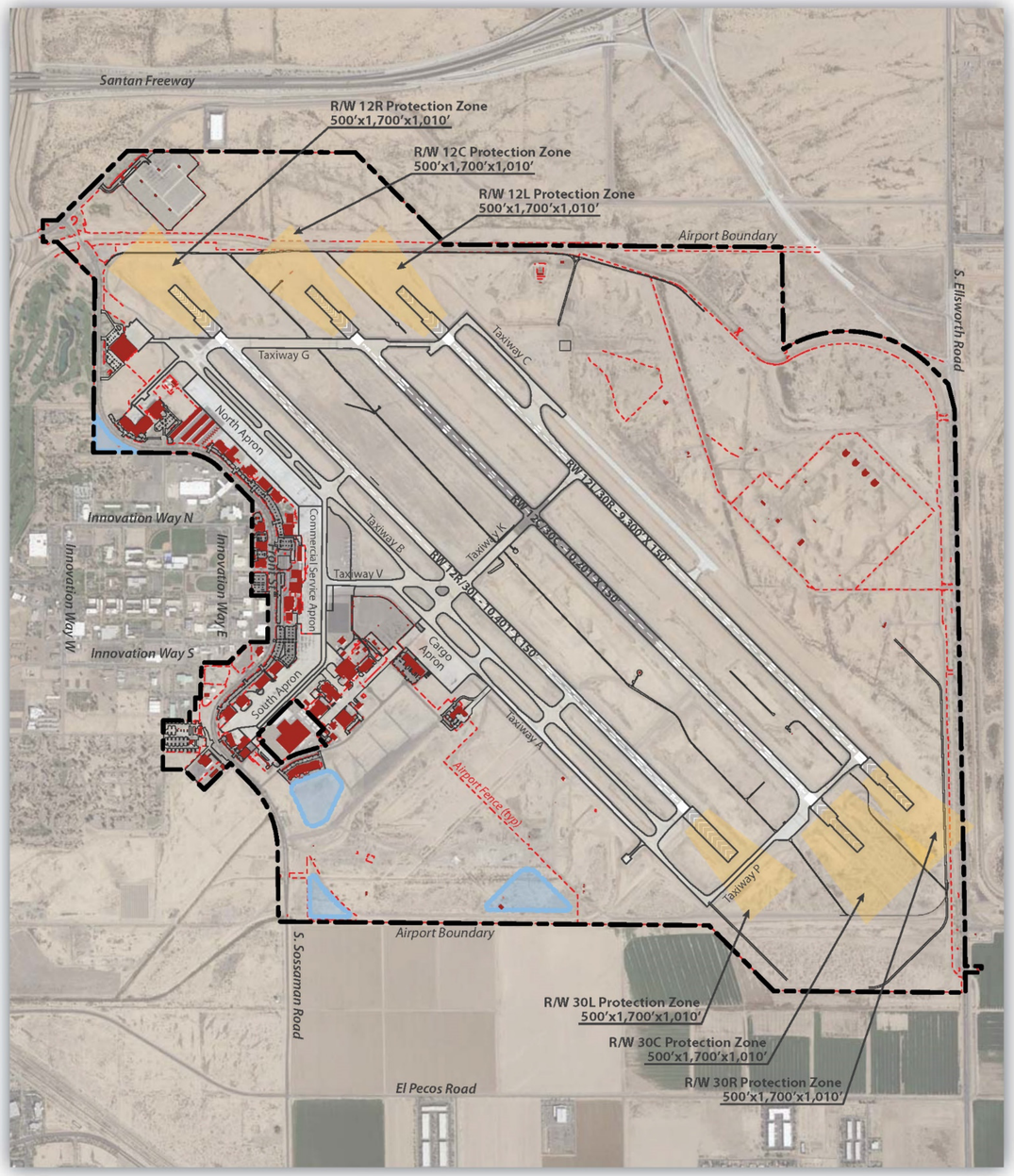
Figure 4-19
Preferred Airport Conceptual Development Plan

Phoenix-Mesa Gateway Airport

Phoenix-Mesa Gateway Airport Master Plan

Mead&Hunt

Existing Facilities



0 750 **1500** 2250
Graphic Scale in Feet

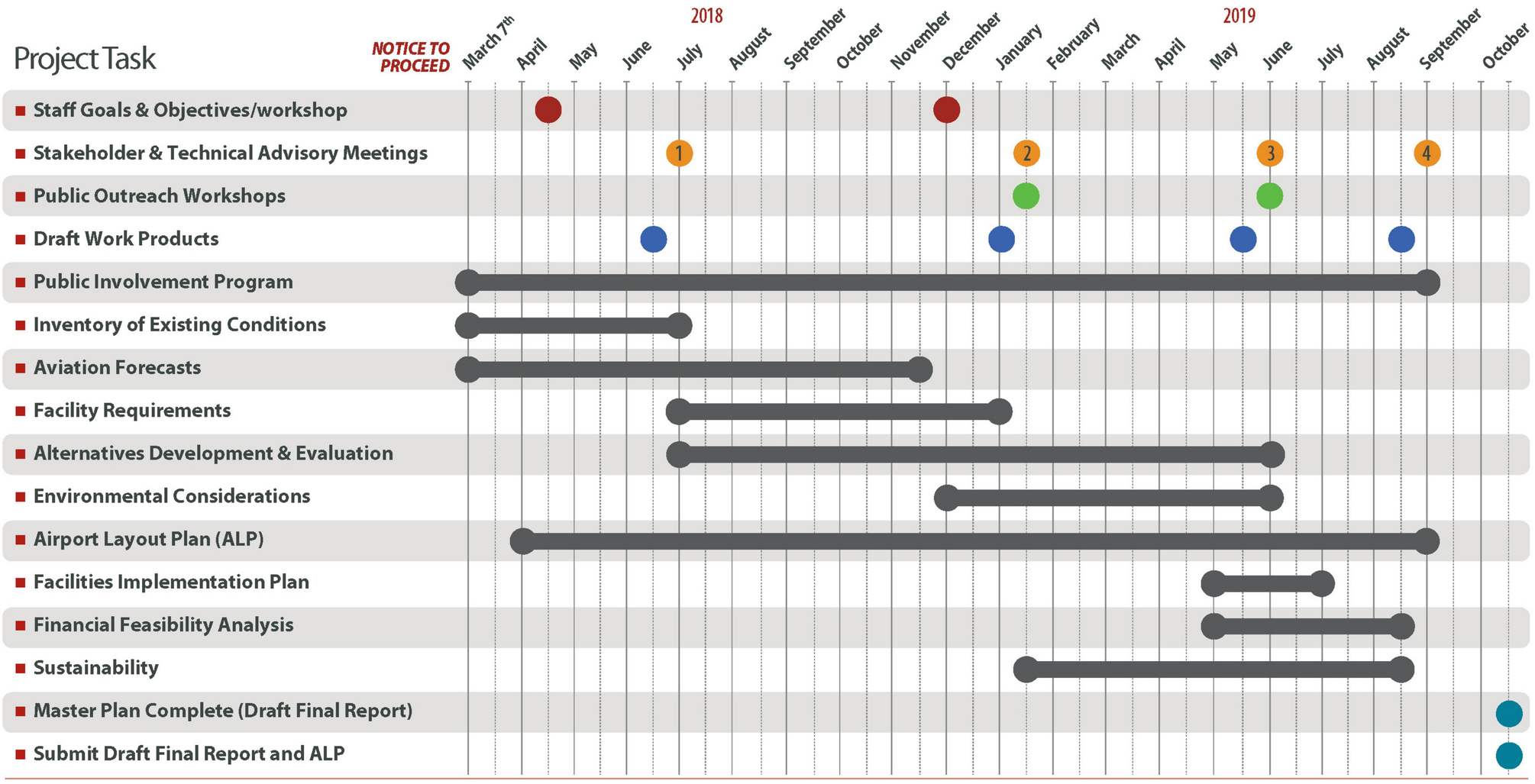
Source: *Phoenix-Mesa Gateway Existing Airport Layout Plan, 2015*

Phoenix-Mesa **Gateway** Airport Master Plan

Mead&Hunt

Phoenix-Mesa
Gateway
Airport Master Plan

Project Schedule Airport Master Plan



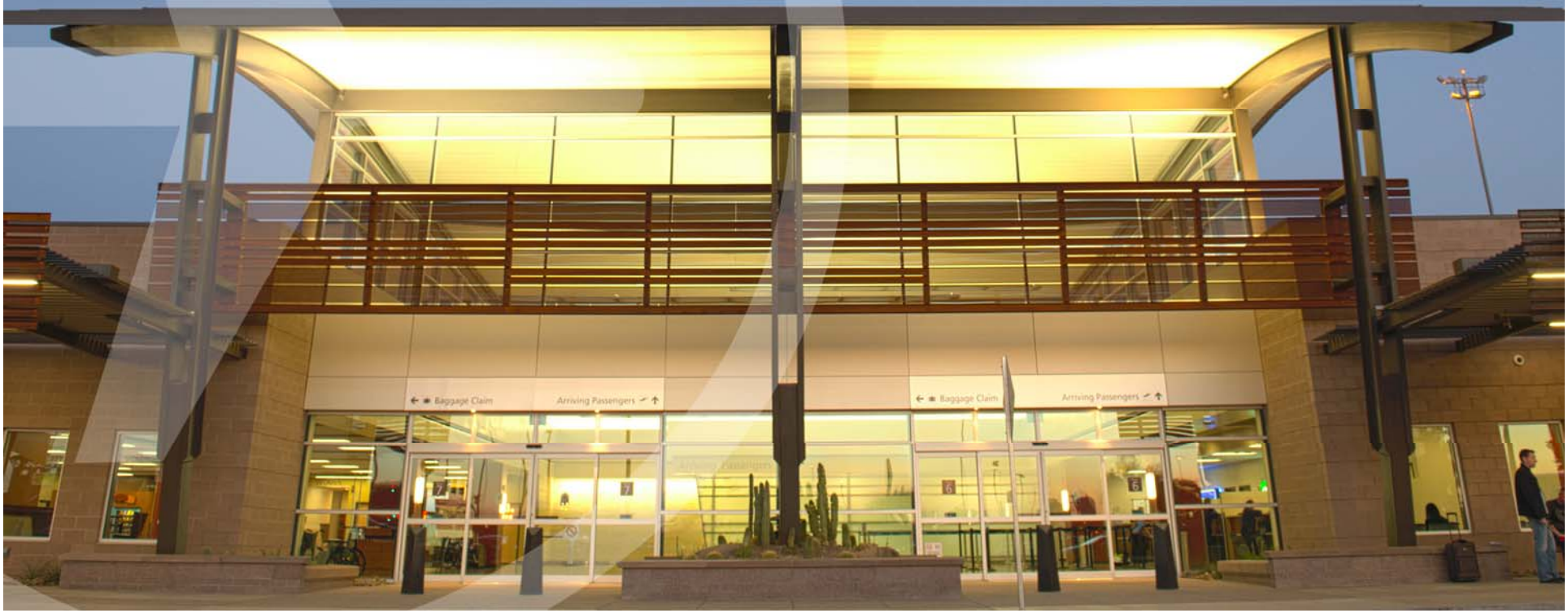
NOTE: Schedule updated May 30, 2019. Subject to change.

Mead&Hunt

Phoenix-Mesa Gateway Airport

Airport Master Plan Update

PMGAA Board Meeting
May 15, 2018

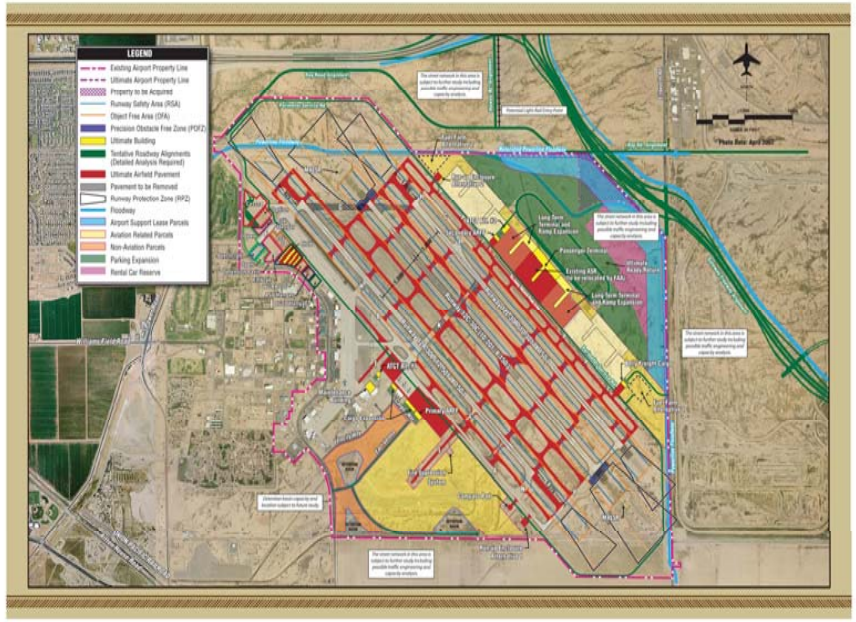


Airport Master Plan Update

Phoenix-Mesa Gateway Airport

- 10-20 year focus, last updated in 2008

- Key Plan Elements:
  - Update Forecasts
  - Facility Requirements
  - Development Alternatives
  - Financial Feasibility
  - Preferred Alternative



Airport & Community Focused Plan

Phoenix-Mesa Gateway Airport

- Public Information Meetings During the Process
- Form Two (2) Committees

Technical Advisory Committee (TAC)

- **FAA**
- **Serco (Air Traffic Control)**
- **TSA**
- **ADOT**
- **Allegiant**
- **WestJet**
- **Worldwide Flight Service (WFS)**
- **Skybridge AZ**
- **University of North Dakota (UND)**
- **ATP (ASU Flight School)**
- **Able Engineering**
- **Cessna**
- **Embraer**
- **Constant Aviation**
- **Native Air**
- **Int'l Air Response (IAR)**
- **Intel/Air Shuttle**
- **Arizona Air National Guard (ANG)**
- **Boeing**
- **US Forest Service**

Airport & Community Focused Plan

Phoenix-Mesa Gateway Airport

Stakeholder Committee

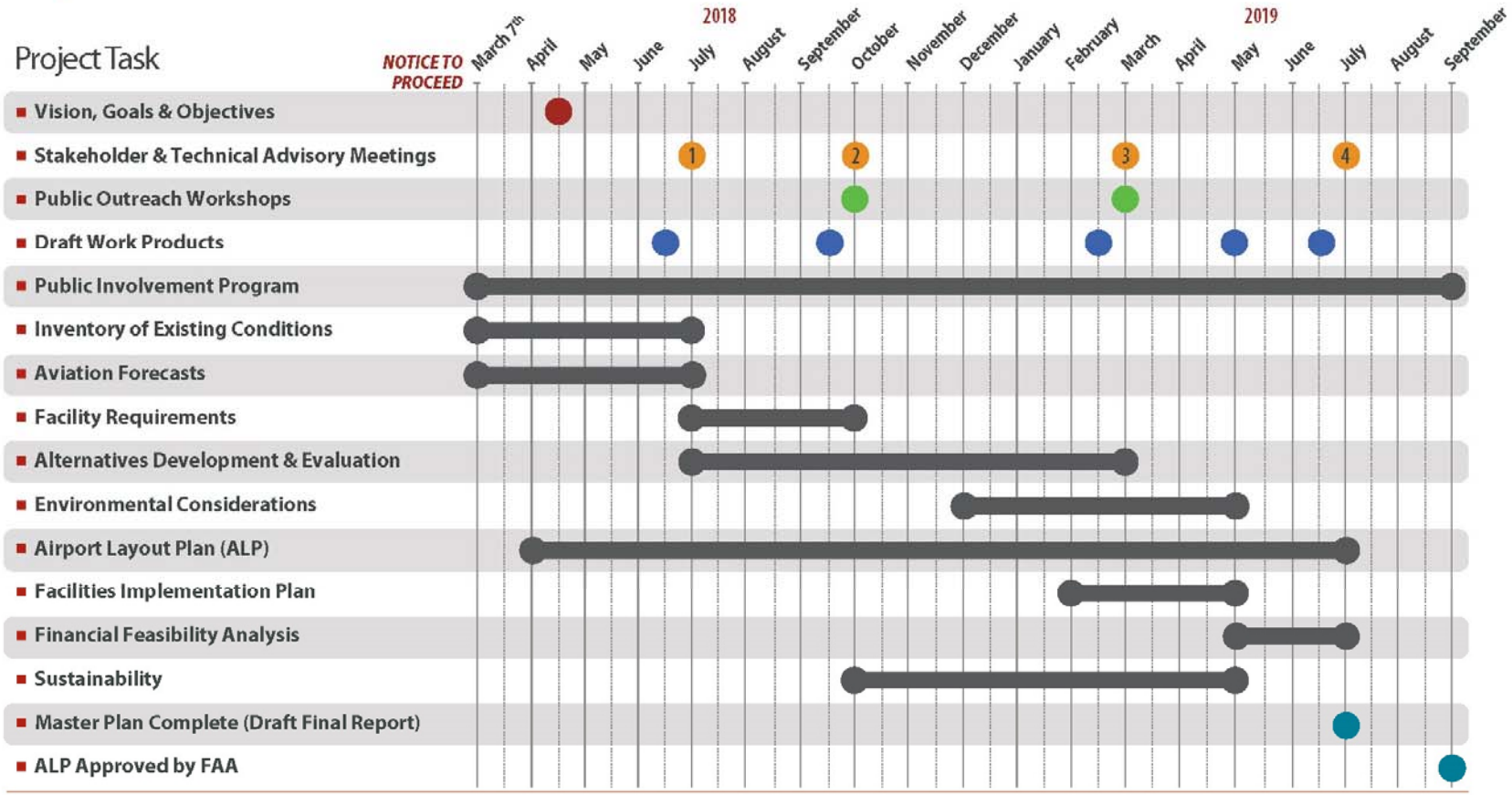
- City of Mesa
- Falcon Field
- City of Phoenix
- Sky Harbor
- City of Apache Junction
- Town of Gilbert
- Town of Queen Creek
- Gila River Indian Community
- Mesa, Gilbert, & Queen Creek to select one resident to serve
- AOPA (Pilot's Association)
- Chandler Airport
- ASU
- Chandler-Gilbert Community College (CGCC)
- East Valley Partnership (EVP)
- Home Builders Assoc. of Central AZ
- National Association of Industrial & Office Properties (NAIOP)
- East Valley Chambers of Commerce Alliance (EVCCA)

- HOA & Neighborhood Outreach w/ PMGAA Community Relations Manager

Project Timeline

Phoenix-Mesa Gateway Airport

Project Schedule Airport Master Plan



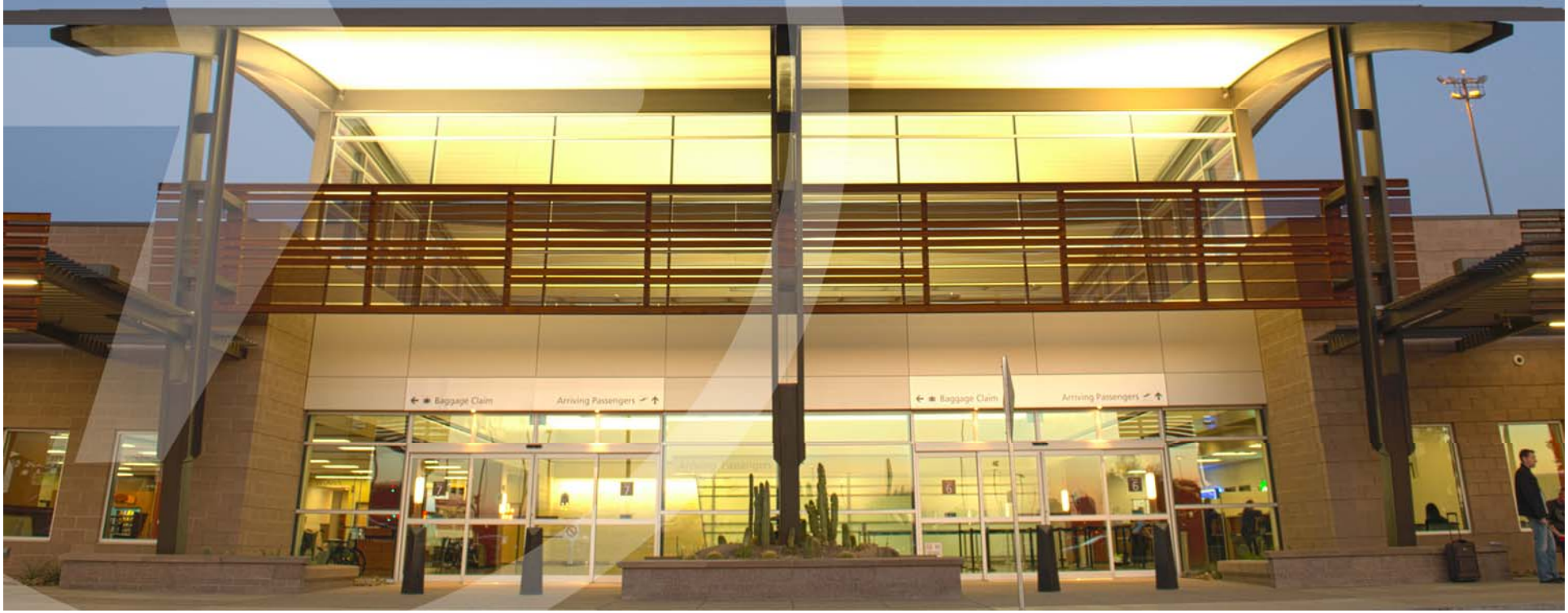
NOTE: Schedule updated April 9, 2018. Subject to change.

Phoenix-Mesa Gateway

Phoenix-Mesa Gateway Airport

Airport Master Plan Forecast

PMGAA Board Meeting
October 16, 2018



Airport Master Plan Forecast

Phoenix-Mesa Gateway Airport

2008 Master Plan

Planning Horizon	Baseline	Short Term	Intermediate Term	Long Term
	2007	2012	2017	2027
Enplanements	177,649*	350,000	850,000	2,200,000
Air Carrier Operations	1,961	9,449	20,806	48,166
Air Cargo Operations	0	800	1,700	3,500
Air Taxi Operations	8,675	12,772	16,171	22,866
Military Operations	9,380	12,500	12,500	12,500
General Aviation Operations	276,670	321,479	363,823	447,968
Total Operations	**296,686**	**357,000**	**415,000**	**535,000**
Enplaned Air Cargo (Tons)	0	10,000	21,000	44,000
Based Aircraft	115	200	241	350

* 2008 Enplanement

Airport Master Plan
Enplanement Forecast

Phoenix-Mesa Gateway Airport

2008 vs. 2018 Master Plan

Planning Horizon	Baseline	Short Term	Intermediate Term	Long Term
	2007	2012	2017	2027
Enplanements	177,649*	350,000	850,000	2,200,000
Air Carrier Operations	1,961	9,449	20,806	48,166
Air Cargo Operations	0	800	1,700	3,500
Air Taxi Operations	8,675	12,772	16,171	22,866
Military Operations	9,380	12,500	12,500	12,500
General Aviation Operations	276,670	321,479	363,823	447,968
Total Operations	**296,686**	**357,000**	**415,000**	**535,000**
Enplaned Air Cargo (Tons)	0	10,000	21,000	44,000
Based Aircraft	115	200	241	350

* 2008 Enplanement

IWA Forecast Enplanements

	Actual	Estimate		Forecast		
Scenario	2017	2018	2019	2023	2028	2038
Master Plan (MP)	681,892	759,033	850,292	924,667	1,022,420	1,245,211

Airport Master Plan
Forecast w/ Monte Carlo Simulation

Phoenix-Mesa Gateway Airport

IWA Forecast Enplanements

	Actual	Estimate		Forecast		
Scenario	2017	2018	2019	2023	2028	2038
Master Plan (MP)	681,892	759,033	850,292	924,667	1,022,420	1,245,211
High Growth (HG)	681,892	759,033	934,839	1,037,426	1,168,589	1,451,202
Low Growth (LG)	681,892	759,033	850,292	903,617	984,846	1,180,070
TAF (CY)	704,268	751,856	771,352	838,428	923,717	1,120,895
Ratio MP - TAF (CY)	0.97	1.01	1.10	1.10	1.11	1.11
Ratio HG - TAF (CY)	0.97	1.01	1.21	1.24	1.27	1.29
Ratio LG - TAF (CY)	0.97	1.01	1.10	1.08	1.07	1.05

Sources: Airport Statistics, U.S. Department of Transportation, OAG Analyzer, and Unison Consulting, Inc.

Airport Master Plan
Operations

Phoenix-Mesa Gateway Airport

IWA Forecast Commercial Aircraft Operations

	Actual	Estimate		Forecast		
Scenario	2017	2018	2019	2023	2028	2038
Master Plan (MP)	10,372	10,920	11,994	12,953	14,070	16,840
High Growth (HG)	10,372	10,920	13,120	14,463	16,020	19,570
High Growth (HG)*	10,372	10,920	13,120	16,795	22,184	31,482
Low Growth (LG)	10,372	10,920	11,994	12,662	13,558	15,967
TAF (CY)	11,630	12,505	12,819	13,899	15,273	18,439

Forecast Noncommercial Aviation Activity

	Actual	Est.	Forecast		
Measure/Scenario	2017	2018	2023	2028	2038
General Aviation	271,446	282,596	296,256	311,455	345,401
Itinerant	104,927	114,236	115,835	119,407	128,625
Local	166,519	168,360	180,421	192,048	216,776
Military	7,503	7,503	7,503	7,503	7,503
Based Aircraft	109	116	121	126	139

Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.

Airport Master Plan
Operations Forecast

Phoenix-Mesa Gateway Airport

2008 vs. 2018 Master Plan

Planning Horizon	Baseline	Short Term	Intermediate Term	Long Term
	2007	2012	2017	2027
Enplanements	177,649*	350,000	850,000	2,200,000
Air Carrier Operations	1,961	9,449	20,806	48,166
Air Cargo Operations	0	800	1,700	3,500
Air Taxi Operations	8,675	12,772	16,171	22,866
Military Operations	9,380	12,500	12,500	12,500
General Aviation Operations	276,670	321,479	363,823	447,968
Total Operations	**296,686**	**357,000**	**415,000**	**535,000**
Enplaned Air Cargo (Tons)	0	10,000	21,000	44,000
Based Aircraft	115	200	241	350

* 2008 Enplanement

Annual Operations Forecast:

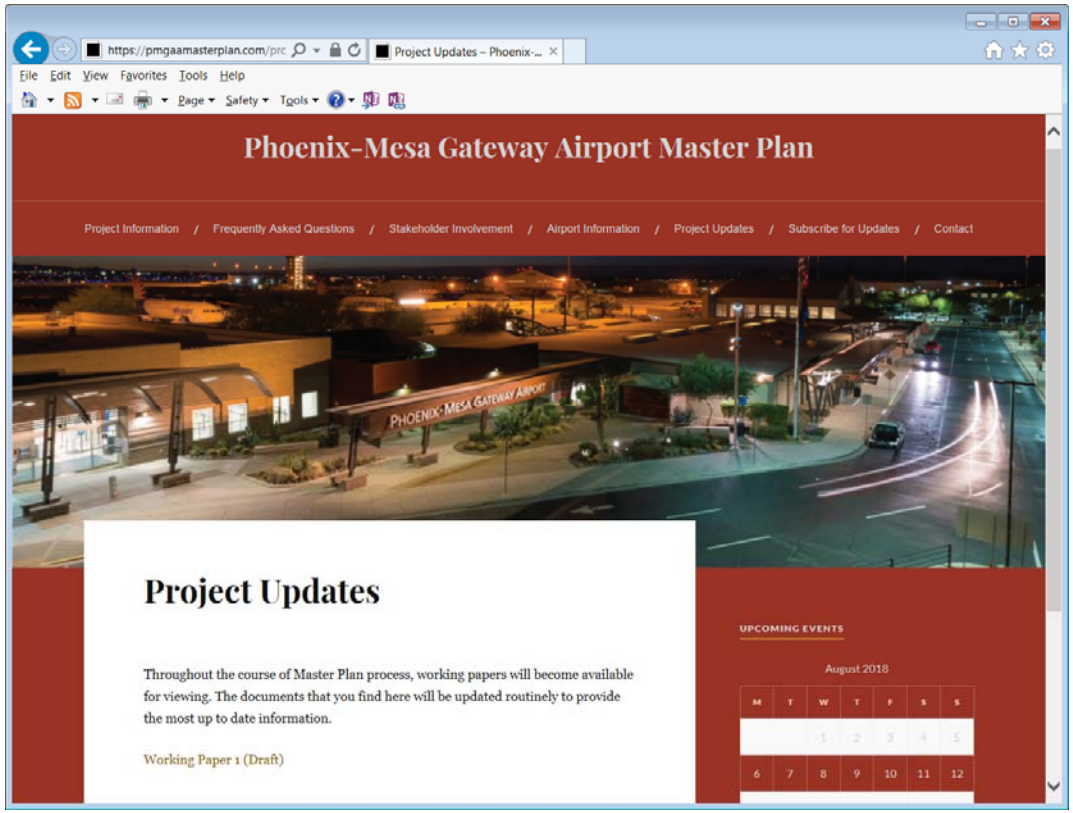
2017 Total= 290,452

2023	2028	2038
316,712	333,028	369,744

Airport Master Plan
Additional Info & Next Steps

Phoenix-Mesa Gateway Airport

Project Website: www.pmgaamasterplan.com



- Submitted forecast to FAA for review (October)
- Facility Requirements & Development Alternatives work (underway)
- Committee Meetings & Public Information Meeting (November)

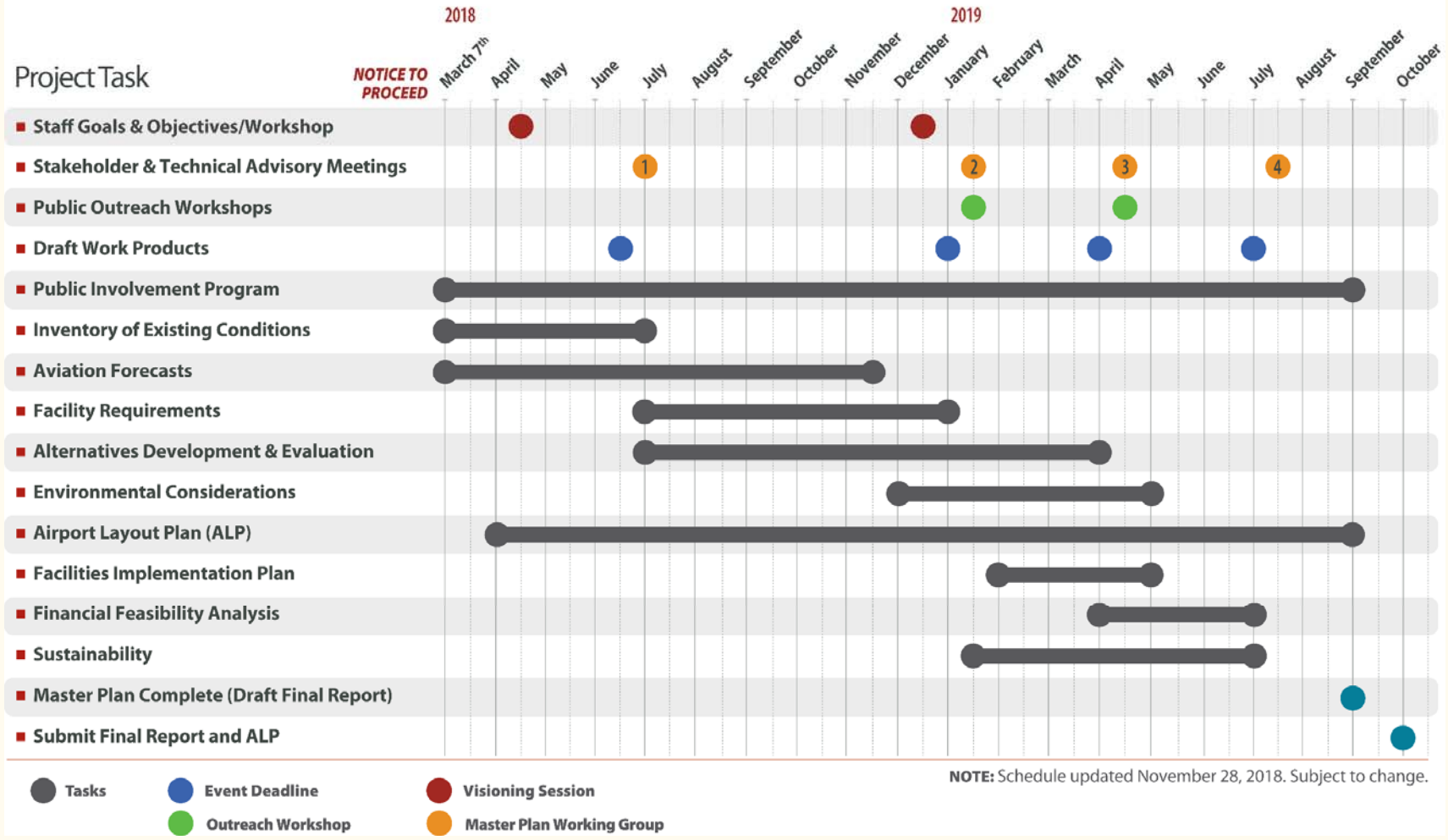
Phoenix-Mesa Gateway Airport

Master Plan- Airport Authority Board Briefing

January 15, 2019

Mead&Hunt

Project Schedule Airport Master Plan



NOTE: Schedule updated November 28, 2018. Subject to change.

Phoenix-Mesa
Gateway
Airport Master Plan

Master Plan – Statement of Policy

- ✓ Anticipate What We Think Will Happen
- ✓ Influence What We Want to Happen

Phoenix-Mesa Gateway Airport Master Plan

Mead&Hunt

Airport Master Plan- FAA Approved Forecast

Enplanement Forecast:
2018 Total= 763,542

2023	2028	2038
924,667	1,022,420	1,245,211

Total Operations Forecast:
2018 Total= 288,921

2023	2028	2038
316,712	333,028	369,744

Total Based Aircraft Forecast:
2017 Actual = 109

2023	2028	2038
121	126	139

Phoenix-Mesa Gateway Airport Master Plan

Mead&Hunt

Airfield Configuration

- ✓ Runway Orientation
- ✓ Airfield Operational Capacity
- ✓ Runway Length Analysis
- ✓ Runway Design and Dimensional Criteria
- ✓ Parallel Runway Separation
- ✓ Instrument Approach Capabilities
- ✓ Taxiway Design and Dimensional Criteria
- ✓ Parallel Taxiway Improvement Considerations
- ✓ Exit and Connecting Taxiways

Phoenix-Mesa Gateway Airport Master Plan

Mead&Hunt

Passenger Terminal

- ✓ Inbound and Outbound Baggage
- ✓ Concourse Holdroom (Gates)
- ✓ Aircraft Parking
- ✓ Passenger Security Checkpoint
- ✓ Check-In Lobby (Ticketing)

Terminal Requirements Summary

Functional Area	Existing (supply) *(a)*	PAL 1 (2023)	PAL 2 (2028)	PAL 3 (2038)
CHECK-IN (TICKETING)				
Queue (sf)	4,500	3,550	3,700	4,350
Counters/Bag drops	32	26	27	31
CHECKED BAGGAGE				
EDS machines *(b)*	2 CT-80	3 MS-EDS	4 MS-EDS	4 MS-EDS
Makeup area (sf)	11,500	11,400	12,800	15,700
SECURITY SCREENING CHECKPOINT				
Queue (sf)	1,725	1,700	1,900	2,625
Lanes	5	5	5	5
PASSENGER HOLDROOM				
Holdroom (sf)	15,260	13,000	15,300	19,700
Podium, queueing, egress (sf)	3,950	3,150	3,675	4,725
APRON (GATES)	6 ADG III, 4 B757	8 ADG III	9 ADG III	11 ADG III
BAGGAGE CLAIM (DEVICES)	2	2	3	3

(a) Existing queues are estimated based on terminal drawings
(b) Requirement, which is based on a hypothetical medium speed inline system (MS-EDS), includes one EDS machine for redundancy

Passenger Terminal Support Facilities

- ✓ Access Roadway System
- ✓ Passenger Parking System
- ✓ Rental Car Parking
- ✓ Employee Parking
- ✓ Cell Phone Lot

Public Parking Demand Forecasts

(Master Plan Projected Growth Rate)

Lot		FY 2018 Peak	Short – Term	Mid – Term	Long – Term
Hourly Express Lot	Supply	183	183	183	183
	Effective Supply	156	156	156	156
	Demand	194	242	265	326
	Surplus/Deficit	**-38**	**-86**	**-109**	**-170**
Daily Lot	Supply	871	871	871	871
	Effective Supply	740	740	740	740
	Demand	717	894	982	1,205
	Surplus/Deficit	**23**	**-154**	**-241**	**-465**
Ray Road Economy Lot	Supply	2,812	2,812	2,812	2,812
	Effective Supply	2,390	2,390	2,390	2,390
	Demand	747	931	1022	1255
	Surplus/Deficit	**1643**	**1459**	**1368**	**1135**
Grand Total	Supply	3,866	3,866	3,866	3,866
	Effective Supply	3,286	3,286	3,286	3,286
	Demand	1,658	2,067	2,270	2,787
	Surplus/Deficit	**1,628**	**1,219**	**1,017**	**499**

Other Landside Facilities

- ✓ General Aviation Storage Facilities
- ✓ Corporate, Maintenance & Repair Facilities
- ✓ Fixed Base Operator (FBO) Facilities
- ✓ Air Cargo Facilities
- ✓ ARFF (Fire Fighting)/Airport Maintenance
- ✓ Airport Traffic Control Tower
- ✓ Fuel Storage

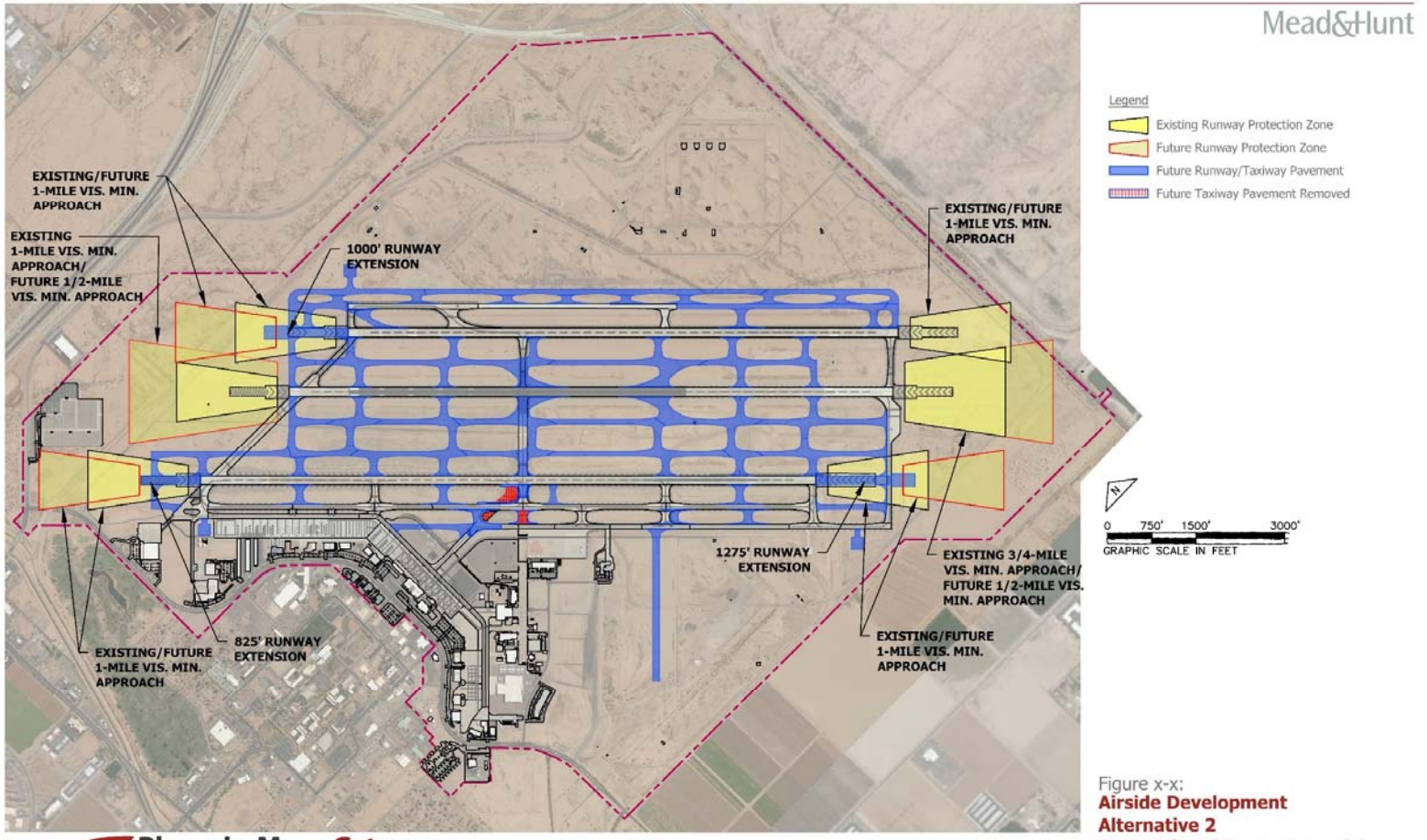
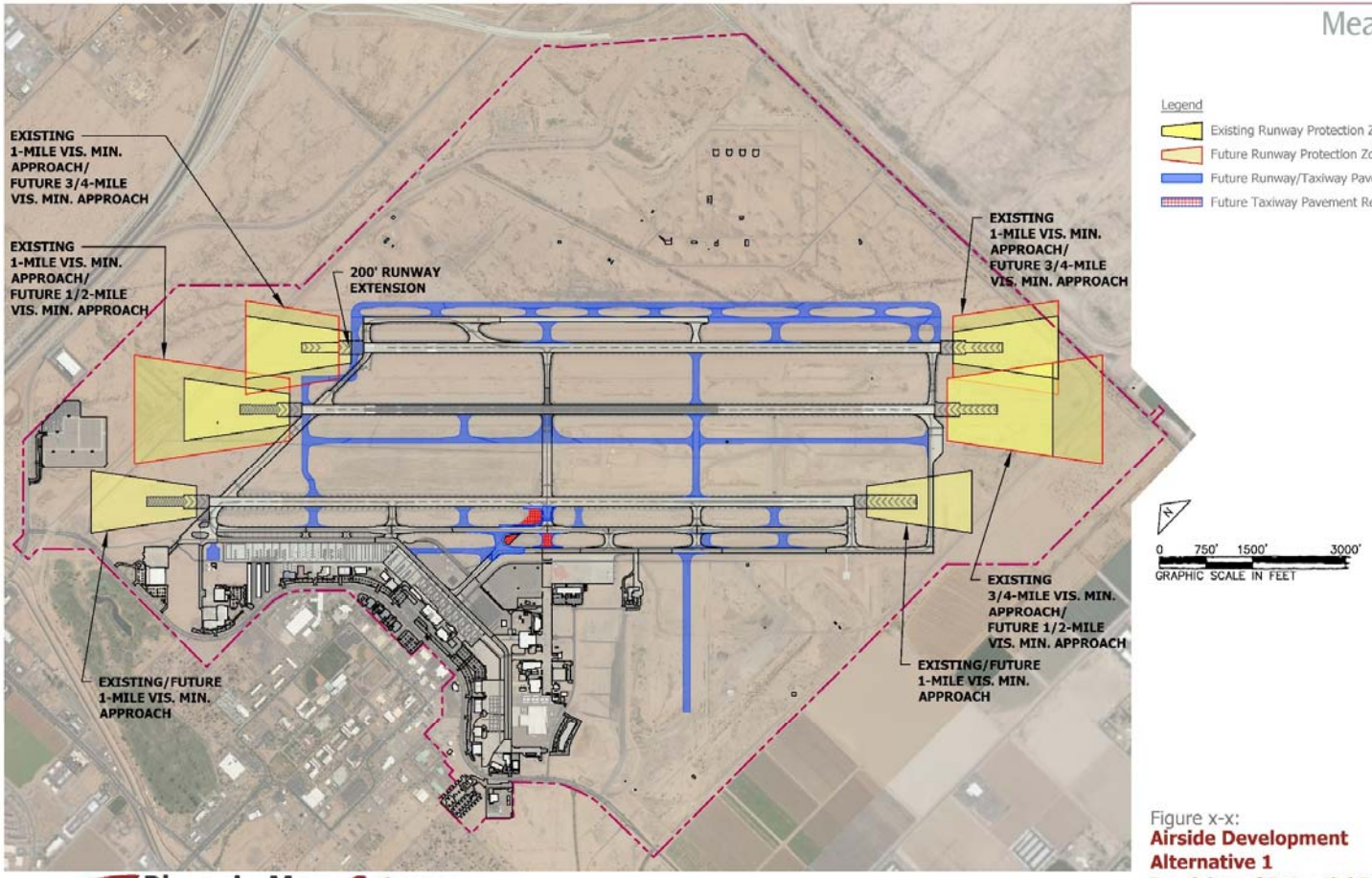


Figure x-x:
Airside Development Alternative 2
Protect for Ultimate Potential Airside Configuration



Phoenix-Mesa Gateway
Airport Master Plan

Figure x-x:
Airside Development Alternative 1
Provision of Potential Demand Driven Improvements

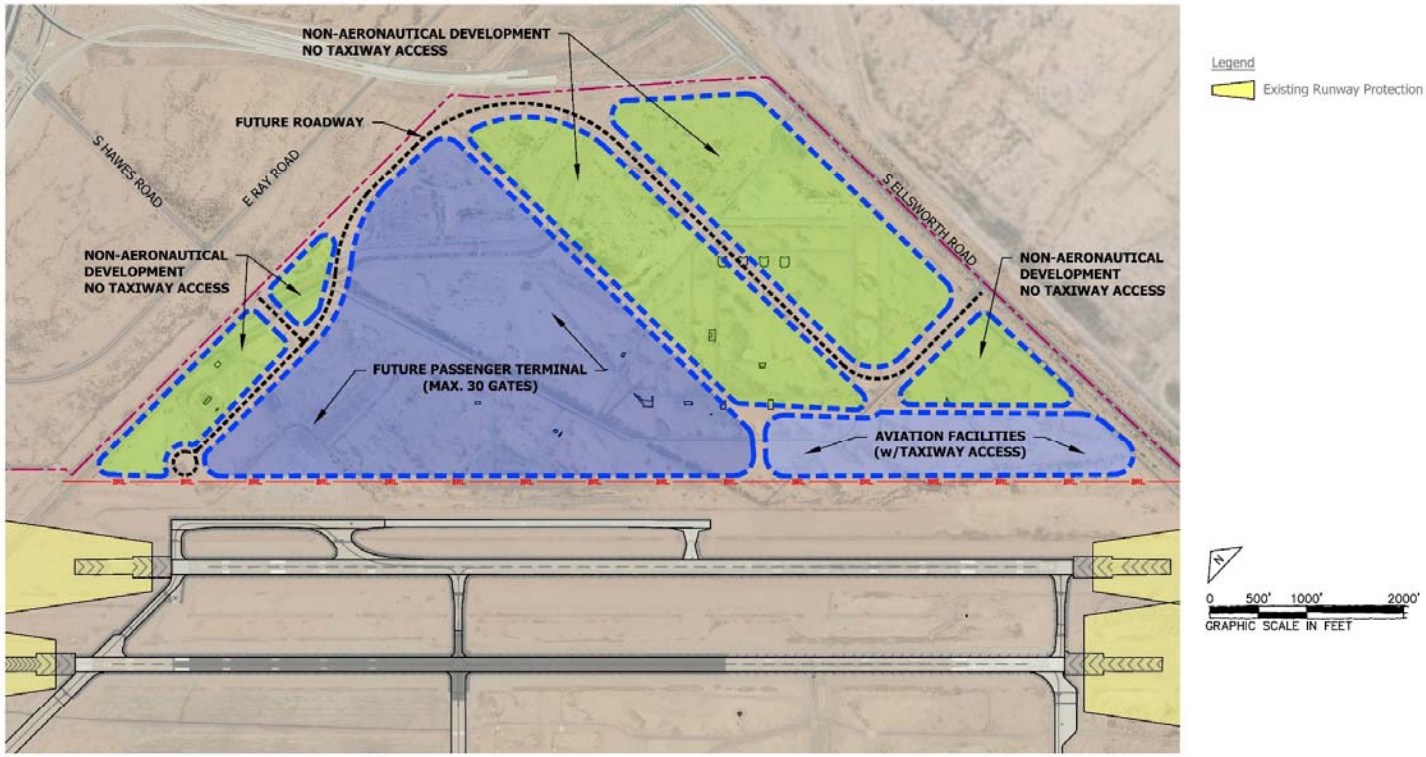


Figure x-x:
Landside Development
Eastside

Phoenix-Mesa
Gateway
Airport Master Plan

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Next Steps

- ✓ Advisory Committee Meetings #2 - January 15-16, 2019
- ✓ Public Information Meeting #1 - January 16, 2019
- ✓ Alternatives Evaluation and Development Plan Identification (Working Paper Three)
- ✓ Next Committee/Public Meetings April/May 2019

Phoenix-Mesa Gateway Airport Master Plan

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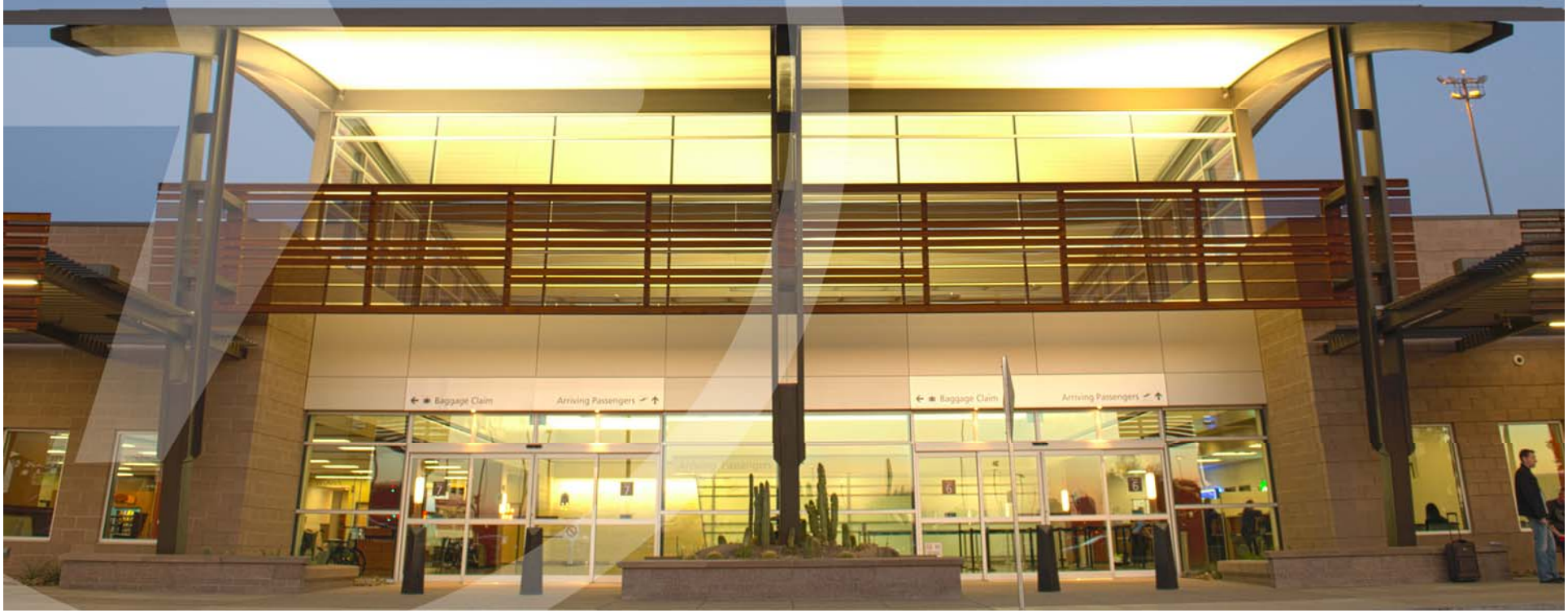
Phoenix-Mesa Gateway Airport

Airport Master Plan
Development Alternatives

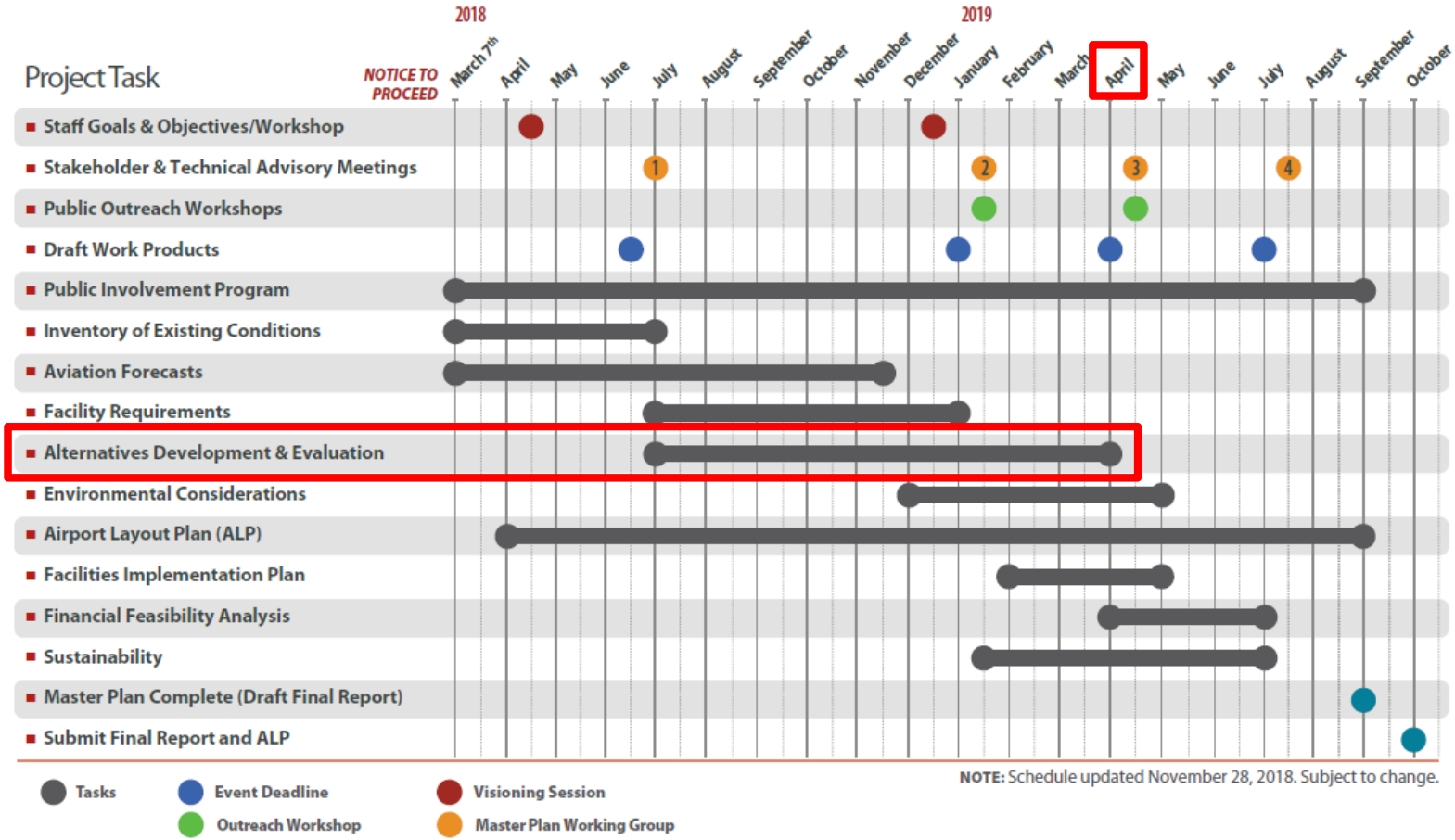
PMGAA Board Meeting
April 16, 2019



Airport Master Plan-Schedule

Phoenix-Mesa Gateway Airport

Project Schedule



NOTE: Schedule updated November 28, 2018. Subject to change.

Development Alternatives- Airfield Alternative 1

Phoenix-Mesa Gateway Airport

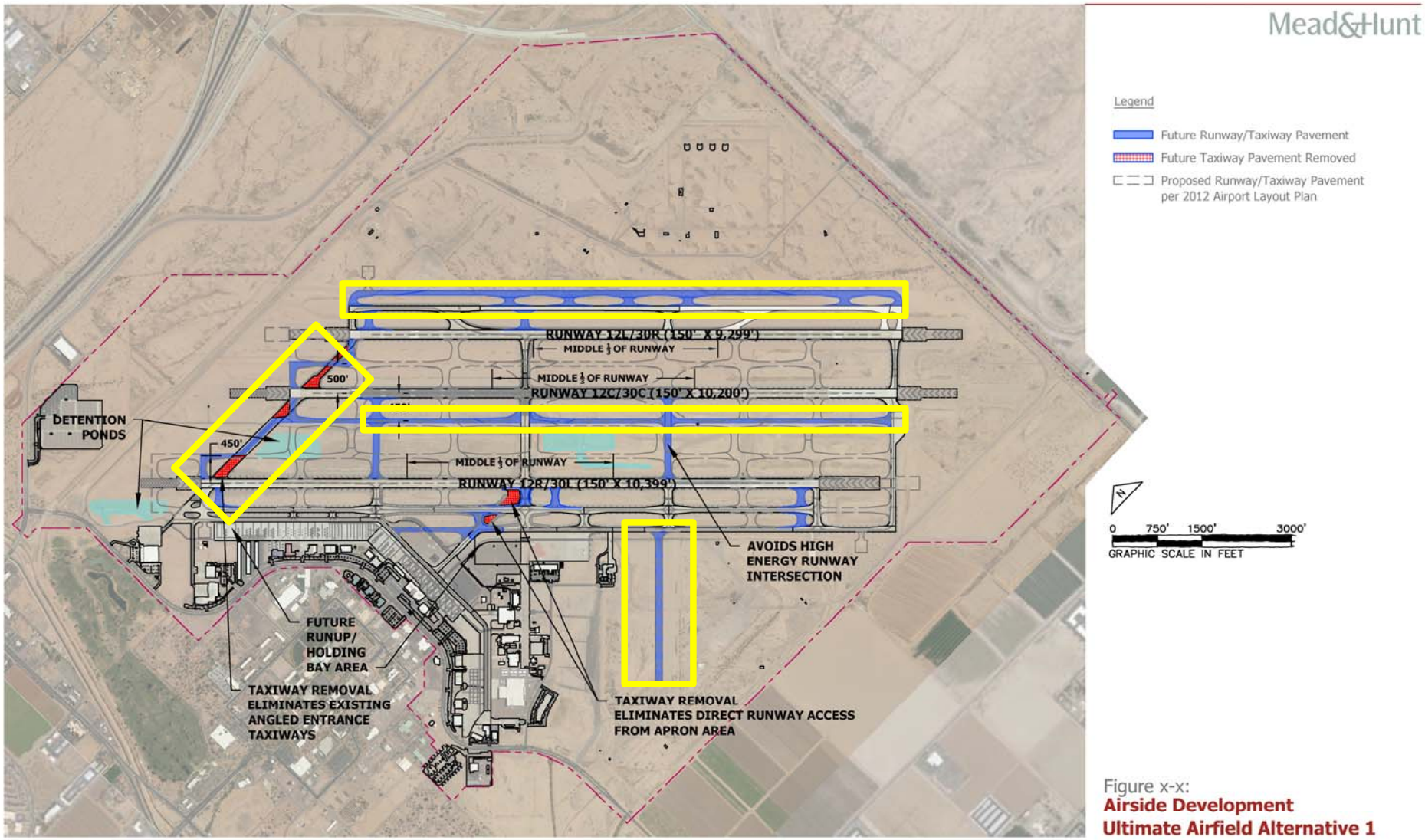


Figure x-x:
Airside Development
Ultimate Airfield Alternative 1

Development Alternatives- Airfield Alternative 2

Phoenix-Mesa Gateway Airport

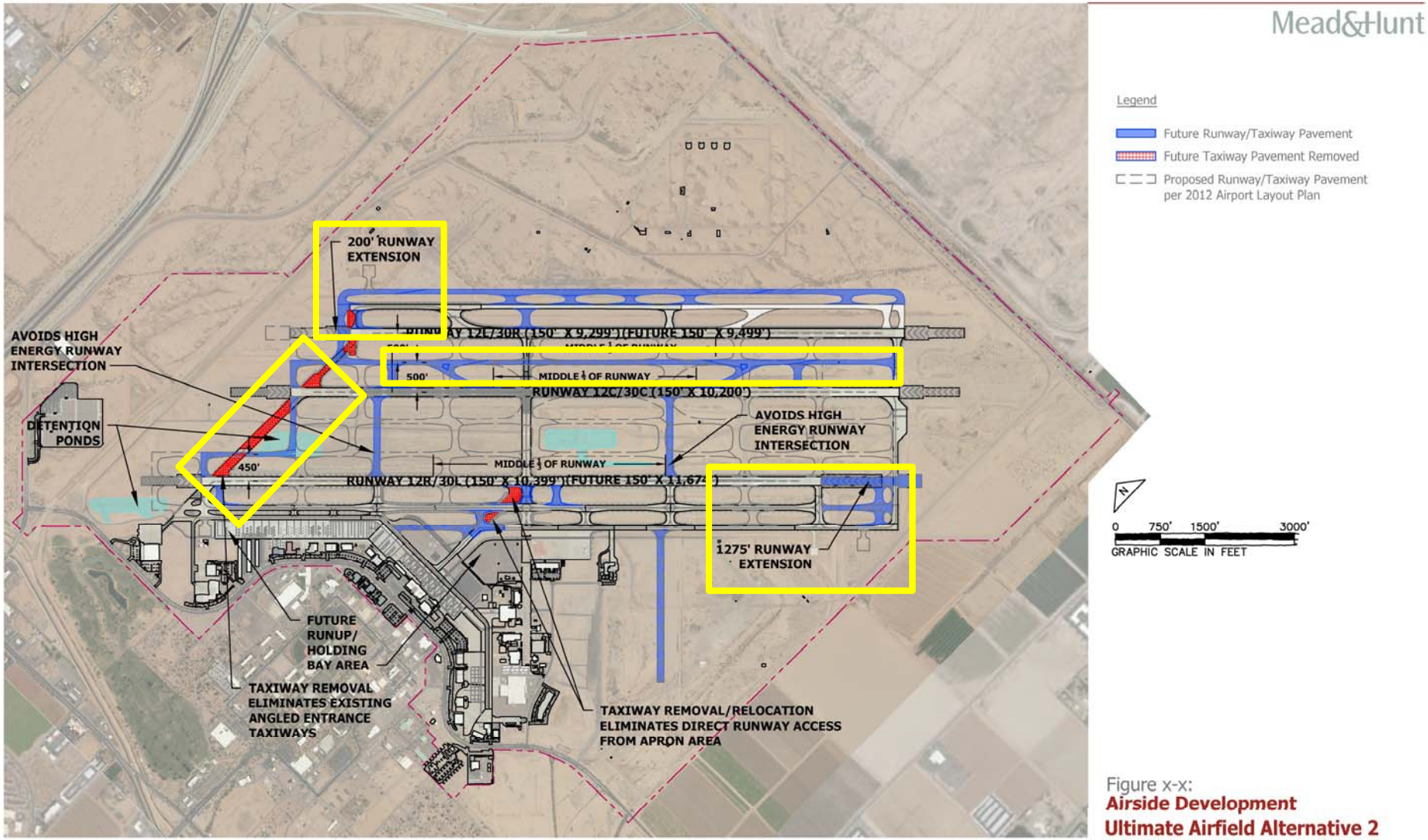
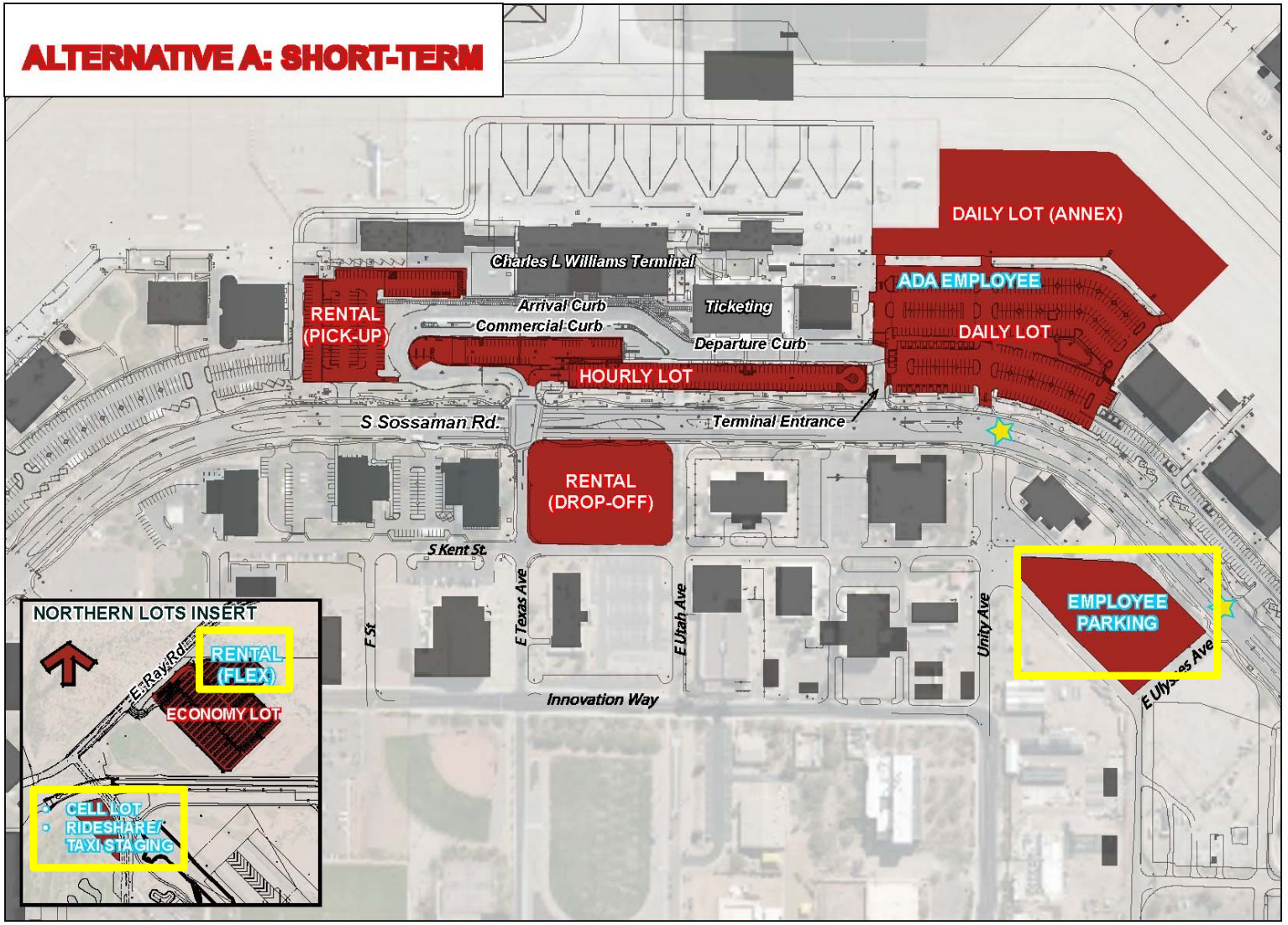


Figure x-x:
Airside Development
Ultimate Airfield Alternative 2

Development Alternatives
Parking - Short Term

Phoenix-Mesa Gateway Airport



NORTH

0 200' 400'

Graphic Scale in Feet

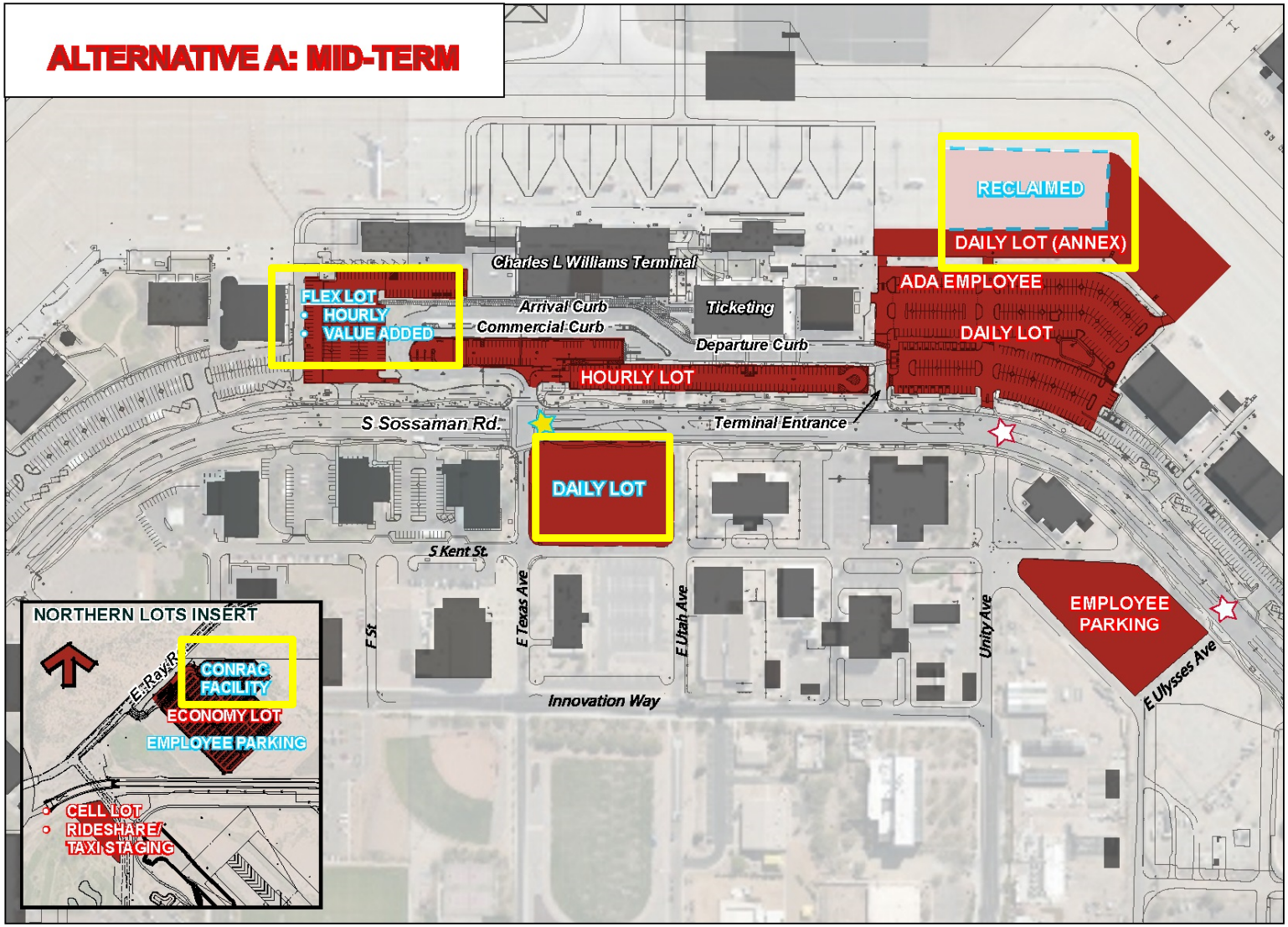
Note:
Accompanied by changes to parking fee structure to encourage use of the Economy Lot.

LEGEND

- IMPROVED PED CROSSING
- LOT — PROPOSED LOT CHANGE
- LOT — EXISTING LOT CONFIG.

Development Alternatives- Parking - Mid Term

Phoenix-Mesa Gateway Airport



NORTH

0 200' 400'

Graphic Scale in Feet

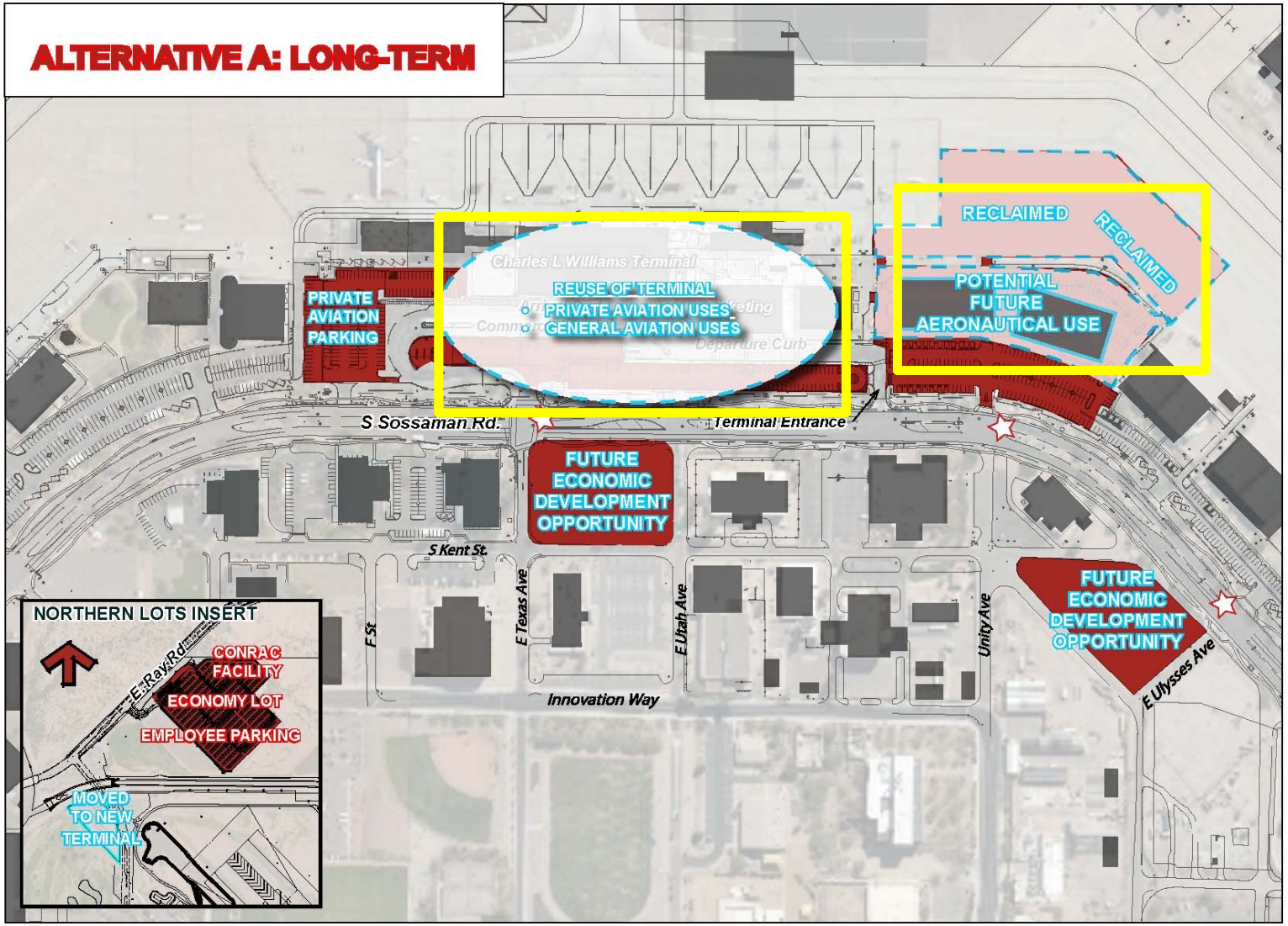
Note:
Presumed loss of +/- 219 Daily Lot parking stalls in the annex. Demand expected to shift to Economy Lot.

LEGEND

- IMPROVED PED CROSSING
- LOT — PROPOSED LOT CHANGE
- LOT — EXISTING LOT CONFIG.

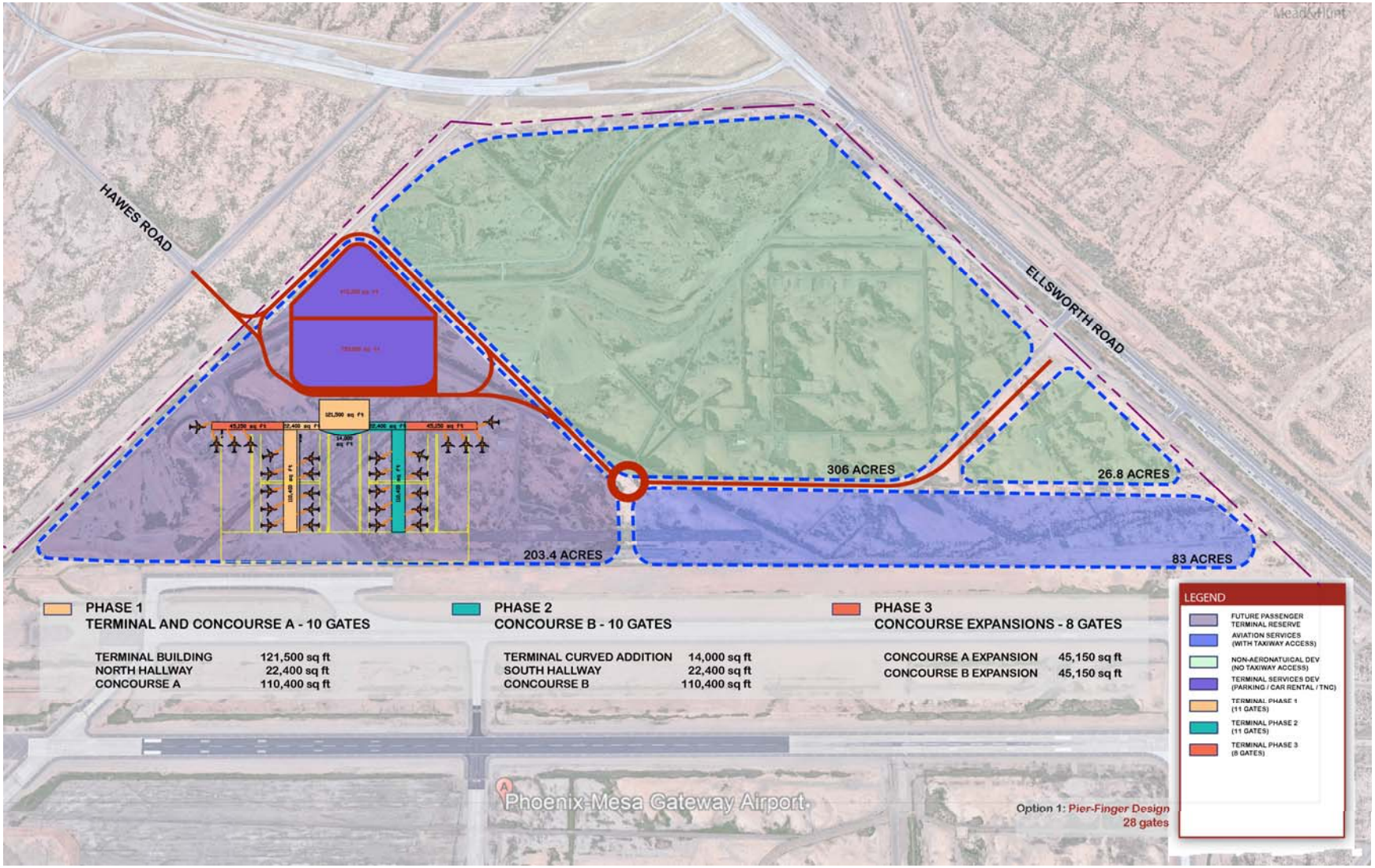
Development Alternatives- Parking - Long Term

Phoenix-Mesa Gateway Airport



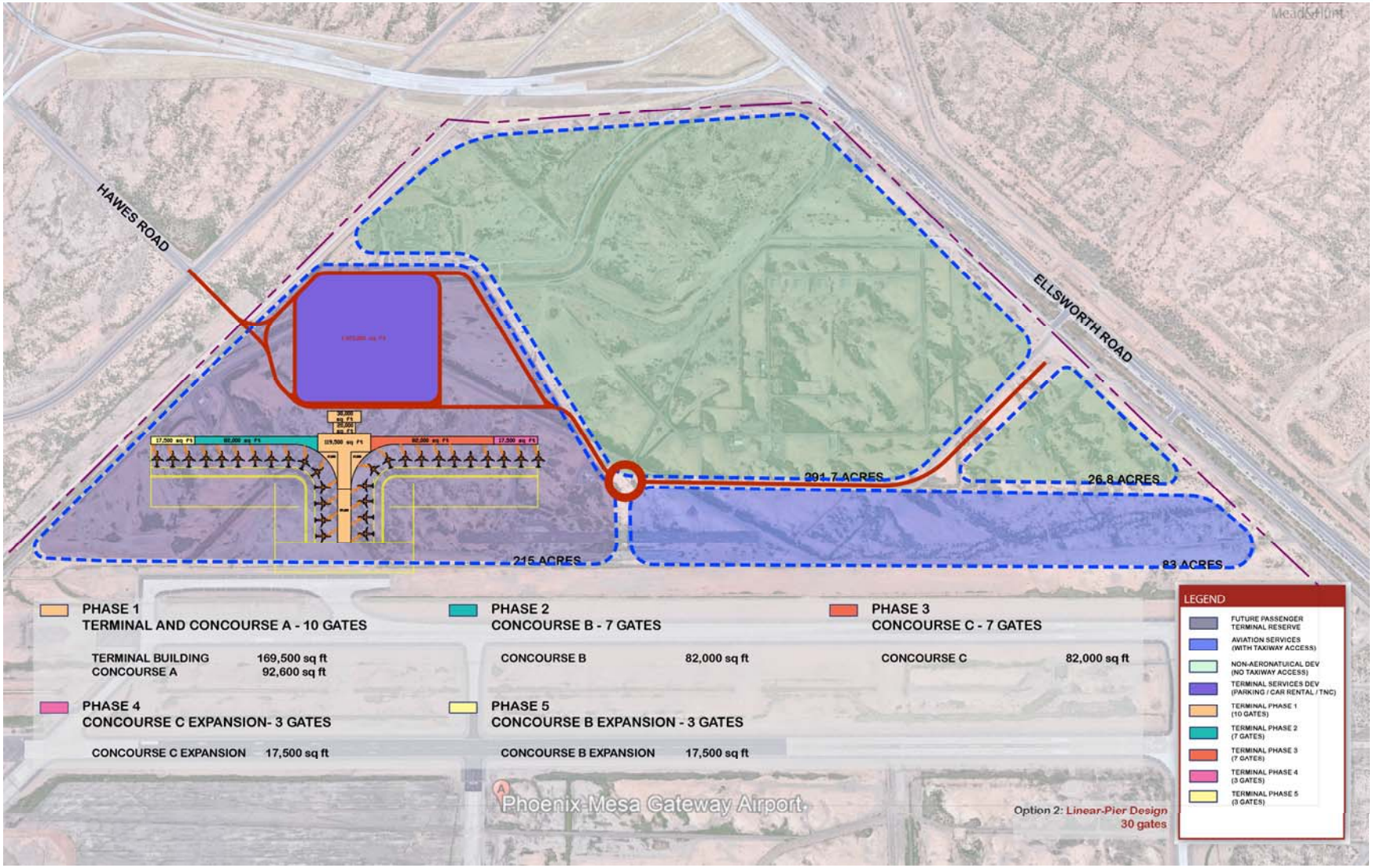
Development Alternatives- Terminal Concept 1

Phoenix-Mesa Gateway Airport



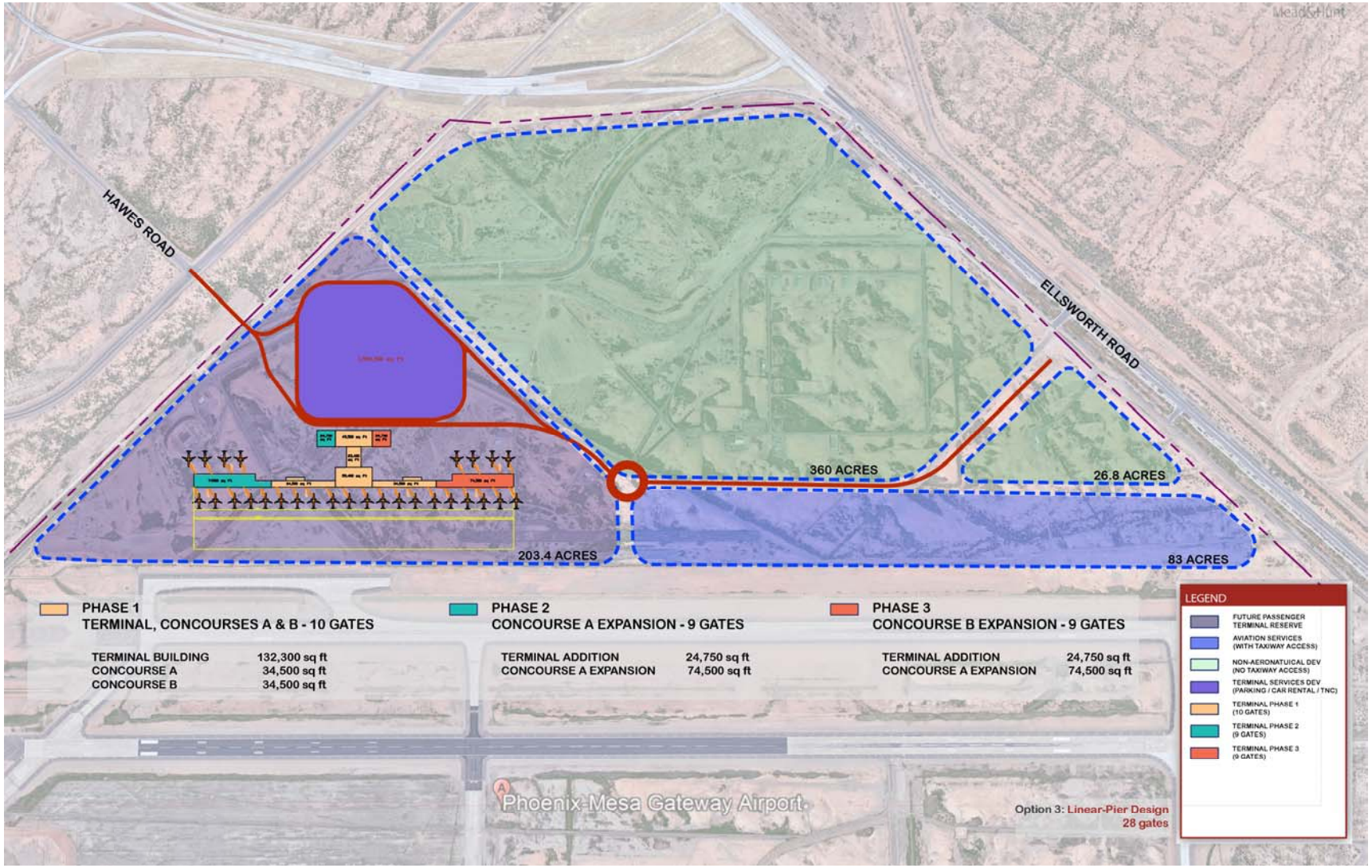
Development Alternatives- Terminal Concept 2

Phoenix-Mesa Gateway Airport



Development Alternatives- Terminal Concept 3

Phoenix-Mesa Gateway Airport



Airport Master Plan- Conclusion

- Upcoming Meetings
  - Stakeholder & Technical Committee Meeting #3: May, 2019
  - Public Information Meeting: May-June, 2019
  - (Dates To Be Determined)

- Next Steps
  - Facility Implementation Priorities
  - Financial Feasibility
  - Preferred Development Alternative

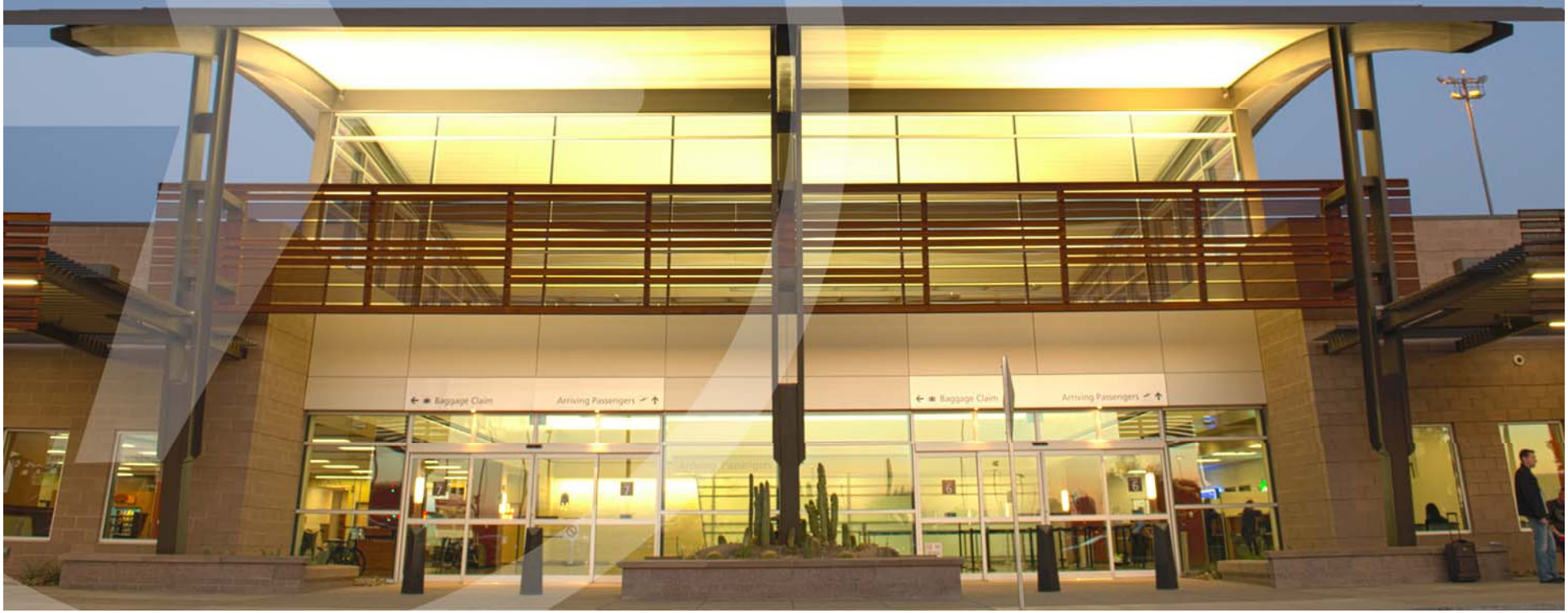
Project Website:
www.pmgaamasterplan.com

Phoenix-Mesa Gateway Airport

Airport Master Plan

Preferred Development Concept & Capital Project Plan

Gateway Board Meeting
November 19, 2019



Airport Master Plan - Process

Phoenix-Mesa Gateway Airport

- Master Plan process approaching conclusion
- Final committee & public meetings have been held
- Present the Preferred Development Concept & Capital Program

Airport Master Plan - Preferred Development Concept

Phoenix-Mesa Gateway Airport

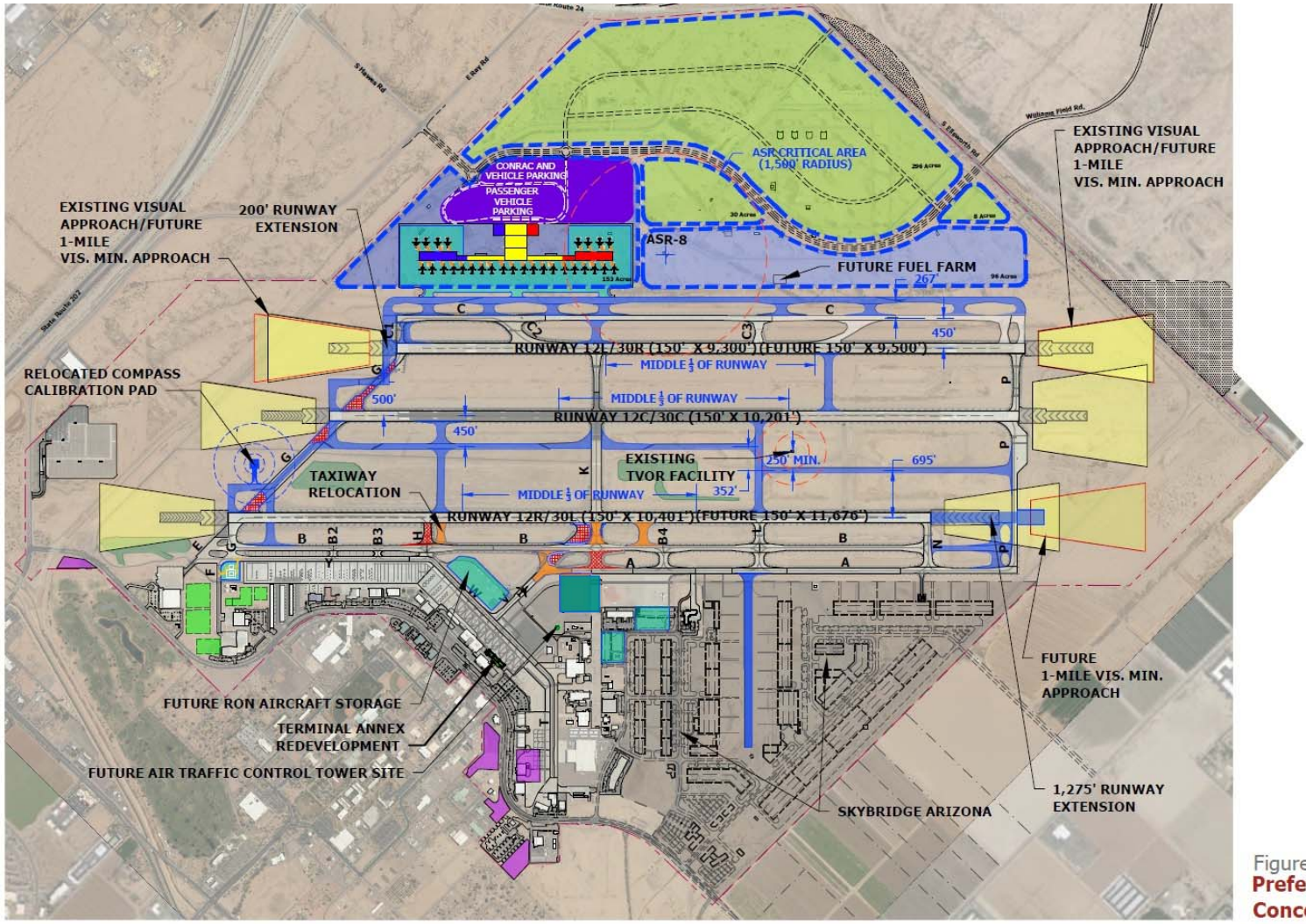
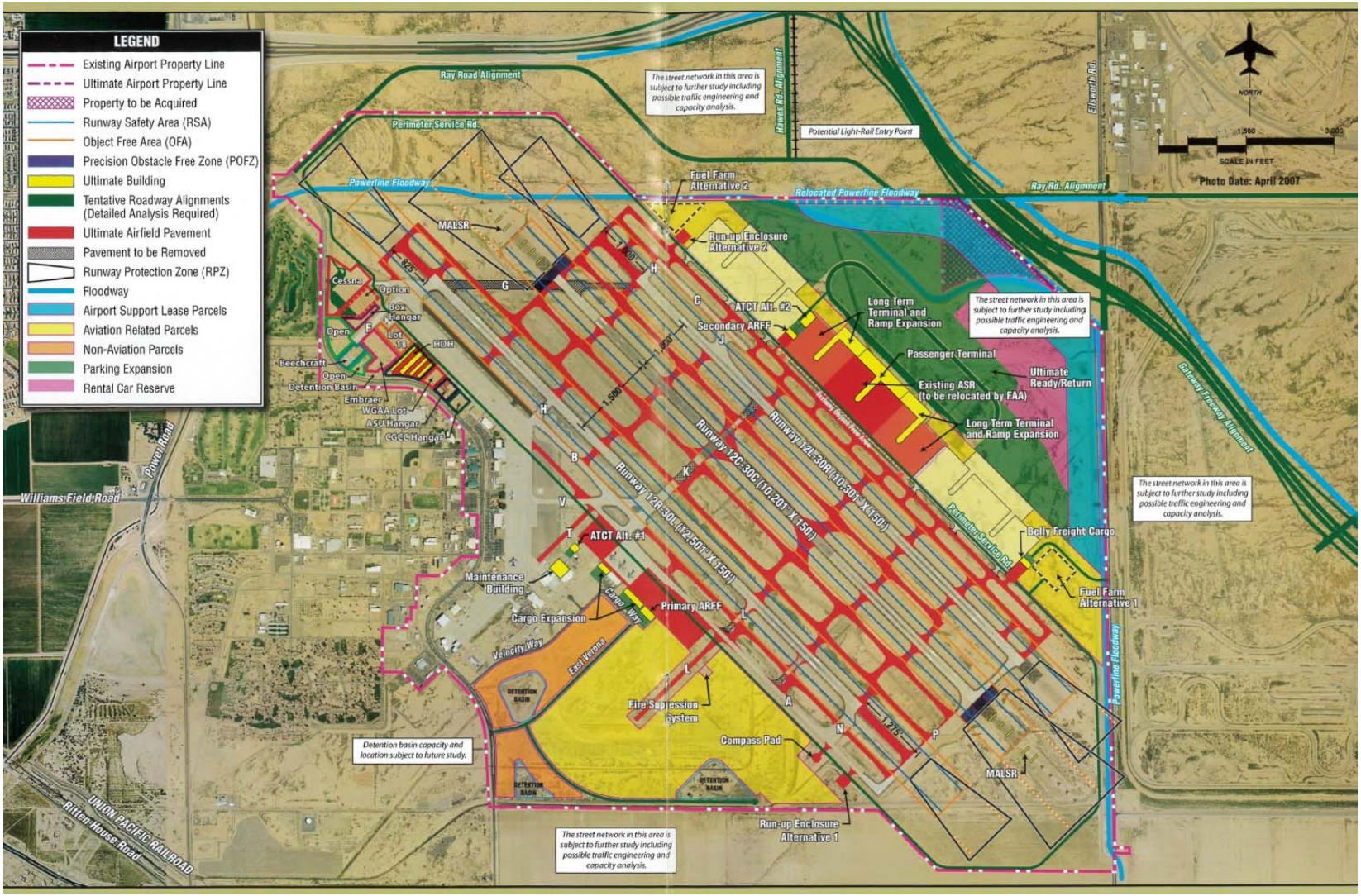


Figure ES-2
Preferred Airport Conceptual Development Plan

Airport Master Plan - Previous Preferred Development Concept

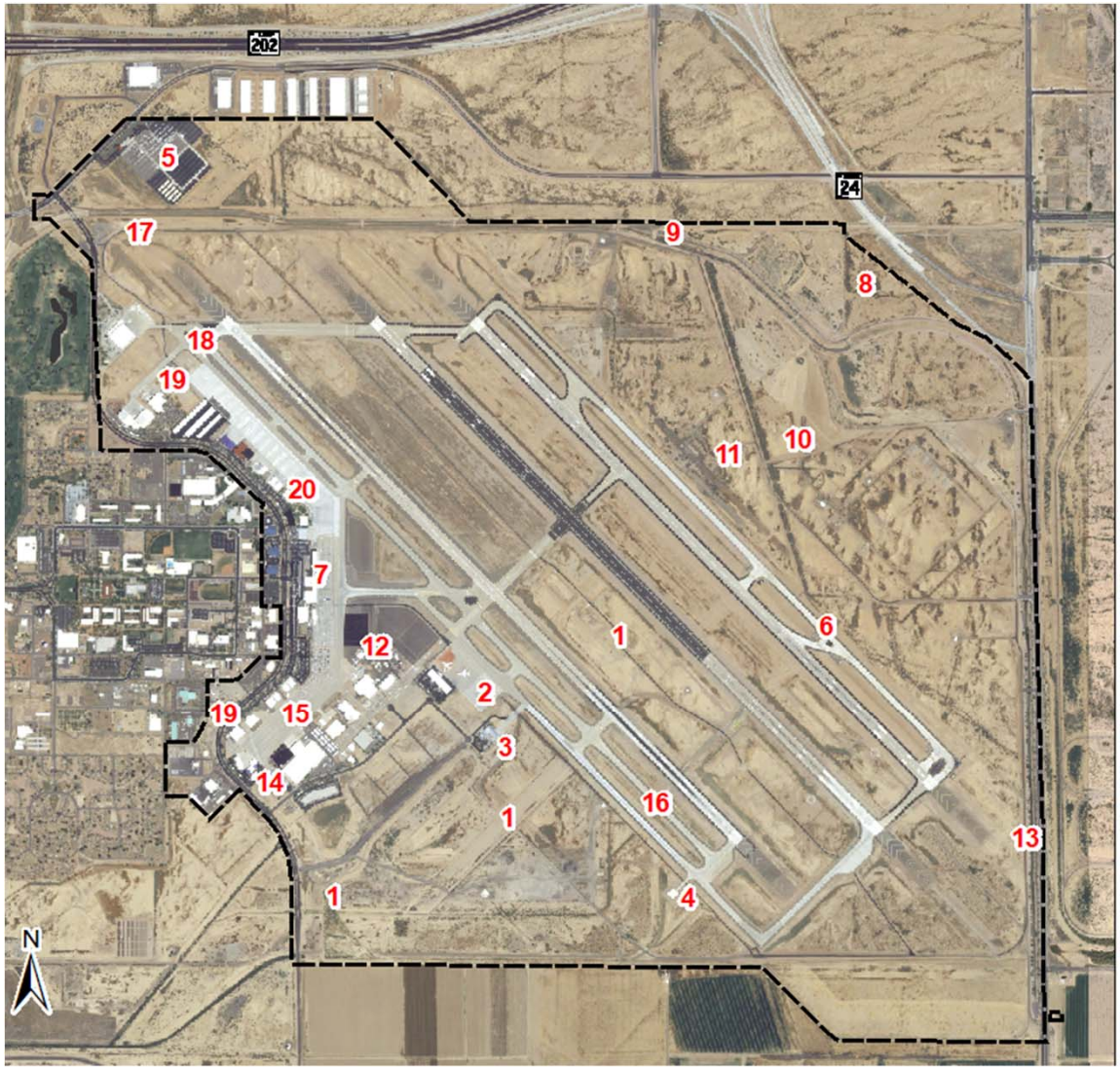
Phoenix-Mesa Gateway Airport



Airport Master Plan - Completed Projects

Phoenix-Mesa Gateway Airport

- Large number of 2008 Master Plan short & mid-term projects have been completed



Completed 2008 Airport Master Plan Projects*

LEGEND

#	Project
1	Taxiway 'L' Design & Drainage South & Mid-Field Basins
2	'Alpha' Apron Design & Extension
3	ARFF Facility
4	Compass Rose
5	North Economy Lot
6	Taxiway 'C' Extension
7	West Terminal Expansion (Phases I, II & III)
8	Northeast Area Development Plan (NADP) Property Control
9	Powerline Floodway & Channel Realignment
10	NADP Environmental Docs (EA)
11	ASR Relocation (Siting Study)
12	ATCT Relocation (Siting Study)
13	RPZ Property Acquisition (Rwy 30 Easement)
14	Fuel Farm Expansion
15	South Apron Drainage
16	Taxiway 'B' Extension
17	Perimeter Service Road Design/Construct
18	Taxiway 'G' Realignment
19	Fire Protection System
20	GA Center Improvements

* Rehabilitation Projects not included

Airport Master Plan - Preferred Development Concept

Phoenix-Mesa Gateway Airport

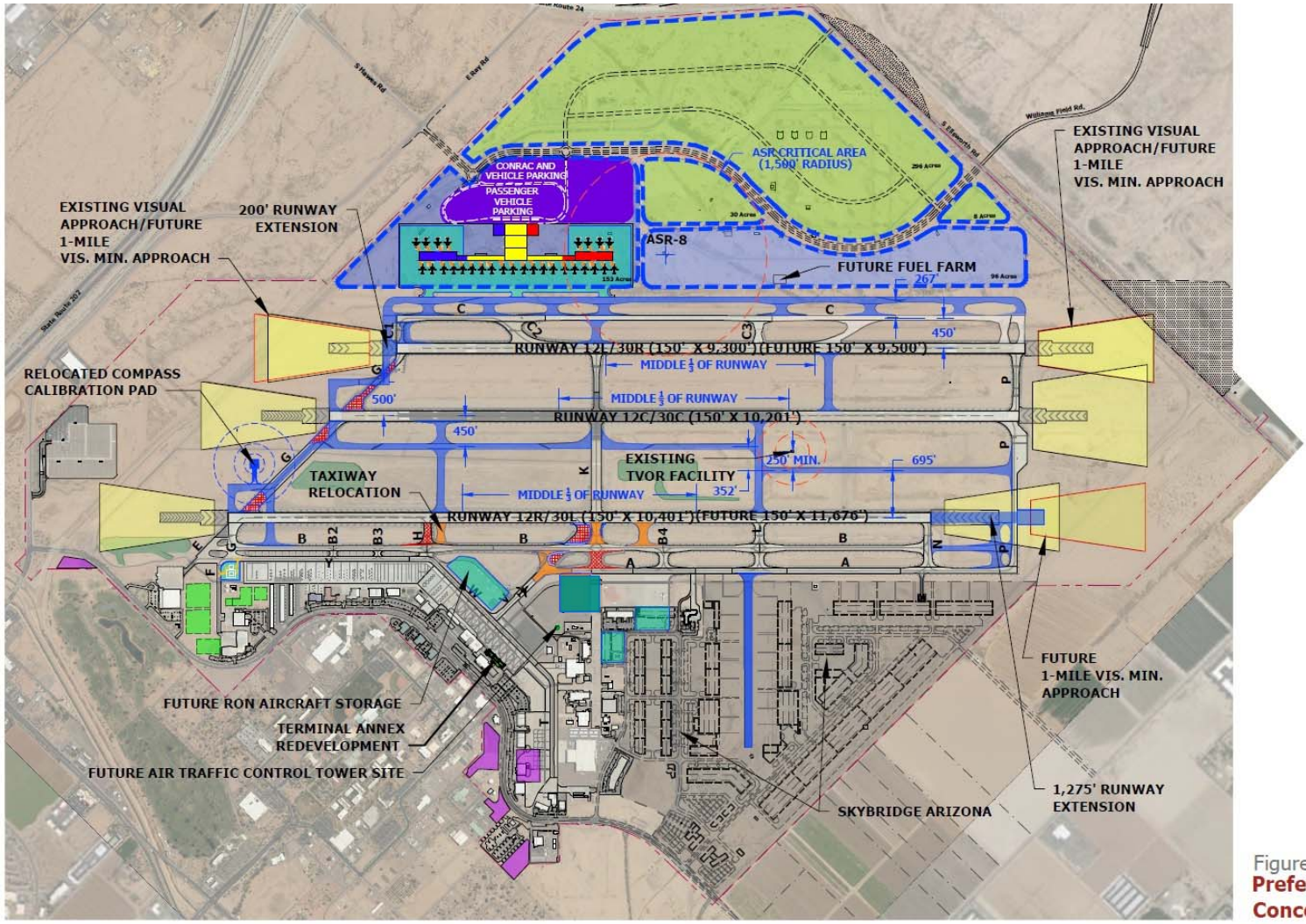


Figure ES-2
Preferred Airport Conceptual Development Plan

Capital Improvement Projects - Phasing Plan

Phoenix-Mesa Gateway Airport

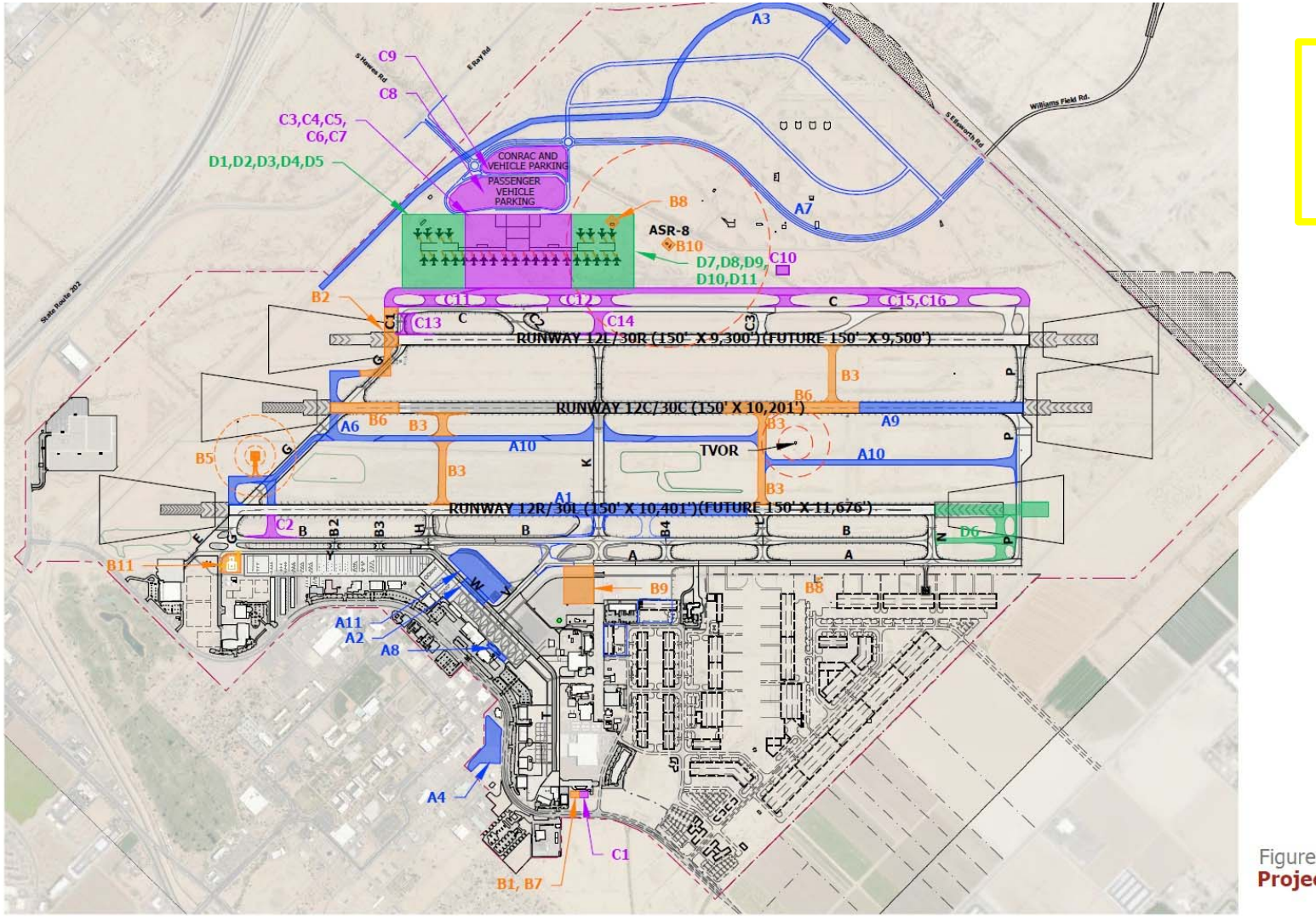


Figure ES-3
Project Phasing Plan

Capital Improvement Projects - Short & Mid-Term

Phoenix-Mesa Gateway Airport

Table ES-9: Estimated Capital Costs and Funding Sources

		Total [1]	AIP		PFCs	ADOT Grants	Member Govt.	Other
			Entitlement	Discretionary				
Phase I - FYs 2021 - 2025								
A1	Reconstruct sections of Runway 12R/30L	$ 24,960,000	$ 3,636,000	$ 19,092,576	$ -	$ 1,115,712	$ 1,115,712	$ -
A2	Taxiway Whiskey-Design/Construct	832,000	-	-	-	748,800	83,200	-
A3	Ellsworth Channel Relocation-Construction	11,897,600	-	-	11,897,600	-	-	-
A4	Employee Parking Lot and Cell Phone Lot Improvements	691,600	-	-	-	-	691,600	-
A5	Safety Management System	324,480	-	-	324,480	-	-	-
A6	Taxiway Golf Realignment - Design/Construct	12,274,800	3,672,360	7,505,073	-	548,684	548,684	-
A7	Eastside Airport Terminal Access Roads - Design/Construct	18,149,771	-	-	10,000,000	709,362	-	7,440,409
A8	Terminal Annex Redevelopment - Design/Construct	15,128,451	-	8,954,379	-	400,260	5,773,812	-
A9	Center Runway Section 30	9,320,400	3,709,084	4,778,073	-	416,622	416,622	-
A10	Parallel Taxiway West of RW 12C/30C - Design/Construct	20,147,600	3,746,174	14,600,230	-	900,598	900,598	-
A11	Aircraft Storage Apron (RON/ROD) - Design/Construct	603,680	-	-	-	-	603,680	-
Total Projects for FYs 2021 - 2025		**$ 114,330,382**	**$ 14,763,618**	**$ 54,930,331**	**$ 22,222,080**	**$ 4,840,037**	**$ 10,133,907**	**$ 7,440,409**
Phase II - FYs 2026 - 2030								
B1	Fuel Farm Expansion - Design/Construct	$ 1,873,362	$ -	$ -	$ -	$ -	$ 1,873,362	$ -
B2	Extend Runway 12L/30R with Taxiway	9,600,640	3,783,636	4,958,707	-	429,149	429,149	-
B3	Mid-Field Connectors Project - Design/Construct	10,430,560	-	9,498,068	-	466,246	466,246	-
B4	ARFF Truck	1,026,000	-	-	1,026,000	-	-	-
B5	Relocate Compass Calibration Pad - Design/Construct	1,414,040	-	-	-	-	-	1,414,040
B6	Reconstruct Runway 12C/30C and LED Lighting Upgrade	14,532,720	3,821,473	9,412,022	-	649,613	649,613	-
B7	Fuel Farm Expansion - Design/Construct	1,938,740	-	-	-	-	1,938,740	-
B8	Electrical Lighting Vault Replacement/Generators & 12C/30R LED Upgrade	12,596,700	7,835,551	3,635,004	-	563,072	563,072	-
B9	Alpha Apron Phase 3 - Design/Construction	6,062,400	-	-	6,062,400	-	-	-
B10	Increase Tower Height/Relocate Existing ASR-8	15,860,000	-	-	-	-	-	15,860,000
B11	Maintenance Run-Up Area with Blast Fence - Design/Construct	1,579,900	-	-	-	-	1,579,900	-
B12	Runway Magnetic Change - Marking/Signage	336,000	-	305,962	-	15,019	15,019	-
Total Projects for FYs 2026 - 2030		**$ 77,251,062**	**$ 15,440,660**	**$ 27,809,762**	**$ 7,088,400**	**$ 2,123,099**	**$ 7,515,101**	**$ 17,274,040**
Total Projects for FYs 2021 - 2030		**$ 191,581,444**	**$ 30,204,278**	**$ 82,740,093**	**$ 29,310,480**	**$ 6,963,136**	**$ 17,649,008**	**$ 24,714,449**

[1] The estimated project costs were developed in 2019 dollars and escalated at 2% per year from that base.

Capital Improvement Projects - Source & Use Summary

Phoenix-Mesa Gateway Airport

Preferred Projects - Sources and Uses of Capital Funding

Sources of Capital Funding	Phase I 2021 - 2025	Phase II 2026 - 2030	Total
AIP Entitlements	$ 14,763,618	$ 15,440,660	$ 30,204,278
AIP Discretionary	54,930,331	27,809,762	82,740,093
PFC Paygo	22,222,080	7,088,400	29,310,480
ADOT Grants	4,840,037	2,123,099	6,963,136
Member Contributions	10,133,907	7,515,101	17,649,008
Other	7,440,409	17,274,040	24,714,449
Total Sources	**$ 114,330,382**	**$ 77,251,062**	**$ 191,581,444**

Uses of Capital Funding	Phase I 2021 - 2025	Phase II 2026 - 2030	Total
Runway/Taxiway Projects	$ 67,534,800	$ 47,496,620	$ 115,031,420
Terminal Improvements	15,128,451	-	15,128,451
Parking	691,600	-	691,600
Fuel Farm	-	3,812,102	3,812,102
Apron Rehabilitation	603,680	6,062,400	6,666,080
Access Roads	18,149,771	-	18,149,771
ARFF	-	1,026,000	1,026,000
Other Projects	12,222,080	18,853,940	31,076,020
Total Uses	**$ 114,330,382**	**$ 77,251,062**	**$ 191,581,444**

- FAA AIP Grants are largest proposed funding source
- Importance of Passenger Facility Charge (PFC)
- No debt issuance planned

- Runway/taxiway projects are primary use of funding
- Maximizing west side terminal lifespan
- Relocate existing radar facility (ASR)

The assumed AIP Discretionary funding is based on the FAA's funding criteria and priority system

Capital Improvement Projects - Long-Term

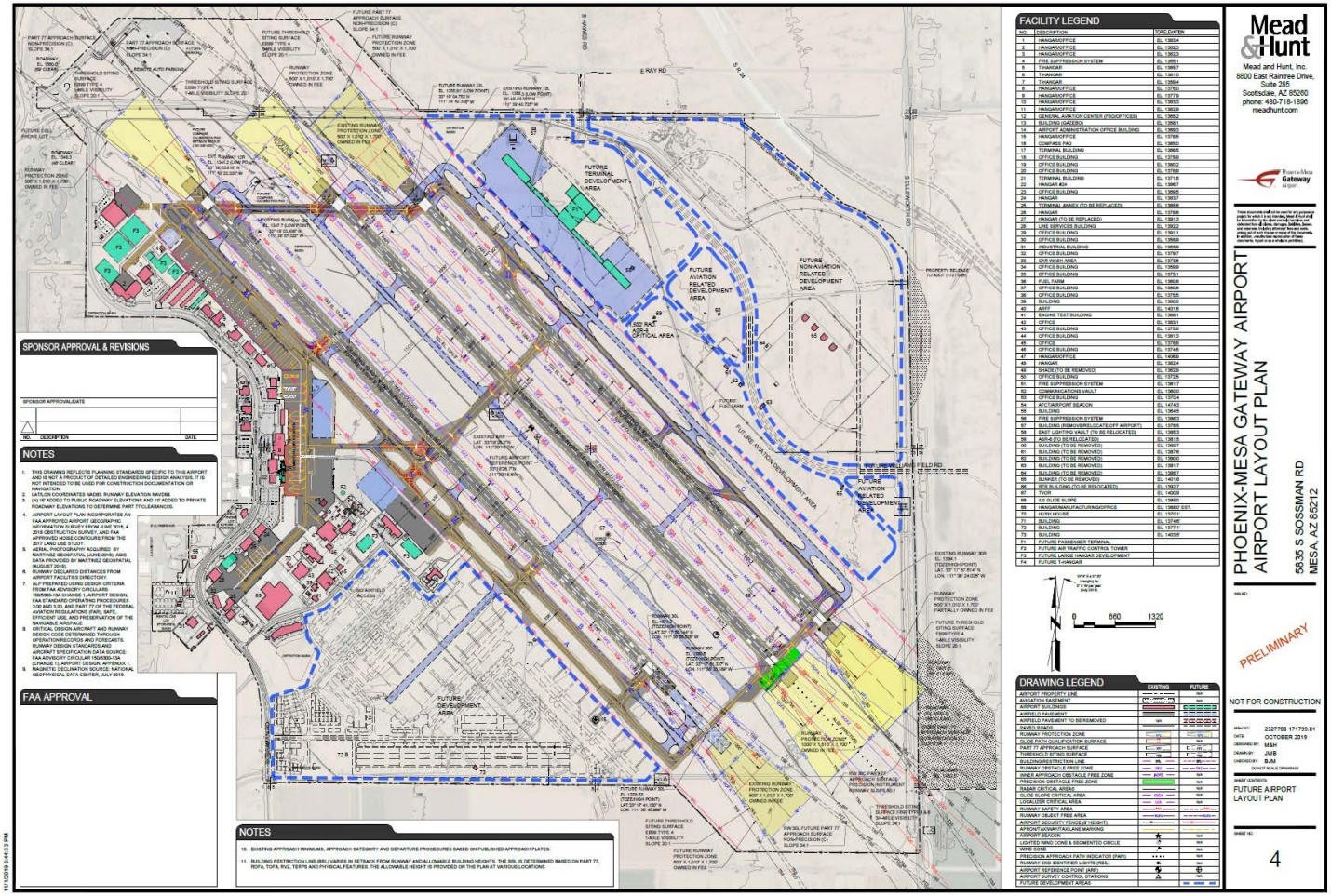
Phoenix-Mesa Gateway Airport

- 2031-2041 projects focus on the east side
  - Aeronautical/terminal development & support facilities
  - No funding plan due to speculation this far out

Federal FY	Project Number	Project Title	Estimated Total Project Cost 2019 Dollars
Proposed FY 2031 to 2041 CIP Projects			
11 to 20 Years	C1	Fuel Farm Expansion: (2) 50,000 USG fuel tanks - Design/Construct	$ 1,643,000.00
	C2	New Taxiway Bravo 1 connector to Runway 12R/30L - Design/Construct	$ 1,824,000.00
	C3	Eastside Apron Phase 1 - Design	$ 1,206,000.00
	C4	Eastside Apron Phase 1 - Construction	$ 11,910,000.00
	C5	Eastside Terminal Replacement (10 gates + 4 hard stand positions) Phase 1 - Design	$ 16,716,560.00
	C6	Eastside Terminal Replacement (10 gates + 4 hardstand positions) Phase 1 - Construction	$ 167,165,600.00
	C7	Passenger Boarding Bridges for Terminal Phase 1 - Design/Construct	$ 10,000,000.00
	C8	Eastside Terminal Parking Surface Lot - Design/Construct	$ 12,981,750.00
	C9	Eastside Consolidated Rental Car Facility w/ConRAC - Design/Construct	$ 16,602,430.00
	C10	Construct New Eastside Fuel Farm (Jet A, 450,000 gallons) to support Eastside Terminal	$ 7,393,500.00
	C11	Parallel Taxiway to Taxiway C Phase 1 - Design	$ 950,000.00
	C12	Parallel Taxiway to Taxiway C Phase 1 - Construct	$ 10,448,000.00
	C13	New Taxiway Connector South of existing C1 Connector - Design/Construct	$ 1,520,000.00
	C14	New Taxiway Connector South of existing C2 Connector - Design/Construct	$ 1,520,000.00
	C15	Parallel Taxiway to Taxiway C Phase 2 - Design	$ 965,000.00
	C16	Parallel Taxiway to Taxiway C Phase 2 - Construct	$ 12,710,000.00
		Total Phase-III (11-20 Years) Development Program Project Costs	**$ 275,555,840.00**

Airport Master Plan - Airport Layout Plan (ALP)

Phoenix-Mesa Gateway Airport

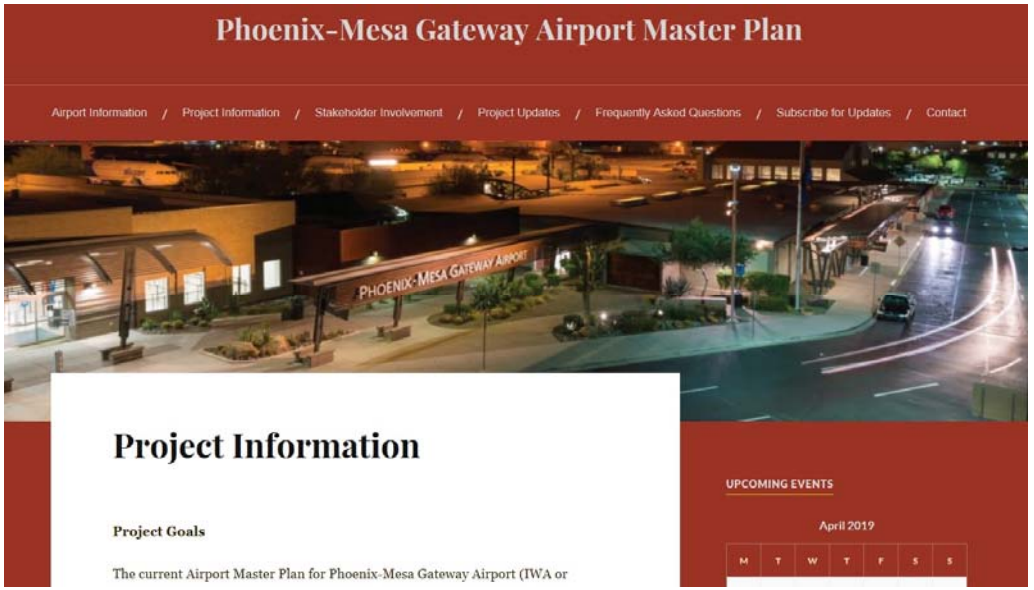


- Technical set of drawings
- Completed w/ Master Plan Update
- Needed for FAA grant funding eligibility
- Requires FAA approval of each sheet

Airport Master Plan - Next Steps

- PMGAA Board to direct staff to submit the ALP to the FAA
- Final plan documents & consideration by PMGAA Board in early 2020

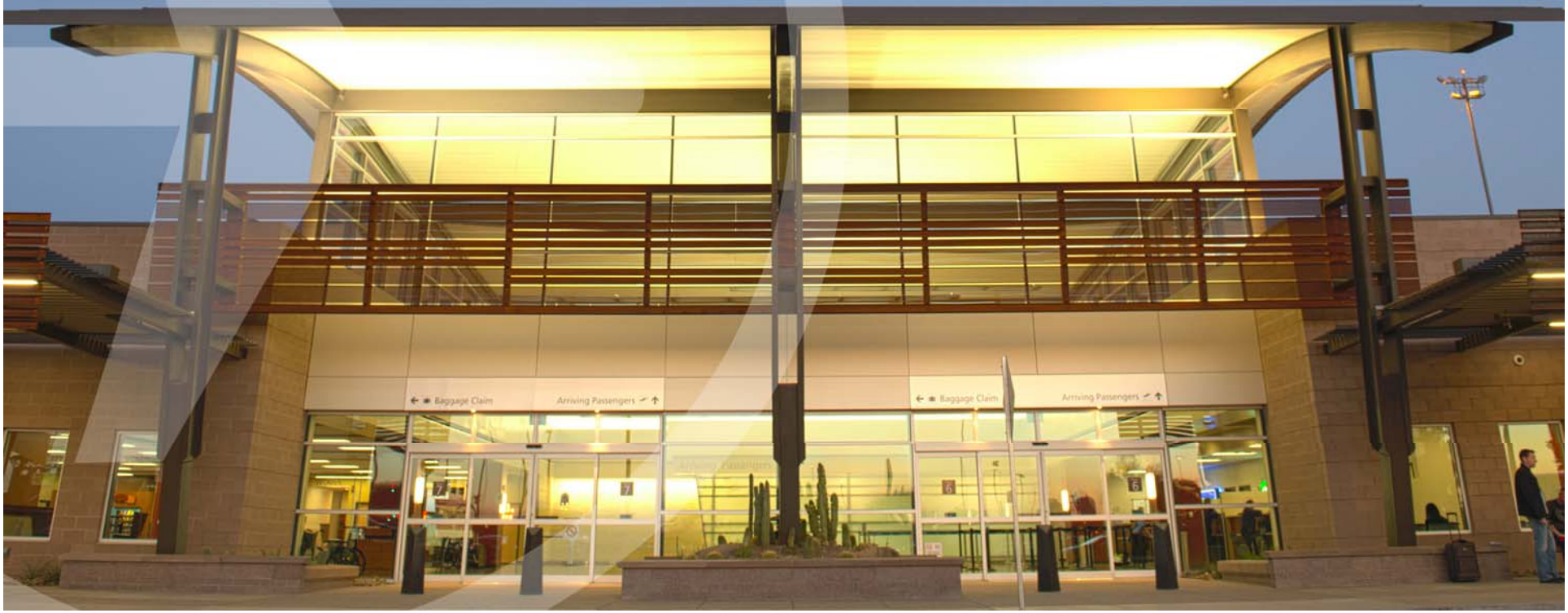
Project Website:
www.pmgaamasterplan.com



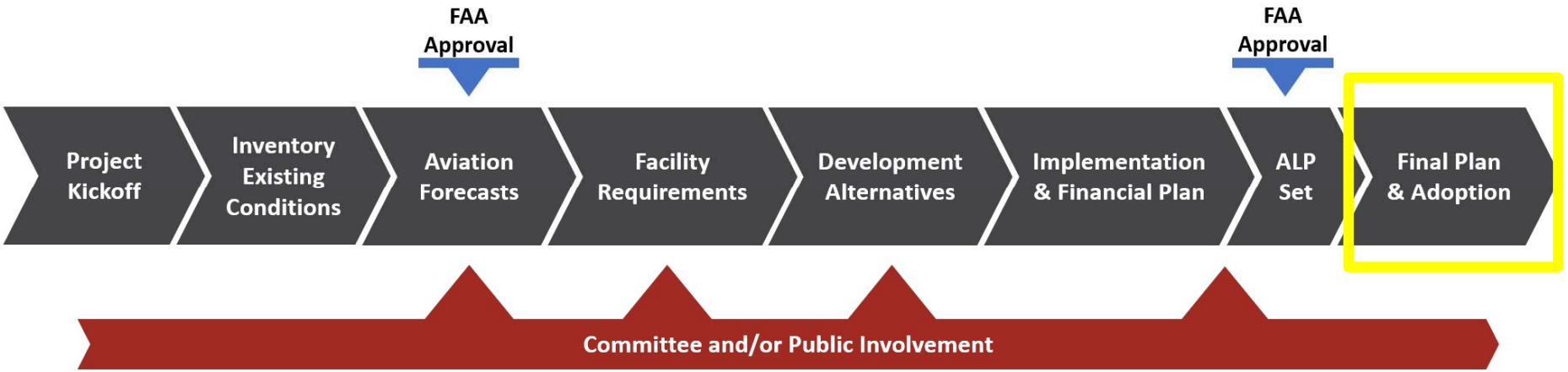
Airport Master Plan

Final Briefing

PMGAA Board Meeting
June 16, 2020



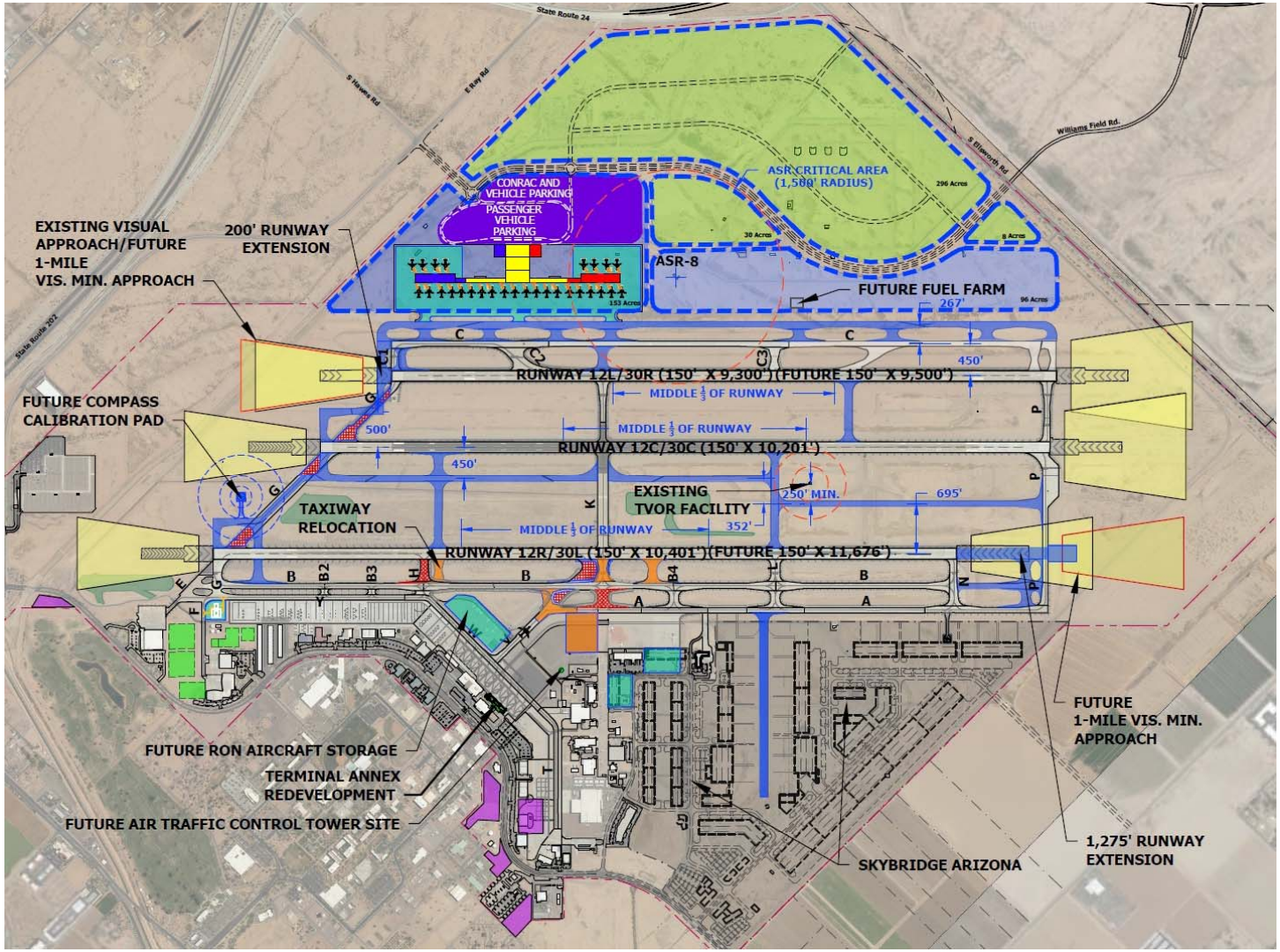
Airport Master Plan - Process



- Master Plan process has concluded
- Final Plan document & Executive Summary complete
- Airport Layout Plan (ALP) set reviewed & approved by FAA

Airport Master Plan - Preferred Development Concept

Phoenix-Mesa Gateway Airport

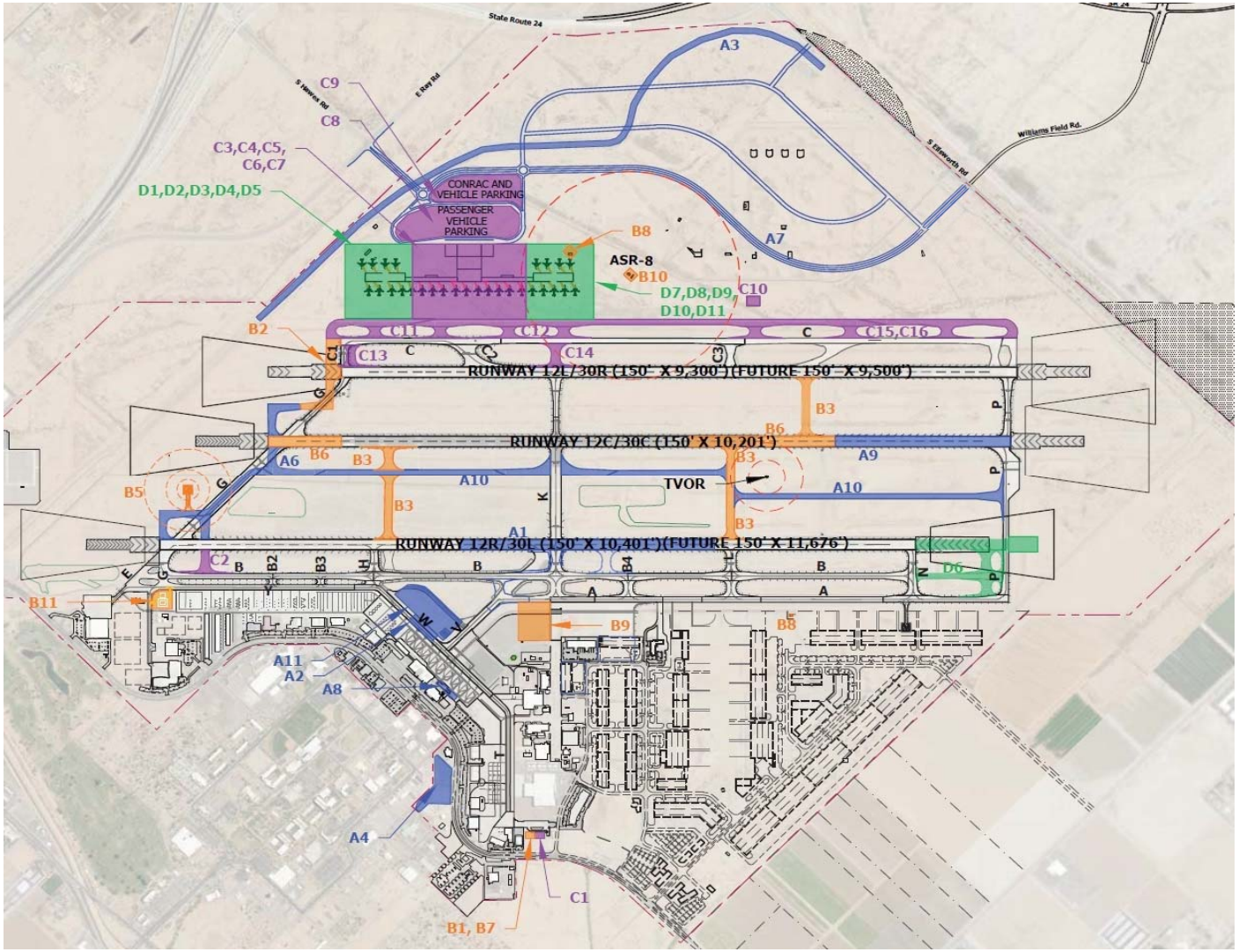


Legend

- Existing Runway Protection Zone
- Preliminary Roadway Development
- Future Passenger Terminal Reserve
- Future Aeronautical Development
- Future Non-Aeronautical Development
- Passenger Terminal Support - Parking/Rental Car/TNC
- Existing Detention Ponds
- Existing Easement
- Future Runway Protection Zone
- Future Runway/Taxiway Pavement
- Future Apron Pavement
- Existing IWA Programmed Project
- Pavement to be Removed
- Future Buildings/Development
- Future Economic Development Opportunity
- Passenger Terminal Phase 1 (10) Gates
- Passenger Terminal Phase 2 (9) Gates
- Passenger Terminal Phase 3 (9) Gates

Capital Improvement Projects - Phasing Plan

Phoenix-Mesa Gateway Airport



Legend

- Phase I - (0 - 5 Years)
- Phase II - (6 - 10 Years)
- Phase III - (11 - 20 Years)
- Phase IV - (20+ Years)

Capital Improvement Projects - Source & Use Summary

Phoenix-Mesa Gateway Airport

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Total Uses	**$ 114,330,382**	**$ 77,251,062**	**$ 191,581,444**

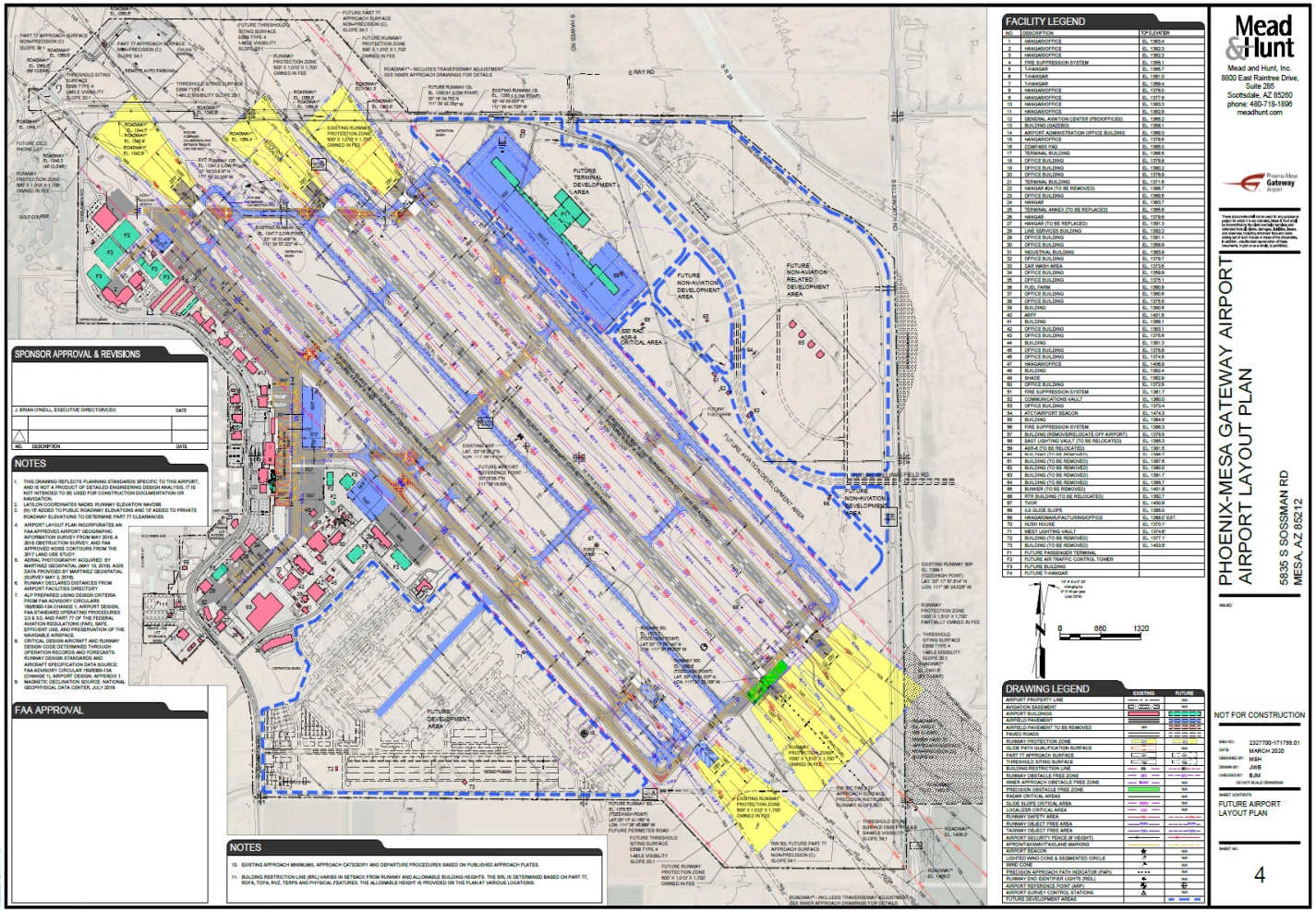
- FAA AIP Grants are largest proposed funding source
- Passenger Facility Charge (PFC)- Short term impact?
- No debt issuance planned

- Runway/taxiway projects are primary use of funding
- Maximizing west side terminal lifespan

The assumed AIP Discretionary funding is based on the FAA's funding criteria and priority system

Airport Master Plan - Airport Layout Plan (ALP)

Phoenix-Mesa Gateway Airport



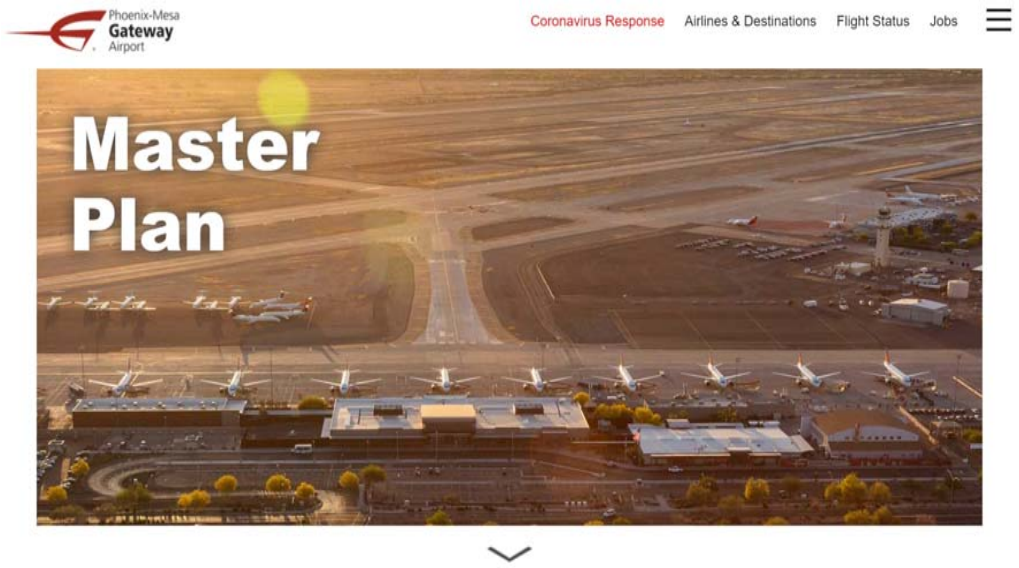
- Technical set of drawings
- Illustrates airport growth plans & grant eligible projects
- Approval by FAA & PMGAA Board

Airport Master Plan - Final Steps

Phoenix-Mesa Gateway Airport

- Approval of the Airport Layout Plan
- Adoption of the Master Plan documents
  - Executive Summary
  - Plan report & recommendations
- Project & grant close out documents w/ FAA

New Plan Website:
gatewayairport.com/masterplan



SCHOLAR FROM PAGE 11

climb the "leadership ladder" within the organization.

During his junior year, he ran for the HOSA state office, where he was later named the Arizona branch president.

The AP student also had the ability to nurture his passions for science and biology while working as a student researcher at the Arizona State University Biodesign Institute.

Adrian had the opportunity to explore the roles of microRNAs and Y RNAs in induced pluripotent stem cells in microscopic worms. Pluripotent stem cells hold immense promise for regenerative medicine due to their self-renewal and potential for differentiation.

He said that he was grateful for the support he received during his time there — especially at such a young age.

"It obviously helped develop my skill sets and allowed me to perform research," he said. "But for the most part, being a part of a community that is passionate about research and understands the difficulties that come with it, is life-changing."

"Especially being a high school student researcher. You're sort of undervalued as a high school student sometimes. When in reality, some of the research we're doing is undergraduate and graduate research."

Adrian will be honored for his accomplishments alongside the other scholars at the White House in Washington, D.C. from June 23 – 25.

The scholar said he is looking forward to his trip to the nation's capital, and that he hopes to network with a variety of politicians during his stay.

"I'm so excited to meet all of these people in the legislative process that are changing the world and how we view the world," said Adrian. "It's also a great honor to meet the president of the United States and to be awarded something so huge."

Adrian will be attending the University of Chicago in the fall, and said he hopes to continue pursuing biological sciences with the dream of becoming an independent researcher.

MISS ARIZONA FROM PAGE 12

more young adults to join the Chandler Lions.

"Her youth and enthusiasm will help to bring more youth into our aging Lions organization," Wick said.

Ticlo said it is intimidating but she is excited to serve as the Chandler Lions president.

"It was intimidating at first because I had really big shoes to fill," she said. "Ruth Jon Wick has been an amazing president. The Chandler Lions Club is like my second family. I feel inspired by all their stories. Blind people joined. One of my goals is to recruit younger, new members, bring them back and show them we're still here; we could use their help."

Ticlo was born in Iowa and moved around often as a child due to her father's job.

Her father, Harvey, is from India, and her mother, Ganjana, is from Thailand, and she has two sisters. She has an older sister, Genevieve, 27, and a younger sister, Tiffany, 17, who is Miss Glendale's Outstanding Teen.

As a nod to her heritage, Ticlo performed Bollywood dances while competing as Miss Arizona and at the Miss America competition. She started dancing at 13, doing jazz and hip-hop and then took classes in Bollywood dancing with her mother starting three years ago.

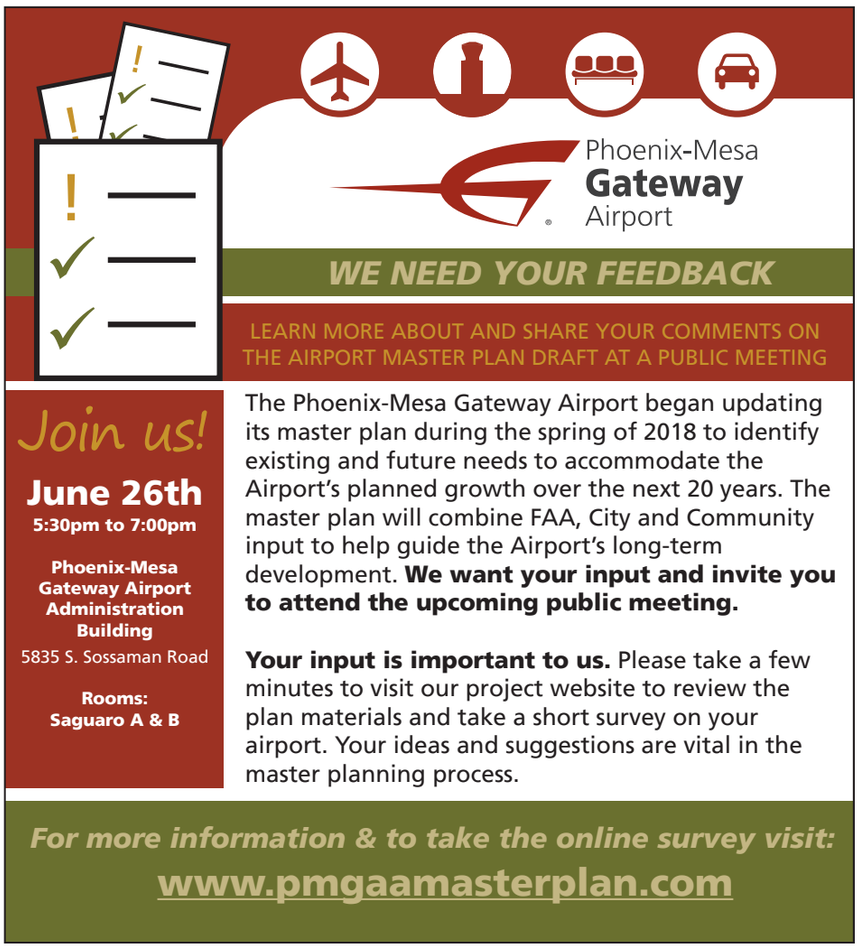
"I moved around a lot as a child and I needed a constant in my life," Ticlo said. "Dance became my constant and my emotional outlet."

She started competing in pageants at about 21 and was in the Miss Arizona competition twice previously before winning.

"Every candidate has the opportunity to win a scholarship just by competing on the stage," Ticlo said. "That was a wonderful bonus. The sisterhood was great. You meet these amazing women."

Serving as Miss Arizona 2018 also helped her, teaching her how to balance different activities and gave her a chance to make more contacts in the volunteer world.

Lions Clubs International has clubs in over 200 countries and geographic regions and started in 1917. Information: e-clubhouse.org/sites/chandlera



ANSWERS TO PUZZLES AND SUDOKU from Page 21

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Join us!

June 26th
5:30pm to 7:00pm

Phoenix-Mesa Gateway Airport Administration Building
5835 S. Sossaman Road

Rooms: Saguaro A & B

The Phoenix-Mesa Gateway Airport began updating its master plan during the spring of 2018 to identify existing and future needs to accommodate the Airport's planned growth over the next 20 years. The master plan will combine FAA, City and Community input to help guide the Airport's long-term development. **We want your input and invite you to attend the upcoming public meeting.**

Your input is important to us. Please take a few minutes to visit our project website to review the plan materials and take a short survey on your airport. Your ideas and suggestions are vital in the master planning process.

For more information & to take the online survey visit:
www.pmgaamasterplan.com

Continued from Page 23

ities! Open to boys and girls ages 8 through 15, this fun-filled summer program will motivate young actors to think creatively and build self-confidence through participation in music, dance and acting, at East Valley Children's Theatre. In addition to these activities, participants will learn skills in musical theatre performance from rehearsal through a final performance. Each session is two weeks of non-competitive, educational FUN with theater. Not to mention you will be working with some of the greatest teachers, staff and volunteers, all highly trained and experienced in theater and the intricate workings of putting on a show. June 17-28, Monday thru Friday. AM program $215; PM program $215; All Day $325. Sibling discounts available. Monday, June 17, through Friday, June 28. Call for times. EVCT Rehearsal Studio, 4501 E. Main St., Mesa. $215-$325. 480-756-3828.

Clayblazers: Women Artists of the '50s, '60s and '70s: With more than 100 artworks, "Clayblazers" celebrates women in the ceramic field during the mid-20th century. Legendary artists like Maija Grotell, Susan Peterson and Marguerite Wildenhain were educators, mentors and masters of their craft and inspired future generations. All of the works in the exhibition are drawn from the ASU Art Museum's ceramics collection of 3,800 objects, representing the full range of technique, aesthetic approaches and possibilities within the field. The exhibition also includes photographs and materials from the ASU Art Museum Ceramics Research Center's Susan Harnly Peterson and Studio Potter archives. The project is funded by the Windgate Charitable Foundation as part of the Windgate Contemporary Craft Initiative at the ASU Art Museum. Visit the museum website for directions and hours and information about bringing classes to tour exhibitions or meet with curators. Image credit: Marilyn Anne Levine, "Eyelet Boots," 1979, Earthenware and leather laces, 8 1/4 x 15 1/4 x 5 inches, Gift of Anne and Sam Davis. Wednesday, June 12, through

Continued on Page 25

Jonathan Kalika, D.M.D.

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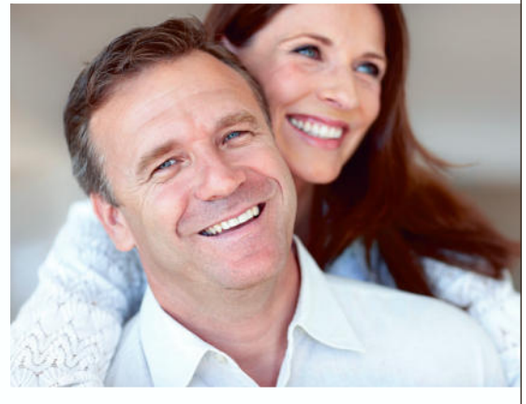

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we'll beat any local competitor's pricing
please call our office for details
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Insurance will be billed if applicable. Call for details. New Patients Only. Expires 6/30/2019

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additional $1300 for implant crown & connector
PPO contracted prices will apply
insurance will be billed if applicable
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crowns starting at
$699
does not include build-up or contracted PPO prices
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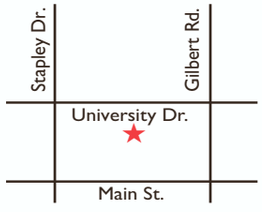

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If you need **Emergency Dental** Work, call us at 480-719-2613

AR-GCI0138793-04

Things to do

WEDNESDAY

John Hiatt

One of the most productive and respected music makers in America for more than 40 years, Hiatt's gonzo world view, wicked sense of humor, wildly entertaining stage presence, engaging personality and singular songwriting ability have led to universal admiration from fellow artists, critics and an ever-growing, passionately loyal fan base.

Details: 8 p.m. Wednesday, June 19. Marquee Theatre, 730 N. Mill Ave., Tempe. $45-$73. 480-829-0607, www.johnhiatt.com.

THURSDAY

Amazing Arizona Kids! Explore Arizona

Want to learn how geologists use fossils to learn about our history? Take part in hands-on activities.

Details: 10 a.m. Thursdays. Arizona Heritage Center at Papago Park, 1300 N. College Ave., Tempe. Call for prices. 480-929-0292, www.arizonahistoricalsociety.org.

THURSDAY

'Gospel Radio Man'

Featuring an introduction and Q&A with director Bruce Nelson. Ninety-two-year-old Larkins is the oldest living, active African American DJ in the USA.

Details: 6:30-7:30 p.m. Thursday, June 20. Arizona Heritage Center at Papago Park, 1300 N. College Ave., Tempe. $10; $8 AHS Members. $12; $10 seniors 65+; $8 youth 7-17; free for children 6 and under, AHS members, military and veterans. 480-929-0292, www.arizonahistoricalsociety.org.

THURSDAY

A Universe of Stories : Perler Bead Space Jam

If you're into perler beads and all things space, come and make special themed key chains, earrings and more to celebrate the Summer Reading Challenge theme: A Universe of Stories. Supplies will be provided. Registration required.

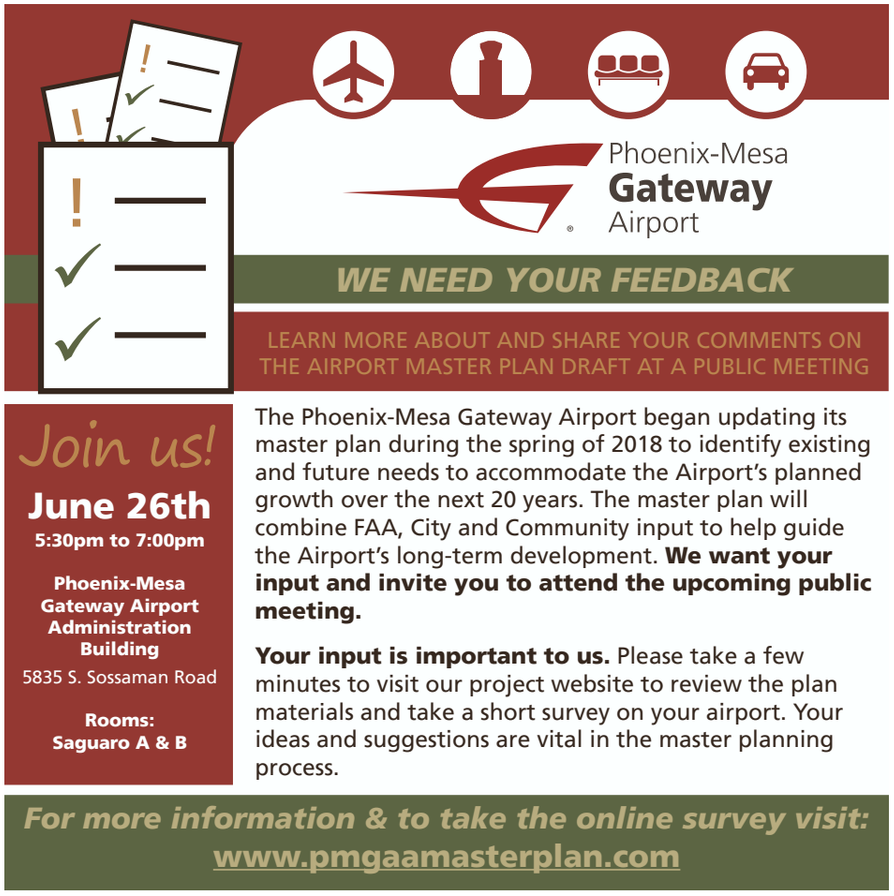
Details: 2-4 p.m. Thursday, June 20. Chandler Public Library - Hamilton Branch Library, 3700 S. Arizona Ave. Free. 480-782-2800, chandlerlibrary.org/.

FRIDAY AND SATURDAY

Slightly Uncensored Improv Comedy

This interactive improv comedy show is recommended for audiences 17+.

Details: Fridays and Saturdays through Dec. 28. Call for times. National Comedy Theatre, 214 W. Main St., Mesa. $12-$14. 602-374-5638.



CALENDAR

Continued from Page 28

-Pinterest and How it Can Help you Sell; -Balancing All the Things: Learn tips to help you balance life, work, small business ownership, and family; -Vision Board and Goals: Set goals you'll accomplish, take ownership of your accomplishments, and focus on you; -VIP level photography workshop. *All registrants get a catered lunch and access to a Media & Marketing Q&A Panel Visit www.madewithloveaz.com for more information and to register or check us out at @builtwithloveco for conference info and speaker bios. 9 am-4:30 pm Sunday, June 23. SoHo63, 63 E. Boston St., Chandler. $300-$350. 480-878-5663, www.SoHo63.com.

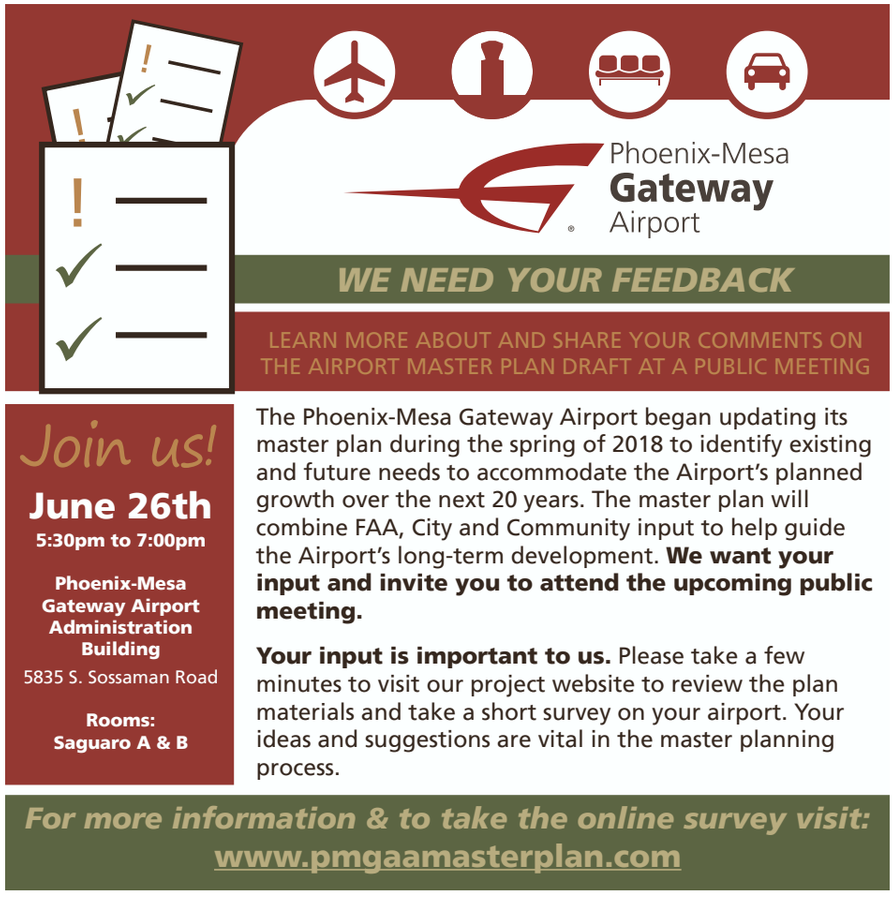
"Self-Inquiry - Who Am I? - Discover Your Blissful Nature!" with Arun Sehra, Hindu Scholar: The magic quest "Know Thyself," attributed to Greek philosopher Socrates, has in fact been the experiential dictum of most Eastern philosophies. "Knowing the Knower" or "Self-Inquiry" is the ultimate pursuit of human life - of Enlightenment - of Eternal Happiness. After one has gained some mastery over the mind, the Self Inquiry or "Who Am I?" begins as a two-step process: examining the "false or shadow self" known as "ego," and then realizing that the "false self is truly false." This interactive session will be followed by a guided meditation. Interfaith is located in the Paragon Business Center just West of Stapley, on the NW corner of Solomon and Baseline. Look for suite 102 on the West side of the building. 1-2:30 pm Sunday, June 23. Interfaith CommUNITY Spiritual Center, 952 E. Baseline, Suite 102, Mesa. Love offering. 480-593-8798.

Monday

Fun & Easy Dance Classes for Couples: Kaleidoscope Dance Studio in Mesa offers Fun & Easy Couples Dance classes every Monday evening from 7 to 8 p.m. These beginner-level classes are wonderful for couples who are wanting to improve their dance moves together for weddings, parties, cruises, or social nights out. Cost is $80 per couple for a four-week session. Each session features one style of dance. The styles for the next three months are: Sept - East Coast Swing, Oct - Rumba, Nov - cha cha. Dress in comfortable clothes and shoes you can move in. Light snacks and water are provided. Pre-registration is required. Call or register online. June 17 through Aug. 12. On Mondays from 7:00 pm to 8:00 pm. Kaleidoscope Dance, 2848 S. Carriage Lane, Mesa. $80/couple. 480-692-0332.

Kyrene Rotary Club: Our Rotary Club meets for lunch at 12 noon each Monday at the Kobe Steak House on the corner of Hardy Dr. and Elliott Rd. in Tempe. We are a group of people who meet to engage with interesting speakers from all aspects of community life including non-profit, business, education, and local government. Our club is service oriented and performs one or more monthly projects within the community such as United Food Bank, school dictionaries and A World in Motion science project, Habitat for Humanity, teacher recognition, Boys & Girls Club, and Save the Family. We also enjoy meeting with spouses and partners at monthly social events. You are welcome to join us as our guest for a stimulating meeting and to learn more about our club. You can learn more about our club at the web site www:kyrenerotary.org June 17 through Nov. 4. On Mondays from 12:10 pm to 1:15 pm. Kobe Steak House, 1125 W. Elliot Road, Tempe. Call for prices. 480-460-1706.

MYS Summer Music Camp: An Instrumental Summer Music Camp for young musicians through the 9th grade! Activities include Band, Orchestras, guitar, fiddling, sectionals, jazz, garageband, movement classes, theory, and more! Monday, June 24, through Friday, June 28. 8 am Monday, 8 am Tuesday, 8 am Wednesday, 8 am Thursday, 8 am Friday. The Church of Jesus Christ of Latter-Day Saints, 977 E. Broadway Road, Mesa. $260 Full Day; $160 Half Day. 480-456-9501.



Phoenix-Mesa Gateway Airport

WE NEED YOUR FEEDBACK

LEARN MORE ABOUT AND SHARE YOUR COMMENTS ON THE AIRPORT MASTER PLAN DRAFT AT A PUBLIC MEETING

Join us!

June 26th

5:30pm to 7:00pm

Phoenix-Mesa Gateway Airport Administration Building

5835 S. Sossaman Road

Rooms: Saguaro A & B

The Phoenix-Mesa Gateway Airport began updating its master plan during the spring of 2018 to identify existing and future needs to accommodate the Airport's planned growth over the next 20 years. The master plan will combine FAA, City and Community input to help guide the Airport's long-term development. **We want your input and invite you to attend the upcoming public meeting.**

Your input is important to us. Please take a few minutes to visit our project website to review the plan materials and take a short survey on your airport. Your ideas and suggestions are vital in the master planning process.

For more information & to take the online survey visit:
www.pmgaamasterplan.com

Police: Mesa officer rear-ended by drunk

Molly Hudson
Arizona Republic
USA TODAY NETWORK

A Mesa police officer was taken to the hospital after his vehicle was rear-ended by a drunk driver early Sunday morning, according to Detective Jason Flam of the Mesa Police Department.

Around 2:24 a.m. on June 16, a Mesa officer was stopped at a red light eastbound on Main Street at Gilbert Road when Hamilton Ruiz, 31, traveling east, failed to stop and rear-ended the police officer's cruiser, according to Flam.

While talking to officers, there was a strong odor of alcohol coming from his breath, according to the police report.

Ruiz

Ruiz reportedly admitted consuming approximately four alcoholic beverages before the collision occurred.

Ruiz was determined to be impaired and was arrested on suspicion of DUI and booked into the Mesa City Jail, Flam said.

The officer was taken to Banner Desert Hospital, where it was determined he had no serious injuries, Flam said.

Breaking News Intern Molly Hudson can be reached at Molly.Hudson@arizonarepublic.com and follow her on twitter @AsuMollyh

PET OF THE WEEK

Sebastian is a mellow kitty

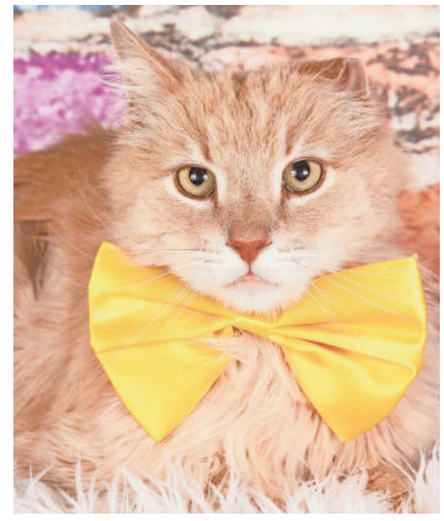
Every year, approximately 6.5 million companion animals enter shelters nationwide, according to the American Society for the Prevention of Cruelty to Animals. Of those, about 3.3 million are dogs and 3.2 million are cats. Each week, The Arizona Republic *highlights a handful of the many pets up for adoption at Valley shelters. To check the status of a specific animal, please contact the shelter directly.*

Sebastian is a domestic long-haired, buff-colored, male tabby cat that's about 8 years old. He is a mellow guy content with just hanging out. He doesn't ask for much from his people, but he does indeed enjoy getting pets.

He doesn't care too much for the company of other cats but would probably do OK with another older, mellow cat that can respect his space.

How to adopt: Sebastian is available for adoption at Friends for Life's adoption center at 952 W. Melody Ave. in Gilbert. His adoption fee is $95. At Friends for Life Animal Rescue, all animals are altered, vaccinated, microchipped, dewormed, and cats are tested for FELV/FIV. For more information, call 480-497-8296, email FFLcats@azfriends.org or visit azfriends.org.

— Jannelle Cosgriff, Friends for Life



Sebastian is available for adoption at 952 W. Melody Ave. in Gilbert. For more information, call 480-497-8296 or email FFLcats@azfriends.org. FRIENDS FOR LIFE ANIMAL RESCUE

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Mon-Sat 4:00PM - 9:30PM
ADULTS $12.99
CHILDREN (4-10 yrs.) $6.99

FRI & SAT DINNER:
4:00PM - 9:30PM
ADULTS $13.99
CHILDREN (4-10 yrs.) $6.99

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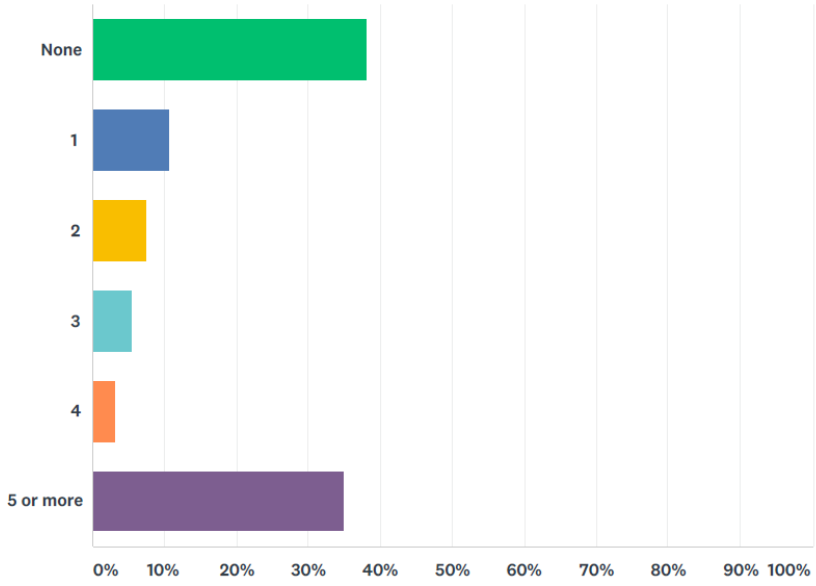
AR-GC10205595-03

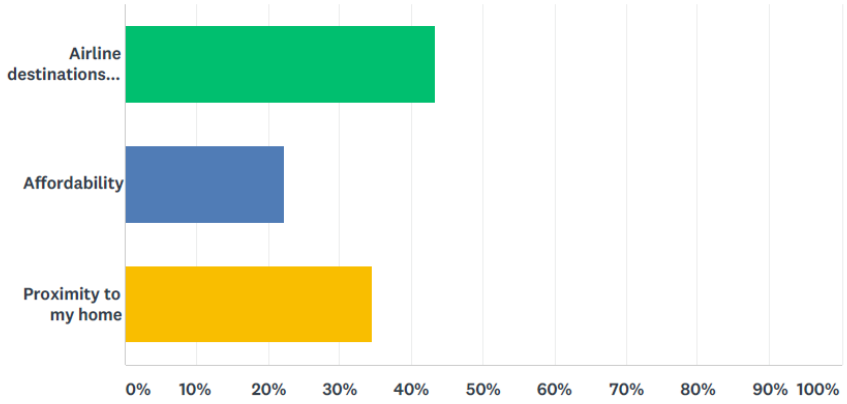
Online Survey Public Feedback
Individual Response & Summary

Question 1: How many times have you, or members of your household, utilized Gateway for air travel in the last 5-years?



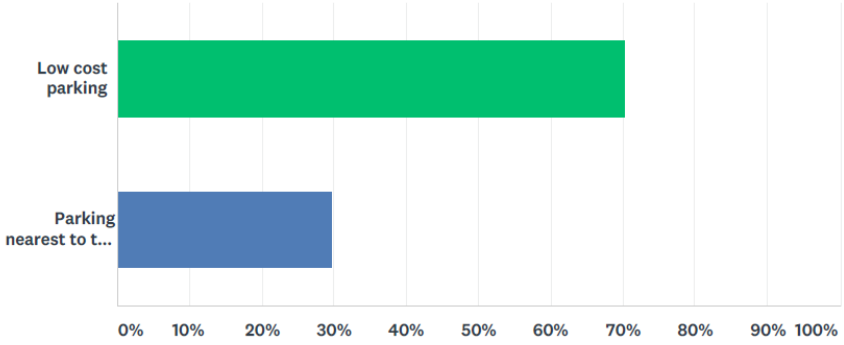
ANSWER CHOICES	RESPONSES	
None	38.17%	71
1	10.75%	20
2	7.53%	14
3	5.38%	10
4	3.23%	6
5 or more	34.95%	65
TOTAL		186

Question 2: What would be the largest factor in why you utilized, or would utilize, Gateway for your air travel?



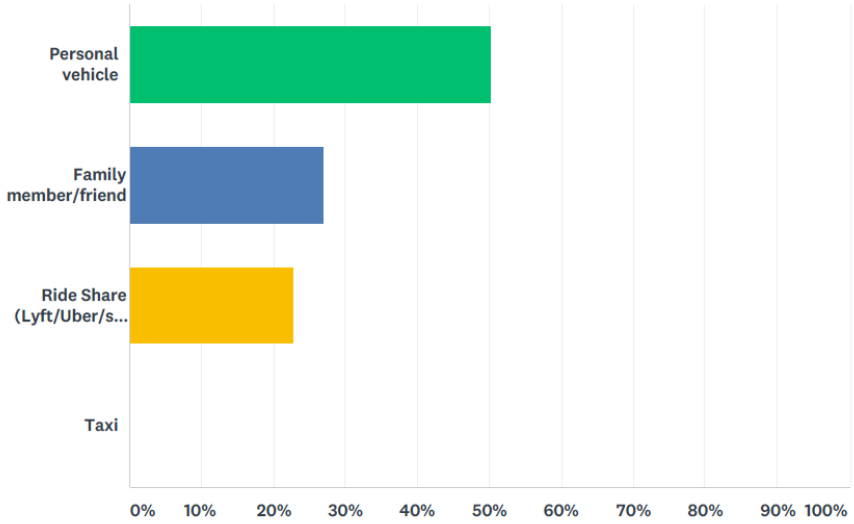
ANSWER CHOICES	RESPONSES	
Airline destinations offered	43.24%	80
Affordability	22.16%	41
Proximity to my home	34.59%	64
TOTAL		185

Question 3: In regard to airport parking, which is more important to you?



ANSWER CHOICES	RESPONSES	
Low cost parking	70.27%	130
Parking nearest to the terminal	29.73%	55
TOTAL		185

Question 4: How do you travel to/from the airport when departing or arriving on a flight?



ANSWER CHOICES	RESPONSES	
Personal vehicle	50.27%	93
Family member/friend	27.03%	50
Ride Share (Lyft/Uber/shuttle)	22.70%	42
Taxi	0.00%	0
TOTAL		185

Question 5: In general, can you share your overall impression of Gateway Airport?

Response 1: Just Plane Easy
Response 2: I would love to make IWA my "go to" airport. Delta, AA, or United are my carriers of choice as I travel for business or on a regular basis.
Response 3: GREAT
Response 4: An airport with relatively low- cost airlines offering flights to small market cities that larger airports do not offer.
Response 5: I have never been to Gateway Airport; I seldom travel, and it is not near my home.
Response 6: Too far away
Response 7: I have no opinion as I have never been to the site.
Response 8: It's small and I like it that way.
Response 9: Nice facilities, great opportunities for growth.
Response 10: Cramped
Response 11: Love the proximity of the airport to my home but I do not and will not fly Allegiant.
Response 12: Great airport to fly out of and close to our home.
Response 13: N/A
Response 14: Not enough carriers.
Response 15: It is a nice airport; however, I would not want to see it grow to big so it becomes a hinderance and nuisance instead of a convenience.
Response 16: Very clean, pleasant staff.

Response 17: No, I've never had cause to use this airport because most destinations I travel to are not offered.
Response 18: Small but well organized
Response 19: It's conveniently located, eat before you go because there aren't many options.
Response 20: Great little airport. Easy to access. Only suggestion is that luggage takes a very long time to come out. Sometimes up to 45 minutes.
Response 21: Good. I hope for a few more destinations.
Response 22: You need to add Southwest before I take this airport seriously.
Response 23: Its nice to have close to home. The airline options could be improved, especially Allegiant. Every time we have tried to use them, wait times are upward of 2 hours. That alone makes it very unappealing to use.
Response 24: Small
Response 25: Small but efficient and easy to get around.
Response 26: Convenient and affordable.
Response 27: Like the ease of getting in and out.
Response 28: Small, only offers Allegiant.
Response 29: Huge potential, Phoenix needs 2 major airports.
Response 30: N/A
Response 31: Good, small location airport. Employees are friendly, however space inside the terminal is at a premium and boarding airplanes having to actually get on the tarmac isn't ideal.
Response 32: Similar airlines fly out of here which isn't convenient for me.
Response 33: Love having an airport so close to our home, but no ideal airline/ flight options are available to easily reach our destination. Very limited commercial flights that cross the US.
Response 34: I like it. I wish the planes wouldn't fly over homes as much though.
Response 35: Easy access. Helpful agents. Look forward to more airlines and locations!
Response 36: I haven't used it, but I would dearly love to. Sky Harbor can be frustrating.
Response 37: I live in the local area and have noise level concerns.
Response 38: Growing but need more diversity of companies with gates/ destinations.
Response 39: Like that it's small and easy to get in and out of. Just wish there were more major locations (e.g., Denver).
Response 40: N/A
Response 41: very easy. wish there were more eating options inside terminal and that the air conditioning was turned up a bit. it's hot in there!
Response 42: Have not been to airport to make a decision
Response 43: Wish we could use it, but without better airlines to service it, it really isn't an option for us. We travel Southwest and JetBlue (primarily). The only locations Gateway seems to service are Midwest via Allegiance. We will never travel Allegiance. We don't feel that is a super safe airline.
Response 44: Would love to see southwest fly out of here
Response 45: It's a great, small, easy to use airport. It just doesn't have the routes/carriers that I use for frequent travel.
Response 46: Easy to use, friendly accommodating staff.
Response 47: I like the airport, it's small, clean and easy to navigate
Response 48: It seems great, but I'm only aware of Allegiant Air and their safety record, pricing model, and flight options are terrible!

Response 49: In general, the airport is small in size and very close to home. In addition, the airport offer some flights, but none to destinations I need to travel to for either business or pleasure. Additional flight options would be great, however, as a resident I am highly concerned with additional air traffic and air noise.
Response 50: Very convenient, clean facility, quickly move through lines, easy to navigate, we will continue to use and hope for more destinations
Response 51: Nice, Friendly, Convenient
Response 52: Nice, smaller airport
Response 53: Undeveloped
Response 54: Very pleased with the accessibility
Response 55: I love this airport its convenient and easy to use. I would like to see the luggage area improved so it doesn't take forever for the luggage to arrive!
Response 56: Have never been but would love to if they flew east.
Response 57: Crappy airlines to not as desirable airports
Response 58: Love it
Response 59: Not enough different airlines or destinations offered at the current time
Response 60: So easy!
Response 61: it's ok
Response 62: Doesn't have any airlines I would want to fly. I don't want to fly Allegiant due to the fees
Response 63: Never been there
Response 64: Clean, quiet, not crowded, easy to navigate.
Response 65: Seems like a very nice airport
Response 66: We enjoy the ease of travel given it is such a small airport. However, it is unfortunate more carriers have not stuck around to provide more options.
Response 67: It's quick and easy to enter and exit the airport.
Response 68: I love that the East Valley has an airport. Not only is it convenient, but it is far less crowded than Sky Harbor.
Response 69: Staff was awesome to my son who is a young adult with Autism. Very patient.
Response 70: Love the easy in and out.
Response 71: Open, Friendly, Clean and ease of access. Just wish an airline such as Southwest would be serving IWA
Response 72: Positive. Love all of the military planes flying out of there.
Response 73: Love the Ray road parking and shuttle. Easy to get to my car and back.
Response 74: Easy to access and navigate
Response 75: It's awesome!
Response 76: Fantastic
Response 77: I think the airport is well maintained. I would like to see other airlines offered so better prices are offered. I won't utilize services because I can't get good prices.
Response 78: Noisy and unwanted.
Response 79: Haven't heard good things about the airline there. Makes me want to go to Sky Harbor instead.
Response 80: It's a very nice airport. I have been to several smaller airports, and Mesa Gateway is by far the nicest. I do wish there were more options for airlines, but not sure if that is even possible. The airport is always maintained so well! We love it!
Response 81: I love it just needs more airlines going out of it. Southwest left right when we arrived in 2013 but since then I have seen a huge population boom. I believe Frontier flew out of there also?

Response 82: It appears to be very nice
Response 83: Small, convenient, clean, limited, well maintained
Response 84: I would love to use this airport however the airline doesn't offer flights to LAX which is where we fly once a month. I wish that Southwest Airlines would come to this airport because I live so close, but i have to go all the way to Sky Harbor to fly out.
Response 85: Great!
Response 86: Decent airport, needs more destinations/airlines.
Response 87: It's good for what it provides, wish it had more carriers, good people, cleanliness is sadly lacking
Response 88: Small, but really love it! Would love to see it grow!
Response 89: Understaffed, slow TSA
Response 90: Nice airport wish it offered move flights
Response 91: Nice hometown airport
Response 92: Nice small airport.
Response 93: It's a nice small airport. I certainly wouldn't want to make it a large airport that disrupts my enjoyment of my home with planes overhead more noise and more traffic congestion
Response 94: Nice little hassle-free terminal.
Response 95: Semi boring, slow service, and poor flight operations; otherwise, the parking is great, the facility is nice. I'm happy there's a brewery close by.
Response 96: This is much easier for the east valley than Sky Harbor. Please increase destinations.
Response 97: Never been there, but would like to fly out of there cause its close to where i live.
Response 98: Wasted space
Response 99: Wish a major carrier would come in. Don't feel safe on Allegiant
Response 100: Love it. close to home and flies to central IL
Response 101: Lack of desirable destinations, lack of carriers
Response 102: Happy
Response 103: Fast and easy travel without the crowds of a big airport
Response 104: Nice airport, but I've never used it because available destinations and flight schedules are so limited. I fly about once a month and have lived here almost two years. I've tried to book every trip from Gateway and haven't been able to make one work yet.
Response 105: We have used the airport for the last 5 years to visit family here, then moved here, and visit family in the Midwest now. Love the many destinations, easy in and out, reasonably priced.
Response 106: convenient
Response 107: Love the airport and its proximity to my home...but it doesn't fly to any of the places I need to fly to :(
Response 108: N/A
Response 109: I like the small feel of it. I am glad I have Precheck because I have seen how inefficient TSA is there. Parking is ridiculously expensive for land in the middle of nowhere and that was gifted.
Response 110: Hope it turns into a bigger hub like a Chicago Midway.
Response 111: The airport itself is convenient, flights are reasonable, and current AIR traffic and noise is tolerable... However, cargo traffic does not have to comply with the same noise criteria as commercial and people under the approach and takeoff patterns, as well as circulating are going to be severely impacted by cargo traffic. A new epa noise

study is required as well as an environmental study - since there has been tremendous growth in the flight plan area...

Response 112: It's great to see some folks taking the load off of Sky Harbor. My biggest concern with the continued growth is all of the housing developments going in that are so close to the airport.

Response 113: Airport is nice, airline is bad

Response 114: I prefer this airport because it isn't overcrowded, easy to navigate, affordable.

Response 115: We've picked up people at the airport and it was quick and easy

Response 116: Good, but crowded

Response 117: Good airport

Response 118: Convenient

Response 119: I used Spirit and Frontier out of Gateway but they seemed to force each other over to Sky Harbor. I Wish there were more options to LA and San Francisco and that s mainline carrier would be at the airport for daily frequencies

Response 120: Excellent airport.

Response 121: I like that its small, but there is only one Airline that flies out. More options would be nice.

Response 122: Don't use it cause they don't offer flights to there I want to go, small, ugly

Response 123: Love the location, the access (being about to hang out and eat by the runway), would love to see bigger/better airlines.

Response 124: Convenient and easy to navigate around

Response 125: Flights are routed over older neighborhoods.

Response 126: Nice. Needs more dining around it and offer more destinations.

Response 127: I love its proximity to my house & would like to utilize for travel, but southwest is the airline I fly almost every time. I live in Montelena and would be concerned if the new runways of flight paths change, as of now there is very little noise from the air traffic over my home & would hope that does not change.

Response 128: I don't know how it stays open.

Response 129: I have been there several times to rent a car. The airport is clean and not overwhelming. It is easy to navigate at it's current size.

Response 130: Good

Response 131: Great airport, we just don't happen to travel to the destinations offered by the current airlines based out of Mesa Gateway. But we enjoy the brewery at least once a week!

Response 132: A great little airport. Easy to use and convenient.

Response 133: The airport is convenient and easy to get in and out of.

Response 134: Ease of use. Clean and convenient terminal.

Response 135: I love to use Gateway Airport. I would like to see an airline to cover some of the destinations in the east that Allegiant doesn't cover. I also think some daily flights to the California, Nevada and Colorado would do very well. I am very exited about the future of Gateway**.**

Response 136: I like the size it is now. Living in Eastmark, I don't want to be bothered by jet noise if more flights were added.

Response 137: Nice for as fast as it has had to grow.

Response 138: Convenient to my home. Easy in-Easy out. Baggage claim can take a long time. Limited concessions and close parking.

Response 139: Seems nice, have never used since the big Airline companies do not fly out of this Airport

Response 140: No opinion at this time
Response 141: I like how easy it is to get around inside the airport/terminals and the time I save with the efficiency provided by the airline staff and TSA. Jobs are done well and thoroughly without the crazy long lines. I fly out of this airport every chance I get, provided the destination I need to arrive it is available to access from this airport. I love the "small town " feel of Mesa Gateway and would take the no frills options it offers over long lines and the hassle flying out of larger airports!
Response 142: I love Gateway, it's only 20 minutes from my home. It's small enough to move through quickly.
Response 143: Excellent
Response 144: I think it's a nice airport
Response 145: zero customer service, unfriendly, unprofessional, dangerous to fly
Response 146: It seems great bit there are no flights to cities I'd like to go to. Like Ontario in California or Los Angeles.
Response 147: Favorable
Response 148: Gateway is great. It could use more food and coffee vendors. The lines are so long that I usually don't even bother to buy anything.
Response 149: Confused.
Response 150: Very much enjoy flying to and from Gateway
Response 151: Small Local Airport, Needs bigger airline traffic to remove congestion from Sky Harbor Airport
Response 152: good, need more airlines and destinations
Response 153: Small and nice
Response 154: Good airport. However, Security gets over loaded since Allegiant am flights are clustered together; all around 6am or so.
Response 155: need more destinations. I really like the convenience, size and location. Prices are always good.
Response 156: Rapidly growing regional airport with easier access and less stress than using Sky Harbor Airport.
Response 157: Convenient affordable, would like more airline providers
Response 158: Easy in/out. Clean and convenient. Limited airline options.
Response 159: It's a nice airport. I live in Queen Creek and hope future plans don't increase the air traffic above my home.
Response 160: Small
Response 161: We appreciate the proximity to our home and ease of getting in and out for departures and arrivals. Destinations served are good, but it would be nice if there were more.
Response 162: Going in the right direction.

Question 6: Looking into the future, what would you like to see accomplished at Gateway Airport over the next 10-20 years?

Response 1: Continued growth. Runway/ taxiway improvements. Air Carrier growth with orderly terminal development.
Response 2: Expanded air service.
Response 3: New terminal
Response 4: N/A
Response 5: Improved customer service and parking

Response 6: Increased airline and travel options; affordability and convenience.
Response 7: Pavement reconstruction
Response 8: No opinion
Response 9: I would like to see it remain a small airport
Response 10: New terminal, increased parking options, and improved concessions.
Response 11: jet bridges
Response 12: Increase air service to include major airlines, similar to Burbank in CA
Response 13: more airlines flying out of Gateway Airport
Response 14: More air service from other carriers
Response 15: more major carriers and destinations
Response 16: Closer parking to terminal.
Response 17: More airlines, more destinations
Response 18: More destination choices
Response 19: More flight options
Response 20: Ensure the traffic flow and parking is well planned
Response 21: A few more restaurants. More locations. Faster baggage claim. More available employees for assistance with questions
Response 22: Another airline with access to hubs for longer travel plans. Also, San Diego?
Response 23: I don't want additional noise pollution from increased flights over Gilbert. Keep the current flight paths.
Response 24: Try to get more airlines. It would be nice to have even American Airlines smaller aircrafts. Big name with good service.
Response 25: Closure (unlikely) or flight paths that do not come over residences
Response 26: more carriers who fly do not fly to major city hubs. I can go to PHX for that.
Response 27: More airlines and destinations.
Response 28: Increase flights, more airlines like spirit or southwest
Response 29: Major terminal expansion, with other carriers
Response 30: keep it small and simple
Response 31: Boarding airplanes without having to get on the tarmac.
Response 32: Nothing, keep it small due to the large amount of communities being built right around the airport. Nobody likes large airlines flying in their backyard. We don't want it to look like central phx
Response 33: A larger airline (or airlines) that offer more flight options/destinations. Such as Southwest or Frontier.
Response 34: ??
Response 35: Additional parking, additional airlines, and more locations
Response 36: Grow a bit, but not a lot. it's a lovely small airport and we don't need 2 big airports.
Response 37: Public outreach should any future changes affect noise levels in certain areas around the airport.
Response 38: limit expansion to the Northwest towards populated Gilbert.
Response 39: Expand flights to major cities
Response 40: Getting a major airline like southwest or JetBlue and adding regular flights to la area, San Diego, Vegas etc.
Response 41: more destinations within u.s. More airlines flying in/out
Response 42: More destinations. LAX, ORD, etc.
Response 43: Please expand airlines and destinations. That is our number one request.
Response 44: Would love to see southwest fly out of here
Response 45: More airlines; limited schedule like john Wayne to keep noise down

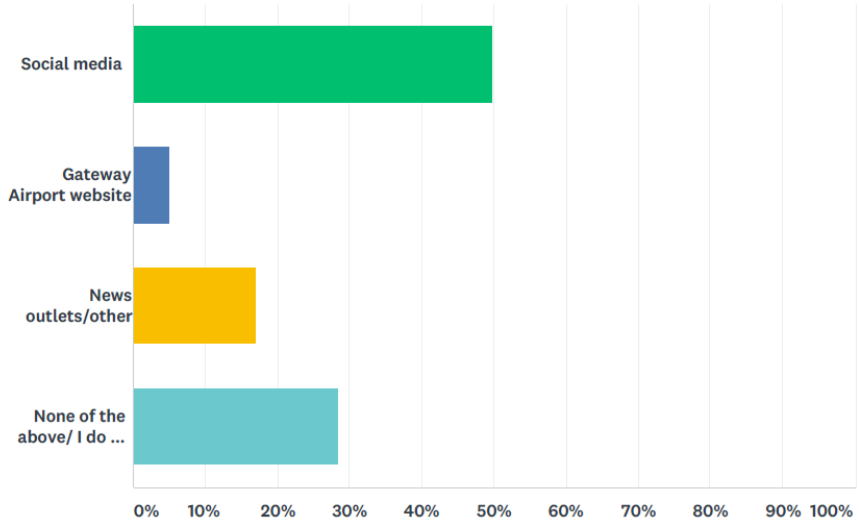
Response 46: Re-locate Rental cars with shade/AC.
Response 47: Efficient management of increased traffic and demand, maintain small feel of airport, maintain airfare at a affordable rate
Response 48: I don't want it to over-expand. I live close and do not want big commercial airlines flying in and out all the time.
Response 49: More airlines besides Allegiant.
Response 51: I am not sure that I want to see growth at the expense of disruption due to increased air traffic noise.
Response 52: Hawaii, Midwest, Europe
Response 53: More Airlines
Response 54: More larger airlines
Response 55: Keep it small.
Response 56: More Airlines - More Destinations
Response 57: More airlines and more destinations
Response 58: Easier faster luggage and ramps to the planes and more airline choices.
Response 59: More airlines/ flights east
Response 60: Big brands
Response 61: More airlines
Response 62: More variety of airlines and destinations
Response 63: Get an airline that has direct flights to Sacramento CA
Response 64: more destinations and days available to fly to said destinations
Response 65: More airlines more places
Response 66: Have major airlines fly in and out
Response 67: More destinations. It would be amazing if it had more flights to California.
Response 68: Service from American Airlines, Southwest, Delta or United
Response 69: Increased carriers.
Response 70: New terminal, with jet bridges on the east side of the runways. Parking garage across from the terminal with bridge access and expanded gates, food options, and expanding airline options.
Response 71: More airline choices and more destinations, including international flights.
Response 72: Not to grow too much, and keep affordability and kindness.
Response 73: More airlines
Response 74: Locate the Passenger Terminal to the NE airport area next to Ellsworth Rd. Use Sossaman for Aircraft Maintenance and or Freight services as a primary function as it would be difficult to expand to handle future passenger traffic.
Response 75: Keep it easy - smaller is always better for the person flying.
Response 76: More destinations and options for air carriers
Response 77: The new east terminal!
Response 78: Get more airlines like Southwest, United, Delta, American, Alaska, etc.!
Response 79: More destinations and carriers
Response 80: It goes back to being a quiet small regional airport.
Response 81: Better news on the airline there.
Response 82: I would love to see more options in airlines, or more routes available through Allegiant, but I'm sure that is more of an Allegiant company issue than Mesa Gateway issue.
Response 83: More Airlines, I think with Gilbert and QC/San Tan Growth a new airline might be sustainable?
Response 84: More flights to the west California/Oregon

Response 85: Maybe 1 more carrier. Don't want Increased overhead traffic.
Response 86: Bring in Southwest Airlines or offer flights to LAX for unaccompanied minors
Response 87: A couple more airlines with non stop flights
Response 88: More destinations and airlines.
Response 89: Bigger terminal, more airlines, cleaner facility
Response 90: Bring on American/ Piedmont
Response 91: More efficient
Response 92: increase airlines that offer flights
Response 93: More airline choices
Response 94: Additional Terminal to allow more airlines.
Response 95: I don't want the airport to keep adding airlines and more flights. I live in Queen creek station and am concerned about airplane noise. I always use sky harbor BTW. Mesa is a small airport and should stay that way.
Response 96: Offer a wider variety of airport destinations
Response 97: Stay small. I don't want to lose value in my home by being in a larger flight path or have more.
Response 98: More flights to more destinations
Response 99: Unique restaurants/shops (AZ based-IE an Olive Mill stand, Cartel coffee, etc.) Displays of art, or projects being accomplished by ASU with an educational component.
Response 100: More airlines, more destinations
Response 101: Limited growth, but options for destinations
Response 102: Nothing. Keep it the same
Response 103: Major carriers
Response 104: More destinations
Response 105: Legacy carriers And southwest flights
Response 106: Would like to be able to fly into Casper, Wyoming again
Response 107: Add airlines for more travel options
Response 108: Bring in airlines which offer a broad selection of major destinations and schedule more flights.
Response 109: Continue opening new destinations, stay convenient and reasonable.
Response 110: more flights to east coast
Response 111: more airlines and destinations
Response 112: Lower cost for baggage
Response 113: Would love to utilize the airport. However it's not possible unless there's more flight availability. I have tried booking flights but only one if the flights worked with schedule as waiting 8 days to return hasn't been a possibility.
Response 114: More destinations.
Response 115: Enlarge terminal, better food options, more carriers
Response 116: That it remain a strictly small commercial airport... Anything else is going to be a noise and an environmental nightmare.
Response 117: Different airlines utilizing the airport
Response 118: Better airlines, don't fly over the town of Queen Creek
Response 119: More dining options while waiting, keep it from being overcrowded by offering limited, affordable flights to popular destinations.
Response 120: More Air Lines with more destinations
Response 121: Not to lose quant feeing, don't feel rushed
Response 122: More airlines
Response 123: Flights to other cities

Response 124: New terminal and main line carriers. I've used Allegiant but we need a full service carrier too
Response 125: New tower, new terminal, more airlines.
Response 126: Additional airlines.
Response 127: Make it look nicer/ modern, offer more flights
Response 128: Bigger terminals and airlines
Response 129: Additional destinations
Response 130: We have been in our home for 20 years at Guadalupe and Recker. We are afraid that as the airport grows we will have many more large planes flying low in their landing and takeoff patterns. Allegiant air comes in quite low at this time.
Response 131: Dining, more destinations, parking garage, trees
Response 132: airlines with direct flights to Chicago, continued growth without changing the air traffic patterns that the airlines currently fly so there is no increase in noise in my neighborhood Montelena
Response 133: I would use it if a major airline had flights out of it.
Response 134: I feel that the airport should maintain it's current size and just make sure it is up to date at all times on technology and safety standards. This placement of this airport dictates that it needs to be small and not try to compete with Sky Harbor. It is very close to ASU polytechnic campus and close to thousands of homes.
Response 135: Increased destinations
Response 136: Hopefully more airlines will make Gateway their home with more destinations. And we miss the open houses/air shows you used to host!
Response 137: More airlines.
Response 138: Additional airlines
Response 139: Continue to grow destinations offered. Build aviation support facilities. Remain just plane easy!
Response 140: 2 or more new airlines. New terminal on the east side or the runway. More private aircraft.
Response 141: No suggestions.
Response 142: New terminal.
Response 143: What happened to the new terminal? More airlines and destinations. Cargo flights. Get rid of the trailer gates!
Response 144: Big Airlines (American, Delta, Southwest) adding flights departing and arriving here daily or a couple times weekly. I will not fly the smaller Airlines like Allegiant, etc.
Response 145: Ensure flight path is not creating more noise of the suburban areas
Response 146: Restaurants or bistros where the ticket counters are located, before you pass through TSA security
Response 147: There is nothing more I need.
Response 148: More carriers and destinations
Response 149: Add Alaska airlines
Response 150: better, safer airlines & customer service
Response 151: If possible, more flights to smaller California airports such as OC or Ontario
Response 152: Jobs, more destinations
Response 153: Better signs along the Sossaman near the terminal might help traffic flow
Response 154: Bring in some real airlines. Specifically, Southwest.
Response 155: More flight options, more airlines, varied destinations
Response 156: Major Hub Airport
Response 157: More airlines and destinations. Including international vacation locations.

Response 158: More flights/destinations; being a good neighbor with outreach
Response 159: More airlines; indoor walkways to/from airplanes; more selection of food/sundries at gates.
Response 160: more destinations
Response 161: Add more direct flights 1-2 times a week to towns in Midwest (Madison, WI).
Response 162: Expansion
Response 163: More airline and destinations. Expanded terminal. Less baggage claim wait times.
Response 164: An increase in use for international shipping.
Response 165: more airlines
Response 166: New terminal and related business growth. Collaboration with ASU's Polytechnic academic programs. More airline options calling Gateway "home".
Response 167: More airlines.

Question 7: How do you typically follow news and events related to Gateway Airport?



ANSWER CHOICES	RESPONSES	
Social media	49.73%	91
Gateway Airport website	4.92%	9
News outlets/other	16.94%	31
None of the above/ I do not currently follow	28.42%	52
TOTAL		183

Question 8: What would you like the Airport Master Plan team to know that we have not asked?

Response 1: How will this survey information be used?
Response 2: -N/A-
Response 3: N/A
Response 4: N/A
Response 5: Ease of check-in, moving about the airport, and assorted, convenient offerings would be keystones for me to make traveling as easy as possible, and safe!

Response 6: Why people aren't using the Airport
Response 7: nothing
Response 8: What can the local community do to help promote the airport.
Response 9: n/a
Response 10: N/A
Response 11: has phx negatively impacted gateways growth?
Response 12: Military association
Response 13: Perhaps a dedicated drop off/pick up drive through.
Response 14: Flight paths are biggest issue for local residents - little thought given to low flight path access over noncommercial properties
Response 15: I think the present runway directs the traffic away from homes. That is an important issue to me. No more air traffic over our home
Response 16: Be sure the planning doesn't detour General Aviation, and training at IWA
Response 17: Allow for more options with respect to restaurants, shopping, etc. Also, less open space between terminals. Too hot for traveling between locations.
Response 18: If the airport was to grow, still regulate when flights are being scheduled, no early morning or late night flights going in or out.
Response 19: None
Response 20: How much will the expansion cost the taxpayers? Not just the East Valley; but Phoenix area, West Valley, and the beyond!
Response 21: How do these future plans affect noise levels in the local area.
Response 22: nothing
Response 23: What is the impact to noise/flight path to surrounding communities.
Response 24: I would visit the airport for restaurant options like Barrio Brewing or a museum.
Response 25: If I were you I would have asked the survey participants, what type of traveler are they: business vs. personal; how often do you travel? How many trips have you taken from PHX vs. Mesa?
Response 26: Again, how will air traffic noise be handled for those of us residents who live in the path currently?
Response 27: na
Response 28: Nothing
Response 29: We do not want it to turn into a large airport with multiple airlines. We do not want the noise and air pollution, and traffic association with large airports.
Response 30: Nothing I can think of
Response 31: ?
Response 32: Get better Airlines and the crowds will come
Response 33: More businesses and restaurants
Response 34: Maybe an additional airline that can do more options for flights
Response 35: Phoenix in general has few direct international flights. Would love to see more destinations outside the US having direct flights
Response 36: What the most desired destinations are for potential flyers in the region. I'm sure the east valley would very much appreciate not having to fly out of sky harbor as much!
Response 37: With the explosion of growth in the southeast valley the demand is high for air travel that is closer with more destinations.
Response 38: Please consider the disabled and seniors who move a little slower.
Response 39: Putting POLITICS aside. with the heavy congestion at PHX I have observed up to 30+ go-arounds at PHX why can't IWA attract and retain Service from American Eagle AL as an example which I feel is a definite must for the future.

Response 40: I do have concerns about a significant increase in air traffic and noise. We live nearby and I realized this when we moved in but I don't want to listen to constant noise all day and night.
Response 41: Keep it small - don't want it to become another Sky Harbor - ugh!
Response 42: Nothing
Response 43: People hate the noisy airport used by Snowbirds and people going to Las Vegas to binge.
Response 44: Concerned about increased traffic/dust in our neighborhood so close to the airport
Response 45: Jeff Brown of Queen Creek does a fantastic job of up to the minute communication. As it effects residents I would love to know relevant airport news.
Response 46: More airlines or destinations would benefit growth to this airport.
Response 47: Will the flight paths change?
Response 48: Nothing
Response 49: Please don't add more airlines and different flight patterns.
Response 51: Please be mindful of people who bought newly constructed homes in the area. We bought for the small town atmosphere and quiet. Not to be part of a huge airport expansion that will increase noise be in a flight path or decrease the value of our homes.
Response 52: Love that we can go up to watch flights, even from a restaurant!
Response 53: Nothing
Response 54: N/A
Response 55: Much as I'd love to use Gateway, I can't do it if your airlines don't fly where I need to go, when I need to go there.
Response 56: need flights to east coast
Response 57: n/a
Response 58: More security on staff at checkpoints
Response 59: Again offer more availability of flights.
Response 60: Let UBER and LYFT in!
Response 61: Hopefully it will bring more commercial to the immediate area (i.e. Restaurants)
Response 62: The areas surrounding the airport have been allowed to develop by the various town gov'ts -even though they and some of us knew years ago that plans were afoot to use this as more than a commercial airport. Developers, and others got there money with little regard for the future of those that have to live here. It is going to be difficult to B.S. the citizenry who were here when the supposedly 'closed' air force base - resurrected from the grave as an airport. Many folks were 'conned' by Brown (mayor), his cronies, and complicit realty companies for misleading the public about future airport plans... Some of them lost their jobs and were prosecuted... You better have noise corridor plots, db printouts, proposed takeoff/ landing approach vectors, frequency and proposed time of flight data available at the next meeting. Also, we would like to see the rules and regulations regarding acceptable noise emissions from cargo /military planes and the effect on the noise levels in the surrounding communities... meeting. closed approach
Response 63: Please take into consideration all of the developments that are near your flight path. Many of us moved here before it was a commercial airport.
Response 64: Tell us more about their future plans
Response 65: Try to keep the small friendly feel
Response 66: Make the speakers for indoor and outdoor. It'd be great to see the light rail extended to this airport.

Response 67: Keeping local traffic paths growing with airport growth so neighboring areas aren't impacted too much
Response 68: Just make it look nice and modern
Response 69: N/A
Response 70: So far it's a great airport!
Response 71: Concerned about noise with so many housing developments nearby.
Response 72: n/a
Response 73: I lead a cycling group and we often stop at Gateway and sit in the Ramada behind the Brewery restaurant where we can watch planes come and go. That's a benefit that no other airport offers.
Response 74: I really appreciate this team seeking the input of residents. Since I have lived in AZ the battle between Phoenix residents and Sky Harbor has been ongoing. Flight paths have had to be changed etc. It would be in everyone's best interests to really take all the time needed to gather all of the data to guide decisions for the future. Gilbert residents like the small town feel...that's why we don't live downtown next to the airport.
Response 75: Runway noise not affecting homes
Response 76: Keep up the great work! You are on the right track.
Response 77: Nothing that I can think of.
Response 78: I enjoy all the different types of aircraft flying in and out of Gateway.
Response 79: Survey the public as to which destinations they would most like to fly to. What we can do to encourage another airline to have a presence at gateway. I would be interested in being a volunteer ambassador/passenger information agent at the terminal. I have vast history with Williams as my Father retired from the there in the ASAF in the mid 70's and I worked for the City of Mesa for 30 years and recently retired.
Response 80: N/A
Response 81: Keep the viewing park. Unique and it's nice to visit.
Response 82: Many people 'would' fly out of here if they added the big commercial airline flights. Only a select few will fly out of here now due to limited destinations. I looked recently to see if any flight from Mesa to Seattle, since none, had to look at Sky Harbor but, would have chosen Mesa if it was available.
Response 83: Design a food court or even just a few sit down options for eating prior to TSA check points.
Response 84: N/a
Response 85: Please keep costs low. This airport is a great alternative and I'm afraid that airlines will relocate to Sky harbor if costs go up.
Response 86: Rental car availability
Response 87: Question 2 misses a major point for me. It's not specifically about destination or affordability. For me, it's about which airlines fly out of there and how regular those flights are. Personally, I won't fly Allegiant. But if I did...last time I checked I was limited to 1 or 2 flights per week to certain destinations. I live 10 minutes from Gateway and love to travel, but I'll drive to Sky Harbor to fly Southwest where I'll have multiple flight options per day to the cities I want to visit.
Response 88: Continue to be futuristic. Keep the future a priority. Don't rest on laurels.
Response 89: Future Projection on Airport
Response 90: none

Response 91: Don't expand without considering impact to communities; grow responsibly and communicate with area neighborhoods. Maybe have a special event again where we can learn what is happening.
Response 92: With increased travelers, move the parking now located directly in front of the terminal to another location; Indoor tram/shuttle from long-term parking to terminal; and covered parking option.
Response 93: i like that the airport is small and easy. needs more destinations.
Response 94: Would pay more for parking if it was covered and/or close to terminal.
Response 95: Nothing
Response 96: Create jobs around the airport. Partner with ASU
Response 97: Will it eventually be connected to light rail system?
Response 98: New destinations.

Question 9: Please let us know how to contact you if follow-up on Question 8 is necessary. For further discussion please see our Project Contacts. To stay updated on project progress please Subscribe for Updates.

Response 1:
Name Jason Ness
Response 2:
Name Zorra Ram Kaur
Response 3:
Name Lynda
Response 4:
Name Bart Gover
Response 5:
Name Jon Faucher
Response 6:
Name Dana
Response 7:
Name Ron Tully
Response 8:
Name L Wolfgang
Response 9:
Name Sarah McDonnell
Response 10:
Name Chris Rodriguez
Response 11:
Name Joe Scheiman
Response 12:
Name David Gadient
Response 13:
Name Memory Bradley
Response 14:
Name Ryan Douglas
Response 15:
Not Necessary

Response 16:
Name Branden Backus
Response 17:
Name Lisa Romero
Response 18:
Name Jamie Mcnamara
Response 19:
Name Karen Thomas
Response 20:
Name Jamie K Bernhardt
Response 21
Name Debbie
Response 22:
Name Katrina Urias
Response 23:
Name Heather Brown
Response 24:
Name Renata Irving
Response 25:
Name Rudy Saltzmann
Response 26
Name Lynda Chesrown
Response 27:
Name Rose
Response 28:
Name Janice Edwards
Response 29:
Name Lynnette Swainston
Response 30:
Name Karl Hudson Wertzberger
Response 31
Name Lisa
Response 32:
Name Elaine
Response 33:
Name Erin Flores
Response 34:
Name Mark
Response 35:
Name Jose Caneira
Response 36:
Name Josiah Taulbee
Response 37:
Name Karen Flaherty
Response 38:
Name Dave shafer
Response 39:
Name Matthew hunter

Response 40:
Name Jeannie
Response 41:
Name David Odiorne
Response 42:
Name Stacey
Response 43:
Name Daric Hartle
Response 44:
Name Ben Fidler
Response 45:
Name Mike Purcells
Response 46:
Name Angie
Response 47:
Name Mike Terry
Response 48:
Name Scott
Response 49:
Name Alyssa
Response 50:
Name Amy Weide
Response 51:
Name Michael panzarella
Response 52:
Name Debbie
Response 53:
Name Heather Plaza
Response 54:
Name Toby Karlquist
Response 55:
Name Darrell Tilus
Response 56:
Name Warren D Bowman
Response 57:
NA
Response 58:
Name Jamie Michelle Paone
Response 59:
Name Molly Mullanaphy
Response 60:
Name Monica Johnson
Response 61:
Name John Pytlik
Response 62:
Name Pat Jones
Response 63:
Name Ilene Olson

Response 64:
Name Scott Richins
Response 65:
Name Gordy Ziebart
Response 66:
None
Response 67:
Name Tracey Groy
Response 68:
Name Brandy McFarland
Response 69:
Name Janette Moerer
Response 70:
Name Barbara J Aarestad
Response 71:
Name David Stoddard

Online Stakeholder Survey Committee Feedback
Individual Response & Summary

Question 1: In general, can you share your overall impression of Gateway Airport?

Response 1: Efficient. Good access. Plenty of room for growth.
Response 2: Full of potential.
Response 3: Airport poised for aggressive growth in the next 10 years due to local economy and urban development south and eastward. Poised to be the second city center for the Phoenix area.
Response 4: Underutilized with great potential. Bring into modern era with futuristic architecture and amenities not offered at other airports.

Question 2: AIRSIDE DEVELOPMENT ALTERNATIVES
Please click on the links below and review the two Airside Alternatives. Do you have any feedback on these Alternative? If yes, please provide:
View Airside Alternative 1
View Airside Alternative 2

Response 1: Prefer Alt 1. Need additional taxiway exits off 12/30C as well connectors to the east & west runways to avoid using runways as taxiways.
Response 2: I do not have expertise to evaluate these.
Response 3: I think that plan 1 has a better plan for taxiway G, but fails to provide the high speeds that #2 does between 30C and 30R. Plan 2 has a taxiway G structure that may slow down ground traffic flow from the west side. Not good use of taxiway construction between 30L and 30C. I do like the runway extension in #2 for the big guys.
Response 4: Alt. 1.

Question 3: TERMINAL DEVELOPMENT OPTIONS
Please click on the links below and review the three Terminal Development Options. Which option do you prefer and why?
View Terminal Development Option 1
View Terminal Development Option 2
View Terminal Development Option 3

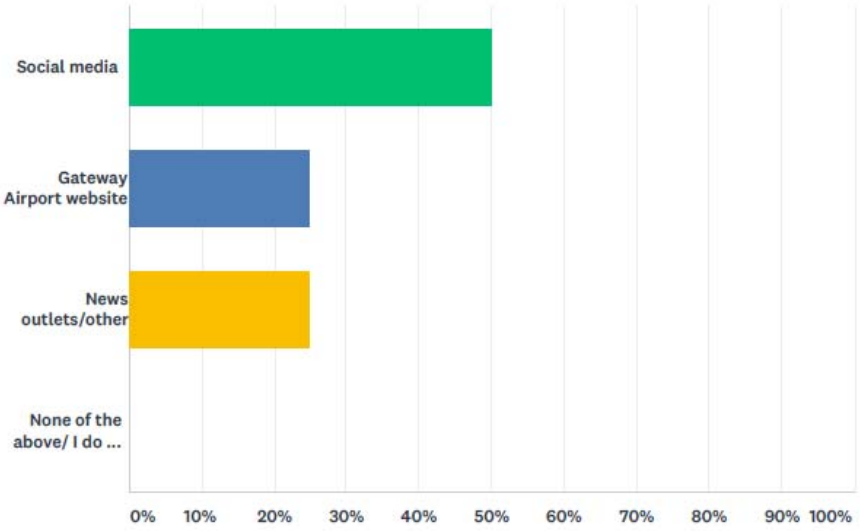
Response 1: Prefer Option #2. Interesting design. Centralized terminal. Build off the center concourse, allow extra space for angled push backs.
Response 2: 2 shorter walk for most passengers to get to their gates.
Response 3: For what little I know about this, #2 looks efficient, but #1 may help with safety of separation of aircraft.
Response 4: Alt 3.

Question 4: Looking into the future, what would you like to see accomplished at Gateway Airport over the next 10-20 years?

Response 1: Continued orderly growth. Increase airfield efficiency thru additional runway exits and parallel taxiways. Add cargo. Build airlines and destinations.
Response 2: 1. air cargo hub, 2. gateway to Mexico/Central America 3. commuter flights to SoCal.
Response 3: Class C transition. Terminal on East side with 2-3 anchor airlines.
Response 4: Modern terminals with a larger secondary hub-hub service system (i.e. IWA - SJC, and others like it).

Question 5: How do you typically follow news and events related to Gateway Airport?

Response 1: Social media.
Response 2: News outlets/other.
Response 3: Gateway Airport website.
Response 4: Social media.



ANSWER CHOICES	RESPONSES	
Social media	50.00%	2
Gateway Airport website	25.00%	1
News outlets/other	25.00%	1
None of the above/ I do not currently follow	0.00%	0
TOTAL		4

Question 6: What would you like the Airport Master Plan team to know that we have not asked/discussed?

Response 1: What would be the timeline for the east side & SkyBridge? What about plans for remainder of east side and roadway connections?
Response 2: Maximize opportunities for industrial development surrounding airport to make it a hub for air cargo and distribution more generally.
Response 3: N/A.
Response 4: Has an option looked at putting Sky Bridge on the east end where it will utilize that runway and expanding terminal area where proposed sky bridge is now?

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