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.

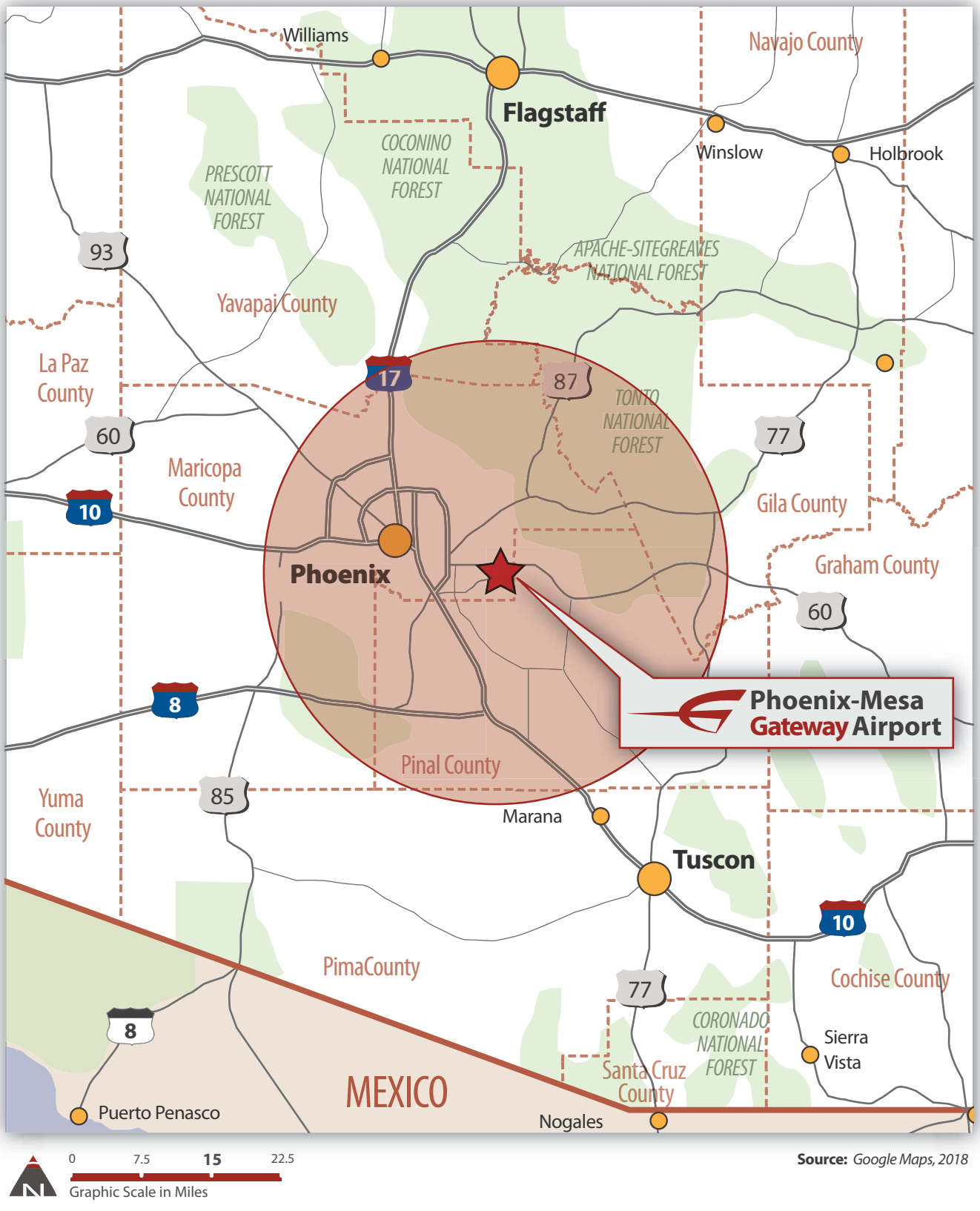
Like the TAF, this chapter presents unconstrained forecasts of aviation activity driven by growth in market demand factors, assuming the Phoenix-Mesa Gateway Airport Authority (PMGAA) will continue efforts to:

- ✓ 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.



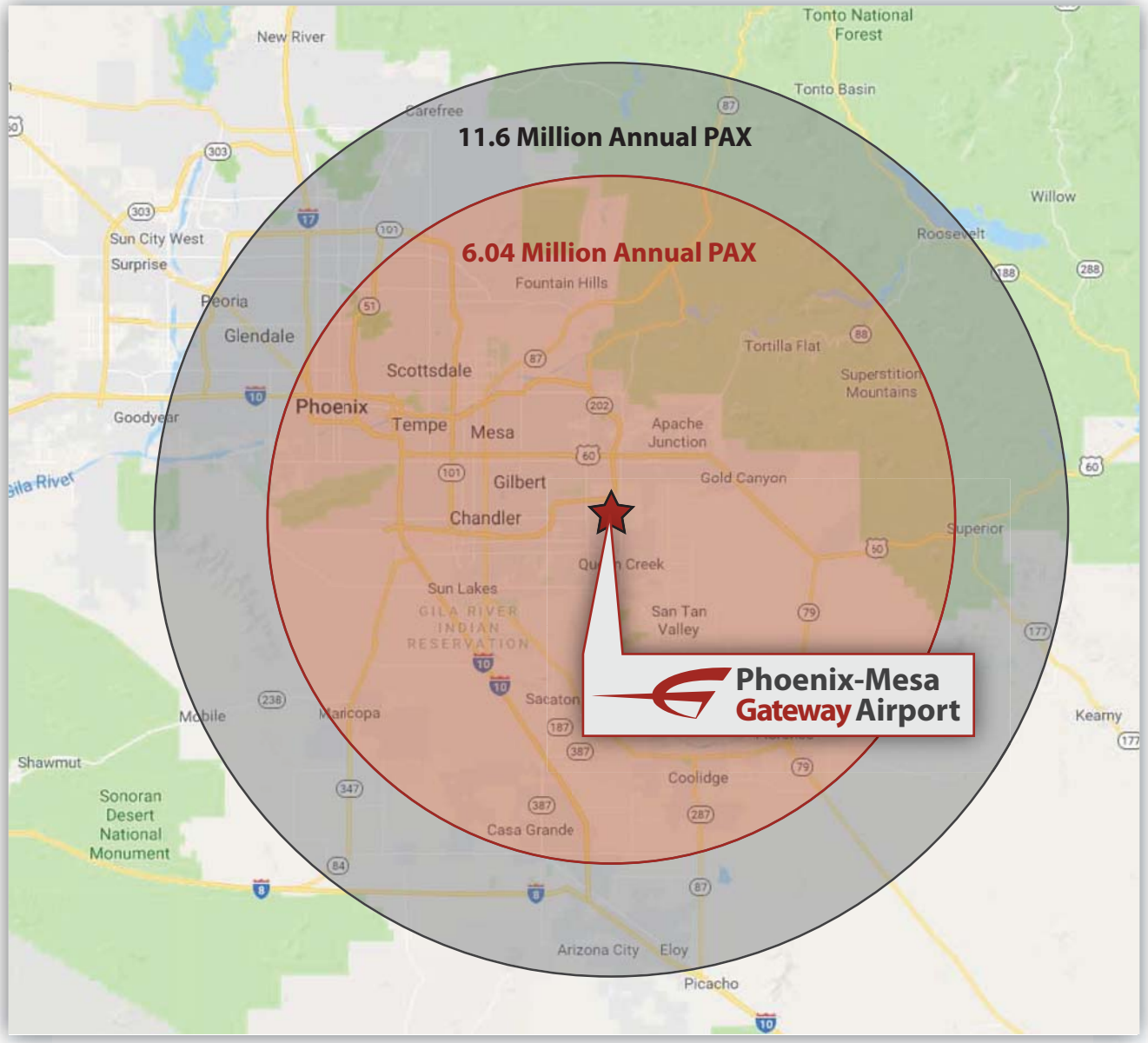
Source: *Google Maps, 2018*

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).

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.

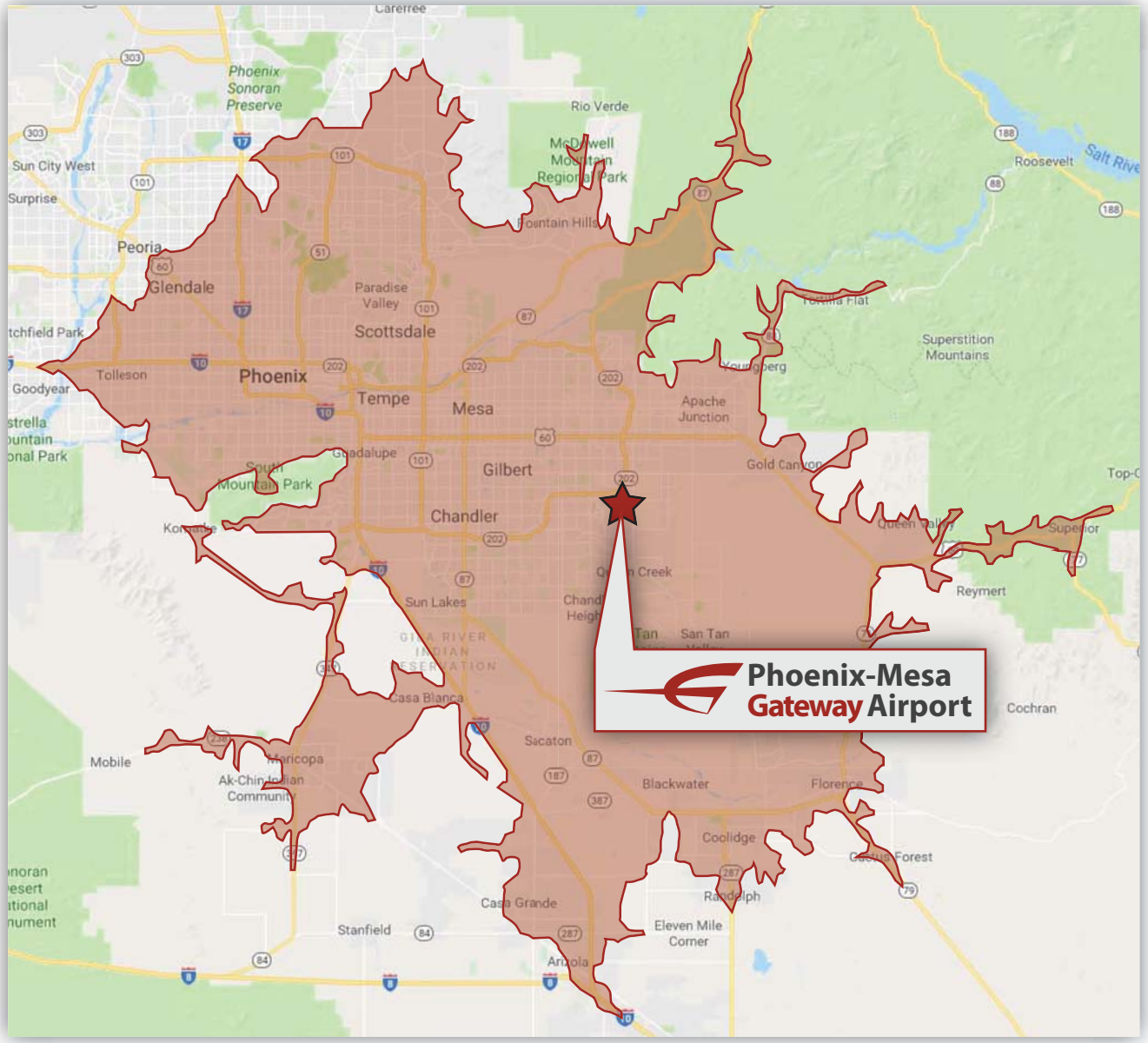


30-Mile Radius
50-Mile Radius

0 9 18 27
Graphic Scale in Miles

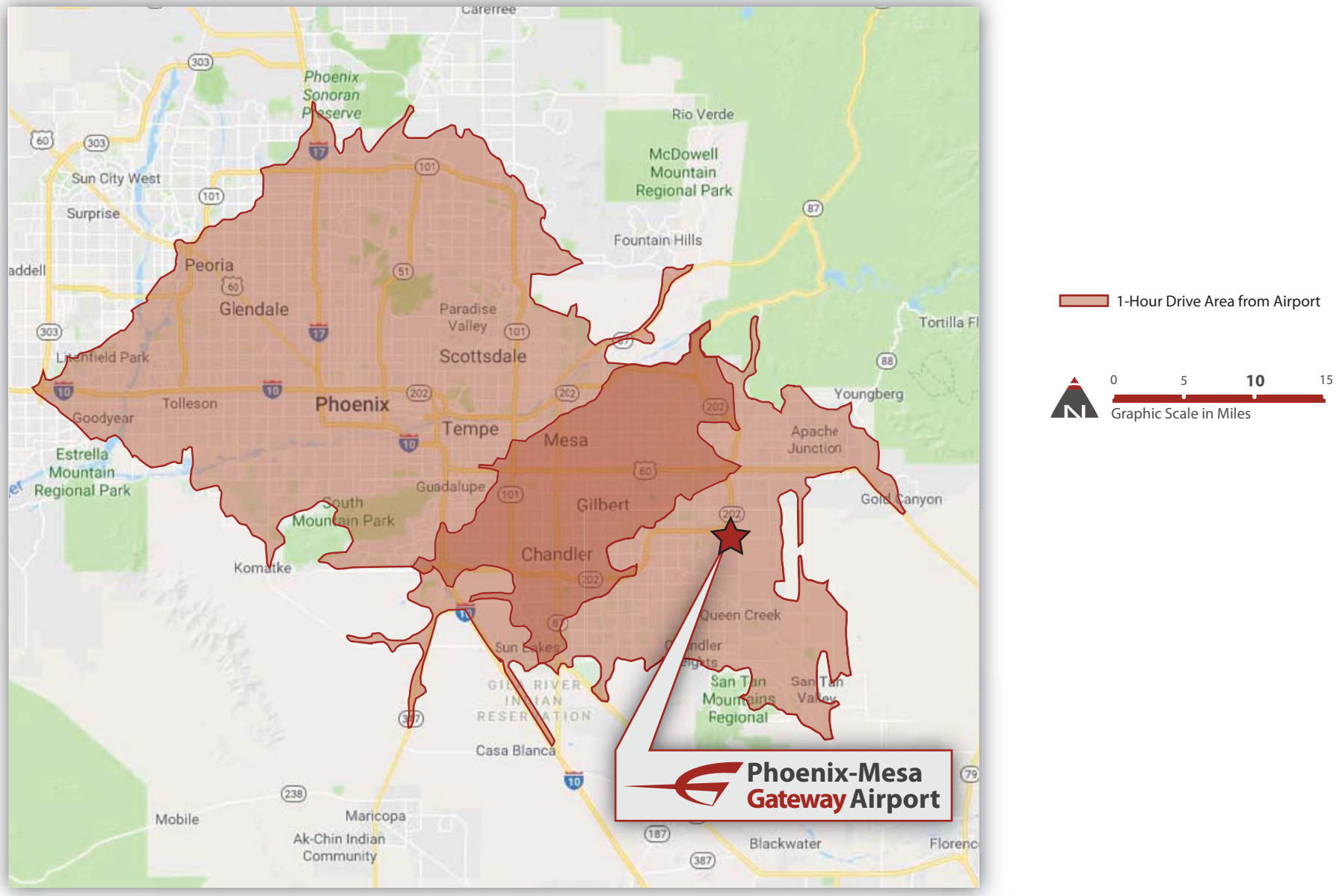
Source: *Google Maps, 2018*

Figure 2-2: **Catchment Area**



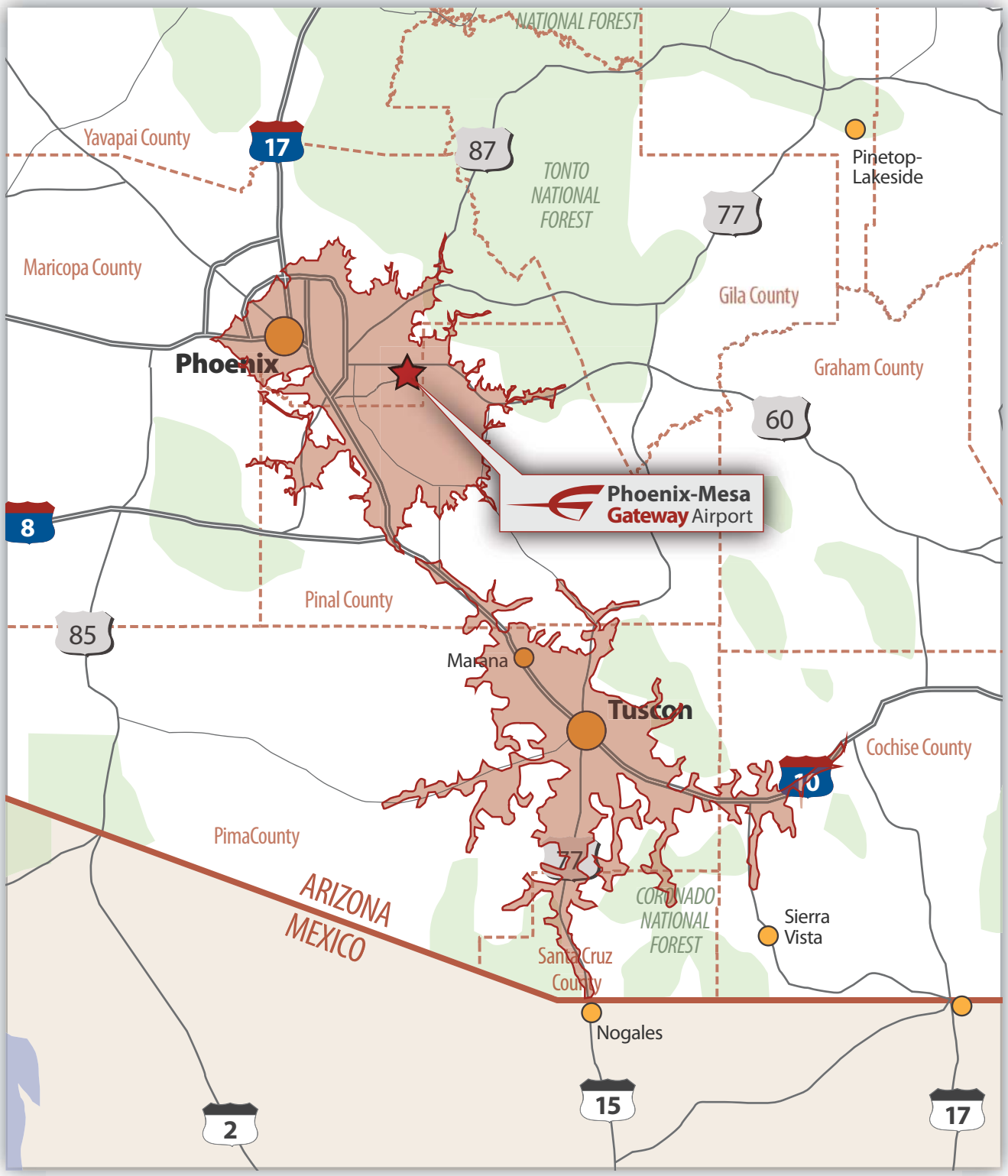
Source: *Google Maps, 2018*

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**



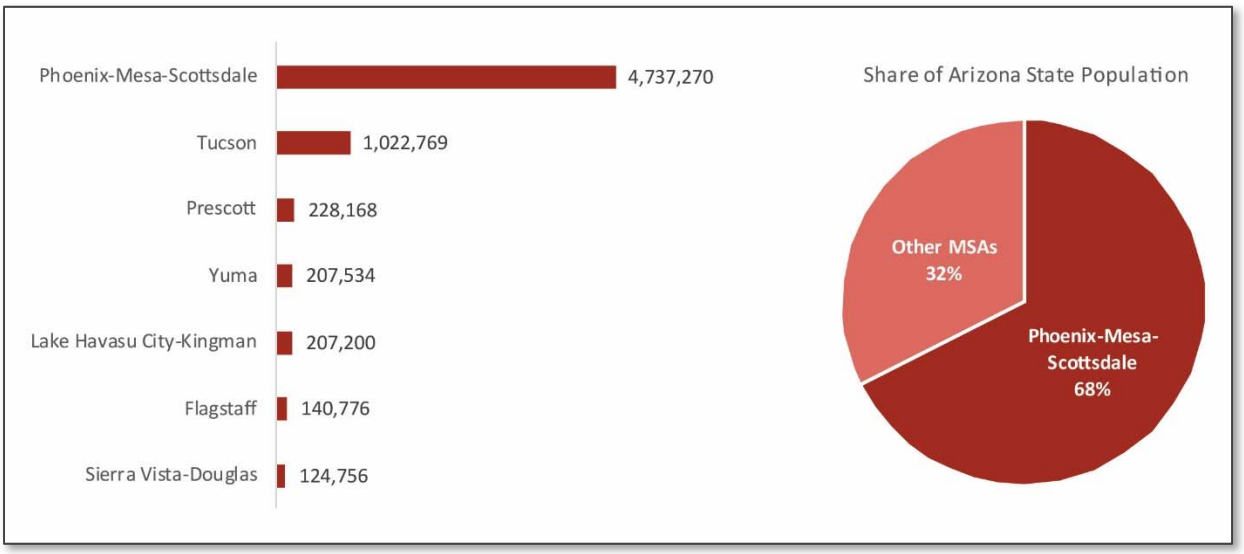
Source: *Google Maps, 2018*

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



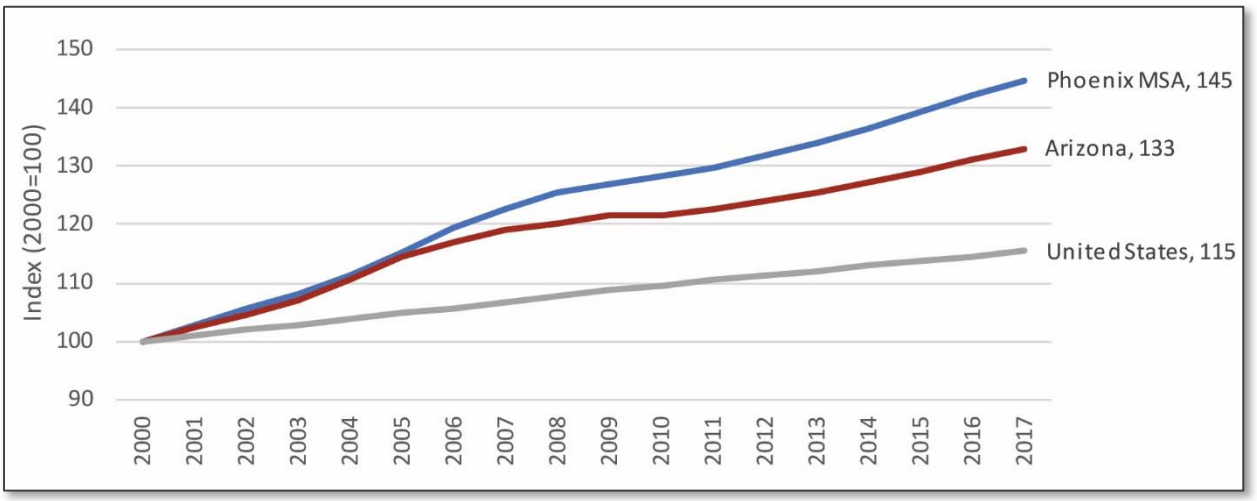
Source: U.S. Census Bureau.

The Phoenix MSA is one of the fast-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.

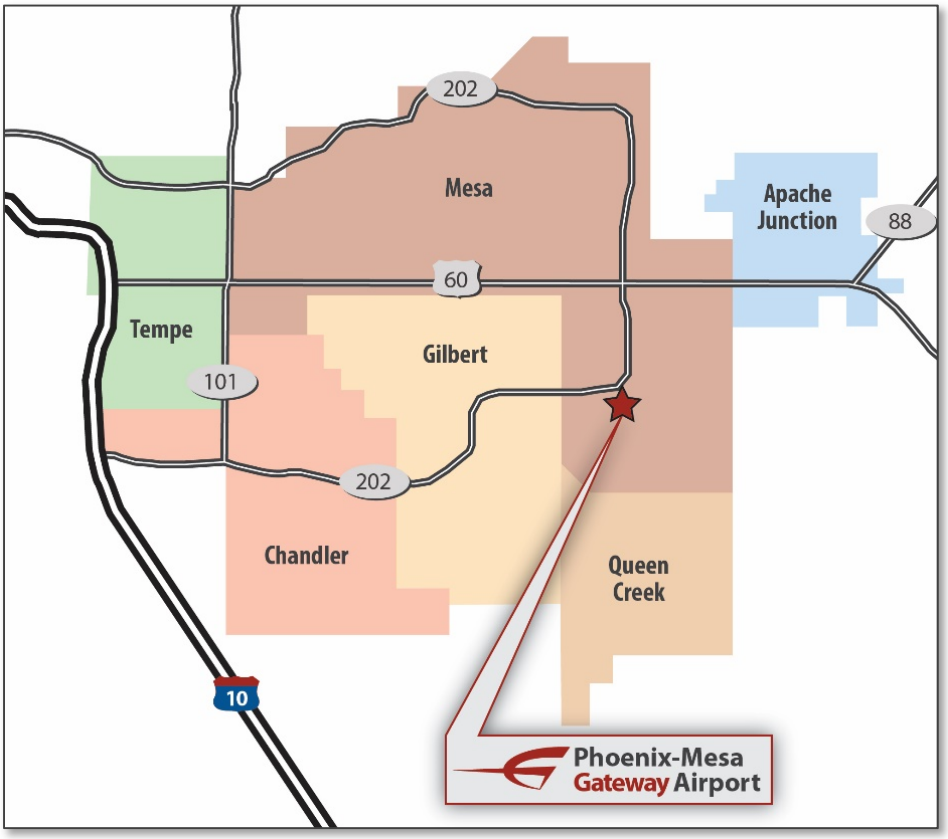
[3] The University of Arizona Economic and Business Research Center (EBRC) prepares a 30-year forecast, which expects the Phoenix MSA to add 2.6 million residents through 2047 at an average annual rate of 1.5 percent. Source: George W. Hammond, Ph.D., EBRC Director and Research Professor, "Growth on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

IWA is located in a rapidly growing area within the Phoenix MSA known as East Valley. East Valley is 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 is 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.

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.

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

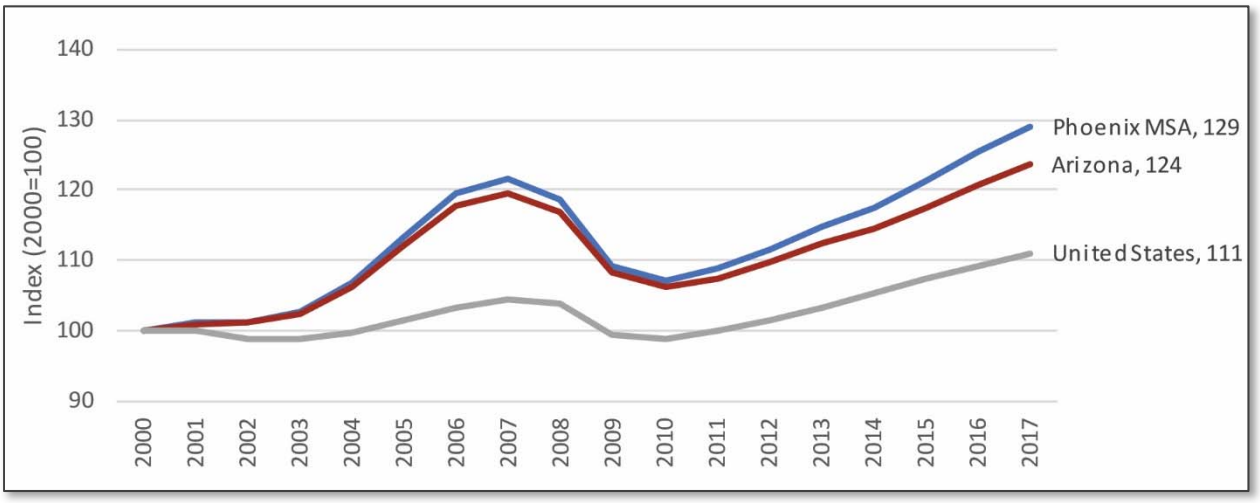
Labor Market

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 haul, 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

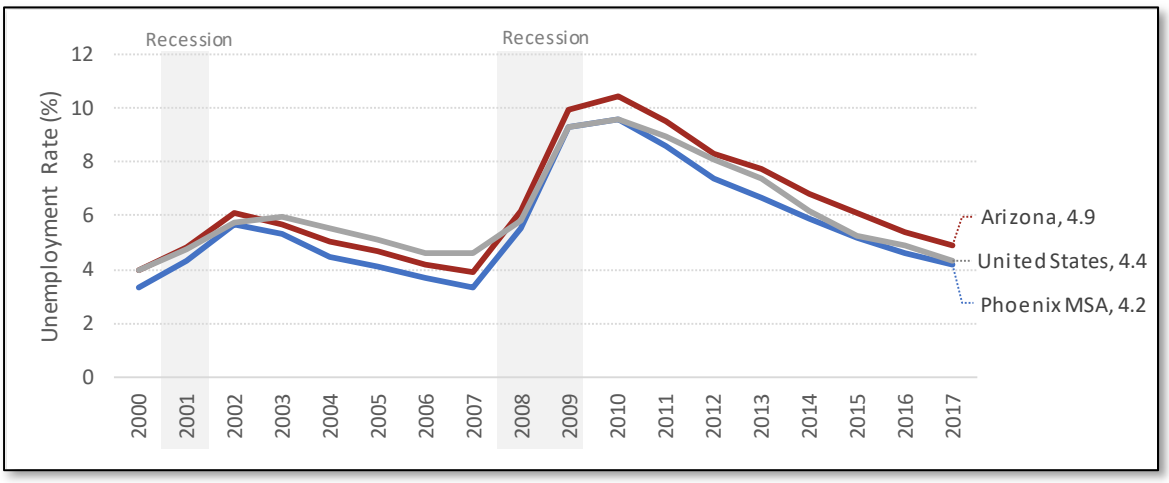


Average Annual Growth Rate			
Period	**Phoenix MSA**	**Arizona**	**United States**
2000-2010	0.7%	0.6%	-0.1%
2010-2007	2.7%	2.2%	1.7%
2000-2017	1.5%	1.3%	0.6%

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 of selected, leading organization 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.

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

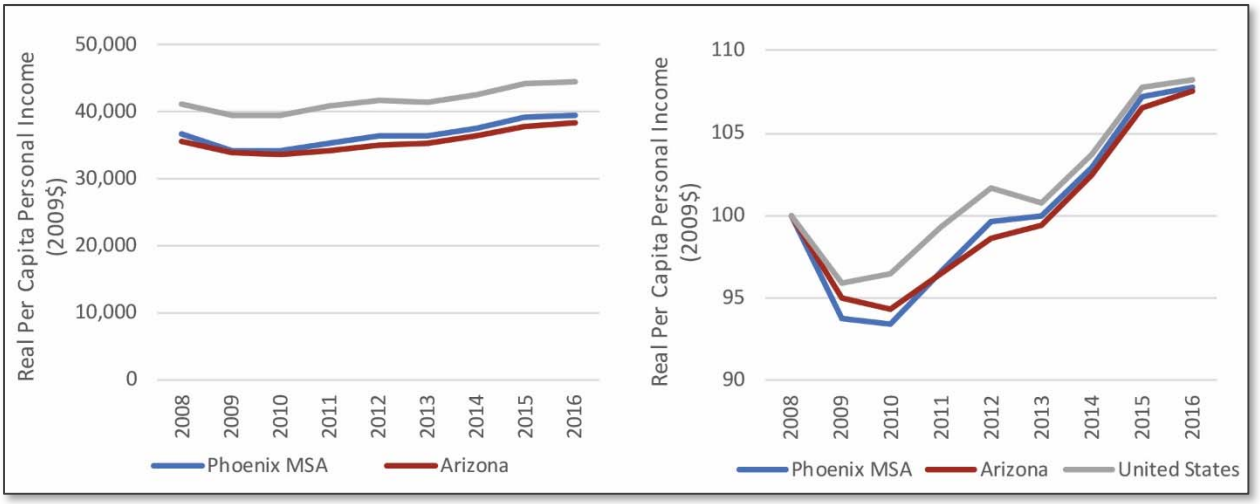
Source: East Valley Partnership, Phoenix East Valley Brochure.

[6] 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.

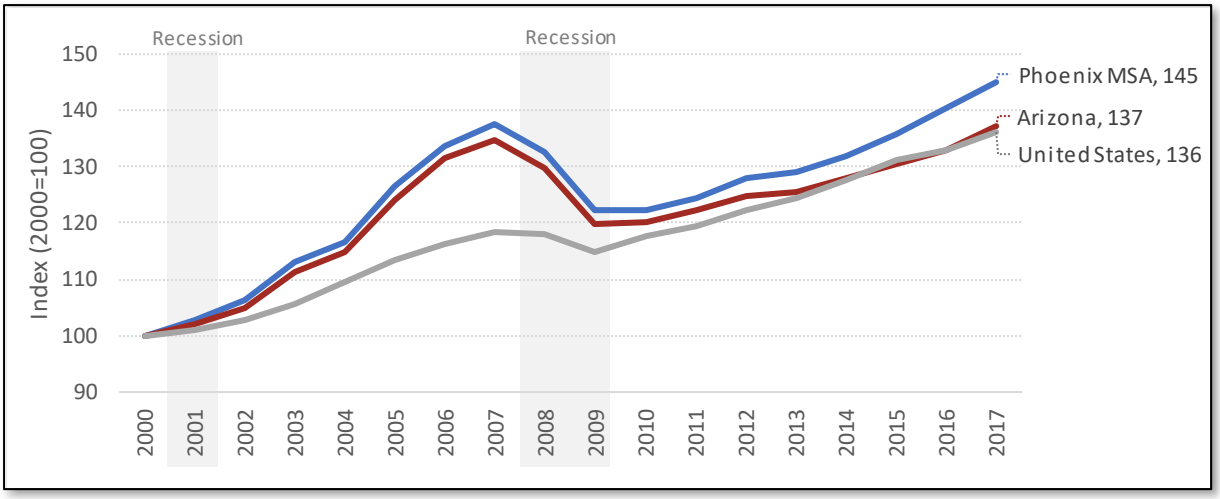
Economic Output

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



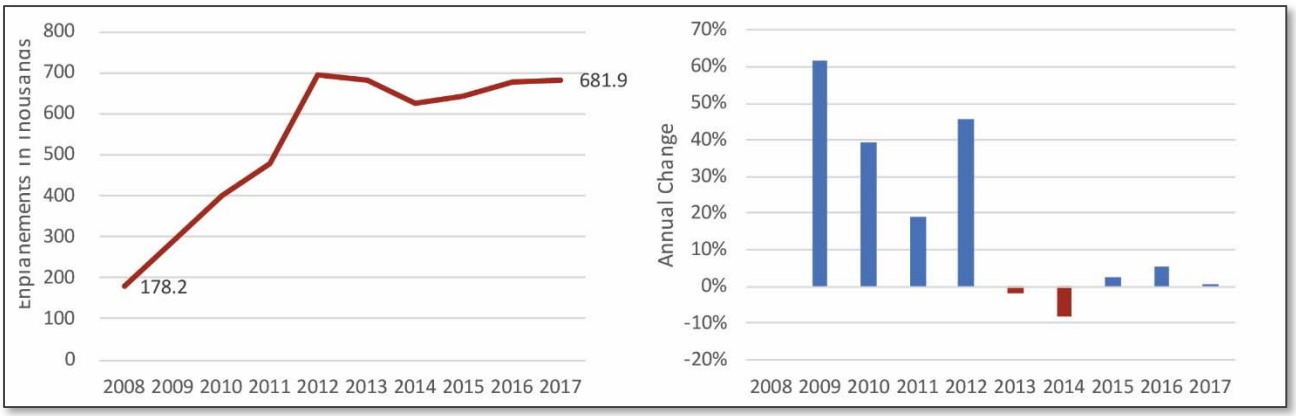
Average Annual Growth Rate			
Period	**Phoenix MSA**	**Arizona**	**United States**
2000-2010	2.0%	1.9%	1.6%
2010-2007	2.5%	1.9%	2.1%
2000-2017	2.2%	1.9%	1.8%

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: IWA 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.

Figure 2-14: IWA 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%

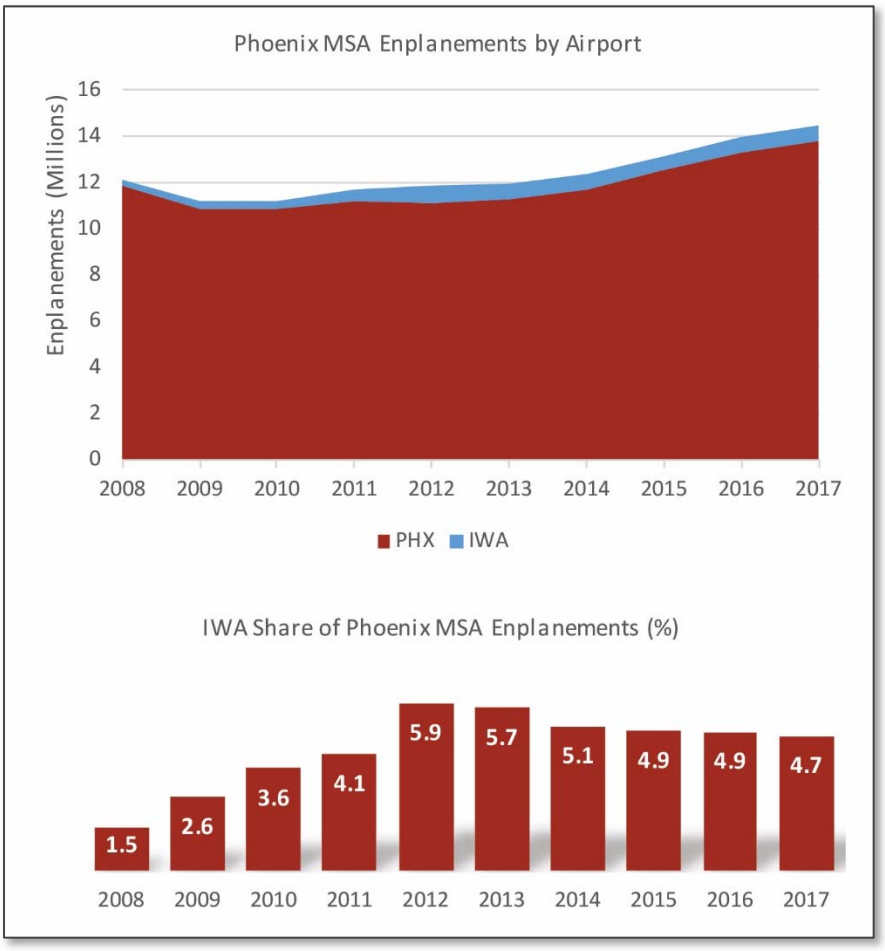
Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority.

[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).

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 IWA Share, 2008-2017***).

Figure 2-15: Phoenix MSA Total Enplanements and IWA Share, 2008-2017

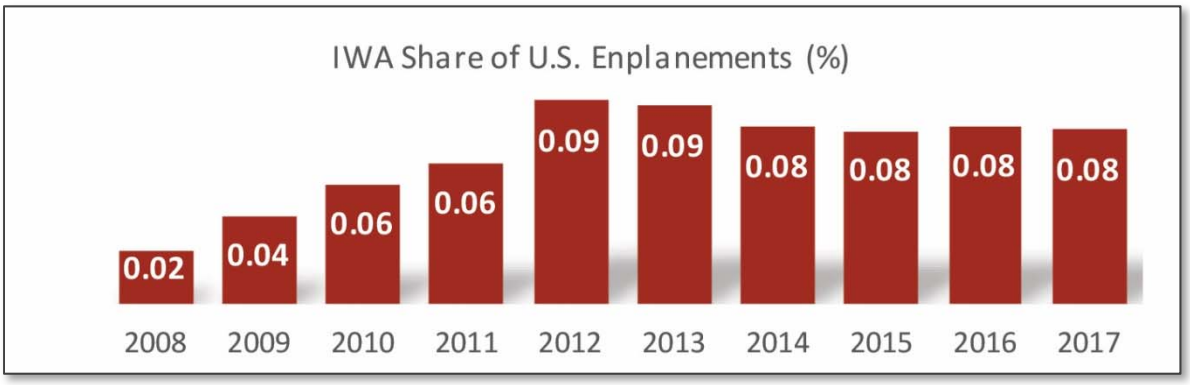


Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority and the U.S. Department of Transportation T100.

IWA 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: IWA 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: IWA Share of U.S. Enplanements, 2008-2017

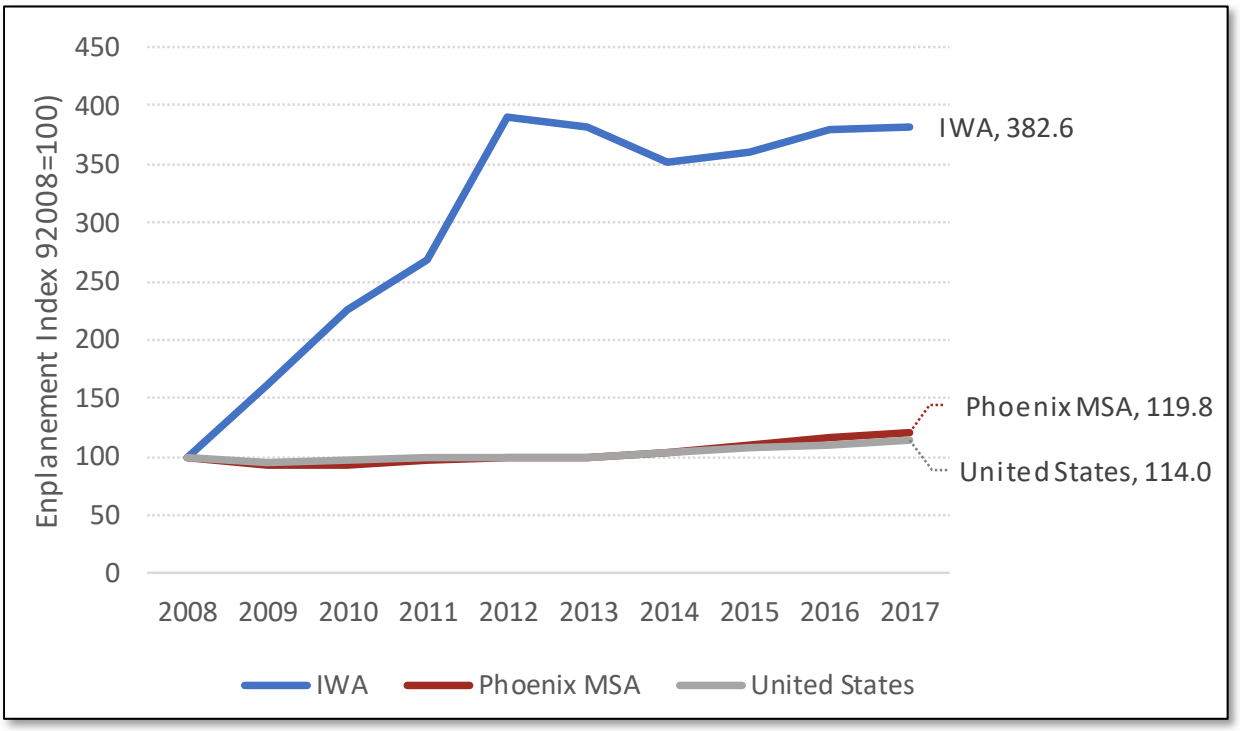


Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority and the U.S. Department of Transportation T100.

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 IWA, 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 haul. 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 IWA, 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 IWA

Allegiant and WestJet currently provide scheduled passenger service at IWA (***Figure 2-18: Air Carriers Serving IWA, 2008-2017*** and ***Figure 2-19: IWA 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.

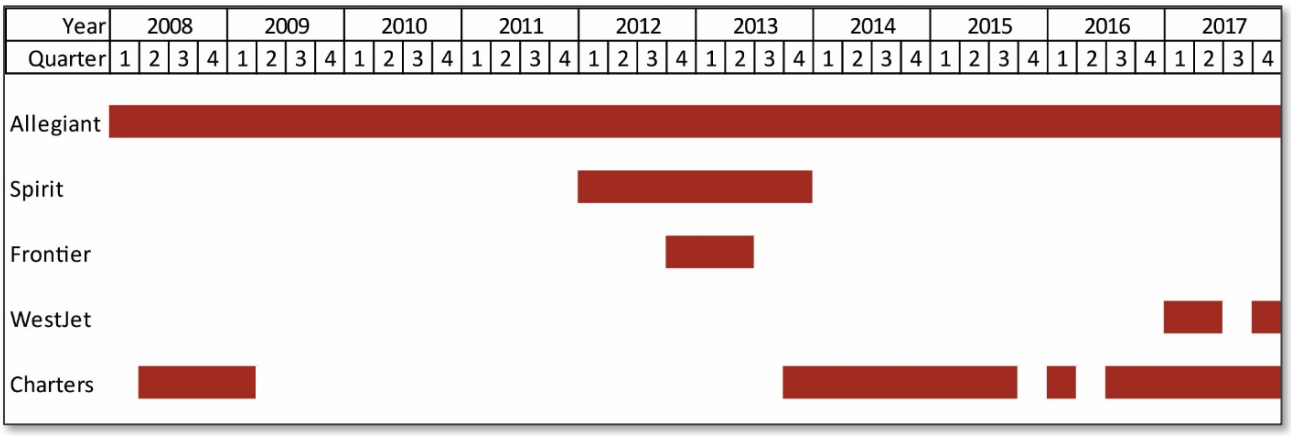
Other air carriers operated at IWA in the past. Spirit and Frontier provided scheduled service in 2012-2013. They were unable to continue service profitably because of intense competition and operational challenges. These airlines consolidated their Phoenix service at PHX.[9] A few other airlines provided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

[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.

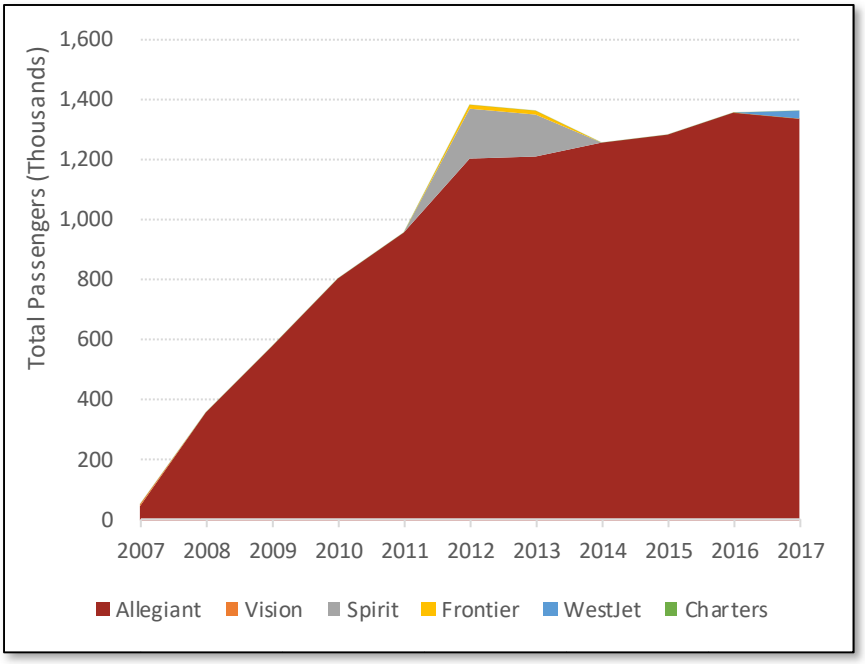
Figure 2-18: Air Carriers Serving IWA, 2008-2017



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

Figure 2-19: IWA Total Passengers by Air Carrier, 2008-2017

Enplaned and Deplaned Passengers (1,000s)					
	Scheduled				Allegiant's
CY	Allegiant	Other	Charters	Total	Share
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%



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

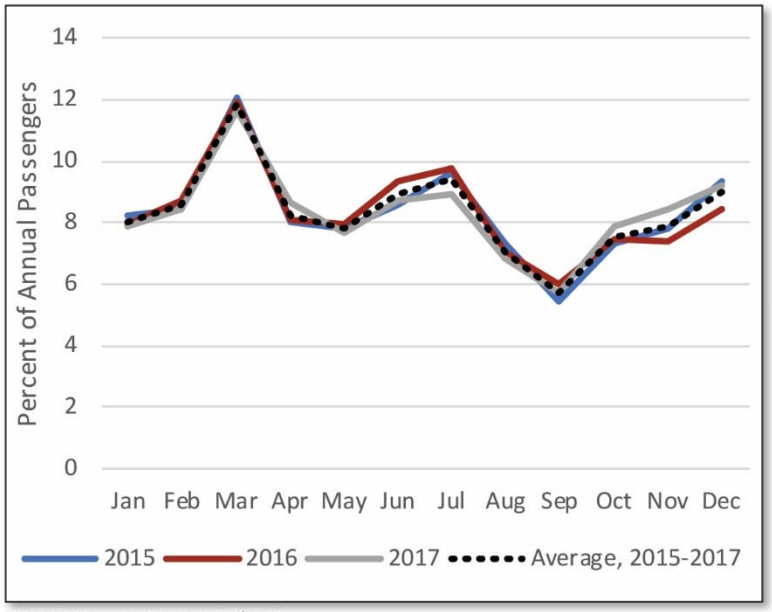
WestJet continues to have flights from PHX. A few other low-cost carriers, other than Southwest, serve the Phoenix MSA from PHX. They are U.S. carriers jetBlue, Spirit, Frontier, Sun Country, Boutique Air, and Mexican carrier Volaris. These airlines present opportunities for expanding service at IWA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



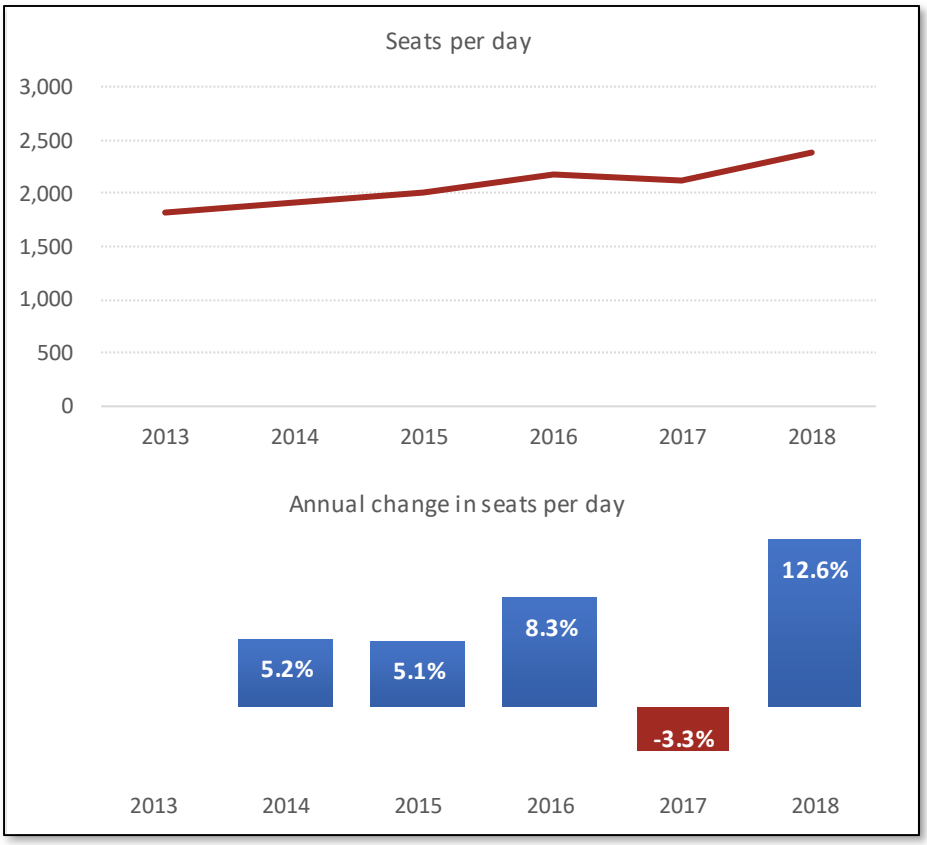
Source: Unison Consulting, Inc., using data from the Phoenix-Mesa Gateway Airport Authority.

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

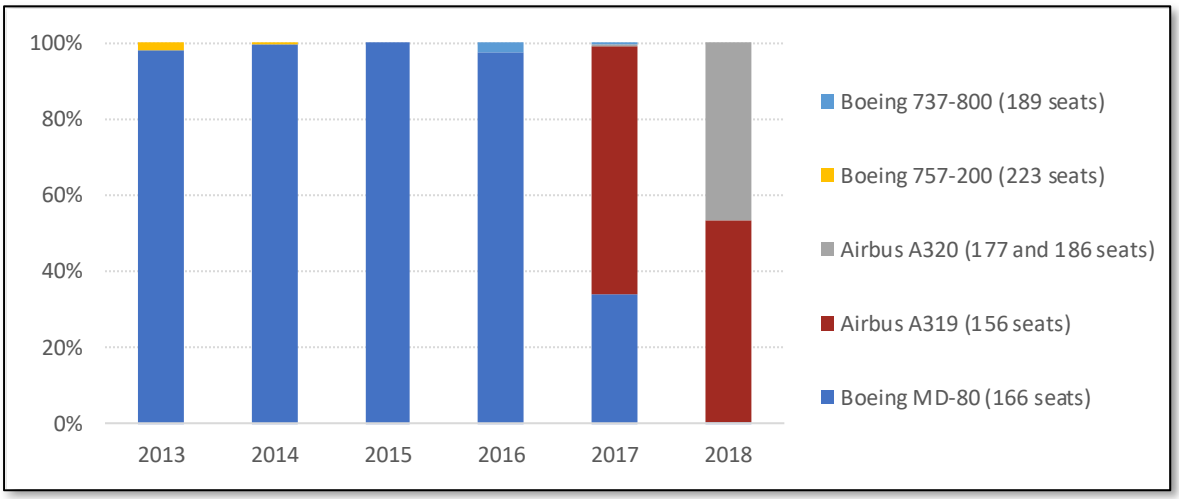
	2013	2014	2015	2016	2017	2018
Airport destinations	37	38	38	38	47	44
Flights per day	11	12	12	13	13	14
Seats per day	1,826	1,921	2,018	2,185	2,114	2,381



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 IWA, 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 IWA, 2013-2018



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

WestJet Service at IWA

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

New Service by Flair Airlines and California Pacific Airlines

In August 2018, Flair Airlines, Canada's only independent low fare airline, announced that it will introduce non-stop flights from Edmonton (4 times a week) and Winnipeg (twice a week) to IWA from December 16, 2018 through April 30, 2019. Flair will use its Boeing 737-400 and 737-800 series aircraft for these flights.

California Pacific Airlines also announced year-round service to Carlsbad, California. Beginning mid-November 2018, the new service will include six weekly flights to Carlsbad using Embraer ERJ aircraft.

Nonstop Destinations from IWA

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 IWA for the 12-Month Period Ended September 2018***).

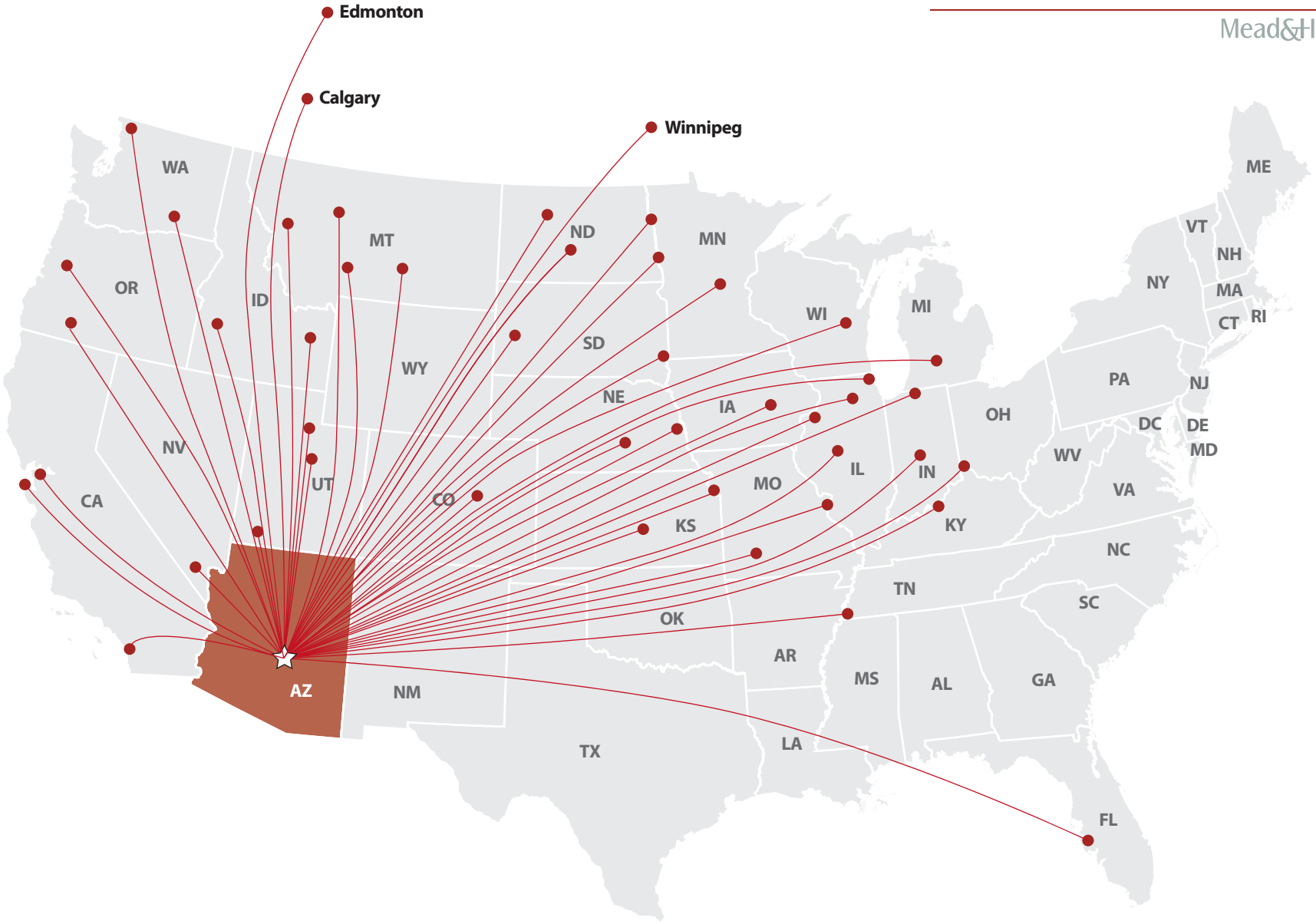
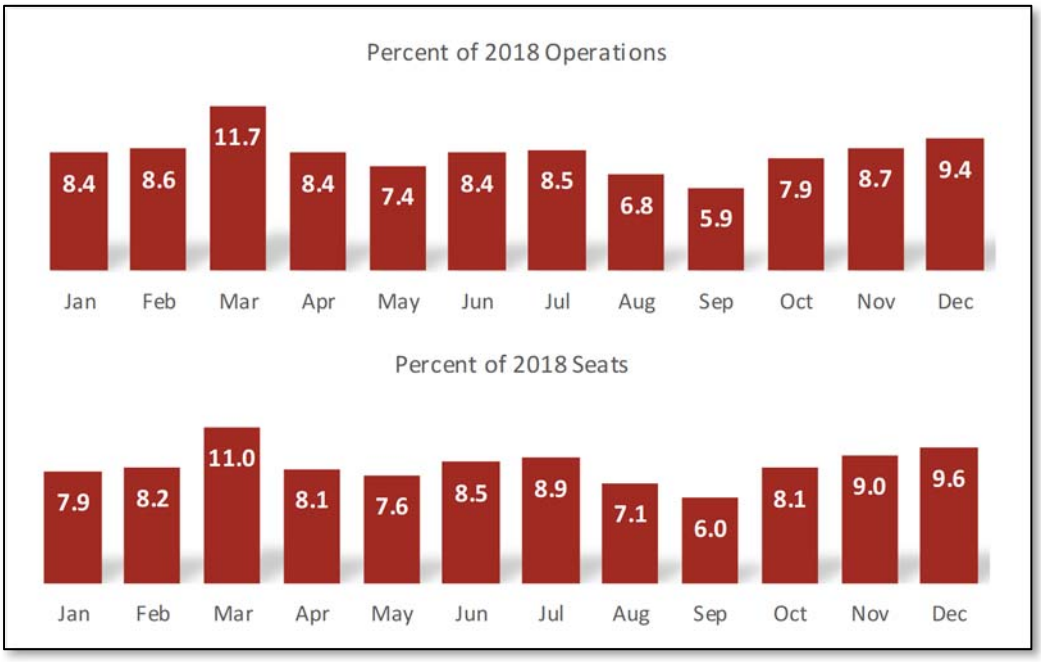


Figure 2-23: **Nonstop Destinations from IWA for the 12-Month Period Ended November 2018**

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

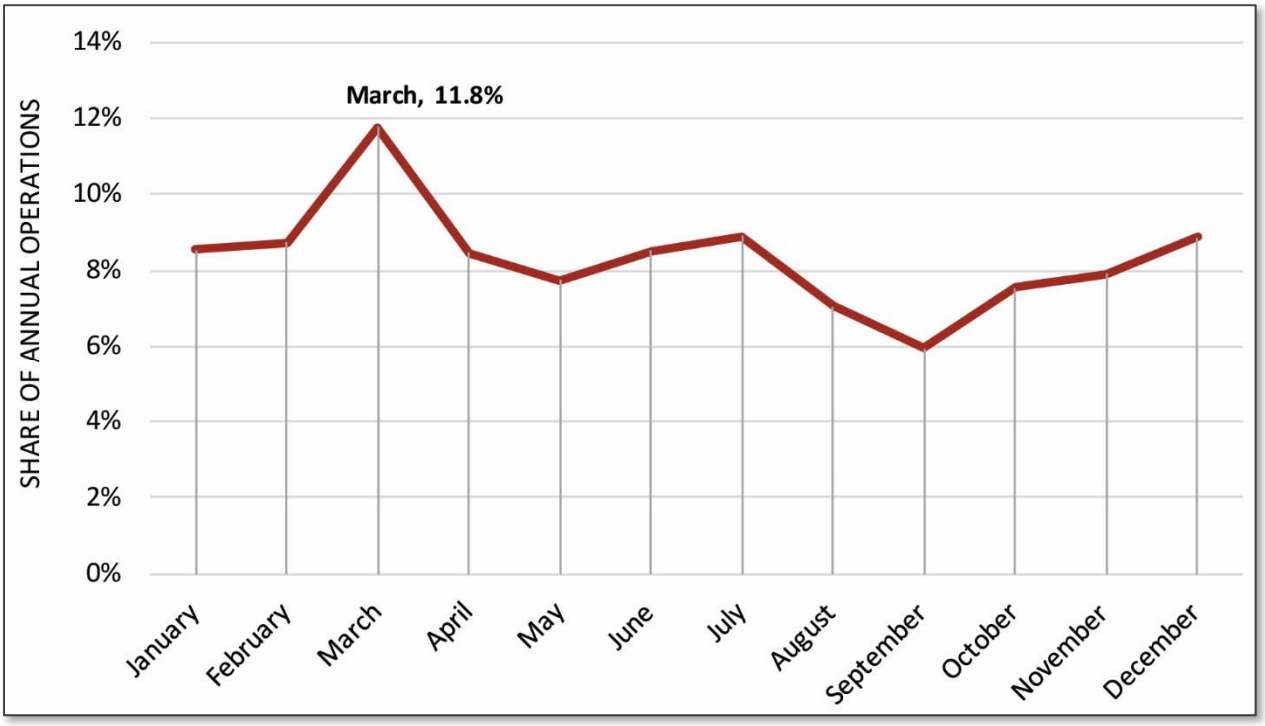


Source: OAG Analyzer.

Peak Month Average Day Distribution of Operations and Seats

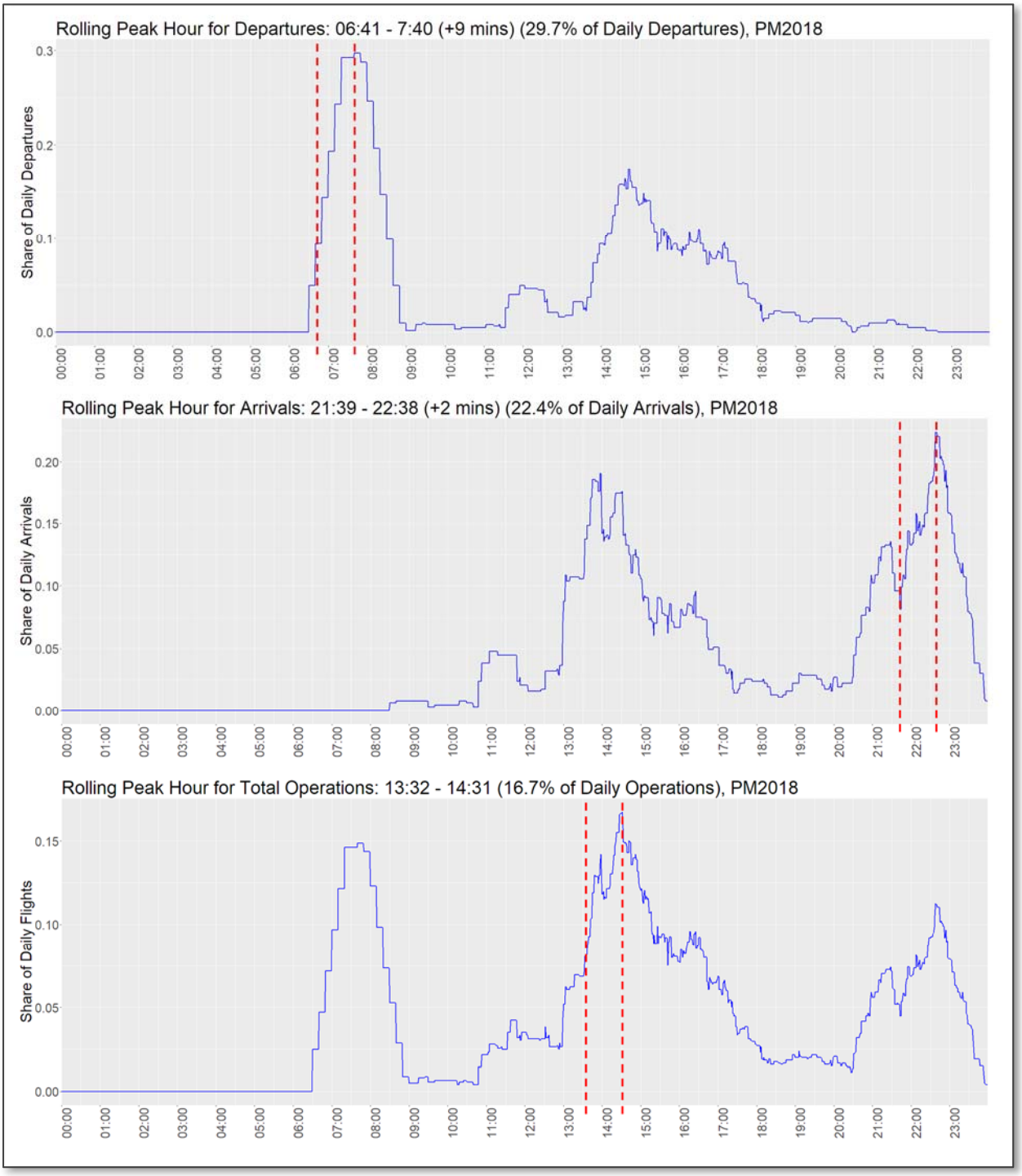
Figure 2-25: Monthly Distribution of Scheduled Commercial Passenger Aircraft Operations, 2013-2018 shows the monthly distribution of commercial passenger aircraft operations at IWA, based on airline flight schedules for 2013-2018. The peak month is March, with an average of 11.8 percent of annual operations 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.; 29.7 percent of daily departures take place during this hour. The rolling peak hour for aircraft arrivals is from 9:39 to 10:38 p.m.; 22.4 percent of daily arrivals take place during this hour. The peak hour for total aircraft operations (departures and arrivals) is from 1:32 to 2:31 p.m.; 16.7 percent of total daily operations take place during this hour.

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

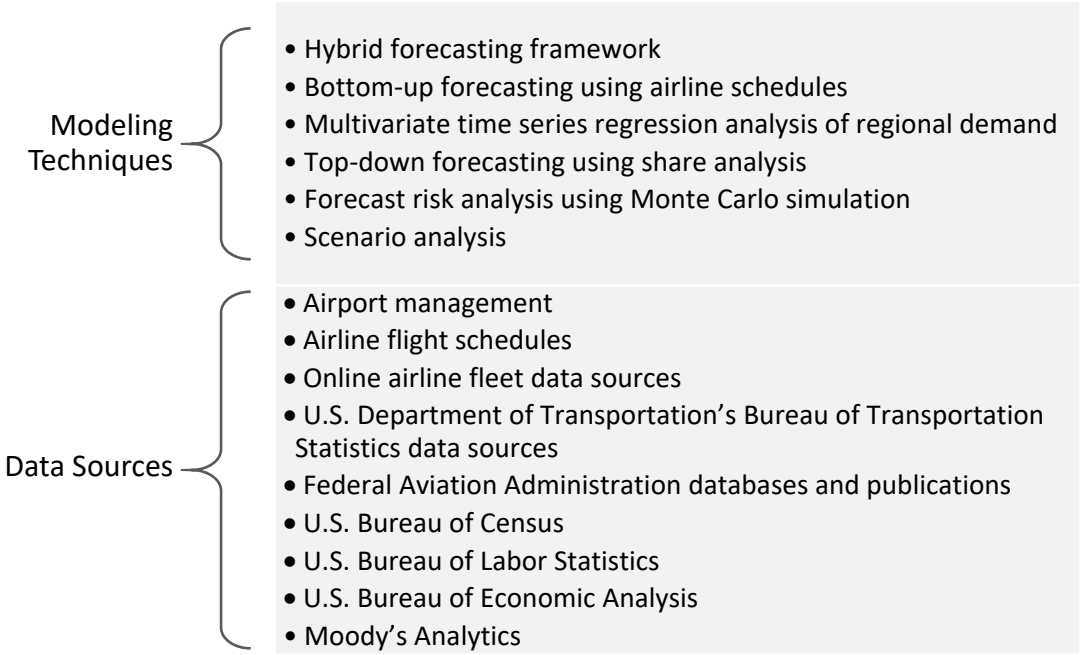


Sources: OAG Analyzer and Unison Consulting, Inc. The distributions are based on scheduled flights for March 2018.

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 & Data Source*****).**

Figure 2-27: Commercial Passenger Activity Forecast Techniques & 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 on trends in boarding load factors and changes in aircraft fleet mix.

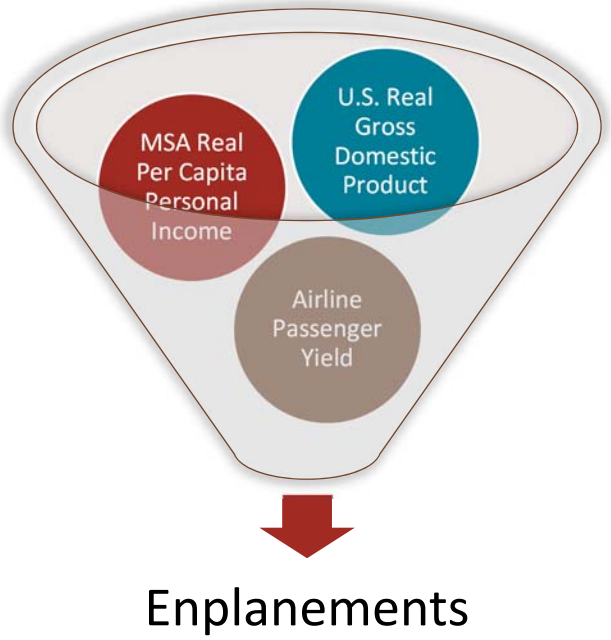
Since IWA is one of two commercial service airports within the air service area, the Consultant approached long-term forecast development for IWA from a regional demand perspective. The Consultant performed multivariate regression analysis of regional demand measured as total O&D enplanements at the 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 reduces 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.

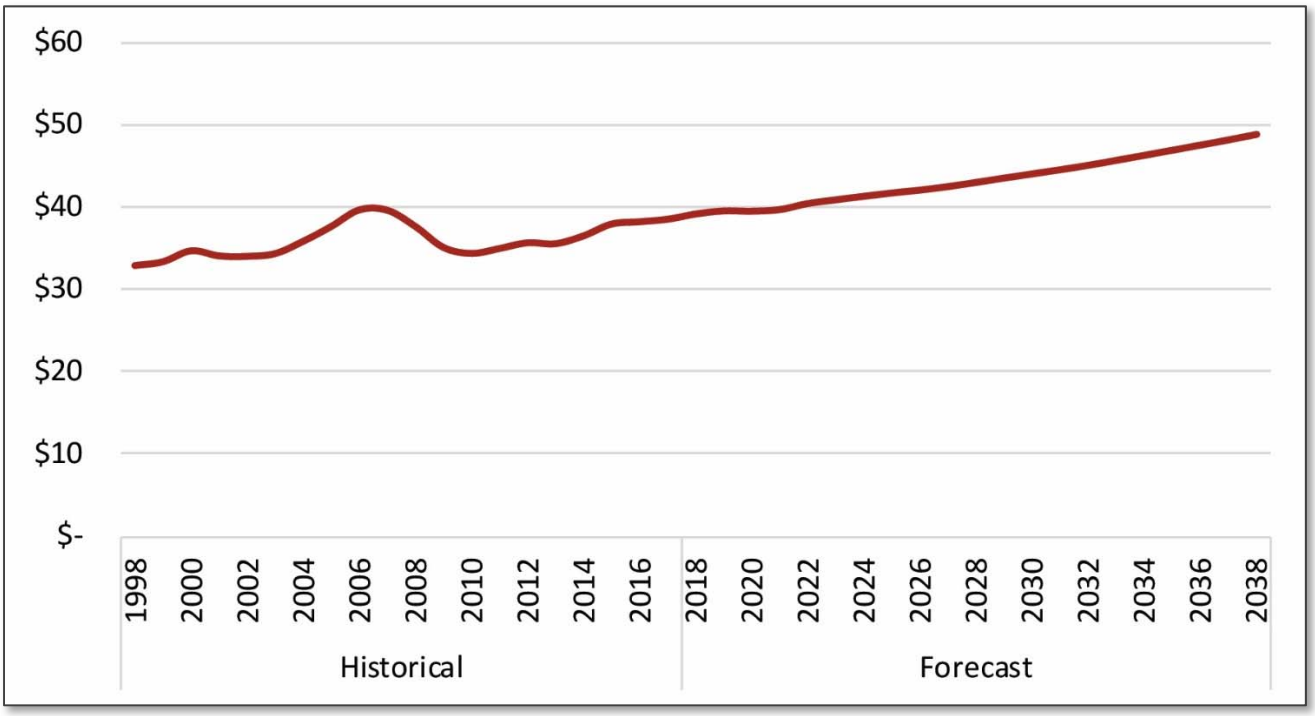
Figure 2-28: Key Drivers of Enplanement Growth



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***).

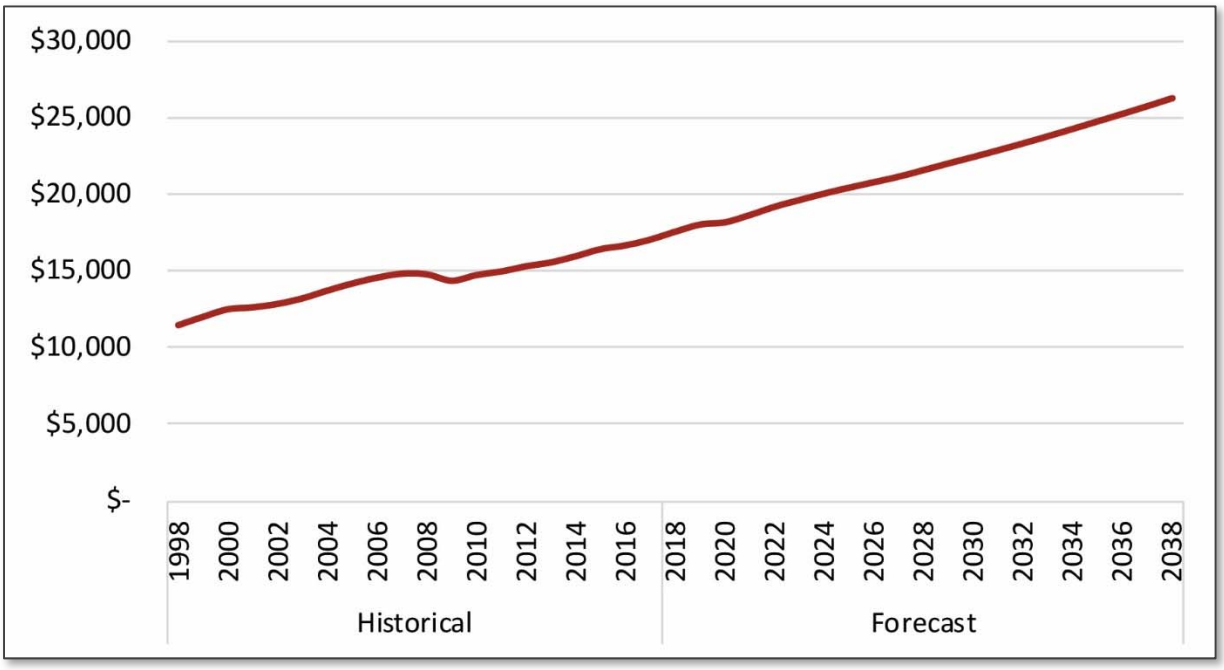
Figure 2-29: Phoenix, AZ, Metropolitan Area Real Per Capita Income (2009 Dollars, Thousands)



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 GDP (2009 Dollars, Billions)***).

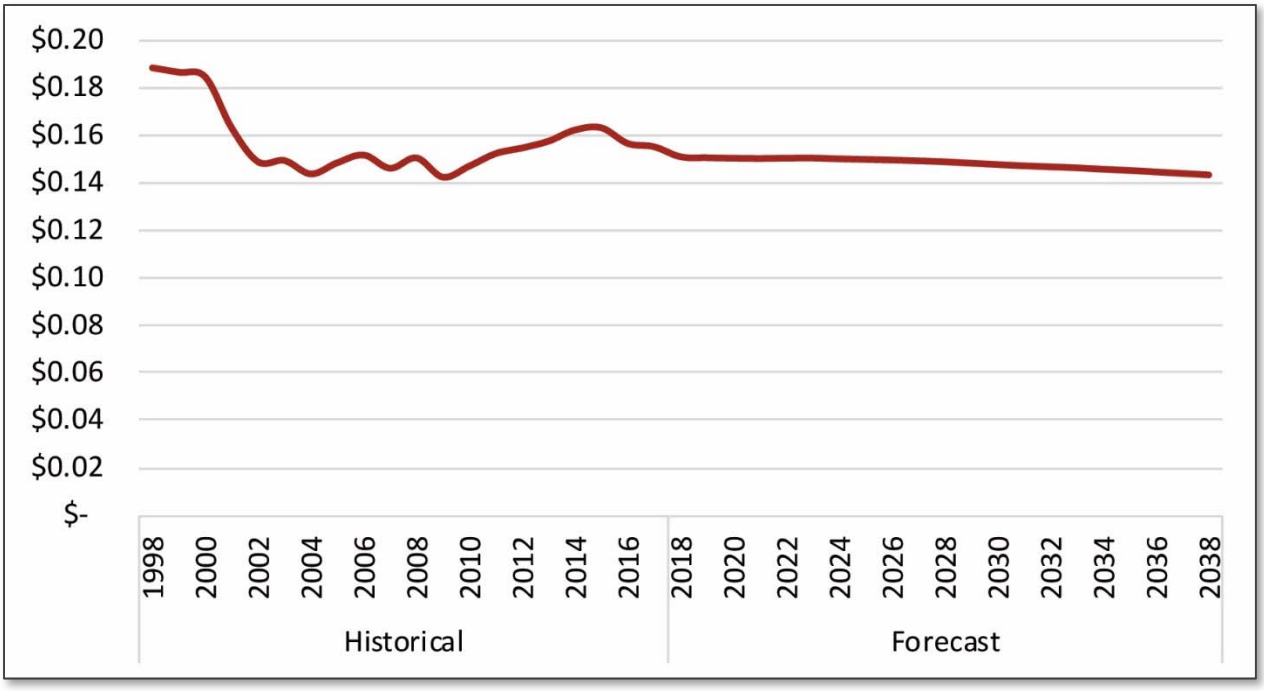
Figure 2-30: U.S. Real GDP (2009 Dollars, Billions)



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, IWA, 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, IWA, Metropolitan Area Average Airline Yield (2009 Dollars)

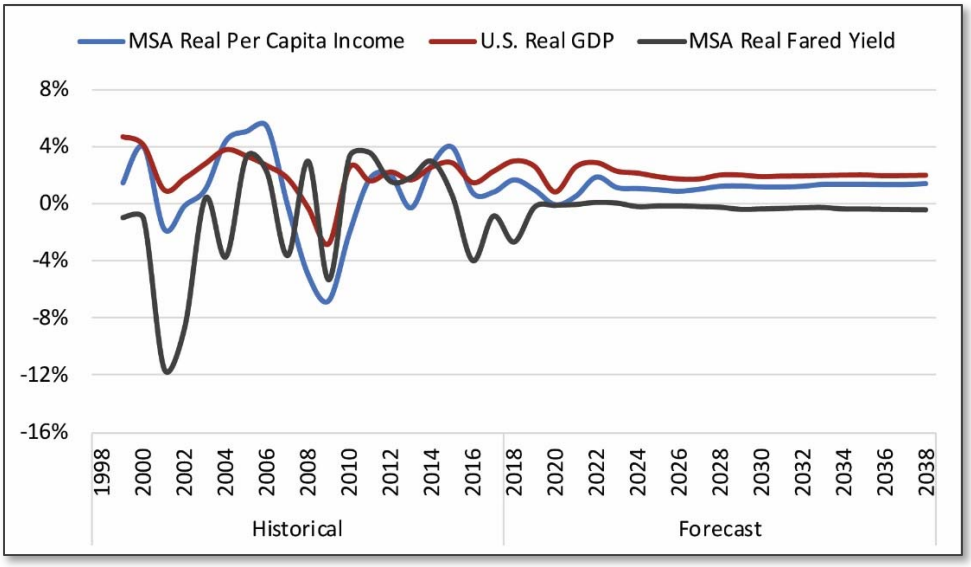


Sources: US DOT DB1B, Federal Aviation Administration, and Unison Consulting, Inc.

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

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.

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 growth 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.

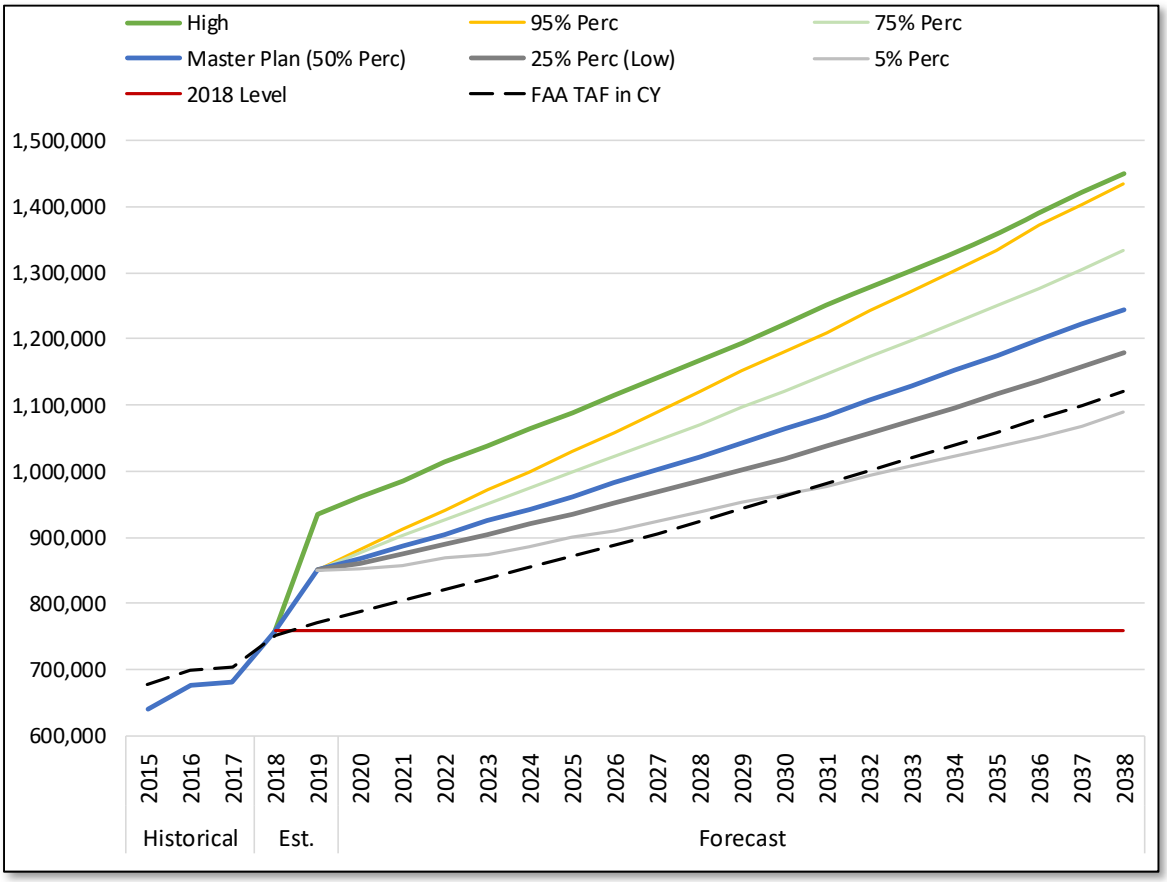
The following examples illustrate how the percentile results can be used to indicate forecast probability:

- ✓ 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.*** 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: IWA Historical and Forecast Total Enplanements



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

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, 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 HG 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: MSA and IWA Enplanements 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.

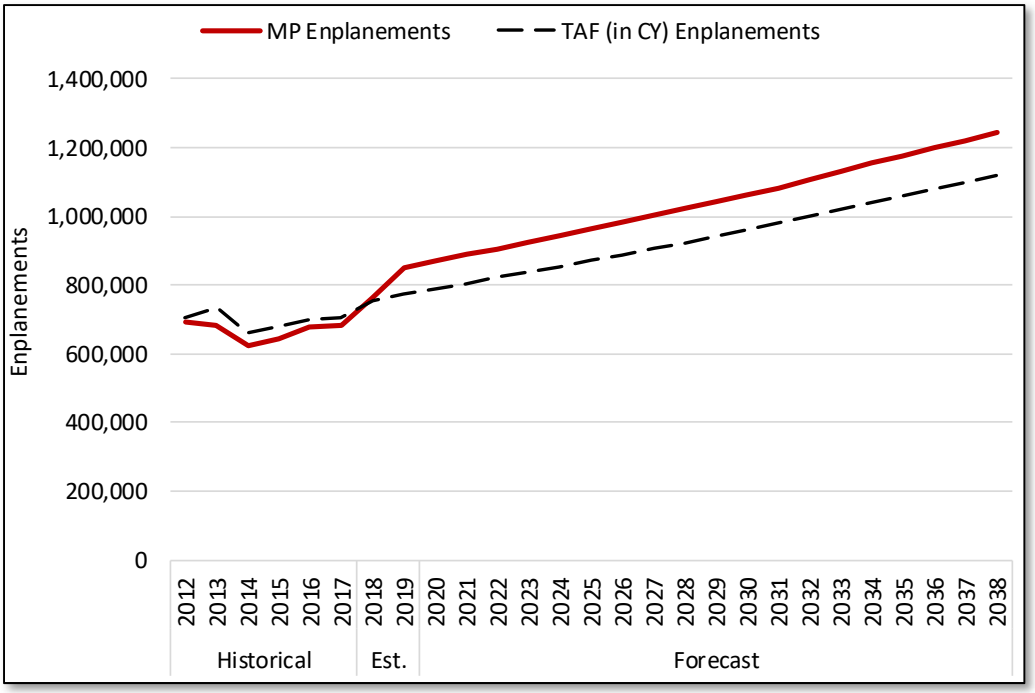
Table 2-1: MSA and IWA Enplanements (EPs) (In Thousands)

	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.

Figure 2-33: IWA 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 2-33: IWA Historical and Forecast Total Enplanements



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

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

Table 2-2: IWA 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.

Table 2-3: IWA 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						

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

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

Table 2-4: IWA Forecast Commercial Passenger Aircraft Landed Weight (1,000 Pounds)

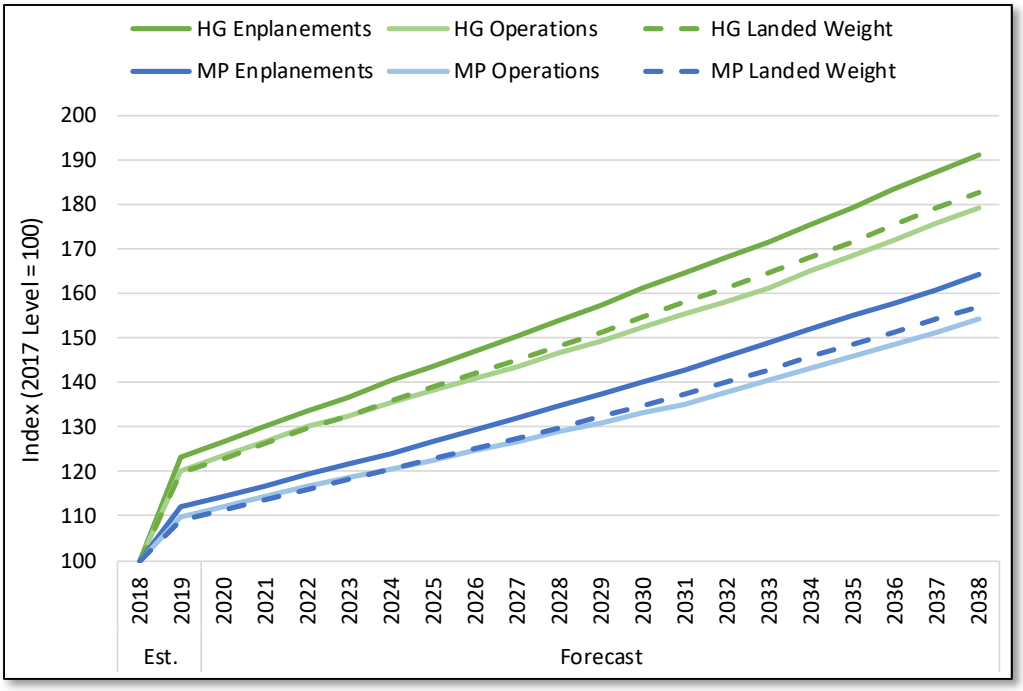
	Actual	Estimate		Forecast			Compound Annual Growth Rate					
Scenario	2017	2018	2019	2023	2028	2038	2017-2018	2018-2019	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan (MP)	698,565	747,698	815,094	883,539	971,348	1,173,779	7.0%	9.0%	3.4%	1.9%	1.9%	2.3%
High Growth (HG)	698,565	747,698	894,777	989,667	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%

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

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

Figure 2-34: 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 2-34: 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 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: IWA 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: IWA 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	

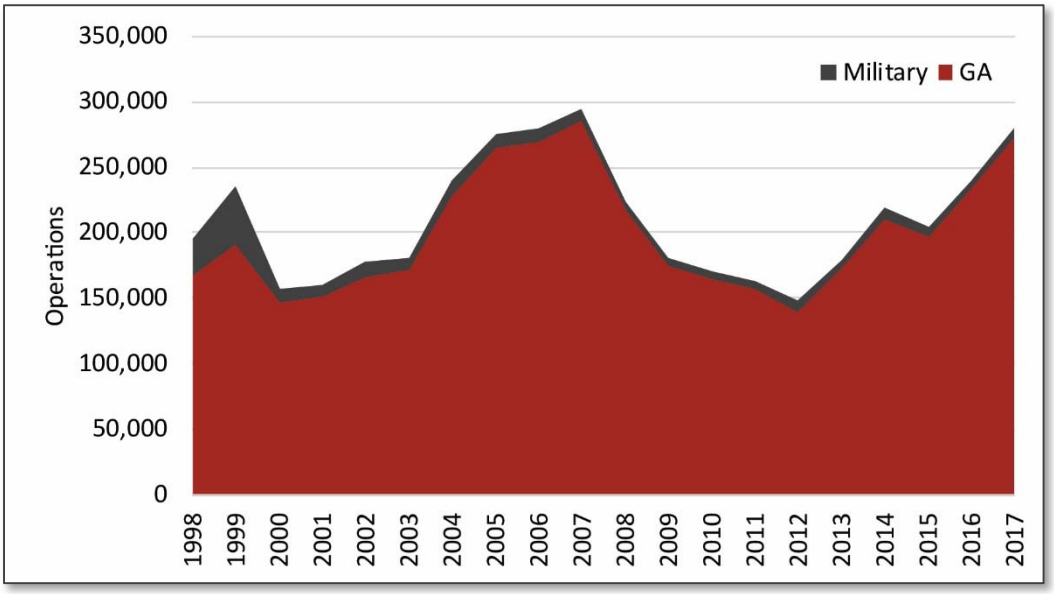
Source: Unison, IWA Airport Master Plan Activity Forecast - Landings by Equipment

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

Noncommercial Aviation Activity

Noncommercial aviation activity includes operations of GA and military aircraft. Air taxi activity are grouped with GA operations. ***Figure 2-35: Trends in Noncommercial Aviation Activity at IWA, 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 operations declined rapidly in 2000, more than offsetting their 66 percent growth in the previous year. They have remained on a slower downward trend since 2000, 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 2-35: Trends in Noncommercial Aviation Activity at IWA, 1998-2017

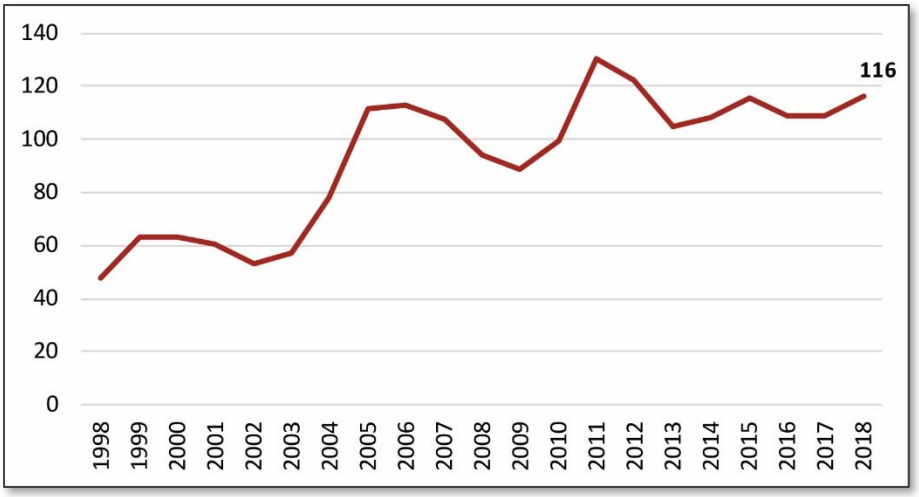


Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.

Figure 2-36: Trends in Based Aircraft at IWA, 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.

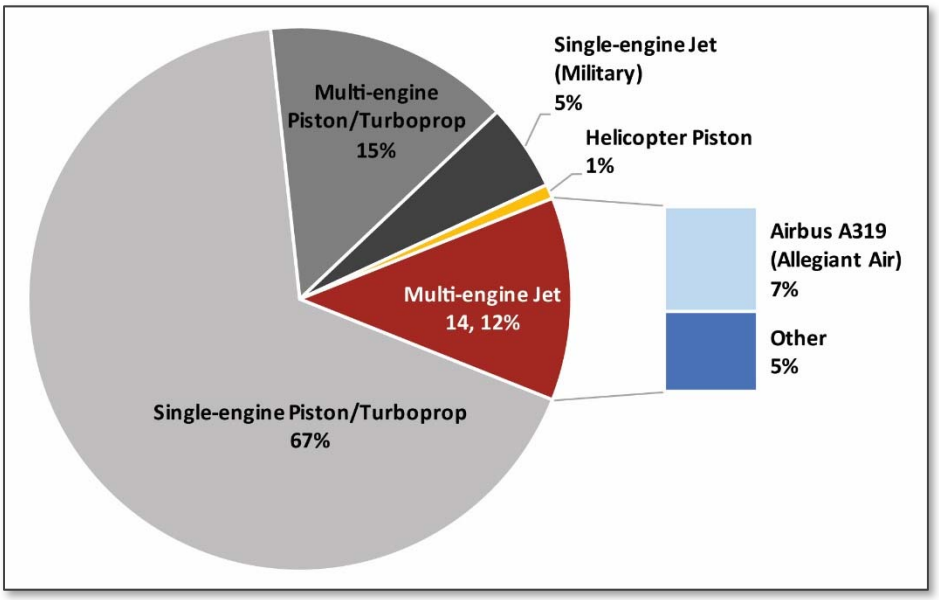
Figure 2-36: Trends in Based Aircraft at IWA, 1998-2018



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

Figure 2-37: IWA Based Aircraft Composition, 2018 shows the latest composition of IWA-based aircraft by aircraft type (as of Q1-2018). 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) and GA service needs at IWA. A Bell 47 helicopter is also currently based at the airport.

Figure 2-37: IWA Based Aircraft Composition, 2018



Sources: Airport Statistics and Unison Consulting, Inc.

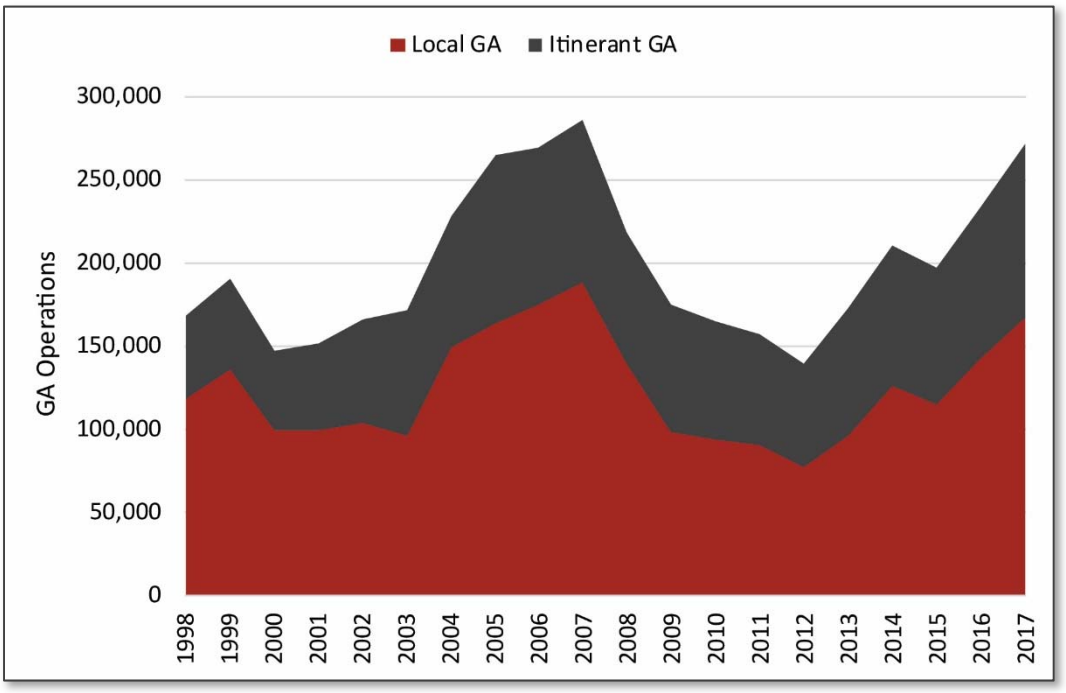
GA Activity – Airport Trends

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 the 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 2-38: IWA 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.

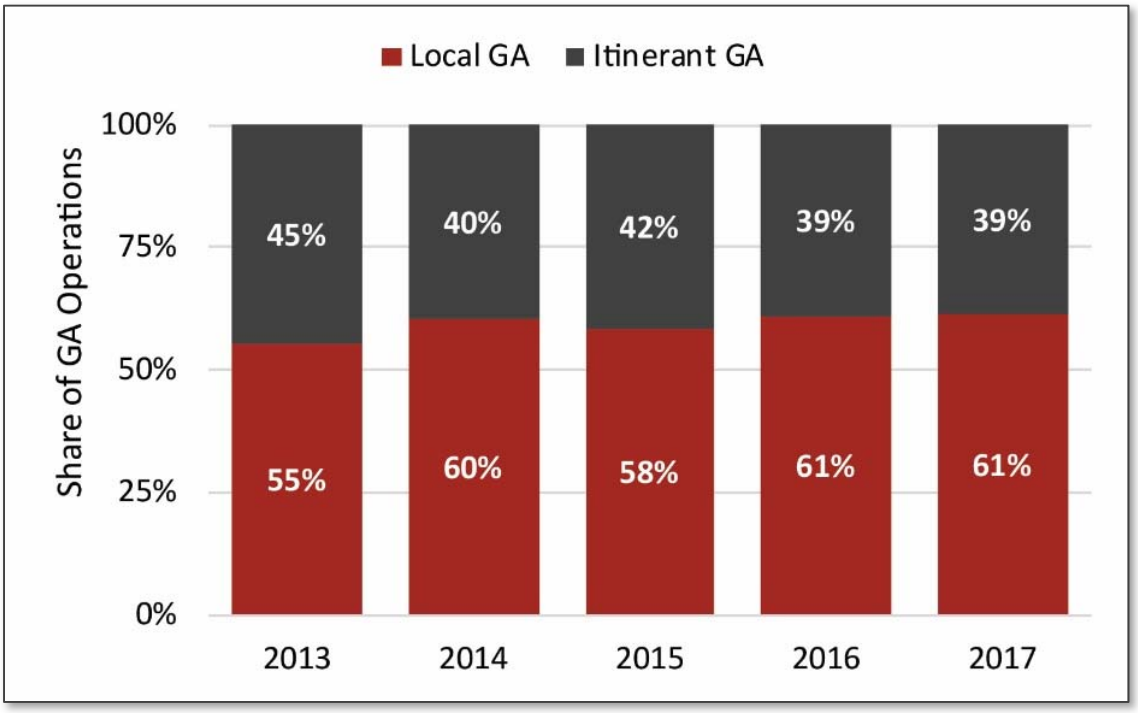
Figure 2-38: IWA Local and Itinerant GA Operations, 1998-2017



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

Figure 2-39: IWA 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 remain the same in 2017. The increase in local operations is attributable to the growth in flight school activity.

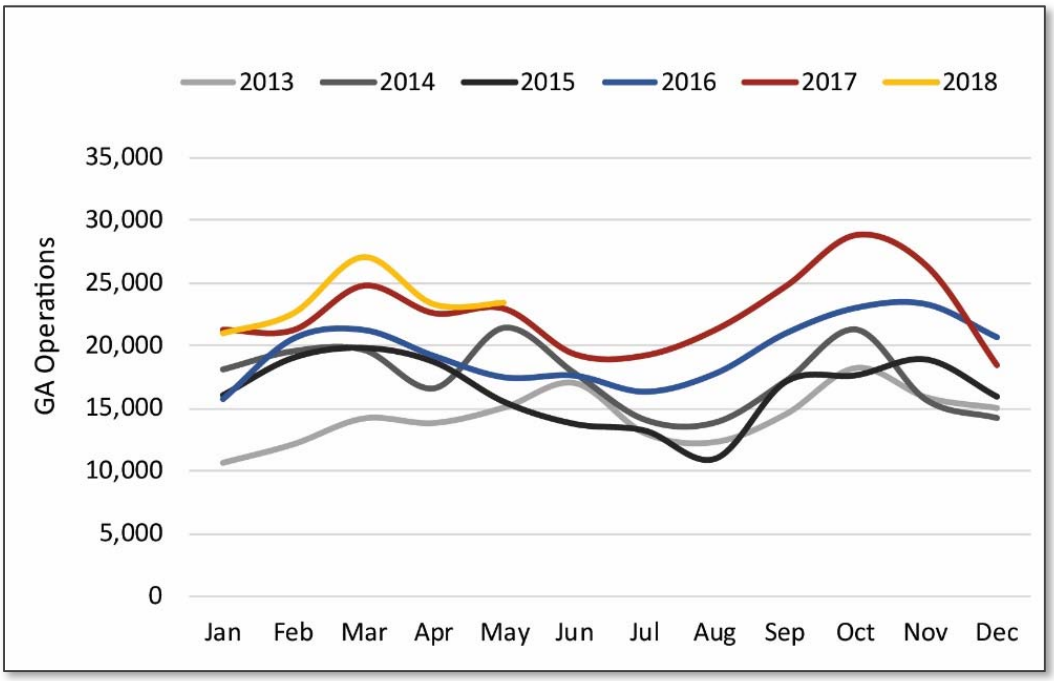
Figure 2-39: IWA Itinerant and Local GA Operations, 2013-2017



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

Figure 2-40: Monthly GA Operations at IWA, 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 2-40: Monthly GA Operations at IWA, Jan 2013-May 2018

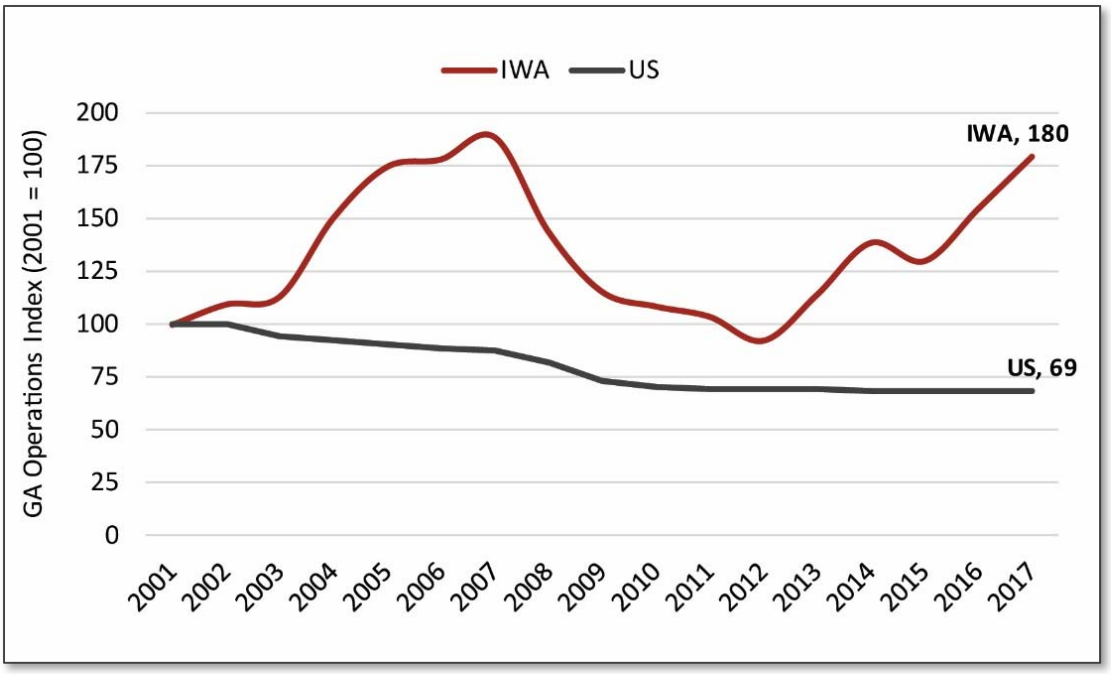


Sources: FAA OPSNET/ATADS, Airport Statistics, and Unison Consulting, Inc.

GA Activity – National Trends

GA activity at IWA does not follow the national trend of declining operations, which began four decades ago. ***Figure 2-41: GA Operations at IWA 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 2-41: GA Operations at IWA 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 FBO 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. 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.

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 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 IWA

Table 2-9: Regional and IWA 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 IWA GA Operations

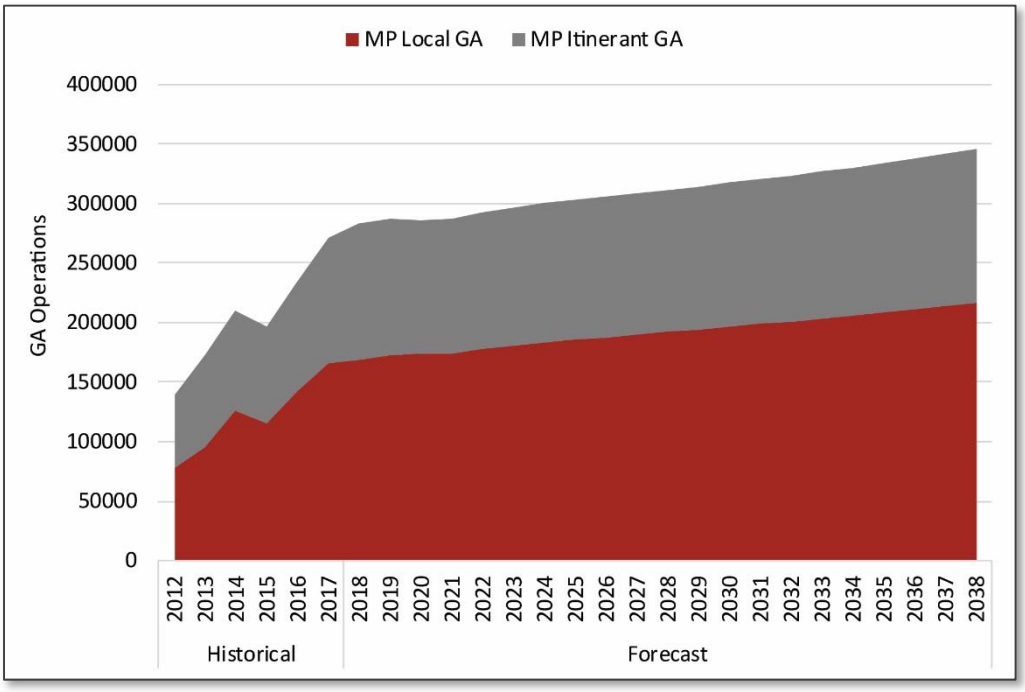
		Regional GA Operations				IWA GA Operations				IWA's Share of Regional GA Operations
	CY	Local	Itinerant	Total	AGR	Local	Itinerant	Total	AGR	
Historical	2008	878,291	616,305	1,494,596		139,808	78,055	217,863		14.6%
	2009	785,444	674,640	1,460,084	-2.3%	97,721	77,070	174,791	-19.8%	12.0%
	2010	670,482	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.

Figure 2-42: 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 2-42: 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 (do not grow in proportion with forecast GA operations).

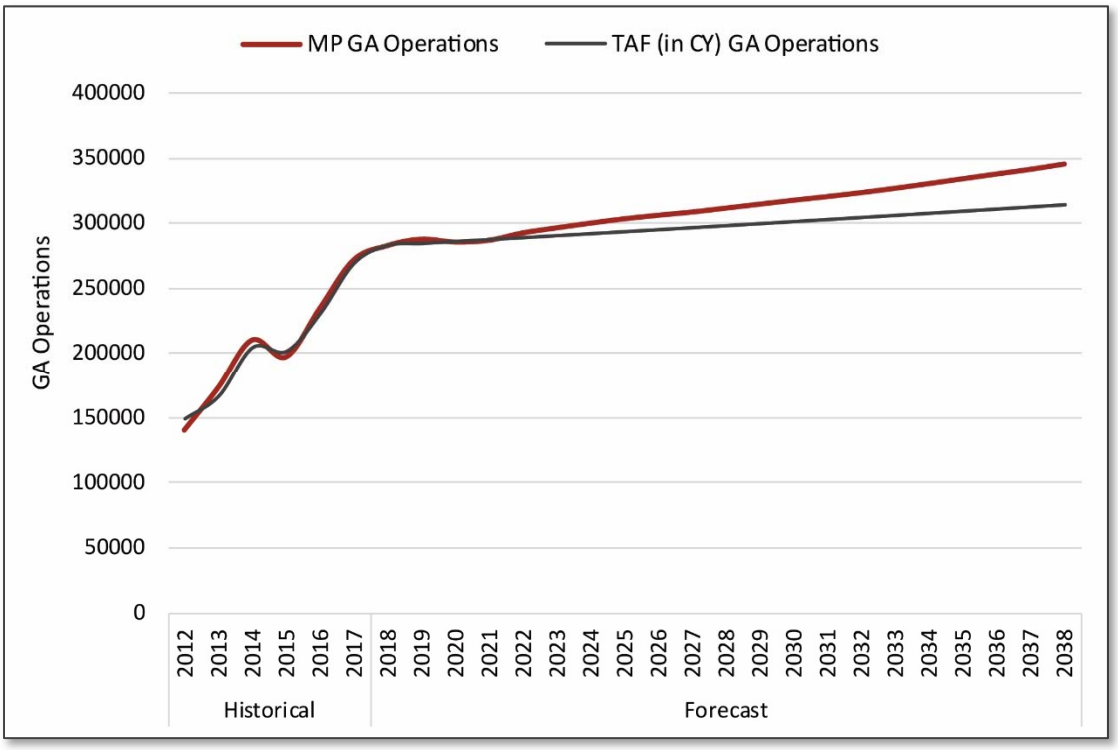
Table 2-10: Forecast Noncommercial Aviation Activity at IWA

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2017-2018**	**2018-2023**	**2023-2028**	**2028-2038**
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 2-43: 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 2-43: 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.

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%**

* Source: 2001-2010, 2012-2014, FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.

**Experimental Light-sport category that was previously shown under Sport Aircraft is moved under Experimental Aircraft category, starting in 2012.

Note: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

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

Table 2-13: Summary of IWA 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 General Aviation (GA) and Military operations.

Table 2-13: Summary of IWA 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%

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

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.

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 a federal fiscal year basis. Since the IWA MPU 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.

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, and its number one goal is to increase air service, targeting passenger traffic growth of three to five 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

[17] *Phoenix-Mesa Gateway Airport Strategic Business Plan 2017*, pages 5-7.

cut capacity, restructured business operations, changed business strategies, and entered into 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). 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 9th 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.

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 as a whole, 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 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.

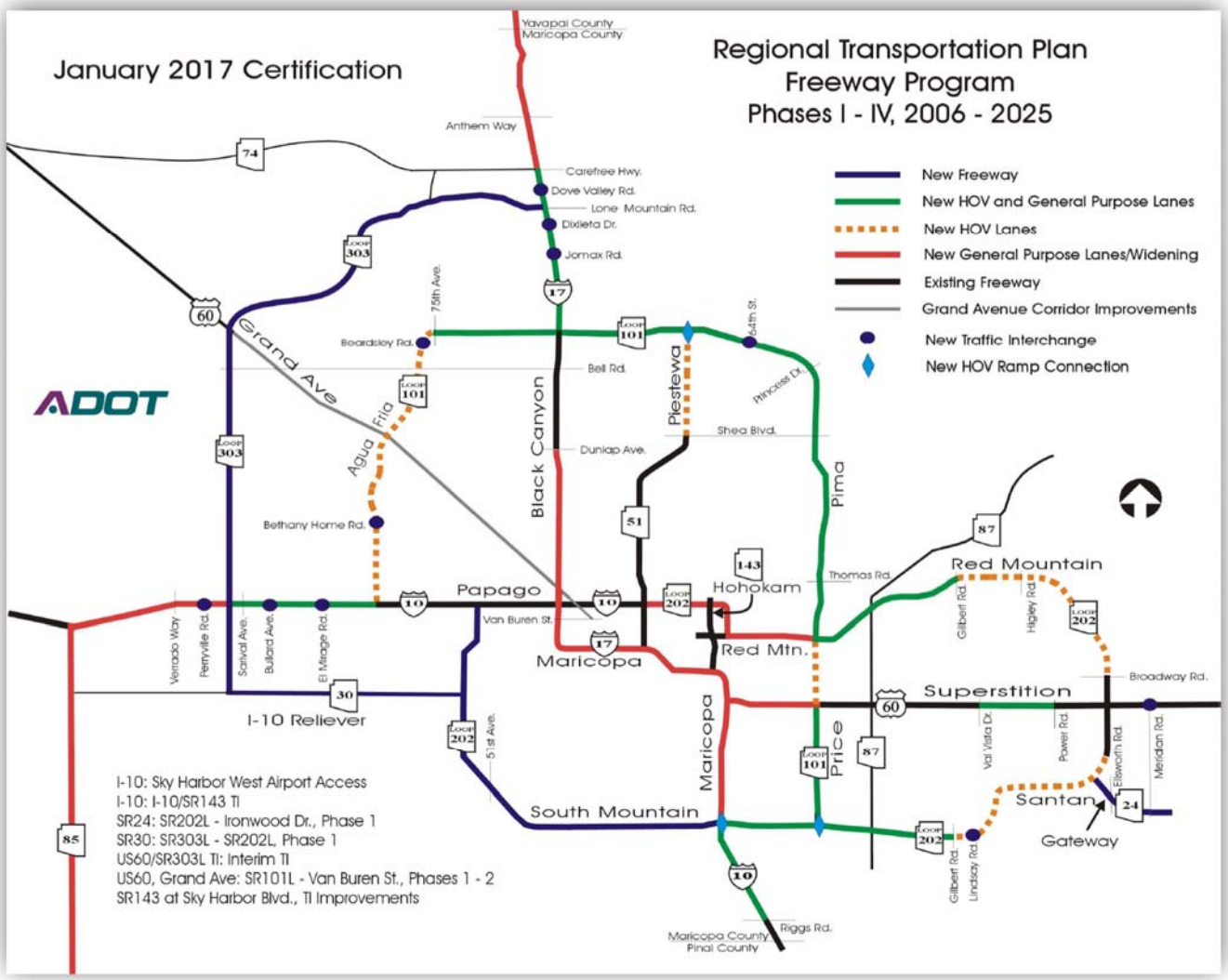
World oil prices are slowly recovering. Since June 2017 they have been on a steady upward trend, raising the average spot price per barrel for 2017 to $50.79 and for April 2018 to $66.25. According to the U.S. Energy Information Administration forecast, WTI spot prices could average around $66 per barrel 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 2-44** 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 scheduled to open in within a year or two, and the I-10 Reliever sometime in the future.

Figure 2-44: ADOT Regional Transportation Plan Freeway Program



Source: Arizona Department of Transportation.