CHAPTER FIVE: AIRPORT CLASSIFICATION ANALYSIS

INTRODUCTION

Determining how airports function within a state system is a foundation of the system planning process. If planned and developed within the context of the state system, individual airports can effectively support a sub-set of aviation activities without impacting service levels within specific regions or communities. Airport planning from the system-wide perspective identifies duplication, gaps, and deficiencies of aviation services in localized areas. This approach supports informed decision-making and resource allocation.

Arizona's classification structure is designed to establish a network of facilities that supports the state's transportation, economic, and access needs. This structure was developed to support an interconnected system of airports that provides the facilities and services required by citizens, visitors, and businesses. All airports contribute to the system; however, the level and type of contribution varies among airports due to numerous factors. Some of these factors are inherent to the airport itself (e.g., available services and facilities), while others are driven by external conditions such as proximity to markets, other airports, and population centers. Because each airport within a system plays a different role, the availability of facilities and services must align with what an airport is and how it functions.

Following a review of federal methodologies, other state classification structures, and an evaluation of the Arizona's existing system, this chapter classifies each airport in the Arizona system. These baseline classifications will be further reviewed in subsequent analyses to identify strategies and recommendations for the optimization of the system under current and future conditions. In addition, objectives for the development of facilities and services that are appropriate for the various classifications are identified.

The information in this chapter is presented as follows:

1. Federal Classifications
2. Other State Classifications
3. Arizona Department of Transportation (ADOT) Functional Roles
4. 2018 State Aviation System Plan (SASP) Update Classifications
5. Facility and Service Objectives
6. Primary Components of Arizona's Aviation Industry

FEDERAL CLASSIFICATIONS

Arizona's airports are classified at the state and federal levels to reflect the diverse roles that airports play in each of these spheres. These various role methodologies complement one another to provide the opportunity to evaluate Arizona's airport system within its full context.

National Plan of Integrated Airport Systems

The *Report to Congress, National Plan of Integrated Airport Systems 2017-2021* (referred to as the NPIAS or 2017-2021 NPIAS) is the latest publication from the Federal Aviation Administration (FAA) and identifies 3,332 existing airports (eight proposed) that are significant to the national air system planning and thus included in the NPIAS. Within the NPIAS, the FAA categorizes airports by type and level of activity, including commercial service,

primary, cargo service, reliever, and general aviation (GA) airports. The FAA's definitions of airport categories are as follows:

1. **Primary.** Public airports that have more than 10,000 enplanements each calendar year and receive scheduled passenger service. Hub categories for primary airports (i.e., large, medium, small, or non) are determined by the number of annual enplanements handled by each airport and are defined as a percentage of total annual enplanements within the U.S. as follows:
   - **Large hub.** One percent or more of U.S. enplanements
   - **Medium hub.** At least 0.25 but less than 1.0 percent of U.S. enplanements
   - **Small hub.** At least 0.05 but less than 0.25 percent of U.S. enplanements
   - **Nonhub.** Less than 0.05 percent of U.S. enplanements but more than 10,000

2. **Non-primary.** Public or primary airports mainly used by GA aircraft. Categories within the non-primary classification include:
   - **Commercial Service.** Public airports receiving scheduled passenger service and at least 2,500 but no more than 10,000 enplaned passengers per year
   - **Reliever.** Public or private airports designated by the FAA to relieve GA traffic congestion at nearby commercial service airports and provide improved GA access to the overall community
   - **GA.** Public-use airports that do not have scheduled air carrier service or have less than 2,500 enplanements

There are 59 airports in Arizona in the 2017-2021 NPIAS.[1] The total number of NPIAS airports within each classification is presented in **Table 1**, along with an example of an Arizona airport or airports in that classification.

Table 1. NPIAS Airports (U.S. and Arizona)

Classification		No. of Airports		Arizona Example
		U.S.	Arizona	
Primary	Large hub	30	1	Phoenix Sky Harbor International
	Medium hub	31	0	N/A
	Small hub	72	2	Phoenix-Mesa Gateway, Tucson International
	Nonhub	249	6	Flagstaff Pulliam, Yuma MCAS/Yuma International
	Sub-Total	**382**	**9**	**N/A**
Non-primary	Commercial service	127	1	Ernest A. Love Field
	Reliever	259	8	Ryan Field, Glendale Municipal
	GA	2,564	41	Casa Grande Municipal, San Carlos Apache
	Sub-Total	**2,950**	**50**	**N/A**
	Total	**3,332**	**59**	**N/A**

Source: 2017-2021 NPIAS

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[1] Please note that the NPIAS includes a subsection of the 67 airports in the Arizona airport system. Arizona system airports excluded from the NPIAS include Cochise College (P03), Douglas Municipal (DGL), Kearny (E67), Rolle Airfield (44A), Seligman (P23), Sells (E78), Superior (E81), and Tombstone Municipal (P29). While not identified by the federal classification system (i.e., the NPIAS), theses airports play an important role within the state system and serve aviation demand at local, regional, and/or statewide levels.

Table 2 presents the latest classifications of all NPIAS airports in Arizona.

Table 2. Arizona's NPIAS Airports

Associated City	Airport Name	FAA ID	Classification
Primary			
Bullhead City	Laughlin/Bullhead City International	IFP	Nonhub
Flagstaff	Flagstaff Pulliam	FLG	Nonhub
Grand Canyon	Grand Canyon National Park	GCN	Nonhub
Page	Page Municipal	PGA	Nonhub
Peach Springs	Grand Canyon West	1G4	Nonhub
Phoenix	Phoenix Sky Harbor International	PHX	Large
Phoenix	Phoenix-Mesa Gateway	IWA	Small
Tucson	Tucson International	TUS	Small
Yuma	Yuma International	NYL	Nonhub
Non-primary			
Ajo	Eric Marcus Municipal	P01	GA
Bagdad	Bagdad	E51	GA
Benson	Benson Municipal	E95	GA
Bisbee	Bisbee Municipal	P04	GA
Buckeye	Buckeye Municipal	BXK	GA
Casa Grande	Casa Grande Municipal	CGZ	GA
Chandler	Chandler Municipal	CHD	Reliever
Chinle	Chinle Municipal	E91	GA
Cibecue	Cibecue	Z95	GA
Clifton	Greenlee County	CFT	GA
Colorado City	Colorado City Municipal	AZC	GA
Coolidge	Coolidge Municipal	P08	GA
Cottonwood	Cottonwood Municipal	P52	GA
Douglas	Bisbee-Douglas International	DUG	GA
Eloy	Eloy Municipal	E60	GA
Gila Bend	Gila Bend Municipal	E63	GA
Glendale	Glendale Municipal	GEU	Reliever
Globe	San Carlos Apache	P13	GA
Goodyear	Phoenix Goodyear	GYR	Reliever
Holbrook	Holbrook Municipal	P14	GA
Kayenta	Kayenta	0V7	GA
Kingman	Kingman	IGM	GA
Lake Havasu City	Lake Havasu City	HII	GA
Marana	Marana Regional	AVQ	Reliever
Marana	Pinal Airpark	MZJ	GA
Maricopa	Ak-Chin Regional	A39	GA
Mesa	Falcon Field	FFZ	Reliever
Nogales	Nogales	OLS	GA
Parker	Avi Suquilla	P20	GA
Payson	Payson	PAN	GA
Phoenix	Phoenix Deer Valley	DVT	Reliever
Polacca	Polacca	P10	GA
Prescott	Ernest A. Love Field	PRC	Commercial Service

Associated City	Airport Name	FAA ID	Classification
Safford	Safford Regional	SAD	GA
San Manuel	San Manuel	E77	GA
Scottsdale	Scottsdale	SDL	Reliever
Sierra Vista	Sierra Vista Municipal-Libby Army Airfield	FHU	GA
Sedona	Sedona	SEZ	GA
Show Low	Show Low Regional	SOW	GA
Springerville	Springerville Municipal	JTC	GA
St. Johns	St. Johns Industrial Air Park	SJN	GA
Taylor	Taylor	TYL	GA
Tuba City	Tuba City	T03	GA
Tucson	Ryan Field	RYN	Reliever
Whiteriver	Whiteriver	E24	GA
Wickenburg	Wickenburg Municipal	E25	GA
Willcox	Cochise County	P33	GA
Williams	H.A. Clark Memorial Field	CMR	GA
Window Rock	Window Rock	RQE	GA
Winslow	Winslow-Lindbergh Regional	INW	GA

Source: 2017-2021 NPIAS

FAA ASSET Study

Approximately 88 percent of NPIAS airports in the U.S. are GA. To capture the diverse functions and economic contributions of GA airports, the FAA conducted two reviews of the network of GA facilities in the NPIAS. In 2012, the results were compiled into *General Aviation Airports: A National Asset* (referred to as ASSET 1 or the ASSET Study). This report acknowledges the following five key aeronautical functions provided by the GA airport system:

1. Emergency preparedness and response
2. Critical community access for remote areas
3. Commercial, industrial, and economic activity functions
4. Access to tourism and special events
5. Other aviation-specific functions, including corporate flights and flight instruction

The ASSET Study introduced four new categories to provide policymakers with a better understanding of the vast and diverse nature of the GA system. The ASSET categories are designed to capture the value of GA airports, which may play a critical role in a local community or region, while filling the gap left by the NPIAS in describing the activities and relative roles of airports in the national GA system.

The evaluation criteria of the ASSET categories incorporate aeronautical functions that are economically and effectively supported by GA operations (FAA 2012). As a result, airports are classified, in part, based on their roles in serving the public interest. The categories are primarily based on existing activity levels, number and type of based aircraft, and volume and types of flights. The ASSET categories also recognize NPIAS airports that are unclassified, as they do not meet other criteria and have limited activity and number of based aircraft. **Table 3** defines the ASSET categories for GA airports, including unclassified.

Table 3. GA Airport ASSET Categories

Role	Description
National	Supports the national and state system by providing communities with access to national and international markets in multiple states and throughout the U.S.
Regional	Supports regional economies by connecting communities to statewide and interstate markets
Local	Supplements communities by providing access to primarily intrastate and some interstate markets
Basic	Links the community with the national airport system and supports GA activities (e.g., emergency services, charter or critical passenger service, cargo operations, flight training and personal flying)
Unclassified	Provides access to the aviation system

Source: ASSET 1 2012

The ASSET Study noted that the FAA would be asking airport sponsors to provide updated information on the aeronautical functional supported at each airport and the sophistication of flying taking place there (Ibid. p. 3). Based in part on this subsequent investigation, the FAA released *ASSET 2: In-Depth Review of 497 Unclassified Airports* in 2014. This report further evaluated the unclassified airports from ASSET 1 to review if additional data were available to categorize these airports. In ASSET 1, Arizona had five unclassified airports:

1. Greenlee County (CFT)
2. Colorado City Municipal (AZC)
3. Pinal Airpark (MZJ)
4. St. Johns Industrial Air Park (SJN)
5. Window Rock (RQE)

During ASSET 2, three of the five Arizona airports were re-classified as Basic and two remained unclassified (Greenlee County and Pinal Airpark). The ASSET classifications were again updated as part of the 2017-2021 NPIAS to add Bisbee Municipal (P04) and San Manuel (E77) for a current total of four unclassified airports in Arizona. All ASSET categories, including unclassified airports, are reviewed during biennial NPIAS updates. **Table 4** presents the current ASSET categories of Arizona's GA airports reflected in the 2017-2021 NPIAS.

Table 4. ASSET Categories of Arizona's GA Airports

Associated City	Airport Name	FAA ID	ASSET Category
Ajo	Eric Marcus Municipal	P01	Basic
Bagdad	Bagdad	E51	Basic
Benson	Benson Municipal	E95	Local
Bisbee	Bisbee Municipal	P04	Unclassified
Buckeye	Buckeye Municipal	BXK	Local
Casa Grande	Casa Grande Municipal	CGZ	Local
Chandler	Chandler Municipal	CHD	Regional
Chinle	Chinle Municipal	E91	Basic
Cibecue	Cibecue	Z95	Basic
Clifton	Greenlee County	CFT	Unclassified
Colorado City	Colorado City Municipal	AZC	Local
Coolidge	Coolidge Municipal	P08	Local
Cottonwood	Cottonwood Municipal	P52	Basic
Douglas	Bisbee-Douglas International	DUG	Basic
Eloy	Eloy Municipal	E60	Local

Associated City	Airport Name	FAA ID	ASSET Category
Gila Bend	Gila Bend Municipal	E63	Basic
Glendale	Glendale Municipal	GEU	Regional
Globe	San Carlos Apache	P13	Basic
Goodyear	Phoenix Goodyear	GYR	Regional
Holbrook	Holbrook Municipal	P14	Basic
Kayenta	Kayenta	0V7	Basic
Kingman	Kingman	IGM	Regional
Lake Havasu City	Lake Havasu City	HII	Regional
Marana	Marana Regional	AVQ	Regional
Marana	Pinal Airpark	MZJ	Unclassified
Maricopa	Ak-Chin Regional	A39	Basic
Mesa	Falcon Field	FFZ	Regional
Nogales	Nogales	OLS	Local
Parker	Avi Suquilla	P20	Local
Payson	Payson	PAN	Local
Phoenix	Phoenix Deer Valley	DVT	National
Polacca	Polacca	P10	Basic
Safford	Safford Regional	SAD	Local
San Manuel	San Manuel	E77	Unclassified
Scottsdale	Scottsdale	SDL	National
Sierra Vista	Sierra Vista Municipal-Libby Army Airfield	FHU	Local
Sedona	Sedona	SEZ	Regional
Springerville	Springerville Municipal	JTC	Local
St. Johns	St. Johns Industrial Air Park	SJN	Basic
Taylor	Taylor	TYL	Basic
Tuba City	Tuba City	T03	Basic
Tucson	Ryan Field	RYN	Regional
Whiteriver	Whiteriver	E24	Basic
Wickenburg	Wickenburg Municipal	E25	Local
Willcox	Cochise County	P33	Local
Williams	H.A. Clark Memorial Field	CMR	Basic
Window Rock	Window Rock	RQE	Basic
Winslow	Winslow-Lindbergh Regional	INW	Basic

Source: 2017-2021 NPIAS

OTHER STATE CLASSIFICATIONS

States develop tailored classifications to ensure their methodologies classify their specific aviation needs based on characteristics important to each state. These tailored methodologies help states capture the activities and services that airports provide to their states, regions, and local communities. States define roles or classifications, with the terms sometimes used interchangeably, using nomenclature that is generally comprehendible by the aviation and non-aviation public. According to the FAA, states "may use terminology such as business class, recreational, local service, general utility, or basic utility to describe individual airport roles" (AC 150-5070, Change 1, §209b).

To obtain additional insight and background into potential methodologies that could be employed for the classification of Arizona's airports, the SASP Update conducted a review of other state airport system plans. This review focused on:

1. Common types of role classification structures
2. Common criteria used to determine airport roles
3. Treatment of privately owned, public-use airports

Types of Role Classification Structures

Most state aviation system planning role classification structures employ one of just a few basic methodologies. These methodologies range from very complex systems that assign points based on airport services and facilities, to relatively straightforward flow chart methodologies. The following section provides an overview of three common role stratification methodologies identified during the system plan review.

Strict Sets of Role Criteria

Applying a strict set of role criteria to each airport role is the most straightforward approach for stratifying a state's airport system. It is also the methodology utilized by the FAA ASSET Study. The approach is simple: to be in the highest airport role, an airport must meet the most demanding set of criteria, followed by continually less-strict criteria for lower airport roles. This methodology typically uses the same type of criteria for all roles, although some system plans modify this methodology to use different criteria depending on the role level. For example, FAA ASSET uses the number of instrument flight rule (IFR) operations, number of based jet aircraft, number of international departures, annual interstate operations, annual enplanements, and air cargo landed weight as criteria for placing airports in the National airport classification. This methodology can also be adapted to allow airports to meet one of several sets of criteria to be placed within a specific role. For example, to be a Regional airport in the ASSET Study, an airport must meet the following criteria:

1. The airport is located in a metropolitan or micropolitan statistical area, has at least 10 annual domestic IFR flights over 500 miles in radius, at least 1,000 annual IFR operations, at least one based jet, or at least 100 based aircraft; or
2. The airport is located in a metropolitan or micropolitan statistical area, and the airport meets the definition of commercial service

This methodology's adaptability is its most notable advantage. By employing different criteria based on role and/or the use of "or" statements, the strict set of criteria methodology can be modified for use in small or complex airport systems, while remaining relatively easy to communicate to clients and the public. Conversely, without such modifications, the methodology is often too rigid to be adequate for all but the simplest of airport systems.

Flow Chart

A flow chart methodology uses an "if-then" series of decisions to first categorize airports by the criterion deemed most important to the state. Airports are then further categorized based on other criteria as prioritized by the state. For example, a system of airports may first be divided based on tiers of primary runway length, then by the type of available fuel or instrument approach capabilities, and followed by other criteria deemed

important to that specific state's airport system. An airport is assigned a role based on the path it takes along the flow chart. A flow chart methodology typically utilizes fewer criteria than other methodologies. Advantages of the flow chart methodology include:

1. Achieves detailed results with just a few decision criteria
2. Easy to communicate to clients and the public
3. Easy to duplicate when updating system plans

However, a flow chart can be less customizable than other structures, particularly the points system methodology described in the following section.

Points System

A points system methodology assigns points to airports based on airport characteristics such as activity and facilities as selected by the state. While the methodology can vary widely amongst states, facilities and services supporting higher levels of activity and larger aircraft are typically assigned a higher level of points. For example, an airport with a 5,500-foot long runway would gain more points for runway length than would an airport with a 3,800-foot long runway. Similarly, an airport with a population of 450,000 people in its market area would earn more points for population coverage than would an airport with a smaller population in its market area. Different criteria may also be weighted differently based on their relative importance in the system. For example, the point total for runway length may be 10, while the total points available for population coverage may be five.

To determine roles, each airport's points are summed, and roles are assigned based on ranges of total points (e.g., 50-36 for primary airports, 35-20 for secondary airports, etc.). The state may also decide to establish a set number of airports in each role and categorize airports based on their relative scores to fit within the pre-established percentage structure. The primary advantage of the points system is that it can be customized to be as complex and nuanced as the airport system requires. However, this methodology is often difficult to clearly communicate to clients and the public.

Review of Other State System Plans

As shown in Table 5, the 2018 SASP Update reviewed the classification methodologies of 10 state system plans. These system plans were all completed over the last 10 years in states across the country. All reviewed system plans used one of the three methodologies described above. Some plans used a very straightforward version of a methodology, while others modified the methodologies to varying degrees.

Table 5. Stratification Methodologies of Reviewed State System Plans

System Plan	Year	Methodology	Number of Criteria	Primary Criteria
Michigan Aviation System Plan	2017	System plan does not use set roles, but adaptable tiers; tiers determined through strict criteria	8	Accessibility; capacity; NPIAS status
Kentucky Statewide Aviation System Plan	2017	Flow chart	3	Type of fuel service
Washington Aviation System Plan	2017	Strict criteria for each role	7	Airport reference code (ARC), activity, accessibility

System Plan	Year	Methodology	Number of Criteria	Primary Criteria
Louisiana Statewide Aviation System Plan	2015	Points system	17	None; all factors weighted evenly
North Dakota State Aviation System Plan	2014	Strict criteria	22	ASSET Study criteria
Ohio Airports Focus Study	2014	Flow chart	4	Runway length
Indiana State Aviation System Plan	2012	Strict criteria	22	ASSET Study criteria
Wisconsin State Airport System Plan 2030	2011	Weighted points system	14	Aviation activities
South Dakota State Aviation System Plan 2010-2030	2010	Strict criteria for each role	6	Runway length; approach; weather reporting; services; fuel; ARC
Oregon Aviation Plan	2007	Strict criteria for each role	7	Operations; location

Sources: Mead & Hunt 2017 (Michigan), CDM Smith 2017 (Kentucky), Parsons Brinckerhoff 2017 (Washington), CDM Smith 2015 (Louisiana), Mead & Hunt 2014 (North Dakota), CDM Smith 2014 (Ohio), Woolpert 2012 (Indiana), Short Elliott Hendrickson 2011 (Wisconsin), Mead & Hunt 2010 (South Dakota), Mead & Hunt 2007 (Oregon)

North Dakota and Indiana employed the most straightforward methodologies. These two systems used ASSET Study roles where available and applied the ASSET criteria to those airports not already assigned roles. The system plans in Kentucky and Ohio utilized the flow chart methodology, while the system plans for Louisiana and Wisconsin employed points systems. The Wisconsin system plan modified a points system methodology by developing categorized criteria into three groups, which were then weighted as follows:

1. **Aviation activity:** 30 percent of the total
2. **Economics and accessibility:** 25 percent (each) of the total
3. **Airport facilities:** 20 percent of the total

The most complex methodology was that employed by the recently completed *2017 Michigan Aviation System Plan*. At its most basic, the Michigan plan used the strict criteria methodology. However, the system plan assigned roles in name only, as airports within each role may have very different sets of facility and service objectives.[2] Each airport in the Michigan system was given a unique tier based on how it performed within each criterion. For example, an airport may be in tier I for accessibility from population centers, but lower tiers for accessibility from tourist centers and number of based aircraft. The methodology is intended to show that airports in the state often fit into several different roles, and that facility and service goals should reflect these different roles. Objectives for facilities and services were then developed for each criterion by tier. As a result, it is possible that no two airports in Michigan have the same set of objectives for their facilities and services.

The reviewed system plans also used a wide range of criteria for stratifying state airport systems, with approximately 50 different criteria used across the 10 plans. Criteria included airport facilities such as runway length, air traffic control towers, and approach capabilities, as well as various characteristics of an airport's based aircraft fleet. Several system plans also stratified airports based on their accessibility to the surrounding population, business centers, and registered pilots, as well as economic factors such as gross regional product (GRP) and total jobs in the surrounding market area. The total number of criteria used also varied greatly, ranging from only three criteria in the *Kentucky Statewide Aviation System Plan*, to over 20 criteria in the system plans based on the ASSET Study's methodology (e.g., North Dakota and Indiana).

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[2] Additional information about facility and service objectives is provided on page 26 of this chapter.

Table 6 summarizes the most common criteria used in the 10 state system plans. The most common criteria were primary runway length, instrument approach capabilities, and total based aircraft (seven system plans), followed by population served, airport location, and aviation activities (six system plans). Some criteria reflect very specific characteristics, while others summarize broader categories of data. For example, "airport location" can describe multiple characteristics of an airport's location such as proximity to metropolitan areas and airport isolation, while economy/employment served can summarize retail sales, GRP, tourism, income, and other factors.

Table 6 also includes details regarding the 2008 SASP, which utilized 21 factors to classify the state's airports. While many of these criteria fit into the categories shown, the 2008 classification structure employed factors that did not appear in any other system plan. Unique criteria included an airport's expansion potential, military or other special tenants, height zoning, and community support and outreach. Additional details about the 21 factors of the 2008 SASP are provided in the following section starting on page 5-5-12.

Table 6. Most Common Criteria Used in System Planning Role Stratification

State	Airport Location	Aviation Activities	Based Jets	Economy/Employment Served	Instrument Approach Capabilities	Land Area Within 30 Minutes	Operations (Number or Characteristics)	Other Airside Facilities	Part 139/Commercial Service	Population Served	Runway Length	Total Based Aircraft	Type of Fuel
Michigan	✓			✓		✓				✓		✓	
Kentucky		✓			✓						✓		
Washington	✓	✓						✓	✓	✓		✓	
Louisiana	✓	✓	✓	✓	✓		✓			✓	✓	✓	
North Dakota	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Ohio					✓						✓		✓
Indiana	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Wisconsin			✓	✓	✓	✓	✓	✓		✓	✓	✓	
South Dakota					✓			✓			✓		✓
Oregon	✓	✓					✓	✓	✓			✓	
Arizona (2008)		✓	✓	✓	✓			✓	✓	✓		✓	

Sources: Mead & Hunt 2017 (Michigan), CDM Smith 2017 (Kentucky), Parsons Brinckerhoff 2017 (Washington), CDM Smith 2015 (Louisiana), Mead & Hunt 2014 (North Dakota), CDM Smith 2014 (Ohio), Woolpert 2012 (Indiana), Short Elliott Hendrickson 2011 (Wisconsin), Mead & Hunt 2010 (South Dakota), Mead & Hunt 2007 (Oregon), Wilbur Smith Associates 2008 (Arizona)

Treatment of Privately Owned, Public-Use Airports

While not eligible for federal or in numerous cases state funding, many states include some privately owned, public-use airports in their aviation systems and in their system plans. Despite private ownership, these airports still serve the needs of GA users and often play an important role in their communities and the aviation system as a whole. On the other hand, some states exclude private airports because development cannot typically be influenced through funding (as they are generally ineligible for public funds). As such, they cannot be relied upon to help manage future statewide or regional demands. Privately owned, public-use airports are generally treated in one of three ways:

1. Exclude all private airports to only focus on those facilities eligible for federal and state funding
2. Select certain airports deemed of high importance to the state's airport system
3. Include all (or nearly all) privately owned, public-use airports

Table 7 summarizes how the 10 state system plans included in this reviewed treated the inclusion of privately owned, public-use airports. The Kentucky airport system has no privately owned airports open to the public; as such, their system plan includes no such airports. Louisiana and South Dakota excluded these airports altogether. The most common treatment was to include all, or virtually all, privately owned, public-use airports.

There are only two privately owned, public-use airports in North Dakota, both of which were included in the *2014 North Dakota State Aviation System Plan*. Other states have far more such airports. The *2017 Michigan Aviation System Plan* includes 97 of these airports (total of 99 in the system). The 2017 *Washington Aviation System Plan* includes 32 of the state's 33 privately owned, public-use airports. The 2007 Oregon plan includes 14 of the state's 15 such airports. The system plans for Ohio, Indiana, and Wisconsin selected which privately owned airports to include, with none picking more than five airports. In all cases where a system plan included at least one privately owned, public-use airport, airports were stratified using the same methodology as all other airports in the system.

Table 7. Treatment of Privately Owned, Public-Use Airports in State System Plans

State	Number of Privately Owned, Public-use Airports	
	Included in the System (at time of the plan)	Located in the State (2017)
Michigan	96	99
Kentucky	0	0
Washington	32	33
Louisiana	0	1
North Dakota	2	2
Ohio	1	51
Indiana	5	33
Wisconsin	4	36
South Dakota	0	1
Oregon	14	15

Sources: Mead & Hunt 2017 (Michigan), CDM Smith 2017 (Kentucky), Parsons Brinckerhoff 2017 (Washington), CDM Smith 2015 (Louisiana), Mead & Hunt 2014 (North Dakota), CDM Smith 2014 (Ohio), Woolpert 2012 (Indiana), Short Elliott Hendrickson 2011 (Wisconsin), Mead & Hunt 2010 (South Dakota), Mead & Hunt 2007 (Oregon)

ADOT FUNCTIONAL ROLES

Until the implementation 2008 SASP, ADOT had classified airports as "primary" and "secondary" based on size and level of activity occurring at each airport. These two classifications were sub-classified based on airport ownership and activity. The 2008 SASP conducted an extensive evaluation to identify possible enhancement to and the continued efficacy of this primary/secondary classification system. Based on a review of the 2000 Arizona State Aviation Needs Study (SANS), NPIAS designations, and other state systems, the 2008 SASP determined that the primary/secondary ADOT classification scheme insufficiently described the unique types of airports in the state.

2008 SASP Roles Evaluation

The 2008 SASP recognized that state-specific classifications can be developed based on an evaluation of many different factors that influence an airport's role in a defined system. Factors such as geography, demographic characteristics, and the current and anticipated future demand for aviation services can be assessed to understand the needs an airport fills in its community. For example, GA airports in rural areas may be essential for access and emergency response (e.g., wildland firefighting and aeromedical flights), while GA airports in an urban region may primarily support law enforcement activities and recreational flying. The total number of individuals served by the facility may be similar; however, these individuals are likely dispersed over a larger geographic space in rural areas than found in urban locations. Other key factors, such as airside and landside facilities and infrastructure, are also significantly important to consider when defining state functional classifications using this type of methodology.

To better define the functional roles of Arizona's airports within the state system, the 2008 SASP employed this functional methodology to establish the existing Arizona classification scheme. Twenty-one factors that influence an airport's role in the system were identified, each of which was then divided into the four goal categories utilized in the 2008 SASP:

Development

1. Total based aircraft
2. Based turbine aircraft
3. Registered pilots served
4. Airside facilities/infrastructure
5. Landside facilities/infrastructure
6. Airport approach type
7. Expansion potential
8. Commercial service
9. Design aircraft

Economic Support

10. Aviation services provided
11. Military or other special tenant organizations
12. Businesses served
13. Population served

14. Industry groups served/economic development
15. Retail sales
16. Accommodations within a 30-minute drive

Safety and Security

17. Emergency use
18. Runway protection zone (RPZ) development controls
19. Height zoning

Environmental Sensitivity and Stewardship

20. Community support
21. Community outreach efforts

In general terms, each factor was scored separately. Each measurable factor had a maximum score of 10, with scores stratified based on specific parameters defined for each individual factor. Factors with a more limited number of choices were analyzed individually to determine the appropriate scoring process. The scores for each factor were summed to determine each airport's initial score. Goal categories were then weighted. The sum of the four category scores, including the weight, produced the results of the roles analysis. Airports were then separated into five groups based on the number of standard deviations above or below their respective scores relative to the average score.

Airport Role Definitions

Based on a review of the previous SANS, other state aviation and FAA classifications, and the specific needs of Arizona, five airport roles were developed to define Arizona's airports. The five airport roles developed by the 2008 SASP are as follows:

1. **Commercial Service.** Publicly owned airports that enplane 2,500 or more passengers annually and receive scheduled passenger air service
2. **Reliever.** FAA-designated airports that relieve congestion at a commercial service airport
3. **GA-Community.** Serve regional economies, connect to state and national economies, and serve all types of GA aircraft [3]
4. **GA-Rural.** Serve a supplemental role in local economies, primarily serving smaller business, recreational, and personal flying[4]
5. **GA-Basic.** Serve a limited role in the local economy, primarily serving recreational and personal flying

Table 8 provides the outcome of the 2008 SASP airport classifications by airport. **Figure 1** graphically depicts Arizona's airport system as classified by ADOT's functional roles from the 2008 SASP.

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[3] A regional economy as the economic activity of an area that encompasses multiple communities or political jurisdictions.
[4] A local economy is defined as the economic activity of a single community or a largely rural area.


Table 8. 2008 SASP Airport Roles[5]

Associated City	Airport Name	FAA Identifier	2008 SASP Role
Ajo	Eric Marcus Municipal	P01	GA-Rural
Bagdad	Bagdad	E51	GA-Basic
Benson	Benson Municipal	E95	GA-Community
Bisbee	Bisbee Municipal	P04	GA-Rural
Buckeye	Buckeye Municipal	BXK	GA-Community
Bullhead City	Laughlin/Bullhead City International	IFP	Commercial Service
Casa Grande	Casa Grande Municipal	CGZ	GA-Community
Chandler	Chandler Municipal	CHD	Reliever
Chinle	Chinle Municipal	E91	GA-Rural
Cibecue	Cibecue	Z95	GA-Basic
Clifton	Greenlee County	CFT	GA-Rural
Colorado City	Colorado City Municipal	AZC	GA-Community
Coolidge	Coolidge Municipal	P08	GA-Community
Cottonwood	Cottonwood Municipal	P52	GA-Community
Douglas	Bisbee-Douglas International	DUG	GA-Rural
Douglas	Cochise College	P03	GA-Rural
Douglas	Douglas Municipal	DGL	GA-Community
Eloy	Eloy Municipal	E60	GA-Community
Flagstaff	Flagstaff Pulliam	FLG	Commercial Service
Gila Bend	Gila Bend Municipal	E63	GA-Rural
Glendale	Glendale Municipal	GEU	Reliever
Globe	San Carlos Apache	P13	GA-Rural
Goodyear	Phoenix Goodyear	GYR	Reliever
Grand Canyon	Grand Canyon National Park	GCN	Commercial Service
Holbrook	Holbrook Municipal	P14	GA-Community
Kayenta	Kayenta	0V7	GA-Rural
Kearny	Kearny	E67	GA-Rural
Kingman	Kingman	IGM	Commercial Service
Lake Havasu City	Lake Havasu City	HII	GA-Community
Marana	Marana Regional	AVQ	Reliever
Marana	Pinal Airpark	MZJ	GA-Community
Maricopa	Ak-Chin Regional	A39	GA-Rural
Mesa	Falcon Field	FFZ	Reliever
Nogales	Nogales	OLS	GA-Community
Page	Page Municipal	PGA	Commercial Service
Parker	Avi Suquilla	P20	GA-Community
Payson	Payson	PAN	GA-Community
Peach Springs	Grand Canyon West	1G4	GA-Rural
Phoenix	Phoenix Deer Valley	DVT	Reliever
Phoenix	Phoenix Sky Harbor	PHX	Commercial Service
Phoenix	Phoenix-Mesa Gateway	IWA	Commercial Service
Polacca	Polacca	P10	GA-Rural
Prescott	Ernest A. Love Field	PRC	Commercial Service

[5] The 2008 SASP included 83 airports in the Arizona system, while only 67 of these facilities are included in the 2017 analysis and thus reflected in Table 10.

Associated City	Airport Name	FAA Identifier	2008 SASP Role
Safford	Safford Regional	SAD	GA-Community
San Luis	Rolle Airfield	44A	GA-Rural
San Manuel	San Manuel	E77	GA-Rural
Scottsdale	Scottsdale	SDL	Reliever
Sedona	Sedona	SEZ	GA-Community
Seligman	Seligman	P23	GA-Rural
Sells	Sells	E78	GA-Basic
Show Low	Show Low Regional	SOW	Commercial Service
Sierra Vista	Sierra Vista Municipal-Libby Army Airfield	FHU	GA-Community
Springerville	Springerville Municipal	JTC	GA-Community
St. Johns	St. Johns Industrial Air Park	SJN	GA-Community
Superior	Superior	E81	GA-Basic
Taylor	Taylor	TYL	GA-Community
Tombstone	Tombstone Municipal	P29	GA-Basic
Tuba City	Tuba City	T03	GA-Rural
Tucson	Ryan Field	RYN	Reliever
Tucson	Tucson International	TUS	Commercial Service
Whiteriver	Whiteriver	E24	GA-Rural
Wickenburg	Wickenburg Municipal	E25	GA-Community
Willcox	Cochise County	P33	GA-Community
Williams	H.A. Clark Memorial Field	CMR	GA-Community
Window Rock	Window Rock	RQE	GA-Rural
Winslow	Winslow-Lindbergh Regional	INW	GA-Community
Yuma	Yuma International	NYL	Commercial Service

Source: Wilbur Smith Associates 2008

Source: ADOT Multimodal Planning Division 2015
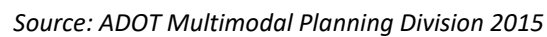
**Figure 1. ADOT Airport Role Functional Classifications**

Classification Considerations

As discussed above, state roles are developed to reflect the existing and future needs of the state. The 2008 SASP role methodology employed 21 evaluation factors associated with the four system plan goal categories (i.e., development, economic support, safety and security, and environmental sensitivity and stewardship). These factors incorporated aviation and non-aviation factors to "achieve balance in evaluating airport needs throughout the state." A detailed analysis was conducted to assign weighted values to each airport based on data gathered during the inventory process and other third-party sources. The results of this analysis were then used to classify airports based on current types and levels of activity occurring at the facility and in the community. The airport roles established during this process were subsequently adopted by the State Transportation Board (STB) as part of its official policy in 2009 (ADOT 2016).

The 2018 SASP Update re-evaluated this methodology to determine its continued ability to classify Arizona's airports in a manner that accurately identifies each airport's role in the system while meeting the needs of the ADOT Aeronautics Group. State roles are particularly important because they are used for the allocation of funds from the State Aviation Fund. According to the STB's Resource Allocation Policy,

> In order to allocate the State Aviation Fund dollars in an equitable, efficient and effective manner, it is the policy of the Board to provide the largest amount of Airport Development Program grant dollars to those airport roles with the largest amount of aviation activity (passenger enplanements, aircraft operations, and registered based aircraft), while also ensuring that eligible airports in all roles have an opportunity to be included in the annual allocation of State Aviation Funds (ADOT 2016, p. 50).

Figure 2 presents the ADOT administrative guidelines for the allocation of the State Aviation Fund.
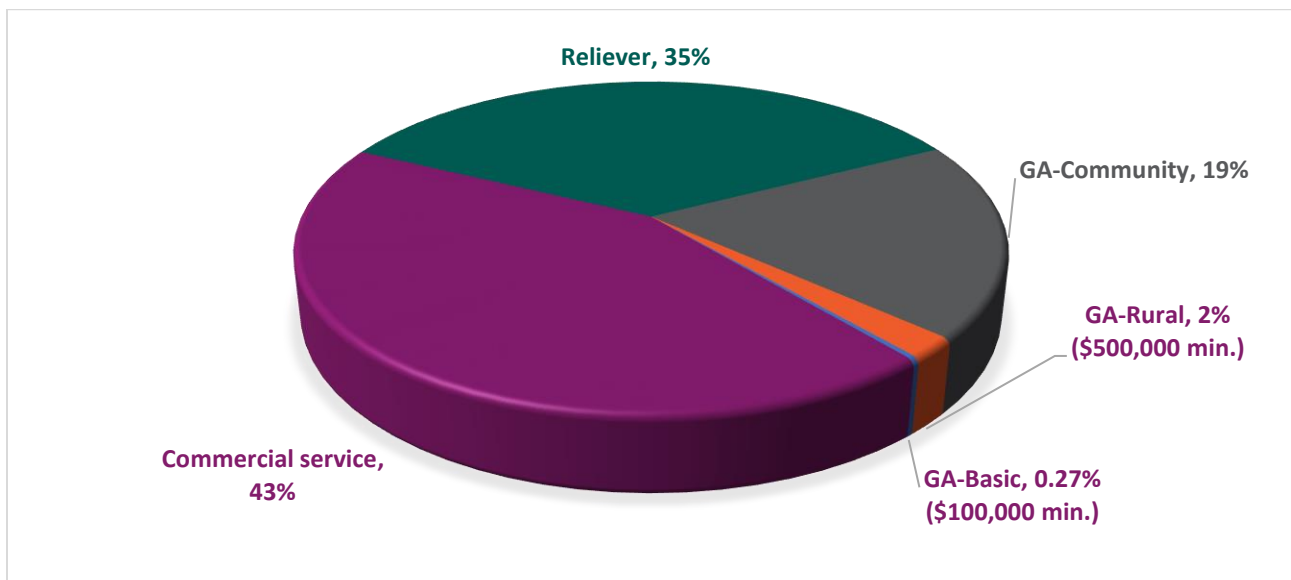
Source: ADOT 2016

Figure 2. State Funding Allocations by Airport Role (Existing)

Since the 2008 SASP, Arizona's economic and legislative landscapes have shifted, causing ripple effects that have significantly impacted funding availability in the State Aviation Fund. Thus, while funding allocations per role have remained consistent, the overall level of available funding has been drastically reduced. This, and other state-specific issues, underline the importance of closely re-examining the existing airport role classification scheme.[6]

Based on the current context of the ADOT Aeronautics Group, the importance of Arizona's classification scheme in state decision-making processes, and the needs of Arizona's airports, several key considerations emerged during the development of the updated methodology:

1. **Simplicity.** The inherent complexity of the 2008 plan's 21 factors makes it difficult for airports to take any proactive steps to impact their role in the system. The updated methodology should allow airports to understand why they are classified in a specific manner and have the ability to impact their classifications by increasing activity levels, service offerings, etc.
2. **Objectivity.** Arizona's airports should be classified using a quantitative, data-driven approach that is defensible and clear to all audiences.
3. **Capacity to conduct ongoing reviews.** The 2017 methodology should provide a straightforward process for assigning roles during the initial study and during interim updates conducted at the discretion of the ADOT Aeronautics Group (i.e., between full SASP updates as necessary).

2018 Update Methodology

Based on these primary goals and discussions with the ADOT Aeronautics Group and the PAC, the 2018 SASP Update developed a flow chart methodology that provides a systematic process for the classification of Arizona's airports, similar to states such as Kentucky and Ohio. The flow chart methodology applies a logical approach to categorize airports based on quantitative data that can be independently validated to evaluate the type and volume of activity occurring at an airport.

The flow chart methodology begins by categorizing commercial service airports into Commercial Service-International and Commercial Service-Domestic as follows:

1. **Commercial Service-International.** Year-round scheduled commercial service to international destinations
2. **Commercial Service-Domestic.** Scheduled commercial service to domestic destinations

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[6] Chapter 3 (Identification of Airport Assets) provides additional information about state- and national-level aviation trends. A more detailed discussion about the ADOT Aeronautics Group's funding policies is provided in Chapter 2 (Review of Current Policy).

GA airports are then analyzed in more detail using a set of factors that mirror those employed by the FAA's ASSET Study.[7] The six factors to categorize GA airports in Arizona are:

1. FAA-designated reliever status
2. Number of instrument approach operations
3. Number of based aircraft
4. Number of based jets
5. Availability of JetA and/or AvGas (100LL)
6. Total operations

The relevancy of these factors as well as the source of data used in the classification analysis are described below.

FAA-Designated Reliever Status

GA airports with FAA-designated reliever status provide pilots with alternatives to using congested commercial service airports and provide GA access to the surrounding area. In addition to relieving congestion at nearby commercial service facilities, they can also help draw GA aircraft with less capacity and slower speeds from commercial service airports. This allows commercial service airports to operate more flights by larger aircraft and can help to keep the operating fleet more homogenous, potentially increasing the operational capacity of the airport. Data on FAA-designated reliever status were obtained from the *2017–2021 NPIAS Report*.

Number of Instrument Approach Operations

Instrument approach procedures (IAPs) are defined as series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport traditionally by the FAA. IAPs allow aircraft to land in inclement weather when visibility is low, allowing an airport to continue to serve the needs of the community despite poor weather conditions. This can be especially important in rural areas that depend on GA airports for emergency response; access; and economic activities such as air cargo, agricultural support, and corporate/business aviation. Data on the number of instrument approach operations were obtained from the FAA's Operational Network (OPSNET) for towered airports and Traffic Flow Management System Counts (TFMSCs) for non-towered facilities.

Based Aircraft

A based aircraft is an aircraft that is operational and air-worthy based at a specific facility for the majority of the year. Based aircraft are one of the best indicators of the level of activity occurring at an airport and reflect the role an airport is playing in meeting the air transportation and economic needs of the market it serves. Updated based aircraft data were obtained from airport management during the 2017 inventory process. If updated

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[7] It is important to note that the analysis developed Arizona-specific parameters, as described in the following Roles Analysis and depicted in Table 9. Additionally, the Arizona aviation system includes 11 publicly owned, public-use non-NPIAS airports that are not classified by the ASSET study. While these non-NPIAS airports are not recognized as significant to the national airspace system, they play important roles in the state.

based aircraft data were unavailable, data were obtained from the most recent ADOT Airport System Manager (ASM) update.

Based Jets

A significant amount of business/corporate activity is conducted with jet aircraft. As a result, a based jet serves as a reliable sign of ongoing economic activity within the market that the airport serves. A based jet also indicates that an airport provides the facilities required by these larger and faster aircraft. Updated based jet data were obtained from airport management during the 2017 inventory. If updated based aircraft data were unavailable, data were obtained from the most recent ADOT ASM information.

Availability of JetA and/or AvGas

The type of fuel at an airport impacts the aircraft that a facility can support. JetA is used by turbine engines, while AvGas is used by piston-powered aircraft. Airports that offer JetA fuel have a greater ability to support the business/corporate aircraft fleet, while airports with AvGas draw a higher number of piston-powered aircraft than those facilities without fuel. Fuel sales can also provide an important source of revenue for airports. In Arizona, the majority of airports that offer JetA also provide AvGas. Data on fuel availability were obtained during the 2017 airport inventory.

Total Operations

The number of total operations at an airport reports the overall volume of flights occurring at the facility and offers key insight into airport activity. An aircraft operation represents either a take-off or a landing; for example, a touch-and-go, which includes a take-off and a landing, counts as two operations. This example is particularly relevant in Arizona, as the state experiences some of the highest levels of flight instruction in the nation. Some airports experience daily flight training activity (through touch-and-go operations), but have few based aircraft. Considering total operations in this evaluation helps capture the important role these types of airports play in this valuable economic activity.

At towered airports, annual operations were derived from FAA OPSNET. At non-towered airports, annual aircraft operations data were derived from updated airport data as estimated by the airport manager. If the airport manager did not have the means to accurately report annual operations, ASM data were used. Generally, ASM data corresponded with FAA 5010 Master Record data.

Classification Analysis

The availability of commercial service (domestic/international) and the six GA factors were used in a flow chart methodology that assigned airport roles based on specific parameters. **Table 9** describes the six roles developed in this study for the classification of Arizona's airports.[8] The 2008 SASP roles are included for comparison purposes. Details about the role parameters selected as part of this evaluation are also provided.

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[8] The 2018 SASP Update evaluated three alternative methodologies reflecting low, medium, and high levels of activity at Arizona's GA airports. Appendix C provides the full results of this evaluation.

Table 9. Arizona Airport Classifications (2008 and 2017)

Classification/Role	2008 SASP	2018 SASP Update	
		Role Parameters	Typical Characteristics (Not Requirements)
Commercial Service-International	Publicly owned airports which enplane 2,500 or more passengers annually and receive scheduled passenger air service	International commercial service	Year-round scheduled commercial service to international destinations for people and cargo. High levels of activity with many jets and multiengine propeller aircraft.
Commercial Service-National		Domestic commercial service	Scheduled commercial service to domestic destinations for people and cargo. May provide seasonal scheduled commercial service to a limited number of international destinations. Moderate to high levels of activity with jets and multiengine propeller aircraft.
Reliever	FAA-designated airports that relieve congestion at a commercial service airport	FAA-designated airport that relieves congestion at a commercial service airport	Serves to relieve congestion at commercial service airports. Supports the national air system and provides access to markets across the U.S. Moderate to high levels of activity with jets and multiengine propeller aircraft.
GA-Community	Airports that serve regional economies, connecting to state and national economies, and serve all types of GA aircraft	250 instrument operations, 10 based aircraft or 1 based jet, and aircraft fuel	Support regional economies and provides access to markets in Arizona and nearby states. Moderate levels of activity with jets and multiengine propeller aircraft.
GA-Rural	Airports that serve a supplemental role in local economies, primarily serving smaller business, recreational, and personal flying	2,500 operations or 10 based aircraft and aircraft fuel	Supplements local economies and provides access to markets in Arizona with limited activity in nearby states. Moderate to low levels of activity with few or no jets and multiengine propeller aircraft.
GA-Basic	Airports that serve a limited role in the local economy, primarily serving recreational and personal flying	All other GA airports	Supports local communities by providing GA services such as emergency response services, charter or medical flights, wildland firefighting, or recreational flying. Low levels of activity primarily composed of single or multiengine piston aircraft.

Sources: Kimley-Horn 2017 and Wilbur Smith Associates 2008

Figure 3 provides the flow chart methodology of the 2018 SASP Update.
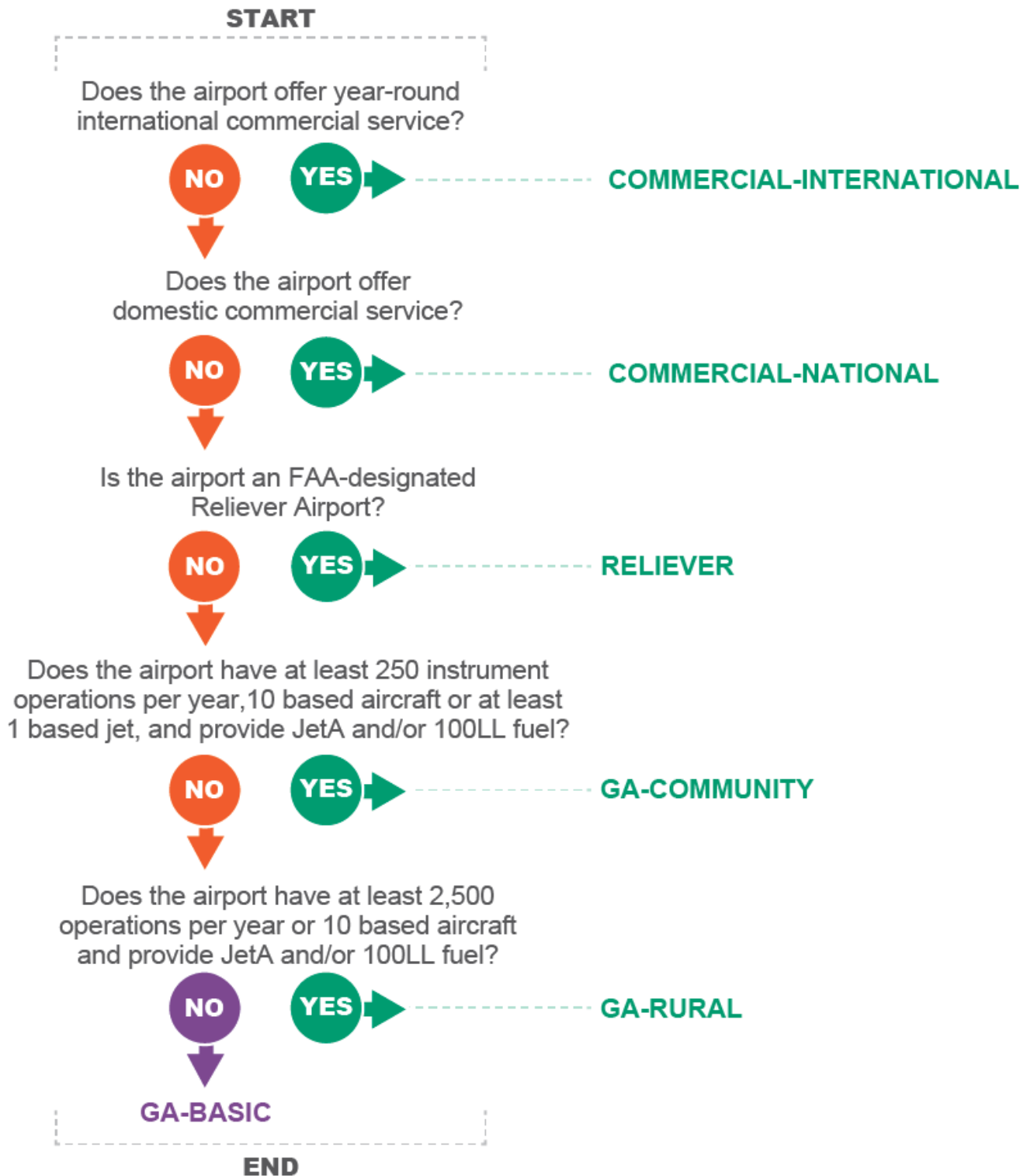
Source: Kimley-Horn 2017
Figure 3. 2018 SASP Update Flow Chart Methodology

Airport Role Definitions

This flow chart methodology was applied to the publicly owned, public-use airports that comprise the Arizona system. **Table 10** summarizes the results of this analysis by classification and compares the results to the 2008 SASP roles. Note that the 2008 SASP evaluated 83 airports in the Arizona system; however, the 2018 SASP Update includes 67 airports, primarily due to the exclusion of privately owned, public-use airports.

Table 10. Summary Results

Classification/Role	Number of Airports (No.)		Percent of Total Airports (%)	
	2008 SASP	2018 Update	2008 SASP	2018 Update
CS*-International	11	2	14%	3%
CS-National		9		13%
Reliever	8	8	10%	12%
GA-Community	29	18	32%	27%
GA-Rural	25	17	32%	25%
GA-Basic	10	13	12%	19%

Note: CS = Commercial Service

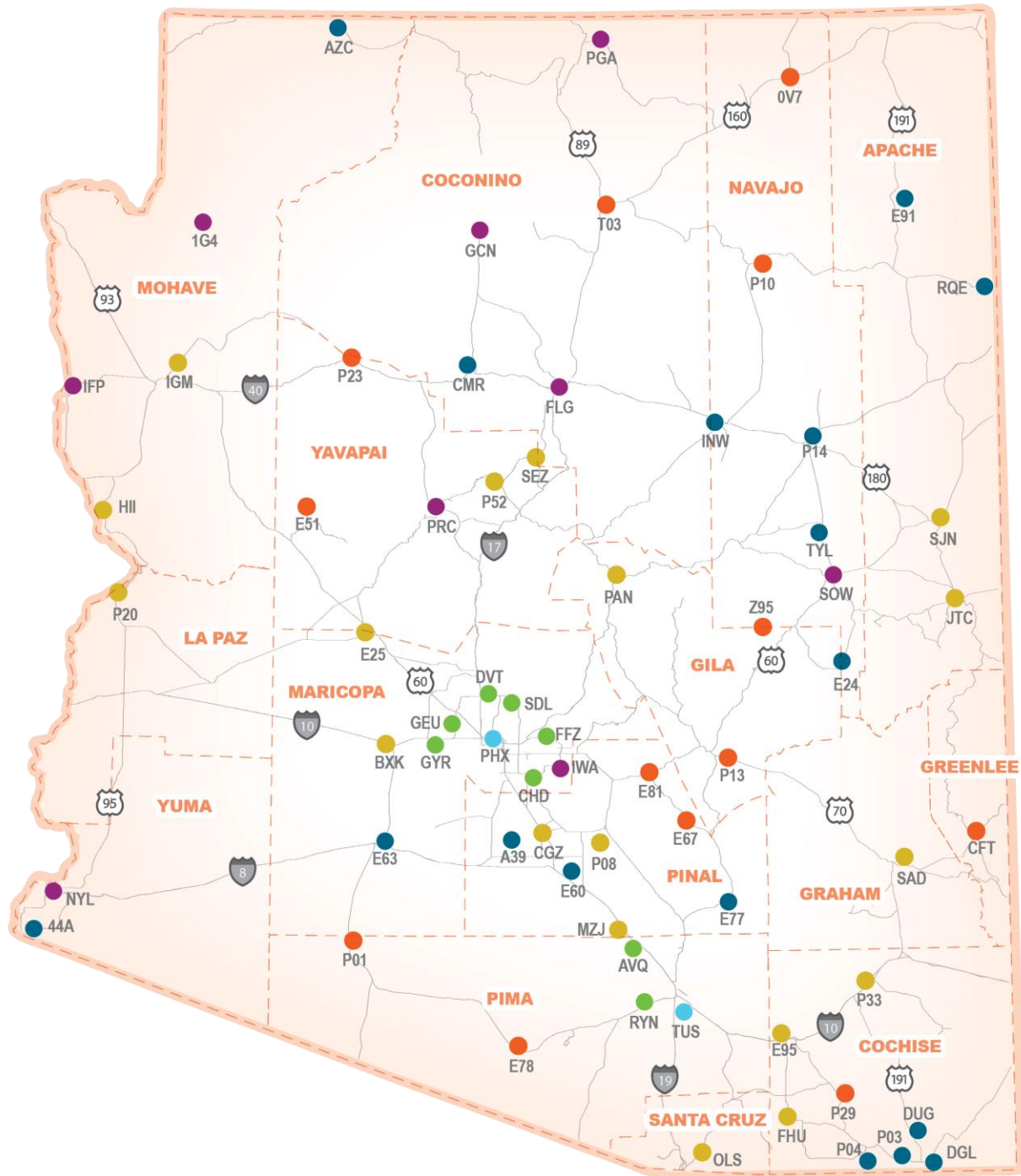*Sources: Kimley-Horn 2017 and Wilbur Smith Associates 2008*

Table 11 lists Arizona's airports by associated city and identifies their updated classification developed as part of the 2018 SASP Update. **Appendix B** provides the data used in the classification analysis. These results represent the initial airport roles that are used as a baseline for further analyses of the system in subsequent chapters. **Figure 4** graphically depicts the 2018 SASP Update classification of Arizona's airports.

Table 11. 2018 SASP Update Classification Summary

Associated City	Airport Name	FAA Identifier	2018 SASP Classification
Ajo	Eric Marcus Municipal	P01	GA-Basic
Bagdad	Bagdad	E51	GA-Basic
Benson	Benson Municipal	E95	GA-Community
Bisbee	Bisbee Municipal	P04	GA-Rural
Buckeye	Buckeye Municipal	BXK	GA-Community
Bullhead City	Laughlin/Bullhead City International	IFP	CS-National
Casa Grande	Casa Grande Municipal	CGZ	GA-Community
Chandler	Chandler Municipal	CHD	Reliever
Chinle	Chinle Municipal	E91	GA-Rural
Cibecue	Cibecue	Z95	GA-Basic
Clifton	Greenlee County	CFT	GA-Basic
Colorado City	Colorado City Municipal	AZC	GA-Rural
Coolidge	Coolidge Municipal	P08	GA-Community
Cottonwood	Cottonwood Municipal	P52	GA-Community
Douglas	Bisbee-Douglas International	DUG	GA-Rural
Douglas	Cochise College	P03	GA-Rural
Douglas	Douglas Municipal	DGL	GA-Rural
Eloy	Eloy Municipal	E60	GA-Rural
Flagstaff	Flagstaff Pulliam	FLG	CS-National
Gila Bend	Gila Bend Municipal	E63	GA-Rural

Associated City	Airport Name	FAA Identifier	2018 SASP Classification
Glendale	Glendale Municipal	GEU	Reliever
Globe	San Carlos Apache	P13	GA-Basic
Goodyear	Phoenix Goodyear	GYR	Reliever
Grand Canyon	Grand Canyon National Park	GCN	CS-National
Holbrook	Holbrook Municipal	P14	GA-Rural
Kayenta	Kayenta	0V7	GA-Basic
Kearny	Kearny	E67	GA-Basic
Kingman	Kingman	IGM	GA-Community
Lake Havasu City	Lake Havasu City	HII	GA-Community
Marana	Marana Regional	AVQ	Reliever
Marana	Pinal Airpark	MZJ	GA-Community
Maricopa	Ak-Chin Regional	A39	GA-Rural
Mesa	Falcon Field	FFZ	Reliever
Nogales	Nogales	OLS	GA-Community
Page	Page Municipal	PGA	Commercial-National
Parker	Avi Suquilla	P20	GA-Community
Payson	Payson	PAN	GA-Community
Peach Springs	Grand Canyon West	1G4	CS-National
Phoenix	Phoenix Deer Valley	DVT	Reliever
Phoenix	Phoenix Sky Harbor	PHX	CS-International
Phoenix	Phoenix-Mesa Gateway	IWA	CS-National
Polacca	Polacca	P10	GA-Basic
Prescott	Ernest A. Love Field	PRC	CS-National
Safford	Safford Regional	SAD	GA-Community
San Luis	Rolle Airfield	44A	GA-Rural
San Manuel	San Manuel	E77	GA-Rural
Scottsdale	Scottsdale	SDL	Reliever
Sedona	Sedona	SEZ	GA-Community
Seligman	Seligman	P23	GA-Basic
Sells	Sells	E78	GA-Basic
Show Low	Show Low Regional	SOW	Commercial-National
Sierra Vista	Sierra Vista Municipal-Libby Army Airfield	FHU	GA-Community
Springerville	Springerville Municipal	JTC	GA-Community
St. Johns	St. Johns Industrial Air Park	SJN	GA-Community
Superior	Superior	E81	GA-Basic
Taylor	Taylor	TYL	GA-Rural
Tombstone	Tombstone Municipal	P29	GA-Basic
Tuba City	Tuba City	T03	GA-Basic
Tucson	Ryan Field	RYN	Reliever
Tucson	Tucson International	TUS	CS-International
Whiteriver	Whiteriver	E24	GA-Rural
Wickenburg	Wickenburg Municipal	E25	GA-Community
Willcox	Cochise County	P33	GA-Community
Williams	H.A. Clark Memorial Field	CMR	GA-Rural
Window Rock	Window Rock	RQE	GA-Rural
Winslow	Winslow-Lindbergh Regional	INW	GA-Rural
Yuma	Yuma International	NYL	CS-National

Source: Kimley-Horn 2017

AZC
PGA
0V7
APACHE
160
89
COCONINO
NAVAJO
E91
1G4
GCN
T03
RQE
MOHAVE
P10
93
IFP
IGM
P23
CMR
FLG
40
YAVAPAI
INW
P14
180
SEZ
HII
P52
TYL
SJN
E51
PRC
SOW
17
Z95
JTC
PAN
P20
GILA
60
LA PAZ
E25
E24
60
DVT
MARICOPA
SDL
10
GEU
FFZ
GREENLEE
BXK GYR PHX
IWA
CHD
E81
P13
70
YUMA
E67
CFT
95
E63
SAD
A39 CGZ
GRAHAM
8
P08
NYL
E60
PINAL
44A
E77
MZJ
P01
AVQ
P33
PIMA
10
RYN TUS
E95
COCHISE
19
191
P29
DUG
E78
FHU
P03
P04
DGL
SANTA CRUZ
OLS

STATE CLASSIFICATIONS

● GA-Basic   ● GA-Community   ● GA-Rural   ● Reliever

● Commercial-International   ● Commercial-National

Source: Kimley Horn 2017

Figure 4. 2018 SASP Update Airport Classifications

FACILITY AND SERVICE OBJECTIVES

To create a truly functional aviation system—one that safely, securely, and efficiently meets the needs of all users—it is important to identify the facilities and services that each classification of airport should offer to perform its role. Facility and service objectives present the recommended minimum level of development an airport should purse in accordance with its classification. They offer specific guidance on how airports can improve their abilities to serve constituents and enhance the statewide aviation system.

It is important to note that facility and service objectives are not requirements, but instead provide a baseline for consideration during planning processes. An airport that offers facilities and services above or below the objectives can still be fulfilling its role based on local needs and context; however, the inability to meet certain guidelines may impact the future functionality of the system. The reduction or removal of facilities and services was not considered during this analysis.

Defining Facility and Service Objectives

The facility and service objectives of the 2018 SASP Update represent the components of an airport with the greatest potential to significantly impact the type and amount of activity that can occur there. The study evaluated the following airport components for each of the six classifications of the Arizona aviation system:

1. **Airside Facilities[9]**

   — Airport Reference Code (ARC)
   — Runway length, width, and surface
   — Taxiway type and width
   — IAPs

   — Visual aids
   — Runway and taxiway lighting
   — Approach lighting systems (ALSs)

2. **Landside Facilities**

   — Airport fencing
   — Aprons and tie-downs
   — Hangars

   — Terminal buildings
   — Automobile parking

3. **Landside Services[10]**

   — Automated weather reporting
   — Fixed base operator (FBO)
   — Air taxi/charter
   — Aircraft rental
   — Aircraft maintenance
   — Avionics sales and service
   — Aircraft fuel: AvGas and Jet A
   — Deicing

   — Oxygen
   — Snow Removal
   — Ground transportation
   — On-site rental car
   — Internet access
   — Phone access
   — Restroom
   — U.S. Customs

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[9] Chapter 3 (Identification of Airport Assets) defines the meaning and relevancy of each of the general airfield facilities within the context of a statewide aviation system plan.

[10] The 2018 SASP Update conducted an online survey of Project Advisory Committee (PAC) members in August 2017 to assist in defining the service objectives for the Arizona aviation system. The survey results have been incorporated in the criteria provided in Table 12.

Table 12 defines the facility and service objectives of the Arizona aviation system by airport classification. In subsequent analyses, the criteria presented in this table will be used to evaluate the performance of the existing aviation system. That analysis will serve as the baseline for the development of possible system enhancements and recommendations.

Table 12. Facility and Service Objectives Criteria by Classification

Objective Criteria	Minimum Objectives by Airport Classification					
	CS-International	CS-National	Reliever	GA-Community	GA-Rural	GA-Basic
Airside Facility Objectives						
ARC	Consistent with master plan	Consistent with master plan	C-III	B-II	B-I	A-I
Runway Length	Consistent with master plan	Consistent with master plan	Accommodate 75% of large aircraft at 90% useful load	Accommodate 75% of large aircraft at 60% useful load	Accommodate 75% of small airplanes	Maintain existing
Runway Width	To meet ARC standards	To meet ARC standards	To meet ARC standards	To meet ARC standards	To meet ARC standards	To meet ARC standards
Runway Surface	Asphalt/paved	Asphalt/paved	Asphalt/paved	Asphalt/paved	Asphalt/paved (desired)	Gravel/dirt (minimum)
Taxiway Type and Width	Consistent with master plan	Consistent with master plan	Full parallel Width per ARC	Full or partial parallel Width per ARC	Full or partial parallel, connectors, or turnarounds Width per ARC	None
Instrument Approach Procedures	Precision (desired) Near-precision (minimum)	Precision (desired) Near-precision (minimum)	Near-precision (desired) Non-precision (minimum)	Non-precision	Non-precision or circling	None
Visual Aids	Rotating beacon Lighted wind cone Segmented circle REILs VGSIs	Rotating beacon Lighted wind cone Segmented circle REILs VGSIs	Rotating beacon Lighted wind cone Segmented circle REILs VGSIs	Rotating beacon Lighted wind cone Segmented circle REILs VGSIs	Rotating beacon Wind cone Segmented circle VGSIs	Wind sock
Runway and Taxiway Lighting	HIRL/HITL (desired) MIRL/MITL (minimum)	HIRL/HITL (desired) MIRL/MITL (minimum)	MIRL/MITL	MIRL/MITL	MIRL/MITL	Reflectors
Approach Lighting Systems	ALS	ALS	ALS (desired)	None	None	None
Landside Facility Objectives						
Airport Fencing	Perimeter fencing Controlled access	Perimeter fencing Controlled access	Perimeter fencing Controlled access	Perimeter fencing	Perimeter fencing	Perimeter fencing (desired)
Aprons and Tie-Downs	N/A	N/A	Apron (25% of based fleet and 75% for transient)	Apron (40% of based fleet and 50% for transient)	Apron (50% of based fleet and 25% for transient)	Apron
Hangars	N/A	N/A	Hangars (75% of based fleet and 25% overnight)	Hangars (60% of based fleet and 25% overnight)	Hangars (50% of based fleet and 25% for transient)	
Terminal Buildings	N/A	N/A	Terminal with pilot's lounge	Terminal with appropriate facilities		

Objective Criteria	Minimum Objectives by Airport Classification					
	CS-International	CS-National	Reliever	GA-Community	GA-Rural	GA-Basic
Auto Parking	Yes	Yes	Yes	Yes	Yes	Yes
Landside Service Objectives						
Automated Weather Reporting	Yes	Yes	Yes	Yes	Yes	
FBO			Yes	Yes		
Air Taxi/Charter	Yes	Yes	Yes			
Aircraft Rental		Yes	Yes	Yes		
Aircraft Maintenance	Yes	Yes	Yes	Yes		
Avionics Sales and Service	Yes	Yes	Yes			
Aircraft Fuel	AvGas and JetA	AvGas and JetA	AvGas and JetA	AvGas and JetA	AvGas	
Deicing	Yes	Yes				
Oxygen	Yes	Yes	Yes	Yes		
Snow Removal	As needed	As needed				
Ground Transportation	Yes	Yes	Yes	Yes	Yes	Yes
On-Site Rental Car	Yes	Yes				
Internet Access	Yes	Yes	Yes	Yes		
Phone Access	Yes	Yes	Yes	Yes	Yes	Yes
Restroom	Yes	Yes	Yes	Yes	Yes	
U.S. Customs	Yes	Yes	Yes			

Acronyms:	ALS = Approach lighting system	HIRL = High-intensity runway lights	MITL = Medium-intensity taxiway lights
	ARC = Airport reference code	HITL = High-intensity taxiway lights	REILs = Runway-end indicator lights
	FBO = Fixed-base operator	MIRL = Medium-intensity runway lights	VGSIs = Visual glide slope indicators

Source: Kimley-Horn 2017

PRIMARY COMPONENTS OF THE ARIZONA AVIATION INDUSTRY

State airport role and classification methodologies often group airports based on available services, infrastructure, and volume of aviation activity. These same types of criteria can likewise drive the type of activity that occurs at an airport. As depicted in **Figure 5**, an interplay arises between an airport's role or classification, the type of activity the airport is best equipped to support, and the facilities and services it offers. This relationship can drive project implementation, as airports prioritize improvement projects during long-term planning efforts based, in part, on the specific needs of the primary users.

Figure 5. Relationship Between Roles, Aviation Activity, and Facilities and Services

The 2012 *Economic Impact of Aviation in Arizona* study (Economic Impact Study) documented the seven most significant components of Arizona's aviation industry, including commercial and GA, off-airport aviation services, aerospace manufacturing, military, aviation education, business aviation, and tourism. In total, these activities contribute $58.0 billion to the state's economy and support 408,000 jobs generating over $21 billion in payroll. Airports should consider the facilities and services required to most effectively support these activities to further enhance aviation's economic impact to the state. The economic impacts of the seven primary components of the Arizona aviation industry by percent of total are depicted in **Figure 6**. Descriptions of each primary component of Arizona's aviation industry and the associated economic impact from the 2012 study are provided below.
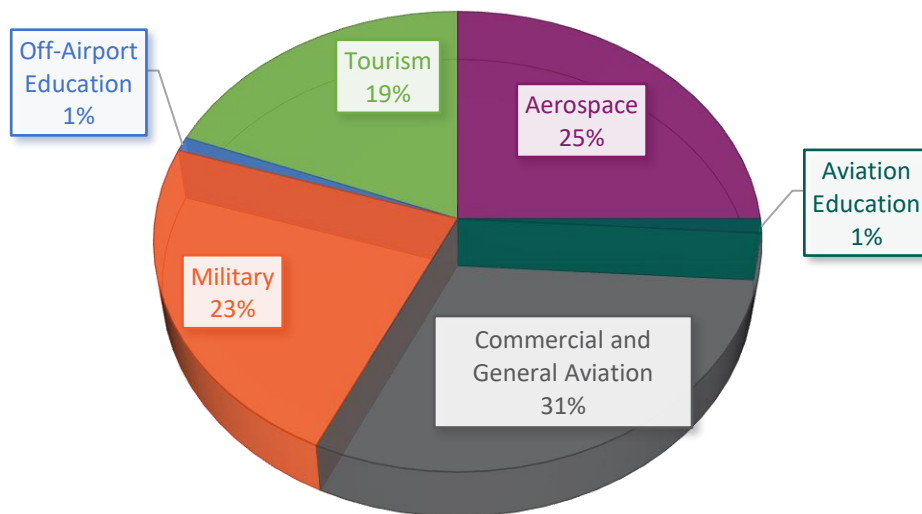

Figure 6. Economic Impact of Primary Components of Arizona's Aviation Industry by Percent of Total

Commercial Aviation

Arizona's commercial service airports provide the gateway for the majority of tourists traveling to the state and represent one of the largest economic impacts of the aviation industry. In total, the 2012 Economic Impact Study estimated that the 12 evaluated commercial service airports generate 125,000 jobs and $20.5 billion total economic impact in the state.[11] The major air carriers generate 40 percent of all jobs and 48 percent of the total economic activity, followed by air cargo and couriers with 22 percent of all jobs. Phoenix Sky Harbor International Airport (PHX) and Tucson International Airport (TUS) provide the largest share of the total impact. Between 2002 and 2011, 88 percent of all enplanements in the state occurred at PHX and eight percent occurred at TUS.

General Aviation

The 2012 Economic Impact Study reported that Arizona ranks fifth in the U.S. in the number of active aircraft and 12th in the number of aircraft per capita. Phoenix Deer Valley (DVT), Ernest A. Love Field (PRC), and Falcon Field (FFZ) are among the top ten busiest GA airports in the country. In 2011, DVT ranked as the busiest in the nation with over 300,000 operations. GA airports support recreational and flight training activity, as well as numerous services that support safety, resiliency, access, and mobility such as aerial firefighting, search and rescue operations, emergency medical transport, and law enforcement. In total, GA airports supports 6,860 jobs generating $261 million in wages with a total economic output of $609 million.

Aerospace

Aerospace is one of the state's most important industries with some of the world's largest aerospace companies conducting significant operations in the state include Boeing, General Dynamics, Honeywell, and Raytheon. Arizona's concentration of aerospace employment is 2.5 times greater than the average across the U.S. economy with salaries 52 percent higher than the state average. In total, aerospace supports 103,200 jobs with an annual payroll of $7.1 billion and total economic output of $20.4 billion.

Military

The State of Arizona is home to numerous military facilities with missions that range from regular fighter and transport aircraft operations to specialized Unmanned Aerial System (UAS) applications. Some of the larger and more specialized facilities include Davis-Monthan Air Force Base (AFB), Luke AFB, Libby Army Airfield, and Marine Corps Air State Yuma. While comprehensive information about economic activity at military installations in not available, Arizona's military presence results in an estimated total impact of 92,103 jobs, $3.8 billion in wages, and $7.6 billion in economic output.

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[11] The 2012 Economic Impact Study included 12 commercial service airports instead of the 11 included in the 2008 SASP and 2018 SASP Update. The 2012 study listed Kingman Airport (IGM) as commercial service airport; however, IGM does not currently offer scheduled commercial service and is therefore evaluated as a GA airport.

Aviation Education

Arizona has the second highest number of flight instructors per capita in the U.S., which is largely attributable to the state's excellent flying conditions. In addition to flight instruction, specialized aviation degree programs are offered at several institutions of higher education including Arizona State University, Cochise College, and Embry-Riddle Aeronautical University. In consideration of the international pilot shortage, demand for aviation professionals will continue to drive demand through the foreseeable future. In total, aviation education is reported to support 2,166 jobs generating $84.1 million in wages and $174 million in total economic activity.

Tourism

According to the 2012 Economic Impact Study, more than 9.9 million out-of-state visitors traveled to Arizona by air in 2011. Approximately 7.4 million visitors arrived via scheduled commercial service and spent an estimated $4.8 billion on lodging, dining, transportation, entertainment, and retail purchases. Another 2.5 million visitors were estimated to travel to Arizona by GA aircraft and spend an estimated $72.4 million. Together, the impact of visitors who traveled to Arizona by air resulted in 76,838 jobs, $2.6 billion in annual wages, and $8.1 billion in total economic output.

The Arizona Office of Tourism presented updated data on the economic impact of the state's travel industry in *Arizona Travel Impacts (1998-2016p).* According to the 2017 report, the travel industry had its second year of exceptionally strong growth by the end of 2016, following mostly modest growth following the recession of 2007 to 2009. The total number of domestic travelers visiting the state experienced 5.4 percent and 7 percent year-over-year growth in 2015 and 2016 (respectively). Concurrently, the foreign share of intra-U.S. travel declined almost a full percentage point from 2015 to 2016 (18.2 percent to 17.2 percent). Visitors also spent more than previous years: real travel spending annually increased 1.8 percent between 2009 and 2013. However, the number of visitors who arrived by air remained essentially flat between 2009 and 2013. In total, Arizona's travel industry resulted in a $9.2 billion gross domestic product in 2016.

Business Aviation

According to the 2012 Economic Impact Study, approximately 11 percent of all private businesses rely on aviation for business travel and 2.3 percent use aviation for air cargo shipments. These estimates equate to nearly 58,000 trips in a year and over 33,000 cargo shipments. Together, the value of the trips and shipments to the aviation industry totaled $49.2 million per year. Additionally:

1. 20 percent of businesses indicated that 50 percent or more of their business activity is dependent on the existence of an airport
2. 30 percent of businesses that utilize aviation reported that sales would decrease if a nearby airport was unavailable
3. 17 percent of airports said that would relocate if an airport was no longer available or commercial service was decreased
4. 37 percent of businesses that utilize aviation noted that they have customers, suppliers, and/or vendors that rely on aviation to do business with them. For large employers with more than 100 employees, that figure reaches 60 percent

Off-Airport Aviation

In the 2012 Economic Impact Study, the off-airport aviation industry indicator served as a category to account for air carrier-related business headquarters, call centers, and other air carrier business operations. Since that time, the U.S. Airways merged with American Airlines its headquarters was moved out of the state. As a result, this type of economic impact has been greatly reduced. At the time of the study, off-airport aviation supported 4,112 jobs generating $384.9 million in payroll with a total economic contribution of $466.8 million.

Considered together, the seven components of aviation activity in Arizona produced an estimated $3 billion in state and local taxes in 2011; that figure has likely only risen since the 2012 Economic Impact Study was completed. In short, Arizona's aviation industry produces significant economic impacts across the state and can have major impacts on local and regional economies. Arizona's airports should proactively work to provide the services and facilities that foster the success of these key aspects of aviation.

SUMMARY

This chapter provides an overview of the classification of Arizona's airports. The chapter first reviewed the FAA's classification methodology used by the NPIAS and provided an explanation of the ASSET classifications developed to capture the unique role of GA facilities in the NAS. While the federal classification methodologies are important on a national level, they are insufficient to describe the role airports play at the state level.

Following an evaluation of the existing role classification scheme developed during the 2008 SASP, the 2018 SASP Update developed a flow chart methodology tailored specifically to capture the unique functions that Arizona's airports provide on a state scale. This methodology offers a systematic process to objectively categorize Arizona's airports into six classifications primarily based on the type and volume of aviation activity that an airport supports. Facility and service objectives were identified for each classification to provide minimum development recommendations for airports. The chapter concluded by providing an overview of how airport classifications and the associated service and facilities objectives can be used to support the key components of Arizona's aviation industry.

The classifications established in this chapter will be used in later analyses to:

1. Assess the performance of the existing system
2. Evaluate the ability of Arizona's airports to function as a system
3. Identify areas of deficiency or overlap in aviation services
4. Prioritize recommendations based on areas of greatest need