

Airport Master Plan



SCOTTSDALE AIRPORT

— S D L —



DRAFT FINAL AIRPORT MASTER PLAN

FOR

SCOTTSDALE AIRPORT
City of Scottsdale, Arizona

PREPARED BY



March 2026

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Introduction





Introduction

The City of Scottsdale, Arizona owns and operates Scottsdale Airport (SDL). SDL is situated on 338 acres of property and is located approximately eight miles north of downtown Scottsdale. SDL serves as a reliever to Phoenix Sky Harbor International Airport, and it consistently ranks as one of the busiest airports in the state. The airport primarily serves corporate jet traffic, but it also experiences frequent charter activity, recreational flying, and flight training.

SDL is a vital infrastructure component that supports economic development and quality of life for residents in and around the Scottsdale area. In addition to connecting air travelers to the national and international airport system, the availability of air transport enhances public safety by supporting police operations and air ambulance services.

A master plan process is being undertaken at SDL to provide the Aviation Department with proper guidance for future development that will satisfy aviation demands while maintaining compatibility with the environment and communities that surround and support the airport.



WHAT IS A MASTER PLAN?

The Federal Aviation Administration (FAA) recommends that airports update their long-term planning documents every seven to 10 years, or as necessary, to address local changes at the airport. The last master plan update for SDL was completed in 2015. The Aviation Department has received a grant from the FAA to update the airport master plan.

The Aviation Department is responsible for coordinating capital improvements at SDL, as well as obtaining FAA and Arizona Department of Transportation – Aeronautics Department (AzDOT) development grants. In addition, the Aviation Department oversees all facility enhancements and infrastructure development projects conducted by private entities at the airport. The **master plan is intended to provide a 20-year vision of how SDL may be developed, guidance for future development, and justification for projects** the airport may receive funding for. Funding priorities will be outlined through an updated capital improvement program (CIP) to be included in this master plan.



The airport master plan follows a systematic approach outlined by the FAA to proactively identify airport needs ahead of the actual demand for improvements. This is done to ensure that the airport can coordinate environmental reviews, project approvals, design, financing, and construction to minimize the negative effects of maintaining and operating inadequate or insufficient facilities. An important outcome of the master plan process is a preferred development plan, which reserves sufficient areas for future facility needs. Such planning will protect development areas and ensure they will be readily available to meet future needs. The intended outcome of this study is a detailed airport land use concept that outlines specific uses for all areas of airport property, including strategies for revenue enhancement.

The preparation of this master plan demonstrates that the City of Scottsdale recognizes the airport's regional importance, along with the unique challenges involved in meeting its unique operating and improvement needs. The cost of maintaining an airport is an investment that yields impressive benefits to the local community. Equipped with a sound and realistic master plan, the airport can maintain its role as an important link to the regional, state, national, and global air transportation systems. Moreover, the plan will support informed decision-making to allocate the airport's limited and valuable resources for future airport development. Ultimately, continued investment in the airport will allow the City of Scottsdale to reap the economic benefits.

Some common questions regarding what a master plan is and is not are answered in the graphic below.

An Airport Master Plan is:	An Airport Master Plan is Not:
✓ A comprehensive, long-range study of the airport and all airside and landside components that describes plans to meet FAA safety standards and future aviation demand. ✓ Required by the FAA to be conducted every 7-10 years to ensure plans are up-to-date and reflect current conditions and FAA regulations. The last master plan was completed in 2015. ✓ Funded by the FAA through the Airport Improvement Program (AIP) at 91.06%, with the remainder split between the City of Scottsdale and the Arizona Department of Transportation – Aeronautics Department (ADOT). In addition, the city is funding an airport economic benefit analysis to be done concurrent with the master plan. ✓ A local document that will ultimately be presented for approval by the City of Scottsdale. The FAA approves only two elements of the Master Plan, which are the aviation demand forecasts and the Airport Layout Plan (ALP) drawing set. ✓ An opportunity for airport stakeholders and the general public to engage with the consultant and aviation department on issues related to the airport and its current and future operations, and potential environmental, socioeconomic impacts. Four (4) public information workshops will be conducted throughout the master plan process to facilitate this public outreach effort.	✗ A Code of Federal Regulations (CFR) Part 150 Noise Study. The airport's current noise abatement procedures can be found on the airport's website: https://www.scottsdaleaz.gov/scottsdaleairport/airport-noise. ✗ A guarantee that the airport will proceed with any planned projects. Master plans are guides that help airport staff plan for future airport development; however, the need/demand for certain projects may never materialize. ✗ A guarantee that the Scottsdale Airport or the FAA will fund any planned projects. Project funding is considered on a project-by-project basis, and requires appropriate need and demand. Certain projects may require the completion of a benefit-cost analysis. ✗ Environmental clearance for any planned projects. The master plan includes an environmental overview that identifies potential environmental sensitivities per the National Environmental Policy Act of 1969 (NEPA); however, most planned projects will require a separate NEPA study (Environmental Assessment/Categorical Exclusion) prior to construction.

WHO IS PREPARING THE MASTER PLAN?

The Aviation Department has contracted with the airport planning firm Coffman Associates, Inc. to undertake the airport master plan. Coffman Associates is an airport consulting firm that specializes in master planning and environmental studies. Coffman Associates will serve as the prime consultant responsible for all aspects of the master plan, including airport planning, environmental analysis, sustainability planning, land use planning, capital improvement planning, and the airport layout plan. Coffman Associates will lead the planning team, with support from the following firms:

- **Compass Rose Communication** | To coordinate public involvement, conduct public information workshops, develop meeting summary notes, write project website content, and write press releases.
- **Mead & Hunt** | To provide engineering support, primarily to offer insights into facility requirements and estimates of probable costs for projects included in the capital improvement program.
- **Quest Energy Group** | To develop an assessment of airport owned and operated facilities and the fixed base operator (FBO) facilities. Identify opportunities to improve energy efficiency.
- **SWCA Environmental Consultants** | To perform a cultural resource literature review.
- **Martinez Geospatial** | To provide aerial photography, ground survey, and GIS products to meet FAA 5300-18B requirements for Airports GIS data submittal.
- **Kimley-Horn** | To provide an economic benefit analysis of the economic impact of the airport.

The airport master plan update will be prepared in accordance with FAA requirements, including Advisory Circular (AC) 150/5300-13B, *Airport Design*, and AC 150/5070-6B, *Airport Master Plans*. The plan will be closely coordinated with other planning studies relevant to the area and with aviation plans developed by the FAA and AzDOT Aviation. The plan will also be coordinated with the City of Scottsdale, the Airport Advisory Commission, and other local and regional agencies as appropriate.

GOALS, OBJECTIVES, AND ASSUMPTIONS

The primary goal of this master plan is to establish a framework to guide future airport development that will cost-effectively satisfy aviation demand, while also accounting for potential environmental and socioeconomic impacts. Accomplishing this goal requires an evaluation of the existing airport to decide what actions should be taken to maintain a safe, adequate, and reliable facility. A long-range planning study also requires several baseline assumptions that will be used throughout the analysis. Specific objectives and assumptions for this study are as follows:

OBJECTIVES

- Follow FAA guidelines for development of an airport master plan.
- Incorporate sustainability analysis and measures throughout the master plan process and provide a sustainability program the airport can use to guide future decision making.
- Revisit existing FAA approved Modification of Design Standards (MODs) for the airfield.
- Determine the current critical aircraft and the implications of any change to the critical aircraft.
- Address all airfield geometry complexities to ensure FAA standards are achieved, where practical.
- Evaluate all runway and taxiway safety areas and analyze options for correcting non-standard conditions.
- Completion of an updated, AGIS-compliant aeronautical survey, in accordance with AC 150/5300-18B standards
- Identify the highest and best use of airport land, including the potential for redevelopment of facilities which are at the end of their useful life.
- Evaluate aircraft parking aprons and identify locations for apron expansion.
- Evaluate automobile parking needs and identify locations for parking expansion.
- Develop a new Airport Layout Plan (ALP) set of technical drawings per FAA's Standard Operating Procedures (SOP) 2.0.
- GA expansion planning (hangars, taxilanes, and apron)
- Consider potential impacts to ATCT line-of-sight during landside development analysis.
- Develop a new Exhibit A - Airport Property Inventory Map per FAA's Standard Operating Procedures (SOP) 3.00 requirements.
- Locate potential areas where eVTOL and Advanced Air Mobility (AAM) activities and facilities are best suited.
- Analyze SDL's economic benefit and impact.
- Maintain a fully transparent process wherein all airport stakeholders and the public can be involved.

ASSUMPTIONS

- SDL will continue to accommodate the diverse needs of general aviation users.
- Scheduled commercial passenger service will not be considered for SDL within the 20-year scope of this master plan.
- This master plan is not a noise study.
- The aviation industry will develop throughout the planning period as projected by the FAA. Specifics of projected changes in national aviation industries are described in Chapter Two – Aviation Demand Forecasts.
- The socioeconomic characteristics of the region will generally change as forecast (see Chapter Two).
- A federal and state airport improvement program will be in place throughout the planning period to assist in funding future capital development needs.

MASTER PLAN ELEMENTS AND PROCESS

The master plan has 11 elements designed to assist in the evaluation of future facility needs and to provide the supporting rationale for their implementation. **Exhibit iA** graphically depicts the study process.

Element 1 – Study Initiation, Organization and Project Management includes the development of the scope of services, schedule, and study website. The planning advisory committee (PAC) is also established at this stage, comprised of various airport stakeholders that will serve as advisors throughout the master plan process. General background information, including an outline of the master plan’s goals and objectives, will be established.

Element 2 – Inventory of Existing Conditions is focused on collecting and assembling relevant data pertaining to the airport and the area it serves. Information is collected on existing facilities and operations. Local economic and demographic data is collected to define the local growth trends, and environmental information is gathered to identify potential environmental sensitivities that might affect future improvements. Planning studies which may have relevance to the master plan are also collected. An AGIS 18B Survey/Obstruction Analysis will be conducted, including the acquisition of new aerial mapping (topographic/planimetric) of the airport and its surrounding environment.

Element 3 – Aviation Demand Forecasts examines the potential aviation demand at SDL. The analysis utilizes local socioeconomic information and national air transportation trends to quantify the levels of aviation activity which can reasonably be expected to occur at SDL over a 20-year period. An existing and ultimate critical design aircraft, based upon AC 150/5000-17, *Critical Aircraft and Regular Use Determination*, is also established to determine future planning design standards. The results of this effort are used to determine the types and sizes of facilities needed to accommodate the projected aviation demand at the airport throughout the planning period. This element is one of two elements that are submitted to the FAA for approval.

Element 4 – Facility Requirements determines the available capacities of various facilities at the airport, assesses their compliance with FAA standards, and identifies what facility updates or additions will be necessary to comply with FAA requirements and/or the projected 20-year demand.

Element 5 – Airport Development Alternatives considers a variety of solutions to accommodate projected airside and landside facility needs throughout the long-term planning period. An analysis is completed to identify the strengths and weaknesses of each proposed development alternative, with the goal of selecting a single direction for development. The airspace around SDL will also be evaluated during this element, aiming to assess the feasibility of improving the instrument approach procedures at the airport. Consideration towards including facilities to accommodate Advanced Air Mobility (AAM) and Electric Vertical Takeoff and Landing (eVTOL) aircraft will also be included within Element 6.

Element 6 – Recommended Master Plan Concept provides both a graphic and narrative description of the recommended plan for the use, development, and operation of the airport. This includes both airside and landside recommendations, as well as on-airport land use classifications.

Element 7 – Capital Improvement Program (CIP) and Financial Plan recommends a 20-year capital program for SDL, analyzing the benefits and costs associated with the recommended master plan described in Element 6. Specific costs are established for each project, ensuring logical staging of improvements. Potential funding sources are also identified, as well as a financial plan that focuses on overall annual operating revenues and expenses.

Element 8 – Environmental Evaluation includes a baseline environmental inventory, with consideration given to resource categories within FAA Order 1050.1F, *Desk Reference*. Additionally, a recycling plan and environmental overview will be prepared that will identify potential environmental issues associated with the recommended concept; this includes mitigation measures that may be necessary for proposed projects. The public airport disclosure map, a required element for Arizona airports, will also be included.

Element 9 – Sustainability Management Plan is a significant element of the master plan and will be integrated throughout the master planning process. This element will include a GHG emissions inventory, an energy assessment of select airport buildings, a recycling plan, establishment of sustainability goals and targets, as well as an implementation and monitoring plan for use into the future.

Element 10 – Airport Layout Plans is the preparation of the official Airport Layout Plan (ALP) drawings based on the recommended development concept. The ALP set is used by the FAA for determining grant eligibility. This element is the second element of the study that is submitted to the FAA for approval. The ALP will be developed in accordance with the FAA's SOP 2.00, *Standard Procedure for FAA Review and Approval of Airport Layout Plans*. The Exhibit A Property Map will be developed in accordance with the FAA's SOP 3.00, *Standard Procedure for FAA Review of Exhibit 'A' Airport Property Inventory Maps*.

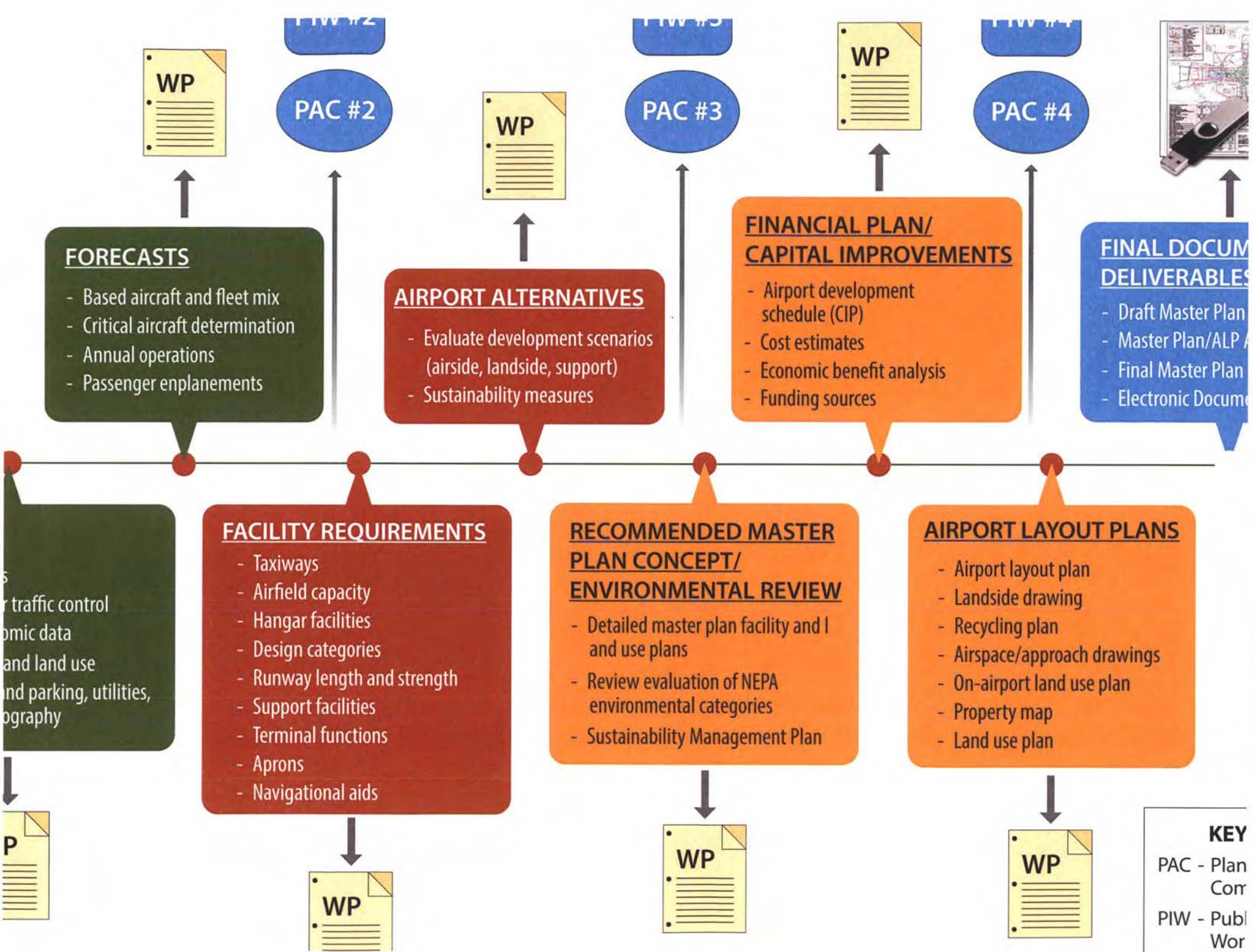
Element 11 – Public Involvement includes meetings with the planning advisory committee (PAC) as well as other public/administrative presentations. These meetings are held at various project milestones to update airport stakeholders on the progress of the master plan, as well as to request input from the committee on the development of the planning study. Additionally, public information workshops are planned to educate and connect with the public, ensuring an open and transparent planning process. Additional public presentations will be made to the Airport Advisory Commission and City Council.

COORDINATION AND OUTREACH

This study is of interest to many within the surrounding community and region. This includes local citizens, local businesses, community organizations, city officials, airport users/tenants, and aviation organizations. As a component of the regional, state, and national aviation systems, SDL holds significance for both state and federal agencies responsible for overseeing the air transportation system.

A planning advisory committee (PAC) has been established to assist in the development of the master plan. PAC members will meet up to four times at designated points during the study to review study materials and provide comments to help ensure that a realistic, viable plan is developed.

Draft working paper materials will be prepared at various milestones in the planning process. The working paper process allows for timely input and review during each step of the master plan to ensure that all issues are fully addressed as the recommended program develops.



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A series of four open-house public information workshops is also planned as part of the study coordination and outreach efforts. Workshops are designed to allow all interested persons to learn about and provide input on the master plan process. Notices of meeting times and locations are advertised through local media outlets. All draft working papers, reports, meeting notices, and materials will be made available to the public on a study-specific website: <https://scottsdale.airportstudy.net>.

SWOT ANALYSIS

A SWOT analysis is a strategic business planning technique used to identify **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats associated with an action or plan. This technique involves identifying an action, objective, or element, and then identifying the internal and external forces that are positively and negatively impacting that action, objective, or element in a given environment. A SWOT analysis was conducted at the first PAC meeting, the findings of which are summarized in **Table iA**.

TABLE iA | SDL SWOT Analysis

STRENGTHS	• Central location • Robust community investment • Reputation as the premier business aviation hub • Strong international brand • U.S. Customs processing • Excellent facilities • Strong airport management team • Clean airport • Good flying weather	• Strong political support for the airport • Availability of sustainable aviation fuels (SAFs) • Three world class FBOs • Robust public involvement program for MP • Transparency • Community events (movie night) • Condition of airport pavements • Airport/Tracon/ATCT relationship
WEAKNESSES	• Limited land for development • Lack of auto parking • Lack of aircraft parking apron • Need more hangars • Limit to size of aircraft that can use the airport • Some airpark facilities are not aeronautical	• Airspace traffic flow • Constraints to facility growth • Meeting airport design standards (FAA) • Wingspan and weight limits • Getting from one side of SDL to the other • Instrument approach capability (need straight-in)
OPPORTUNITIES	• Promoting the economic benefits • Capitalize on uptick in international interest • Implementing sustainability initiatives • Availability of air travel through a general aviation airport • Redevelopment of older facilities	• New chip plant (and other businesses) in the area • Sustainability is a great opportunity • Increase in transient operations • Airpark development momentum
THREATS	• Competition from other airports • Growth plans of other airports • Other airports are striving to be "Scottsdale" • Airport design standards should align with activity • No straight-in instrument approaches (RNP only) • Congested airspace	• Changing economic climate • Land locked • Airfield capacity • PHX operations get priority • Northeast flight training area • Residential noise concerns



SCOTTSDALE AIRPORT

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Chapter 1 Inventory



Chapter 1

Inventory



The initial step in the preparation of the master plan for Scottsdale Airport (SDL) is the collection of information that directly pertains to or influences the airport and the area it serves. The information summarized in this chapter will be used in subsequent analyses within this study, including the following:

- Background information related to the City of Scottsdale, Maricopa County, and the service area region, including descriptions of the local geography, regional climate, and surface transportation systems
- Physical inventories and descriptions of current facilities and services offered at SDL; the analysis includes airfield and landside infrastructure and services, local and regional airspace, competing airport facilities, air traffic control, and aircraft operating procedures
- SDL's role in regional, state, and national aviation systems; development at the airport since the completion of the previous master plan (2015) will also be discussed



Socioeconomic data will be analyzed, including population, employment, and income activity sectors. These sectors typically offer an indication of future trends that could influence aviation activity at SDL. The inventory analysis also includes the following:

- A review of existing local and regional plans and studies, which will be utilized later in the process to determine their potential influence on the development and implementation of this sustainable airport master plan
- A review of existing environmental conditions and sensitivities on or near SDL to be factored into the recommended development plan

The information outlined in this chapter provides a foundation for all subsequent chapters. Much of the information was obtained through on-site inspections of SDL and interviews with airport staff, control tower staff, commercial operators, and other tenants. Information was also obtained from outside resources, including documents prepared by the Federal Aviation Administration (FAA), Arizona Department of Transportation (ADOT), City of Scottsdale, Maricopa County, and other pertinent regional planning and economic development agencies.

REGIONAL SETTING

The City of Scottsdale is a suburb of Phoenix, Arizona. As of 2024, Scottsdale is home to 244,000 people and the greater Phoenix region contains 5.1 million people. Scottsdale is situated to the north and east of downtown Phoenix. The city encompasses 184 square miles and is bordered by Phoenix to the west, Tonto National Forest to the north, the McDowell Mountains to the east, and the Salt River to the south. Scottsdale is a desert city known for its spa resorts, golf courses, and outdoor activities, as well as the relatively high wealth of its residents. **Exhibit 1A** presents the regional setting for Scottsdale.

REGIONAL ECONOMY

The tourism industry is Scottsdale's primary employment sector and accounts for 39 percent of the city's workforce. Scottsdale is home to more than 60 hotels and resorts with a combined total of more than 12,000 rooms. The region's year-round warm weather and abundant sunshine are major factors in Scottsdale's tourism appeal. Scottsdale has a diverse economy with significant employment in healthcare, manufacturing, retail, financial and professional service sectors. **Table 1A** shows the top 10 employers in Scottsdale as of 2024.



TABLE 1A | City of Scottsdale Top 10 Employers

Employer	Number of Employees
HonorHealth	6,323
Vanguard	3,365
CVS	2,978
City of Scottsdale	2,694
Scottsdale Unified School District	2,668
General Dynamics	2,403
Mayo Clinic	2,011
Nationwide	1,240
Yelp	1,200
Go Daddy	882

Source: www.AZCentral.com

AIRPORT/AIRPARK ECONOMIC IMPACT

Airports are a significant economic engine for any region. SDL is especially impactful because it does not only provide aviation services but also supports area businesses. In 2021, the ADOT Aeronautics Department commissioned a statewide airport economic impact study, which documented that the Scottsdale Airport/Airpark accounted for more than \$1.0 billion in annual economic impact as shown in Figure 1-1.

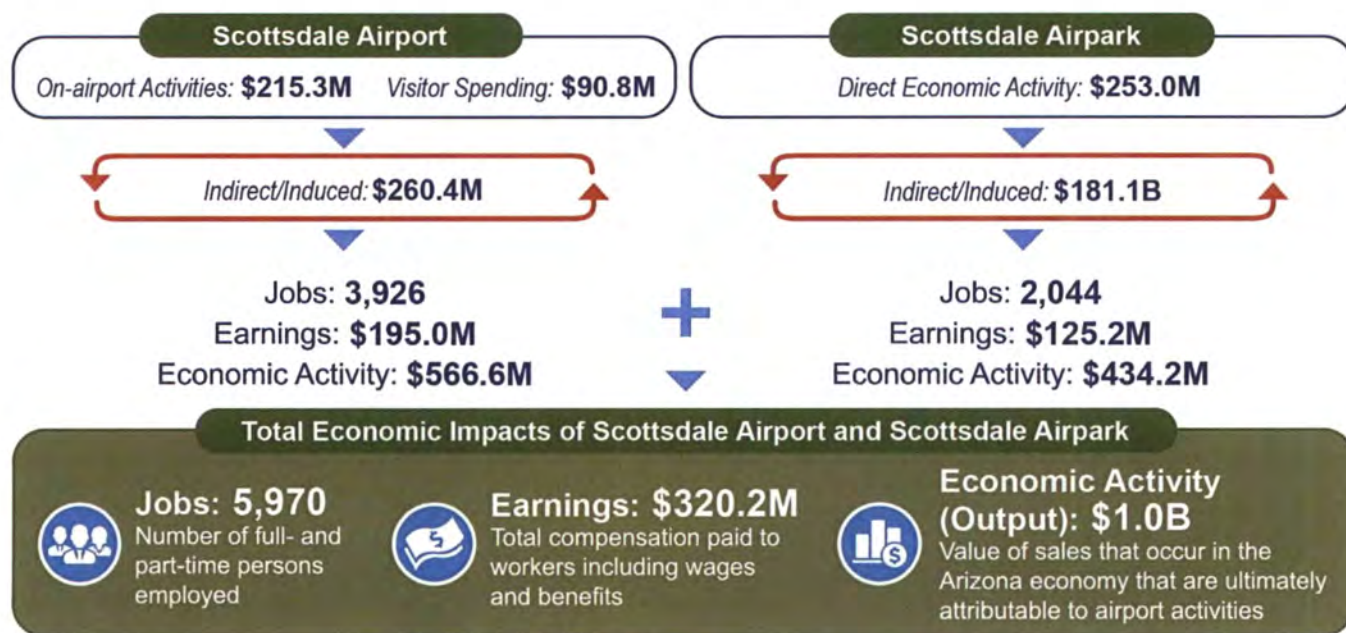


Figure 1-1: Airport/Airpark Economic Impact 2021

AIRPORT TENANTS

Table 1B lists the major tenants that operate from the airport. There are three full-service fixed base operators at SDL.

TABLE 1B | Airport Businesses

Business Name	Type
Atlantic Aviation	Fixed Base Operator
Jet Aviation	Fixed Base Operator
Signature Aviation	Fixed Base Operator
Elevage Flight Travel; Elite Flight Jets; Legacy Jets; PrismJet; Jet Pros, Jet Linx; Alpha Jet; Pinnacle Air Charter; M&N Aviation; JSX; GrandView Aviation; NetJets; Western Sky Helicopters; AD ASTRA; Fly House; All Access Jets; H5 Helicopters	Aircraft Charter Services
Cirrus Aircraft; GGR Aviation; Universal Helicopters; Sierra Charlie Aviation; Flightworks; Leopard Aviation; Scottsdale Executive Flight Training; Legacy Flight Training; ATP; American Flyers; Plus Five	Aircraft Maintenance & Repair
Arizona Aircraft Interior Design	Specialized Aircraft Repair
Duncan Aviation	Avionics Sales/Repair
Cirrus Aircraft; GGR Aviation; Universal Helicopters; Sierra Charlie Aviation; Flightworks; Leopard Aviation; Scottsdale Executive Flight Training; Legacy Flight Training; ATP; American Flyers; Plus Five	Flight Training and Aircraft Rentals
Great American Hangar; 7689 LLC; Building D LLC; CWIE Management Resources; Jon Vesely Revocable Trust; Astor Airpark Holdings; Sky Harbor Leasing; Aire Lane; Hangar Three; Larry Coffey; Scottsdale Hangar One; Signature Aviation Private Hangars; BCO; Development Services; Graystar Corp; Visionmakers Intl.; Pacific Marine Management; Southwest Jet Center; CC Office LLC; Wallace Holdings; Watts Investments LLC	Hangar Leasing
Lake Chef Services; Emily's Events; Volanti Private Jet Catering; Square One Concepts; Air Culinaire Worldwide; Cater AZ Jets; AtYourJet; GAT Airline Ground Support	In-Flight Catering
Hertz; Avis; Enterprise; Go Rentals; Alamo/National	Rental Car/Transportation
American Flight Support; C Wright Aviation, LLC; WC Aviation; Southwest Aero; Mackin Aviation; Luxury Aero Collection; ACE Aircraft Sales; Jet Fleet	Aircraft Sales
Bradley Mack Aviation; Executive Jet Management; J&S Aviation; Siglo Aviation; Business Aircraft Management	Aircraft Management
Prime Appearance; Aero Panache; West Coast Wash Station; JB's Executive Detailing; SkyLuxe Aircraft Detailing; Sparrowhawk Mobile Detailing; Time for Sale	Aircraft Cleaning & Detailing
SunState Helicopters	Tours/Photo Flights
Note: Current as of 2/14/25	

SURFACE ROAD ACCESS

The airport is the central feature of land that is zoned for industrial use. East Butherus Drive is the main airport entrance road and extends from an intersection with Scottsdale Road to the west of the airport. Frank Lloyd Wright Boulevard extends on the north side of the airport and Arizona State Route 101 passes to the east of the airport.

AIRPORT ADMINISTRATION

The Aviation Department of the City of Scottsdale operates Scottsdale Airport. The department is run by professional airport staff that manages day-to-day operations and capital development projects for SDL. The Airport Director supervises a staff of 14 people. **Exhibit 1B** shows the airport organization chart.

An Airport Advisory Commission has been established to advise the city council on policy matters relating to the operation of the airport, proposals for development, airport area land use, fees, and safety concerns. The city council appoints seven commission members to serve three-year terms. The Airport Advisory Commission acts in an advisory capacity and any recommendations made are considered by the city council. The commission meets with airport staff on the third Wednesday of every month.

The airport is operated strictly as an enterprise fund. It does not accept, utilize, or compete for revenues or other financial resources of the City of Scottsdale's general fund. As such, the airport is not financially supported by local sales tax, property tax, or other special assessment taxes for its operation, maintenance, or capital improvement. All operating revenue and capital funding for the airport are derived from operating and lease revenues and federal and state grants.

REGIONAL CLIMATE

Weather conditions are important to the planning and development of an airport. Temperature is an important factor in determining runway length requirements, while wind direction and speed are used to determine optimum and adequate runway orientation. The need for navigational aids and lighting is determined by the percentage of time visibility is impaired due to cloud coverage or other conditions.

In Scottsdale, the summers are sweltering and dry, the winters are cool, and it is mostly clear year-round. Over the course of the year, the temperature typically varies from 44°F to 106°F and is rarely below 36°F or above 111°F. The highest average monthly high temperature is 104.1°F, which occurs in July. **Table 1C** summarizes 30 years of climate data sourced from the on-airport weather sensor.

City of Scottsdale
Aviation Department - Scottsdale Airport

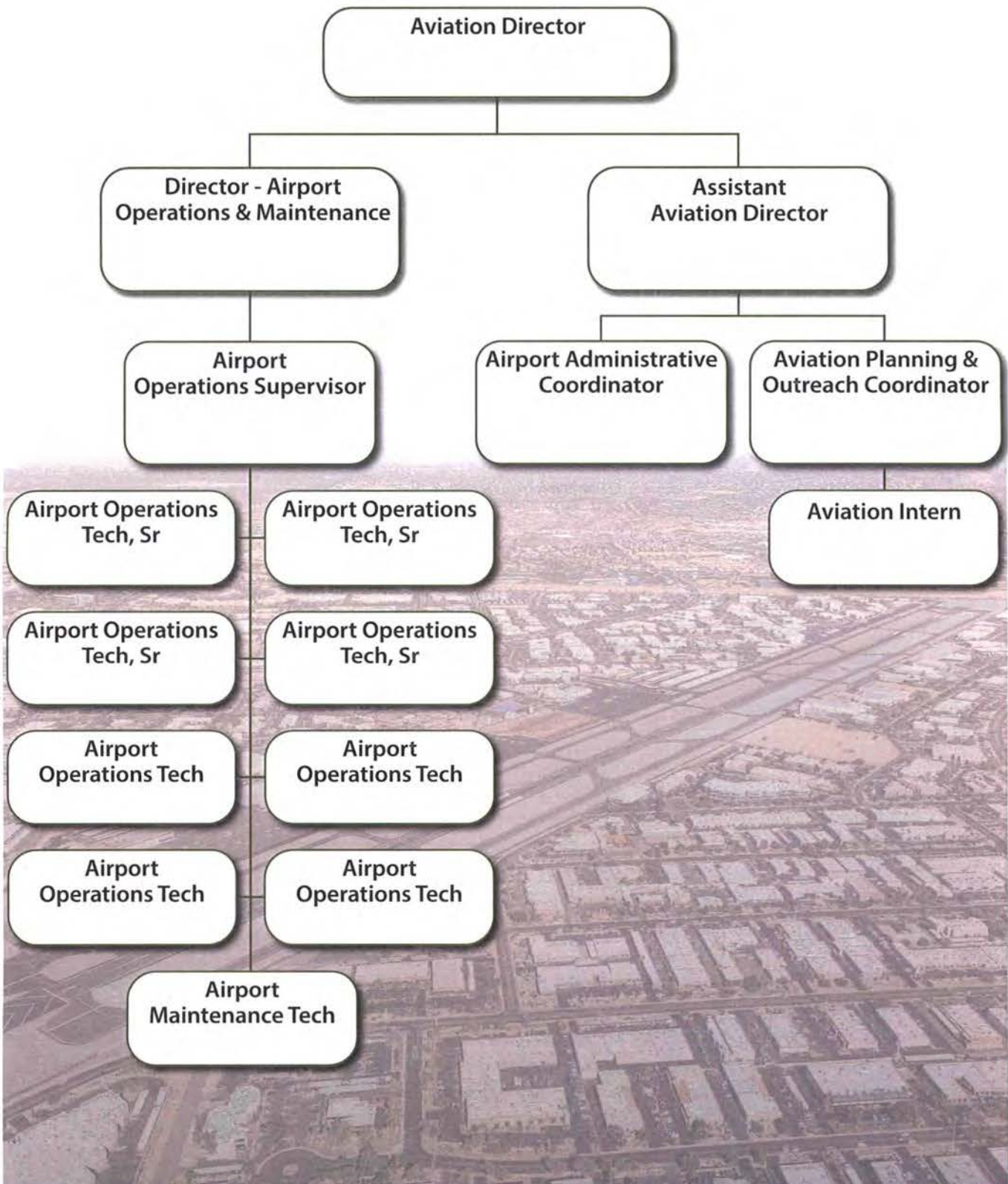


TABLE 1C | 30-Year Climate Data Averages

Period	Average Precipitation (inches)	Average Daily High Temp (°F)	Average Daily Low Temp (°F)
January	1.11	66.5	43.4
February	1.24	68.7	46.0
March	1.10	75.7	51.7
April	0.34	82.8	58.3
May	0.16	91.8	66.7
June	0.05	102.0	76.2
July	0.90	104.1	82.6
August	0.83	102.9	81.8
September	0.60	98.2	75.3
October	0.62	87.3	62.7
November	0.79	74.8	50.6
December	0.99	64.6	42.5

Source: National Oceanic and Atmospheric Administration, Climatology of the U.S., No. 81, 30 years of data from 1991-2020, as sourced from the on-airport automated surface observation system

VICINITY AIRPORTS

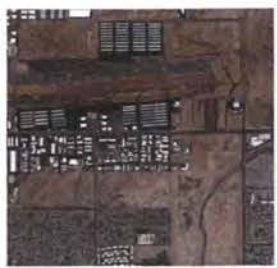
The greater Phoenix area is rich in aviation services. The year-round good weather is a significant benefit to aviation in the region. Every quadrant of the region is served by a general aviation airport and Phoenix Sky Harbor International Airport (PHX) is the centrally located anchor commercial service airport. Mesa Gateway Airport has emerged in recent decades as a viable additional commercial service airport in the southeast quadrant of the region.

It is important to consider the capabilities and limitations of these airports when planning for future improvements at Scottsdale Airport. In an urban setting, airports within 30 nautical miles (nm) of each other can have some influence on the activity of the other airport.

Exhibit 1C provides information about the airports within 30 nm of SDL, including the facilities available, the services they provide, and the operational levels they experience. Information pertaining to each airport was obtained from FAA Form 5010-1, *Airport Master Record*.

From this analysis of public-use airports in the region, it is evident several facilities serve the needs of all types of aviation activity. Phoenix Sky Harbor International Airport and Mesa Gateway Airport primarily cater to scheduled commercial airline activity and large corporate jets. Mesa Gateway Airport also provides facilities and services that accommodate smaller general aviation aircraft. Except Stellar Airpark, the other airports provide an array of services that cater to general aviation needs, including some business jets. The available runway lengths of Falcon Field Airport, Stellar Airpark, and Chandler Municipal Airport are limiting factors for larger general aviation aircraft, including business jets.

Despite the nearby presence of several aviation facilities, Scottsdale Airport is well-positioned due to the full range of services offered at the airport and in the community. In addition, SDL has one of the longest runways in the region, which allows it to support general aviation activity ranging from small single-engine piston-powered aircraft up to large corporate jets. Each vicinity airport has unique qualities that may serve a specific segment of aviation; these factors must be carefully considered in determining the service area for Scottsdale Airport, which will be discussed in the next chapter.

	Distance from SDL: 12 nm Southwest NPIAS Classification: Primary Commercial Service GA Asset Classification: None Primary Runway: 8-26 Length: 11,489' Width: 150' 	Distance from SDL: 13 nm Southeast NPIAS Classification: Reliever GA Asset Classification: Regional Primary Runway: 4R-22L Length: 5,101' Width: 100' 	Distance from SDL: 19 nm South NPIAS Classification: None GA Asset Classification: None Primary Runway: 17-35 Length: 3,913' Width: 60'
os. DWL; 255,000 lbs. DTWL Maintenance, Hangars, er, Instruction, Rental, Sales 7R 25L	Surface Type / Condition: Concrete / Good Strength Rating: 30,000 lbs. SWL; 200,000 DWL; 400,000 lbs. DTWL; 620,000 lbs. DDTWL Marking: Precision Runway Lighting: HIRL Nav aids: PAPI-4; REILs; MALSR; MALSF Based Aircraft: 68 Annual Operations: 450,204 Annual Enplanements: 18,439,079 (domestic) Services Provided: Scheduled Airlines, Fuel (100LL & Jet A), Hangars, Maintenance, Tiedowns, Air Ambulance, Avionics, Cargo, Charter, Sales Instrument Approaches: Multiple ILS or LOC Multiple RNAV (GPS)	Surface Type / Condition: Asphalt / Good Strength Rating: 38,000 lbs. SWL; 60,000 lbs. DWL; 90,000 lbs. DTWL Marking: Non-precision Runway Lighting: MIRL Nav aids: PAPI-2; REILs Based Aircraft: 611 Annual Operations: 190,605 Services Provided: Fuel (100LL and Jet A), Maintenance, Air Ambulance, Avionics, Charter, Instruction, Rental, Sales Instrument Approaches: RNAV (GPS) Rwy 4L RNAV (GPS) Rwy 4R RNAV (GPS)-B	Surface Type / Condition: / Strength Rating: N/A Marking: Basic Runway Lighting: MIRL Nav aids: PAPI-2 ; REILs Based Aircraft: 161 Annual Operations: 39,000 Services Provided: Aircraft Instrument Approaches: V
port (GEU)	Chandler Municipal Airport (CHD)	Mesa-Gateway Airport (IWA)	Phoenix Go
	Airport Sponsor: City of Chandler Distance from SDL: 22 nm Southeast NPIAS Classification: Reliever GA Asset Classification: Regional Primary Runway: 4R-22L Length: 4,870' Width: 75' 	Airport Sponsor: Phoenix-Mesa Gateway Airport Authority Distance from SDL: 23 nm Southeast Airport Classification: Primary Commercial Service GA Asset Classification: None Primary Runway: 12R-30L Length: 10,401' Width: 150' 	Airport Sponsor: City of Phoenix Distance from SDL: 26 nm Southwest NPIAS Classification: Reliever GA Asset Classification: Regional Primary Runway: 13-21 Length: 8,501' Width: 150'
os. DWL Maintenance, Hangars, er, Instruction, Rental, Sales 1 19	Surface Type / Condition: Asphalt / Good Strength Rating: 30,000 lbs. SWL Marking: Non-precision (4R); Basic (22L) Runway Lighting: MIRL Nav aids: PAPI-4; REILs Based Aircraft: 333 Annual Operations: 197,427 Services Provided: Fuel (100LL & Jet A), Maintenance, Hangars, Tiedowns, Agriculture, Avionics, Charter, Instruction, Rental, Sales Instrument Approaches: RNAV (GPS) Rwy 4R VOR Rwy 4R NDB Rwy 4R	Surface Type / Condition: Concrete / Good Strength Rating: 55,000 lbs. SWL; 95,000 lbs. DWL; 185,000 lbs. DTWL; 550,000 lbs. DDTWL Marking: Precision Runway Lighting: HIRL Nav aids: PAPI-4; REILs Based Aircraft: 128 Annual Operations: 157,915 Annual Enplanements: 693,543 Services Provided: Scheduled Airlines, Fuel (100LL & Jet A), Hangars, Maintenance, Tiedowns; Air Ambulance, Cargo, Charter, Instruction, Rental Instrument Approaches: ILS or LOC Rwy 30C Multiple RNAV (GPS) VOR or TACAN Rwy 30C	Surface Type / Condition: / Strength Rating: 75,000 lb: Marking: Basic Runway Lighting: MIRL Nav aids: PAPI-2; REILs Based Aircraft: 223 Annual Operations: 144,17 Services Provided: Fuel (10 Tiedowns, Instruction Instrument Approaches: Rf

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AIRPORT HISTORY AND BACKGROUND

AIRPORT HISTORY

Scottsdale Airport opened on June 22, 1942, as Thunderbird Field II, a basic training facility for World War II (WWII) U.S. Army Air Corps pilots. Thunderbird Field II graduated more than 5,500 students and was deactivated in October 1944.

After the war, the Arizona State Teachers College (now Arizona State University in Tempe, Arizona), acquired the airport to implement an aviation and flight training program. The distance from the college campus and the cost of operating an aviation program led the college to abandon its plans.

The Arizona Conference of Seventh Day Adventists purchased the airport in 1953 and established Thunderbird Academy. Former barracks became dormitories and hangars were adapted to house a wood products industry and a vocation education center that offered training in mechanics, woodworking, and welding. The airfield itself became a training field for missionary pilots. In 1963, an industrial park was established surrounding the airport.

The City of Scottsdale acquired the airfield portion of the academy's property in 1966 and has continued to own and operate it since that time. The first fixed base operator began operation at SDL in April 1967. The first airpark tenant, Casa Precision, broke ground for its first building unit in August 1968. By December 1969, 127 aircraft and 20 helicopters were based at Scottsdale Airport.



Scottsdale Airport Circa 1990

The Aviation Business Center at SDL was built in 2018 and features a Stearman (a historic aircraft similar to those flown during WWII), which is the centerpiece of the Thunderbird Field II Veterans Memorial.

Approximately 166,000 takeoffs and landings occurred at SDL in 2024, making it one of the premier single-runway general aviation airports in the country and one of the busiest corporate jet facilities in the state.

GREATER SCOTTSDALE AIRPARK AREA

The Scottsdale Airpark area is one of the largest employment centers in the State of Arizona. It is the headquarters for a multitude of national and regional corporations; includes a variety of smaller and locally owned businesses; contains the largest employment and industrial-zoned area within Scottsdale; and is home to Scottsdale Airport. The Greater Airpark Growth Area is the location of some of the largest signature special events in the city, such as the Waste Management Phoenix Open golf event, the Barrett-Jackson collector car auction, and the Scottsdale Arabian Horse Show. **Figure 1-2** shows the greater Scottsdale Airpark area.

In 1980, the Scottsdale Airpark area accounted for 3,320 employees, 1.5 million square feet of buildings, and 268 companies. By 2023, the Scottsdale Airpark area had $\pm 66,000$ employees, ± 48.0 million square feet of buildings, and $\pm 3,339$ companies, according to a report published annually by Colliers International, a commercial real estate firm. By 2030, the Scottsdale Airpark is projected to contain more than 70,000 employees, 50 million square feet of building space, and upwards of 3,600 companies.

The Scottsdale Airpark, the 2,600-acre commercial/industrial area surrounding the airport, has become a national model for airport-based business parks. The Scottsdale Airpark is the second largest employment center in the state and supports approximately 59,000 jobs. Approximately 140 properties within the Scottsdale Airpark have taxilane access to the airfield (shown on **Exhibit 1D**). Six controlled-access gates provide access to and from the Scottsdale Airpark; an airpark tenant can apply for a gate access device and pay a fee for the ability to access the airfield.



Figure 1-2: Greater Scottsdale Airpark Area



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AIRPORT GRANT HISTORY

The federal government makes significant levels of funding available for eligible capital improvements to airports across the country. The primary funding mechanism is through the Airport Improvement Program (AIP). The AIP is funded through the Aviation Trust Fund, which was established in 1970 to provide funding for aeronautical capital investment programs (i.e., aviation development, facilities and equipment, and research and development). The Aviation Trust Fund also finances a portion of FAA operations. The AIP is funded by user fees, such as taxes on airline tickets, aviation fuel taxes, and taxes on the sales of various aircraft parts and equipment.

The AIP provides entitlement funding to general aviation airports and airports with passenger service based on annual passenger enplanements (boardings). The AIP also has a pool of discretionary funding that is distributed based on the priority rankings of proposed projects.

Airports have recently been eligible for additional funding through several programs passed by U.S. Congress to blunt the negative impact of the COVID-19 pandemic. The *CARES Act* provided immediate funding to airports, which temporarily increased the federal share of AIP projects from 90 percent to 100 percent in 2020; this was a one-time program. U.S. Congress then passed the *Coronavirus Response and Relief Supplemental Appropriation Act* (CRRSAA) (Public Law 116-260), which provided additional funding for airports, and the *Infrastructure Investment and Jobs Act* (Public Law 117-58; also referred to as the *Bipartisan Infrastructure Law* [BIL]), which invests an additional \$25 billion into airport infrastructure.

The State of Arizona has long recognized the value and importance of the airports in the state and has established several funding mechanisms to support capital improvements for airports in the state. The ADOT Aeronautics Department is responsible for prioritizing and distributing funds for airport projects through the State Aviation Fund. The State Aviation Fund received approximately \$23.4 million in 2022 from aviation fuel taxes, flight property taxes, aircraft registration fees, airport loan payments, and investment interest.

Exhibit 1E summarizes capital improvement funding the airport has received from federal and state sources. SDL has received more than \$45 million from the federal government and \$3.5 million from the state.

HISTORICAL AERONAUTICAL ACTIVITY

The number of based aircraft and annual operations (takeoffs and landings) in aggregate and by aircraft type are important aeronautical activity measures to factor. These indicators will be used in subsequent analyses to project future aeronautical activity and determine future facility needs for SDL. Each activity segment is briefly described below. **Exhibit 1F** summarizes the last 10 years of these activity statistics.

AIRCRAFT OPERATIONS

Aircraft operations are classified as either local or itinerant. Local operations mostly consist of training flights conducted in the airport traffic pattern, such as touch-and-go training and practice instrument approaches. Itinerant operations are conducted by arriving or departing aircraft with origins or destinations away from the airport.

Aircraft operations are further classified into four general categories: air carrier, air taxi, general aviation, and military. There are no air carrier operations at SDL. Air taxi operations can include charter service aircraft operations, as well as general aviation-type aircraft for the on-demand commercial transport of persons and property in accordance with 14 CFR Part 135 and Subchapter K of 14 CFR Part 91. General aviation operations are all non-military operations including private, business, and charter aviation.

There were 166,585 operations at SDL in 2024.

Table 1D shows the range of operational levels at SDL since 2010. There were 166,585 operations in 2024.

TABLE 1D | Airport Operations

Year	ITINERANT OPERATIONS				LOCAL OPERATIONS			Total Operations
	Air Taxi	General Aviation	Military	Subtotal	General Aviation	Military	Subtotal	
2010	12,250	69,767	365	82,382	51,055	78	51,133	133,515
2011	12,974	73,304	580	86,858	54,620	162	54,782	141,640
2012	14,531	70,719	530	85,780	60,234	78	60,312	146,092
2013	14,902	75,045	802	90,749	51,567	44	51,611	142,360
2014	15,594	74,710	1,115	91,419	58,830	170	59,000	150,419
2015	15,362	77,281	824	93,467	54,158	128	54,286	147,753
2016	15,404	83,950	593	99,947	58,270	78	58,348	158,295
2017	15,000	93,124	577	108,701	59,368	62	59,430	168,131
2018	15,304	87,810	731	103,845	62,245	101	62,346	166,191
2019	16,513	89,634	606	106,753	79,743	18	79,761	186,514
2020	23,150	87,161	316	110,627	85,160	65	85,225	195,852
2021	35,805	78,906	436	115,147	48,880	24	48,904	164,051
2022	47,734	84,200	481	132,415	40,298	34	40,332	172,747
2023	55,587	74,486	541	130,614	45,204	8	45,212	175,826
2024	66,178	64,608	320	131,106	35,478	4	35,482	166,588

Source: FAA Operations Network (OPSNET)

	Entitlement	Discretionary	SA/ARPA	BIL/AIG	Grand Total
oad	\$394,250	-	-	-	\$394,250
oron Lighting	-	\$3,794,217	-	-	\$3,794,217
	\$1,232,693	-	-	-	\$1,232,693
	\$326,307	\$1,673,693	-	-	\$2,000,000
dy	\$273,738	-	-	-	\$273,738
	\$69,233	\$584,863	-	-	\$654,096
ron (32,680sy)	\$1,892,097	\$23,750	-	-	\$1,915,847
	\$427,500	-	-	-	\$427,500
Signage	\$318,710	-	-	-	\$318,710
	\$2,733,759	\$1,000,000	-	-	\$3,733,759
	\$161,595	\$2,121,309	-	-	\$2,282,904
vements	\$768,546	-	-	-	\$768,546
	-	\$1,304,159	-	-	\$1,304,159
ing	\$3,150,000	\$1,219,696	-	-	\$4,369,696
500sy)	\$150,000	\$2,291,345	-	-	\$2,441,345
g	\$549,845	-	-	-	\$549,845
	\$750,000	-	\$73,632	-	\$823,632
	\$959,956	\$8,736,515	\$988,628	-	\$10,685,099
	-	-	\$57,000	-	\$57,000
	-	-	\$148,000	-	\$148,000
	\$649,602	\$3,420,000	-	-	\$4,069,602
y	-	-	-	\$763,000	\$763,000
e Taxiway	-	-	-	\$844,000	\$844,000
	\$910,600	-	-	-	\$910,600
	-	-	-	\$846,003	\$846,003
	\$15,718,431	\$26,169,547	\$1,267,260	\$2,453,003	\$45,608,241

TBD - 2025	Kilo Apron Rehabilitation
11/22/24	Airport Master Plan
2/12/24	Main Apron Lighting Upgrades
1/6/23	Airport Drive Rehabilitation
4/19/22	Reconstruct Perimeter Service Road
11/8/22	Reconstruct 760 LF of TWY A & Associated A13 Apron Connector
11/8/22	Reconstruct Taxiway A to Include Five Aircraft Runup
3/18/21	Upgrade Airport Security Fence
12/7/20	Rehab/Reconst Rwy 3-21 - Design Only
11/13/19	Rehabilitate Runway Lighting
2/1/19	Rehabilitate D Apron
11/30/17	Rehabilitate Apron - Transient Aircraft Parking Apron in Front of the Termin
	(Matching AIP# 3-04-0032-034-2017)
11/30/17	Rehabilitate Taxiway A and Rehabilitate Taxiway A Lighting (Matching AIP#
10/3/16	Install Airport Beacons, Misc. Airport Improvements
8/29/16	Runway 3 Approach Area Rock Project
8/11/15	Place Additional Rock in the Approach Area of Rwy 3 (Approx. 70,000 sy)
8/10/15	Rehabilitate Taxiway Bravo
3/30/15	Rehabilitate Parallel Taxiway "B" - Phase 1
10/29/13	Rehabilitate Runway Lighting
11/28/12	Conduct Airport Master Plan Update
1/17/12	Reconstruction of Landmark North Apron (Approximately 32,680 Square Y
	TOTAL

Source: Airport records

omic Security Act, 2020
Supplemental Appropriations Act, 2020

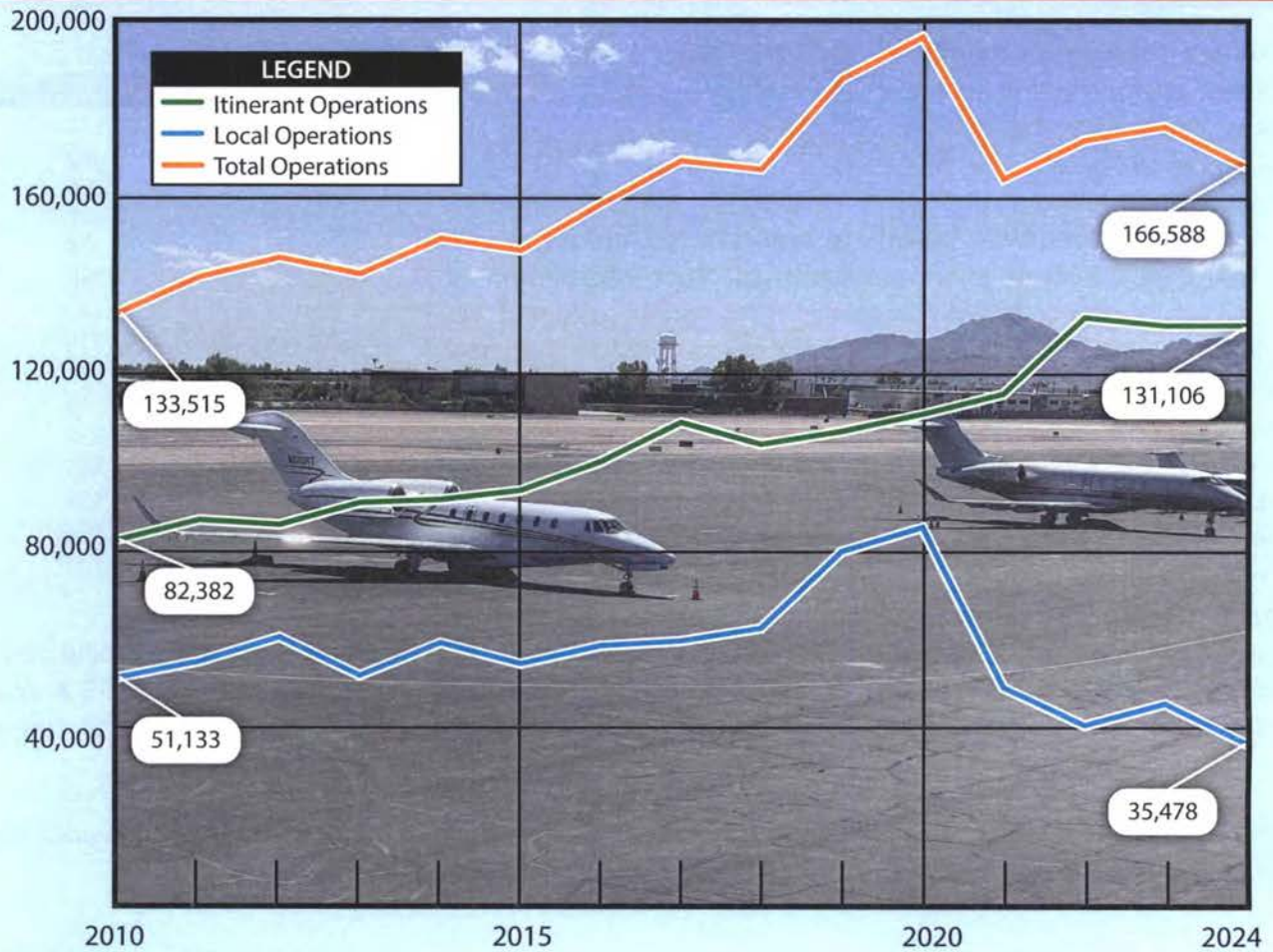
port Infrastructure Grant

http://www.faa.gov/airports/aip/grantapportion_data/



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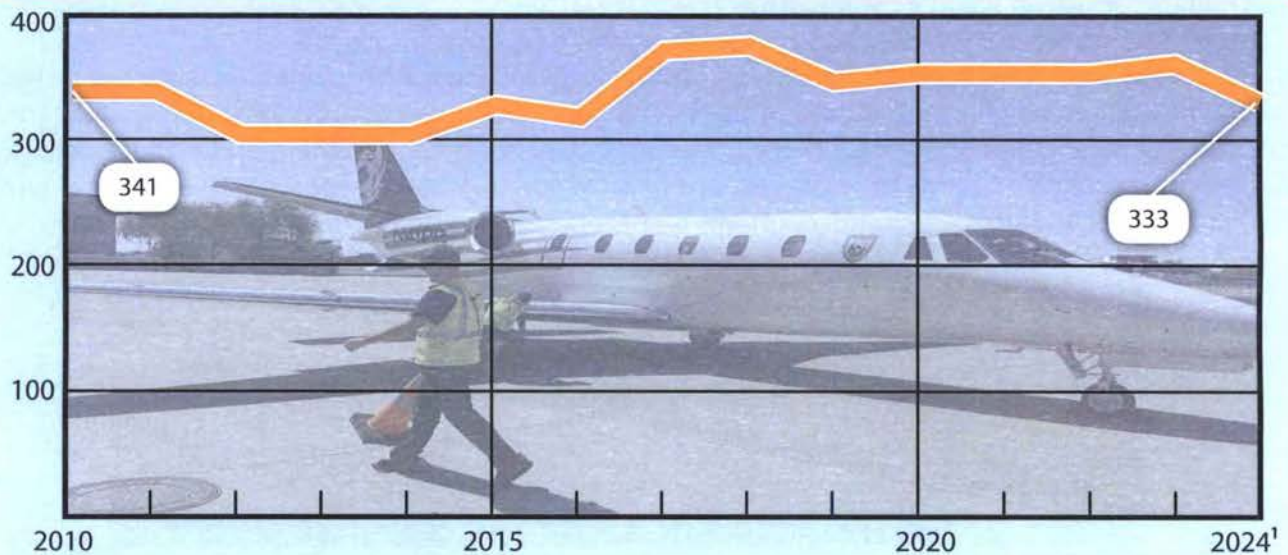
AIRCRAFT OPERATIONS



Source: FAA Operations Network (OPSNET)

2024 CHARTER/AIR TAXI ENPLANEMENTS = 43,765

BASED AIRCRAFT



Source: TAF (2025 pub.)

BASED AIRCRAFT

Identifying the current number of based aircraft is vital to the master plan analysis but can be challenging because of the transient nature of aircraft storage.

**There were 333
FAA-validated aircraft
based at SDL in 2024.**

The FAA requires airports to report based aircraft to the National Based Aircraft Inventory database. That information is then cross-referenced with records from other airports. A validated based aircraft figure represents the aircraft that are based at the airport at least six months of the year. There are currently 333 validated based aircraft at SDL in the FAA's database. Per the FAA, this database is to account for aircraft that are located on airport property and specifically states that aircraft located off airport property, but afforded through-the-fence access, shall not be included as based at the airport. It is important to note that there are more than 400 combined based aircraft on airport property and in the adjacent Scottsdale Airpark (through-the-fence); however, only 333 are validated in the FAA's system likely due to the number of aircraft based off airport property. Of these 333 aircraft, the fleet mix is comprised of 115 single-engine piston aircraft, 21 multi-engine aircraft, 157 turbine aircraft, and 40 helicopters.

TABLE 1E | Based Aircraft

Year	Aircraft
2010	341
2011	341
2012	306
2013	306
2014	306
2015	330
2016	320
2017	374
2018	378
2019	349
2020	356
2021	356
2022	356
2023	364
2024 ¹	333

Sources: ¹BasedAircraft.com; FAA TAF, 2025

Table 1E summarizes historical based aircraft counts at SDL, as sourced from the FAA *Terminal Area Forecast* (TAF) published in January 2025.

PASSENGER ENPLANEMENTS

The FAA uses passenger enplanement numbers to determine what level of entitlement grant funding airports can receive. Airports with more than 10,000 annual enplanements are eligible to receive at least \$1.3 million for use on eligible capital projects.

While passenger enplanements are more commonly associated with commercial service activities, paying passengers on charter flights or other flights operating under 14 CFR Parts 135 and 91 are also counted as enplanements. Because there is frequent activity at SDL operating under these conditions, the airport has enplanements. It is the responsibility of the operator to report those enplanements to FAA. In 2024, 43,765 passenger enplanements were reported at SDL.



Charter Passenger Aircraft

AIRPORT SYSTEM PLANNING ROLE

Airport planning occurs at the national, state, and local levels. Each level has a different emphasis and purpose. At the national level, SDL is included in the *National Plan of Integrated Airport Systems* (NPIAS). At the state level, the airport is included in the *Arizona State Aviation System Plan* (SASP). Locally, the primary planning document is the airport master plan. The previous airport master plan for SDL was completed in 2015 and had a base forecast year of 2012.

NATIONAL AIRPORT PLANNING

The nationwide system of airports that exists today is a direct result of federal policy that promotes the development of civil aviation. Most of the existing airports within the national network were initially constructed by the federal government, and (in most cases) their maintenance and development are still funded primarily through various federal grant programs that aid communities in the care of their prospective airfields.

The NPIAS is published every two years, as required by Title 49 United States Code (USC) § 47103, as part of the continuing effort to maintain a thriving national airport system. The FAA maintains the NPIAS, which identifies the amounts and types of airport development eligible for federal funding under the AIP and the BIL over the next five years. The BIL establishes formulas and competitive grants for airport terminal projects, on-airport rail access projects, and airport-owned airport traffic control towers (ATCTs), which have historically received little or no AIP funding.

There are more than 19,000 airports and landing strips in the U.S. The NPIAS identifies 3,287 of these as public-use facilities that are important to the national airport system and are thus eligible for federal development grants. NPIAS airports are grouped as either primary airports (of which there are 390) or nonprimary airports (of which there are 2,897). Primary airports are those with 10,000 or more annual passenger enplanements. Nonprimary airports are general aviation airports.

SDL is classified in the current NPIAS (2025–2029) as a national general aviation (GA) reliever airport. SDL is one of only 122 national general aviation airports. These airports are critical to the National Airspace System because they are intended to be maintained to accommodate the entire general aviation fleet of aircraft. The reliever status is also important because relievers are meant to attract general aviation aircraft that might otherwise use congested commercial service airports, like PHX. **Table 1F** outlines and describes the different categories of airports included in the NPIAS.

TABLE 1F | Activity and Development at NPIAS Airports

Airport Category	No. of Airports	% of 2023 Enplanements	% of Based Aircraft	% of NPIAS Cost
Large Hub	31	71	1	36
Medium Hub	33	17	2	14
Small Hub	74	8	4	10
Nonhub	252	3	9	12
Primary Subtotal:	390	99	16	72
National	122	—	14	5
Regional	586	—	25	9
Local	1,220	—	18	9
Basic	778	—	3	5
Unclassified	191	—	1	0
Nonprimary Subtotal:	2,897	0.07	61	28
Total NPIAS Airports:	3,287	100	77	100

Source: NPIAS, 2025-2029

STATE AIRPORT PLANNING

The primary planning document for the State of Arizona is the State Aviation System Plan (SASP), which was last updated in October 2018. The SASP focuses on keeping Arizona's airports highly advanced, safe, and responsive to the public's needs today and through the 20-year planning horizon. There are five categories of airports in the SASP:

1. **Commercial Service** – publicly owned airports that enplane 2,500 or more passengers and receive scheduled passenger air service
2. **Reliever** – FAA-designated airports that relieve congestion at commercial service airports
3. **GA-Community** – airports that serve regional economies, connect to state and national economies, and serve all types of general aviation aircraft
4. **GA-Rural** – airports that serve supplemental roles in local economies and primarily serve small business, recreational, and personal flying
5. **GA-Basic** – airports that serve limited roles in the local economy and primarily serve recreational and personal flying

Scottsdale Airport is classified as a reliever airport in the SASP. These airports serve to relieve congestion at busy commercial service airports (e.g., PHX). Reliever airports support the NAS and provide access to markets across the U.S. (and internationally, in some cases). High levels of activity by business jets and turboprops are typical of reliever airports.

The Arizona SASP presents development objectives for airports based on their classifications in the SASP. **Table 1G** summarizes the development objectives for reliever airports like SDL. Several airside objectives are not met at SDL. The preferred minimum airport reference code is C-III, which encompasses large business jets. The design standard for runway-to-taxiway separation for C-III airports is 400 feet; at SDL, the separation distance from the runway centerline to the centerlines of Taxiways A and B is only 250 feet. The recommended taxiway width is 50 feet; several taxiways at SDL are 40 feet wide. An approach lighting system is preferred for reliever airports, depending on the instrument approach capability, but is not required. SDL does not require an approach lighting system.

For landside facilities, SDL does not meet the objectives for adequate apron area and tiedown positions. The airport needs more hangars to accommodate demand and available public automobile parking is lacking. The airport provides all landside service objectives outlined in the SASP.

TABLE 1G | SASP Service Objectives for Reliever Airports

Objective Criteria	Minimum Objective	SDL Status
Airside Facility Objectives		
Airport Reference Code	C-III	Does not meet objective
Runway Length	Accommodate 75% of large aircraft at 90% useful load	Meets objective
Runway Width	100 feet	Meets objective
Runway Surface	Paved	Meets objective
Taxiway Type	Full parallel and connectors	Meets objective
Taxiway Width	50 feet minimum	Does not meet objective
Instrument Approach Procedures	Non-precision	Meets objective
Visual Aids	Beacon, lighted windsock, segmented circle, REILs, PAPIs	Meets objective
Runway & Taxiway Lighting	MIRL/MITL	Meets objective
Approach Lighting Systems	Desired	N/A
Landside Facility Objectives		
Airport Fencing	Full perimeter fencing & controlled access	Meets objective
Aprons & Tiedowns	Accommodate 25% of based fleet & 75% of transient fleet	Does not meet objective
Hangars	Accommodate 75% of based fleet & 25% of overnight	Does not meet objective
Terminal Facilities	Terminal with pilot lounge	Meets objective ¹
Auto Parking	Enough to accommodate activity	Does not meet objective
Landside Service Objectives		
Automated Weather Reporting	Yes	Meets objective
Fixed Base Operator (FBO)	Yes	Meets objective
Air Taxi/Charter	Yes	Meets objective
Aircraft Rental	Yes	Meets objective
Aircraft Maintenance	Yes	Meets objective
Avionics Sales & Service	Yes	Meets objective
Aircraft Fuel	Yes	Meets objective
Deicing	N/A	N/A
Oxygen	Yes	Meets objective
Snow Removal	N/A	N/A
Ground Transportation	Yes	Meets objective
On-Site Car Rental	Yes	Meets objective
Internet Access	Yes	Meets objective
Phone Access	Yes	Meets objective
Restrooms	Yes	Meets objective
U.S. Customs	Yes	Meets objective

¹Combination of FBOs and Aviation Business Center meets this objective

Source: Arizona SASP Update, 2018

LOCAL AIRPORT PLANNING

The airport master plan and airport layout plan (ALP) are the primary local planning documents. Guidelines for the development of an airport master plan and ALP are provided in FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*. The AC identifies the following functions of a master planning study:

- The airport master plan is the sponsor's conceptual design for the long-term development of the airport. Master plans are prepared to support the modernization or expansion of existing airports and the creation of new airports.
- The goal of a master plan is to provide the framework needed to guide future airport development that will cost-effectively satisfy aviation demand while addressing relevant environmental and socioeconomic issues.
- Each master plan should meet the following objectives:
 - Justify the plan through technical, economic, and environmental investigation of concepts and alternatives.
 - Provide an effective graphic presentation of the future development of the airport and anticipated land use in the vicinity of the airport.
 - Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term capital improvement program.
 - Propose an achievable financial plan to support the implementation schedule.
 - Provide sufficient project definitions and details for subsequent environmental evaluations that may be required before the project is approved.
 - Present a plan that adequately addresses the issues at the airport and satisfies local, state, and federal regulations.
 - Document policies and future aeronautical demand to support municipal or local deliberations regarding spending, debt, land use controls, and other policies necessary to preserve the integrity of the airport and its surroundings.
 - Set the stage and establish the framework for a continuing planning process. Such a process should monitor key conditions and permit changes in plan recommendations, as required.

The products of a master planning process vary with the complexity of the study and may include a variety of supporting studies and appendices; however, all products fall within one of two basic types: airport master plans or ALP updates.

Master Plan Reviews by the FAA

The recommendations contained in an airport master plan represent the views, policies, and development plans of the airport sponsor and do not necessarily represent the views of the FAA. Acceptance of the master plan by the FAA does not constitute a commitment on the part of the United States to participate in any development depicted in the plan, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public law. The FAA reviews all elements of the master plan to ensure sound planning techniques have been applied; however, the FAA only approves the following elements of airport master plans:

- *Forecasts of Aviation Demand* | The master plan forecast should be reviewed to ensure the underlying assumptions and forecast methodologies are appropriate. Paragraph 704.h of FAA AC 150/5070-6B, *Airport Master Plans*, should be used to determine consistency of the master plan forecast with the FAA TAF. Inconsistencies between the master plan forecast and TAF must be resolved, and the forecast must be approved before subsequent planning work proceeds.
- *Critical Aircraft* | The current critical aircraft is an airplane (or group of airplanes with similar characteristics) that operates at least 500 times annually at the airport. The future critical aircraft is the airplane (or group of airplanes with similar characteristics) that is projected to account for at least 500 annual operations at the airport in the future. The future critical aircraft may be the same as the current critical aircraft or may be different. The future critical aircraft must be reasonable and based on historical trends or reasonably assumed changes in aircraft usage.
- *Airport Layout Plan* | All airport development at federally obligated airports must be done in accordance with an FAA-approved ALP. Furthermore, proposed development must be shown on an approved ALP to be eligible for AIP funding. FAA approval of the ALP indicates that the existing facilities and proposed development depicted on the ALP conform to the FAA airport design standards in effect at the time of the approval, or that an approved modification to standard has been issued. Such approval also indicates that the FAA finds the proposed development to be safe and efficient.

In many regards, an airport master plan can be considered a feasibility study of what may be possible or desired as part of the long-term vision for an airport. Multiple alternative development scenarios that may be feasible are included in a master plan; however, implementation of any of these will require FAA approval. While a single long-term vision is included in a master plan, it can be revised in the future by updating the ALP or the master plan.

AIRFIELD FACILITIES

Airfield facilities facilitate aircraft movements between the air and ground. Generally, these facilities include runways, taxiways, airport lighting and markings, and navigational aids. **Exhibit 1G** depicts airfield facility information atop an aerial photograph for visual reference.

RUNWAY 3-21

SDL has one runway, designated as Runway 3-21. Runway 3-21 is 8,249 feet long by 100 feet wide and is oriented in a northeast to southwest manner. The asphalt pavement has a grooved surface treatment and is reported as being in good condition by official FAA publications. The runway underwent a significant \$10 million rehabilitation in 2020. Runway 3-21 has non-precision markings on both ends. The runway slopes generally from northeast to southwest; the north end is the high point of the runway and is approximately 68 feet higher than the south end. The runway gradient is 0.98 percent (effective gradient of 0.81 percent). There are blast pads at the end of each runway that measure 150 feet long by 120 feet wide and are marked with chevrons. The landing thresholds to both runway ends are displaced for obstacle clearance. The landing threshold to Runway 3 is displaced by 739 feet and the landing threshold to Runway 21 is displaced by 400 feet. **Table 1H** summarizes the runway data.

**Runway 3-21 is
8,249' x 100'.**

TABLE 1H | Runway Data

	Runway 3	Runway 21
Field Elevation	1510.1' above sea level	
Runway Length	8,249'	
Runway Width	100'	
Blast Pad Dimensions	150' x 120'	150' x 120'
Pavement Type	Asphalt	
Pavement Condition (FAA Reported)	Good	
Gradient	0.81%	
Landing Threshold Displacement	739'	400'
Runway Load Bearing Strength ¹	Single Wheel (S): 45,000 lbs. Dual Wheel (D): 75,000 lbs. Two Single Wheels in Tandem (2S): 95,000 lbs.	
Runway Markings/Condition	Non-precision/Good	
Touchdown Point Marking/Lighting	Yes/No Lights	
Runway Edge Lights	Medium Intensity (MIRL)	
Runway End Identifier Lights	Yes	Yes
Distance Remaining Signs	Yes (Lighted)	
Visual Glidepath Indicator/Slope	PAPI-2L (4.00°)	PAPI-2L (4.00°)
Traffic Pattern	Left	Right
Traffic Pattern Altitude (AGL)	Piston/Turboprop: 990' Jets: 1,490' Helicopters: 490'	
Calm Wind Runway	Yes	No

¹Prior permission required for aircraft between 75,001-100,000 lbs.; aircraft above 100,000 lbs. are prohibited
AGL = above ground level

Sources: Airport/Facility Directory, Southwest U.S., effective December 26, 2024; SDL Records

RUNWAY MARKINGS

Various runway markings are used to provide information to pilots. Runways intended for use by only small aircraft typically have basic markings, while runways available for larger transport aircraft have more complex markings that provide more information. Runways that support instrument approach procedures with both horizontal and vertical guidance (precision or Category I approaches) have additional markings. Runway markings are described in further detail as follows.



Airfield Data	
3	21
8,249'	
100'	
1,444.2'	1,510.1'
0.98%	
Asphalt	
on-Precision	Non-Precision
MIRL	
REILs	REILs
45,000 lbs. SWL, 75,000 lbs. DWL	
PAPI-2 I	PAPI-2 I

Airfield Data	
TAXIWAYS	
Lighting	MITL
Surface Material	Asphalt
Width	40' - 50'
WEATHER AND NAVIGATIONAL AIDS	
Lighted Wind Cone	ASOS

KEY	
ASOS	- Automated Weather Observation Station
ATCT	- Airport Traffic Control Tower
ATIS	- Automatic Terminal Information Service
DWL	- Dual Wheel Landing Gear
MIRL	- Medium Intensity Runway Lights
MITL	- Medium Intensity Taxiway Lights
PAPI	- Precision Approach Path Indicator

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- **Threshold Bars** | The threshold bar is a 10-foot-wide white stripe at the end of each runway that visually designates the runway landing threshold and the end of the runway. Threshold bars are typically associated with precision markings and/or displaced landing thresholds.
- **Threshold Stripes** | Runway threshold stripes are a series of white stripes that are 150 feet long by six feet wide. These markings provide a visual grid that alerts pilots to the location of the landing threshold. The total number of threshold stripes indicates the width of the runway to pilots. There are eight threshold stripes on each end of the runway, which is the standard for showing that the runway is 100 feet wide.
- **Runway Designators** | The end of each runway at SDL is marked with a number and/or a number and letter combination that indicates the approximate magnetic azimuth of the direction of operation. Runway designators are white with a height of 60 feet.
- **Aiming Point Markings** | Aiming point markings are used to provide enhanced visual guidance to pilots when landing. At SDL, these markings consist of two white stripes that are 150 feet long, 20 feet wide, and spaced 50 feet apart about the runway centerline. The aiming point markings are placed approximately 1,000 feet from the landing threshold for each end.
- **Centerline and Edge Stripes** | The runway centerline is a dashed white line positioned on the centerline of the runway. Runway edge stripes are solid white lines that designate the edges of the runway.

PAVEMENT STRENGTH

Pavement strength ratings have traditionally been measured in terms of the number of wheels on each landing gear strut of an aircraft. Additional wheels on each landing gear provide greater dispersal of an aircraft's weight, enabling the pavement to withstand heavier aircraft. The strength rating, which is expressed in pounds, indicates that the pavement can withstand repeated usage by aircraft within that weight limitation and experience normal wear and tear. Repeated usage of the runway by aircraft that are heavier than the strength rating will cause greater wear and tear and will shorten the useful life of the pavement.

Aircraft with a single wheel on each landing gear strut are classified as single wheel (S). Aircraft with two wheels on each landing gear strut are classified as double wheel (D) and aircraft with two single wheels in tandem are classified as (2S). The following are the published weight-bearing capacities for Runway 3-21 at SDL:

- 45,000 lbs. (S); Examples include small/medium business jets such as the Cessna Citation V
- 75,000 lbs. (D); Examples include large business jets such as Gulfstream V
- 95,000 lbs. (2S); Example includes the C-130

The airport publishes local rules regarding operations by heavier aircraft. Prior permission is required by operators using aircraft with maximum takeoff weights between 75,001-100,000 pounds. Aircraft above 100,000 pounds are prohibited.

In 2014, the FAA moved to implement the International Civil Aviation Organization (ICAO) pavement classification number (PCN) for identifying the strength of airport pavements. The PCN is a five-part code and is described as follows:

1. **PCN Numerical Value** – indicates the load-carrying capacity of the pavement, expressed as a whole number; the value is calculated based on several engineering factors, such as aircraft geometry and pavement usage
2. **Pavement Type** – expressed as either R for rigid pavement (typically concrete) or F for flexible pavement (typically asphalt)
3. **Subgrade Strength** – expressed as A (high), B (medium), C (low), or D (ultra low); a subgrade of A would be considered very strong, like concrete-stabilized clay, and a subgrade of D would be very weak, similar to uncompacted soil
4. **Maximum Tire Pressure** – expressed as W (unlimited/no pressure limit), X (high/254 pounds per square inch [PSI]), Y (medium/181 PSI), or Z (low/72 PSI); indicates the maximum tire pressure the pavement can support (concrete surfaces are usually rated W)
5. **Process of Determination** – expressed as either T (technical evaluation) or U (physical evaluation); indicates the method of pavement testing

The runway does not have a published PCN value as of this writing (January 2025). In 2014, the airport received a draft PCN report, which indicated that the PCN was 7/F/D/Y/T; however, that PCN was never published for pilot reference. The runway was rehabilitated in 2021, so the PCN from 2014 is likely out of date.

FAA AC 150/5335-5D, *Standardized Method of Reporting Airport Pavement Strength – PCR*, provides guidance on a new method for reporting airport pavement strengths. The new reporting method is the Aircraft Classification Rating - Pavement Classification Rating (ACR-PCR) method. There is no mathematical correlation between the ACN-PCN method and the new ACR-PCR method. This new method provides the benefit of expressing the effect of an individual aircraft on different pavements with a single unique number, the ACN. CAN varies according to aircraft weight and configuration (e.g. tire pressure, gear geometry, etc.), pavement type, and subgrade strength. Conversely, the load-carrying capacity of a pavement can be expressed by a single unique number, the PCR, without specifying a particular aircraft or detailed information about the pavement structure.

For general aviation airports, reporting pavement strength with the ACR-PCR method is voluntary and is typically completed when the airport undertakes various pavement maintenance projects. Currently, pavement strength at SDL is not classified under the ACR-PCR methodology.

PAVEMENT CONDITION

Airport sponsors are required to maintain airport pavement surfaces in suitable condition, as outlined in Federal Grant Assurance No. 11 and Public Law 103-305. To this end, airport sponsors must implement effective airport pavement maintenance/management programs. Essentially, airport sponsors must continually assess the conditions of airport pavements and provide preventative maintenance to preserve the useful life of the pavements.

The ADOT Aeronautics Division funds pavement inspections for approximately 80 airports in the state every five years through the Arizona Pavement Preservation Program (APPP). A pavement condition survey for SDL was completed in 2022.

The survey was conducted using the pavement condition index (PCI) procedure documented in the following publications:

- FAA AC 150/5380-6B, *Guidelines and Procedures for Maintenance of Airport Pavements*
- American Society for Testing and Materials (ASTM) D-5340, *Standard Test Method for Airport Pavement Condition Index Surveys*

The PCI procedure is the standard used by the aviation industry to visually assess pavement conditions. It was developed to provide engineers with a consistent, objective, and repeatable tool to represent overall pavement condition. During a PCI survey, visible signs of deterioration within a selected sample area are identified, recorded, and analyzed.

The results of a PCI evaluation provide an indication of the structural integrity and functional capabilities of the pavement. It should be noted that only the top layer of the pavement is examined during a PCI inspection and no direct measure is made of the structural capacity of the pavement system; nevertheless, the PCI provides an objective basis for determining maintenance and repair needs and establishing rehabilitation priorities in consideration of constrained resources. Furthermore, the results of repeated PCI monitoring over time can be used to determine the rate of pavement deterioration and estimate the time(s) at which certain rehabilitation measures can be implemented.

The PCI scale ranges from 0 to 100. A PCI rating between 0 and 10 indicates a failed pavement condition and a PCI rating between 85 and 100 indicates good condition. In general, pavements with PCI ratings above 85 may only need spot repairs. Pavements with PCI ratings between 40 and 70 are more likely to be candidates for major rehabilitation, such as structural overlays or concrete section replacement. Reconstruction is often the most viable option when the PCI rating is below 40. Thresholds for maintenance, rehabilitation, or reconstruction will vary based on operational priority and other considerations.

Exhibit 1H shows the pavement condition index map from the 2022 inspections. In 2022, the aircraft run-up areas and the north portion of Taxiway A were under construction. The new pavement in this area is shown with an estimated PCI of 98. The 2022 pavement condition report is timely, as its publication can inform this master plan. When considering the future condition of the pavements, a general rule of thumb is to subtract one to two PCI points for each year removed from the survey date.

Generally, the pavements at SDL are in very good condition. The runway was recently rehabilitated and has a PCI value of 100. Parallel Taxiway A has a PCI value of 93 (very good condition). Taxiway B has a PCI rating of 82, which means it is in good condition but would benefit from ongoing maintenance to extend its useful life. Several sections of the west side apron areas have lower PCI values that range from 68-76. These areas will also need ongoing maintenance.

TAXIWAYS/TAXILANES

The taxiway/taxilane system at SDL is extensive and includes parallel taxiways, connector taxiways, and entrance/exit taxiways. Taxiways are associated with movement to or from runways and are typified by higher aircraft movement speeds. Taxilanes are movement surfaces that provide access to hangar areas and are typified by slower aircraft movement speeds.

The width of each taxiway varies based on aircraft design and usage. Each taxiway/taxilane at SDL is listed on **Table 1J**. Taxiways and taxilanes have protected object free areas and safety areas that are centered on the taxiway/taxilane to protect aircraft. Objects (other than those necessary for navigation, such as edge lights) must not penetrate the ground elevation of these surfaces. Certain taxilanes are not part of the movement areas controlled by tower controllers; therefore, pilots on the non-movement areas do not have to be in contact with the tower controllers. All taxiways/taxilanes have medium intensity taxiway edge lights.

TABLE 1J | Taxiway Detail

Taxiway Designation	Width	Safety Area Width	Object Free Area Width
Taxiway A (parallel)	40'	79'	124'
Taxiway B (parallel)	40'	79'	124'
Taxiway A1 (Runway 3 threshold)	40'	79'	124'
Taxiways A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15	40'-50'	79'	124'
Taxiway A16 (Runway 21 threshold)	40'	79'	124'
Taxiway B1 (Runway 3 threshold)	40'	79'	124'
Taxiways B2, B3, B5, B6, B7, B10, B11, B12, B13	40'-50'	79'	124'
Taxiway B16 (Runway 21 threshold)	50'	79'	124'

Source: SDL ALP

Taxiway and Apron Markings | Taxiway and taxilane centerline markings are provided to assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway/taxilane edges. Enhanced taxiway centerline markings lead from all runway hold positions to the parallel taxiways. Other taxiway markings include leadoff lines on normally used exits and continuous-type edge markings along paved shoulders. Aircraft movement areas on various aprons are identified with centerline markings. Aircraft tiedown positions are identified on various apron surfaces. There are aircraft holding position markings on each taxiway that leads to the runway. The holding position markings are 152 feet from the runway centerline.



Taxiway Markings at SDL

AIRFIELD LIGHTING

Airfield lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. Various lighting systems are installed at the airport for this purpose. These lighting systems are categorized by function and summarized as follows.



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Identification Lighting | The location of the airport at night is universally identified by a rotating beacon, which projects two beams of light (one white and one green) 180 degrees apart. The rotating beacon at SDL is located on the west side of the airport, atop the airport operations center building. The beacon is owned by the airport.

Runway and Taxiway Lighting/Signage | Runway and taxiway edge lighting utilize light fixtures placed near the edges of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility to maintain safe and efficient access to and from the runways and aircraft parking areas.

The runway is equipped with standard medium intensity runway edge lights (MIRL). All runway edge light lenses are split (white/yellow) to mark the caution zone on the last 2,000 feet of each runway end. All taxiways are equipped with medium intensity taxiway edge lighting (MITL).

The airport also has a runway/taxiway signage system. The presence of runway/taxiway signage is an essential component of a surface movement guidance control system and is necessary for the safe and efficient operation of the airport. The signage system installed at SDL includes runway and taxiway designations, holding positions, critical areas, routing/directional indication, and runway ends and exits. All edge lighting and signs at SDL are owned and maintained by the airport.

Distance-Remaining Signs | The runway is equipped with lighted distance-remaining signs placed at 1,000-foot intervals to one side of the runway. These signs alert pilots to the number of feet remaining before the end of the runway. The distance-remaining signs are owned and maintained by the airport.

Visual Glideslope Approach Aids | Visual glideslope approach aids provide visual cues to pilots, alerting them to whether they are on the correct glide path to landing. The approaches to both ends of Runway 3-21 are equipped with two-light precision approach path indicator (PAPI) lights on the left side of the runway (PAPI-4L). Both PAPIs are set to a 4.0-degree glide path (standard glide path is 3.0 degrees). The PAPIs are owned by the airport.

Runway End Identification Lighting | Runway end identifier lights (REILs) are strobe lights placed at the edges of the landing thresholds to provide rapid identification of the landing threshold for up to 20 miles. The approaches to both ends of Runway 3-21 are equipped with a REIL system.

Pilot Controlled Lighting | The airport's lighting system is connected to a pilot-controlled lighting (PCL) system. When the ATCT is closed, the PCL system allows a pilot to activate the PAPIs, REILs, and MIRL system on Runway 3-21 through a series of clicks with their transmitter on the common traffic advisory frequency (CTAF) 119.9 megahertz (MHz).

COMMUNICATION AND WEATHER REPORTING FACILITIES

Windsocks | There are two windsocks in proximity to the runway system at SDL. The primary lighted windsock is located within the segmented circle on the east side of the runway. a second windsock is situated on the west side of the runway near Gate 5 and the Kilo GA hangars.

Automated Surface Observation System | The SDL automated surface observation system (ASOS) is located at the south end of the airfield. The ASOS automatically records weather conditions, such as temperature, dew point, wind speed, altimeter setting, visibility, sky condition, and precipitation. The ASOS updates observations each minute, 24 hours a day, and this information is transmitted to pilots in the airport vicinity via an FAA very high frequency (VHF) ground-to-air radio transmitter. Pilots can receive these broadcasts on the automated terminal information service (ATIS) frequency or via a dedicated ASOS local telephone number (480-483-3049), through which a computer-generated voice presents airport weather information. ATIS broadcasts are updated hourly and provide arriving and departing pilots with the current surface weather conditions, communication frequencies, and other important airport-specific information. The ATIS frequency at SDL is 118.6 MHz.



Windsock and Segmented Circle



ASOS Weather Equipment

The Office of the Federal Coordinator for Meteorological Services and Supporting Research document FCM-S4-2019, *Federal Standard for Siting Meteorological Sensors at Airports*, provides guidance for critical areas for ASOS facilities. Within 100 feet of the visibility sensor, no grass or vegetation should be higher than 10 inches. The wind sensor should be at least 15 feet higher than any obstruction within 500 feet and 10 feet higher than any obstruction between 500 and 1,000 feet from the sensor.

Segmented Circle | A segmented circle provides information related to the traffic pattern to pilots in the vicinity of the airport. The segmented circle is centrally located on the airfield, immediately east of Taxiway B. The segmented circle markings indicate that the Runway 3 traffic pattern is to the left and the Runway 21 traffic pattern is to the right.

Remote Communications Outlet | The remote communications outlet (RCO) is an unmanned remote aviation radio transceiver station that is used to extend the communication range of air traffic control (ATC) facilities, allowing communication with aircraft farther from the main control tower. The Prescott Radio RCO frequency is 122.2 MHz (Phoenix RCO).

AREA AIRSPACE AND AIR TRAFFIC CONTROL

The *Federal Aviation Act of 1958* established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe and efficient airspace

environment for civil, commercial, and military aviation. The NAS covers the common network of U.S. airspace, including air navigation facilities; airports and landing areas; aeronautical charts; associated rules, regulations, and procedures; technical information; and personnel and material. The system also includes components shared jointly with the military.

AIRSPACE STRUCTURE

Airspace within the United States is broadly classified as either controlled or uncontrolled. The difference relates primarily to requirements for pilot qualifications, ground-to-air communications, navigation and air traffic services, and weather conditions. Six classes of airspace have been designated in the United States, as shown on **Exhibit 1J**. Airspace designated as Class A, B, C, D, or E is considered controlled airspace. Aircraft operating within controlled airspace are subject to varying requirements for positive air traffic control.

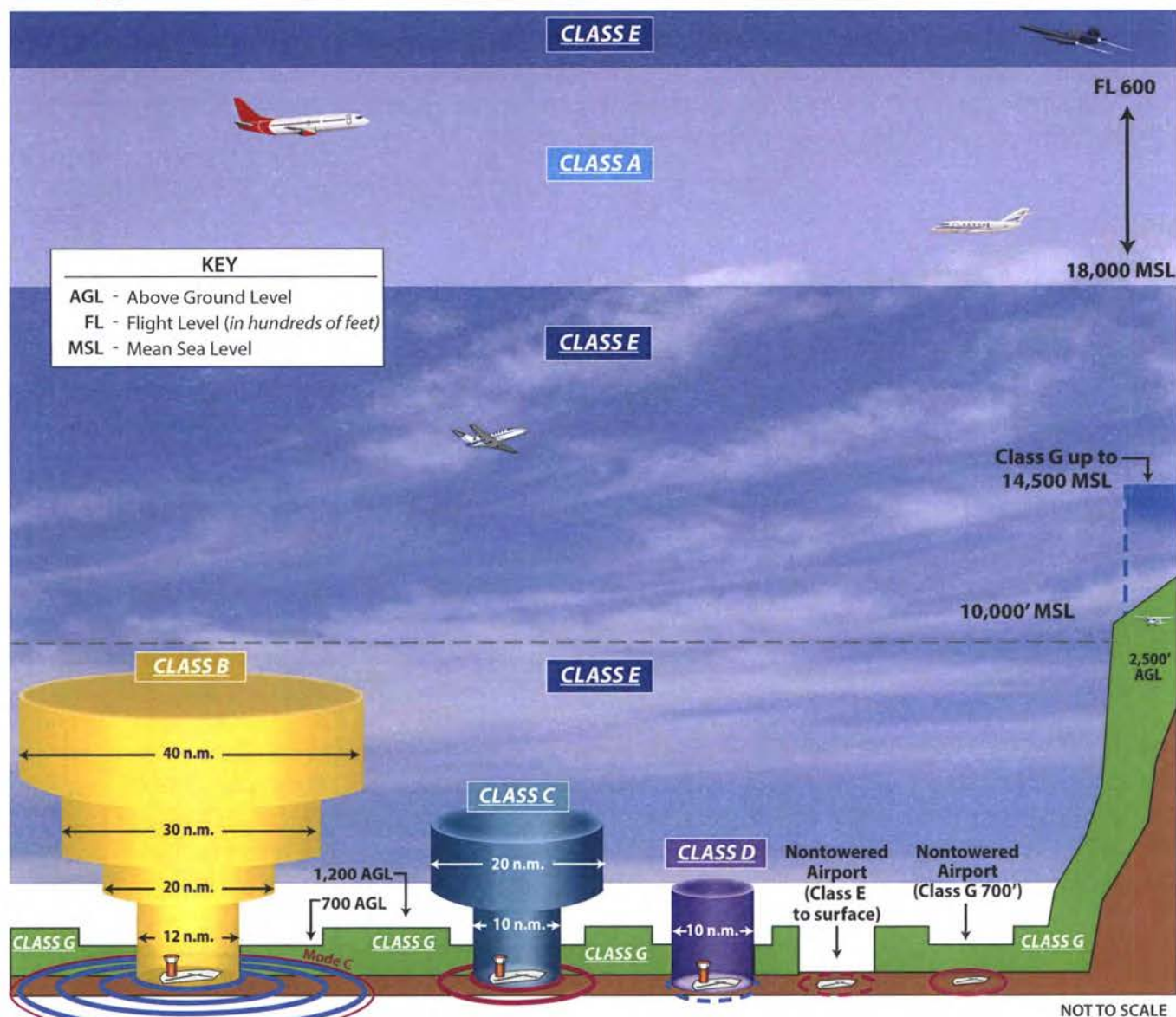
Class A | Class A airspace includes all airspace from 18,000 feet mean sea level (MSL) to flight level (FL) 600 (60,000 feet MSL). This airspace is designated in Federal Aviation Regulation (FAR) Part 71.193 for positive control of aircraft. The positive control area (PCA) allows only flights governed under instrument flight rules (IFR). An aircraft must have appropriate radio and navigation equipment and its pilot must obtain clearance from an ATC facility to enter Class A airspace. In addition, the pilot must possess an instrument rating.

Class B | Class B airspace has been designated around some of the country's busiest commercial service airports, such as Phoenix Sky Harbor International Airport (PHX). Class B airspace is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high-performance passenger-carrying aircraft at busy commercial service airports. This airspace is the most restrictive controlled airspace encountered by pilots operating under visual flight rules (VFR).

To fly within Class B airspace, an aircraft must be equipped with special radio and navigation equipment and must obtain clearance from ATC. Its pilot must have at least a private pilot's certificate or be a student pilot who has met the requirements of FAR Part 61.95, which requires special ground and flight training for Class B airspace. Aircraft are also required to have and utilize Mode C transponders within a 30-nm range of the center of Class B airspace; a Mode C transponder allows the ATCT to track the altitude of the aircraft. A helicopter does not need special navigation equipment or a transponder if it operates at or below 1,000 feet and has made a prior arrangement in the form of a Letter of Agreement with the FAA controlling agency.

SDL is located under the PHX Class B airspace; however, the Class B airspace over SDL is from 6,000 feet to 9,000 feet.

Class C | The FAA has established Class C airspace at 122 airports around the country as a means of regulating air traffic in these areas. Class C airspace is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high-performance passenger-carrying aircraft at some commercial service airports.



DEFINITION OF AIRSPACE CLASSIFICATIONS

- CLASS A** Think A - Altitude. Airspace above 18,000 feet MSL up to and including FL 600. Instrument Flight Rule (IFR) flights only, ADS-B 1090 ES transponder required, ATC clearance required.
- CLASS B** Think B - Busy. Multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports. ADS-B 1090 ES transponder required, ATC clearance required.
- CLASS C** Think C - Mode C. Mode C transponder required. ATC communication required. Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
- CLASS D** Think D - Dialogue. Pilot must establish dialogue with tower. Generally airspace from the surface to minimum 2,500 feet AGL surrounding towered airports.
- CLASS E** Think E - Everywhere. Controlled airspace that is not designated as any other Class of airspace.
- CLASS G** Think G - Ground. Uncontrolled airspace. From surface to a 1,200 AGL (in mountainous areas 2,500 AGL) Exceptions: near airports it lowers to 700' AGL; some airports have Class E to the surface. Visual Flight Rules (VFR) minimums apply.

Source: www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/media/15_phak_ch15.pdf

To fly inside Class C airspace, an aircraft must have a two-way radio and an encoding transponder and must have established communication with the ATCT. Aircraft may fly below the floor of the Class C airspace or above the Class C airspace ceiling without establishing communication with ATC. The closest Class C airspace surrounds Tucson International Airport (TUC).

Class D | Class D airspace is controlled airspace surrounding airports with ATCTs. The Class D airspace at an airport typically constitutes a cylinder with a horizontal radius of up to five miles from the airport, extending from the surface up to a designated vertical limit, which is typically set at approximately 2,500 feet above the airport elevation. If an airport has an instrument approach or departure, the Class D airspace sometimes extends along the approach or departure path. During periods when the airport's ATCT is closed, the Class D airspace typically reverts to Class E airspace. SDL is in Class D airspace, as are many other Phoenix area airports, such as Phoenix-Deer Valley Airport (DVT), Falcon Field Airport (FFZ), and Glendale Regional Airport (GEU).

Class E | Class E airspace is controlled airspace designed to contain IFR operations near an airport and while aircraft are transitioning between the airport and en-route environments. Unless otherwise specified, Class E airspace terminates at the base of the overlying airspace. Only aircraft operating under IFR are required to be in contact with ATC when operating in Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio communication with ATC facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist. Class E airspace encompasses the Scottsdale area, except where it is superseded by Class B or D airspace.

Class G | Airspace not designated as Class A, B, C, D, or E is considered uncontrolled, or Class G, airspace. ATC does not have the authority or responsibility to exercise control over air traffic within this airspace. Class G airspace lies between the surface and the overlying airspace.

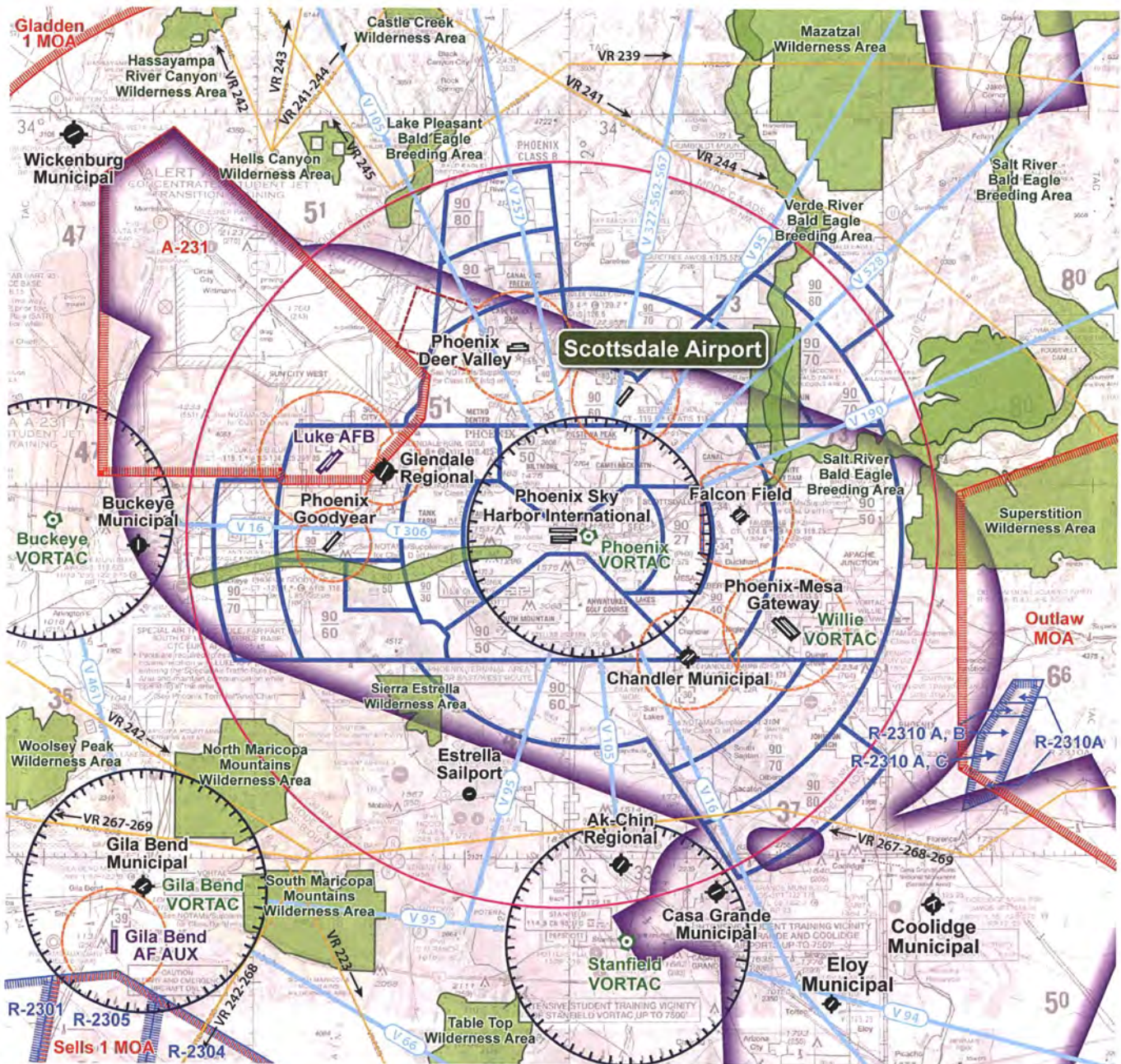
Exhibit 1K shows the Class D airspace surrounding SDL. FAA Order JO 7400.11J, *Airspace Designations and Reporting Points* (dated July 31, 2024), describes the Scottsdale Class D airspace as follows:

"That airspace extending upward from the surface to but not including 4,000 feet MSL within a 4.3-mile radius of the Scottsdale Municipal Airport. This Class D airspace is in effect during the specific dates and times established in advance by a Notice to Airmen. The effective date and time will therefore be continuously published in the Airport/Facility Directory."

(Note: The referenced FAA Order refers to the previous name of the airport.)

SPECIAL USE AIRSPACE

Special use airspace is defined as airspace where activities must be confined because of their nature or where limitations are imposed on aircraft not taking part in those activities. The designation of special use airspace identifies for other users the areas where military activity occurs, provides for segregation of such activity from other fliers, and allows charting to keep airspace users informed. These areas are depicted on **Exhibit 1K**.



LEGEND

- | | | | |
|--|---|--|--|
| | Airport with hard-surfaced runways 1,500' to 8,069' in length | | Class D Airspace |
| | Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069' (Military airfields are shown in Purple, public in Black) | | Class E Airspace |
| | Compass Rose | | Class E (sfc) Airspace with floor 700 ft. above surface that laterally abuts 1200 ft. or higher Class E airspace |
| | VORTAC | | Mode C |
| | Alert Area and Military Operations Area (MOA) | | Victor Airways |
| | Restricted Areas | | Military Training Routes |
| | Class B Airspace | | Wilderness/Monument Area |

Source: Phoenix Sectional Chart, US Department of Commerce, National Oceanic and Atmospheric Administration, 9/19/2024.

Restricted Areas | No person may operate an aircraft within a restricted area between the designated altitudes and during the times of designation unless they have the advanced permission of the using agency. Restricted areas R2310-A, -B, and -C are in the southeast portion of the Phoenix region, approximately 50 miles from SDL. R2310-A extends from the surface to 10,000 feet MSL. R2310-B extends from 10,000 to 17,000 feet MSL. R2310-C extends from 17,000 to 35,000 feet MSL. These areas are restricted when published by Notice to Air Missions (NOTAM) at least 48 hours in advance. The Arizona Air National Guard is the primary using agency.

Alert Areas | An airspace alert area is a designated area in which pilots are made aware of unusual aerial activity or a large volume of pilot training. Pilots are advised to be alert when flying in these areas. Alert area A-231 is west of Phoenix and is associated with Luke Air Force Base (AFB) activity. FAA Order JO 7400.10F, *Special Use Airspace* (dated February 16, 2024), states that A-231 extends from 500 feet above ground level (AGL) to and including 6,500 feet MSL, excluding the airspace below 4,000 feet AGL within the Luke AFB Class D airspace.

Military Operations Areas | A military operations area (MOA) is special use airspace established outside positive control areas to separate/segregate certain nonhazardous military activities from IFR traffic and to identify them for VFR traffic where these activities are conducted. MOAs are established to contain certain military activities (such as air combat maneuvers, air intercepts, acrobatics, etc.). The Outlaw MOA is located approximately 30 miles to the east of SDL. The Outlaw MOA extends from the surface to 8,000 feet MSL or 3,000 feet AGL (whichever is higher but not including flight level FL 18,000 feet MSL), exclusive of restricted areas R-2310A, -B, and -C, when activated. The using agency is the Arizona Air National Guard 162nd Wing fighter pilot group.

Military Training Routes | A military training route (MTR) is designated airspace generally established for use by high-performance military aircraft to train below 10,000 feet AGL and in excess of 250 knots. There are VR (visual) and IR (instrument) designated MTRs. MTRs with no segment above 1,500 feet AGL are designated with VR or IR followed by a four-digit number. MTRs with one or more segments above 1,500 feet AGL are identified by the route designation followed by a three-digit number (e.g., VR152). The arrows on the route show the direction of travel. VR244, VR241, and VR239 are approximately 25 miles to the north of SDL. General aviation aircraft should be alert when in proximity to an MTR.

Victor Airways | Victor airways are a system of federal airways established for aircraft arriving or departing regional areas using very high frequency omni-directional range (VOR) facilities. Victor airways are eight-mile-wide corridors of airspace that extend upward from 1,200 feet AGL to 18,000 feet MSL and extend between VOR navigational facilities. Numerous Victor airways pass in the vicinity of SDL, including V327, V562, and V567, which pass directly over SDL.

Wind Farms/Wilderness Areas | While not specifically considered part of the U.S. airspace structure, the boundaries of certain ground-based features are included on airspace sectional charts, including wind farms, national parks, wildlife areas, wilderness areas, and primitive areas. Aircraft operations are not specifically restricted over these areas; however, pilots should maintain a minimum altitude of 2,000 feet above the surface. There are several wilderness areas to the east of SDL, including the Verde River and Salt River Bald Eagle Breeding Areas and the Superstition Wilderness Area.

AIRSPACE CONTROL

The approximately 90-foot-tall ATCT at SDL was constructed in 1989 by the FAA and is staffed by FAA-certified controllers. The ATCT is located on the east side of the airfield, east of Taxiway B and near the midpoint of the runway. The height from the ground to the cab floor is 77 feet 10 inches. The tower operates from 6:00 a.m. to 9:00 p.m. seven days a week. SDL controllers are responsible for the Class D airspace surrounding SDL.

The following frequencies are used at SDL:

- Scottsdale Ground – 121.6 MHz
- Scottsdale Tower – 119.9 MHz
- Phoenix Approach/Departure – 120.7 MHz
- Clearance Delivery – 124.8 MHz
- Clearance Delivery when ATCT is closed – 127.45 MHz
- Automated Terminal Information System (ATIS) – 118.6 MHz
- Common Traffic Advisory Frequency (CTAF) – 119.9 Mhz
- Prescott Radio Remote Communications Outlet (RCO) – 122.2 Mhz



SDL Control Tower

ELECTRONIC NAVIGATIONAL AIDS

Navigational aids are electronic devices that transmit radio frequencies, which pilots of properly equipped aircraft can translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from SDL include a VOR facility and global positioning system (GPS).

In general, a VOR facility provides azimuth readings to pilots of properly equipped aircraft by transmitting a radio signal at every degree to provide 360 individual navigational courses. Distance measuring equipment (DME) is frequently combined with a VOR facility (VOR-DME) to provide distance (as well as direction) information to pilots. Military tactical air navigation (TACAN) aids and civil VORs are commonly combined to form VORTACs, which provide distance and direction information to both civil and military pilots. The Phoenix VORTAC is located on the airfield at PHX.

GPS was initially developed by the United States Department of Defense for military navigation around the world. GPS differs from VOR in that it does not require pilots to navigate using specific facilities. GPS uses satellites placed in orbit around the earth to transmit electronic radio signals, which pilots of properly equipped aircraft can use to determine altitude, speed, and other navigational information. With GPS, a pilot can navigate directly to any airport in the country and is not required to navigate to a specific ground-based navigation facility.

INSTRUMENT APPROACH PROCEDURES

Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic navigational aids that assist pilots in locating and landing at airports, especially during instrument flight conditions. There are currently six published instrument approach procedures at SDL; three are circling-only approaches, two lead to Runway 3, and one leads to Runway 21.

There are currently 6 published instrument approach procedures at SDL.

The capability of an instrument approach procedure is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance a pilot must be able to see to complete the approach. Cloud ceilings define the lowest elevation a cloud layer (defined as feet above the ground) can be situated for the pilot to complete the approach. If the observed visibility or cloud ceilings are below the minimums prescribed for the approach, the pilot cannot complete the instrument approach. **Exhibit 1L** shows the FAA-approved and published approach plates. The table on the exhibit summarizes the lowest approach minimums available by runway end.

Instrument approaches based on GPS have become common across the country. GPS does not require a significant investment in ground-based systems by the airport or the FAA. The runway ends at SDL are served by specialized GPS approaches. A variant of GPS, required navigation performance (RNP), is an instrument approach that supports the operation of the airport along a precise flight path with a high level of accuracy and the ability to determine aircraft position. RNP offers safety benefits by means of its precision and accuracy and it reduces the cost of operational efficiencies associated with traditional step-down non-precision and circling approaches. However, the RNP instrument approaches require special training and FAA authorization for each operator. As a result, the RNP instrument approaches are seldom used.

It should be noted that the close proximity of Phoenix Deer Valley Airport (DVT), with a similar runway configuration, requires the two airports to be considered as one for purposes of arrival and departure by Phoenix Approach (P50). When conditions are below VFR minimums, P50 must balance the operations at both airports, which often causes delays and flow restrictions.

STANDARD TERMINAL ARRIVAL PROCEDURES

Standard terminal arrival (STAR) procedures provide a predetermined flight path for pilots operating under IFR to follow so they can smoothly transition from the en-route phase of a flight to the final approach phase. STAR procedures aid efficient and safe arrival management by coordinating aircraft movements around busy airports. There are four published STAR procedures for those heading to SDL.

TERMINAL DEPARTURE PROCEDURES

Departure procedures are published flight procedures followed by pilots on IFR flight plans immediately after takeoff from an airport. Departure procedures have been developed to optimize the route of flight when considering a variety of factors, such as terrain, obstacles, noise abatement, and overall airspace management. Departure procedures are most common for airports located in complex airspace environments, like the greater Phoenix area. There are 12 published departure procedures for SDL.

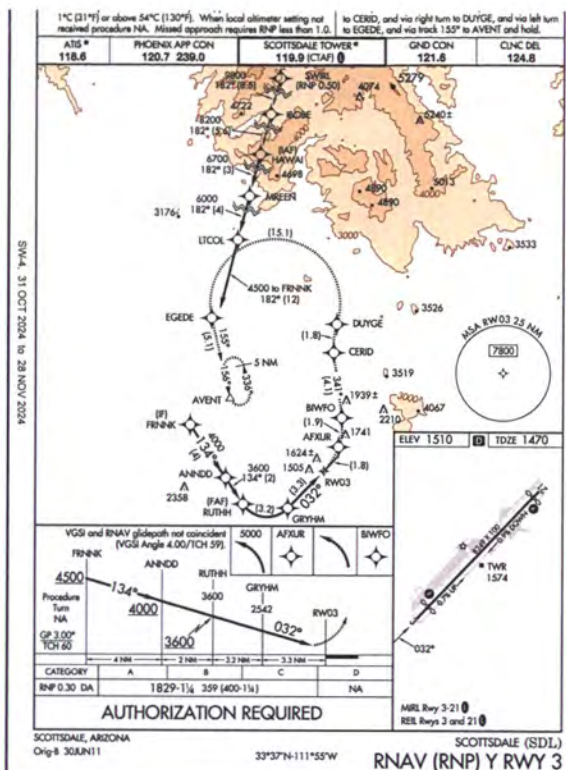
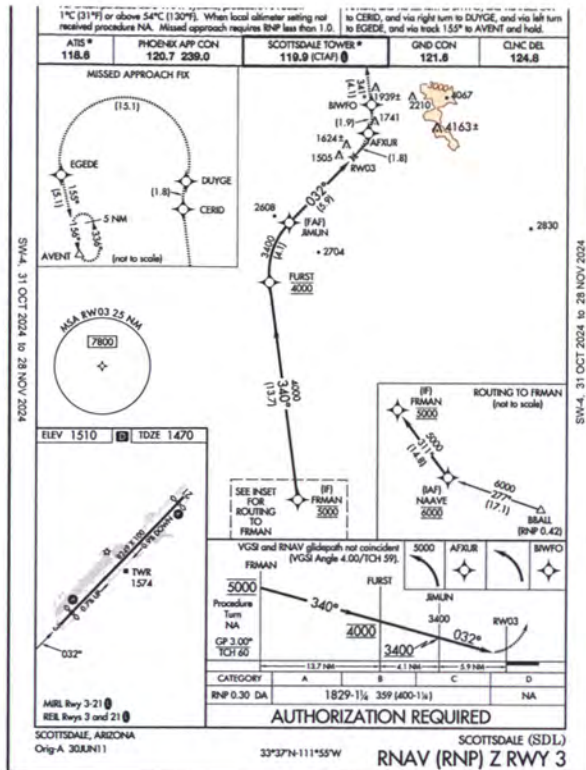
LOCAL OPERATING PROCEDURES

SDL is situated at 1,510.1 feet MSL. The airport has published notices to pilots to make them aware of certain special circumstances at the airport. Local operating procedures of note are as follows:

- There may be wildlife in the vicinity of the runway.
- For clearance delivery when the ATCT is closed, contact Phoenix Approach at 602-306-2565.
- Maintenance run-ups are prohibited between 10:00 p.m. and 7:00 a.m.
- 24-hour prior permission is required for military operations.
- There is a voluntary noise abatement curfew from 10:00 p.m. to 6:00 a.m.
- Prior permission required for aircraft with a maximum certified takeoff weight (MTOW) between 75,001-100,000 lbs.; aircraft above 100,000 lbs. MTOW are prohibited.
- Obstructions: There are 58-foot-tall trees located 1,695 feet from the Runway 3 end, 390 feet to the right of the centerline. A 25:1 slope is required to clear the trees.
- Obstructions: There is a 25-foot-tall hill located 850 feet from the Runway 21 end, 375 feet to the right of the centerline. A 26:1 slope is required to clear the hill.
- Midfield departures and stop-and-go landings are not allowed. Touch-and-go operations are not permitted between 9:30 p.m. and 6:00 a.m.
- The airport has a voluntary noise abatement policy.

LANDSIDE FACILITIES

Landside facilities are airport elements that support aircraft and pilot/passenger handling functions and are not directly related to the airfield system. Landside elements include the terminal functions, general aviation facilities, aircraft storage facilities, aviation and non-aviation businesses located at the airport, and support facilities, such as fuel storage, airport maintenance, and aircraft rescue and firefighting. A generalized map of landside facilities at SDL is shown on **Exhibit 1M**. The exhibit also documents the footprint/square footage of those facilities, as well as the space potentially available for aircraft storage, where applicable.

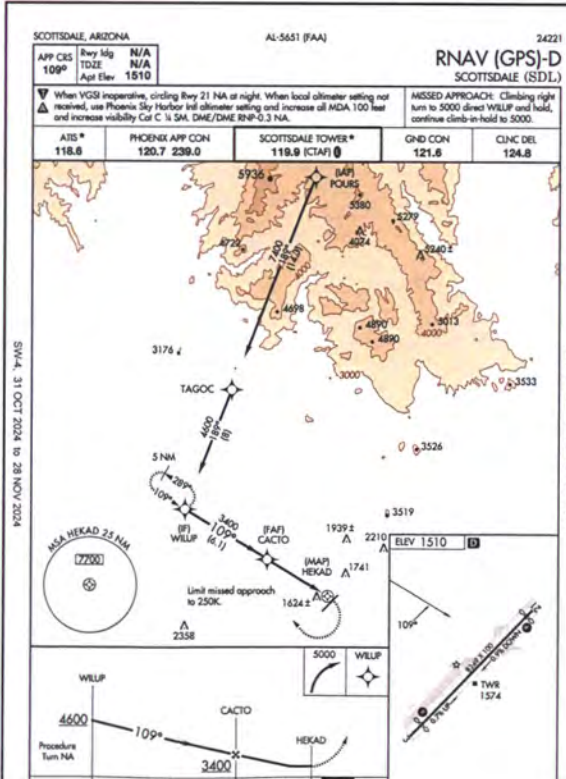
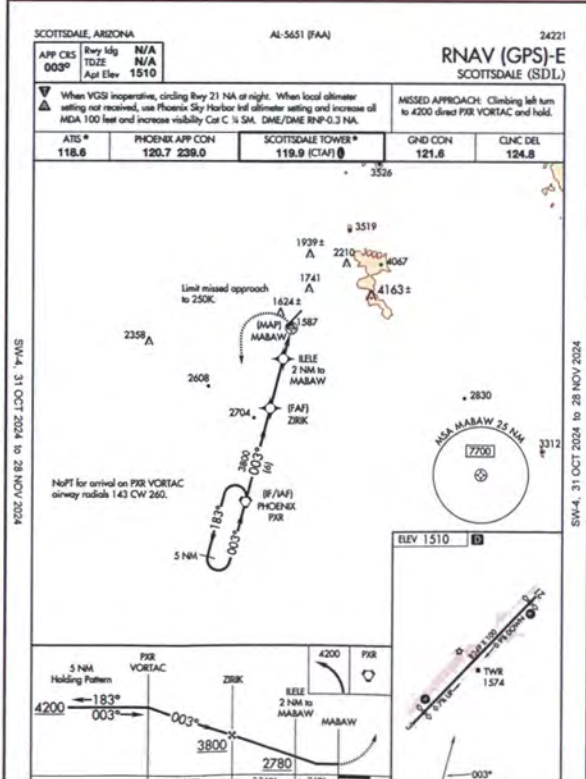
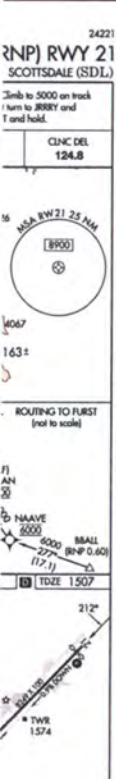


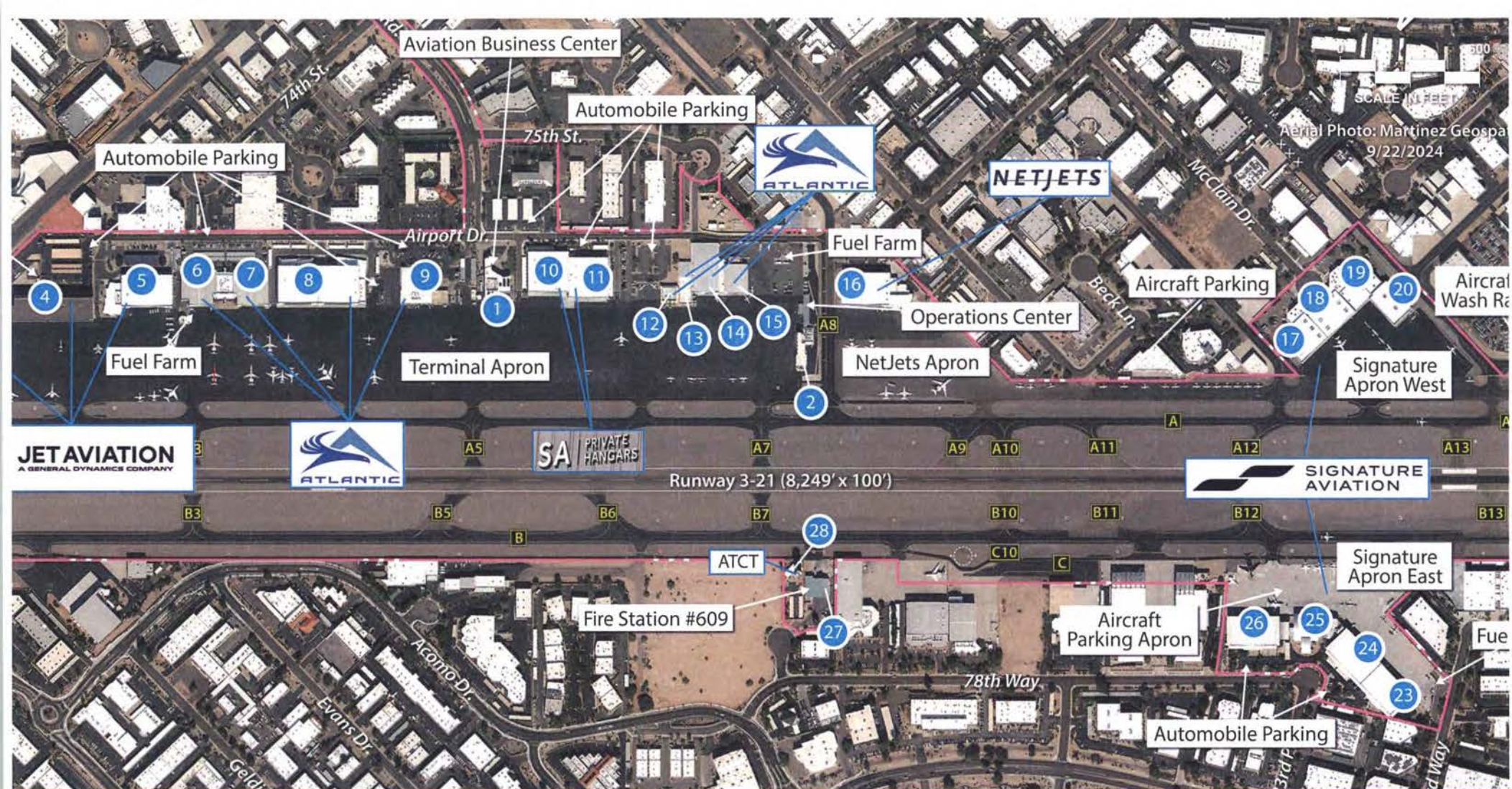
RNAV (RNP) Runway 21		
RNP 0.16 DA		486'/1 ³ / ₈ -n
RNAV (GPS) Y Runway 3		
RNP 0.30 DA		359'/1 ¹ / ₄ -n
RNAV (GPS) Z Runway 3		
RNP 0.30 DA		359'/1 ¹ / ₄ -n
RNAV (GPS) D		
Circling	570'/1-mile	590'/1-m
RNAV (GPS) E		
Circling		630'/1-mile
VOR/DME-A		
Circling		870'/1 ¹ / ₂ -mile

Aircraft categories are based on the approach speed of aircraft, w speed in landing configuration. The approach categories are as fc

Category A:	0-90 knots (e.g., Cessna 172)
Category B:	91-120 knots (e.g., Beechcraft KingAir)
Category C:	121-140 knots (e.g., B-737, Regional Jets, Canadair)
Category D:	141-166 knots (e.g., B-747, Gulfstream IV)
Category E:	Greater than 166 knots (e.g., Certain large military)

Abbreviations:
GPS - Global Positioning System
RNAV- A technical variant of GPS - area navigation
RNP - Required navigation performance
DA - Decision Altitude (Used for vertically guided approaches)
Note: (xxx'/ x-mile) = Visibility (in feet)/Cloud ceiling height (in mi





BUILDING KEY

Office Space Footprint (sf)	Building Type	Operator/Function	#	Hangar Space Footprint (sf)	Office Space Footprint (sf)	Building Type	Operator/Function
23,781	Aviation Business Center	Scottsdale Airport	15	12,000	1,500	Conventional Hangar	Atlantic
10,000	Operations Center	Scottsdale Airport	16	25,000	7,700	Conventional Hangar	NetJet
1,500	Conventional Hangar	Jet Aviation/Helicopter Flight School	17	22,700	6,000	Conventional Hangar	Signature
0	Linear Hangars	Jet Aviation/Air Commerce Center	18	20,000	3,200	Conventional Hangar	Signature
24,000	Hangar/Office	Jet Aviation/Air Commerce Center	19	10,000	8,000	Conventional Hangar	Signature
8,900	Conventional Hangar	Jet Aviation	20	16,800	5,000	Conventional Hangar	Flight
3,300	Conventional Hangar	Atlantic South	21	22,200	0	Connected Box Hangars	Private
3,300	Conventional Hangar	Atlantic South	22	22,200	0	Connected Box Hangars	Private
9,500	Conventional Hangar	Atlantic	23	23,500	5,200	Conventional Hangars	Signature
3,800	Atlantic Main Terminal	Atlantic	24	23,500	5,200	Conventional Hangars	Signature
5,000	Conventional Hangar	SA Private Hangars	25	NA	12,400	Signature Terminal	Signature
3,300	Conventional Hangar	SA Private Hangars	26	24,400	10,000	Conventional Hangar	Signature

GENERAL AVIATION FACILITIES

General aviation facilities are intended to support private and corporate aviation and typically include aircraft hangars and aircraft parking aprons. Since the 2015 master plan, the airport has undergone a transformation as older hangar facilities have been replaced with new modern, sustainable facilities. Four new hangar structures, the Aviation Business Center, and the Airport Operations Center have been constructed along the main terminal apron on the west side, encompassing approximately 186,000 square feet of hangar space (not including the associated office space). Numerous other hangars have been constructed in the Scottsdale Airpark area.

Hangars | There are numerous buildings and hangars at SDL. Approximately 500,000 square feet of hangar space on airport property is able to accommodate aircraft and there is an additional 190,000 square feet of building/office space. If calculating a general industry standard of 2,500 square feet of space per aircraft, enclosed aircraft parking is available for 200 aircraft. Each hangar will likely have a different utilization ratio; nevertheless, this calculation provides a reasonable indication of the aircraft storage capacity on airport property. The Scottsdale Airpark has the capability to accommodate many more aircraft, as it contains 140 parcels with taxilane access to the airfield.



Atlantic Conventional Hangars



Signature Private Conventional Hangars



Jet Aviation Hangars



Connected Box Hangars

Aircraft Aprons | The main public terminal area aircraft apron on the west side of the airfield encompasses approximately 131,000 square yards of pavement. Much of the terminal apron is unmarked to allow for greater flexibility in the movement and parking of aircraft during busy times. Approximately 24 tiedown positions for small aircraft are marked on the northern portion of the terminal apron. The northern portion of the apron, north of the Aviation Business Center, is primarily intended for transient visitors to the airport. There are 21 additional tiedown positions for small aircraft on the west side of Taxiway A. It is estimated that the main terminal apron (exclusive of the marked tiedown positions) can accommodate approximately 100 business jets, depending on size.



Main Terminal Apron

The airport's rules and regulations stipulate the following:

"Airport-owned apron areas (e.g., the main terminal apron), are primarily intended to facilitate movement and operations of hangars, terminals, buildings or other structures associated with the apron space. All users shall conduct their operations in a manner that promotes the efficient use of the apron space near their facilities and avoids unnecessary use of apron space near others."

There are three additional aircraft parking aprons, which are under private leasehold. The NetJets apron is approximately 20,000 square yards, the Signature West apron is approximately 14,000 square yards, and the Signature East apron is approximately 24,000 square yards.

Vehicle Parking Lots | Interviews with the managers of the fixed base operators (FBOs) indicated a significant vehicle parking deficit at the airport, which became especially acute during the COVID-19 pandemic in 2020 with the significant growth of charter and fractional activities. All conventional hangars have associated vehicle parking lots. The Aviation Business Center parking lot across the street has 63 uncovered spots and 54 covered spots.

Aviation Business Center | The Scottsdale Airport Aviation Business Center opened in 2018 as a Leadership in Energy and Environmental Design (LEED)-certified new construction building. The Aviation Business Center is focused on hospitality and features high-end, modern amenities and breathtaking vistas, with the goal of creating a welcoming experience for users and the Scottsdale community. The 23,781-square-foot facility was designed to be the beacon for the aviation campus and consolidates the airport's landside administration offices, customs operations, and existing tenant spaces. A 3,200-square-foot multi-use space located on the second floor can be reserved for training, meetings, and social events with full catering services by Volanti, the new 2,400-square-foot farm-to-table restaurant and bar. Both spaces feature full glass façades and outdoor patios that overlook the active runway and McDowell Mountains.



Aviation Business Center – Landside

Upon arrival, an impressive public art installation of a WWII-era Stearman biplane aircraft is suspended above the park-like plaza as a point of pride. The aircraft serves as a memorial for those who trained at the airfield during WWII and all who have served the country since then. Inside, public art integrated into the lobbies depicts Scottsdale's regional aviation history and the surrounding desert landscape. Visitors to the airport can also listen in on a live feed of airport communications between pilots and tower control, which creates an authentic and engaging experience.

A primary goal was to promote sensitive and sustainable design throughout the building and regional environment. To achieve this, the site design responds to the surroundings and takes advantage of the solar orientation. The main glass facade faces north to control heat gain and integrated shade screens provide additional protection from the south and west exposures. The building's massing is subdivided into smaller elements that express small-scale details and provide the protection of glazing. On-site renewable energy was incorporated through the installation of photovoltaic panels mounted on the roof top of the building. The energy use intensity (EUI), including on-site renewable energy contribution, is 105.00 kBtu (kilo-British thermal units) per square foot per year. According to Energy Star Target Finder, the regional energy reduction is 22 percent. Water-efficient landscaping was incorporated to reduce usage and demand on city water supply, resulting in a 50 percent reduction of potable water consumption. During construction, 10 percent of materials introduced to the project were processed and manufactured within 500 miles of the project site. Low-emitting materials in paints, carpet systems, and composite wood were measured to reduce the quantity of indoor air contaminants that are odorous, irritant, and/or harmful to the comfort and well-being of installers and occupants.

FBO Facilities | The airport has three nationally prominent fixed base operators on the airfield. Each FBO has made significant investments in airport facilities over the years and provides full line services, fueling, overnight hangarage and ramp parking, lavatory and cleaning services, concierge services, and catering. Each FBO also provides all expected amenities, including first-class executive terminal facilities, passenger and crew lounges, conference rooms, Wi-Fi, flight planning stations, and restrooms.

- Atlantic Aviation occupies several hangars at the midfield of the airport. Most recently, Atlantic Aviation constructed a large hangar, office, and ramp area, which is leased to NetJets. Atlantic Aviation also leases passenger processing space for various charter operators.



Aviation Business Center – Airside



Aviation Business Center – Lobby



Volanti Restaurant

- Jet Aviation began operating in 2020 and is the newest FBO to serve SDL. Jet Aviation occupies several hangar buildings on the southwest end of the airfield. Jet Aviation recently constructed a large hangar, office, and ramp area, which is leased to NetJets. Jet Aviation additionally provides aircraft maintenance, aircraft interior design, aircraft sales, aircraft management, and charters.
- Signature Aviation established operations in 1992 and has a long history serving customers at SDL. Signature Aviation occupies a hangar and apron complex at the northeast end of the airfield and occupies space on the west side of the airfield. Signature Aviation recently constructed two conventional hangars (SA Private Hangars) encompassing approximately 60,000 square feet of space.



NetJets Office/Hangar Complex



Atlantic FBO



Jet Aviation FBO



Signature Aviation FBO

Airport Operations Center Building | The 10,000-square-foot Airport Operations Center at Scottsdale Airport opened in 2017 and is the hub for monitoring daily operations, such as safety, security, and maintenance of the airfield. This building is a state-of-the-art facility and is also environmentally friendly. The U.S. Green Building Council recognized the Scottsdale Airport Operations Center with the LEED Silver certification; this award recognizes the Scottsdale Airport Operations Center project for its sustainable, green building qualities.



Airport Operations Center Looking North



Airport Operations Center Looking West

AIRPORT SUPPORT FACILITIES

Aircraft Rescue and Firefighting | Commercial service airports are required to have on-field aircraft rescue and firefighting (ARFF) services available. SDL is not a commercial service airport and is not required to have ARFF services; however, the City of Scottsdale owns and maintains an ARFF-certified fire station at the airport to provide an additional level of safety to airport users. Fire Station 609 is 8,636 square feet in size and is located on the east side of the airfield immediately north of the ATCT. The facility is designed to provide emergency and rescue services to the airport and surrounding area. At least five full-time firefighters are present at the facility 24 hours per day. In the event of an emergency call outside the airport, at least one ARFF-certified firefighter will remain on duty at the airport.

The station houses two ARFF crash trucks. The primary truck is a 2021 Oshkosh Striker 1500. The secondary truck is a 2018 International 7400. Both ARFF trucks have capacities of 1,500 gallons of water, 210 gallons of aqueous film-forming foam (AFFF), and 450 pounds of dry chemical (Purple K).



Fire Station 609 at SDL – Airside View



2021 Oshkosh ARFF Truck Stationed at SDL

SUPPORT FACILITIES

Fuel Storage | Fueling services are primarily provided by the three fixed base operators. Each FBO pays a fuel flowage fee to the airport for the right to sell aviation fuel on the airfield. The FBOs also sell sustainable aviation fuel (SAF). The following combined total fuel capacity is available at the airport from the FBOs:

- Jet A fuel – 135,000 gallons of static storage and 79,000 gallons of fuel truck storage
- AvGas fuel – 55,000 gallons of static storage and 5,000 gallons of fuel truck storage



Jet A Fuel Trucks

In addition, private individual leaseholders can obtain permits to fuel their own aircraft. Including the airpark, there are currently 27 permits for self-fueling.

Utilities | Utility companies serving SDL include Arizona Public Service (APS), the electric company that supplies bulk electricity to the airport. Scottsdale Water provides water and sewer service in Scottsdale. Gas services are provided by Southwest Gas. Various communications companies provide fiber and cellular services.

U.S. Customs | Scottsdale Airport is designated as a *landing rights* airport by U.S. Customs and Border Protection. The U.S. Customs office is located in the Aviation Business Center building. An aircraft arriving from an international location must pass through customs procedures and must request arrival and customs inspection at least 60 minutes prior to departure from its foreign port or place of origin. An inbound international flight must also pay the customs user fee to the airport in advance of its arrival. Regular business hours are from 9:00 a.m. to 7:00 p.m. After-hours appointments will incur an additional fee.



U.S. Customs Facility

Transit Station | To diversify the City of Scottsdale's transportation system, a park-and-ride transit facility has been constructed at the southeast corner of the intersection of Scottsdale Road and Thunderbird Road on airport property. This property is physically separated from the airfield by Thunderbird Road. The facility is designed to serve express bus routes that travel on Loop 101, local bus routes on Scottsdale Road and Thunderbird Road, and planned bus rapid transit on Scottsdale Road. Other transportation sources, such as carpools and vanpools, can also use the facility.

The park-and-ride facility includes approximately 275 parking spaces (including 173 covered spaces), a designated walkway to guide people from the parking areas to the passenger pick-up platform, fare vending machines, an information kiosk, pedestrian amenities, lighting, display boards showing real-time bus information, and a maintenance/storage building.

Airport Fencing and Gate Access | The airport operations area is completely enclosed with a chain-link fence topped by three-strand barbed wire to prevent inadvertent access of the airport by vehicles and pedestrians. The fence does not always follow the legal airport property boundary due to the layout of physical features and infrastructure development. Several controlled-access gates serve different areas on the airfield. In addition, there are manual gates on airport property that are controlled by airport personnel and private airport tenants. Six controlled-access gates provide aircraft access to and from the Scottsdale Airpark.

Aircraft Wash Racks | A designated aircraft wash rack is located on the west side of the airport, adjacent to the Kilo connected box hangars. This facility allows aircraft owners to wash their aircraft and was constructed to ensure proper drainage of run-off water and cleaners. Atlantic Aviation also has a wash rack next to the Atlantic South hangar.

AIRPORT REGULATORY DOCUMENTS

Scottsdale Airport and the Scottsdale Airpark maintain numerous regulatory and operating documents for easy access by current or future airport uses. Each of these documents may be accessed via the airport website site: <https://www.scottsdaleaz.gov/scottsdale-airport/regulatory-documents>.

Scottsdale Revised Code, Chapter 5, Aviation Code | This document provides the foundation for the airport regulatory program. The information in the revised code applies to all persons conducting any activity at SDL or within the Scottsdale Airpark.

Airport Minimum Operating Standards | This document identifies the minimum operating standards for conducting commercial aeronautical activity on the airport. This document includes the minimum insurance requirements and associated fee structure for specific aeronautical business types and is only applicable to persons interested in conducting commercial aeronautical activity on Scottsdale Airport.

Airport Rules and Regulations | This document contains the general rules and regulations associated with the operating environment of the airport. All persons accessing Scottsdale Airport property should become familiar with this document.

Airpark Minimum Operating Standards | This document identifies the minimum operating standards for conducting commercial aeronautical activity in the approved areas of the Scottsdale Airpark. This document includes the minimum insurance requirements and associated fee structure for specific aeronautical business types and is only applicable to persons interested in conducting commercial aeronautical activity in the approved areas of the Scottsdale Airpark.

Airpark Rules and Regulations | This document contains the general rules and regulations for the operating environment of the properties associated with taxilanes in the Scottsdale Airpark. All persons with access to the taxilanes within the Scottsdale Airpark should become familiar with this document.

Rates and Fees Schedule | This document identifies all general rates and fees related to the use of Scottsdale Airport and the Scottsdale Airpark.

Permits and Forms | These documents are needed in conjunction with the use of Scottsdale Airport and the Scottsdale Airpark.

Airport Vicinity Development Guidelines and Checklist – Short Form | This packet is required to be completed for proposed development plans for projects located within 20,000 feet of Scottsdale Airport that are not located on an airpark taxilane or adjacent to airport property.

Airport Vicinity Development Guidelines and Checklist – Long Form | This packet is required to be completed for proposed development plans for projects within 20,000 feet of Scottsdale Airport that are located on an airpark taxilane or adjacent to airport property.

AREA LAND USE AND ZONING

Existing and planned land uses surrounding airports can impact airport operations and growth. Understanding the land use issues surrounding SDL will assist decision-makers in making appropriate recommendations for the future sustainability of the airport regarding environmental compatibility and economic development.

Arizona state law (ARS 9-461.05A) requires each city to adopt a comprehensive, long-range general plan to guide the physical development of its community. The Scottsdale City Charter also requires its adoption. The general plan is the primary tool for guiding the future of the city and contains the community's goals and policies on character and design, land use, open space and the natural environment, business and economics, community services, neighborhood vitality, transportation, and

growth. The general plan covers a period of 20 years and Arizona state law requires readoption and voter ratification of the general plan every 10 years.

The *City of Scottsdale General Plan 2035* was adopted by the Scottsdale City Council on June 8, 2021, via Resolution No. 12177. It was ratified by the citizens of Scottsdale on November 2, 2021, via Proposition 463. The *City of Scottsdale General Plan 2035* was amended on November 21, 2022, via Resolution 12655 to comply with House Bill 2482.

FEDERAL LAWS AND REGULATIONS

There are numerous federal laws and regulations related to airport land use compatibility. Airports that accept federal development grants are required to make every reasonable effort to comply with the laws and regulations. The following is a summary of the federal laws and regulations related to land use compatibility and zoning surrounding airports and a list of the primary FAA guidance documents that support airport-compatible land use planning and detail the responsibilities of airports.

FAA AC 150/5190-4B, *Airport Land Use Compatibility Planning*

This advisory circular is intended to help a broad audience understand the effects of land use on the safety and utility of airport operations and identify compatible land use development tools, resources, and techniques to protect surrounding communities from adverse effects associated with airport operations.

This AC describes the major incompatible land uses that conflict with or are impacted by operations at local public-use airports, including the following:

- Residential use within airport noise contours
- Airspace obstructions and hazards to safe navigation to and from the airport, such as tall structures, light, glare, electronic/radio interference, smoke, steam, or other atmospheric interference emanating from nearby land uses
- Land uses that attract birds and other wildlife hazards to the airport and its immediate environs
- Land uses with concentrations of people or property within airport runway protection zones

Airport-compatible land uses are defined as uses that can coexist with a nearby airport without constraining the safe and efficient operation of the airport or exposing people living or working nearby to potential negative environmental or safety impacts.

The intent of this document is to inform, educate, and increase awareness about land use compatibility issues related to airports and community development. This AC provides broad, general guidance to communities across the country on airport-compatible land use planning. Because the FAA does not have the authority to directly control off-airport land uses, and because land use decisions are often made at the local level, it is important for local land use planners to understand the implications of land use compatibility between airports and their local communities. The guidance in this AC does not replace any local land use regulations that may be in place.

Through federal grant assurances, airport sponsors and owners are obligated to pursue all reasonable and appropriate actions to secure and promote compatible land use and development within their local areas. An airport that is owned and operated by the same jurisdiction that is the land use authority (e.g., a city- or county-owned airport) is expected to adequately control land use near the airport and prevent new incompatible development. An airport located within multiple jurisdictions or that has no land use authority is expected to remain vigilant of incompatible development proposals within the airport environs and take reasonable and appropriate action to mitigate incompatible land use and promote compatible development.

This AC does not constitute a regulation and is not legally binding in its own right. Conformity with this AC is voluntary and noncompliance will not affect right and obligations under existing statutes and regulations, except for projects funded through the Airport Improvement Program or the Passenger Facility Charge Program.

Airport and Airway Improvement Act of 1982 (Title 49 USC)

Upon acceptance of federal funds, this act obligates an airport owner to operate and maintain the airport and comply with specific grant assurances, including maintenance of compatible land uses around the airport. The implementation of this act is handled through stipulations outlined in the grant documents signed by airport owners when they accept federal funds for projects.

Pursuant to the provisions of Title 49 USC, Subtitle VII (as amended), assurances are required to be submitted as part of a project application by a sponsor requesting funds. Upon acceptance of the grant offer by the sponsor, these assurances are incorporated in and become part of the grant agreement. There are 39 grant assurances, several of which address airport planning. The following are the primary land use compatibility grant assurances:

- Grant Assurance 20 relates to an airport sponsor's obligation for hazard removal and mitigation to address potential obstructions to the airspace around the airport. Grant Assurance 20 states that the airport sponsor *"will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards."*
- Grant Assurance 21 requires, in part, that the sponsor *"take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft."*

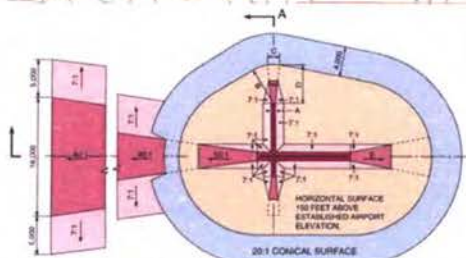
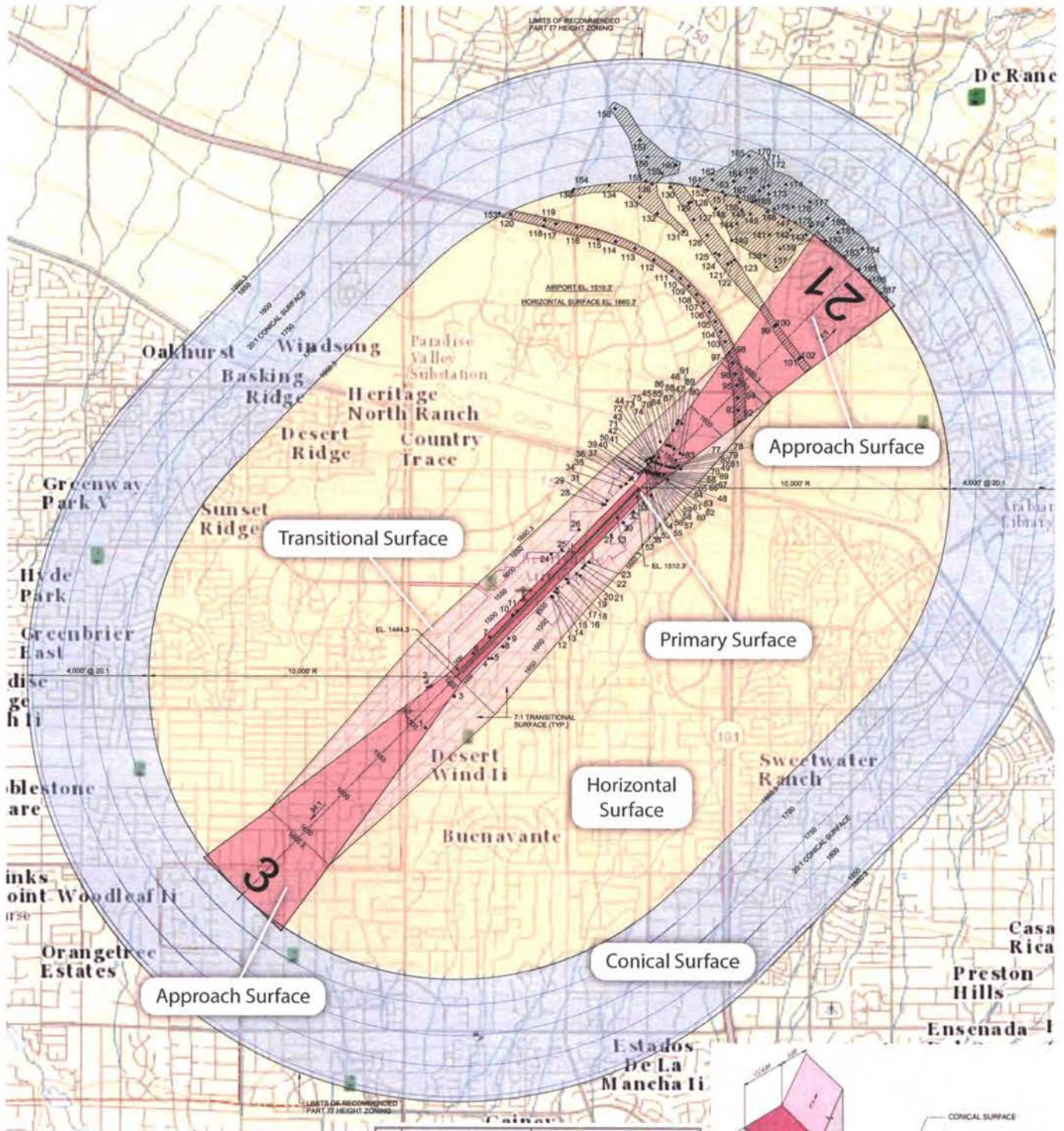
Title 14 CFR Part 77, *Objects Affecting Navigable Airspace*

This federal regulation establishes standards for determining obstructions in navigable airspace. It sets forth requirements for the construction and alteration of structures (i.e., buildings, towers, etc.). Any penetration of the Part 77 surfaces is considered an obstruction by the FAA. The guidance provides for the FAA to conduct airspace studies of any obstructions to determine if they are hazards to the safe and efficient use of airspace. Some mitigating action must be implemented if a hazard exists. Mitigating action may include alteration of the flight path and instrument capabilities, shortening of the runway, or removal of the hazard.

Implementation and enforcement of the elements contained in this regulation are a cooperative effort between the FAA and the individual state aviation agencies or the airports themselves.

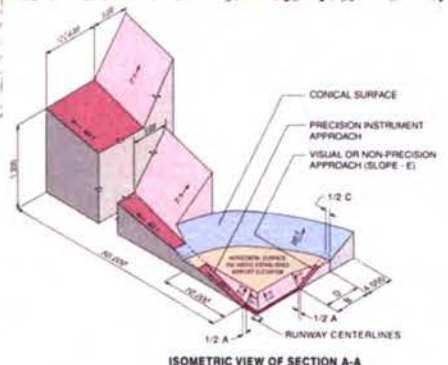
The imaginary surfaces defined in Part 77 include the primary surface, transitional surface, approach surface, horizontal surface, and conical surface. **Exhibit 1N** depicts the Part 77 drawing for SDL that was produced for the 2015 master plan. The surfaces depicted are as follows:

- *Primary Surface* | The primary surface is an imaginary surface that is longitudinally centered on the runway and extends 200 feet beyond each runway end. The elevation of any point on the primary surface is the same as the elevation along the nearest associated point on the runway centerline. The width of the primary surface is a function of the planned runway classification and the most capable instrument approach procedure planned for the runway, regardless of which end supports the approach. The width of the primary surface is 500 feet.
- *Approach Surface* | An approach surface is established for each runway end. The approach surface begins at the end of the primary surface and is the same width as the primary surface at this point. It extends upward and outward at a slope of 34:1 from the primary surface end and is centered along an extended runway centerline. The approach surface leading to each runway is based on the type of instrument approach planned (instrument or visual). The approach surface has an inner width of 500 feet, outer width of 3,500 feet, and length of 10,000 feet.
- *Transitional Surface* | The runway has a transitional surface that begins at the outside edge of the primary surface at the same elevation as the runway. The surface rises at a slope of 7:1 to a height of 150 feet above the highest runway elevation. At that point, the transitional surface ends at the horizontal surface.
- *Horizontal Surface* | The horizontal surface is established at 150 feet above the highest elevation of the runway surface. The horizontal surface has no slope and connects the transitional and approach surfaces to the conical surface at 10,000 feet from the end of the primary surface of each runway.
- *Conical Surface* | The conical surface begins at the outer edge of the horizontal surface and continues for an additional 4,000 feet horizontally at a slope of 20:1; therefore, at 4,000 feet from the horizontal surface, the elevation of the conical surface is 350 feet above the highest airport elevation.



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY		PRECISION INSTRUMENT RUNWAY	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	A	B	A	B	C	D
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,000	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	1
E	APPROACH SLOPE	20:1	20:1	20:1	20:1	24:1	24:1

A. UTILITY RUNWAYS
B. RUNWAYS LARGER THAN UTILITY
C. VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D. VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E. PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET



Source: 2015 SDL Master Plan

SOURCE: 14 CFR Part 77, Section 77.25, Civil Airport Imaginary Surfaces.

Title 14 CFR Part 150, *Airport Noise Compatibility Planning*

This federal regulation provides guidance on planning for aviation noise compatibility on and around airports. These procedures and standards are used by airports to prepare noise exposure maps and noise compatibility programs. The Part 150 process enables communities to plan for compatible land use around airports to minimize impacts from incompatible on-airport land uses.

The noise compatibility planning process is the only regulatory avenue available to local airport operators for addressing airport noise issues; however, the City of Scottsdale uses the Part 150 study process to raise awareness of aircraft noise issues and educate pilots on recommended noise abatement procedures.

FAA AC 150/5070-6B, *Airport Master Plans*

This document guides the development of airport master plans. The guiding principle of the airport planning process is to develop a safe and efficient airport through the use of acceptable standards. While there are many steps in the planning process, none of these steps should be treated in a piecemeal manner. The airside and landside issues must be equally evaluated to create a plan that provides for compatible airport and community development, where possible.

FAA AC 150/5300-13B, *Airport Design*

This document provides the basic standards and recommendations for airport design. Topics include various runway and taxiway safety areas, runway protection zones, threshold siting surfaces, runway length, and facility separation standards.

Airport Noise and Compatibility Act of 1990 (ANCA) (S-3094)

This law established a national aviation noise policy for the first time. It gave the FAA greater authority to regulate aircraft noise levels around airports, including the power to restrict the use of older, noisier aircraft (e.g., Stage 2 aircraft) and require airports to implement noise compatibility programs to mitigate noise impacts on nearby communities. While the ANCA gives the FAA greater authority to regulate noise issues associated with airports and aircraft types, it does not authorize the FAA to compromise safety. The ANCA was a landmark act; one result was that local airport operators no longer had the authority to restrict aircraft operations by type or frequency because of the overall goal of making the NAS safer. Local airports were no longer allowed to implement various restrictions on aviation; therefore, many airports (including SDL) have grandfathered restrictions. The remaining aviation prohibitions for SDL are:

- Prohibition of intersection takeoffs, stop-and-go operations, formation flying, simulated engine failure departures, and simulated go-arounds;
- Prohibition of touch-and-go operations between 9:30 p.m. and 6:00 a.m.; and
- Prohibition of engine maintenance run-ups between 10:00 p.m. and 7:00 a.m., except in emergencies.

EXISTING LAND USE

Exhibit 1P presents the current (2025) land uses in the Scottsdale Airpark area. Most of the land surrounding Scottsdale Airport is under the jurisdiction of the City of Scottsdale. The land west of Scottsdale Road is within the City of Phoenix. The airport is primarily surrounded by commercial land, which encompasses areas that comprise the Scottsdale Airpark, as well as property immediately adjacent to Scottsdale Road west of the airport, Frank Lloyd Wright Boulevard north of the airport, and Loop 101 east of the airport. A Central Arizona Project (CAP) canal, which is managed and operated by the Central Arizona Water Conservation District, is located adjacent to Frank Lloyd Wright Boulevard immediately northeast of the airport. To the north of the CAP canal is the TPC Scottsdale Champions Golf Course. Pockets of commercial, residential, and open space uses are located farther north. Land to the south and west of the airport is predominantly residential in nature.

FUTURE LAND USE

The *City of Scottsdale General Plan 2035* identifies preferred future land uses and includes the map on **Exhibit 1Q**. The future land use map shows that land immediately surrounding the airport is intended for light industrial/office space use, which is a compatible land use; the land is almost entirely developed with compatible land uses. Farther away from the airport is planned mixed use, and even farther away is planned residential land use.

Ideally, future development immediately surrounding the airport would be limited to compatible land uses, as outlined in the general plan. Compatible uses would include light and heavy industrial and commercial development. Land use zoning is the most common land use control method. The City of Scottsdale has a detailed zoning plan in place for all areas adjacent to Scottsdale Airport. Property immediately surrounding the airport contains a number of zoning designations, including Industrial Park, Central Business District, General Commercial, Commercial Office, and Open Space designations.

SOCIOECONOMIC CHARACTERISTICS

Socioeconomic information related to the approximate airport service area is an important consideration in the master planning process because it provides an understanding of the demographic dynamics of the area. The historical demographic trends in population, employment, and income provide insight into the long-term socioeconomic conditions of the region. This information is essential in determining aviation service level requirements and forecasting aviation demand elements for airports. Aviation forecasts are typically related to the population base and economic strength of the region, as well as the ability of the region to sustain a strong economic base over an extended period of time.

Socioeconomic baseline information was obtained from Woods & Poole Economics' 2024 *Complete Economic and Demographic Data Source* (CEDDS). Woods & Poole is an FAA-approved source for socioeconomic data and utilizes information from the U.S. Census Bureau, as well as other national and state organizations, for historical data and future projections. The historical socioeconomic information is presented on **Table 1K**.

TABLE 1K | Socioeconomic Data

Year	STATE OF ARIZONA			MARICOPA COUNTY		
	Population	Employment	Income	Population	Employment	Income
2015	6,716,074	3,547,646	\$40,932	4,106,807	2,439,527	\$44,129
2016	6,803,119	3,644,792	\$41,831	4,176,050	2,517,630	\$45,074
2017	6,880,741	3,740,745	\$43,202	4,232,574	2,597,415	\$46,390
2018	6,970,505	3,854,741	\$44,348	4,293,298	2,690,527	\$47,791
2019	7,070,808	3,929,946	\$46,072	4,364,459	2,756,810	\$49,834
2020	7,186,683	3,920,031	\$49,777	4,445,059	2,755,090	\$53,484
2021	7,272,487	4,086,801	\$51,707	4,499,438	2,884,525	\$55,911
2022	7,365,684	4,287,594	\$50,318	4,555,833	3,038,704	\$54,635
2023	7,431,344	4,369,756	\$51,789	4,585,871	3,106,741	\$56,955
2024	7,525,596	4,439,367	\$52,498	4,649,484	3,163,334	\$57,729
CAGR 2015-2024:	1.14%	2.27%	2.52%	1.25%	2.63%	2.72%

CAGR = compound annual growth rate

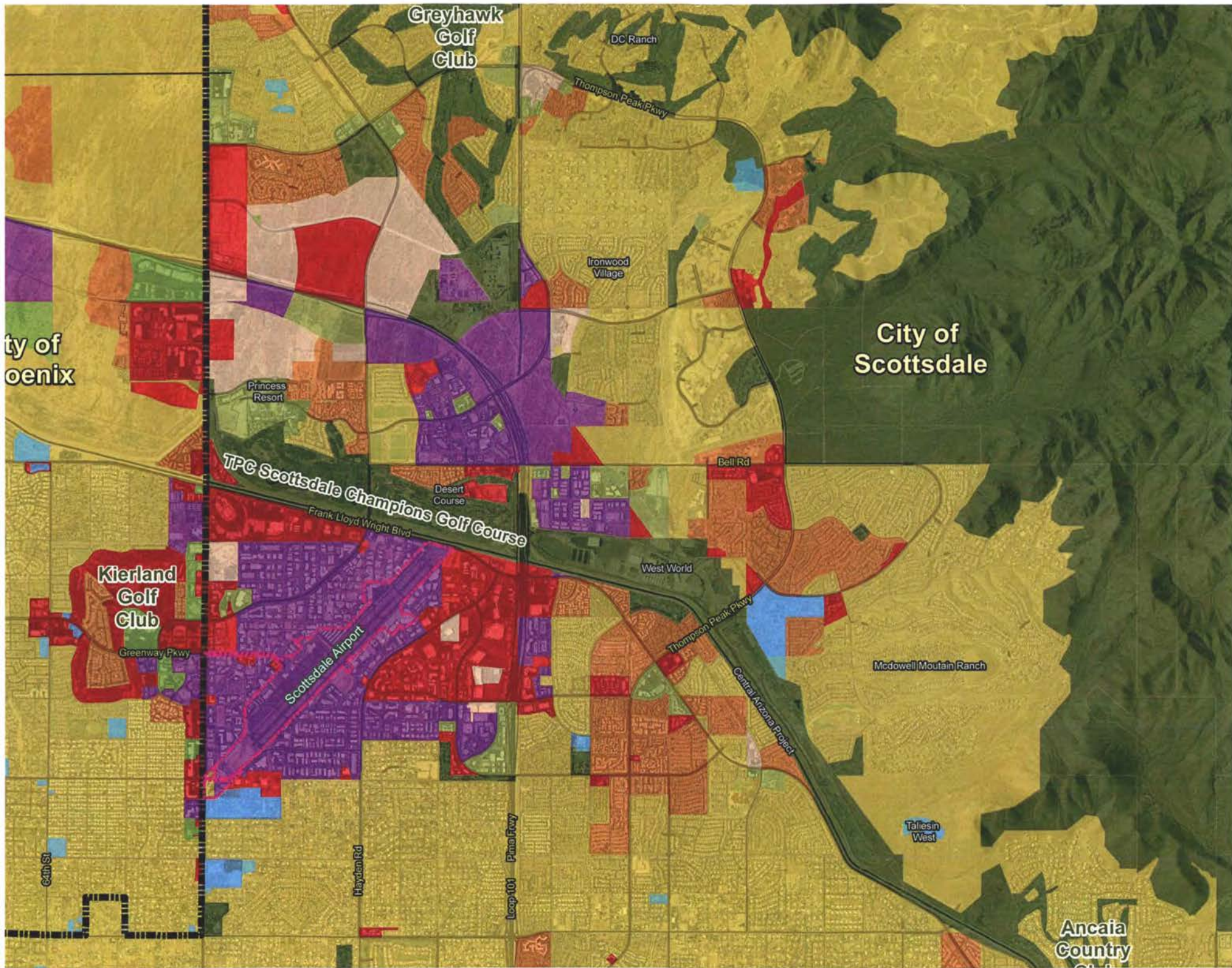
Source: Woods & Poole, CEDDS 2024

The Maricopa County population has increased by 1.25 percent annually since 2015, which is an increase of more than 542,000 residents. Employment has increased by 2.63 percent annually and income has increased by 2.72 percent. The county has seen greater growth in each socioeconomic indicator than that of the State of Arizona over the same time period. While increasing population relates to growth in aviation activity, increases in employment and income often relate to increases in aviation demand to a greater degree.

ENVIRONMENTAL INVENTORY

The purpose of the following environmental inventory is to identify potential environmental sensitivities that should be considered when planning future improvements at the airport. Research was performed for each of the 13 impact categories within FAA Order 1050.1G, *FAA National Environmental Policy Act Implementing Procedures* (§1.2(b)(1)). When considering the effects to the impact categories listed below, the FAA may examine both the short and long-term effects, beneficial and adverse effects, effects on public health and safety, economic effects, and the effects on the quality of life to American people.

- i. Aviation Emissions and Air Quality
- ii. Biological Resources (including fish, wildlife, and plants)
- iii. Coastal Resources
- iv. *Department of Transportation Act*, Section 303 (referred to as “Section 4(f)”) and Land and Water Conservation Fund (referred to as “Section 6(f)”)
- v. Farmlands
- vi. Hazardous Materials, Solid Waste, and Pollution Prevention
- vii. Historical, Architectural, Archeological, and Cultural Resources
- viii. Land Use
- ix. Natural Resources and Energy Supply
- x. Noise and Noise-Compatible Land Use
- xi. Socioeconomic and Children’s Health and Safety Risks
- xii. Visual Effects (including light emissions)
- xiii. Water Resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers)



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JENNY LIN RD.

CIRCLE MOUNTAIN RD.

HONDA BOW RD.

ROCKAWAY HILLS RD.

DESERT HILLS DR.

JOY RANCH RD.

STAGE COACH PASS

CAREFREE HWY.

DOVE VALLEY RD.

LONE MOUNTAIN RD.

DIXIE LANE DR.

DYNAMITE BLVD.

JOMAX RD.

HAPPY VALLEY RD.

PINNACLE PEAK RD.

DEER VALLEY RD.

LOOP 101

UNION HILLS DR.

BELL RD / FRANK LLOYD WRIGHT BLVD.

GREENWAY PKWY.

THUNDERBIRD RD.

CACTUS RD.

SHEA BLVD.

DOUBLETREE RANCH RD.

MCCORMICK PKWY.

INDIAN BEND RD.

LINCOLN DR.

MCDONALD DR.

CHAPARRAL RD / CAMELBACK RD.

CAMELBACK RD.

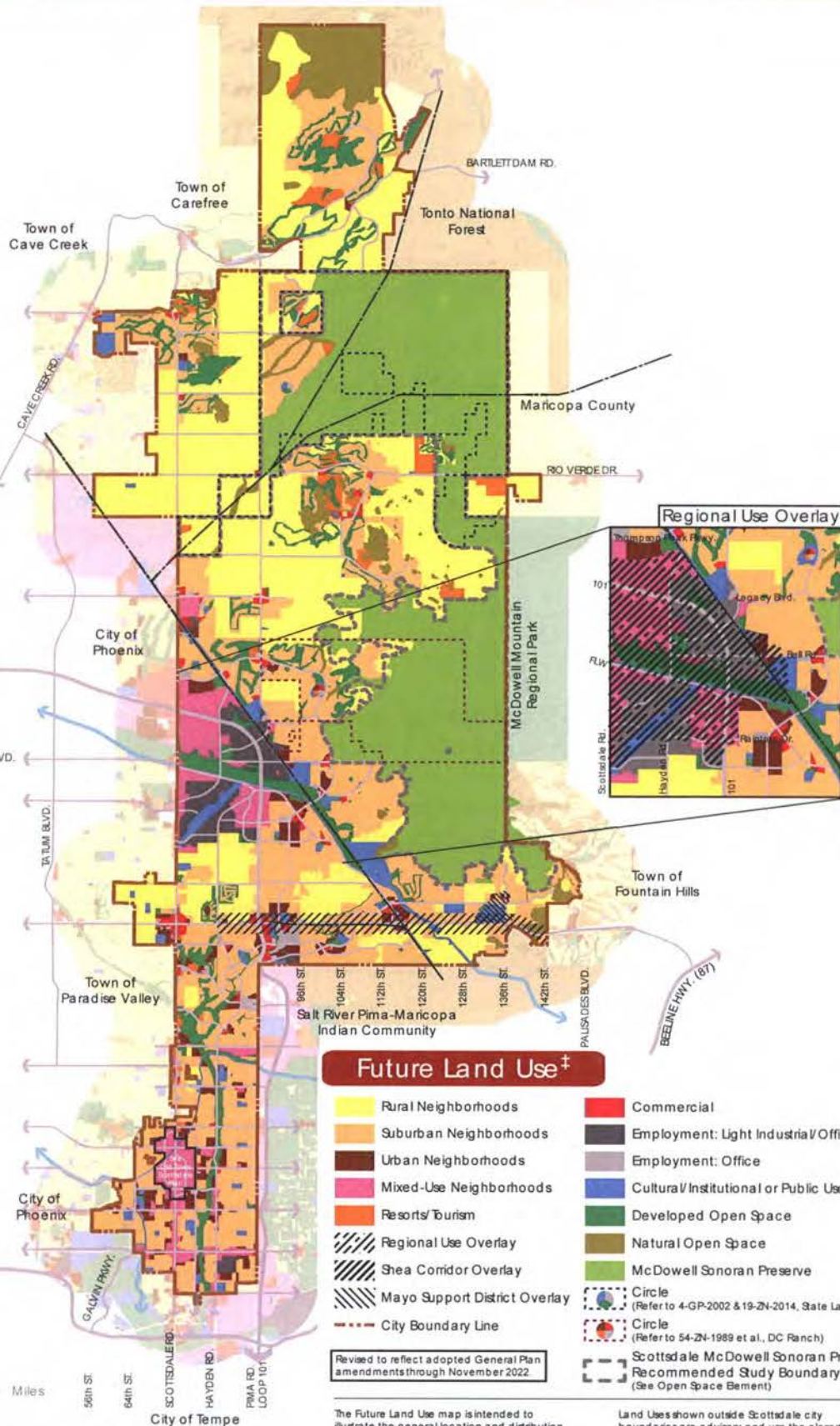
INDIAN SCHOOL RD.

THOMAS RD.

MCDOWELL RD.

LOOP 202

McKELIPS RD.



0 1 2 3 Miles

56th St

64th St

SCOTTSDALE RD

HAYDEN RD

PIMA RD

LOOP 101

City of Tempe

Source: City of Scottsdale General Plan 2035

AVIATION EMISSIONS AND AIR QUALITY

The concentration of various pollutants in the atmosphere defines the local air quality. The significance of a pollutant's concentration is determined by comparing it to the state and federal air quality standards. In 1971, the U.S. Environmental Protection Agency (EPA) established standards that specify the maximum permissible short-and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for criteria pollutants: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), coarse particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), and lead (Pb).

Based on federal air quality standards, a specific geographic area can be classified as an attainment, maintenance, or nonattainment area for each pollutant. The threshold for nonattainment designation varies by pollutant.

The airport is in Maricopa County, Arizona, located nine miles north of downtown Scottsdale. Maricopa County is designated as a nonattainment area for PM₁₀ (serious), eight-hour O₃ (2008) (moderate), and eight-hour O₃ (2015) (marginal) standards. Maricopa County is also classified as an area of maintenance for CO (1971).¹

BIOLOGICAL RESOURCES

Biological resources include the various types of plants and animals that are present in an area. The term also applies to rivers, lakes, wetlands, forests, and other habitat types that support plants and animals.

The U.S. Fish and Wildlife Service (USFWS) is charged with overseeing the *Endangered Species Act* (ESA), specifically Section 7, which sets forth requirements for a consultation to determine if a proposed project may affect a federally endangered or threatened species. If an agency determines that an action may affect a federally protected species, Section 7(a)(2) requires the agency to consult with the USFWS. Significant impacts occur when a proposed action could jeopardize the continued existence of the species or result in the destruction or adverse modification of federally designated critical habitat in the area.

The USFWS Information for Planning and Consultation (IPaC) resource list describes species and habitats protected under the ESA within the vicinity of the airport (**Table 1L**); however, as noted in the table, due to a lack of habitat, none of these species are likely to occur at the airport.

¹ U.S. EPA, Arizona Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants (https://www3.epa.gov/airquality/greenbook/anayo_az.html), September 30, 2024

TABLE 1L | Species Protected Under ESA Section 7 with Potential to Occur Near the Airport

Common Name (Scientific Name)	Federal Status*	Habitat and Range	Potential for Occurrence
BIRDS			
cactus ferruginous pygmy-owl (<i>Glaucidium brasilianum cactorum</i>)	Threatened	This species is found in the desert habitat of southern Arizona and in northwestern Mexico. The pygmy owl is found inhabiting areas along desert rivers, washes, and in Sonoran Desert habitats at elevations below 4,000 feet above mean sea level (amsl). This species roosts and nests in desert scrub thickets, trees, and large cacti and often inhabits ironwood, mesquite, acacia, saguaro, and organ pipe cacti.	Unlikely to occur. Suitable habitat is not present at the airport.
California least tern (<i>Sternula antillarum browni</i>)	Endangered	This species nests in both natural and human-made areas near beaches close to river mouths, estuaries, and coastal embayments. These nests are situated in areas that are removed from potential disturbance and predators.	Unlikely to occur. No perennial bodies of water are located at the airport.
southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	Endangered	This species is observed in moist microclimatic and vegetative conditions, requires dense riparian vegetation near surface water or saturated soil to breed, and frequently builds nests in nonnative tamarisk (<i>Tamarix</i> spp.) and native willow (<i>Salix</i> spp.). During the winter, southwestern willow flycatchers use a variety of habitats but appear to prefer semi-open brushy areas near water.	Unlikely to occur. No perennial water is present at the airport or in the adjacent vicinity.
yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Threatened	The yellow-billed cuckoo is typically found in riparian woodland vegetation (cottonwood, willow, or salt cedar) at elevations below 6,600 feet amsl. Dense understory foliage is an important factor in nest site selection. The highest concentrations in Arizona are along the Agua Fria, San Pedro, upper Santa Cruz, and Verde River drainages, and Cienaga and Sonoita Creeks.	Unlikely to occur. No suitable habitat is present within airport property boundaries.
FISHES			
desert pupfish (<i>Cyprinodon macularius</i>)	Endangered	This species has been observed in the Salton Sea, shoreline pools, freshwater ponds, and irrigation drains, as well as in creeks/washes, below 5,000 feet amsl. One natural population still occurs in Quitobaquito Spring and Quitobaquito Pond in Pima County, and reintroductions of this species have been made in Pima, Pinal, Maricopa, Graham, Cochise, La Paz, and Yavapai Counties.	Unlikely to occur. The airport does not contain perennial water sources.
Gila topminnow (incl. <i>Yaqui</i>) (<i>Poeciliopsis occidentalis</i>)	Endangered	This species prefers shallow warm waters, including ponds, cienegas, tanks, pools, springs, small streams, and the margins of larger streams at elevations below 4,500 feet amsl. Dense mats of algae and debris along habitats are an important habitat component for cover and foraging. In Arizona, most remaining native populations are in the Santa Cruz River system.	Unlikely to occur. The airport does not contain aquatic habitat.

Continues on the next page

TABLE 1L | Species Protected Under ESA Section 7 with Potential to Occur Near the Airport (continued)

INSECTS			
monarch butterfly (<i>Danaus plexippus</i>)	Proposed Threatened	The monarch butterfly is a migratory species found in a variety of habitats and requires milkweed (<i>Asclepias</i> spp.) for breeding. During fall migration in Arizona, monarch butterflies favor nectar from native plants, including sunflowers (<i>Helianthus</i> spp.), rabbitbrush (<i>Ericameria</i> spp.), desertbroom (<i>Baccharis sarothroides</i>), sweetbush (<i>Bebbia juncea</i>), milkweeds, and a variety of other native and garden plants. Populations in Arizona can migrate to California or Mexico for winter or may overwinter in the low deserts in California or Arizona. In the southwestern United States, migrating monarch butterflies often occur near water sources (e.g., rivers, creeks, riparian corridors, roadside ditches, and irrigated gardens). In the low deserts of Arizona, monarch butterflies breed in late August to early September.	Unlikely to occur. The entire airport has been developed and does not contain suitable habitat or foraging areas for this species.

*USFWS Status Definitions:

Proposed Threatened: an animal or plant species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and has been proposed to be listed as threatened; proposed threatened species are not protected by the take prohibition of section 9 of the ESA.

Threatened: any animal or plant species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its habitat range; species that fall under this listing are protected by the take prohibitions of Section 9, consistent with any protective regulations finalized under Section 4(d) of the ESA

Endangered: any animal or plant species that is in danger of extinction throughout all or a significant portion of its habitat range; endangered species are protected by the take prohibitions of Section 9 under the ESA

Sources: USFWS, IPaC (<https://ipac.ecosphere.fws.gov/>); Center for Biological Diversity, Species (<https://www.fws.gov/species/>)

Section 3 of the ESA is used to protect critical habitat areas. Designated critical habitat areas are geographically defined and have been determined to be essential to the recovery of a specific species. There is no federally designated critical habitat at or within one mile of the airport.

Additional federal laws that may be applicable to the airport are the *Bald and Golden Eagle Protection Act* (BGEPA) and the *Migratory Bird Treaty Act* (MBTA), which prohibit activities that would harm eagles and other migratory birds, their eggs, or their nests. For birds protected under the BGEPA or MBTA, all project proponents are responsible for complying with the appropriate regulations protecting birds when planning and developing a project; however, given the lack of vegetation at the airport, eagles and migratory birds are not expected to be present.

COASTAL RESOURCES

Federal activities that involve or affect coastal resources are governed by the *Coastal Barriers Resource Act*, the *Coastal Zone Management Act*, and Executive Order (E.O.) 13089, *Coral Reef Protection*.

The airport is not located within a coastal zone. The closest National Marine Sanctuary is the Channel Islands National Marine Sanctuary, which is located 271 miles away.

DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(F)

Section 4(f) of the *Department of Transportation Act*, which was recodified and renumbered as Section 303(c) of Title 49 United States Code, provides that the Secretary of Transportation will not approve any program or project that requires the use of any publicly or privately owned historic sites, public parks or

recreation areas, or waterfowl and wildlife refuges of national, state, regional, or local importance, unless there is no feasible and prudent alternative to the use of such land and the project includes all possible planning to minimize harm resulting from the use.²

Table 1M and **Exhibit 1R** identify potential Section 4(f) resources within one mile of the airport. School playgrounds or athletic fields may be considered Section 4(f) resources if the recreational facilities at the school are readily available to the public.

TABLE 1M U.S. Department of Transportation Section 4(f) Resources Within One Mile of the Vicinity of the Airport			
Place	Location	Distance from Airport	Direction from Airport
Public Recreational Facilities			
Kierland Park	6502 E Monte Cristo Avenue	1.0 mile	Northwest
Northsight Park	8400 E Thunderbird Road	0.90 miles	South
Sandpiper Park	6530 E Hearn Road	0.80 miles	West
Cactus Park	7202 E Cactus Road	0.80 miles	South
Kierland Villas Country Club	15620 N Clubgate Drive	0.50 miles	Northeast
Public Schools			
Sandpiper Elementary	6724 E Hearn Road	0.65 miles	West
Sonoran Sky Elementary	12990 N 75 th Street	0.55 miles	South

Source: U.S. Google Earth Aerial Imagery

There are no National Register of Historic Places (NRHP)-listed resources within one mile of the airport.

There are also no waterfowl and wildlife refuges within one mile of the airport. The nearest wilderness and national recreation areas are listed below.

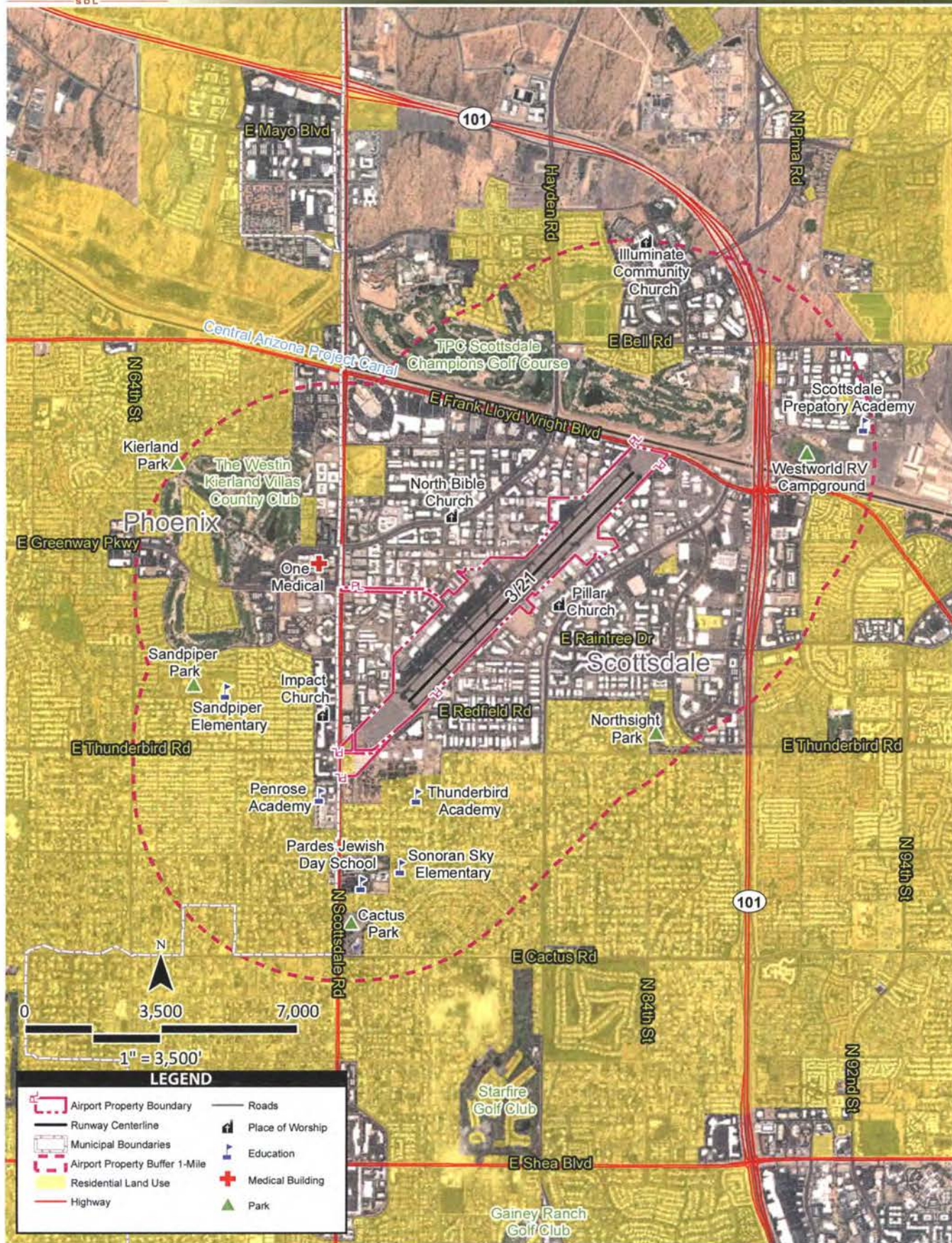
- Nearest wilderness area: Four Peaks Wilderness (located 25 miles from SDL)
- Nearest national recreation area: Lake Mead National Recreation Area (located 175 miles from SDL)

FARMLANDS

Under the *Farmland Protection Policy Act* (FPPA), federal agencies are directed to identify and consider the adverse effects of federal programs on the preservation of farmland; consider appropriate alternative actions that could reduce adverse effects; and ensure such federal are compatible with state or local government programs and policies to protect farmland, to the extent practicable. The FPPA guidelines were developed by the U.S. Department of Agriculture (USDA) and apply to farmland classified as prime, unique, or of state or local importance, as determined by the appropriate government agency with concurrence by the Secretary of Agriculture.

The USDA Natural Resources Conservation Service (NRCS) Web Soil Survey shows the types of soils and their farmland classifications on and adjacent to the airport. The airport is within an urbanized area boundary and is entirely covered with pavement, buildings, or landscape materials; therefore, even though soils at the airport (which are comprised of Gilman loams) are classified as prime farmland if irrigated, the FPPA would not be applicable to airport property and coordination with the USDA would not be needed.

² Title 49 U.S. Code § 303, Policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites



Source: ESRI Basemap Imagery (2023), USDA, City of Scottsdale, City of Phoenix

HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

Federal, state, and local laws regulate hazardous materials use, storage, transportation, and disposal. These laws may extend to past and future landowners of properties that contain these materials. In addition, disrupting sites that contain hazardous materials or contaminants may cause significant impacts to soil, surface water, groundwater, air quality, and the organisms using these resources. According to the U.S. EPA's *NEPAAssist* online tool, there are no Superfund or brownfield sites within one mile of the airport.

The closest landfill is the Scottsdale Transfer Facility, which is located more than three miles from the airport boundaries.

National Pollutant Discharge Elimination System (NPDES) permits outline the regulatory requirements of municipal stormwater management programs and establish requirements to help protect the beneficial uses of the receiving waters. NPDES permits require permittees to develop and implement best management practices (BMPs) to control/reduce the discharge of pollutants to waters of the United States, to the maximum extent practicable (MEP). The NPDES program manages wastewater, construction, stormwater, and pretreatment.

In Arizona, there is a state-specific permit called the Arizona Pollutant Discharge Elimination System (AZPDES) permit.³ AZPDES permits are required for all stormwater discharges that enter Arizona surface waters or municipal separate storm sewer systems (MS4s) leading to Arizona surface waters. These permits are also associated with construction activities that disturb one or more acres of land, and support activities from temporary plants or operations set up to produce concrete, asphalt, or other materials exclusively for permitted construction projects.⁴

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Determination of a project's impact on historic and cultural resources is made under guidance in the *National Historic Preservation Act of 1966* (NHPA), as amended, the *Archaeological and Historic Preservation Act of 1974* (AHPA), the *Archaeological Resources Protection Act* (ARPA), and the *Native American Graves Protection and Repatriation Act of 1990* (NAGPRA). The *Antiquities Act of 1906*, the *Historic Sites of 1935*, and the *American Indian Religious Freedom Act of 1978* also protect historic, architectural, archaeological, and cultural resources. Impacts may occur when a proposed project causes an adverse effect on a resource that has been identified (or is identified after being unearthed during construction) as having historic, architectural, archaeological, or cultural significance.

A cultural resource record search was conducted in preparation for the master plan and identified seven archaeological sites within a one-mile radius of the airport;⁵ however, none of these sites are located on airport property. Of the seven identified archaeological sites, two sites are historic-era artifact scatters, two are prehistoric artifact scatters, two are of unknown cultural or temporal affiliation, and one is newly

³ State of Arizona Department of Environmental Quality (ADEQ) (https://static.azdeq.gov/permits/azpdes/msgp_permit.pdf)

⁴ ADEQ (<https://azdeq.gov/AZPDES/CGP>)

⁵ SWCA Environmental Consultants, Cultural Resources Archival Research for the Scottsdale Airport Master Plan Update Project, City of Scottsdale, Maricopa County, Arizona, prepared by David M.R. Barr, October 2024

recorded and has yet to be affiliated with a known cultural or temporal connection. The report concluded that no further cultural resource work is recommended for the current SDL property, as the airport is entirely developed and there are no undisturbed native soils at SDL.

The airport was opened in March 1943 and buildings or structures of historic age (i.e., 50 years or older) may still be present within airport property. Based on historic aerial imagery of the area, one current executive hangar (south of Airport Drive) and one current structure (the runway system) were built in the late 1960s and are of historic age; however, the runway system has routinely received pavement maintenance over the years and is unlikely to contain any of its initial pavement from the 1960s. Two additional hangars at SDL will reach historic age within the next 10 years.

The nearest tribal land to Scottsdale Airport is the Salt River Reservation, located three and half miles south of airport.⁶

LAND USE

Land use regulations near airports are achieved through local government codes, city policies, and plans that include airport districts and planning areas. Regulations are used to avoid land use compatibility conflict around airports.

Based on the City of Scottsdale's interactive maps, the airport is zoned as I-1 (Industrial Park). The city's unified development code defines the I-1 zoning designation as land uses intended to provide light manufacturing, aeronautical, light industrial, office, and other development that sustains and enhances employment opportunities. This zoning classification is also intended to provide flexibility in development that remains consistent with standard design principles and allows for transition areas adjacent to residential districts.⁷

According to the *City of Scottsdale General Plan 2035* (adopted in November 2021), the Future Land Use Map classifies the airport as a Cultural/Institutional or Public land use. The land uses immediately surrounding the airport boundary have been primarily classified as Employment: Light Industrial/Office and Mixed-Use Neighborhoods, with developed open space to the northeast and northwest of the airport. The *City of Scottsdale General Plan 2035* affirms the airport's role as both an integral transportation hub and an economic engine. The plan further maintains the importance of enhancing and protecting the airport when considering future land use development.

The airport is designated as Aviation in the city's Greater Airpark Character Area Plan land use plan, which was last amended November 10, 2020. Areas immediately surrounding the airport are designated as Employment to the northwest and south, Airpark Mixed Use to the east, west, and northwest, and Airpark Mixed Use–Residential to the northwest and southwest. Chapter Three of the Greater Airpark Character Area Plan further outlines goals and policies for SDL to promote a safe, sustainable, and self-sustaining airport.

⁶ U.S. EPA, EJScreen (<https://ejscreen.epa.gov/mapper/>), accessed November 2024

⁷ Municode Codification, Scottsdale, Arizona, Code of Ordinances, Section 5.1801

The airport is currently surrounded by a mixture of industrial and commercial land uses that comprise the Scottsdale Airpark, which is a two-mile by three-mile corridor anchored by and adjacent to SDL that offers an array of aviation and non-aviation services. State Route 101 is located to the east and north of the airport. General land uses within one mile of the airport, including those that could be sensitive to airport noise or other effects, are identified on **Exhibit 1R**.

NATURAL RESOURCES AND ENERGY SUPPLY

Natural resources and energy supply provide an evaluation of a project's consumption of natural resources. It is the policy of FAA Order 1053.1C, *Energy and Water Management Program for FAA Buildings and Facilities*, to encourage the development of facilities that exemplify the highest standards of design, including principles of sustainability.

Under the *Environmental Quality Act of 1986*, the Arizona State Legislature created the Arizona Department of Environmental Quality (ADEQ) in 1987 as the state's cabinet-level environmental agency.⁸ ADEQ's main goal is to protect the state's public health and environment, and the department consists of three primary environmental programs: Air Quality, Water Quality, and Waste. Each program operates units responsible for technical, operational, and policy support. ADEQ administers the state's environmental laws and delegates federal programs to prevent air, water, and land pollution and ensure cleanup. ADEQ is responsible for a series of core functions: planning, permitting, compliance management, monitoring, assessment, cleanups, and outreach.

Chapter Six of the *Greater Airpark Character Area Plan* outlines goals and initiatives to act as a framework for any development or redevelopment within the airpark. The goals outlined in Chapter Six are listed below.

- Goal 1: Reduce energy consumption.
- Goal 2: Promote energy efficiency and sustainable design.
- Goal 3: Reduce the urban heat island effect.
- Goal 4: Promote a sustainable balance between environmental stewardship and development/redevelopment of land uses in the airpark.
- Goal 5: Improve existing water conservation efforts and increase the amount of graywater reuse.
- Goal 6: Manage and improve stormwater drainageways.

The City of Scottsdale relies on the Central Arizona Project (CAP) for approximately two thirds of its water supply.⁹ The water campus in north Scottsdale treats 70 million gallons of water per day.

NOISE AND NOISE-COMPATIBLE LAND USE

Federal land use compatibility guidelines are established under Title 14 Code of Federal Regulations (14 CFR) Part 150, *Airport Noise Compatibility Planning*. According to 14 CFR Part 150, residential land and schools are noise-sensitive land uses that are not considered compatible if impacted by a 65-decibel (dB)

⁸ ADEQ (<https://azdeq.gov/AboutUs>)

⁹ City of Scottsdale, Water Supply (<https://www.scottsdaleaz.gov/water/water-supply-recycling/water-supply>)

or higher day-night average sound level (Ldn or DNL).¹⁰ Other noise-sensitive land uses (such as religious facilities, hospitals, or nursing homes), if located within a 65 dB DNL contour, are generally compatible if a minimum interior noise level reduction of 25 dB is incorporated into the design and construction of structures. Special consideration should also be given to noise-sensitive areas within Section 4(f) properties where the land use compatibility guidelines in 14 CFR Part 150 do not account for the value, significance, and enjoyment of the area in question.¹¹ A Part 150 study was conducted for SDL in the early 2000s to depict aircraft noise impacts through the use of noise exposure maps.

The closest residential areas to the airport are single-family residential units located 0.15 miles to the east across from N 71st Street and 0.22 miles to the south across from E Thunderbird Road. **Table 1N** and **Exhibit 1R** identify other noise-sensitive land uses within one mile of the airport.

TABLE 1N | Noise-Sensitive Land Uses Within One Mile of the Airport

Facility	Location	Direction from Airport	Distance from Airport Boundary
Medical Facilities			
One Medical	15000 N Airport Drive	Northwest	0.65 miles
Schools			
Scottsdale Preparatory Academy	16537 N 92 nd Street	East	0.95 miles
Sandpiper Elementary	6724 E Hearn Road	West	0.65 miles
Penrose Academy	13402 N Scottsdale Road	Southwest	0.15 miles
Pardes Jewish Day School	12753 N Scottsdale Road	South	0.60 miles
Sonoran Sky Elementary	12990 N 75 th Street	South	0.55 miles
Thunderbird Academy	7410 E Sutton Drive	South	0.30 miles
Places of Worship			
Illuminate Community Church	17800 N Perimeter Drive	North	1 mile
North Bible Church	15678 N Greenway	North	0.35 miles
Pillar Church	15020 Hayden Road	South	0.10 miles
Impact Church	13802 N Scottsdale Road	West	0.15 miles

Source: Google Earth Aerial Imagery, November 2024

SOCIOECONOMICS AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Socioeconomics | Socioeconomics is an umbrella term used to describe aspects of a project that are either social or economic in nature. A socioeconomic analysis evaluates how elements of the human environment (such as population, employment, housing, and public services) might be affected by the proposed action and alternative(s).

The FAA has identified factors to consider when evaluating the context and intensity of potential environmental impacts, including whether the proposed action would:

- Directly or indirectly induce substantial economic growth in an area;
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation when sufficient replacement housing is unavailable;

¹⁰ DNL accounts for the increased sensitivity to noise at night (10:00 p.m. to 7:00 a.m.) and is the metric preferred by the FAA, U.S. EPA, and U.S. Department of Housing and Urban Development as an appropriate measure of cumulative noise exposure.

¹¹ Title 49 U.S. Code § 47141, Compatible Land Use Planning and Projects by State and Local Governments

- Cause extensive relocation of community business that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities; or
- Produce a substantial change in the community tax base.

Children’s Environmental Health and Safety | Per E.O. 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, federal agencies are directed to prioritize identifying and assessing environmental health and safety risks that may disproportionately impact children, including those attributable to products or substances children are likely to encounter or ingest (i.e., air, food, and water, including drinking water) or to which they may be exposed.

See Tables 1N and 1P for lists of schools and parks near the airport.

VISUAL EFFECTS

Visual effects include the extent to which a proposed action or alternative(s) would (1) produce light emissions that create an annoyance or interfere with activities or (2) contrast with or detract from the visual resources and/or visual character of the existing environment. Each jurisdiction will typically address outdoor lighting, scenic vistas, and scenic corridors in zoning ordinances and its general plan.

Light Emissions | These impacts typically relate to the extent to which any light or glare results from a source that could create an annoyance for people or would interfere with normal activities. Generally, a local jurisdiction will include ordinances in its local code that address outdoor illumination to reduce the impact of light on surrounding properties. The City of Scottsdale’s municipal code states that exterior lights should be designed to minimize glare and light trespass, conserve energy, and maintain dark skies.¹²

Airfield lighting at the airport includes a rotating beacon, medium intensity runway lighting (MIRL) serving Runway 3-21, medium intensity taxiway lighting (MITL), runway end identifier lights (REILs) at each runway end, and two-light precision approach path indicator (PAPI) lights at each runway end. The airfield lights utilize pilot-controlled lighting (PCL); thus, the airfield lights are only illuminated when activated by pilots using the airport. (See the Airfield Lighting, Signage, and Markings section earlier in this chapter for further discussion regarding the types of airfield lighting and visual approach aids at SDL.)

Visual Resources and Visual Character | Visual character refers to the overall visual conditions of the existing environment where a proposed action or its alternative(s) would be located. For example, environments near densely populated areas generally exhibit a visual character that could be defined as urban, whereas a less developed area may have a visual character defined as suburban or rural, based on the surrounding pattern and density of development, as well as topographical and landscape features (e.g., open grass fields, forests, mountains, deserts, etc.).

¹² Scottsdale, Arizona, Code of Ordinances, Section 7.600, Outdoor Lighting (https://library.municode.com/az/scottsdale/codes/code_of_ordinances?nodeId=VOLII_APXBBAZOR_ARTVIIIGEP_S7.600OULI)

Visual resources include buildings, sites, traditional cultural properties, and other natural or human-made landscape features that are visually important or have unique characteristics. In addition, visual resources can include the cohesive collection of various individual resource components that can be viewed at once or together from the area surrounding the site of the proposed action or alternative(s).

Scottsdale Airport is located within an urban area that is visually characterized by densely populated buildings and landscape. Partial views of the airfield are accessible along nearby roadways (i.e., E Redfield Road, N 76th Place, N 78th Way, and E Frank Lloyd Wright Boulevard) on the airport's southern and eastern boundaries due to a lack of vegetation along the airport's perimeter fence. Long-range views of the airport are not readily available due to the relatively flat topography of the airport environs.

ADOT administers the state-designated scenic roads program, while the Federal Highway Administration (FHWA) administers the byways program. In Arizona, a scenic road is a general term that is often used to identify state-designated and federally designated scenic roads.¹³ At present, there are 26 total state-designated scenic roads in Arizona, three of which are state-designated historic roads and four of which are state-designated parkways. There are no state-designated scenic roads within one mile of the airport.

There are five federally designated byways in the state. Of the five byways in Arizona, three are National Scenic Byways and two are classified as All-American Roads. There are no byway routes within the City of Scottsdale; therefore, there are no federal or national scenic byways near the airport. No scenic routes in Scottsdale are identified in the *City of Scottsdale General Plan 2035*.

WATER RESOURCES

Wetlands | The U.S. Army Corps of Engineers regulates the discharge of dredged and/or fill material into waters of the United States, including adjacent wetlands, under Section 404 of the *Clean Water Act* (CWA). Wetlands are defined in E.O. 11990, *Protection of Wetlands*, as "those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction." Wetlands can include swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mudflats, natural ponds, estuarine areas, tidal overflows, and shallow lakes and ponds with emergent vegetation. Wetlands exhibit three characteristics: the soil is inundated or saturated to the surface at some time during the growing season (hydrology), has a population of plants able to tolerate various degrees of floodings or frequent saturation (hydrophytes), and has soils that are saturated enough to develop anaerobic (absent of air or oxygen) conditions during the growing season (hydric).

The USFWS manages the National Wetlands Inventory on behalf of all federal agencies. The National Wetlands Inventory identifies surface waters and wetlands in the nation. The NWI map denotes the presence of riverines that traverse the airport;¹⁴ however, these riverines are drainage features at the airport. A review of the USDA-NRCS Web Soil Survey further indicates that no hydric soils are located on airport property.

¹³ ADOT, Types of Scenic Roads (<https://azdot.gov/about/historic-and-scenic-roads/types-scenic-roads#:~:text=There%20are%20a%20total%20of%20five%20feder-ally%20designated%20byways%20in>)

¹⁴ National Wetlands Inventory, Surface Waters and Wetlands (<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>)

Floodplains | E.O. 11988, *Floodplain Management*, directs federal agencies to take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by the floodplains. U.S. DOT Order 5650.2, *Floodplain*

According to the Federal Emergency Management Agency's Flood Insurance Rate Map No. 04013C1320L (October 16, 2013), the airport and its surrounding environs are mapped as Zone X (shaded), 0.2 percent annual chance flood hazard; therefore, the airport is within the 500-year floodplain (**Exhibit 1S**).¹⁵ The airport is protected from the 100-year floodplain to the north by the CAP canal and berms.

Surface Waters | The CWA establishes water quality standards, controls discharges, develops waste treatment management plans and practices, prevents or minimizes the loss of wetlands, and regulates other issues concerning water quality. Water quality concerns related to airport development most often relate to the potential for surface runoff and soil erosion, as well as the storage and handling of fuel, petroleum products, solvents, etc. Additionally, U.S. Congress has mandated the NPDES under the CWA.

Scottsdale Airport is located within two watersheds: Upper Indian Bend Wash and Lower Indian Bend Wash. Two waterbodies are located within these watersheds: Indian Bend Wash (headwaters to Salt River) and Chaparral Park Lake.¹⁶ Indian Bend Wash has been identified as a waterbody with an unknown water condition, meaning this waterbody has been identified for a specific use but has not been properly assessed for that use. Chaparral Park Lake is classified as a waterbody with a good water condition; the water conditions within this waterbody fully support its designated use under the CWA. There are no Outstanding Arizona Waters within or near the project area.¹⁷

Groundwater | Groundwater is subsurface water that occupies the space between sand, clay, and rock formations. The term *aquifer* is used to describe the geologic layers that store or transmit groundwater, such as wells, springs, and other water sources. Examples of direct impacts to groundwater could include withdrawal of groundwater for operational purposes or reduction of infiltration or recharge area due to new impervious surfaces.¹⁸

The U.S. EPA's Sole Source Aquifer (SSA) program was established under Section 1424(e) of the *Safe Drinking Water Act* (SDWA) (Public Law 93-523, 42 U.S.C. 300 et. seq). Since 1977, the SSA program has been used by communities to help prevent contamination of groundwater from federally funded projects and has increased public awareness of the vulnerability of groundwater resources.

According to the U.S. EPA's *Sole Source Aquifers for Drinking Water* website, there are no sole source aquifers located within (or within one mile of) airport boundaries. The nearest sole source aquifer is the Upper Santa Cruz and Avra Basin SSA, located 63 miles south of the airport.¹⁹

Wild and Scenic Rivers | The *National Wild and Scenic Rivers Act of 1968* was established to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Nationwide Rivers Inventory (NRI) is a list of over 3,400 rivers or river segments that appear to meet the minimum *Wild and Scenic Rivers Act* eligibility

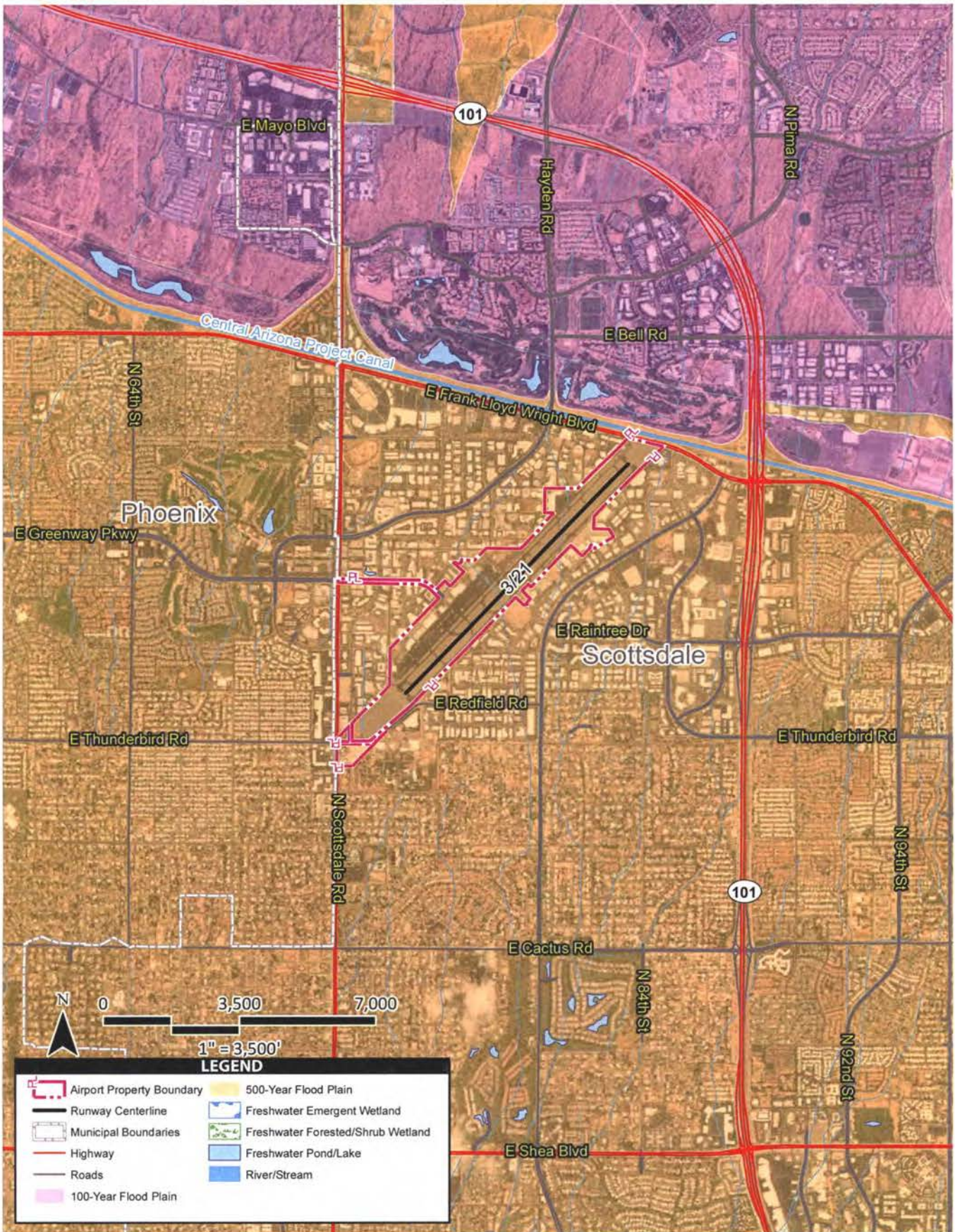
¹⁵ FEMA, Flood Map (<https://www.fema.gov/flood-maps>)

¹⁶ U.S. EPA, How's My Waterway (<https://mywaterway.epa.gov/community/scottsdale%20airport/overview>)

¹⁷ Arizona Administrative Code A.A.C.R18-11-112(G), Outstanding Arizona Waters (OAWs)

¹⁸ United States Geological Survey, What is Groundwater? (<https://www.usgs.gov/faqs/what-groundwater>)

¹⁹ U.S. EPA, Sole Source Aquifers (<https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b>)



requirements, based on free-flowing status and resource values. The development of the NRI resulted from Section 5(d)(1) of the *Wild and Scenic Rivers Act*, which directs federal agencies to consider potential wild and scenic rivers in the comprehensive planning process.

The closest designated national wild and scenic river identified is a segment of the Verde River that is located 38 miles from the airport.²⁰ The nearest NRI feature is a segment of the Verde River that is located 30 miles from the airport.²¹

²⁰ National Wild and Scenic Rivers System, Arizona (<https://www.rivers.gov/arizona>)

²¹ National Park Service, Nationwide Rivers Inventory (<https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm>)



Chapter 2

Forecasts



Chapter 2

Forecasts



Projections of aviation demand will be vital in determining the future needs of the airport. Over the past several decades, the aviation industry has experienced several system shocks, including the Great Recession of 2008-2009, various mergers and acquisitions, transitions in the aircraft fleet mix, and the COVID-19 pandemic of 2020-2021. Despite all the turmoil in the aviation industry over the years, Scottsdale Airport (SDL) has maintained and grown its reputation as one of the most significant general aviation airports in the country. While it is impossible to predict future system shocks, these events typically even out over time. This chapter presents new aviation demand forecasts for Scottsdale Airport.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. In addition, aviation activity forecasts may be an important input to future analysis associated with planned airport development.



The FAA is responsible for the review and approval of airport forecasts developed for planning and design, project justification, *National Environmental Policy Act* (NEPA) environmental reviews, benefit-cost analyses (BCAs), and Part 150 noise compatibility planning (NCP). When reviewing a sponsor's forecast, the FAA must ensure the forecast is based on reasonable planning assumptions, uses current data, and is developed using appropriate forecast methods. Guidance for the development of FAA-approved aviation demand forecasts is provided in the following publications:

- FAA Order 5090.5, *Formulation of the National Plan of Integrated Airport Systems (NPIAS) and Airports Capital Improvement Plan (ACIP)*
- FAA Memorandum: *Forecast Review and Approval Instructions* (dated August 12, 2024)
- FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*
- FAA AC 150/5000-17, *Critical Aircraft and Regular Use Determination*

According to FAA Order 5090.5, forecasts should be:

- Realistic;
- Objective in their reasoning;
- Based on the latest available data;
- Reflective of current conditions at the airport (as a baseline);
- Supported by information in the study; and
- Able to provide adequate justification for airport planning and development.

The forecasting process for an airport master plan involves a series of basic steps that vary in complexity, depending on the issues to be addressed and the level of effort required. The steps include a review of previous forecasts, determination of data needs, identification of data sources, collection of data, selection of forecast methods, preparation of the forecasts, and documentation and evaluation of the results. FAA AC 150/5070-6B, *Airport Master Plans*, outlines seven standard steps involved in the forecast process:

1. **Identify Aviation Activity Measures:** Determine the levels and types of aviation activities likely to impact facility needs. For general aviation, these typically include based aircraft and operations.
2. **Review Previous Airport Forecasts:** Sources may include the FAA *Terminal Area Forecast*, state or regional system plans, and previous master plans.
3. **Gather Data:** Determine what data are required to prepare the forecasts, identify data sources, and collect historical and forecast data.
4. **Select Forecast Methods:** Several appropriate methodologies and techniques are available, including regression analysis, trend analysis, market share or ratio analysis, exponential smoothing, econometric modeling, comparison with other airports, survey techniques, cohort analysis, choice and distribution models, range projections, and professional judgment.
5. **Apply Forecast Methods and Evaluate Results:** Prepare the actual forecasts and evaluate them for reasonableness.
6. **Summarize and Document Results:** Provide supporting text and tables, as necessary.

7. **Compare Forecast Results with the FAA TAF:** Based aircraft and total operations forecasts are considered consistent with the TAF if they meet one of the following criteria:

- The forecasts differ by less than 10 percent in the five-year forecast period and less than 15 percent in the 10-year forecast period;
- The forecasts do not affect the timing or scale of an airport project; or
- The forecasts do not affect the role of the airport, as defined in the current version of FAA Order 5090.5, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)* and the *Airports Capital Improvement Plan (ACIP)*.

If the master plan forecast is not consistent with the TAF, differences must be resolved if the forecast is to be used in FAA decision-making. This may involve revisions to the forecasts submitted, adjustment to the TAF, or both. It should be noted that the FAA's forecast approval is limited to the 10-year outlook period unless a longer period is specifically needed for environmental analyses or a benefit-cost analysis.

The forecasts must also include an analysis of the current critical aircraft, which is the aircraft or family of characteristically similar aircraft that accounts for at least 500 annual operations at the airport, as well as the future critical aircraft. FAA AC 150/5000-17, *Critical Aircraft and Regular Use Determination*, is referenced when conducting the critical aircraft analysis.

Aviation activity can be affected by many influences on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over 20 years with certainty; therefore, it is important to remember that forecasts are intended to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The following forecast analysis for the airport was produced following these basic guidelines. Existing forecasts are examined and compared against current and historical activity. The historical aviation activity is then examined, along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation demand projections for the airport that will enable airport management to make planning adjustments, as necessary, to maintain a viable, efficient, and cost-effective facility.

These aviation demand forecasts were prepared in February 2025. The base year is the full calendar year of 2024 and projections are made for a 20-year period through 2044.

NATIONAL AVIATION TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for large air carriers, air taxi, general aviation, and FAA workload measures. The forecasts are prepared to meet the budget and planning needs of the FAA and provide information that can be used by state and local authorities, the aviation industry, and the general public. The current edition when this chapter was prepared was *FAA Aerospace Forecasts – Fiscal Years (FY) 2024-2044*. The FAA primarily uses the economic performance of the United States (U.S.) as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets. The following discussion is summarized from *FAA Aerospace Forecasts – FY 2024-2044*.

From 2009, following the Great Recession, until 2020, with the onset of the COVID-19 pandemic, the airline industry experienced a period of relative stability. The COVID-19 pandemic brought a rapid and cataclysmic end to those boom years for the airlines. By 2023, travelers were ready to return to normal and passenger enplanements (boardings) across the country rebounded. By 2024, many commercial service airports were experiencing record passenger levels, surpassing the 2019 highs.

Recovery of the general aviation sector from the impact of the COVID-19 crisis was faster than for the airlines. Private aviation became attractive as the COVID-19 pandemic raged. While there has been some observed decline in general aviation activity in 2024, much of the growth experienced in 2020 and 2021 has remained. The FAA is currently observing the highest number of people pursuing aviation and becoming student pilots in the past three decades, along with the greatest increase in private pilot certifications since 1995.

ECONOMIC ENVIRONMENT

Aviation activity tends to track closely with the state of the economy and the FAA uses economic indicators as a basis for its national forecasts. According to the FAA forecast, the annual gross domestic product (GDP) of the U.S. is expected to increase by 1.7 percent over the next 20 years. U.S. carriers posted profits in 2023, and the FAA expects carriers to remain profitable over the next few years as demand rises, despite higher fares, which offset the raised labor and fuel costs. As yields stabilize and carriers return to levels of capacity consistent with their fixed costs and shed excess debt, consistent profitability should continue. Over the long term, a competitive and profitable aviation industry is anticipated, characterized by increasing demand for air travel and airfares growing more slowly than overall inflation, reflecting growing U.S. and global economies.

Prior to the COVID-19 pandemic, the U.S. economy was recovering from the most serious economic downturn and slow recovery since the Great Depression. Demand for aviation is fundamentally driven by economic activity; as economic growth picks up, so does growth in aviation activity. Overall, the FAA forecast calls for annual passenger growth over the next 20 years to average 2.5 percent. Oil prices surged to \$93 per barrel in 2022, largely due to the Russian invasion of Ukraine, after averaging \$55 per barrel over the five-year period from 2016 to 2021. Prices are forecasted to remain consistent over the next few years before climbing slowly to reach \$107 per barrel by 2044.

FAA GENERAL AVIATION FORECASTS

The long-term outlook for general aviation is promising, as growth at the high end of the segment offsets continuing retirements at the traditional low end. The active general aviation fleet is forecasted to remain relatively stable, increasing by just 0.4 percent between 2024 and 2044. While steady growth in GDP and corporate profits results in continued growth of the turbine and rotorcraft fleets, the largest segment of the fleet, fixed-wing piston aircraft, continues to shrink over the forecast period.

The FAA forecasts the fleet mix and hours flown for single-engine piston aircraft; multi-engine piston aircraft; turboprops; business jets; piston and turbine helicopters; and light sport, experimental, and other aircraft (e.g., gliders and balloons). The FAA forecasts active aircraft, not total aircraft; an active aircraft is one that is flown at least one hour during the year. **Table 2A** shows the primary general aviation demand indicators, as forecasted by the FAA.

TABLE 2A | FAA General Aviation Forecasts

Demand Indicator	2024	2044	CAGR
OPERATIONS (thousands)			
General Aviation Itinerant	15,125	16,569	0.46%
General Aviation Local	15,900	17,571	0.50%
Air Taxi	6,476	7,490	0.73%
Total Operations:	37,501	41,630	0.52%
FLEET MIX			
Single-Engine Piston	124,965	119,930	-0.21%
Multi-Engine Piston	11,520	10,860	-0.29%
Turboprops	10,860	13,255	1.00%
Jets	17,045	28,325	2.57%
Helicopters	10,090	14,025	1.66%
Other (experimental, Light Sport, etc.)	35,380	42,580	0.93%
Total General Aviation Fleet:	209,860	228,975	0.44%

CAGR = compound annual growth rate

Source: FAA Aerospace Forecasts – FY 2024-20244

General Aviation Fleet Mix

For 2024, the FAA estimates there are 136,485 piston-powered fixed-wing aircraft in the national fleet. That number is forecasted to decline by 0.2 percent by 2044, resulting in 130,790 aircraft. This includes a decline of 0.2 percent in single-engine piston aircraft and a decline of 0.3 percent in multi-engine piston aircraft.

Total turbine aircraft are forecasted to grow at an annual rate of 2.0 percent through 2044. The FAA estimates there are 27,905 turbine-powered fixed-wing aircraft in the national fleet in 2024 and there will be 41,580 by 2044. Turboprops are forecasted to grow by 1.0 percent annually, while business jets are projected to grow by 2.6 percent annually through 2044.

Total helicopters are projected to grow by 1.7 percent annually in the forecast period. There are an estimated 10,090 total helicopters in the national fleet in 2024, and that number is expected to grow to a total of 14,025 by 2044. This includes annual growth rates of 0.8 percent for piston helicopters and 2.0 percent for turbine helicopters.

The FAA also forecasts experimental aircraft, light sport aircraft (LSA), and others. Combined, there are an estimated 31,100 other aircraft in 2024, which are forecasted to grow to 37,810 by 2044 at an annual growth rate of 1.0 percent.

General Aviation and Air Taxi Operations

The FAA also forecasts total operations based on activity at airport traffic control towers across the United States. Operations are categorized as air carrier, air taxi/commuter, general aviation, and military. While the fleet size remains relatively level, the number of general aviation operations at towered airports is projected to increase from 31.0 million in 2024 to 34.1 million in 2044, with an average increase of 0.5 percent per year as growth in turbine, rotorcraft, and experimental hours offsets a decline in fixed-wing piston hours. This includes annual growth rates of 0.5 percent for local general aviation operations and 0.5 percent for itinerant general aviation operations.

The FAA also forecasts air taxi operations, which are operations utilized in a for-hire capacity. Air taxi operations include commercial aircraft with fewer than 60 seats, charters, fractional ownership operations, air ambulances, and some small air cargo operations. The FAA estimates that air taxi operations will increase over the next 20 years at an annual growth rate of 0.73 percent. **Exhibit 2A** presents the historical and forecasted U.S. active general aviation aircraft and operations.

General Aviation Aircraft Shipments and Revenue

On an annual basis, the General Aviation Manufacturers Association (GAMA) publishes an aviation industry outlook that documents past and current trends and provides an assessment of the future condition of the general aviation industry. **Table 2B** presents historical data related to general aviation aircraft shipments.

TABLE 2B | Annual General Aviation Airplane Shipments – Manufactured Worldwide

Year	Helo	SEP	MEP	TP	J	Total	Net Billings (\$ million)
2012	1,186	817	91	584	672	2,164	\$22,934
2013	1,446	908	122	645	678	2,353	\$30,296
2014	1,148	986	143	603	722	2,454	\$31,079
2015	1,090	946	110	557	718	2,331	\$29,413
2016	917	890	129	582	667	2,268	\$25,146
2017	968	936	149	563	676	2,324	\$24,321
2018	1,035	952	185	601	703	2,441	\$24,776
2019	877	1,111	213	525	809	2,658	\$27,342
2020	709	1,164	157	443	644	2,408	\$23,447
2021	860	1,261	148	527	710	2,646	\$25,769
2022	932	1,361	158	582	712	2,813	\$27,385
2023	1,020	1,508	174	638	730	3,050	\$28,304

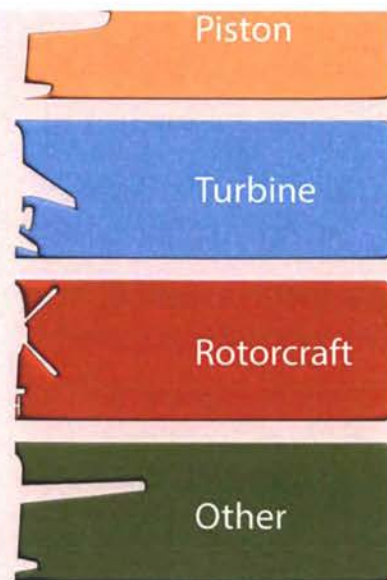
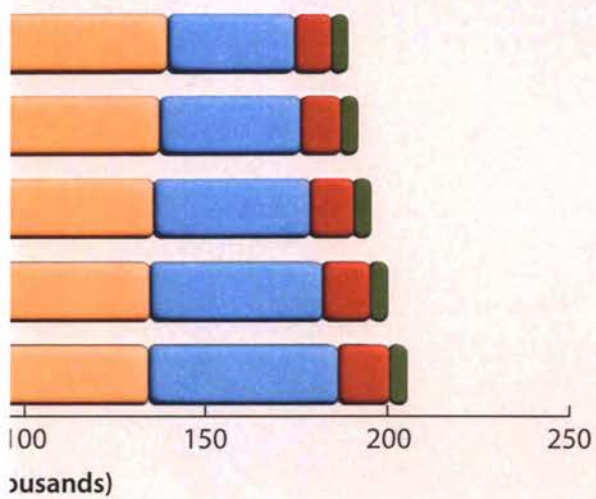
Helo = helicopter
J = jet
MEP = multi-engine piston
SEP = single-engine piston
TP = turboprop

Source: GAMA, 2023 Statbook

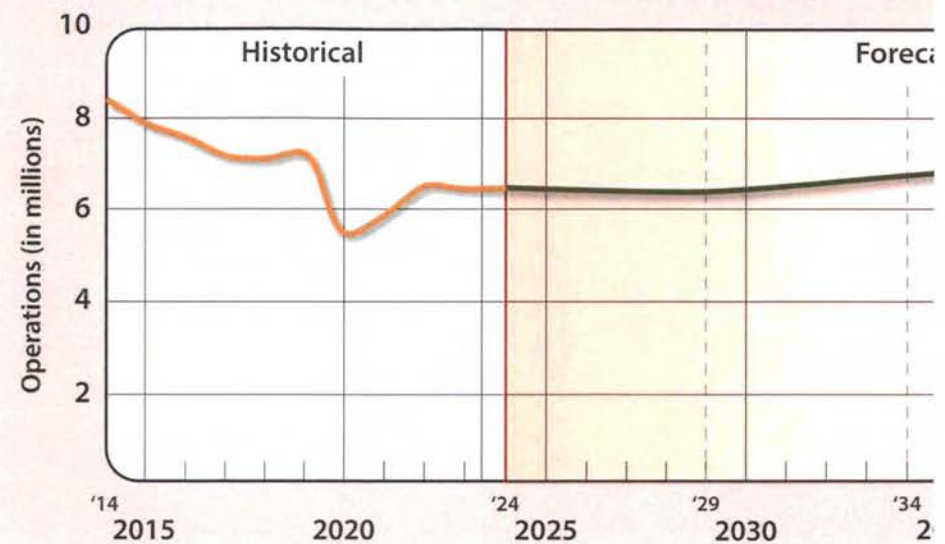
Worldwide shipments of general aviation airplanes increased in 2023. A total of 3,050 units were delivered around the globe, compared to 2,813 units in 2022: the third year in a row to experience an increase after the drop during 2020, when 2,408 units were delivered. Worldwide general aviation billings were highest in 2014. In 2023, an increase in new aircraft shipments generated more than \$28.3 billion, compared to \$27.4 billion in the previous year. North America continues to be the largest market for general aviation aircraft and leads in the manufacturing of piston, turboprop, and jet aircraft. Europe is the second largest market, while Latin America follows Europe closely in the turboprop market.

- **Business Jets** | Business jet deliveries increased from 712 units in 2022 to 730 units in 2023. The North America market accounted for 74.9 percent of business jet deliveries, which is a 7.3 percent increase in market share compared to 2022.

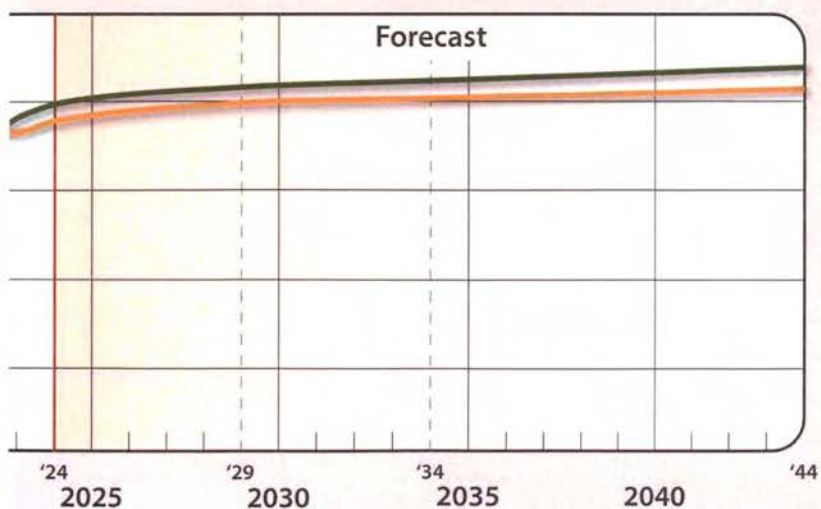
Total Aviation Aircraft



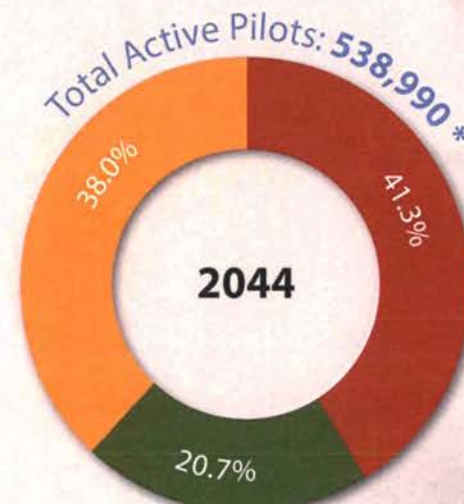
U.S. Air Taxi Operations



General Aviation Operations



Active Pilots By Certificate



- Recreational / Sport Pilot / Private / Glider / Rotorcraft
- Commercial
- Airline Transport

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- **Turboprops** | Turboprop shipments increased from 582 in 2022 to 638 in 2023. North America's market share of turboprop aircraft decreased by 2.1 percent in the last year. The Europe, Middle East, and Africa market shares increased, while the Asia-Pacific and Latin America market shares decreased.
- **Pistons** | In 2023, piston airplane shipments increased to 1,682 units from 1,519 units in the prior year. North America's market share of piston aircraft deliveries rose 7.2 percent from the year 2022. The Europe, Latin America, Middle East, and Africa regions experienced a positive rate in market shares during the past year, while the Asia-Pacific market saw a decline.
- **Helicopters** | This category includes both piston- and turbine-engine helicopters. New helicopter deliveries reached above 1,000 in 2023, which was the first time since 2018.

U.S. PILOT POPULATION

There were 490,470 active pilots certificated by the FAA at the end of 2023 and 500,406 active pilots are projected in 2024. All pilot categories, except private and recreational-only certificates, are expected to continue to increase for the forecast length. Excluding student pilots, the number of active pilots is projected to increase by about 38,584 (up 0.4 percent annually) between 2024 and 2044.

The airline transport pilot (ATP) category is forecasted to increase by 25,800 (up 0.7 percent annually). Sport pilots are predicted to increase by 2.4 percent, commercial pilots should remain steady over the forecast period, and private pilot certificates are projected to decrease at an average annual rate of 0.1 percent through 2044. The FAA has currently suspended the student pilot forecast.

UNMANNED AIRCRAFT SYSTEMS (UAS)

UAS, which are commonly referred to as drones, have been experiencing healthy growth in the U.S. and around the world over the past few years. According to *FAA Aerospace Forecasts – FY 2024-2044*:

"A drone consists of a remotely piloted aircraft and its associated elements – including the control station and the associated communication links – that are required for the safe and efficient operation in the national airspace system (NAS). The introduction of drones in the NAS has opened up numerous possibilities, especially from a commercial perspective. This has also brought challenges including drones' safe and secure integration into the NAS. Despite these challenges, the drone sector holds enormous promise; potential uses range from individuals flying solely for recreational purposes to large companies delivering commercial packages and delivering medical supplies. Public service uses, such as conducting search and rescue support missions following natural disasters, are proving promising as well."

On December 21, 2015, the FAA launched an online registration system for recreational/model small drones. This system requires all drones that weigh more than 0.55 pounds (or 250 grams) and fewer than 55 pounds (or 25 kilograms) to be registered. The registration system captures the number of registered pilots but does not capture individual drone aircraft; nevertheless, the registration information provides a basic understanding of the growth in drone activity, from which the FAA has made a growth forecast for the next five years.

Trends in Recreational/Model Aircraft

Through an examination of the drone aircraft registrations and renewals, the FAA estimated that there were as many as 1,776,800 small drones in the national fleet in 2023. FAA developed three forecasts (low range, base range, and high range), which are presented in **Table 2C**. By 2028, the FAA forecasts nearly two million small drones in its high range forecast.

TABLE 2C | Total Recreational/Model Fleet

Fiscal Year	Low Range*	Base Range**	High Range**
2023	557,300	1,776,800	1,776,800
FORECAST			
2024	555,700	1,826,400	1,830,800
2025	583,200	1,847,000	1,867,400
2026	609,200	1,867,300	1,891,300
2027	621,300	1,878,700	1,907,500
2028	628,800	1,883,000	1,920,800
CAGR	2.44%	1.17%	1.57%

CAGR = compound annual growth rate
 *Effective/active fleet counts combined with multiplicity of aircraft ownership
 **New registration counts combined with multiplicity of aircraft ownership

Source: FAA Aerospace Forecasts – FY 2024-2044

Trends in Commercial/Non-Model UAS Aircraft

Online registration for commercial/non-model small drones went into effect on April 1, 2016. These are commercial drones that weigh less than 55 pounds. Unlike recreational/model ownership, each aircraft must be individually registered. Registrations of commercial/non-model UAS aircraft have been increasing every year, according to the FAA. **Table 2D** shows the FAA forecast for this category of UAS. It is estimated that there were up to 960,000 commercial/non-model UAS in 2023, which is expected to increase to 1,176,000 by 2028 in the high range forecast.

TABLE 2D | Total Commercial/Non-Model Fleet

Fiscal Year	Low Range*	Base Range**	High Range**
2023	361,000	842,000	960,000
FORECAST			
2024	369,000	951,000	960,000
2025	371,000	1,032,000	1,050,000
2026	372,000	1,083,000	1,113,000
2027	373,000	1,110,000	1,152,000
2028	374,000	1,122,000	1,176,000
CAGR	0.71%	5.91%	4.14%

CAGR = compound annual growth rate
 *Effective/active fleet counts
 **New registration counts based fleet counts

Source: FAA Aerospace Forecasts – FY 2024-2044

Trends in Large UAS

Drones that weigh 55 pounds (large UAS) or more cannot be operated as recreational remote-piloted aircraft. They are registered with the FAA using the existing aircraft registration system. Large UAS require a Section 49 United States Code (USC) § 44807 exemption or a public aircraft operator (PAO) certification. These drones are also required to have tail numbers. At present, most large drones are flown by government entities, but commercial operators have steadily increased; most new large drone operators are active in agricultural spraying operations. The FAA estimates there were 2,311 large drones operating in the NAS in 2023. By 2028, FAA forecasts that 24,000 commercial large drones will be operating.

Advanced Air Mobility (AAM)

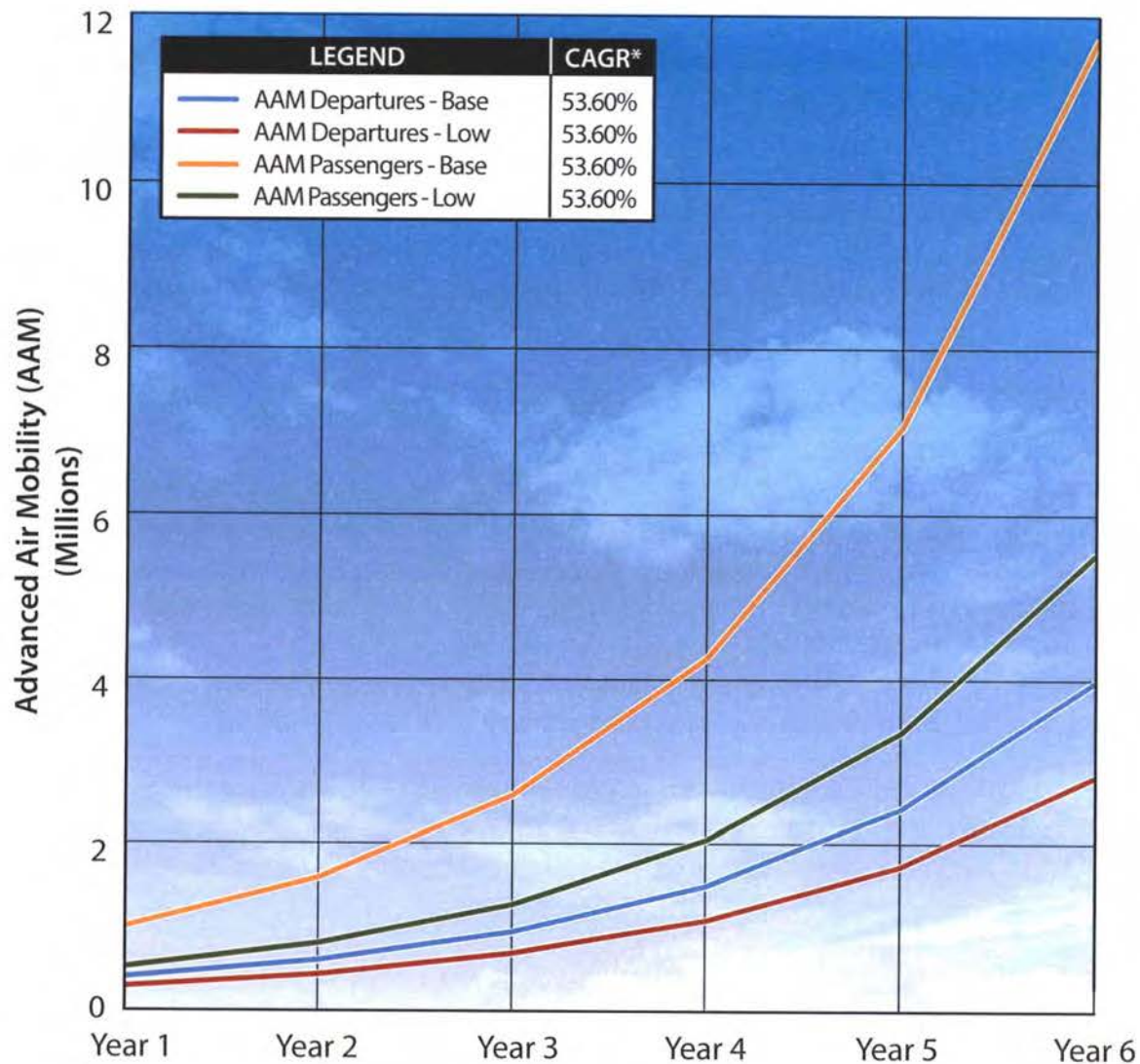
The AAM segment encompasses piloted electric vertical takeoff and landing (eVTOL) vehicles with progressively remote-piloted or automated control options. AAM is defined as “a safe and efficient system for air passenger and cargo transportation, inclusive of small package delivery and other urban drone services, which support a mix of onboard/ground-piloted and increasingly autonomous operations.” Urban air mobility (UAM), a subset of the larger AAM category, is envisioned as a transportation system that is likely to use piloted and progressively automated aircraft to move passengers and cargo at lower altitudes within urban and suburban environments.

AAM technology presents considerable opportunities for economic growth over the coming decades. Despite many regulatory and technological issues and given the fact that AAM services have not yet begun in the U.S., the FAA provides a general projection of departures and passengers, as outlined on **Exhibit 2B**.

One of the potential challenges of eVTOL entering the marketplace is infrastructure. A system of vertiports for AAM services appears to be the preferred method of operation. Joby Aviation and Archer have partnered with REEF Technology, a parking garage operator, with the goal of using parking garage rooftops as vertiports. Other options may include establishing vertiports at existing airports. Because AAM aircraft operate in a manner similar to helicopters, it is anticipated that initial AAM operations will follow existing helicopters’ operations and traffic patterns. If demand grows significantly, formal vertiports may be necessary to more efficiently separate air traffic and increase the safety of operations.

RISKS TO THE FORECAST

While the FAA is confident its forecasts for aviation demand and activity can be reached, they are dependent on several factors, including the strength of the global economy, security (including the threat of international terrorism), the changing geopolitical landscape, and oil prices. Higher oil prices could lead to further shifts in consumer spending away from aviation, dampening a recovery in air transport demand. The COVID-19 pandemic introduced a new risk, and although the industry has rebounded, the threat of future global health emergencies and potential economic fallout remains.



ADVANCED AIR MOBILITY (AAM) FORECASTS

Fiscal Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	CAGR
AAM Departures							
Base	295,530	494,637	827,887	1,385,657	2,319,213	3,881,730	53.60%
Low*	206,871	346,246	579,521	969,960	1,623,449	2,717,211	53.60%
AAM Passengers**							
Base	886,590	1,483,911	2,483,661	4,156,971	6,957,639	11,645,190	53.60%
Low	413,742	692,492	1,159,042	1,939,920	3,246,898	5,434,422	53.60%

CAGR: Compound annual growth rate

*Base (risk-adjusted potential) is based on linear interpolation of ASSURE forecasts; Low forecast is 30% lower than base forecasts.

**Estimate of 3 passengers per departure in base range scenario and passengers per departure in the low range scenario.

Source: FAA Aerospace Forecasts FY 2024-2044

FORECASTING APPROACH

The development of aviation forecasts goes through both analytical and judgmental processes. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth; however, the judgment of the forecast analyst, based on professional experience, knowledge of the aviation industry, and assessment of the local situation, is important in the selection of the preferred forecast. The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Frequently considered methodologies include trend line/time series projections, correlation/regression analysis, and market share analysis.

Trend line/time series projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical data and then extending them into the future, a basic trend line projection is produced. A basic assumption of this technique is that outside factors will continue to affect aviation demand in a similar manner as in the past. As broad as this assumption may be, the trend line projection serves as a reliable benchmark for comparing other projections.

Correlation analysis provides a measure of the direct relationship between two separate sets of historical data. If there is a reasonable correlation between the data sets, further evaluation using regression analysis may be employed.

Regression analysis measures statistical relationships between dependent and independent variables, yielding a correlation coefficient. The correlation coefficient (Pearson's r) measures association between the changes in the dependent variable and the independent variable(s). The higher the r^2 value (coefficient determination), the more reliable the forecast is. Low r^2 values may be used with the understanding that the predictive reliability is reduced.

Market share analysis involves a historical review of the airport activity as a percentage, or share, of a larger regional, state, or national aviation market. A historical market share trend is determined, providing an expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections but can provide a useful check on the validity of other forecasting techniques.

Forecasts will age, and the further one is from the base year, the less reliable a forecast may become, particularly due to changing local and national conditions; nevertheless, the study includes a 20-year forecast of aviation demand. Facility and financial planning usually require at least a 10-year view because it often takes more than five years to complete a major facility development program; however, it is important to use forecasts that do not overestimate revenue-generating capabilities or understate the demand for facilities necessary to meet public (user) needs.

Future facility requirements (e.g., terminal complex component spaces, general aviation hangars, and apron areas) are derived from projections of various aviation demand indicators. Using a broad spectrum of local, regional, and national socioeconomic and aviation information and analyzing the most current aviation trends, forecasts are presented for the following aviation demand indicators:

- General Aviation
 - Based Aircraft
 - Based Aircraft Fleet Mix
 - General Aviation Operations
 - Air Taxi and Military Operations
- Charter Activity
 - Charter Enplanements
 - Charter Operations
- Peaking Characteristics
 - Operations Peaks
- Critical Aircraft Determination
 - Airport Critical Aircraft
 - Runway Design Code

RECENT COMPARISON FORECASTS

Part of the process of developing master plan forecasts is to review any aviation demand forecasts that have been developed recently. The following section discusses these recent forecasts for the airport.

FAA TERMINAL AREA FORECAST (TAF)

On an annual basis, the FAA publishes the *Terminal Area Forecast* (TAF) for each airport included in the *National Plan of Integrated Airport Systems* (NPIAS). The TAF is a generalized forecast of airport activity used by the FAA for internal planning purposes. It is available to airports and consultants to use as a baseline projection and is an important point of comparison while developing local forecasts.

Table 2E presents the 2024 TAF for the airport (published in January 2025). Itinerant general aviation operations are projected to increase by 0.60 percent annually, while local general aviation operations are projected to increase by 2.05 percent annually. Air taxi (charter) operations are projected to increase by 4.10 percent annually. Total operations are projected to increase by 2.47 percent annually. Based aircraft are projected to grow by 1.00 percent annually, increasing from 340 to 415 within the next 20 years. Charter passengers are projected to increase 1.37 percent annually.

TABLE 2E | 2024 FAA Terminal Area Forecast

Parameter	2024	2029	2034	2044	CAGR
ANNUAL OPERATIONS					
Itinerant Operations					
Air Taxi (Charter)	63,600	77,761	95,060	142,061	4.10%
General Aviation	66,668	74,054	74,425	75,172	0.60%
Military	365	365	365	365	0.00%
Total Itinerant Operations:	130,633	152,180	169,850	217,598	2.58%
Local Operations					
General Aviation	38,572	55,379	56,213	57,918	2.05%
Military	2	2	2	2	0.00%
Total Local Operations:	38,574	55,381	56,215	57,920	2.05%
TOTAL ANNUAL OPERATIONS:	169,207	207,561	226,065	275,518	2.47%
BASED AIRCRAFT					
Based Aircraft	340	355	375	415	1.00%
TOTAL BASED AIRCRAFT:	340	355	375	415	1.00%
ENPLANEMENTS					
Air Taxi (Charter)	27,323	35,904	35,904	35,904	1.37%
TOTAL ENPLANEMENTS:	27,323	35,904	35,904	35,904	1.37%

CAGR = compound annual growth rate

Source: FAA Terminal Area Forecast, January 2025

MASTER PLAN FORECASTS 2015

As noted, the previous master plan for the airport was finalized in 2015 and had a base forecast year of 2012. Generally, forecasts that are this old are not relevant to a new forecasting effort. They are presented in **Table 2F** to memorialize what those forecasts were at the time.

TABLE 2F | 2015 Master Plan Forecasts

Parameter	2012 Baseline	2022	2032	CAGR
ANNUAL OPERATIONS				
Itinerant Operations				
Air Taxi	15,258	16,590	18,900	1.08%
General Aviation	74,255	82,950	94,500	1.21%
Military	638	630	630	-0.06%
Total Itinerant Operations:	90,151	100,170	114,030	1.18%
Local Operations				
Local	63,246	70,350	78,750	1.10%
Total Local Operations:	63,246	70,350	78,750	1.10%
TOTAL ANNUAL OPERATIONS:	153,397	170,520	192,780	1.15%
BASED AIRCRAFT				
Based Aircraft	368	430	500	1.54%
TOTAL BASED AIRCRAFT:	368	430	500	1.54%

Source: 2015 Master Plan (2012 base year)

The biggest change to the operational fleet mix since the previous master plan is a dramatic increase in air taxi operations from approximately 15,000 in 2012 to nearly 64,000 in 2024, according to the TAF.

BACKGROUND DATA

To evaluate aviation demand at SDL and the facilities necessary to properly accommodate present and future activity, two basic elements must be forecasted: based aircraft and operations. General aviation airports with at least 2,500 enplanements (passengers boarding an aircraft who have paid a fare) also need to project future enplanements. At general aviation airports, these enplanements are typically passengers boarding charter flights.

SOCIOECONOMIC TRENDS

Local and regional forecasts of key socioeconomic variables, such as population, employment, and income, provide an indication of the potential for growth in aviation activities at an airport. In 2024, the base year for these forecasts, there were an estimated 4.6 million residents of Maricopa County. This is projected to grow to 5.9 million by 2044, for an annual growth rate of 1.22 percent. Employment is projected to grow annually at 1.65 percent, while income growth is projected at 1.36 percent through 2024. **Table 2G** summarizes socioeconomic history and projections for Maricopa County, Arizona.

TABLE 2G | Socioeconomic Data

Year	STATE OF ARIZONA			MARICOPA COUNTY		
	Population	Employment	Income	Population	Employment	Income
2015	6,716,074	3,547,646	\$40,932	4,106,807	2,439,527	\$44,129
2016	6,803,119	3,644,792	\$41,831	4,176,050	2,517,630	\$45,074
2017	6,880,741	3,740,745	\$43,202	4,232,574	2,597,415	\$46,390
2018	6,970,505	3,854,741	\$44,348	4,293,298	2,690,527	\$47,791
2019	7,070,808	3,929,946	\$46,072	4,364,459	2,756,810	\$49,834
2020	7,186,683	3,920,031	\$49,777	4,445,059	2,755,090	\$53,484
2021	7,272,487	4,086,801	\$51,707	4,499,438	2,884,525	\$55,911
2022	7,365,684	4,287,594	\$50,318	4,555,833	3,038,704	\$54,635
2023	7,431,344	4,369,756	\$51,789	4,585,871	3,106,741	\$56,955
2024	7,525,596	4,439,367	\$52,498	4,649,484	3,163,334	\$57,729
CAGR 2015-2024	1.14%	2.27%	2.52%	1.25%	2.63%	2.72%
FORECAST						
2029	8,005,347	4,807,177	\$56,200	4,970,672	3,465,843	\$61,810
2034	8,495,073	5,181,872	\$60,146	5,292,885	3,773,389	\$66,178
2044	9,497,220	5,943,662	\$68,671	5,929,280	4,391,689	\$75,691
CAGR 2024-2044	1.17%	1.47%	1.35%	1.22%	1.65%	1.36%

CAGR = compound annual growth rate

Source: Woods & Poole, Complete Economic and Demographic Data Source (CEDDS), 2024

The Maricopa Association of Governments (MAG) is the metropolitan planning organization (MPO) that includes Scottsdale. MPOs are policy boards that include representatives from local governments and transportation agencies. The MAG is responsible for regional short- and long-term transportation planning for the region. To facilitate its planning efforts, the MAG also projects certain socioeconomic data. The MAG projections were reviewed in comparison to the data presented in **Table 2G**.

For a period from 2020-2040, the MAG projected an annual population increase of 1.68 percent for Maricopa County and a 1.43 percent increase for employment. The MAG does not develop projections of income.

GENERALIZED SERVICE AREA

The initial step in determining the aviation demand for an airport is to define its generalized service area for various segments of aviation. The service area is determined primarily by evaluating the locations of competing airports and their capabilities, services, and relative attraction and convenience. In determining the aviation demand for an airport, it is necessary to identify the role of the airport, as well as the specific areas of aviation demand the airport is intended to serve. Scottsdale Airport is classified as a national general aviation (GA) reliever airport within the NPIAS, which makes it one of the most important general aviation airports in the country. This category of airports is intended to serve the full range of the general aviation fleet, including the largest business jets, and SDL is intended to be an alternate airport for general aviation operators to relieve congestion at Phoenix Sky Harbor International Airport.

General aviation includes all segments of the aviation industry, except commercial air carriers and the military. GA is the largest component of the national aviation system and includes activities such as pilot training, recreational flying, and the use of sophisticated turboprop and jet aircraft for business and corporate use.

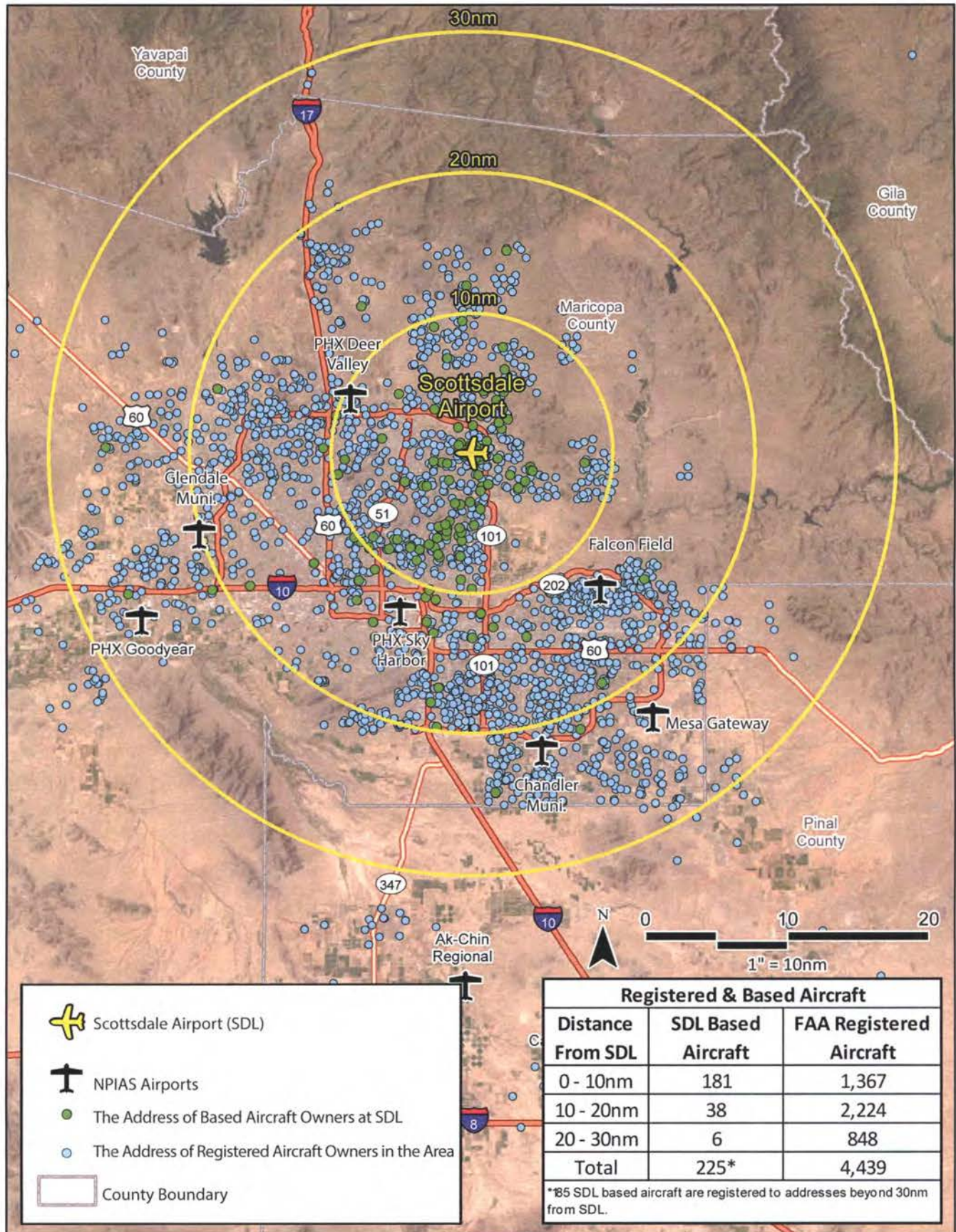
The service area for an airport is a geographical region from which an airport can be expected to attract the largest share of its activity. The definition of the service area can then be used to identify other factors (such as socioeconomic and demographic trends) that influence aviation demand at the airport. Aviation demand is impacted by the proximity of competing airports, the surface transportation network, and the strength of general aviation services provided by the airport and competing airports.

As in any business enterprise, the more attractive the facility is in terms of services and capabilities, the more competitive it will be in the market. If an airport's attractiveness increases in relation to nearby airports, so will the size of its service area. If its facilities and services are adequate and/or competitive, some level of aviation activity might be attracted to the airport from more distant locales.

Often, a primary consideration of aircraft owners/operators when choosing where to base their aircraft is the convenience of an airport relative to their homes or places of work. As a general rule, an airport's service area can extend up to and beyond 30 miles. The proximity and level of general aviation services are a defining factor when describing the general aviation service area. A description of nearby airports was previously completed in Chapter One, as presented in Exhibit 1C.

An effective method of defining an airport's service area is to examine the number of registered aircraft owners in proximity to the airport. As previously mentioned, aircraft owners typically choose to base their aircraft at airports near their homes or businesses. **Exhibit 2C** shows all registered general aviation aircraft in the region, based on the zip codes of the aircraft registrations. The exhibit also shows the zip code locations of registered aircraft that are based at SDL.

Of those aircraft based at the airport that are registered to local addresses, the vast majority are within 10 miles of the airport; however, SDL is unusual in that approximately 35 percent of aircraft based at the airport (129 aircraft) are registered to out-of-state addresses, including five registered in Canada. This is a clear indication that SDL offers certain amenities that aircraft owners desire, which may include the level of fixed base operator (FBO) services or proximity to vacation or winter homes. It can also be a function of a business decision to register an aircraft out-of-state for tax purposes or because a corporation's headquarters is in another state. For example, there are 34 SDL based aircraft registered in Delaware,



a state known for advantageous tax policies for businesses. **Table 2H** summarizes the registration locations for aircraft based at SDL. This table lists all in the basedaircraft.com inventory, several of which are not officially validated by FAA.

For the purposes of this study, the service area is defined as Maricopa County for two primary reasons: (1) most aircraft registrations are within 30 miles of SDL and are in the county, and (2) it is more practicable to assess future aviation demand as a function of countywide data, which is readily available.

TABLE 2H | SDL Based Aircraft Registration Location

Distance from SDL/State	# Based at SDL
10 nm	181
10-20 nm	38
20-30 nm	6
Other Arizona	11
Delaware	34
Oregon	22
Texas	20
Utah	14
Montana	11
Florida	8
CO, VA	5
NC, NE	4
AK, ID, KS, NV	3
CA, IN, MN, NY, PA, WA, WY	2
AR, GA, IL, KY, MA, MI, ND, NJ, RI, SC, SD, TN	1
Canada	5

nm = nautical miles

Source: National Based Aircraft Inventory database (basedaircraft.com)

GENERAL AVIATION FORECASTS

Forecasts of based aircraft and operations are an important measure for airports to consider when planning future facility needs. Many models used in airport planning use these data as a base input data point. As previously described, several forecasting techniques are employed to develop multiple forecasts. These forecasts will effectively create a planning envelope from which a single selected forecast will be identified and used to determine facility requirements. It is preferred to select a single forecast among the several developed; however, it is also acceptable to blend multiple forecasts to arrive at a selected forecast. It is also common to identify high-, medium-, and low-range scenarios that fall within the planning envelope, but a single forecast must ultimately be selected. The following subsections present the analysis for the forecast.

General aviation encompasses all portions of civil aviation, except commercial service and military operations. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity at SDL, certain elements of this activity must be forecasted. These indicators of general aviation demand include based aircraft, aircraft fleet mix, and annual operations.

BASED AIRCRAFT FORECAST

The number of aircraft based at general aviation airports is the most basic indicator of demand. The numbers and types of aircraft based at an airport may influence the need for hangars and other facilities, as well as the applicable airport design standards. The applicable design standards may include separation distances and object-clearing surfaces. The addition of numerous small aircraft may have no effect on design standards, while the addition of a few larger business jets can have a substantial impact on applicable design standards.

As of December 30, 2024, there were more than 400 aircraft based at the airport (on airport and off airport property combined); however, the validated based aircraft count from the FAA's National Based Aircraft Inventory database is 333. It is the validated based aircraft count that must serve as the baseline figure for the forecasting effort, as required by the FAA. The fleet mix includes 115 single-engine aircraft,

10 multi-engine piston aircraft, 11 turboprops, 157 business jets, and 40 helicopters. It should be noted that in the facility requirements evaluation to follow, within this master plan, the total number of based aircraft as reported by the airport will be used to evaluate airside and landside facility needs.

The process of developing forecasts of based aircraft begins with an analysis of aircraft ownership in the service area (Maricopa County) through a review of historical aircraft registrations and a projection thereof. Once a registered aircraft projection is developed, it can then be used as one input when developing the based aircraft forecasts.

Registered Aircraft Projections

Aircraft ownership trends for the primary service area will influence the based aircraft trends for an airport. For general aviation activity, the primary service area is Maricopa County. In 2024, there were 4,508 aircraft registered in the county, as shown on **Table 2J**. This is the highest number of registered aircraft since 2012. The last six years have shown an increasing trend in registered aircraft. Not all aircraft registered in one county will be based at an airport in that county. Typically, the number of aircraft registered in a particular county but based at more distant airports will balance out with the number of aircraft owners who registered their aircraft elsewhere but base their aircraft at a subject airport.

TABLE 2J | Maricopa County Registered Aircraft

Year	Single-Engine Piston	Multi-Engine Piston	Helicopters	Turboprop	Jets	Other ¹	Total
2012	3,381	391	321	147	310	415	4,965
2013	2,975	337	266	130	341	332	4,381
2014	2,914	330	252	134	198	317	4,145
2015	2,947	314	242	125	222	329	4,179
2016	3,019	316	245	145	251	399	4,375
2017	3,006	302	250	139	261	398	4,356
2018	2,824	254	231	153	273	360	4,095
2019	2,831	253	216	139	304	337	4,080
2020	2,856	249	202	135	308	349	4,099
2021	2,874	258	220	145	330	354	4,181
2022	2,860	250	233	151	326	359	4,179
2023	3,010	255	273	145	301	359	4,343
2024	3,101	270	290	171	308	368	4,508

¹Other = gliders, kit planes, sport aircraft, balloons, UAV, electric aircraft, etc.

Source: FAA aircraft registration database

Seven different forecasts of registered aircraft in Maricopa County have been developed. The first considers the FAA's national forecast of active general aviation aircraft, which projects an increase of 0.44 percent annually through 2024. By applying this growth rate to the base year figure of 4,508 registered aircraft, a forecast emerges that results in 4,922 registered aircraft by 2044.

Three growth rate forecasts of registered aircraft were then developed utilizing the projected increases in population (1.22 percent), employment (1.65 percent), and income (1.36 percent) for Maricopa County. These and the other forecasts are summarized in **Table 2K**.

The next forecast utilized the regression model to project 10 years of registered aircraft data into the future plan years. This regression resulted in a very low r^2 value of 0.07, which indicates low statistical reliability. The calculated future registered aircraft projection results in nearly zero growth over the next 20 years, which is the opposite of the trend over the last six years.

TABLE 2K | Maricopa County Registered Aircraft Forecasts

Projection	2024	2029	2034	2044	CAGR 2024-2044
FAA Forecast Growth Rate for Active Aircraft	4,508	4,608	4,710	4,922	0.44%
Population Growth Rate	4,508	4,790	5,089	5,745	1.22%
Employment Growth Rate	4,508	4,892	5,310	6,254	1.65%
Income Growth Rate	4,508	4,823	5,130	5,906	1.36%
Regression 2015-2024 Time Series	4,508	4,362	4,427	4,556	0.05%
Statewide TAF Growth Rate in Based Aircraft	4,508	4,871	5,263	6,144	1.56%
SDL TAF Growth Rate in Based Aircraft	4,508	4,738	4,980	5,501	1.00%
Selected Forecast	4,508	4,738	4,980	5,501	1.00%

The next forecast applies the annual growth rate of based aircraft in the state, as projected in the statewide TAF. The TAF projects that total based aircraft in the state will increase by 1.56 percent annually. By applying this growth rate to Maricopa County registered aircraft, a forecast emerges that results in 6,144 registered aircraft in the county by 2024.

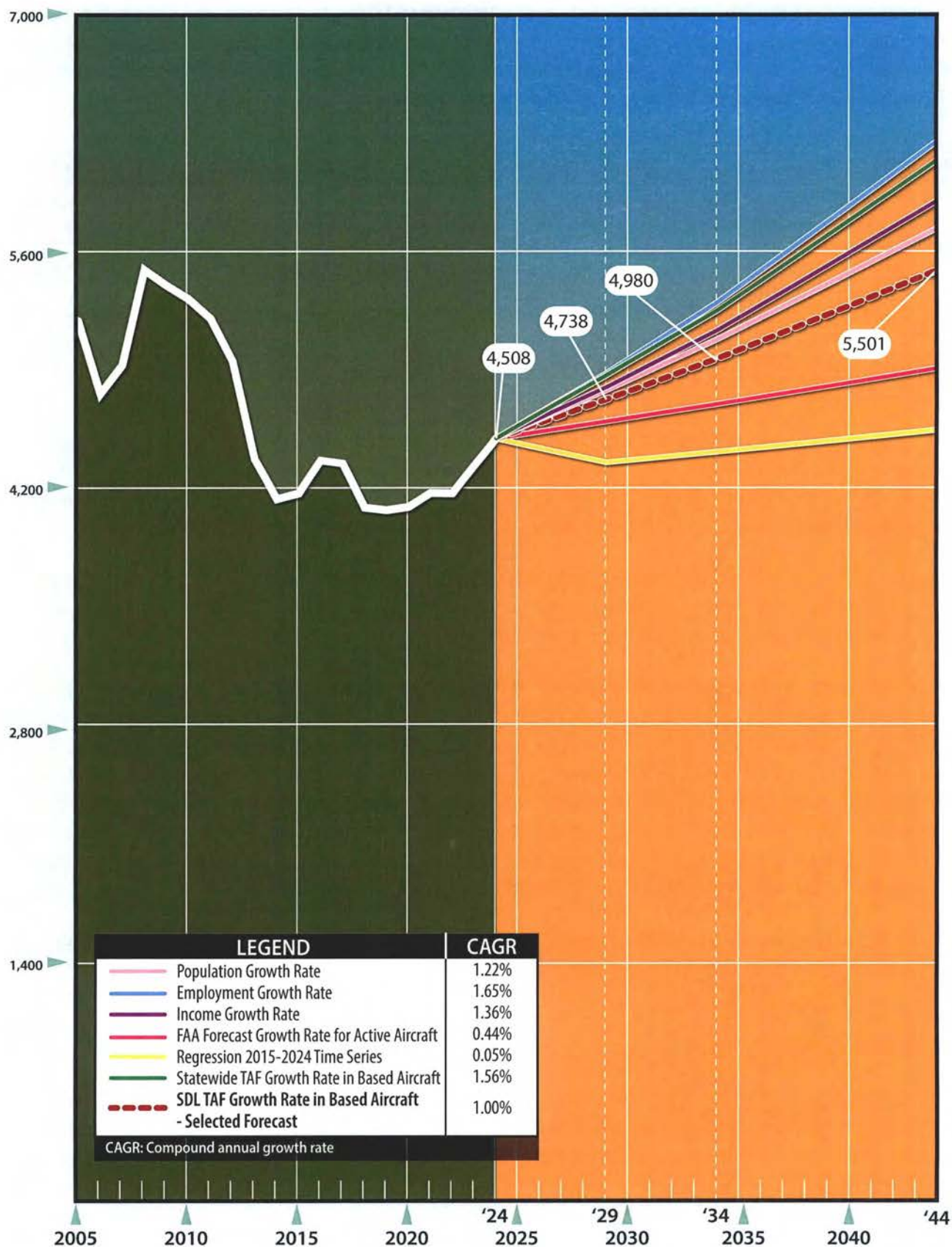
Finally, the TAF for the airport projects that based aircraft will increase by 1.0 percent annually through 2024. When this growth rate is applied to the current level of registered aircraft in the county, a forecast results for the planning years. This forecast results in 5,501 registered aircraft in the county by 2024.

The collection of these seven registered aircraft forecasts forms a planning envelope with a high and low range. For forecasting purposes, a specific forecast must be selected. A review of the history of registered aircraft in Maricopa County shows that registered aircraft have declined since 2012; however, they have increased (or remained level) year-over-year for each of the past six years. From 2022 to 2024, a total of 164 and 165 new registered aircraft were added each year, respectively; therefore, the growth is happening now in Maricopa County, so the forecast that falls near the middle of the planning envelope is the selected forecast. This forecast acknowledges the recent growth trend while tempering longer-range growth. This is the forecast that applies the based aircraft growth rate from the airport TAF.

Exhibit 2D shows the seven different registered aircraft forecasts for Maricopa County and the selected forecast for use in subsequent based aircraft analyses.

Based Aircraft Projections

A series of based aircraft forecasts are presented in an effort to create a planning envelope of reasonable forecasts. From this envelope, a single forecast will be selected. That forecast of based aircraft will then be used in subsequent analyses to determine facility needs, such as hangar space and aircraft parking apron needs.



Forecasts in Relation to County Registered Aircraft

With 333 validated aircraft currently based at the airport, 7.39 percent of county aircraft registrations are based at SDL (in aggregate). Two based aircraft forecasts were developed utilizing the registered aircraft projection as a data input. These are presented in **Table 2L**.

TABLE 2L Based Aircraft Forecasts as a Function of Registered Aircraft			
Year	Maricopa County Registered Aircraft	Based Aircraft	Market Share
2015	4,179	330	7.90%
2016	4,375	320	7.31%
2017	4,356	374	8.59%
2018	4,095	378	9.23%
2019	4,080	349	8.55%
2020	4,099	356	8.69%
2021	4,181	356	8.51%
2022	4,179	356	8.52%
2023	4,343	364	8.38%
2024	4,508	333	7.39%
Constant Share Projection (CAGR = 1.00%)			
2029	4,738	350	7.39%
2034	4,980	368	7.39%
2044	5,501	406	7.39%
Increasing Market Share Projection (CAGR = 2.14%)			
2029	4,738	367	7.75%
2034	4,980	423	8.50%
2044	5,501	509	9.25%
Statewide TAF Growth Rate (CAGR = 1.56%)			
2029	4,738	360	7.60%
2034	4,980	389	7.81%
2044	5,501	454	8.25%
SDL TAF (CAGR = 1.11%)			
2029	4,738	355	7.49%
2034	4,980	375	7.53%
2044	5,501	415	7.54%
CAGR = compound annual growth rate TAF = Terminal Area Forecast			

The first forecast considers the airport maintaining its 7.39 percent share of county registered aircraft through the 20-year planning period. This results in an annual growth rate of 1.00 percent and a long-term total of 406 based aircraft.

The second forecast considers the possibility of the airport capturing an increasing portion of county registered aircraft. By the long-range time period, this forecast assumes the airport will capture 9.25 percent of county registered aircraft, which is nearly the same as the previous high of 9.23 percent, which was achieved in 2018. This forecast results in an annual growth rate of 2.14 percent and a long-range based aircraft number of 509.

The table also includes two additional forecasts, which are based on the statewide and airport-specific *Terminal Area Forecasts*. These are included as a check of reasonableness. The first utilizes the statewide TAF growth rate of 1.56 percent applied to based aircraft at SDL, which results in a long-term forecast of 454 based aircraft. The last column, which shows the percentage of based aircraft compared to registered aircraft in the county, is the check on reasonableness. This forecast is reasonable, as it falls within the historical average ratio of based aircraft to registered aircraft.

The last forecast is the airport TAF forecast, which has an annual growth rate of 1.11 percent and a long-term forecast of 415 based aircraft. The calculated ratio of based aircraft to registered aircraft is also reasonable for the TAF.

Regression Forecasts

Regression analysis is often a preferred method of forecasting aviation activity because of the statistical nature of the regression model; however, when the historical data associated with the dependent variable (based aircraft) are not consistent, regression models can become less reliable. Over the last 10 years, the TAF data indicate that only three new aircraft have based at the airport. This data set has the effect of severely smoothing the results so that small or no growth results.

Four single-variable regressions were run, the results of which are documented in **Table 2M**. All of the regressions resulted in very low r^2 values, which is an indicator of low statistical reliability. Each regression also resulted in similar projections of based aircraft. These results are a function of the regression model, in which historical based aircraft have been somewhat stagnant and population, employment, and income show steady growth in the future; thus, the based aircraft regressions for these socioeconomic indicators are very similar. The detailed regression models run are included in **Appendix B**.

TABLE 2M | Regression Analysis Based Aircraft Forecasts

Independent Variable	r^2 Value	Dependent Variable (Based Aircraft)				CAGR 2024-2044
		2024	2029	2034	2044	
Year (Time Series)	0.03	333	362	368	379	0.65%
Population	0.04	333	363	369	381	0.68%
Employment	0.03	333	361	365	374	0.58%
Income	0.03	333	358	361	367	0.48%

Forecasts as a Function of the National General Aviation Aircraft Fleet

Utilizing the FAA national forecast for active general aviation aircraft in comparison to based aircraft at SDL, forecasts of future based aircraft can be developed. Two such forecasts are presented in **Table 2N**.

TABLE 2N | Based Aircraft Forecasts as a Function of National Fleet Forecasts

Year	FAA Active Aircraft Forecast ¹	Based Aircraft	Market Share
2015	210,031	330	0.15712%
2016	211,794	320	0.15109%
2017	211,757	374	0.17662%
2018	211,749	378	0.17851%
2019	210,981	349	0.16542%
2020	204,140	356	0.17439%
2021	209,194	356	0.17018%
2022	209,540	356	0.16990%
2023	209,730	364	0.17356%
2024	210,105	333	0.15849%
Constant Share Projection (CAGR = 0.43%)			
2029	213,370	338	0.15849%
2034	217,685	345	0.15849%
2044	228,975	363	0.15849%
Increasing Market Share Projection (CAGR = 1.35%)			
2029	213,370	341	0.16000%
2034	217,685	370	0.17000%
2044	228,975	435	0.19000%

CAGR = compound annual growth rate

Source: ¹FAA Aerospace Forecasts – FY 2024-2044

The first forecast considers the airport's market share of national active aircraft, which was 0.17356 percent in 2024. By maintaining this percentage constant through the planning years, a forecast emerges that results in an annual growth rate of 0.43 percent and a long-term total of 363 based aircraft.

The second forecast utilizing the national active aircraft forecast from the FAA considers an increasing market share for SDL. Over the last 10 years, the airport's market share has ranged between 0.15 and 0.18 percent. The increasing market share forecast considers a long-term market share of 0.19 percent, which results in an annual growth rate of 1.35 percent and 435 based aircraft by 2044.

Based Aircraft Forecasts as a Function of Socioeconomic Data

Socioeconomic data for a region an airport serves can be a key indicator of aviation demand; therefore, several forecasts have been developed that take into consideration projections for population, employment, and income.

Table 2P presents two projections of based aircraft in relation to projected population growth in Maricopa County. In 2024, the 333 aircraft based at the airport represented 0.07162 aircraft per 1,000 residents. The first projection maintains this ratio into the future years, which results in a based aircraft forecast. By 2044, this forecast predicts 425 based aircraft and an annual growth rate of 1.22 percent.

TABLE 2P | Based Aircraft Forecasts as a Function of Population

Year	Maricopa Population ¹	Based Aircraft	Aircraft per 1,000 Residents
2015	4,106,807	330	0.08035
2016	4,176,050	320	0.07663
2017	4,232,574	374	0.08836
2018	4,293,298	378	0.08804
2019	4,364,459	349	0.07996
2020	4,445,059	356	0.08009
2021	4,499,438	356	0.07912
2022	4,555,833	356	0.07814
2023	4,585,871	364	0.07937
2024	4,649,484	333	0.07162
Constant Share of Population Ratio Projection (CAGR = 1.22%)			
2029	4,970,672	356	0.07162
2034	5,292,885	379	0.07162
2044	5,929,280	425	0.07162
Increasing Share of the 10-Year Average Aircraft per 1,000 Residents (CAGR = 1.80%)			
2029	4,970,672	367	0.07376
2034	5,292,885	402	0.07590
2044	5,929,280	475	0.08017

CAGR = compound annual growth rate

Source: ¹Woods & Poole, CEDDS

The second population-based forecast uses the 10-year average of the number of based aircraft per 1,000 residents and sets that ratio for the long-term planning timeframe. The short- and intermediate-term timeframes are a mathematical function between the high and low ratios. This forecast results in 475 based aircraft by 2044 and an annual growth rate of 1.80 percent.

Table 2Q presents two projections of based aircraft in relation to projected employment growth in Maricopa County. In 2024, the 333 aircraft based at the airport represented 0.10527 aircraft per 1,000 jobs. The first projection maintains this ratio into the future years, which results in a based aircraft forecast. By 2044, this forecast predicts 462 based aircraft and an annual growth rate of 1.65 percent.

The second employment-based forecast uses the 10-year average of the number of based aircraft per 1,000 jobs and sets that ratio for the long-term planning timeframe. The short- and intermediate-term timeframes are a mathematical function between the high and low ratios. This forecast results in 556 based aircraft by 2044 and an annual growth rate of 2.59 percent.

TABLE 2Q | Based Aircraft Forecasts as a Function of Employment

Year	Maricopa Employment ¹	Based Aircraft	Aircraft per 1,000 Jobs
2015	2,439,527	330	0.13527
2016	2,517,630	320	0.12710
2017	2,597,415	374	0.14399
2018	2,690,527	378	0.14049
2019	2,756,810	349	0.12660
2020	2,755,090	356	0.12922
2021	2,884,525	356	0.12342
2022	3,038,704	356	0.11716
2023	3,106,741	364	0.11716
2024	3,163,334	333	0.10527
Constant Share Projection (CAGR = 1.65%)			
2029	3,465,843	365	0.10527
2034	3,773,389	397	0.10527
2044	4,391,689	462	0.10527
Increasing Share to the 10-Year Average of Aircraft per 1,000 Jobs (CAGR = 2.59%)			
2029	3,465,843	383	0.11059
2034	3,773,389	437	0.11592
2044	4,391,689	556	0.12657

CAGR = compound annual growth rate

Source: ¹Woods & Poole, CEDDS

Table 2R presents two projections of based aircraft in relation to projected income growth in Maricopa County. In 2024, the 333 aircraft based at the airport represented 5.76833 aircraft per \$1,000 in income. The first projection maintains this ratio into the future years, which results in a based aircraft forecast. By 2044, this forecast predicts 437 based aircraft with an annual growth rate of 1.36 percent.

The second employment-based forecast uses the 10-year average of the number of based aircraft per \$1,000 in income and sets that ratio for the long-term planning timeframe. The short- and intermediate-term timeframes are a mathematical function between the high and low ratios. This forecast results in 524 based aircraft by 2044 and an annual growth rate of 2.29 percent.

TABLE 2R | Based Aircraft Forecasts as a Function of Income

Year	Maricopa Income	Based Aircraft	Aircraft per \$1,000 of Income
2015	44,129	330	7.47808
2016	45,074	320	7.09944
2017	46,390	374	8.06208
2018	47,791	378	7.90944
2019	49,834	349	7.00325
2020	53,484	356	6.65620
2021	55,911	356	6.36726
2022	54,635	356	6.51597
2023	56,955	364	6.39101
2024	57,729	333	5.76833
Constant Share Projection (CAGR = 1.36%)			
2029	61,810	357	5.76833
2034	66,178	382	5.76833
2044	75,691	437	5.76833
Increasing Share to the 10-Year Average Aircraft per \$1,000 of Income (CAGR = 2.29%)			
2029	61,810	374	6.05752
2034	66,178	420	6.34672
2044	75,691	524	6.92511

CAGR = compound annual growth rate

Source: Woods & Poole, CEDDS

Based Aircraft Forecast Summary

A multitude of forecasts have been developed for based aircraft at SDL. Each forecast is summarized in Table 2S, in which they are listed in order from lowest to highest growth rate.

TABLE 2S | Based Aircraft Forecast Summary

Method	2024	2029	2034	2044	CAGR
Market Share of U.S. Active Aircraft (Constant)	333	338	345	363	0.43%
Regression 10-Year Income	333	358	361	367	0.48%
Regression 10-Year Trend Line	333	362	368	379	0.65%
Regression 10-Year Employment	333	361	365	374	0.58%
Regression 10-Year Population	333	363	369	381	0.68%
Market Share of Registered Aircraft (Constant)	333	350	368	406	1.00%
SDL FAA Terminal Area Forecast (TAF)	333	355	375	415	1.11%
Market Share of Population to Based Aircraft (Constant)	333	356	379	425	1.22%
Market Share of U.S. Active Aircraft (Increasing)	333	341	370	435	1.35%
Market Share of Income (Constant)	333	357	382	437	1.36%
Statewide TAF Growth Rate for Based Aircraft	333	360	389	454	1.56%
Market Share of Employment (Constant) – SELECTED FORECAST	333	365	397	462	1.65%
Market Share of Population to Based Aircraft (10-Year Average)	333	367	402	475	1.80%
Market Share of Registered Aircraft (Increasing)	333	367	423	509	2.14%
Market Share of Income (10-Year Average)	333	374	420	524	2.29%
Market Share of Employment (10-Year Average)	333	383	437	556	2.59%

CAGR = compound annual growth rate

Source: Coffman Associates analysis

It is the responsibility of the forecast analyst to select a single forecast for use in facility planning. The long-term forecast of based aircraft ranges from a low of 363 to a high of 556. The airport expects to experience continued hangar development and redevelopment to accommodate increasing demand. A selected mid-range forecast would be appropriate for planning purposes; therefore, **the selected based aircraft planning forecast is the constant market share of employment forecast.**

The forecast of based aircraft for SDL is an unconstrained forecast, which means no constraints have been placed on the results based on hangar or aircraft apron availability. The unconstrained forecast can only be realized if facility development to accommodate the new based aircraft is able to keep up with demand.

The following is the recommended based aircraft forecast to be carried forward for planning purposes:

- 2024 – 333 based aircraft
- 2029 – 365 based aircraft
- 2034 – 397 based aircraft
- 2044 – 462 based aircraft

Exhibit 2E graphically presents the planning envelope created by the multiple based aircraft forecasts developed, as well as the selected forecast.

BASED AIRCRAFT FLEET MIX

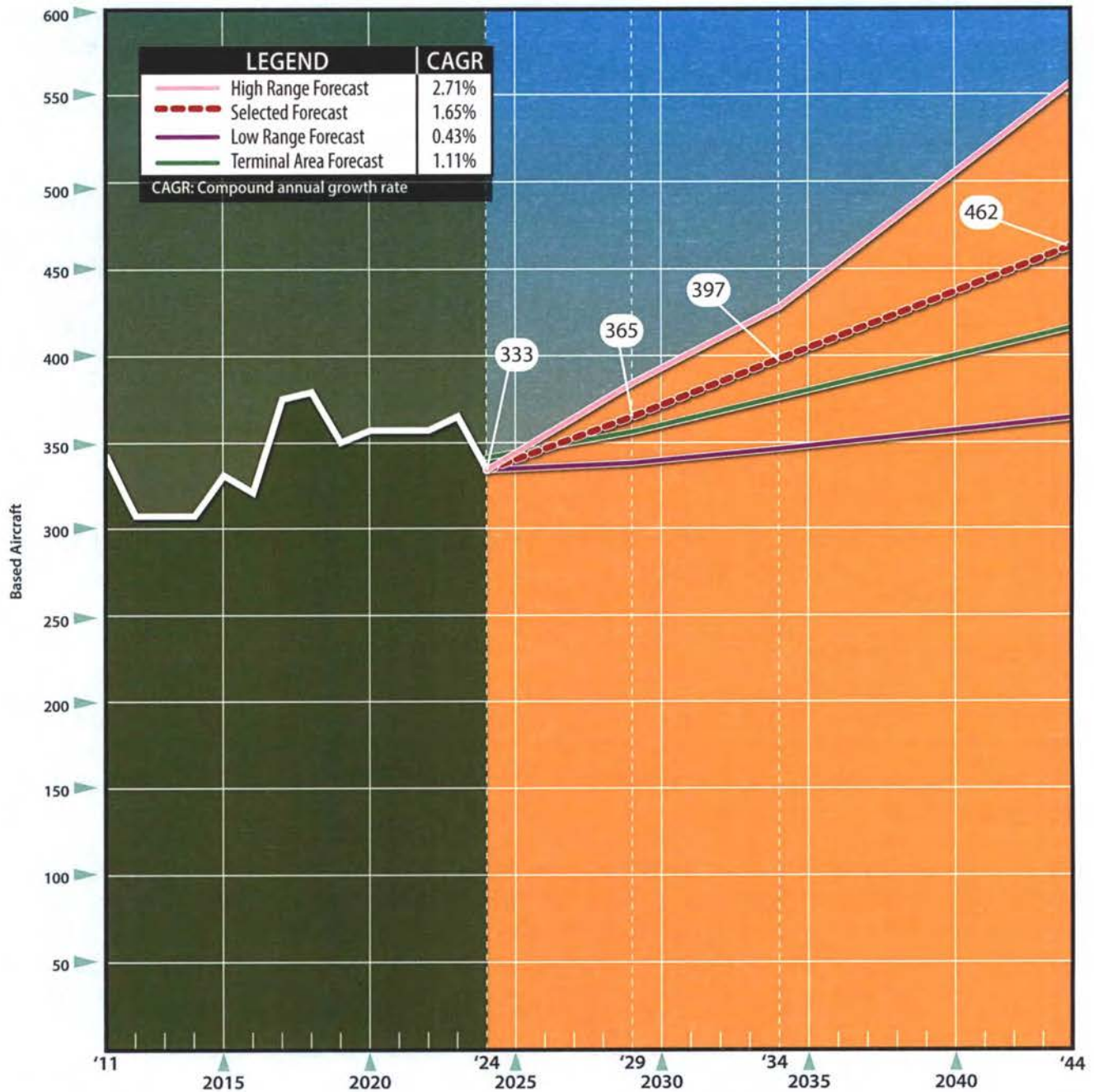
The fleet mix of based aircraft is often more important to airport planning and design than the total number of aircraft. For example, the presence of one or a few large business jets can impact design standards for the runway and taxiway system more than a large number of smaller single-engine piston-powered aircraft.

The based aircraft fleet mix forecast for SDL is presented in **Table 2T** and at the bottom of **Exhibit 2E**. This forecast has been developed based on local aircraft type usage and national trends, as presented in the *FAA Aerospace Forecasts – FY 2024-2044*. The FAA expects business jets will continue to be the fastest growing general aviation aircraft type in the future. SDL is well-positioned to accommodate more business jets; nevertheless, smaller piston-powered aircraft will continue to have a significant presence. According to airport staff, helicopter activity is likely to decline over time.

TABLE 2T | Based Aircraft Fleet Mix

Aircraft Type	EXISTING		FORECAST					
	2024	%	2029	%	2034	%	2044	%
Single-Engine Piston	115	34.5%	125	34.2%	142	35.8%	167	36.1%
Multi-Engine Piston	10	3.0%	10	2.7%	10	2.5%	10	2.2%
Turboprop	11	3.3%	18	4.9%	24	6.0%	35	7.6%
Jet	157	47.1%	177	48.5%	191	48.1%	225	48.7%
Helicopter	40	12.0%	35	9.6%	30	7.6%	25	5.4%
Totals:	333	100.0%	365	100.0%	397	100.0%	462	100.0%

Source: basedaircraft.com; forecast is Coffman Associates analysis of local and national trends



Aircraft Type	EXISTING		FORECAST					
	2024	%	2029	%	2034	%	2044	%
SSingle Engine Piston	115	34.5%	125	34.2%	142	35.8%	167	36.1%
Multi-Engine Piston	10	3.0%	10	2.7%	10	2.5%	10	2.2%
Turboprop	11	3.3%	18	4.9%	24	6.0%	35	7.6%
Jet	157	47.1%	177	48.5%	191	48.1%	225	48.7%
Helicopter	40	12.0%	35	9.6%	30	7.6%	25	5.4%
Totals	333	100.0%	365	100.0%	397	100.0%	462	100.0%

Source: basedaircraft.com. Forecast is Coffman Associates analysis of local and national trends.

GENERAL AVIATION OPERATIONS

Operations at SDL are classified as general aviation, air taxi, or military. General aviation operations include a wide range of activities, from recreational use and flight training to business and corporate uses. Air taxi operations are those conducted by aircraft operating under Title 14 Code of Federal Regulations (CFR) Part 135, otherwise known as for-hire or on-demand activity. Military operations are those conducted by various branches of the U.S. military.

General aviation operations are classified by the airport traffic control tower (ATCT) as either local or itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of an airport or executes simulated approaches or touch-and-go operations at an airport. Itinerant operations are those performed by aircraft with specific origins or destinations away from an airport. Generally, local operations are characterized by training operations. Itinerant operations tend to increase with business and commercial use because business aircraft are typically operated at a higher frequency.

Table 2U summarizes the itinerant and local general aviation operations at the airport since 2015. As of 2024, itinerant general aviation operations represent 64.6 percent of total general aviation operations at SDL and local general aviation operations represent 35.4 percent of the total.

TABLE 2U | Historical General Aviation Operations

Year	Itinerant	% of Total	Local	% of Total	Total	Year Over Year Percent Change +/-
2015	77,281	58.8%	54,158	41.2%	131,439	N/A
2016	83,950	59.0%	58,270	41.0%	142,220	8.2%
2017	93,124	61.1%	59,368	38.9%	152,492	7.2%
2018	87,810	58.5%	62,245	41.5%	150,055	-1.6%
2019	89,634	52.9%	79,743	47.1%	169,377	12.9%
2020	87,161	50.6%	85,160	49.4%	172,321	1.7%
2021	78,906	61.7%	48,880	38.3%	127,786	-25.8%
2022	84,200	67.6%	40,298	32.4%	124,498	-2.6%
2023	74,486	62.2%	45,204	37.8%	119,690	-3.9%
2024	64,608	64.6%	35,478	35.4%	100,086	-16.4%

Source: OPSNET FAA database of SDL tower counts

Each classification of operation will be forecasted individually and then combined to arrive at a total operations forecast.

Itinerant General Aviation Operations Forecast

Itinerant general aviation operations are conducted by pilots who are operating to or from the airport and are not within the traffic pattern. Several forecasts for itinerant general aviation operations have been developed, the collection of which will form the planning envelope. The planning envelope represents the high and low range of potential future itinerant general aviation activity. A single forecast will be selected for use in future facility needs analysis.

Regression Analysis

The first set of forecasts utilizes the statistical regression model. The first set of regressions utilizes time as the independent variable. This type of regression analysis is also referred to as time series analysis. Multiple time series regressions were run with itinerant general aviation operations as the dependent variable. At least 10 years of historical data is preferred.

Three total time series regressions were run. The first used 10 years of data, the second used 15 years, and the third used 25 years. The results of these time series regressions are presented in **Table 2V**, and the analytical data and regression model are included in **Appendix B**. Because of the variable nature of historical itinerant general aviation operations, the time series regressions returned r^2 values that indicate low statistical reliability. Only the 15-year time series regression returned a forecast that seems reasonable; however, this regression also returned the lowest r^2 value.

TABLE 2V | Regression Analysis – Itinerant GA Operations

Independent Variable	r^2 Value	Dependent Variable (Itinerant GA Ops)				CAGR 2024-2044
		2024	2029	2034	2044	
Time Series (2015-2024)	0.30	64,608	67,485	59,785	44,385	-1.86%
Time Series (2010-2024)	0.05	64,608	84,112	86,251	90,527	1.70%
Time Series (2000-2024)	0.54	64,608	60,487	51,137	32,437	-3.39%
Population (2015-2024)	0.27	64,608	68,484	60,908	45,945	-1.69%

An additional regression was run that utilized 10 years of population data for Maricopa County. This regression also has low statistical reliability and resulted in a negative growth curve. None of these regressions are considered reliable and none will be the selected forecast for itinerant general aviation operations.

Market Share Analysis

Several market share forecasts for itinerant general aviation operations have been developed and are presented in **Table 2W**. The market share forecasts consider the airport's share of national itinerant general aviation operations as projected by the FAA in *Aerospace Forecasts – FY 2024-2044*. The table also includes the ratio of itinerant general aviation operations to the number of aircraft based at the airport. Both of these variables are used to not only develop specific forecasts, but also to serve as a check on the reasonableness of the forecast, showing future ratios in comparison to historical ratios.

The first market share forecast maintains the airport's 2024 market share of national itinerant general aviation operations (0.4272 percent) through the future plan years. This forecast results in moderate growth in itinerant general aviation operations at SDL and an annual growth rate of 0.46 percent.

The TAF for the airport, as developed by FAA headquarters, is shown in the table so it can be compared against other forecasts. The relationship of the TAF to U.S. itinerant general aviation operations and to operations per based aircraft can be examined for reasonableness.

The next forecast applies the TAF annual growth rate (0.60 percent) to the number of itinerant general aviation operations in 2024, creating a projection of future operations.

TABLE 2W | General Aviation Itinerant Operations Forecast

Year	SDL GA Itinerant Operations ¹	U.S. GA Itinerant Operations ² (thousands)	Market Share of National GA Itinerant Operations
2015	77,281	13,887	0.5565%
2016	83,950	13,905	0.6037%
2017	93,124	13,839	0.6729%
2018	87,810	14,130	0.6214%
2019	89,634	14,245	0.6292%
2020	87,161	12,608	0.6913%
2021	78,906	13,775	0.5728%
2022	84,200	14,635	0.5753%
2023	74,486	14,591	0.5105%
2024	64,608	15,125	0.4272%
Constant Market Share of 2024 Share of U.S. Itinerant Operations (CAGR = 0.46%)			
2029	68,018	15,924	0.4272%
2034	68,913	16,133	0.4272%
2044	70,773	16,569	0.4272%
SDL Terminal Area Forecast (CAGR = 0.76%)			
2029	74,054	15,924	0.2900%
2034	74,425	16,133	0.3000%
2044	75,172	16,569	0.3200%
2024 FAA TAF Projection Growth Rate (CAGR = 0.60%)			
2029	66,570	15,924	0.4181%
2034	68,591	16,133	0.4252%
2044	72,819	16,569	0.4395%
Increasing Market Share of U.S. Itinerant Operations (CAGR = 1.65%) – SELECTED FORECAST			
2029	70,812	15,924	0.4447%
2034	77,019	16,133	0.4774%
2044	89,636	16,569	0.5410%

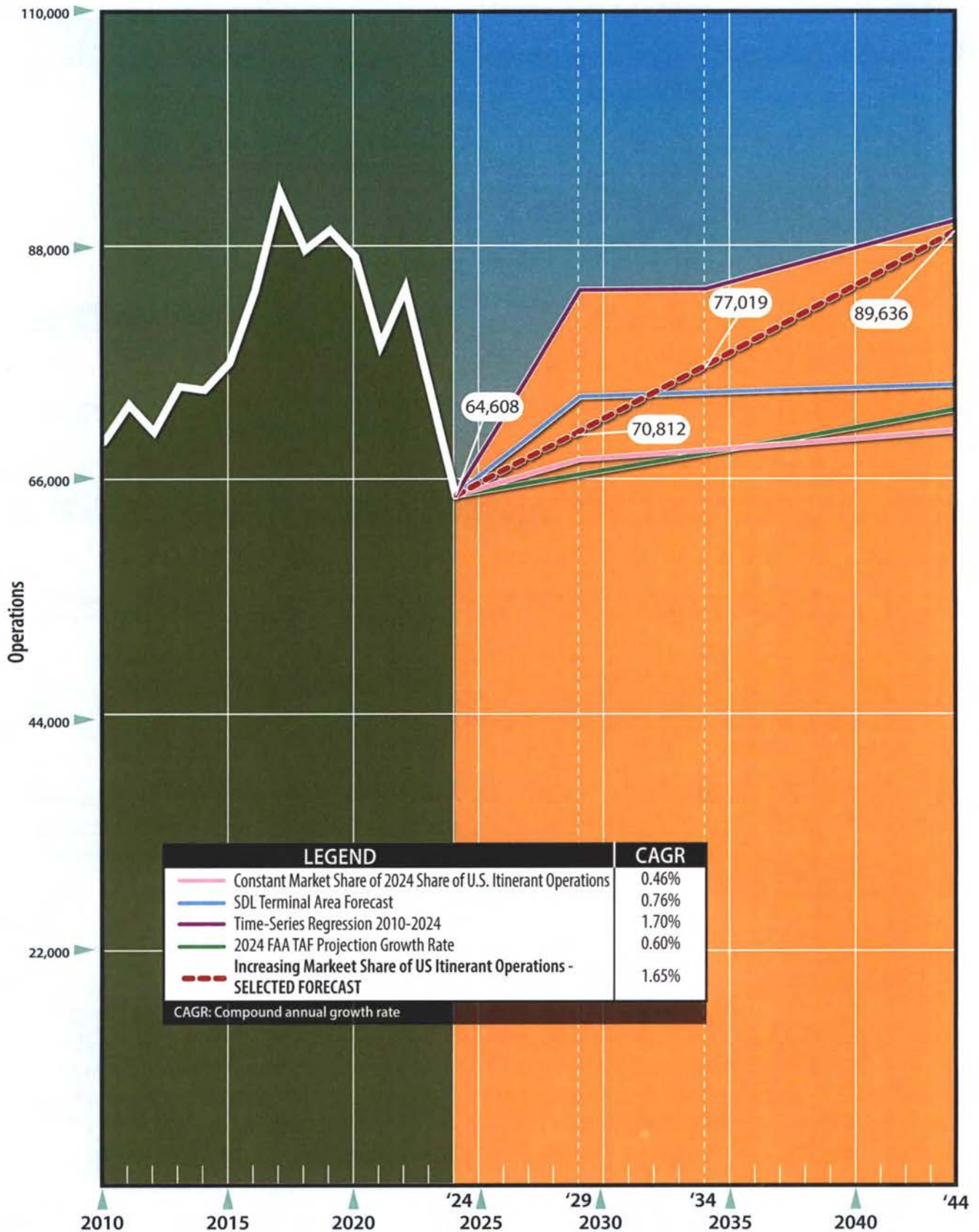
CAGR = compound annual growth rate from 2024 to 2044

Sources: ¹Historical data from ATCT records, as reported to the FAA; ²FAA Aerospace Forecasts – FY 2024-2044

The last market share forecast considers the airport capturing an increasing percent of national itinerant general aviation operations. In 2017, the airport experienced more than 93,000 itinerant general aviation operations. This forecast results in a long-term total of 89,636 itinerant general aviation operations and an annual growth rate of 1.65 percent.

Selected Itinerant General Aviation Operations Forecast

Exhibit 2F graphically shows the market share forecasts and the most reasonable of the regression forecasts. The collection of forecasts forms the planning envelope. The increasing market share of U.S. itinerant general aviation operations is the selected forecast. This forecast was selected because in the recent past, the airport has experienced more than 90,000 annual itinerant general aviation operations, so it is reasonable to believe they can return to those levels. The selected forecast also falls within the mid-range of the planning envelope; therefore, it will be used for subsequent facility planning.



Local General Aviation Operations Forecast

Local general aviation operations are conducted by pilots operating within the airport's traffic pattern and/or conducting training operations. Several forecasts for local general aviation operations have been developed, the collection of which will form the planning envelope. The planning envelope represents the high and low range of potential future local general aviation activities. A single forecast will be selected for use in future facility needs analysis.

Regression Analysis

The first set of forecasts utilizes the statistical regression model with time as the independent variable. This type of regression analysis is also referred to as time series analysis. Two time series regressions were run with local general aviation operations as the dependent variable. The first considered 10 years of data and the second considered 15 years of data.

The results of these time series regressions are presented in **Table 2Y**, and the analytical data and regression model are included in **Appendix B**. Because of the variable nature of historical local general aviation operations, the time series regressions returned r^2 values that indicate low statistical reliability.

TABLE 2Y | Regression Analysis – Local GA Operations

Independent Variable	r^2 Value	Dependent Variable (Local GA Operations)				CAGR 2024-2044
		2024	2029	2034	2044	
Time Series (2015-2024)	0.20	35,478	34,448	22,642	-971	N/A
Time Series (2010-2024)	0.03	35,478	50,262	47,730	42,664	0.93%
Population (2015-2024)	0.17	35,478	36,370	24,971	2,458	-12.50%

A third single-variable regression utilizing historical and projected population growth in Maricopa County was also run. This regression also had a low r^2 value and resulted in a declining trend in local general aviation operations to less than 3,000 annual operations. Only the 2010-2024 time series regression appears reasonable; however, even this regression shows a large, short-term increase in local general aviation operations followed by a declining trend in subsequent timeframes. As a result of the low statistical reliability of the regression forecasts, these are not considered further.

Market Share Analysis

Several market share forecasts for local general aviation operations have been developed and are presented in **Table 2Z**. The market share forecasts consider the airport's share of national local general aviation operations as projected by the FAA in *Aerospace Forecasts – FY 2024-2044*. The table also includes the ratio of local general aviation operations to the number of aircraft based at the airport. Both variables are used to not only develop specific forecasts, but also to serve as a check on the reasonableness of other forecasts by showing future ratios in comparison to historical ratios.

The first market share forecast maintains the airport's 2024 ratio of national local general aviation operations (0.2231 percent) through the future plan years. This forecast results in moderate growth in local general aviation operations at SDL and an annual growth rate of 0.50 percent.

TABLE 2Z | General Aviation Local Operations Forecast

Year	SDL GA Local Operations ¹	US GA Local Operations ² (thousands)	Market Share Local Operations
2015	54,158	11,691	0.4632%
2016	58,270	11,633	0.5009%
2017	59,368	11,732	0.5060%
2018	62,245	12,354	0.5038%
2019	79,743	13,109	0.6083%
2020	85,160	12,333	0.6905%
2021	48,880	13,479	0.3626%
2022	40,298	14,029	0.2872%
2023	45,204	15,282	0.2958%
2024	35,478	15,900	0.2231%
Constant Market Share of 2024 Share of U.S. Local Operations (CAGR = 0.50%)			
2029	37,163	16,655	0.2231%
2034	37,821	16,950	0.2231%
2044	39,205	17,571	0.2231%
Increasing Market Share of U.S. Local Operations (CAGR = 3.73%)			
2029	43,304	16,655	0.2600%
2034	54,242	16,950	0.3200%
2044	73,798	17,571	0.4200%
SDL Terminal Area Forecast (CAGR = 2.48%)			
2029	55,379	16,655	0.3325%
2034	56,213	16,950	0.3316%
2044	57,918	17,571	0.3296%
2024 FAA TAF Projection Growth Rate (CAGR = 2.05%) – SELECTED FORECAST			
2029	39,267	16,655	0.2358%
2034	43,460	16,950	0.2564%
2044	53,238	17,571	0.3030%

CAGR = compound annual growth rate from 2024 to 2044

Sources: ¹Historical data from ATCT records, as reported to FAA; ²FAA Aerospace Forecasts – FY 2024-2044

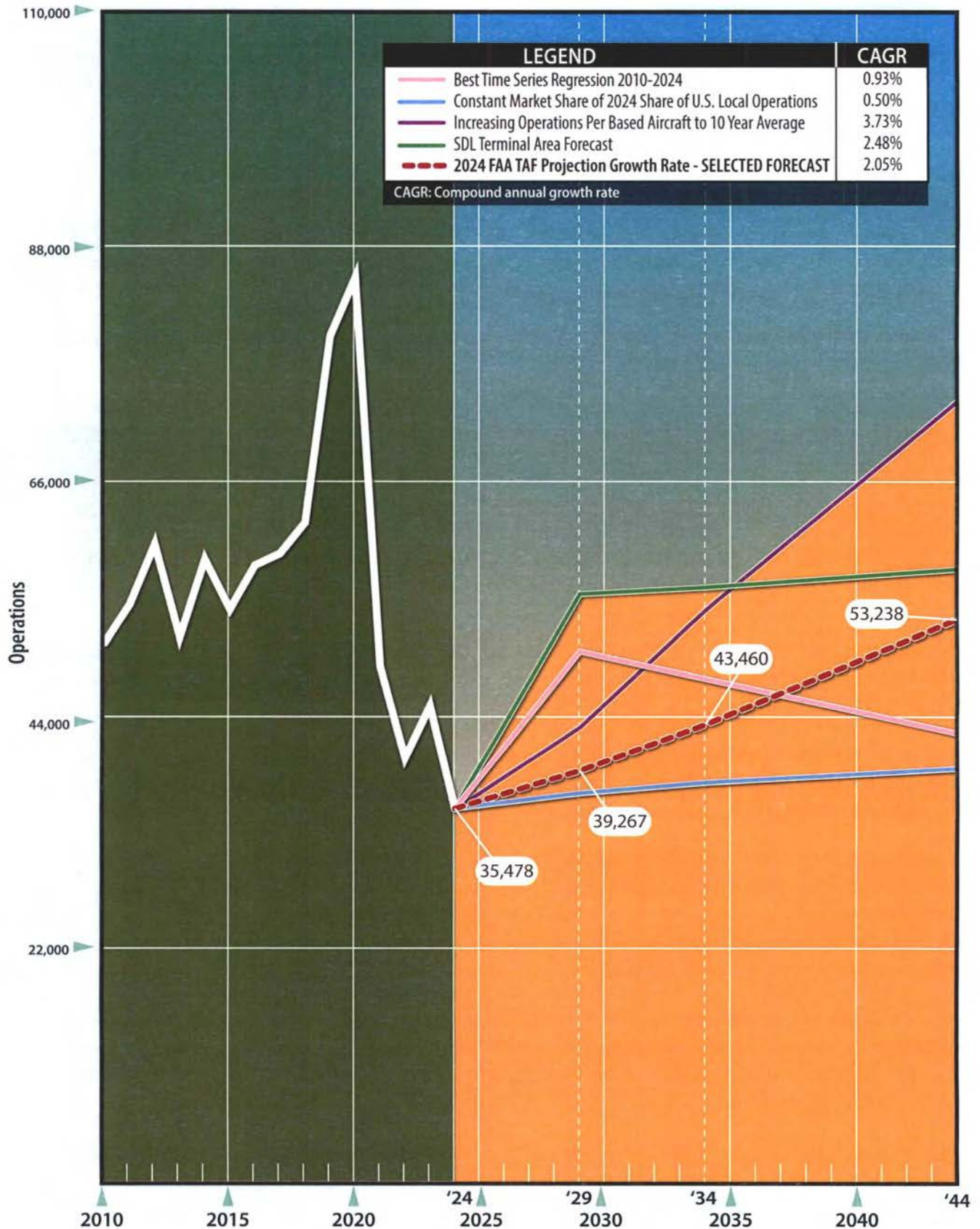
The next market share forecast considers the airport capturing a higher percentage of national local general aviation operations. As recently as 2020, the airport captured 0.69 percent of national local general aviation operations. This increasing market share reflects an increase to 0.42 percent. While this is still well below recent levels, it also reflects the fact that local general aviation operations have been decreasing overall at SDL.

The TAF for the airport, as developed by FAA headquarters, is shown in the table so it can be compared against other forecasts. The relationship of the TAF to U.S. local general aviation operations and to operations per based aircraft can be examined for reasonableness.

The last forecast applies the TAF annual growth rate (2.05 percent) to the number of local general aviation operations in 2024, creating a projection of future operations.

Selected Local General Aviation Operations Forecast

Exhibit 2G graphically shows the local general aviation operations forecasts and the selected forecast. The collection of forecasts forms the planning envelope. The selected forecast falls within the mid-range of the planning envelope and will be used for subsequent facility planning. The selected forecast reflects a modest but reasonable increase in local general aviation operations.



Air Taxi Operations Forecast

Air taxi operations are those with authority to provide on-demand transportation of persons or property via aircraft with fewer than 60 passenger seats. At SDL, the air taxi category encompasses most charter, fractional, aerial tour, and air ambulance aircraft.

Regression Analysis

The first set of air taxi forecasts is comprised of three time series forecasts that utilize the regression model with air taxi operations as the dependent variable. The first forecast considers 10 years of data, the second considers 15 years of data, and the third considers historical data back to the year 2000.

The results of these time series regressions are presented in **Table 2AA**, and the analytical data and regression model are included in **Appendix B**.

TABLE 2AA | Regression Analysis – Air Taxi Operations

Independent Variable	r ² Value	Dependent Variable (Air Taxi Operations)				CAGR 2024-2044
		2024	2029	2034	2044	
Time Series (2015-2024)	0.84	66,178	86,477	115,884	174,699	4.97%
Time Series (2010-2024)	0.68	66,178	63,986	80,194	112,611	2.69%
Time Series (2000-2024)	0.56	66,178	45,717	53,501	69,070	0.21%
Population (2015-2024)	0.80	66,178	85,002	115,234	174,945	4.98%
Population (2010-2024)	0.66	66,178	63,204	79,912	112,910	2.71%

The time series regression that considered 10 years of data resulted in an r^2 value of 0.84, which indicates moderate statistical reliability. This forecast results in an aggressive annual growth rate of 4.97 percent and nearly 175,000 air taxi operations by 2044.

The second time series forecast considered 15 years of historical data and resulted in an r^2 value of 0.68, which is lower than preferred. This forecast results in an annual growth rate in air taxi operations of 2.69 percent and a total of 69,070 operations by 2044.

The third time series regression considers 25 years of historical data. Typically, large historical data sets have the effect of smoothing the projections so that spikes in the data or recent trends are more subdued. Such is the case with this projection, as air taxi operations decline significantly in the first five years and then begin to increase in the 10- and 20-year timeframes. This forecast results in a low r^2 value of 0.21, which indicates low statistical reliability.

Two more single-variable regressions were run utilizing population as the independent variable. The first considered 10 years of population data and resulted in an r^2 value of 0.80. This r^2 value is lower than is generally considered statistically reliable and results in an annual growth rate of 4.98 percent and nearly 175,000 air taxi operations by 2044.

A second regression that considered 15 years of data was also run. As expected with a larger data set, the result was to moderate the projected growth in air taxi operations. This forecast of air taxi operations had an r^2 value of 0.66, indicating moderate to low statistical reliability, and resulted in 112,910 operations by 2044.

Market Share Analysis

Several market share forecasts for air taxi operations were developed and are presented in **Table 2BB**. The market share forecasts consider the airport's share of national air taxi operations as projected by the FAA in *Aerospace Forecasts – FY 2024-2044*. The table also includes the TAF projection of air taxi operations and the application of the TAF growth rate to the 2024 air taxi operations figure to project future activity levels.

TABLE 2BB Air Taxi Operations Forecast			
Year	SDL Total Air Taxi Operations ¹	U.S. ATCT Air Taxi Operations ² (thousands)	SDL Percent
2015	15,362	7,895	0.1946%
2016	15,404	7,580	0.2032%
2017	15,000	7,180	0.2089%
2018	15,304	7,126	0.2148%
2019	16,513	7,234	0.2283%
2020	23,150	5,472	0.4231%
2021	35,805	5,885	0.6084%
2022	47,734	6,522	0.7319%
2023	55,587	6,456	0.8610%
2024	66,178	6,476	1.0219%
Constant Market Share of US Air Taxi Operations (CAGR = 0.73%)			
2029	65,261	6,386	1.0219%
2034	68,960	6,748	1.0219%
2044	76,543	7,490	1.0219%
Increasing Market Share of US Air Taxi Operations (CAGR = 4.81%)			
2029	78,470	6,386	1.2288%
2034	96,876	6,748	1.4356%
2044	169,498	7,490	2.2630%
2024 Terminal Area Forecast (CAGR = 3.89%)			
2029	77,761	6,386	1.2177%
2034	95,060	6,748	1.4087%
2044	142,061	7,490	1.8967%
2024 FAA TAF³ Growth Rate Projection (CAGR = 4.10%) – SELECTED FORECAST			
2029	80,903	6,386	1.2669%
2034	98,906	6,748	1.4657%
2044	147,818	7,490	1.9735%

CAGR = compound annual growth rate (2024-2044)

Sources: ¹Historical data from ATCT records, as reported to the FAA; ²FAA Aerospace Forecasts – FY 2024-2044; ³2024 Terminal Area Forecast, published January 2025

The first market share forecast maintains the airport's 2024 ratio of air taxi operations (1.0219 percent) to national air taxi operations and extends that ratio through the future plan years. This forecast results in moderate growth in air taxi operations at SDL and an annual growth rate of 0.73 percent.

The next market share forecast considers an increasing ratio of SDL air taxi operations to the national forecast for air taxi operations. Over the past 10 years, this ratio has been increasing. This forecast considers the growth rate percentage over the last 10 years and applies it to the 20-year projection. This forecast results in an annual growth rate of 4.81 percent and 169,498 air taxi operations by 2044.

The TAF forecast of air taxi operations for the airport, as developed by FAA headquarters, is shown in the table so it can be compared against other forecasts. The relationship of the TAF to U.S. air taxi operations can be examined for reasonableness in comparison to historical trends. The TAF forecast has an annual growth rate of 3.89 percent and a 2044 total of 142,061 air taxi operations. It should be noted that the growth rate for this forecast includes the actual 2024 air taxi operations as counted by the ATCT.

The last forecast uses the TAF annual growth rate of 4.10 percent. This growth rate is slightly higher than the previous TAF-related forecast because the TAF air taxi number for 2024 was lower than the actual number of air taxi operations. When applying the TAF growth rate, 147,818 total air taxi operations are anticipated by 2044.

Selected Air Taxi Operations Forecast

According to the FAA TAF, air taxi operations at SDL are projected to increase significantly over the next 20 years. Air taxi activity in recent years would support such a forecast. When the COVID-19 pandemic started, commercial activity plummeted but general aviation activity increased; the air taxi segment increased precipitously. In 2019, SDL experienced 16,513 air taxi operations. In each subsequent year, air taxi operations have increased, and by 2024, there were 66,178 air taxi operations, which is a 301 percent increase (26.03 percent annually) over these six years.

Over this same timeframe, facility development at the airport has primarily been to accommodate growth in the air taxi segment. Most of the new hangars constructed, both on the airport and in the airpark, are larger conventional hangars, which typically house larger aircraft that are normally utilized in an air taxi capacity. In addition, several new entrants in the air taxi class have begun operations at the airport, including JSX, which offers public charter air taxi service, and NetJets, which utilizes SDL as a national base and has a new hangar/office/apron complex.

The collection of air taxi forecasts creates a planning envelope that represents the high and low range. For planning purposes, a single forecast is selected for use in subsequent facility requirements analysis. The selected forecast is the one that applies the TAF growth rate of 4.10 percent to the 2024 air taxi operations figure and extends that growth rate through the plan years. This forecast was selected because it is consistent with the trend over the last six years and reflects the changing dynamic of activity at the airport toward a greater percentage of air taxi operations as compared to general aviation operations. **Exhibit 2H** graphically shows the air taxi forecasts and the selected forecast.

Military Operations

Military aircraft can (and do) utilize civilian airports across the country. Scottsdale Airport experiences activity by military aircraft. Forecasts of military activity are inherently difficult because of the national security nature of military activity and the fact that military missions can change without notice; thus, it is typical for the FAA to utilize a flat line number for military operations in the TAF. At Scottsdale Airport, the FAA TAF projects 365 annual itinerant military operations and two annual local military operations for each year of the 20-year planning horizon. These estimates for military operations will be carried forward in this master plan. **Table 2CC** summarizes the history of military operations at SDL and shows the operations estimated in the future from the TAF.

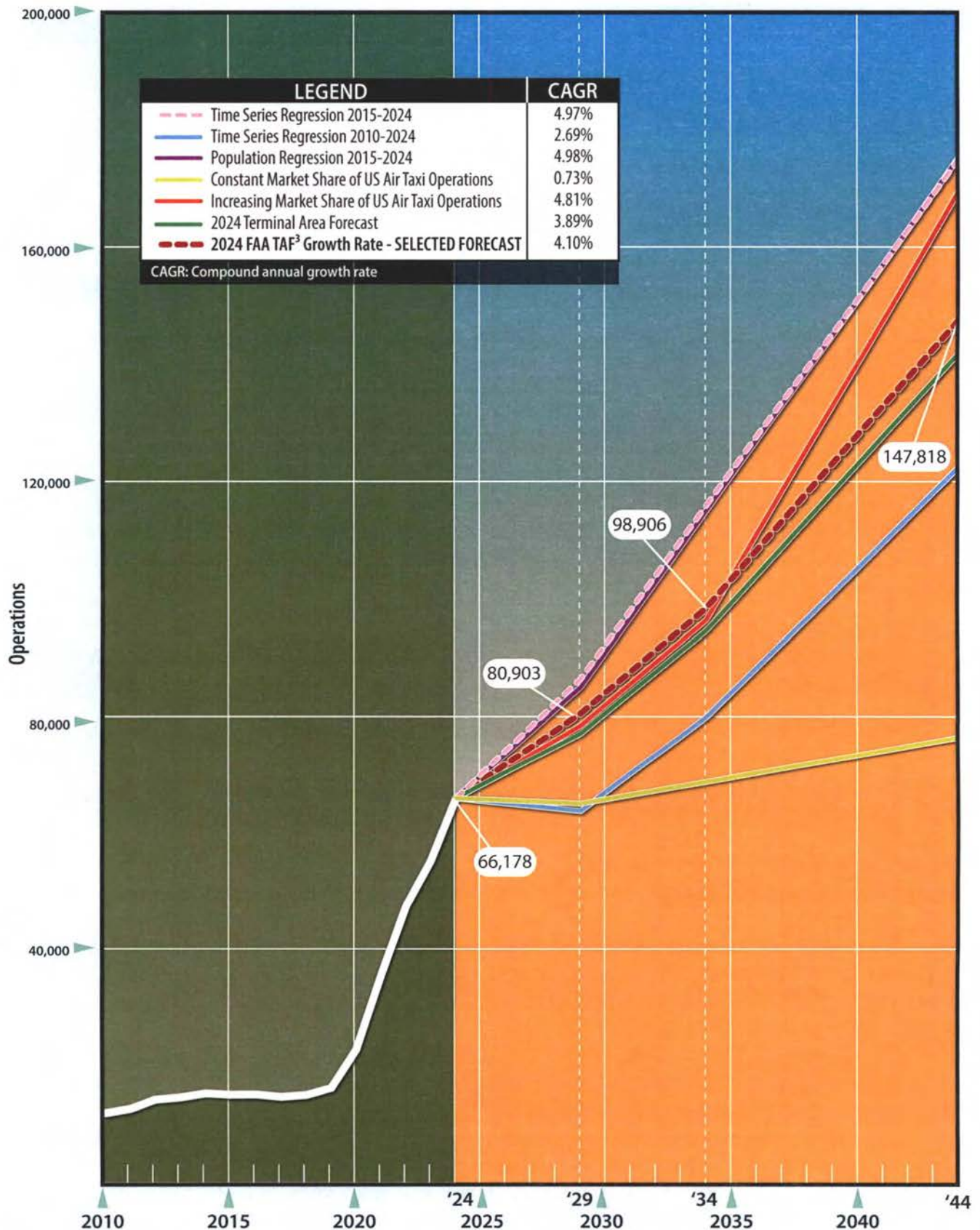


TABLE 2CC | Military Operations Forecast

Year	Military Itinerant	Military Local	Total
2015	824	128	952
2016	593	78	671
2017	577	62	639
2018	731	101	832
2019	606	18	624
2020	316	65	381
2021	436	24	460
2022	481	34	515
2023	541	8	549
2024	320	4	324
Military Operations Forecast (CAGR = 0.0%)			
2029	365	2	367
2034	365	2	367
2044	365	2	367

Sources: FAA Terminal Area Forecast (TAF); history from FAA OPSNET

Total Operations Forecast Summary

Each operational element has been individually forecasted. **Table 2DD** presents a summary of the operations forecast to be utilized in this master plan. Air taxi operations are projected to account for an increasing portion of total operations over time, ultimately representing more than 50 percent of total operations by 2044.

TABLE 2DD | Total Operations Forecast

Year	ITINERANT OPERATIONS				LOCAL OPERATIONS			TOTAL OPERATIONS
	Air Taxi	GA	MIL	Subtotal	GA	MIL	Subtotal	
2024	66,178	64,608	320	131,106	35,478	4	35,482	166,588
2029	80,903	70,812	365	152,080	39,267	2	39,269	191,349
2034	98,906	77,019	365	176,290	43,460	2	43,462	219,752
2044	147,818	89,636	365	237,819	53,238	2	53,240	291,059
CAGR 2024-2044	4.10%	1.65%	N/A	3.02%	2.05%	N/A	2.05%	2.83%

CAGR = compound annual growth rate

OPERATIONS PEAKING FORECAST

Many aspects of facility planning relate to levels of peaking activity (times when an airport is busiest). For example, the appropriate size of aircraft apron facilities can be estimated by determining the number of aircraft that could reasonably be expected to use the apron at a given time. The following planning definitions apply to the peak periods:

- Peak month – the month within the calendar year when peak aircraft operations occur
- Design day – the average day in the peak month
- Design hour – the average peak hour within the design day of a typical week in the peak month

Peak Month | The peak month is an absolute peak within a given year. In 2024, the peak month for operations was April, during which there were 15,627 operations, which represented 9.38 percent of annual operations. All other peak periods will be exceeded at various times during the year. The peak

period forecasts represent reasonable planning standards that can be applied without overbuilding or being too restrictive. The method for forecasting the peak operational parameters was to first determine the peak parameters for the base year of 2024, utilizing ATCT records. From this analysis, appropriate factors can be applied to the forecast years.

Design Day | The design day was determined by dividing peak month operations by the number of days in the month. There are 30 days in April; therefore, the design day is 521 operations.

Design Hour | The design hour is determined through an examination of the hourly operations of the peak days of the peak month. Hourly operational data for April 2024 was utilized for this analysis. **Table 2EE** presents the hourly operations total, as counted by the ATCT, for April 2024. The design hour is calculated by averaging the peak hour of the peak day of each week of the peak month (67, 65, 73, and 65, the average of which equals 68).

TABLE 2EE | Design Hour Operations Determination

Time	Thursday 4/4/24	Thursday 4/11/24	Thursday 4/18/24	Wednesday 4/24/24
12-1 a.m.	4	5	0	6
1-2 a.m.	0	0	0	0
2-3 a.m.	0	0	0	0
3-4 a.m.	0	0	0	0
4-5 a.m.	0	0	3	3
5-6 a.m.	2	2	1	0
6-7 a.m.	7	21	5	8
7-8 a.m.	15	20	22	32
8-9 a.m.	44	35	20	32
9-10 a.m.	43	64	70	43
10-11 a.m.	55	61	67	56
11-12 a.m.	57	43	38	56
12-1 p.m.	53	65	57	61
1-2 p.m.	42	38	46	45
2-3 p.m.	53	40	49	55
3-4 p.m.	63	47	73	49
4-5 p.m.	67	57	59	65
5-6 p.m.	39	33	53	31
6-7 p.m.	26	25	25	32
7-8 p.m.	33	17	17	12
8-9 p.m.	0	4	20	9
9-10 p.m.	0	0	12	6
10-11 p.m.	0	3	4	0
11-12 p.m.	0	0	0	2
Total:	603	580	641	603
Peak Hour %:	11.11%	11.21%	11.39%	10.78%

Design Hour is the average of 67, 65, 73, 65 = 68

Note: Peak Hour is **bold italicized**.

Source: Hourly operations count for April 2024

Table 2FF summarizes the key peaking operations parameters. A calculation factor was determined for each peaking parameter based on 2024 ATCT operations counts. That factor was then applied to the five-year, 10-year, and 20-year planning horizons. The operational peak month for 2024 was April, with 15,627 operations, which represented 9.38 percent of annual operations. The design day is 521 operations, which is 3.3 percent of the peak month. The design hour of 68 is 13.0 percent of the design day.

TABLE 2FF | Peak Operations Forecast

Peaking Parameter	Factor	2024	2029	2034	2044
Annual Operations	100% of tower count	166,588	191,349	219,752	291,059
Peak Month	9.38% of annual operations	15,627	18,599	21,360	28,291
Design Day	3.3% of peak month	521	620	712	943
Design Hour	13.0% of design day	68	85	98	129

OPERATIONS BY FLEET MIX

Developing an understanding of the operational fleet mix, including the approximate volume of operations by aircraft type, is utilized in airfield capacity analysis, fuel storage capacity analysis, and pavement utilization determination. The approximate numbers of operations by certain aircraft types are available from the FAA Traffic Flow Management System Counts (TFMSC) database. This database captures flight plans filed to and from airports. Not all flights are required to file flight plans, so this database does not capture all activity; however, the FAA indicates that the capture rate is better than 95 percent for turboprops and jets. **Table 2GG** presents the historical TFMSC operations data for jets and turboprops.

TABLE 2GG | Historical Jet and Turboprop Operations at SDL

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Jets	32,684	34,172	36,250	37,204	39,194	40,844	54,610	59,020	53,746	57,668
Turboprops	5,878	6,374	6,390	5,952	5,870	5,968	6,984	7,658	6,780	6,192

Source: SDL TFMSC 2015-2024 (data normalized annually)

By identifying the number of operations by turboprops and jets, it is possible to deduce an estimate of operations by remaining aircraft types. In addition, experience at other airports has shown that general operational estimates can be made by multiplying the number of based aircraft by utilization factors. Multi-engine piston aircraft are estimated to account for 200 annual operations. Turboprops are estimated to account for 350 annual operations and helicopters are estimated to account for 400 annual operations. Turboprops and helicopters typically have higher utilization rates than piston aircraft. It should be noted that these operational estimates account for all operations by each aircraft type, not just those based at an airport. **Table 2HH** presents the operational fleet mix forecast estimate for the airport.

TABLE 2HH | Fleet Mix Operations Forecast

	2024	2029	2034	2044
Local Operations				
Single Engine Piston	24,682	30,469	36,662	48,440
Multi-Engine Piston	800	800	800	800
Helicopter	10,000	8,000	6,000	4,000
Total Local	35,482	39,269	43,462	53,240
Itinerant Operations				
Single Piston	60,046	65,250	74,124	87,174
Multi-Piston	1,200	1,200	1,200	1,200
Turboprop	6,192	12,741	15,195	21,517
Jet	57,668	66,889	79,772	121,929
Helicopters	6,000	6,000	6,000	6,000
Total Itinerant	131,106	152,080	176,290	237,819
Total Operations	166,588	191,349	219,752	291,059

Source: Coffman Associates analysis

ANNUAL INSTRUMENT APPROACHES

Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. An instrument approach is defined as "an approach to an airport with intent to land by an aircraft in accordance with an instrument flight rules (IFR) flight plan, when visibility is less than three miles and/or when the cloud ceiling is at or below the minimum initial approach altitude." Typically, no local operations occur during inclement weather conditions; therefore, the AIA analysis focuses on itinerant operations.

The number of AIAs was calculated for the planning period by first identifying 50 percent of itinerant operations (arrivals only). The FAA's OPSNET database was then consulted to determine the total number of arrivals using an instrument approach procedure (32,261). The last step in estimating AIAs is to estimate what portion of operations under IFR are in IFR conditions (less than three-mile visibility and less than 1,000-foot cloud ceiling height). According to the National Weather Service, Scottsdale annually experiences sunny days, on average. It is estimated that three percent of those non-sunny days would occur in IFR conditions; therefore, estimated AIAs are three percent of arrivals conducted by those on IFR flight plans. The AIA projection is presented in **Table 2JJ**.

TABLE 2JJ | Annual Instrument Approach (AIA) Forecast

	2024	2029	2034	2044
Total Itinerant Operations	131,106	152,080	176,290	237,819
Total Instrument Operations ¹	64,521	74,843	86,757	117,038
Instrument Flight Rule (IFR) Arrivals	32,261	37,421	43,379	58,519
AIAs (3%):	968	1,123	1,301	1,756

Source: ¹2024 from FAA OPSNET

CHARTER ENPLANEMENT FORECAST

Paying passengers boarding charter flights are considered enplanements by the FAA. Total enplanements can be an important metric for airports, as airports that exceed 10,000 enplanements are entitled to at least \$1.3 million in capital improvement funding from the FAA via the Airport Improvement Program (AIP). A forecast of charter passenger enplanements is necessary so airports can effectively plan for capital improvements and the funding thereof.

Scottsdale Airport has frequent charter service operations. Charter operators are certified under Title 14 CFR Part 135 to offer non-scheduled charter and air taxi flights. SDL has a variety of operators including NetJets, Flexjet, JSX, and many others. **Scottsdale Airport, as a general aviation airport, is not nor is it planned to offer scheduled passenger service like commercial service airports. Passenger enplanement activity is limited to charter operations only.**

The FAA asks that Part 135 operators voluntarily submit their annual revenue passenger enplanement data on FAA Form 1800-31, *Airport Activity Survey*. Charter operators can easily submit their passenger enplanement data via the FAA Airports External Portal (AEP), which is accessible at aep.airports.faa.gov.

For calendar year 2024, there were 43,765 reported passenger enplanements. This was the first year SDL exceeded the 10,000-enplanement threshold. The other charter operators had enplanements;

however, these were not reported to the FAA. The airport has requested that all charter operators begin to report their enplanement figures annually. Therefore, the actual 2024 enplanement figure is likely more than has been reported.

PUBLIC CHARTER ENPLANEMENT FORECAST

At the most basic level, an enplanement forecast can be developed based on the flight schedule, number of available seats, and the board loading factor (BLF). The BLF is the percentage of available seats that are filled. This data is only available from JSX currently; therefore, the enplanement forecast is developed from these inputs. However, the final enplanement forecast is assumed to include all the charter operators at SDL.

In 2024, there were 1,996 departures by JSX. Each aircraft can hold up to 30 passengers. Therefore, there were 59,880 seats available, and 43,765 were filled, for a BLF of 73.09 percent. **Table 2LL** presents multiple enplanement forecasts based on the BLF under four different scenarios.

TABLE 2LL | BLF Enplanements Forecasts

	Current Schedule ¹		Add 3 Destinations with 1 Daily Flight		Add 6 Destinations with 1 Daily Flight		Add 6 Destinations and More Flights to Current Destinations	
BLF Percent	Annual Seats Available	Enp.	Annual Seats Available	Enp.	Annual Seats Available	Enp.	Annual Seats Available	Enp.
70% BLF	126,360	88,452	159,120	111,384	191,880	134,316	324,480	227,136
73% BLF		92,243		116,158		140,072		236,870
80% BLF		101,088		127,296		153,504		259,584
90% BLF		113,724		143,208		172,692		292,032

BLF = board loading factor

Enp. = enplanements

Source: ¹Based on March 2-9, 2025, JSX flight schedule

Scenario 1 | The first scenario assumes the flight schedule for the first week of March 2025 is repeated every week in the year. This would result in a total of 126,360 available seats. Four BLF enplanement forecasts are shown in the table. Under this scenario, the range of potential annual enplanements is from a low of 88,452 to a high of 113,724 enplanements.

Scenario 2 | The second scenario considers the possibility of adding three new destinations with one daily departure to each new destination. When adding these new departures to the current schedule, a total of 159,120 seats would be available. This enplanement forecast ranges from a low of 111,384 to a high of 143,208 enplanements.

Scenario 3 | The third scenario considers the addition of six new destinations with one daily departure. When adding these new departures to the current schedule, a total of 191,880 seats would be available. This enplanement forecast ranges from a low of 134,316 to a high of 172,692 enplanements.

Scenario 4 | The fourth scenario considers the addition of six new destinations with two daily departures and additional flights to existing destinations. This scenario would offer a total of 324,480 available seats. This enplanement forecast ranges from a low of 227,136 to a high of 292,032 enplanements.

SELECTED CHARTER ENPLANEMENT FORECAST

Developing an enplanement forecast is challenging when there is only one year of records and, thus, no trend on which to rely. What is known is that in 2024, 43,765 enplanements were reported at SDL, 1,996 departures in 30-seat aircraft occurred, and a BLF of 73.09 percent was realized with those departures. Charter activity is expected to continue to grow at SDL. For example, JSX increased the number of destinations served during the first 12 months of operations, and JSX management has indicated intentions to offer additional destinations and add additional flights to current destinations. NetJets has expanded its operations at the airport by way of a new hangar/office/apron complex. Flexjet is in the permitting process to build a terminal/hangar facility with underground vehicle parking.

A range of potential enplanement forecasts has been presented. The low range assumes no changes to the current schedule and a BLF of 70 percent, which is lower than experienced in 2024. The high range includes the addition of six new destinations, with two daily departures to each destination and additional flights to existing destinations by charter operators. For planning purposes, the selected forecast generally uses the BLF of 73 percent under each scenario as follows:

- 2024 – 43,765 enplanements
- 2029 – 92,243 enplanements (Scenario 1)
- 2034 – 140,072 enplanements (Scenario 3)
- 2044 – 236,870 enplanements (Scenario 4)

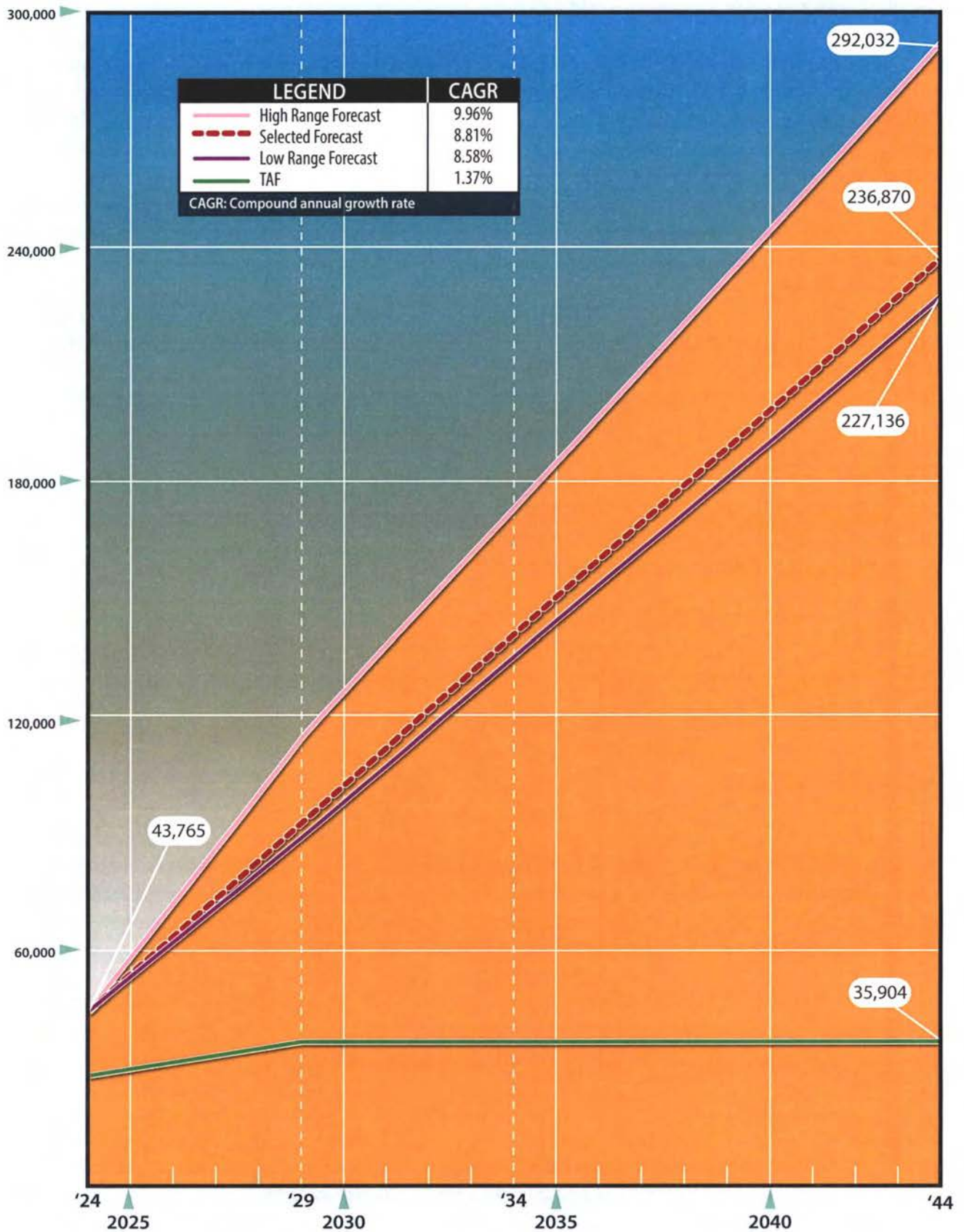
Exhibit 2J shows the high- and low-range public charter enplanement forecasts, as well as the selected forecast. Although the enplanement forecast envelope was developed based on JSX activity, the selected forecast is assumed to include enplanements generated by all charter and fractional operators at the airport, including JSX, NetJets, Flexjet, and others.

FORECAST SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the planning period. **Exhibit 2K** presents a summary of the aviation demand forecasts prepared in this chapter. The base year for these forecasts is 2024 with a 20-year planning horizon to 2044. Several forecasts for each aviation demand indicator were developed to create a range of reasonable forecasts, from which a single forecast was selected for use in this master plan.

Air taxi operations, which include charter operations, fractional operations, air ambulance operations, and other for-hire activities, are projected to increase from 66,178 in 2024 to 147,818 by 2044, for an annual growth rate of 4.10 percent. This growth rate for air taxi operations is the same as the rate projected by the FAA in the TAF.

Itinerant general aviation operations have remained fairly steady over the last 10 years, while local general aviation operations have declined. Both categories of general aviation operations are projected to increase over the next 20 years, albeit at a slower rate than air taxi operations.



	BASE	FORECAST			CAGR
	2024	2029	2034	2044	2024-2044
ANNUAL OPERATIONS					
<i>Air Taxi/Charter Operations (Itinerant)</i>					
Air Taxi	66,178	80,903	98,906	147,818	4.10%
Total Air Taxi/Charter Operations	66,178	80,903	98,906	147,818	4.10%
<i>General Aviation Operations</i>					
Itinerant	64,608	70,812	77,019	89,636	1.65%
Local	35,478	39,267	43,460	53,238	2.05%
Total General Aviation Operations	100,086	110,079	120,479	142,874	1.80%
<i>Military Operations</i>					
Itinerant	320	365	365	365	0.66%
Local	4	2	2	2	-3.41%
Total Military Operations	324	367	367	367	0.63%
Total Itinerant Operations	131,106	152,080	176,290	237,819	3.02%
Total Local Operations	35,482	39,269	43,462	53,240	2.05%
TOTAL ANNUAL OPERATIONS	166,588	191,349	219,752	291,059	2.83%
ENPLANEMENTS					
Charter Enplanements	43,765	92,243	140,072	236,870	8.81%
BASED AIRCRAFT					
Single Engine Piston	115	125	142	167	1.88%
Multi-Engine Piston	10	10	10	10	0.00%
Turboprop	11	18	24	35	5.96%
Jet	157	177	191	225	1.82%
Helicopter	40	35	30	25	-2.32%
TOTAL BASED AIRCRAFT	333	365	397	462	1.65%
PEAKING ACTIVITY PROJECTIONS					
Annual Operations	166,588	191,349	219,752	291,059	
Peak Month	15,627	18,599	21,360	28,291	
Design Day	521	620	712	943	
Design Hour	68	85	98	129	



Total operations are projected to increase from 166,588 in 2024 to 291,059 in 2044, for an annual growth rate of 2.83 percent. By 2044, air taxi operations are projected to surpass combined general aviation operations and represent more than 50 percent of total operations.

The FAA requests that air taxi operators report their passenger enplanement counts annually. In 2024, the air taxi operators reported 43,765 passenger enplanements. Future passenger enplanements are projected to reach 236,870 by 2044.

Based aircraft are forecasted to increase from approximately 333 in 2024 to 462 by 2044, for an annual growth rate of 1.65 percent.

Projections of aviation demand will be influenced by unforeseen factors and events in the future. In the recent past, factors such as terrorist attacks, economic recession, and the COVID-19 pandemic have impacted aviation demand; nevertheless, the forecasts developed for this planning effort are considered reasonable for planning purposes. The FAA will review and (if acceptable) approve these forecasts for planning purposes.

FORECAST COMPARISON TO THE FAA TAF

When reviewing airport master plan forecasts, the FAA compares them to the most recent TAF for consistency. To be consistent with the TAF, the master plan forecasts should differ by 10 percent or less in the first five years and 15 percent or less in the 10-year timeframe. If the forecasts are not consistent with these parameters, further discussion with the local FAA Airports District Office (ADO) will be required. Ultimately, the forecasts may be forwarded to FAA headquarters in Washington, D.C., for further review. Deviation from these thresholds will require specific local documentation.

Table 2MM presents a comparison of the master plan forecasts and the FAA TAF (published in January 2025) for commercial operations (air taxi), total operations, charter enplanements, and based aircraft. The percentage difference is the absolute value of the difference between the two numbers divided by the average of the two numbers. The base year was established as calendar year 2024.

TABLE 2MM Forecast Comparison to the 2024 FAA Terminal Area Forecast (TAF)					
	2024	2029	2034	2044	CAGR 2024-2044
Commercial Operations (Air Taxi)					
Master Plan Forecast	66,178	80,903	98,906	147,818	4.10%
FAA TAF 2024 ¹	63,600	77,761	95,060	142,061	4.10%
% Difference:	4.0%	4.0%	4.0%	4.0%	—
Total Operations					
Master Plan Forecast	166,588	191,349	219,752	291,059	2.83%
FAA TAF 2024 ¹	169,207	207,561	226,065	275,518	2.47%
% Difference:	1.6%	8.1%	2.8%	5.5%	—
Charter Passenger Enplanements					
Master Plan Forecast	43,765	92,243	140,072	236,870	8.81%
FAA TAF 2024 ¹	27,323	35,904	35,904	35,904	1.37%
% Difference:	46.3%	87.9%	118.4%	147.3%	—
Based Aircraft					
Master Plan Forecast	333	365	397	462	1.65%
FAA TAF 2024 ¹	340	355	375	415	1.00%
% Difference:	2.1%	2.7%	5.8%	10.8%	—
CAGR = compound annual growth rate					

Source: ¹Terminal Area Forecast, published January 2025

Charter/Air Taxi Operations | The 2024 TAF (published in January 2025) estimated 63,600 commercial operations (Air Taxi) for 2024. According to tower operational counts, there were 66,178 actual air taxi operations in 2024. The commercial operations (Air Taxi) forecasts are within TAF tolerances.

Total Operations | The total operations forecast is within the TAF tolerance of 10 percent in the five-year term and 15 percent in the 10-year term.

Charter Passenger Enplanements | In 2024, the airport documented 43,765 total charter passenger enplanements. The TAF enplanement number of 27,323 is below the actual number of enplanements. The TAF estimates a total of 35,904 charter enplanements by 2044, a total that has already been exceeded by 2024 enplanements; therefore, the charter enplanement forecast is not within TAF tolerance because the TAF is not reflective of current (2024) activity levels and does not take into consideration future plans for more destinations and more flights to current destinations.

Based Aircraft | The based aircraft forecast is within the TAF tolerance of 10 percent in the five-year term and 15 percent in the 10-year term.

AIRCRAFT/AIRPORT/RUNWAY CLASSIFICATION

The FAA has established several aircraft classification systems that group aircraft types based on their performance (approach speed in landing configuration) and design characteristics (wingspan and landing gear configuration). These classification systems are used to determine the appropriate airport design standards for specific airport elements, such as runways, taxiways, taxilanes, and aprons.

AIRCRAFT CLASSIFICATION

The selection of appropriate FAA design standards for the development and location of airport facilities is primarily based on the characteristics of the aircraft that currently use or are expected to use an airport. The critical aircraft is used to define the design parameters for an airport and may be a single aircraft type or a composite aircraft that represents a collection of aircraft with similar characteristics. The critical aircraft is classified by three parameters: aircraft approach category (AAC), airplane design group (ADG), and taxiway design group (TDG). FAA AC 150/5300-13B, *Airport Design*, describes the following airplane classification systems, the parameters of which are presented on **Exhibit 2L**.

Aircraft Approach Category (AAC) | The AAC is a grouping of aircraft based on a reference landing speed (V_{REF}), if specified, or if V_{REF} is not specified, 1.3 times stall speed (V_{SO}) at the maximum certificated landing weight. V_{REF} , V_{SO} , and the maximum certificated landing weight are values established for the aircraft by the certification authority of the country of registry.

The AAC generally refers to the approach speed of an aircraft in landing configuration. The higher the approach speed, the more restrictive the applicable design standards will be. The AAC, depicted by a letter (A through E), relates to aircraft approach speed (operational characteristics). The AAC generally applies to runways and runway-related facilities, such as runway width, runway safety area (RSA), runway object free area (ROFA), runway protection zone (RPZ), and separation standards.

AIRCRAFT APPROACH CATEGORY (AAC)

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

AIRPLANE DESIGN GROUP (ADG)

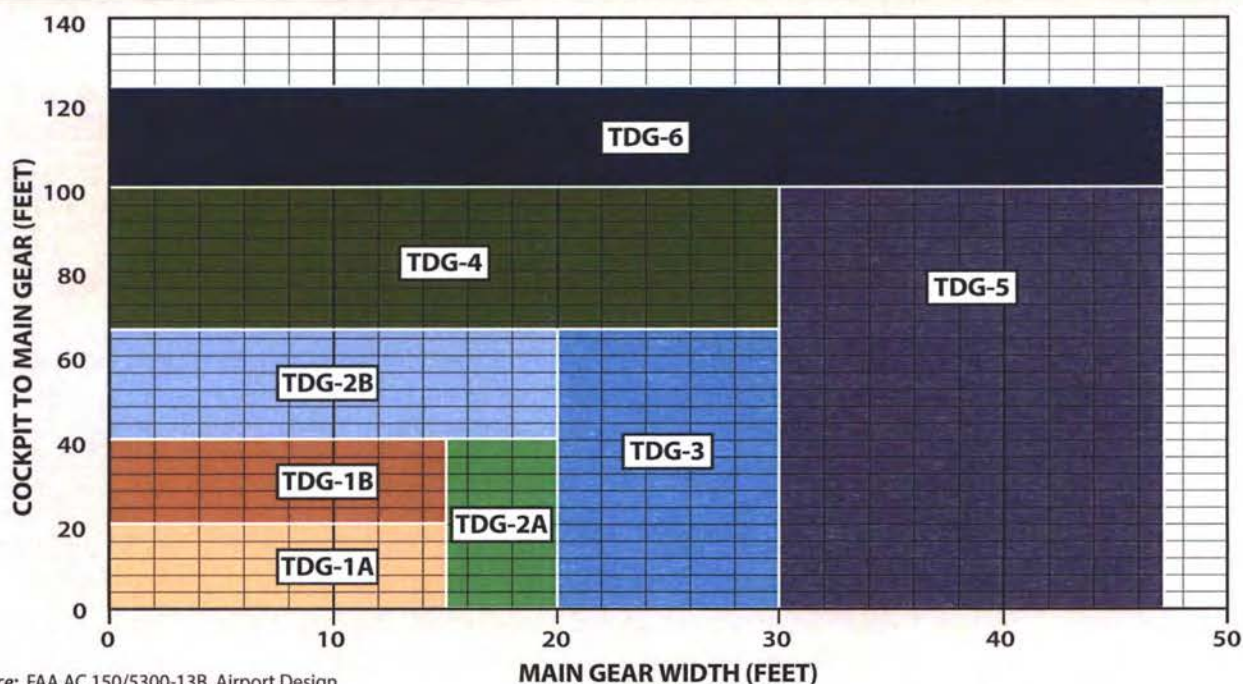
Group #	Tail Height (ft)	Wingspan (ft)
I	<20	<49
II	20-<30	49-<79
III	30-<45	79-<118
IV	45-<60	118-<171
V	60-<66	171-<214
VI	66-<80	214-<262

VISIBILITY MINIMUMS

RVR* (ft)	Flight Visibility Category (statute miles)
VIS	3-mile or greater visibility minimums
5,000	Not lower than 1-mile
4,000	Lower than 1-mile but not lower than ¾-mile
2,400	Lower than ¾-mile but not lower than ½-mile
1,600	Lower than ½-mile but not lower than ¼-mile
1,200	Lower than ¼-mile

*RVR: Runway Visual Range

TAXIWAY DESIGN GROUP (TDG)



Source: FAA AC 150/5300-13B, Airport Design

Airplane Design Group (ADG) | The ADG, depicted by a Roman numeral (I through VI), is a classification of aircraft that relates to aircraft wingspan or tail height (physical characteristics). When the aircraft wingspan and tail height fall within different groups, the higher group is used. The ADG influences design standards for taxiway safety area (TSA), taxiway object free (TOFA), taxilane object free area, apron wingtip clearance, and various separation distances.

Taxiway Design Group (TDG) | The TDG is a classification of airplanes based on outer-to-outer main gear width (MGW) and cockpit-to-main gear (CMG) distance. The TDG relates to the undercarriage dimensions of the design aircraft. The taxiway design elements determined by the application of the TDG include the taxiway width, taxiway edge safety margin, taxiway shoulder width, taxiway fillet dimensions, and, in some cases, the separation distance between parallel taxiways/taxilanes. Other taxiway elements, such as the taxiway safety area (TSA), taxiway/taxilane object free area (TOFA), taxiway/taxilane separation to parallel taxiway/taxilanes or fixed or movable objects, and taxiway/taxilane wingtip clearances, are determined solely based on the wingspan (ADG) of the design aircraft utilizing those surfaces. It is appropriate for taxiways to be planned and built to different TDG standards based on expected use.

Exhibit 2M summarizes the classifications of the most common aircraft in operation today. Generally, recreational and business piston and turboprop aircraft will fall in AAC A and B and ADG I and II. Business jets typically fall in ACC B and C, while the larger commercial aircraft will fall in AAC C and D.

AIRPORT AND RUNWAY CLASSIFICATION

Along with the previously defined aircraft classifications, airport and runway classifications are used to determine the appropriate FAA design standards to which the airfield facilities should be designed and built.

Runway Design Code (RDC) | The RDC is a code that signifies the design standards to which the runway should be built. The RDC is based on planned development and has no operational component.

The AAC, ADG, and runway visual range (RVR) are combined to form the RDC of a particular runway. The RDC provides the information needed to determine certain applicable design standards. The first component, depicted by a letter, is the AAC and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristics), whichever is most restrictive. The third component relates to the available instrument approach visibility minimums, expressed by RVR values in feet of 1,200 (⅓-mile), 1,600 (¼-mile), 2,400 (½-mile), 4,000 (¾-mile), and 5,000 (1-mile). The RVR values approximate standard visibility minimums for instrument approaches to the runways. The third component is labeled “VIS” for runways that are designed for visual approach use only.

Approach Reference Code (APRC) | The APRC is a code that signifies the current operational capabilities of a runway and associated parallel taxiway with regard to landing operations. The APRC has the same three components as the RDC: AAC, ADG, and RVR. The APRC describes the current operational capabilities of a runway under particular meteorological conditions in which no special operating procedures are necessary, unlike the RDC, which is based on planned development and has no operational component. The APRC for a runway is established based on the minimum runway-to-taxiway centerline separation.

A-I	Aircraft	TDG	C/D-II	Aircraft	TDG	
	• Beech Bonanza • Cessna 150, 172 • Piper Comanche, Seneca	1A 1A 1A		• Challenger 600/604 • Cessna Citation III, VI,VII, X • Embraer Legacy 135/140 • Gulfstream IV (D-II) • Gulfstream G280 • Lear 70, 75 • Falcon 50, 900, 2000 • Hawker 800XP, 4000	1B 1B 2B 2A 1B 1B 2A 1B	
B-I	• Eclipse 500 • Beech Baron 55/58 • Beech King Air 100 • Cessna 421 • Cessna Citation M2 (525) • Cessna Citation 1(500) • Embraer Phenom 100	1A 1A 1A 2A 1A 1A 1A	C/D-III <i>less than 150,000 lbs.</i>		• Gulfstream V • Gulfstream 550, 600, 650 • Global 5000, 6000	2B 2B 2B
A/B-II <i>12,500 lbs. or less</i>	• Beech Super King Air 200 • Beech King Air 90 • Cessna 441 Conquest • Cessna Citation CJ2 • Pilatus PC-12	2A 1A 1A 2A 2	C/D-III <i>over 150,000 lbs.</i>		• Airbus A319, A320, A321 • Boeing 737-800, 900 • MD-83, 88	3 3 4
B-II <i>over 12,500 lbs.</i>	• Beech Super King Air 350 • Cessna Citation CJ3(525B) • Cessna Citation CJ4 (525C) • Cessna Citation Latitude • Embraer Phenom 300 • Falcon 20 • Pilatus PC-24	2A 2A 1B 1B 1B 1B 2A	C/D-IV		• Airbus A300 • Boeing 757-200 • Boeing 767-300, 400 • MD-11	5 4 5 6
A/B-III	• Bombardier Dash 8 • Bombardier Global 7500 • Falcon 7X, 8X	3 2B 2A	C/D-V		• Airbus A330-200, 300 • Airbus A340-500, 600 • Boeing 747-100 - 400 • Boeing 777-300 • Boeing 787-8, 9	5 6 5 6 5
C/D-I	• Lear 35, 40, 45, 55, 60XR • F-16	1B 1A	E-I		• F-15	1B

Note: Aircraft pictured is identified in bold type.

Departure Reference Code (DPRC) | The DPRC is a code that signifies the current operational capabilities of a runway and associated parallel taxiway with regard to takeoff operations. The DPRC represents those aircraft that can take off from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions with no special operating conditions. The DPRC is similar to the APRC but has two components: ACC and ADG. A runway may have more than one DPRC, depending on the parallel taxiway separation distance.

Airport Reference Code (ARC) | The ARC is an airport designation that signifies the airport's highest RDC minus the third (visibility) component of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely at an airport. The current airport layout plan (ALP) for the airport, which will be updated as part of this planning effort, identifies an ARC of D-II currently and in the future.

CRITICAL AIRCRAFT

The selection of appropriate FAA design standards for the development and location of airport facilities is primarily based on the characteristics of the aircraft that currently use or are expected to use an airport. The critical aircraft is used to define the design parameters for an airport and may be a single aircraft type or a composite aircraft that represents a collection of aircraft classified by the three parameters: AAC, ADG, and TDG. In the case of an airport with multiple runways, a design aircraft is selected for each runway.

The first consideration is the safe operation of aircraft that are likely to use an airport. Any operation of an aircraft that exceeds the design criteria of an airport may result in either an unsafe operation or a decreased safety margin; however, it is not the usual practice to base the design of an airport on an aircraft that infrequently uses the airport.

FAA AC 150/5000-17, *Critical Aircraft and Regular Use Determination*, provides guidance for determining the critical aircraft for the airport and each runway. **The critical aircraft is defined as the most demanding aircraft type, or grouping of aircraft with similar characteristics, that makes regular use of the airport. Regular use is 500 annual operations, excluding touch-and-go operations.** Planning for future aircraft use is of particular importance because the design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure short-term development does not preclude the reasonable long-range potential needs of the airport.

According to FAA AC 150/5300-13B, *Airport Design*, "airport designs based only on existing aircraft can severely limit the ability to expand the airport to meet future requirements for larger, more demanding aircraft. Airport designs that are based on large aircraft never likely to be served by the airport are not economical." Selection of the current and future critical aircraft must be realistic in nature and supported by current data and realistic projections.

AIRPORT CRITICAL AIRCRAFT

The critical aircraft is the aircraft (or family of aircraft with similar design characteristics) that accounts for 500 or more annual operations.

The FAA maintains the TFMSC database, which documents certain aircraft operations at airports. Information is added to the TFMSC database when pilots file flight plans and/or when flights are detected by the National Airspace System, usually via radar. It includes documentation of commercial traffic (air taxi), general aviation, and military aircraft. Due to factors such as incomplete flight plans, limited radar coverage, and VFR operations, TFMSC data do not account for all aircraft activity at an airport by a given aircraft type; therefore, there are likely more operations at an airport than are captured by this methodology. The FAA indicates that the capture rate for turboprops and jets is better than 95 percent because operators of these types of sophisticated aircraft generally file flight plans. TFMSC data are available for activity at the airport and were utilized in this analysis.

Exhibit 2N presents the TFMSC annual activity for jets and turboprops from 2015 through 2024. Aircraft in AAC D accounted for 3,862 operations in 2024 and have averaged 3,121 over the last 10 years. There are very few operations by aircraft in AAC E; therefore, the critical AAC for the airport is identified as AAC D.

Aircraft in ADG III accounted for 3,638 operations in 2024. There were no operations by aircraft with wider wingspans at the airport. The number of operations by aircraft in ADG III have been increasing since 2020; therefore, the first two elements of the critical aircraft classification are D-III, as it is documented that there are more than 500 annual operations by D-III aircraft.

The third element of the critical aircraft classification is the TDG. An examination of the TFMSC database shows specific aircraft types that have been cross-referenced with the FAA's aircraft characteristics database (faa.gov/airports/engineering/aircraft_char_database). The critical aircraft TDG is 2B, which accounted for more than 7,600 operations in 2024. Aircraft with a TDG of 3 have never exceeded the 500 operations threshold at Scottsdale Airport.

The current critical aircraft for the airport is D-III-2B. A representative aircraft with a TDG of 2B is the Gulfstream V. This aircraft has a maximum take-off weight of 90,500 pounds. It should be noted that there are business jets in the B-III-2B and D-III-2B category that have a maximum takeoff weight above 100,000 pounds, which exceeds the current weight limitation for the runway at SDL.

Future Critical Aircraft

Section 2.3 of FAA AC 150/5000-17 outlines a specific approach to projecting a future critical aircraft. According to the AC:

"The forecast, as submitted to FAA by the airport sponsor, must include a projection of the number of operations by the future critical aircraft for the planning horizon year (i.e., typically not more than 20 years from the base year). Proper diligence and awareness of aircraft fleet trends is needed when establishing the future critical aircraft, particularly in cases where the future RDC may change due to an aircraft type with greater requirements (i.e., runway or airfield geometry).

No Data	0	2	2	2	4	2	0	0	0	0
No Data	12	10	12	12	14	16	42	62	60	54
2A	4	14	2	12	6	0	12	12	16	12
1A	12	14	4	2	4	8	32	44	20	0
1A	0	0	0	0	2	0	0	0	0	4
1A	336	480	578	370	338	464	348	278	208	142
1A	0	0	22	64	226	492	682	838	786	1,042
No Data	0	2	0	0	0	0	0	0	0	0
1A	126	92	104	66	102	80	60	40	22	48
1A	292	388	408	402	310	280	326	344	278	288
1A	0	58	88	184	314	336	380	398	428	558
1A	0	0	2	0	0	0	0	0	0	0
	792	1,066	1,222	1,114	1,326	1,678	1,884	2,024	1,818	2,148
1A	30	20	20	52	46	16	30	20	10	6
1A	4	0	0	0	0	0	0	0	0	0
1A	0	0	0	0	0	0	2	0	0	0
2	1,412	1,618	1,664	1,730	1,756	1,744	2,130	2,416	2,566	2,756
No Data	0	0	0	0	0	0	0	0	0	2
No Data	2	0	4	0	0	0	0	0	0	0
	1,448	1,638	1,688	1,782	1,802	1,760	2,162	2,436	2,576	2,764
3	0	0	0	4	2	4	2	0	0	0
	0	0	0	4	2	4	2	0	0	0
2A	2	0	0	0	0	0	0	0	0	0
2A	254	228	182	132	114	118	168	52	52	22
1A	24	22	28	24	26	16	10	18	14	6
1A	1,270	1,340	1,338	1,112	928	1,018	1,352	1,262	1,092	1,116
1A	0	4	0	0	0	0	0	0	0	0
1A	506	428	336	224	298	246	296	354	252	234
1A	0	72	230	154	222	294	372	452	332	596
2A	88	74	48	40	34	34	34	36	40	22
1A	34	56	22	24	12	6	30	34	4	2
1A	128	160	114	66	46	62	82	92	72	22
1A	824	648	512	664	528	652	716	520	438	420
1A	1,202	1,304	1,614	1,396	1,588	1,416	1,620	1,304	978	498
1A	0	2	0	0	0	0	2	0	0	0
1A	838	788	854	834	766	248	360	546	298	184
1A	486	270	364	538	506	778	902	734	456	318
No Data	58	48	24	50	52	40	82	94	66	52
2A	0	18	128	126	160	116	238	550	476	458
No Data	0	0	0	0	0	0	0	0	0	2
1B	26	8	2	0	0	0	0	0	0	0
1A	262	268	202	166	168	110	124	176	124	124
1A	32	30	26	24	22	20	22	48	42	32
1A	4	18	6	2	2	0	0	0	6	18
2A	6	0	6	4	18	12	2	0	0	2
2A	24	20	8	14	10	0	4	10	20	14
2A	4	14	4	4	6	2	6	2	2	4
2A	20	4	2	0	0	0	4	0	0	2
1A	632	766	724	924	1,988	2,258	2,576	2,424	1,510	1,448
No Data	0	2	0	0	0	0	0	0	0	0
No Data	0	0	0	0	0	2	0	0	0	0
1A	48	62	48	96	40	42	74	106	74	52
	6,772	6,654	6,822	6,618	7,534	7,490	9,076	8,814	6,348	5,648
1A	16	2	0	0	0	0	0	0	0	0
2A	0	0	0	12	4	2	8	2	2	0
2A	524	732	1,070	1,038	926	916	1,150	1,318	884	418

B-II cont.	C23B - Cessna Citation CJ3	2A	620	1,200	1,000	1,000	1,500	
	C25C - Cessna Citation CJ4	1B	574	628	706	738	608	
	C441 - Cessna Conquest	1A	174	250	230	168	186	
	C550 - Cessna Citation II/Bravo	2A	984	1,150	1,050	786	454	
	C551 - Cessna Citation II/SP	1A	10	40	36	20	44	
	C55B - Cessna Citation Bravo	3	0	0	0	14	18	
	C560 - Cessna Citation V/Ultra/Encore	2A	1,436	1,378	1,244	918	1,024	
	C56X - Cessna Excel/XLS	1B	2,360	2,596	2,818	3,130	3,008	
	C680 - Cessna Citation Sovereign	1B	832	930	1,062	964	1,030	
	C68A - Cessna Citation Latitude	1B	0	6	314	872	1,612	
	D328 - Dornier 328 Series	1B	20	2	6	0	2	
	E120 - Embraer Brasilia EMB 120	3	0	0	0	0	0	
	E545 - Embraer EMB-545 Legacy 450	1B	0	10	180	276	396	
	E550 - Embraer Legacy 500	1B	24	138	130	146	176	
	E55P - Embraer Phenom 300	1B	1,164	1,396	1,642	1,876	2,010	
	FA20 - Dassault Falcon/Mystère 20	2A	390	126	112	102	102	
	J328 - Fairchild Dornier 328 Jet	1B	6	2	0	8	6	
	PC24 - Pilatus PC-24	2A	0	0	0	0	76	
	SC7 - Short Skyvan SC7	1A	2	0	0	0	0	
	SH33 - Shorts 330	2A	0	2	0	0	0	
	SW2 - Swearingen Merlin 2	2A	0	0	2	0	0	
	SW3 - Fairchild Swearingen SA-226T/TB Merlin 3	2A	214	102	134	122	154	
	SW4 - Swearingen Merlin 4/4A Metro2	3	14	2	8	2	4	
Total			11,662	13,058	14,538	14,714	15,044	1
B-III	C2 - Grumman C-2 Greyhound	No Data	2	0	0	0	0	
	DA7X - Dassault Falcoln 7x	2A	16	18	4	0	0	
	DH8C - Dash 8/DHC8-300	3	0	0	0	0	4	
	E2 - Grumman TE-2 Hawkeye	No Data	0	0	0	0	0	
	FA7X - Dassault Falcon F7X	2A	236	258	282	304	374	
	FA8X - Dassault Falcon 8X	2A	0	0	0	70	84	
	GL7T - Bombardier Global 7500	2B	0	0	0	0	0	
Total			254	276	286	374	462	
B-IV	C130 - Lockheed 130 Hercules	2B	0	0	0	0	0	
	C30J - C-130J Hercules ; Lockheed	2B	0	0	2	0	0	
	Total			0	0	2	0	0
C-I	F18 - Boeing FA-18 Hornet	1B	22	8	2	0	2	
	F18H - F/A 18 Hornet	1B	0	2	22	12	16	
	F18S - F18 Hornet	1B	0	0	18	26	36	
	HAR - Boeing AV-8 Harrier	No Data	0	0	0	2	12	
	HAWK - BAe Systems Hawk	1A	56	30	6	34	34	
	L36 - Bombardier Learjet 36	1B	0	0	0	0	2	
	LJ24 - Bombardier Learjet 24	1A	0	2	4	0	0	
	LJ25 - Bombardier Learjet 25	1A	24	14	10	8	0	
	LJ35 - Bombardier Learjet 35/36	1B	1,084	792	740	580	470	
	LJ40 - Learjet 40; Gates Learjet	1B	328	228	102	70	108	
	LJ45 - Bombardier Learjet 45	1B	828	914	1,014	1,208	1,196	
	LJ55 - Bombardier Learjet 55	1B	172	122	88	222	106	
	LJ60 - Bombardier Learjet 60	1B	778	700	644	652	670	
	LR35 - Learjet 35	1B	2	0	0	0	0	
	P180 - Piaggio P-180 Avanti	2A	134	54	58	40	24	
	SBR1 - North American Rockwell Sabre 40/60	1A	30	20	20	4	4	
	T45 - BAe T-45 Goshawk	No Data	0	0	2	4	2	
	WW23 - IAI 1123 Westwind	1B	0	0	2	2	2	
	WW24 - IAI 1124 Westwind	1B	112	80	66	38	28	
Total			3,570	2,966	2,798	2,902	2,712	
	A10 - Fairchild A10	2A	0	0	0	0	0	

00	1A	1,000	1,004	1,000	1,010	1,004	1,042	2,144	2,404	2,430	2,322
	1B	38	456	858	1,258	1,258	1,984	2,762	2,898	2,996	
	1B	1,458	1,596	1,588	1,614	1,682	1,546	2,174	2,110	1,896	1,948
	2A	0	0	0	0	0	0	0	2	0	2
	2B	116	88	86	58	46	24	26	22	30	1,222
	2B	0	0	0	2	0	2	4	2	10	3,144
	2B	8	12	44	46	54	92	188	148	156	264
	2B	0	2	0	4	0	0	0	0	0	0
	2A	1,460	1,568	1,590	1,606	1,234	1,076	964	1,062	1,156	1,278
	2A	680	800	798	758	740	632	830	846	982	792
	2A	728	632	532	704	744	816	1,140	1,144	900	620
	2A	0	0	0	0	0	0	0	0	0	2
	1B	144	194	314	322	430	404	620	948	670	364
	No Data	2	0	0	0	0	0	0	0	0	0
	1B	0	2	0	0	2	0	0	0	0	0
	1B	164	224	324	392	494	366	476	612	690	952
	1B	636	466	480	508	436	420	692	602	612	818
	1B	10	0	6	0	4	0	6	0	6	2
	2A	226	270	286	118	40	18	12	14	18	16
	1A	12	4	4	0	4	0	0	0	2	6
	1B	2,026	2,114	1,856	1,530	1,422	1,244	1,256	1,674	1,708	2,042
	1B	34	106	138	96	102	110	130	106	70	38
	1B	112	118	202	204	194	188	256	348	256	182
	1B	2	0	0	0	0	0	2	0	0	0
	1B	38	72	66	34	52	70	76	76	70	74
	1B	116	184	184	190	190	294	346	448	432	372
	3	0	0	0	0	2	0	4	2	0	2
11,808		12,548	12,830	12,956	13,162	12,886	16,682	18,416	17,732	22,724	
00	3	0	0	0	0	0	0	0	0	0	4
	2A	0	0	2	0	0	0	0	0	0	0
	3	2	0	0	0	0	0	0	0	0	2
	No Data	0	0	2	2	2	0	0	0	0	0
	2B	138	160	198	256	234	238	418	372	480	416
	2B	386	424	348	366	438	420	680	794	766	572
	5	0	0	0	2	0	0	0	0	0	0
	3	0	0	2	0	0	0	2	0	6	4
	526		584	552	626	674	658	1,100	1,166	1,252	998
	5	0	0	0	0	0	0	0	2	0	0
	0		0	0	0	0	0	0	2	0	0
	5	0	0	0	0	2	0	0	0	0	0
	0		0	0	2	0	0	0	0	0	0
	1A	0	2	0	0	2	0	0	0	0	2
	1B	0	0	0	0	2	2	4	2	2	0
	1A	10	2	2	6	0	4	8	2	0	0
	10		4	2	6	4	6	12	4	2	2
	1B	2	0	0	0	0	0	0	0	0	0
	1B	10	2	6	10	60	888	1,390	1,728	1,840	296
	No Data	0	0	0	0	2	0	0	0	0	0
	2A	1,310	1,254	1,332	1,382	1,430	1,412	1,688	1,682	1,480	1,550
	1,322		1,256	1,338	1,392	1,492	2,300	3,078	3,410	3,320	1,846
	3	0	0	0	0	0	0	0	2	0	0
	3	0	0	0	0	2	0	0	0	0	0
	2B	2	0	0	0	0	0	2	0	0	4
	2B	0	0	2	2	74	188	310	398	386	480
	2B	0	0	0	2	2	8	40	22	276	306
	2B	368	446	488	576	684	514	738	904	842	852
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A-I	792	1,066	1,222	1,114	1,326	1,678	1,88
A-II	1,448	1,638	1,688	1,782	1,802	1,760	2,16
A-III	0	0	0	4	2	4	
B-I	6,772	6,654	6,822	6,618	7,534	7,490	9,07
B-II	11,662	13,058	14,538	14,714	15,044	16,378	22,17
B-III	254	276	286	374	462	382	57
C-I	3,570	2,966	2,798	2,902	2,712	2,500	3,57
C-II	11,808	12,548	12,830	12,956	13,162	12,886	16,68
C-III	526	584	552	626	674	658	1,10
C-IV	0	0	0	0	0	0	
C-V	0	0	0	0	2	0	
D-I	10	4	2	6	4	6	1
D-II	1,322	1,256	1,338	1,392	1,492	2,300	3,07
D-III	396	496	562	668	848	768	1,27
E-I	2	0	0	0	0	2	
Total	38,562	40,546	42,638	43,156	45,064	46,812	61,59

Approach Category

AC	2015	2016	2017	2018	2019	2020	2021
A	2,240	2,704	2,910	2,900	3,130	3,442	4,04
B	18,688	19,988	21,646	21,706	23,040	24,250	31,82
C	15,904	16,098	16,180	16,484	16,550	16,044	21,36
D	1,728	1,756	1,902	2,066	2,344	3,074	4,36
E	2	0	0	0	0	2	
Total	38,562	40,546	42,638	43,156	45,064	46,812	61,59

Design Group

DG	2015	2016	2017	2018	2019	2020	2021
I	11,146	10,690	10,844	10,640	11,576	11,676	14,55
II	26,240	28,500	30,394	30,844	31,500	33,324	44,09
III	1,176	1,356	1,400	1,672	1,986	1,812	2,95
IV	0	0	0	0	0	0	
V	0	0	0	0	2	0	
Total	38,562	40,546	42,638	43,156	45,064	46,812	61,59

Taxiway Design Group

TDG	2015	2016	2017	2018	2019	2020	2021
1A	9,042	9,266	9,524	9,346	10,646	10,618	12,77
1B	15,202	16,052	17,418	18,732	19,930	21,798	30,12
2A	12,680	13,756	14,094	13,316	12,456	12,444	15,46
2B	1,044	1,182	1,240	1,400	1,618	1,544	2,58
3	16	2	10	20	32	92	15
Total	37,984	40,258	42,286	42,814	44,682	46,496	61,11

Caution is warranted when a change in the critical aircraft is identified in the long-term forecast (years 11-20) given the uncertainty inherent to this forecast range. The long-term change to the critical aircraft must be supported by a reasonable forecast."

An operational fleet mix by engine type was previously presented in **Table 2HH**. To meet the requirements for determining a future critical aircraft, a projection of operations by ARC (ADG and AAC) has been developed. **Table 2NN** shows this projection for jets and turboprops. Only jets and turboprops were examined because the critical aircraft will be a jet or turboprop (or a combination of the two) and the TFMSC database provides highly reliable data on operations by these aircraft types.

TABLE 2NN | Jet & Turboprop Fleet Mix Forecast by Aircraft Reference Code

Design Category	Historical Jet & Turboprop Operations				Forecast Jet & Turboprop Operations					
	2015	%	2024	%	2029	%	2034	%	2044	%
AAC A/B	20,928	54.3%	33,202	52.0%	39,019	49.0%	44,634	47.0%	60,247	42.0%
AAC C	15,904	41.2%	26,792	42.0%	34,241	43.0%	39,886	42.0%	64,550	45.0%
AAC D	1,730	4.5%	3,864	6.1%	6,370	8.0%	10,446	11.0%	18,648	13.0%
Total	38,562	100.0%	63,858	100.0%	79,630	100.0%	94,966	100.0%	143,445	100.0%
ADG I	11,146	28.9%	10,870	17.0%	10,352	13.0%	11,396	12.0%	15,779	11.0%
ADG II	26,240	68.0%	49,350	77.3%	63,704	80.0%	75,023	79.0%	109,018	76.0%
ADG III	1,176	3.0%	3,638	5.7%	5,574	7.0%	8,547	9.0%	18,648	13.0%
Total	38,562	100.0%	63,858	100.0%	79,630	100.0%	94,966	100.0%	143,445	100.0%

AAC: Aircraft Approach Category; ADG: Airplane Design Group

Determining the future critical aircraft can be challenging, as fleet mixes change over time; however, at SDL, historical operations in D-III-2B have exceeded the threshold of 500 operations every year for the past 10 years. Operations by larger aircraft are exceedingly rare and are not expected to exceed the threshold of 500 operations within the next 20 years; therefore, **the future critical aircraft is to remain D-III-2B**. This critical aircraft is best represented by the Gulfstream V/G500.

RUNWAY DESIGN CODE (RDC)

The RDC relates to specific FAA design standards that should be met in relation to a runway. The RDC takes into consideration the AAC, ADG, and RVR. In most cases, the first two elements of the critical aircraft will also be the first two elements of the RDC for the primary runway. For an airport with a single runway, the RDC is the same as the critical aircraft.

The lowest visibility minimum is 1-mile, which is associated with the circling approaches to the airport. The instrument approach visibility minimums are not anticipated to be lower than 1-mile in the future; therefore, **the current and future RDC for Runway 3-21 is D-III-5000**.

APPROACH AND DEPARTURE REFERENCE CODES

The approach and departure reference codes (APRC and DPRC) describe the current operational capabilities of each runway and the adjacent parallel taxiways, where no special operating procedures are necessary. Essentially, the APRC and DPRC describe the current condition at an airport in runway classification terms when considering the parallel taxiway and instrument approach visibility minimums.

Taxiways A and B are parallel to Runway 3-21 and are separated by 250 feet from centerline to centerline. The lowest visibility minimum to the runway is 1-mile, which is expected to remain the same through the planning period; therefore, the APRC for Runway 3-21 is B-II-4000. This classification is an indication that the current runway-to-taxiway separation meets the recommended design standard for frequent operations by aircraft in ACC B and ADG II.

The DPRC is based solely on the runway-to-taxiway separation distance, centerline to centerline. The DPRC is classified as B-II.

Table 2PP shows the FAA definitions of APRC and DPRC based on the runway-to-taxiway separation distances. Under ideal circumstances, the runway-to-parallel taxiway separation distance would be at least 400 feet to fully accommodate the frequent operations by the critical aircraft in D-III-2B. The feasibility of shifting the parallel taxiways will be examined in the facility requirements section of the master plan.

TABLE 2PP | FAA Approach and Departure Reference Codes

1-Mile Visibility Minimum	Runway-to-Taxiway Separation			
	≥240'	≥250'	≥300'	≥400'
Approach Reference Code (APRC)	B-II-4000	B-II-4000	B-III-4000 D-II-4000	D-IV-4000 D-V-4000
Departure Reference Code (DPRC)	B-II	B-II	B-III D-II	D-IV D-V

Source: FAA AC 150/5300-13B, Airport Design

CRITICAL AIRCRAFT SUMMARY

Table 2QQ summarizes the airport and runway classifications for the current and future condition. Based on current activity levels, the airport is best classified as ARC D-III. This ARC is forecasted to remain the same through the 20-year scope of this study. The RDC for Runway 3-21 is currently D-III-5000 and is expected to remain the same in the future. The APRC and DPRC are shown to remain the same in the future.

TABLE 2QQ | Airport and Runway Classifications

	Current	Future
Airport Reference Code (ARC)	D-III	D-III
Airport Critical Aircraft	D-III-2B	D-III-2B
Runway Design Code (RDC)		
Runway 3-21	D-III-5000	D-III-5000
Approach Reference Code (APRC)		
Runway 3-21	B-II-4000	B-II-4000 ¹
Departure Reference Code (DPRC)		
Runway 3-21	B-II	B-II ¹

¹If the runway-to-taxiway separation were to change, the APRC and DPRC would also change.

Sources: Current ALP; FAA AC 150/5300-13B, Airport Design

SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the planning period, as well as the critical aircraft for the airport. Total operations are forecasted to increase 2.83 percent annually, largely led by a significant increase in air taxi operations. Charter passenger enplanements are forecasted to grow from 43,765 in 2024 to 236,870 by 2044, for an annual growth rate of 8.81 percent. Based aircraft are forecasted to grow from 333 currently to 462 in the long term, for an annual growth rate of 1.65 percent.

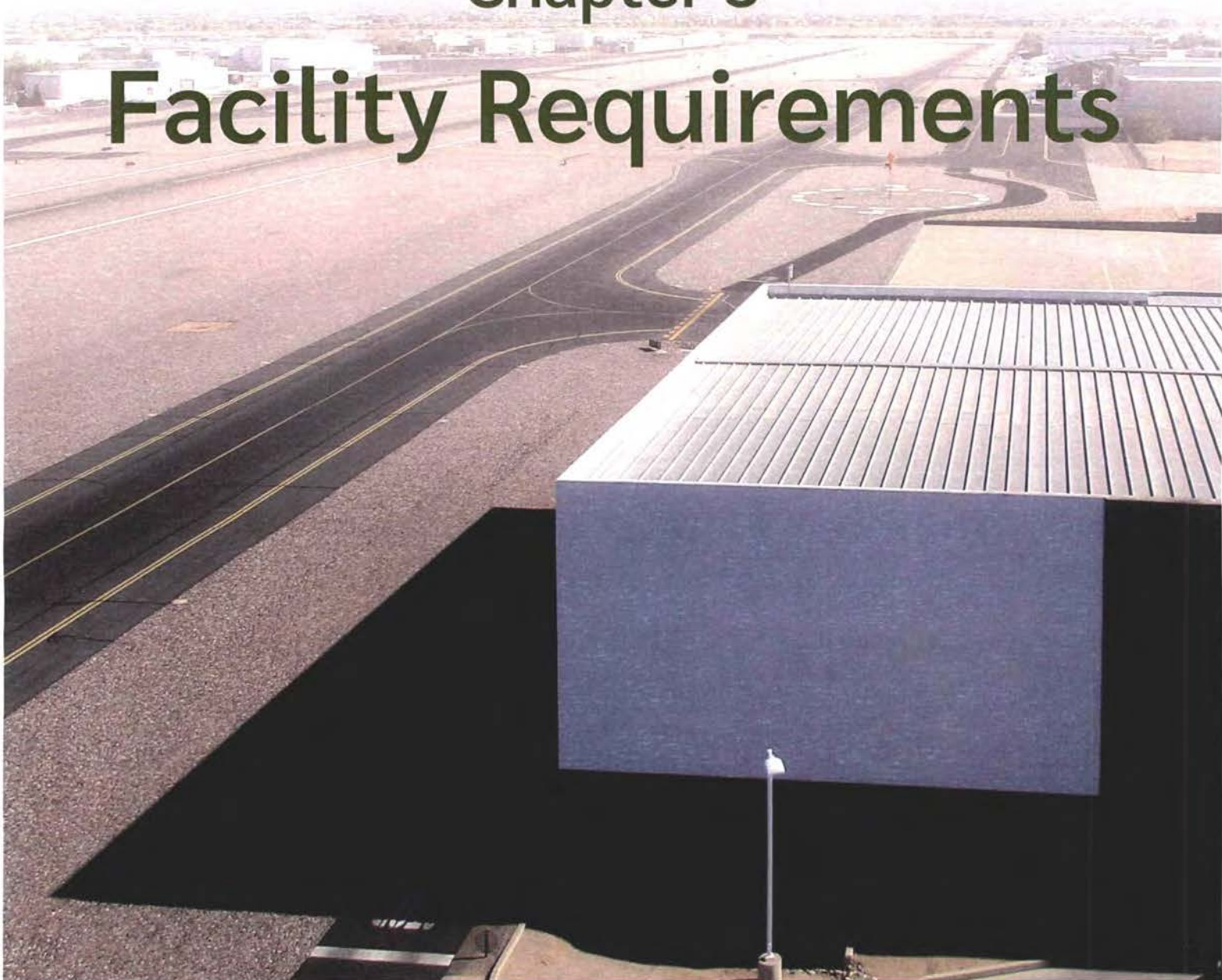
The critical aircraft for the airport was determined by examining the FAA TFMSC database of flight plans to and from the airport. Based on 2024 data, the current critical aircraft is described as D-III-2B, which is primarily represented by the Gulfstream V business jet. The critical aircraft classification is planned to remain the same through the 20-year planning period. The facility requirements chapter to follow will examine the applicable design standards based on the critical aircraft.

The next step in the planning process is to assess the capabilities of the existing facilities to determine what improvements may be necessary to meet future demands. The range of forecasts developed here will be carried forward in the next chapter as planning horizon activity levels that will serve as milestones or activity benchmarks in evaluating facility requirements.



Chapter 3

Facility Requirements



Chapter 3

Facility Requirements



The objective of this chapter is to identify, in general terms, the adequacy of the existing facilities at the Scottsdale Airport (SDL) and outline what facilities may be needed to accommodate future demands. Airport facilities include airside and landside components. Airside components include the runway system (runways and taxiways), navigational aids, lighting, and marking. Landside components include terminal facilities, aircraft parking aprons, storage and maintenance hangars, auto parking, surface road access, and support facilities. Once these facility needs are established, alternatives for providing the facilities will be evaluated in the following chapter.

This chapter examines several components of the airport and their respective capacities to determine future facility needs over the planning period. The identified deficiencies will then be examined in the alternatives evaluation.



The facility requirements were evaluated using guidance contained in Federal Aviation Administration (FAA) publications, including the following:

- Advisory Circular (AC) 150/5300-13B, *Airport Design*
- AC 150/5060-5, *Airport Capacity and Delay*
- AC 150/5325-4B, *Runway Length Requirements for Airport Design*
- Title 14 Code of Federal Regulations (CFR) Part 77, *Objects Affecting Navigable Airspace*
- Order 5090.5, *Formulation of the National Plan of Integrated Airport Systems (NPIAS) and the Airports Capital Improvement Plan (ACIP)*

PLANNING HORIZONS

An updated set of aviation demand forecasts for the airport has been established; a summary of the primary forecasting elements was previously presented on Exhibit 2H. The forecasts were approved by the FAA in a letter dated August 28, 2025. These activity forecasts include annual operations, based aircraft, based aircraft fleet mix, and peak activity periods. With this information, specific components of the airfield and landside systems can be evaluated to determine their capacity to accommodate future demand.

Cost-effective, efficient, and orderly development of an airport should rely more on actual demand at an airport than on a time-based forecast figure. To develop a study that is demand-based, rather than time-based, a series of planning horizon milestones is established. The planning horizons presented in **Table 3A** are segmented as the short term (approximately years 1-5), the intermediate term (approximately years 6-10), and the long term (years 11-20).

TABLE 3A | Planning Horizon Activity Levels

	PLANNING HORIZONS			
	Base Year 2024	Short Term (5 Years)	Intermediate Term (10 Years)	Long Term (20 Years)
ANNUAL OPERATIONS				
Itinerant Operations				
Air Taxi	66,178	80,903	98,906	147,818
General Aviation	64,608	70,812	77,019	89,636
Military	320	365	365	365
Total Itinerant Operations:	131,106	152,080	176,290	237,819
Local Operations				
General Aviation	35,478	39,267	43,460	53,238
Military	4	2	2	2
Total Local Operations:	35,482	39,269	43,462	53,240
TOTAL ANNUAL OPERATIONS:	166,588	191,349	219,752	291,059
BASED AIRCRAFT:	333	365	397	462
CHARTER ENPLANEMENTS:	43,765	92,243	140,072	236,870

Source: Coffman Associates analysis

Actual activity at the airport may be higher or lower than what the annualized forecast portrays. By anticipating needs according to planning horizon milestones, the resultant plan can accommodate unexpected shifts or changes in the area's aviation demand so airport officials can respond to such unexpected changes in a timely fashion.

Utilizing milestones allows airport management the flexibility to make decisions and develop facilities according to needs generated by actual demand levels. The demand-based schedule provides flexibility in development, as development schedules can be slowed or expedited according to demand at any given time over the planning period. The resultant plan provides airport officials with a financially responsible and needs-based program.

Throughout this chapter, references to "current" mean the base year of 2024. References to "future" mean within the next five years. References to "ultimate" mean sometime in the next five to 20 years. The reason for this differentiation is that any potential projects identified for the current or future timeframe must include actual justification. Projects that may be needed beyond the five-year timeframe likely will not be justified at present but will require justification prior to implementation.

AIRFIELD CAPACITY

An airfield's capacity is expressed in terms of its annual service volume (ASV). ASV is a reasonable estimate of the maximum level of aircraft operations that can be accommodated in a year without incurring significant delay factors. As operations near or surpass the ASV, delay factors increase exponentially. Guidance on calculating ASV is found in FAA AC 150/5060-5, *Airport Capacity and Delay*.

FACTORS AFFECTING ANNUAL SERVICE VOLUME (ASV)

Many factors are considered in the calculation of an airport's ASV, including airfield characteristics, meteorological conditions, aircraft mix, and demand characteristics (aircraft operations). These factors are described as follows and on **Exhibit 3A**.

Airfield Characteristics

The layout of runway and taxiways directly affects an airfield's ASV, including the orientation of the runway and the percentage of time that the runway is in use. Additional airfield characteristics include the length, width, weight bearing capacity, and instrument approach capability of each runway at an airport, all of which determine the type(s) of aircraft that may operate on the runway, as well as if operations can occur during poor weather conditions.

Runway Configuration

SDL has one runway, Runway 3-21, which is 8,249 feet long and 100 feet wide.

AIRFIELD LAYOUT

Runway Configuration



Runway Use



Number of Exits



WEATHER CONDITIONS

VMC (VFR)

Visual Meteorological Conditions



IMC (IFR)

Instrument Meteorological Conditions



PVC

Poor Visibility Conditions



AIRCRAFT MIX

Category A & B Aircraft
(0-12,500 lbs)



Category C Aircraft
(12,500-300,000 lbs)



Category D Aircraft
(>300,000 lbs)



OPERATIONS

Arrivals



Departures



Touch-and-Go Operations



Total Annual Operations



Meteorological Conditions

Weather conditions have a significant effect on airfield capacity. Airfield capacity is usually highest in clear weather when flight visibility is best. Airfield capacity is diminished as weather conditions deteriorate and cloud ceilings and visibility are reduced. As weather conditions deteriorate, the spacing of aircraft must increase to provide allowable margins of safety. The increased distance between aircraft reduces the number of aircraft that can operate at the airport during any given period, which consequently reduces overall airfield capacity.

There are three categories of meteorological conditions, each of which is defined by the reported cloud ceiling and flight visibility. Visual flight rules (VFR) conditions exist whenever the cloud ceiling is greater than 1,000 feet above ground level and visibility is greater than three statute miles. VFR flight conditions permit pilots to approach, land, or take off by visual reference, and see and avoid other aircraft.

Instrument flight rules (IFR) conditions exist when the reported cloud ceiling is less than 1,000 feet above ground level and/or visibility is less than three statute miles. Under IFR conditions, pilots must rely on instruments for navigation and guidance to the runway. Safe separations between aircraft must be assured by following air traffic control rules and procedures. This leads to increased distances between aircraft, which diminishes airfield capacity.

Poor visibility conditions (PVC) exist when cloud ceilings are less than 500 feet above ground level or visibility is less than one mile.

SDL has an on-field automated surface observing system (ASOS). According to the last 10 years of data retrieved from the ASOS weather station, VFR conditions have been in effect 99.7 percent of the time, IFR conditions have been in effect 0.2 percent of the time, and PVC conditions have been in effect 0.1 percent of the time. **Table 3B** summarizes the annualized meteorological conditions at SDL.

TABLE 3B | Meteorological Conditions

Condition	Criteria		SDL ASOS			
	Cloud Ceiling	Visibility	Time (minutes)	Percent	Observations	Percent
VFR	Greater than 1,000' and	Greater than 3 miles	5,204,209	99.7%	89,731	99.1%
IFR	Between 1,000' and 500' or	Between 1-3 miles	12,531	0.2%	723	0.8%
PVC	Less than 500' or	Less than 1 mile	1,200	0.1%	93	0.1%
Total:			5,217,940	100%	90,547	100%
ASOS = automated surface observing system			PVC = poor visibility conditions			
IFR = instrument flight rules			VFR = visual flight rules			

Source: ASOS data from January 1, 2015–December 31, 2024, Station ID: 72278903192

Instrument Approach Procedures

The instrument approach capabilities of a runway factor into the airfield capacity determination. The lower the cloud ceiling minimums and visibility minimums are, the more capable a runway will be, thus resulting in greater airfield capacity. While the airport has instrument approach capability, the approaches are required navigation performance (RNP) approaches, which require special aircraft equipment and special pilot training and limit the airport's capability. The visibility minimums of the RNP instrument approaches are between one and three miles.

Runway Use

Runway use is normally dictated by wind conditions. The direction of takeoffs and landings is generally determined by the speed and direction of wind. It is generally safest for aircraft to depart and land into the wind to avoid a crosswind or tailwind component during these operations. In addition, due to the busy airspace in the Phoenix region, aircraft flow can be dictated by air traffic control when winds are calm. The prevailing winds favor the use of Runway 21 approximately 60 percent of the time.

Exit Taxiways

Exit taxiways have a significant impact on airfield capacity because the number and locations of exits directly determine the occupancy time of an aircraft on the runway. Based on the aircraft mix using the airport, taxiways located between 2,000 and 4,000 feet from the landing threshold and separated by at least 750 feet are factored in the exit rating for the airfield. The greater the number of appropriately spaced taxiway exits, the lower the runway occupancy time for an aircraft will be, which contributes to a higher overall capacity for the airfield. Under this criterion, Runway 3 is credited with three exits and Runway 21 is credited with two. Two or more exits provide the greatest capacity relief within the capacity model.

Aircraft Mix

Aircraft mix refers to the speed, size, and flight characteristics of aircraft operating at the airport. As the mix of aircraft operating at an airport increases to include larger aircraft, airfield capacity begins to diminish due to larger separation distances that must be maintained between aircraft of different speeds and sizes.

Aircraft mix for the capacity analysis is defined by the FAA in terms of four aircraft classes, only three of which are reflected in the mix at SDL. Classes A and B consist of single- and multi-engine aircraft that weigh less than 12,500 pounds. Aircraft within these classifications are primarily associated with general aviation operations, but this classification also includes some air taxi aircraft. Class C consists of aircraft that weigh over 12,500 pounds but do not exceed 300,000 pounds. Class D aircraft are those over 300,000 pounds, which do not operate at the airport and are not included in the aircraft mix calculation.

For the capacity analysis, the percentage of Class C aircraft operating at the airport impacts the ASV, as these classes include the larger and faster aircraft in the operational mix. The existing and projected operational fleet mix was previously shown in Table 2NN, which showed that more activity by larger business jets and turboprops is anticipated. By the long-term planning period, activity by aircraft that weigh more than 12,500 pounds is estimated to represent 36.4 percent of overall operations. In the capacity model, capacity begins to be constrained when operations by aircraft in Class C exceed 20 percent. **Table 3C** summarizes the aircraft operational fleet mix as classified for the capacity model.

TABLE 3C | Aircraft Operational Fleet Mix

Weather	Term	A & B ¹	C ²
VFR (Visual)	Existing	69.6%	30.4%
VFR (Visual)	Short Term	68.4%	31.6%
VFR (Visual)	Intermediate Term	66.8%	33.2%
VFR (Visual)	Long Term	63.6%	36.4%
IFR (Instrument)	Existing/Future	30.0%	70.0%

¹A & B = 12,500 pounds or less (Includes helicopters)

²C = 12,500 to 300,000 pounds

Source: FAA AC 150/5060, Airport Capacity and Delay

Demand Characteristics

Operations—not only the total number of annual operations, but also the way in which they are conducted—have an influence on airfield capacity. Peak operational periods, touch-and-go operations, and the percentage of arrivals have an impact on the number of annual operations that can be conducted at the airport.

Peak Period Operations

For the airfield capacity analysis, average daily operations during the peak month are determined based on airport traffic control tower (ATCT) data. Typical operational activity is important in the calculation of an airport's ASV, as peak demand levels occur sporadically. The peak periods used in the capacity analysis are representative of normal operational activity and can be exceeded at various times throughout the year. The design day of 521 operations is utilized for 2024. By 2044, the design day is estimated at 943 operations.

Touch-and-Go Operations

A touch-and-go operation involves an aircraft making a landing and then an immediate takeoff without coming to a full stop or exiting the runway. Touch-and-go activity is counted as two operations, as both an arrival and a departure are involved. A high percentage of touch-and-go traffic normally results in a higher operational capacity because one landing and one takeoff occur within a shorter time period than individual operations. These operations are normally associated with general aviation training operations and are included in local operations data. Touch-and-go operations at the airport have historically averaged approximately 32 percent of small general aviation operations.

Percent Arrivals

Under most circumstances, a lower percentage of arrivals correlates to a higher capacity. Except in unique circumstances, the aircraft arrival/departure split is typically 50/50.

ESTIMATION OF ANNUAL SERVICE VOLUME

The preceding information was used in conjunction with the airfield capacity methodology developed by the FAA to determine airfield capacity for SDL.

Table 3D shows the calculation of the ASV, which is $C \times D \times H$. Following this formula, the current airfield capacity is estimated at 216,800 annual operations. With the increase of operations projected over time and the increasing number of operations by larger aircraft (requiring greater separation distances on landing), the ultimate ASV is estimated at 187,200 annual operations.

TABLE 3D | Annual Service Volume Calculation

ASV Calculation Input	2024	Short Term	Intermediate Term	Long Term
C = Weighted hourly capacity	88	86	85	83
D = Ratio of annual demand to average daily demand during the peak month	166,588 annual operations / 521 design day operations = 320	191,349 annual operations / 620 design day operations = 309	219,752 annual operations / 712 design day operations = 309	291,059 annual operations / 943 design day operations = 309
H = Ratio of average daily demand to peak hour demand during the peak month	521 design day operations / 68 design hour operations = 7.7	620 design day operations / 85 design hour operations = 7.3	712 design day operations / 98 design hour operations = 7.3	943 design day operations / 129 design hour operations = 7.3
Annual Service Volume = C x D x H	216,800	194,000	191,700	187,200

Note: ASV is rounded to nearest 1,000 and C/D/H ratios have fractions.

Delay

As the number of aircraft operations approaches the airfield's capacity, increasing amounts of delay begin to occur for arriving and departing aircraft in all-weather conditions. Arriving aircraft delays result in aircraft holding outside the airport traffic area, while departing aircraft delays result in aircraft holding at the runway end until they can safely take off.

Total annual delay at the airport is currently estimated at 1,166 hours (0.42 minutes per aircraft) (reference Figure 2.2, FAA AC 150/5060-5). If no capacity improvements are made, total annual delay can be expected to reach 39,778 hours (8.2 minutes per aircraft) by the long-term planning horizon. At times, delays five to 10 times the average could be experienced by individual aircraft.

Conclusion

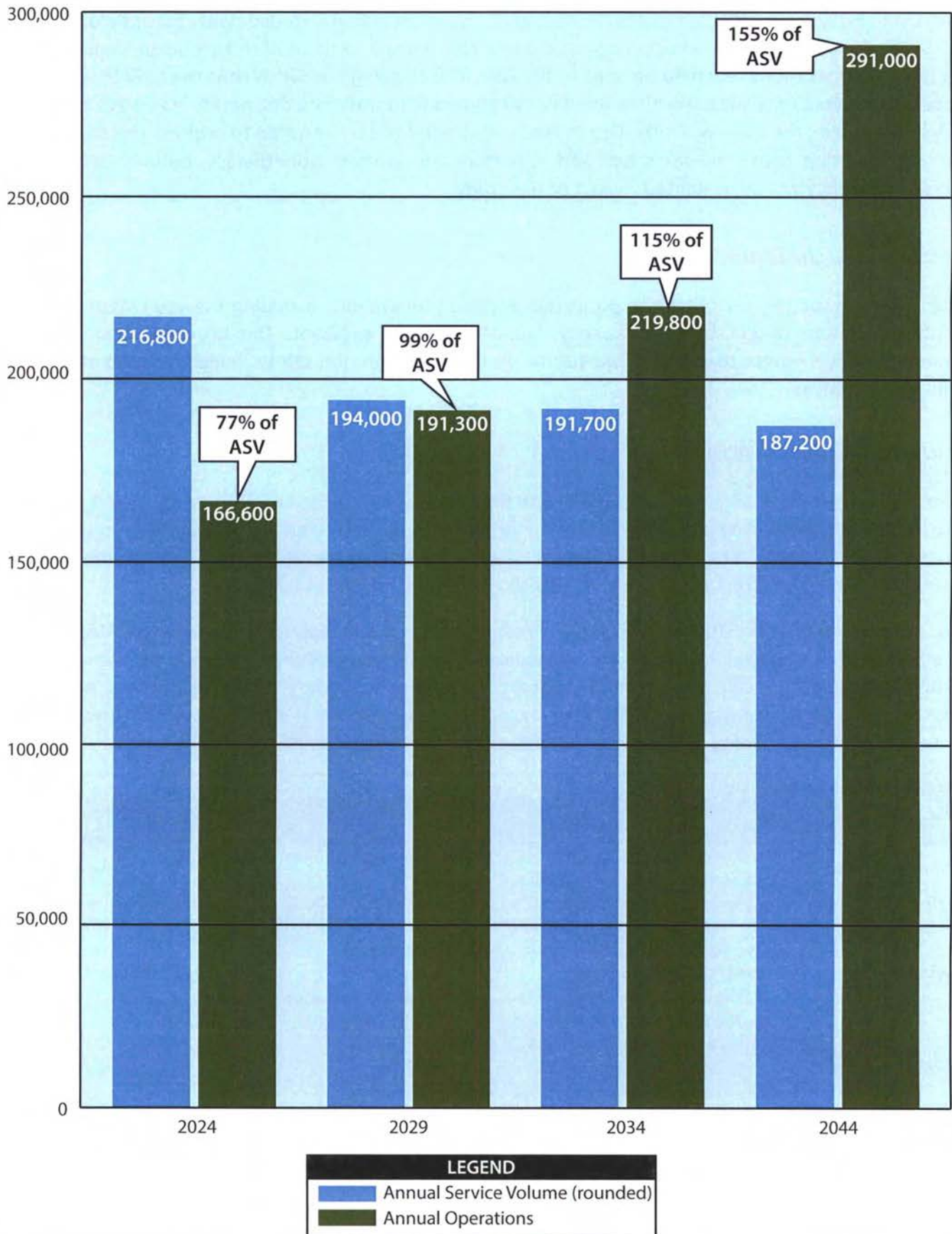
Table 3E provides a comparison of the ASV at the operational levels for each planning horizon. The current level of operations represents 77 percent of the ASV. In 20 years, the percentage is projected to reach 155 percent of the ASV. As shown in the table, the ASV will decline over time as a greater number of aircraft over 12,500 pounds utilize the airport. These aircraft require greater separation distances, thus reducing capacity.

TABLE 3E | Annual Service Volume Summary

	Annual Operations (rounded)	Weighted Hourly Capacity	Annual Service Volume (rounded)	Percent of Capacity
EXISTING CONFIGURATION				
Existing	166,600	88	216,800	77%
Short Term	191,300	86	194,000	99%
Intermediate Term	219,800	85	191,700	115%
Long Term	291,000	83	187,200	155%

Source: Coffman Associates analysis using FAA AC 150/5060-5, Airport Capacity and Delay

The capacity analysis shows how delays will increase exponentially as the number of operations approaches the ASV. The ASV is not an absolute maximum the runway can accommodate but represents the approximate number of operations that can occur before delay becomes significant. **Exhibit 3B** graphically shows the comparison of the ASV to projected operations.



FAA Order 5090.5, *Formulation of the NPIAS and ACIP*, indicates that improvements for airfield capacity purposes should be considered when operations reach 60 percent of the ASV and should be implemented by the time operations reach 80 percent of the ASV. The challenge at SDL is that the airfield geometry (pavement layout) already maximizes the ASV calculation with taxiway exits, parallel taxiways, and hold bays. Ultimately, the FAA Air Traffic Organization may need to be consulted to address the delay issue by implementing restrictive approach and departure procedures. Nonetheless, options to improve airfield efficiency will be evaluated as part of this study.

AIRSIDE REQUIREMENTS

The following section examines the projected airside requirements, including runway length, runway width, pavement weight bearing capacity, line-of-sight, and gradient. The taxiway system will be examined with respect to current and future design standards for safety, including separation and wingtip clearances.

RUNWAY CONFIGURATION

Scottsdale Airport is a single-runway airfield with the runway oriented in a northeast/southwest manner. For the operational safety and efficiency of an airport, it is desirable for the runway to be oriented as close as possible to the direction of the prevailing winds, which reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off.

According to FAA Order 5100.38D, *Airport Improvement Handbook*, only one runway at a NPIAS airport is eligible for ongoing maintenance and rehabilitation funding unless the FAA Airports District Office (ADO) has made a specific determination that a crosswind or secondary runway is justified. A runway that is not a primary runway, crosswind runway, or secondary runway is an *additional* runway, which is not eligible for FAA funding. **Table 3F** presents the eligibility requirements for runway types.

TABLE 3F | Runway Eligibility

For the following runway type...	Must meet all of the following criteria...	And is...
Primary Runway	1. A single runway at an airport is eligible for development consistent with FAA design and engineering standards.	Eligible
Crosswind Runway	1. The wind coverage on the primary runway is less than 95%.	Eligible if justified
Secondary Runway	1. There is more than one runway at the airport. 2. The non-primary runway is not a crosswind runway. 3. Either of the following: a. The primary runway is operating at 60% or more of its annual capacity. b. The FAA has made a specific determination that the runway is required.	Eligible if justified
Additional Runway	1. There is more than one runway at the airport. 2. The non-primary runway is not a crosswind runway. 3. The non-primary runway is not a secondary runway.	Ineligible

Source: FAA Order 5100.38D, *AIP Handbook*

FAA AC 150/5300-13B, *Airport Design*, recommends a crosswind runway when the primary runway orientation provides for less than 95 percent wind coverage for specific crosswind components. The 95 percent wind coverage is computed based on wind not exceeding a 10.5-knot (12 miles per hour [mph])

component for runway design code (RDC) A-I and B-I; 13-knot (15 mph) component for RDC A-II and B-II; 16-knot (18 mph) component for RDC A-III, B-III, C-I through C-III, and D-I through D-III; and 20 knots for wider wingspans.

It is preferable to analyze weather data local to the airport being studied. The ASOS weather sensor currently located at SDL is connected to the National Oceanic and Atmospheric Administration (NOAA), so the data are available for analysis.

According to FAA guidelines, the most recent 10 years of wind data should be analyzed to determine various facility requirements, including the appropriate runway configuration. **Exhibit 3C** shows wind rose analysis of 10 years of wind data from SDL. A wind rose is a graphic tool that gives a succinct view of how wind speed and direction are historically distributed at a location. The table at the top of the wind rose indicates the percent of wind coverage for the runway at specific wind intensity.

Runway 3-21 provides 99.3 percent wind coverage at 10.5 knots and 99.7 percent wind coverage at 13 knots. Because the runway provides greater than 95 percent total wind coverage, a crosswind runway is not justified.

DECLARED DISTANCES

Declared distances are used to define the effective runway length for landing and takeoff when a standard safety area cannot be achieved. The declared distances include the following:

- Takeoff run available (TORA) – the runway length declared available and suitable for the ground run of an aircraft taking off (factors in the positioning of the departure RPZ)
- Takeoff distance available (TODA) – the TORA plus the length of any remaining runway or clearway beyond the far end of the TORA; the full length of the TODA may need to be reduced because of obstacles in the departure area
- Accelerate-stop distance available (ASDA) – the runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff (factors in the length of RSA/ROFA beyond the runway end)
- Landing distance available (LDA) – the runway length declared available and suitable for landing an aircraft (factors in the length of RSA/ROFA beyond the runway end and the positioning of the approach RPZ)

At SDL, declared distances are currently in effect to achieve standard safety areas (described in the next section) and/or to eliminate penetrations to the departure surface. The existing declared distances are outlined in **Table 3G**.

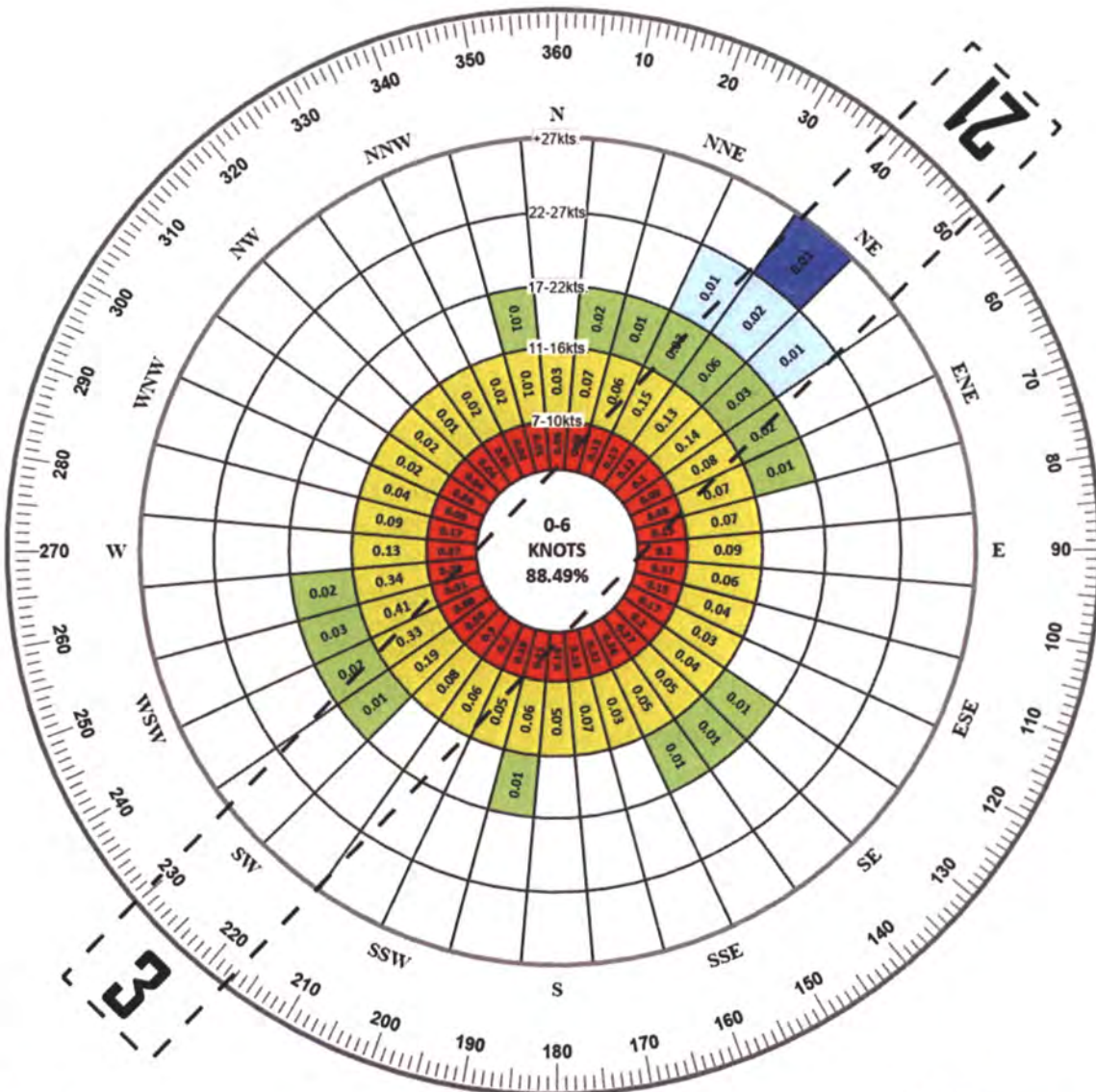
TABLE 3G | Current Declared Distances

Declared Distance Parameters	Current Declared Distances	
	Runway 3	Runway 21
TORA: Takeoff Run Available	8,249	8,249
TODA: Takeoff Distance Available	8,249	8,249
ASDA: Accelerate-Stop Distance Available	7,849	8,069
LDA: Landing Distance Available	7,110	7,669

Source: Coffman Associates analysis of FAA AC 150/5300-13B, Airport Design

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 3-21	99.27%	99.69%	99.93%	99.98%



Wind Speed Percentages

- 7 - 10 kts.
- 11 - 16 kts.
- 17 - 22 kts.
- 23 - 27 kts.
- + 27 kts.

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Scottsdale Airport
Scottsdale, Arizona, USA

OBSERVATIONS:
81,099 All Weather Observations
Jan. 1, 2016 - Dec. 31, 2025

The TORA and TODA do not involve consideration of the RSA beyond the runway ends. The ASDA and LDA must include the standard RSA beyond the ends of the runway. The standard RSA for Runway 3-21 extends 1,000 feet beyond the runway ends. The following describes how the declared distances are currently determined and applied at SDL.

Runway 3

- *TORA/TODA* | The full pavement length is 8,249 feet.
- *ASDA* | The ASDA is measured from the pavement end of Runway 3, extending 7,849 feet to a point on the runway that is 400 feet short of the Runway 21 pavement end. The end of the Runway 3 ASDA coincides with the location of the landing threshold for Runway 21. The end of the ASDA is declared 400 feet short of the pavement end to allow for the full 1,000-foot RSA beyond the runway end.
- *LDA* | The landing threshold to Runway 3 is displaced by 739 feet. The end of the Runway 3 LDA is 400 feet short of the Runway 21 pavement end, co-located with the Runway 21 landing threshold and the end of the Runway 3 ASDA. The end of the LDA is declared 400 feet short of the pavement end to allow for the full 1,000-foot RSA beyond the runway end. The LDA is 7,110 feet in length.

Runway 21

- *TORA/TODA* | The full pavement length is 8,249 feet.
- *ASDA* | The ASDA is measured from the pavement end of Runway 21, extending 8,069 feet to a point on the runway that is 180 feet short of the Runway 3 pavement end. The end of the ASDA is declared 180 feet short of the pavement end to allow for the full 1,000-foot RSA beyond the runway end.
- *LDA* | The landing threshold to Runway 21 is displaced by 400 feet. The end of the Runway 21 LDA is declared 180 feet short of the Runway 3 pavement end to allow for the full 1,000-foot RSA beyond the declared end of the runway. The LDA is 7,669 feet in length.

As part of this master plan, a new aerial survey of the airport has been undertaken. The data will be uploaded to the official FAA Airports Geographic Information System (AGIS) and the FAA Airport Data Information Portal (ADIP). This survey is developed following FAA protocol, and it will ultimately serve as the official survey data for the airport. It is not uncommon for the AGIS survey to improve upon past surveys of the airport and for certain elements to change, including the length of the runway. In subsequent chapters and on the airport layout plan, the new survey data will be applied to the current and future conditions of the airport. Where appropriate, adjustments to the current declared distances will be recommended.

MODIFICATION OF STANDARDS

FAA Order 5300.1G, *Modifications to Agency Airport Design, Construction, and Equipment Standards*, establishes the process for the initiation, revision, coordination, and management of Modifications of

Standards (MOS) applicable to airport design, construction, and equipment projects. An MOS is any deviation from or addition to standards that is applicable to airport design, material, and construction standards or equipment projects resulting in an acceptable level of safety, useful life, lower costs, greater efficiency, or the need to accommodate an unusual local condition on a specific project through approval on a case-by-case basis.

An MOS cannot be issued for RSA dimensions. Instead, the FAA's Regional Airports Division Manager will evaluate RSAs and issue a determination in accordance with FAA Order 5200.8, *Runway Safety Area Program*.

During the development process of the 2015 airport master plan, it was recommended that the airport and the FAA consider four MOS. Following extensive review, the following three MOS were approved by the FAA on January 3, 2019:

1. SDL-MOS1: Runway Object Free Area – Width and Length Beyond Runway
 - Establishes a ROFA that is 630 feet wide, 470 feet beyond the Runway 3 end and 500 feet beyond the Runway 21 end
2. SDL-MOS3: Runway Centerline to Parallel Taxiway Centerline
 - Establishes that the existing runway to parallel taxiway separation of 250 feet provides an acceptable level of safety
3. SDL-MOS4: Runway Centerline to Aircraft Parking
 - Establishes that aircraft parking can begin 325 feet from the runway centerline

In 2023, FAA published "Engineering Policy Memo 23-01: Sponsor Status Updates for an Existing Approved Modification of Standards". This policy memo replaced the requirement for Sponsors to resubmit MOS forms every five years with a requirement to provide a status update utilizing the online Airport Data and Information Portal (ADIP). In April 2025, airport management submitted the MOS status update into the ADIP for the three previously approved MOS.

It should be noted that SDL-MOS4, which addressed the runway centerline to aircraft parking area standard, may no longer applicable because the design standards have changed. There is no longer a specific standard distance from the runway centerline to aircraft parking area. Instead, aircraft parking areas must be clear of all object clearing surfaces on an airport and the aircraft parking areas at SDL meet this new standard; therefore, only MOS1 and MOS3 address existing non-standard conditions. The reason for these two MOS will be discussed in this chapter and opportunities to achieve the design standard will be examined again in the alternatives chapter of this airport master plan.

RUNWAY DESIGN STANDARDS

The FAA has established several imaginary surfaces to protect aircraft operational areas and keep them free from obstructions that could affect their safe operation. These include the runway safety area (RSA), runway object free area (ROFA), runway obstacle free zone (OFZ), and runway protection zone (RPZ).

The RSA and OFZ areas must be owned by the airport, be maintained free of obstacles, and be readily accessible by maintenance and emergency personnel. If either of these two runway protection surfaces

cannot meet the FAA standard, other options must be considered, including shortening runways. The ROFA should be under the ownership of the airport. Under certain special conditions that are approved by the FAA, some ROFA deficiencies may be permissible.

The RPZs are not required to be under airport ownership, but it is strongly recommended by the FAA. An alternative to outright ownership of the RPZs is the purchase of aviation easements (acquiring control of designated airspace within the RPZ) or having land use control measures in place (i.e., zoning) to ensure the RPZ remains free of incompatible development.

Dimensional standards for the various safety areas associated with the runways are a function of the type of critical aircraft, as well as the instrument approach visibility minimums. The FAA has approved a D-II critical aircraft in its forecast approval letter, which is dated August 28, 2025 (see **Appendix B**). Runway 3-21 should meet the design standards for RDC D-II-5000. **Table 3H** presents the runway design standards applicable to the runway. **Exhibit 3D** presents the existing RSA, ROFA, OFZ, and RPZs, as well as the declared distances.

TABLE 3H | Runway Design Standards

AIRPORT DATA		Runway 3-21 Design Standard/Actual	
Airport Critical Aircraft		D-II-2B	
Runway Design Code		D-II-5000	
Visibility Minimums		1-mile	
RUNWAY DESIGN			
Runway Width		100	
Runway Shoulder Width		20/12	
Blast Pad Length/Width (if provided)		150 x 120	
RUNWAY PROTECTION			
Runway Safety Area (RSA)			
Width		500/400 ¹	
Length Beyond Departure End		1,000	
Length Prior to Threshold		600	
Runway Object Free Area (ROFA)			
Width		800/630 ²	
Length Beyond Departure End		1,000/470 Runway 3 ²	1,000/500 Runway 21 ²
Length Prior to Threshold		600	
Runway Obstacle Free Zone (OFZ)			
Width		400	
Length Beyond End		200	
Approach Runway Protection Zone (RPZ)		Runway 3	Runway 21
Length		1,700	1,700
Inner Width		500	500
Outer Width		1,010	1,010
Departure Runway Protection Zone (RPZ)		Runway 3	Runway 21
Length		1,700	1,700
Inner Width		500	500
Outer Width		1,010	1,010
RUNWAY SEPARATION			
Runway Centerline to:			
Holding Position		250/ (152)	
Parallel Taxiway		300/ (250 ²)	
Note: All dimensions are in feet. Values in () are actuals.			
¹ When the standard RSA width of 500 feet is not practical, an RSA width of 400 feet is permissible.			
² Actual dimensions are based on FAA-approved Modification of Standards.			

Source: FAA AC 150/5300-13B, Airport Design

As documented in Chapter Two, SDL experiences more than 500 annual operations by aircraft in the D-III category; therefore, these aircraft were identified as the operational critical aircraft. The FAA approved a critical aircraft in the D-II category because, during development of the previous master plan, the FAA agreed it would be impracticable to meet all design standards associated with D-III and issued MOS in relation to those design standards.

Four primary design elements are different between D-II and D-III standards. The differing design elements are summarized in **Table 3J**.

TABLE 3J | Design Standard Differences

Design Element	Runway Design Standards		Currently Available
	D-III-5000 ¹	D-II-5000 ²	D-II-5000
Runway to Taxiway Separation	400'	300'	250' ³
Holding Position	266'	250'	152'
Runway Safety Area Width	500'	400'	400'
Blast Pad Length & Width	200' x 140'	150' x 120'	150' x 120'

¹Operational critical aircraft

²FAA-approved critical aircraft (August 28, 2025)

³FAA Modification of Standards (approved on January 3, 2019)

Source: FAA AC 150/5300-13B, *Airport Design*

Runway Safety Area (RSA)

The RSA is defined in FAA AC 150/5300-13B, *Airport Design*, as a “surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of undershoot, overshoot, or excursion from the runway.” The RSA is centered on the runway and dimensioned in accordance with the approach speed of the critical aircraft using the runway. The FAA requires the RSA to be cleared and graded, drained by grading or storm sewers, capable of accommodating the design aircraft and fire and rescue vehicles, and free of obstacles not fixed by navigational purpose.

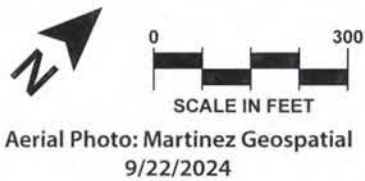
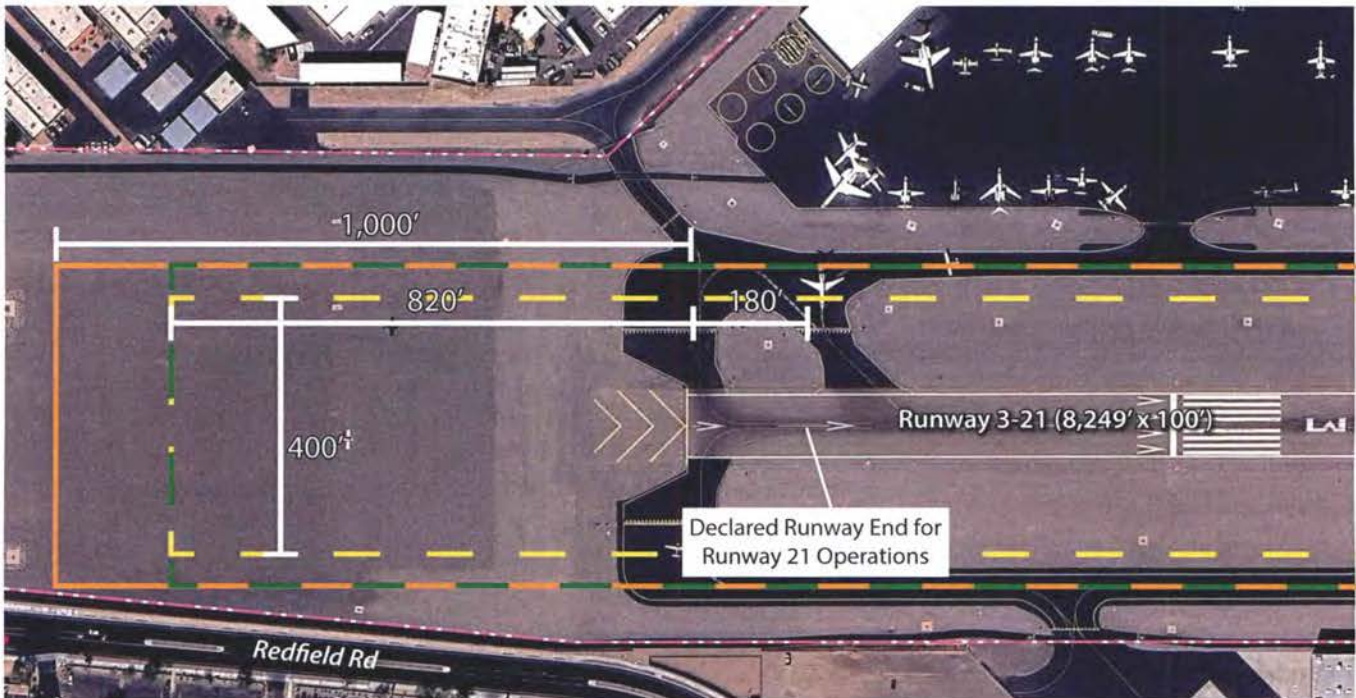
The traditional RSA dimensions for a D-II runway are 500 feet wide, centered on the runway, and extend 1,000 feet beyond the far end of the runway. Prior to landing, 600 feet of RSA is the standard. Behind the Runway 3 end, the standard RSA can be accommodated and there are no penetrations. Behind Runway 21, the standard RSA is penetrated by the perimeter service road, perimeter fence, East Frank Lloyd Wright Boulevard, and the Central Arizona Project Canal. **Exhibit 3E** shows details of the RSA as it extends 1,000 feet beyond the runway pavement ends.

Because the RSA is a required element for a runway, it is necessary to take mitigating steps to provide for the 1,000-foot RSA. According to FAA Order 5200.8, *Runway Safety Area Program*, the following mitigating alternatives can be considered:

1. Provide the standard traditional graded area surrounding the runway
 - At SDL, this would be impossible because of the existing penetrations to the RSA.
2. Reduce runway length where the existing runway length exceeds what is required for the existing critical aircraft



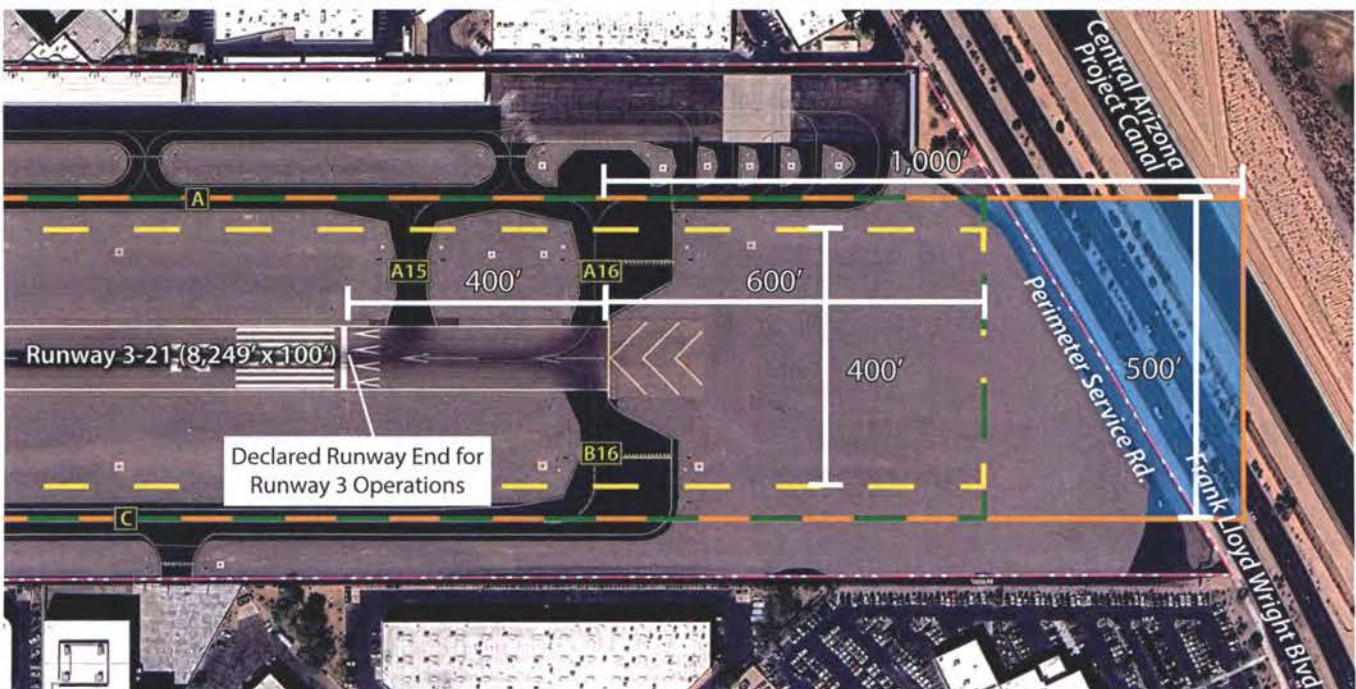
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KEY
RSA - Runway Safety Area

LEGEND

- Airport Property Line
- A Taxiway Designation
- Current 400'-Wide RSA with Declared Distances
- RSA Based on Runway Pavement End
- RSA Based on Declared Distances
- RSA Penetrations Without Declared Distances and MOS



- At SDL, more runway length is needed, not less, to accommodate the critical aircraft, which is the family of large business jets (see the *Runway Length* section).
- 3. A combination of runway relocation, shifting, grading, realignment, or reduction
 - Due to the constrained runway environment at SDL, this option is not feasible.
- 4. Implement declared distances
 - This is the option currently implemented at SDL (see the *Declared Distances* section).
- 5. Install an Engineered Materials Arresting System (EMAS) beyond the runway ends
 - EMAS is a crushable concrete that provides an acceptable level of RSA safety protection beyond the runway ends when in a constrained RSA environment. A standard EMAS bed requires an area of 600 feet beyond the runway end.

At SDL, declared distances are implemented to provide for the required RSA that extends 1,000-feet beyond the runway end. To do this, the end of runway is declared to be 400 feet short of the Runway 21 threshold. Pilots utilize this adjusted runway length when calculating available runway length for arrivals and departures using Runway 3. Even with the declared runway end, a corner of the RSA still crossed the perimeter service road on the northwest end.

According to FAA AC 150/5300-13B, *Airport Design*, “when an RSA width of 500 feet is not practical, an RSA width of 400 feet is permissible.” Historically, SDL has maintained a 400-foot-wide RSA. One of the reasons a 400-foot RSA is used is to mitigate the north corner RSA penetration by the perimeter service road. In 2023, the airport rerouted the perimeter service road slightly so that the 400-foot-wide RSA is completely clear.

A second reason for applying the 400-foot-wide RSA is that both parallel taxiways are 250 feet from the runway, centerline to centerline. A 500-foot-wide RSA would extend to the center of both parallel taxiways, creating a runway incursion anytime an aircraft is taxiing on one of the parallel taxiways. As a result, the permissible 400-foot-wide RSA is applied at SDL and an RSA that meets the width and length standard is provided in conjunction with declared distances.

The declared distances also affect the RSA behind the Runway 3 end. The RSA beyond the runway end for arrivals and departures on Runway 21 is declared to begin 180 feet before the Runway 3 pavement end; therefore, the RSA extends 820 feet from the pavement end. The use of declared distances provides for an RSA that fully meets the design standard for length and width.

Through the implementation of declared distances and the application of the FAA-permissible 400-foot-wide RSA, the current RSA meets design standards and should be maintained.

Runway Object Free Area (ROFA)

The ROFA is “a two-dimensional ground area surrounding runways which is clear of object penetrations except for objects whose location is fixed by function (i.e., airfield lighting, signs, etc.).” The ROFA does not have to be graded and level like the RSA; instead, the primary requirement for the ROFA is that no

object in the ROFA penetrates the lateral elevation of the RSA. The runway ROFA is centered on the runway and extends out in accordance with the critical aircraft design category utilizing the runway.

According to FAA AC 150/5300-13B, *Airport Design*, the principal purpose of the ROFA is to ensure:

- A development buffer in proximity to a runway, and
- Wing clearance for a runway excursion event to the outer limit of the RSA.

The standard ROFA is 800 feet wide and extends 1,000 feet beyond the runway ends and it typically ends in the same location as the RSA. **Exhibit 3F** shows the standard ROFA, which is penetrated on the north end by the perimeter service road, the perimeter fence, a blast fence, Frank Lloyd Wright Boulevard, and the Central Arizona Project Canal. On the south end, it is penetrated by the perimeter service road, the property fence, and Redfield Road. The ROFA is also penetrated on the east side by numerous hangars and buildings, including the airport traffic control tower (ATCT).

For the ROFA to be clear of object penetrations and still meet the safety intent, the length behind Runway 21 is limited to 470 feet from the pavement end. Behind the Runway 3 end, the ROFA length is limited to 30 feet due to the angle of the perimeter fence and Redfield Road.

With the existing application of declared distances, the ROFA would extend 600 feet behind the Runway 21 pavement end (the same as the RSA); however, it would still be penetrated by the perimeter service road, the perimeter fence, a blast fence, and Frank Lloyd Wright Boulevard. On the south end, the ROFA would still be penetrated by the same obstructions.

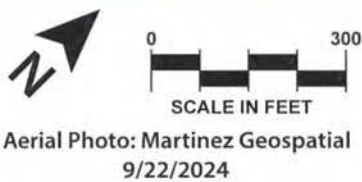
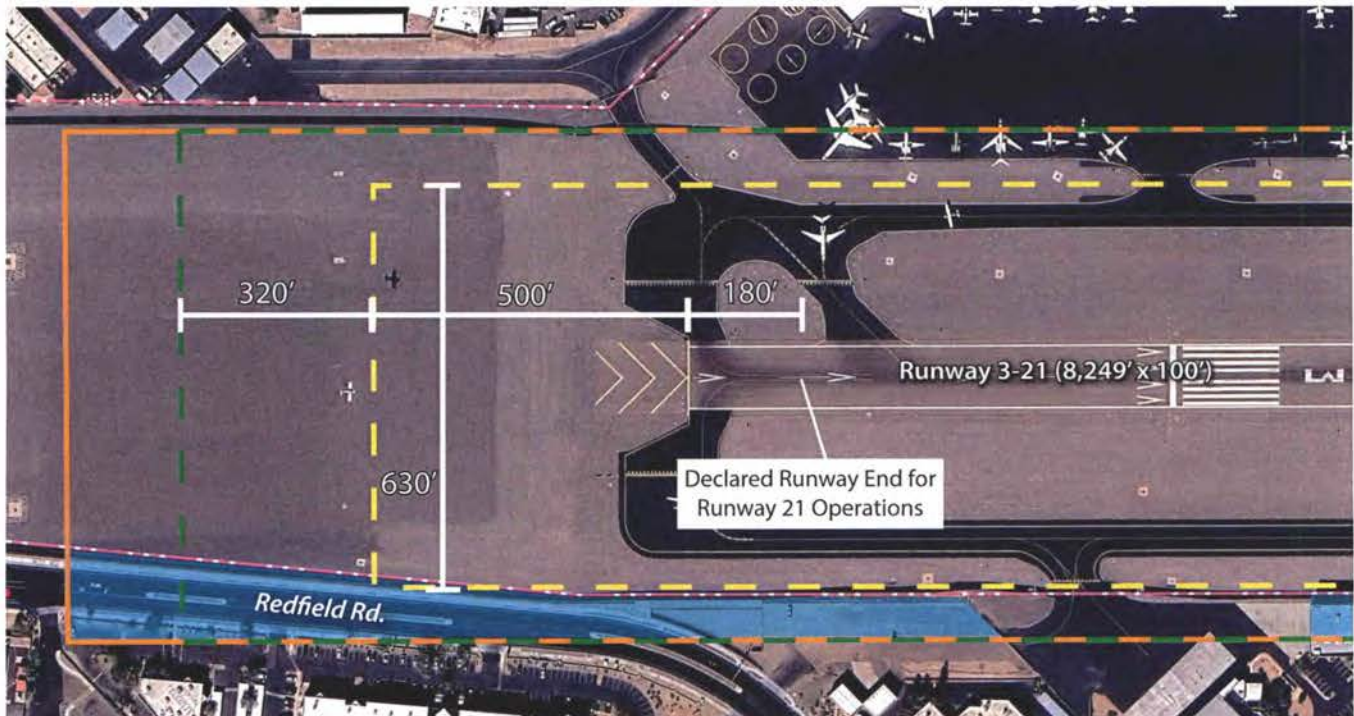
This same condition existed during the development of the previous master plan in 2015. An extensive alternatives analysis was undertaken to identify an acceptable level of safety for the ROFA. The FAA approved an MOS for the ROFA, in which the ROFA dimensions are as follows:

- 630 feet wide – 315 feet to both sides of the runway
- 470 feet beyond the Runway 3 end – behind Runway 21
- 500 feet beyond the Runway 21 end – behind Runway 3

The alternatives chapter of this master plan will reexamine opportunities to provide the standard ROFA or incrementally improve on the approved MOS dimensions for the ROFA.

Runway Obstacle Free Zone (ROFZ)

The ROFZ is an imaginary surface that precludes object penetration, including taxiing and parked aircraft. The only allowance for ROFZ obstructions is for navigational aids mounted on frangible bases, which are fixed in their locations by function (such as airfield signs). The ROFZ is established to ensure the safety of aircraft operations. If the ROFZ is obstructed, the airport's approaches could be removed or its approach minimums could be increased. The base elevation of the ROFZ is the same as the highest runway elevation at that particular location.



KEY
ROFA - Runway Object Free Area

LEGEND	
	Airport Property Line
	Taxiway Designation
	Current ROFA - FAA-Approved Modification of Standards
	ROFA Based on Runway Pavement Ends
	ROFA Based on Declared Distances
	ROFA Penetrations Without Declared Distances and MOS



The ROFZ is 400 feet wide, centered on the runway, and extends 200 feet beyond the physical runway ends. The presence of declared distances or displaced landing thresholds does not impact the ROFZ. The hold line markings are 152 feet from the runway centerline; therefore, any aircraft at a runway hold line are within the ROFZ because the ROFZ extends 200 feet from the runway centerline. In addition, the wing of any aircraft with a wingspan greater than 100 feet would penetrate the ROFZ while taxiing on either Taxiway A or B; however, the protected area for takeoff and landings is defined by the location of the hold lines, so holding and taxiing aircraft would not be considered incursions by the SDL ATCT.

Runway Protection Zone (RPZ)

The RPZ is a trapezoidal area centered on the runway, typically beginning 200 feet beyond the runway end. When an RPZ begins at a location other than 200 feet beyond the end of a runway, two RPZs are required (i.e., a departure RPZ and an approach RPZ). The RPZ has been established by the FAA to provide an area that is clear of obstructions and incompatible land uses to enhance the protection of people and property on the ground.

On September 16, 2022, the FAA published AC 150/5190-4B, *Airport Land Use Compatibility Planning*. This AC represented a significant effort to address RPZ land use compatibility. Airport-compatible land uses are those that can coexist with a nearby airport without constraining the safe and efficient operations of the airport. Assuring compatible land uses within the RPZ is best achieved through one of the following methods:

1. Airport ownership of the RPZ property
2. Possessing sufficient interest in the RPZ property through easements, deed restrictions, etc.
3. Possessing sufficient land use control authority to regulate land use in the jurisdiction containing the RPZ
4. Possessing and exercising the power of eminent domain over the RPZ property
5. Possessing and exercising permitting authority over proponents of development within the RPZ

Expectations of Airport Sponsors

The FAA requires all federally obligated airport sponsors to comply with FAA grant assurances. These include (but are not limited to) FAA Grant Assurance 21, *Compatible Land Use*. Sponsors should take appropriate measures to protect against, remove, or mitigate land uses that introduce incompatible development within RPZs. For projects proposed by the sponsor (such as runway extensions or new runways) that would result in moving the RPZ into an area that has incompatible land uses, the FAA expects the sponsor to have or secure sufficient control of the RPZ, ideally through fee simple ownership, including any off-airport property within the RPZ.

Existing Incompatible Land Uses

The FAA expects airport sponsors to seek all possible opportunities to eliminate, reduce, or mitigate existing incompatible land uses. Examples may include land acquisition, land exchanges, right-of-first-

refusal to purchase, agreements with property owners on land uses, easements, or other such measures. The FAA also expects sponsors to actively consider and evaluate available options any time there is an ALP update or master plan update, and to be vigilant for any other opportunities that may arise from time to time (especially opportunities to purchase land) to eliminate or minimize existing incompatibilities. The FAA expects airport sponsors to document their efforts to demonstrate that they are complying with the relevant FAA Grant Assurances. **Table 3K** summarizes FAA expectations regarding existing incompatible land uses within an RPZ.

TABLE 3K | Expectations of Airport Sponsors – Existing Incompatible Land Uses

Type of Land Use Control	Expectations of Airport Sponsors
The airport sponsor owns the land	Because the sponsor has total land use control, the FAA considers it a reasonable expectation that the sponsor will establish and enforce the necessary zoning controls or lease terms to enable the sponsor to address existing incompatible land uses when the opportunity arises.
The property is off-airport but the sponsor has land use authority, or the local jurisdiction and land use regulatory authority is owned by the same governing body	Because the sponsor has at least some influence over land use control, the FAA considers it a reasonable expectation that the sponsor will seek to establish the necessary zoning controls to enable the sponsor to address existing incompatible land uses when the opportunity arises. Although the sponsor has no land use control, the FAA still considers it a reasonable expectation that the sponsor will actively seek opportunities to establish the necessary zoning controls to enable the sponsor to address existing incompatible land uses when the opportunity arises.
The sponsor has no land use control (i.e., RPZ land falls in another jurisdiction)	The FAA will consider providing financial assistance to public-sector airport sponsors for land acquisition even if the airport sponsor has no land use control, but only if the sponsor demonstrates that the airport sponsor is taking all appropriate steps available to enhance control and mitigate existing risks.

Source: FAA AC 150/5190-4B, Airport Land Use Compatibility Planning

Proposed Incompatible Land Uses

The FAA expects the airport sponsor to take active steps to prevent or mitigate proposed incompatible land uses; actively seek opportunities to prevent or mitigate risks associated with proposed incompatible land uses within the RPZ; and secure control of land within the RPZ if a sponsor-initiated project results in incompatible land use within the newly defined RPZ. These actions are expected of the airport sponsor, regardless of the funding source(s) involved. Sponsors should actively monitor conditions and publicly object to proposed incompatible land uses and should make it a high priority (financially or otherwise) to acquire land or otherwise establish land use controls that prevent incompatible uses. The FAA expects an airport sponsor to document its efforts so the sponsor can demonstrate that the airport is complying with its grant assurances. **Table 3L** summarizes FAA expectations regarding proposals for introducing new incompatible land uses within an RPZ.

Potential new incompatible land uses within an RPZ might be caused by one or more circumstances. Some of these circumstances may result from airport sponsor-proposed projects, including (but not limited to) one of the following:

- An airfield project (e.g., runway extension, runway shift)

- A change in the critical design aircraft that increases the RPZ dimensions
- A new or revised instrument approach procedure that increases the size of the RPZ
- A local development proposal in the RPZ (either new or reconfigured), which can include roadway construction, relocation, or improvements

TABLE 3L | Expectations of Airport Sponsors - New Incompatible Land Uses

Type of Land Use Control	Expectations of Airport Sponsors
The airport sponsor owns the land	Because the sponsor has total land use control, the FAA expects that the sponsor will establish all necessary protections to prevent new incompatible land uses.
The property is off-airport but the sponsor has land use authority or the local jurisdiction and land use regulatory authority is owned by the same governing body	The FAA expects the sponsor to take all appropriate steps available to establish and exercise zoning controls necessary to prevent any new incompatible land uses. The FAA recognizes that the standard of “appropriate action, to the extent reasonable” does not mean, in this case, that the sponsor can always prevail; rather, the FAA expects the sponsor to demonstrate and document a reasonable effort.
The sponsor has no land use control (i.e., RPZ land falls within another jurisdiction)	Although the sponsor has no land use control, the FAA still expects the sponsor to actively pursue and consider all possible steps to secure land necessary to prevent any new incompatible land uses. The FAA recognizes that the standard of “appropriate action, to the extent reasonable” may not succeed. Even so, the FAA expects the sponsor to demonstrate and document a reasonable effort. The FAA expects the airport sponsor to adopt a strong public stance to oppose incompatible land uses and communicate the purpose of the RPZ and associated risks to the proponent, and to actively consider measures such as land acquisition, land exchanges, right-of-first-refusal to purchase, agreements with property owners regarding land uses, or other such measures.

Source: FAA AC 150/5190-4B, *Airport Land Use Compatibility Planning*

The FAA has higher expectations for the airport sponsor to mitigate potential incompatible land uses within the RPZs when the introduction of the incompatible land use is the result of an airport sponsor-initiated project (regardless of the funding source). The sponsor should submit an alternatives evaluation to the FAA unless the land use is permissible. These are the permissible land uses that require no further evaluation:

- Farming that meets airport design clearance standards in FAA AC 150/5300-13 and guidance as outlined in AC 150/5200-33
- Irrigation channels that meet the standards of AC 150/5200-33 and FAA/USDA manual, *Wildlife Hazard Management at Airports*
- Airport service roads, as long as they are not public roads and are directly controlled by the airport operator
- Underground facilities, as long as they meet other design criteria (such as RSA standards), as applicable

- Navigational aids (NAVAIDs) and aviation facilities, such as equipment for airport facilities that are considered fixed by function in regard to the RPZ
- Aboveground fuel tanks associated with backup generators for unstaffed NAVAIDs

At SDL, there are some existing incompatible land uses within the RPZs, such as public roads. The airport staff should remain engaged with city transportation planning staff and advocate for any proposed roadway alterations that would improve the land use compatibility of the RPZs. While it is not the responsibility of the airport to propose such changes, the airport should be engaged when these opportunities arise.

Runway/Taxiway Separation

The design standard for the separation between runways and parallel taxiways is determined by the runway design code (RDC). The FAA-approved RDC for Runway 3-21 is D-II-5000, which has a separation standard of 300 feet from the centerline of the runway to the centerline of a parallel taxiway. Parallel Taxiways A and B are both 250 feet from the runway.

During the 2015 master plan, extensive analysis was undertaken to determine the feasibility of relocating one or both parallel taxiways to 300 feet. It was determined that such a shift would have a significant and negative impact on airport operations, as well as a significant impact on numerous hangars, buildings, and private property interests. As a result, a Modification of Standards (SDL-MOS3) was approved by the FAA on January 3, 2019.

The MOS supporting the existing runway-to-taxiway separation states the following:

"Allowing parallel Taxiways A and B to remain in their existing locations at 250 feet from the Runway 3-21 centerline provides for an acceptable level of safety on the airfield, as the design standards for Runway Safety Area (RSA) and Runway Obstacle Free Zone (ROFZ) are met under the existing airfield configuration. Furthermore, the current locations of the parallel taxiways provide for the appropriate TOFA of 131 feet (since changed to 124 feet) and TSA of 79 feet for Airplane Design Group (ADG) II aircraft. The 250-foot runway centerline to taxiway centerline distance would provide for 171 feet of wingtip clearance of ADG II aircraft simultaneously operating on Runway 3-21 and either parallel taxiway."

The runway-to-taxiway separation will be reexamined in the alternatives chapter of this master plan.

Hold Line Separation

The distance that aircraft hold lines should be marked on taxiways is a function of the RDC. The standard for the applicable RDC of D-II-2B is 250 feet from the runway centerline. Currently, the hold lines for Runway 3-21 are 152 feet from the runway centerline. Because the parallel taxiways are 250 feet from the runway centerline, it would be impossible to place hold lines on the centerlines of the parallel taxiways; doing so would lead to significant congestion every time an aircraft was holding because the aircraft would block the taxiway.

A Safety Risk Management Document (SRMD) was undertaken between 2010 and 2013 to address the impacts to safety if the hold position markings were relocated from the current 152 feet from the runway centerline to somewhere between 200 and 250 feet from the runway centerline. The panel included active participation from representatives of SDL Airport Management Staff, AWP Office of Runway Safety, AWP ADO, SDL ATCT, Phoenix TRACON, AZD Safety Assurance Staff, Aircraft Owners and Pilots Association, AZD Operations Support (Procedures) Staff, Western Service Area Quality Control Group (AJV-W11), NATCA, Flight Standards, SDL FBOs, and the NBAA. Over the course of several meetings, it was concluded that a hold line change could not be introduced into the National Airspace System (NAS) with an acceptable level of risk, as defined in the FAA Safety Management System (SMS) Manual.

The SRMD states: “Based on the safety analysis conducted by the Safety Risk Management Panel (SRMP), combined with the recorded results from the Tower Simulation System (TSS), some of the air traffic control (ATC) procedures that would be required in support of the hold line relocation change cannot currently be introduced into the National Airspace System (NAS) with an acceptable level of risk, as defined in the FAA Safety Management System (SMS) manual.” The SRMD identified nine risk hazards associated with relocating hold lines. Four of the hazards were initially considered high-risk and two of the four hazards could not be sufficiently mitigated. The seven remaining risk hazards could be mitigated; therefore, the holding position markings remain at a distance of 152 feet from the runway centerline.

Operationally, the holding position markings define the runway environment for control tower personnel at SDL; therefore, if an aircraft were to fail to hold at the holding position when instructed and enter the runway environment, that action would be reported as a runway incursion. A runway incursion is defined as “any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft.” While the RSA typically defines the lateral limits of the protected area of a surface designated for the landing and takeoff, the hold position markings operationally define the lateral limits of the protected area.

The locations of the hold lines will be reexamined in the alternatives chapter.

RUNWAY LENGTH REQUIREMENTS

Aircraft operate on a wide variety of available runway lengths. Many factors govern the suitability of runway lengths for aircraft, such as elevation, temperature, wind velocity, aircraft operating weight, wing flap settings, runway condition (wet or dry), runway gradient, vicinity airspace obstructions, and any special operating procedures. Runway 3-21 is 8,249 feet long. FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides a five-step process for determining runway length needs:

1. Identify the list of critical design airplanes or airplane group.
2. Identify the airplanes or airplane group that will require the longest runway length at maximum certificated takeoff weight (MTOW).
3. Determine which of the three methods described in the AC will be used for establishing the runway length.
4. Select the recommended runway length from the appropriate methodology.
5. Apply any necessary adjustments to the obtained runway length.

There are three methodologies for determining runway length requirements. These methodologies are based on the MTOW of the critical aircraft or the airplane group for each runway. The airplane group consists of multiple aircraft with similar design characteristics. The three weight classifications are airplanes with an MTOW of 12,500 pounds or less, those that weigh over 12,500 pounds but less than 60,000 pounds, and those that weigh 60,000 pounds or more. **Table 3M** shows these classifications and the appropriate related methodology to use in runway length determination.

TABLE 3M | Airplane Weight Classification for Runway Length Requirements

Airplane Weight Category (MTOW)		Design Approach	Methodology
12,500 pounds or less	Approach speeds of less than 30 knots	Family grouping of small airplanes	Chapter 2: para. 203
	Approach speeds of at least 30 knots but less than 50 knots	Family grouping of small airplanes	Chapter 2: para. 204
	Approach speeds of 50 knots or more with fewer than 10 passenger seats	Family grouping of small airplanes	Chapter 2: para. 205, Figure 2-1
	Approach speeds of 50 knots or more with 10 or more passenger seats	Family grouping of small airplanes	Chapter 2: para. 205, Figure 2-1
Over 12,500 pounds but less than 60,000 pounds		Family grouping of large airplanes	Chapter 3: Figures 3-1 or 3-2 and Tables 3-1 or 3-2
60,000 pounds or more, or regional jets		Individual large airplanes	Chapter 4: <i>Airplane Performance Manuals</i>

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*

SDL experiences more than 500 annual operations by aircraft that weigh more than 60,000 pounds. **Table 3N** summarizes most of those aircraft and the total number of operations for 2024. The appropriate methodology for determining the optimal runway length at SDL is to reference individual aircraft planning manuals. The table also shows the recommended runway length for each of the selected aircraft. At maximum takeoff weight and on a 104-degree day, all of these aircraft would require a runway length of at least 8,350 feet.

TABLE 3N | Operations by Aircraft over 60,000 Pounds MTOW

Aircraft	MTOW	2024 Operations ¹	Estimated Takeoff Runway Length at MTOW ²
Gulfstream IV/G400	73,200	1,550	8,350'
Gulfstream V/500	91,000	1,332	9,250'
Gulfstream 600	94,600	678	8,700'
Global 5000/Express	92,500	988	8,860'
TOTAL:		4,548	

MTOW = maximum takeoff weight

Sources: ¹FAA, *Traffic Flow Management System Counts*; ²Flight planning manuals for each aircraft type

Supplemental Analysis Undertaken for Typical Business Jets Operating with Local Conditions

An additional analysis was undertaken to estimate the required runway lengths for common business jets under a variety of conditions. This analysis is the output from UltraNav software, which utilizes flight planning manuals for the selected aircraft.

The required takeoff and landing lengths for maximum load and range (adjusted for temperature and elevation) for many of the turbine aircraft utilizing the airport are presented in **Table 3P** for both dry and wet pavement conditions. The takeoff distance requirements reflect maximum gross weight for the aircraft; however, the percentage of useful load has also been calculated for the existing 8,249-foot runway length. When the runway length exceeds the available runway length at the given design temperature, aircraft operators may be required to reduce payload. Runway length requirements that exceed the current length of Runway 3-21 are noted in red type.

Business jets may operate under different regulations depending on the type of flight being conducted, as noted in **Table 3P**. These regulations may impact the calculated runway available for landing. CFR Part 91k refers to operations conducted via fractional ownership, and Part 135 refers to commuter/on-demand (charter) operations. Fractional operators typically must be capable of landing within 80 percent of the landing distance available (LDA) and commuter/on-demand operators must be capable of landing within 60 percent of the LDA. Operations conducted under CFR Part 25 are general aviation operations conducted by private owners, which are unfactored.

TABLE 3P | Runway Length Requirements for Business Jets

Airfield Parameters										
Elevation: 1,510.1' MSL										
Temperature: 104.1°F, 40°C										
0.81% Runway 3-21 (66')										
Runway Parameters	Takeoff Length Required at MTOW		% Useful Load for Takeoff on 8,249' Runway		Landing Length Requirements					
					CFR Part 25 (Unfactored)		CFR Part 135 (60% Factored)		CFR Part 91k (80% Factored)	
Runway Condition	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
Lear 60	8,249	8,249	79.45%	69.48%	3,776	5,049	6,293	8,415	4,720	6,311
Gulfstream V	9,773	10,000	89.27%	84.23%	2,880	3,312	4,800	5,520	3,600	4,140
Citation X	7,859	8,653	83.58%	78.30%	3,953	5,642	6,588	9,403	4,941	7,053
Falcon 50EX	6,783	7,174	82.34%	82.34%	3,019	3,472	5,032	5,787	3,774	4,340
Gulfstream IV	6,471	7,411	78.62%	78.62%	3,717	7,125	6,195	11,875	4,646	8,906
Challenger 300	8,184	8,127	100.00%	100.00%	2,686	5,149	4,477	8,582	3,358	6,436
Lear 45XR	7,679	7,642	100.00%	100.00%	2,952	3,809	4,920	6,348	3,690	4,761
Citation (525) CJ1	10,000	10,000	71.74%	85.15%	3,031	4,096	5,052	6,827	3,789	5,120
Beechjet 400A	6,372	8,114	92.78%	92.78%	3,828	5,535	6,380	9,225	4,785	6,919
Citation Bravo	6,903	6,641	100.00%	100.00%	3,791	5,961	6,318	9,935	4,739	7,451
Citation 560 XLS	6,326	6,326	98.89%	98.89%	3,530	5,566	5,883	9,277	4,413	6,958
Citation Encore	5,931	6,209	100.00%	100.00%	3,135	4,700	5,225	7,833	3,919	5,875
Citation (525A) CJ2	5,476	5,678	97.29%	97.27%	3,276	4,745	5,460	7,908	4,095	5,931
Citation Sovereign	5,493	5,533	100.00%	100.00%	2,920	3,722	4,867	6,203	3,650	4,653
Citation CJ3	5,598	5,511	100.00%	100.00%	3,095	4,213	5,158	7,022	3,869	5,266
Citation I/SP	4,166	4,791	80.89%	80.89%	2,495	2,869	4,158	4,782	3,119	3,586
CFR = Code of Federal Regulations MSL = mean sea level MTOW = maximum takeoff weight										
CFR Part 25: standard unfactored landing lengths										
CFR Part 135: 60% factored landing length as required by commuter/on-demand operators										
CFR Part 91k: 80% factored as required by fractional operators										
Figures in red exceed the available runway length.										

CFR = Code of Federal Regulations MSL = mean sea level MTOW = maximum takeoff weight
 CFR Part 25: standard unfactored landing lengths
 CFR Part 135: 60% factored landing length as required by commuter/on-demand operators
 CFR Part 91k: 80% factored as required by fractional operators
 Figures in red exceed the available runway length.

Source: Aircraft operating manuals from UltraNav software

FAA Runway Length for Jets That Weigh Less Than 60,000 Pounds

Utilizing FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, the following is the five-step process for determining the recommended runway length for aircraft with an MTOW between 12,500 pounds and 60,000 pounds.

Step 1: Identify the critical airplane or airplane group.

This runway length analysis assumes the critical aircraft is a large business jet that weighs less than 60,000 pounds MTOW. There are more than 500 annual operations by these types of aircraft at SDL. In this case, the appropriate runway length methodology is to examine the general runway length tables from Chapter 3 of AC 150/5325-4B for aircraft that weigh between 12,500 pounds and 60,000 pounds.

Step 2: Identify the airplanes or airplane group that will require the longest runway length at MTOW.

Business jets typically require the longest runway lengths; therefore, the runway length curves in Chapter 3 of AC 150/5325-4B will be examined for future conditions.

Step 3: Determine which of the three methods described in the AC will be used to establish the runway length.

In consideration of the growing number of business jets at SDL, it is necessary to select the specific methodology to use for the business jets. Chapter 3 of the AC groups business jets that weigh over 12,500 pounds but less than 60,000 pounds into the following two categories:

- 75 percent of the fleet
- 100 percent of the fleet

The AC states that the airplanes in the *75 percent of the fleet* category generally need 5,000 feet or less of runway at mean sea level and standard day temperature (59 degrees Fahrenheit [°F]), while those in the *100 percent of the fleet* category need more than 5,000 feet of runway under the same conditions.

The AC indicates that the airport designer must determine which category to use for runway length determination. SDL experiences significant levels of business jet activity from the full range of the business jet fleet. **Table 3Q** shows example aircraft for each runway length category. For this analysis, business jets in the 75-100 percent category will be evaluated.

TABLE 3Q | Aircraft Categories for Runway Length Determination

0-75 Percent of the National Fleet	MTOW	75-100 Percent of the National Fleet	MTOW
Lear 35	20,350	Lear 55	21,500
Lear 45	20,500	Lear 60	23,500
Cessna 550	14,100	Hawker 800XP	28,000
Cessna 560XL	20,000	Hawker 1000	31,000
Cessna 650 (VII)	22,000	Cessna 650 (III/IV)	22,000
IAI Westwind	23,500	Cessna 750 (X)	35,700
Beechjet 400	15,800	Challenger 604	47,600
Falcon 50	18,500	IAI Astra	23,500

MTOW = maximum takeoff weight

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*

Two runway length curves are presented in the AC under the 75-100 percent category:

- 60 percent useful load
- 90 percent useful load

The useful load is the difference between the maximum allowable structural weight and the operating empty weight (OEW). The useful load consists of passengers, cargo, and usable fuel. The determination of which useful load category to use will have a significant impact on the recommended runway length; however, it is inherently difficult to determine because of the variable needs of each aircraft operator. For shorter flights, pilots may take on less fuel, but pilots may choose to ferry fuel so they do not have to frequently refuel. Because of the variability in aircraft weights and haul lengths, the 60 percent useful load category is typically considered the default, unless there are specific known operations that would suggest using the 90 percent useful load category.

For SDL, there are known long-haul (cross-country) operations that would suggest applying the 90 percent useful load classification. Data acquired from GCR, Inc. documents city pairs by air taxi aircraft. An examination of the cities shows more than 800 operations between SDL and airports that are more than 1,000 miles away. This examination is of air taxi operations only and does not include private flights. Because of the frequency of long-haul flights to and from SDL, the 90 percent useful load category is the most appropriate to apply when estimating runway length requirements for business jets that weigh between 12,500 and 60,000 pounds.

Step 4: Select the recommended runway length from the appropriate methodology.

The next step is to examine the performance charts for the *100 percent of the fleet* classification for the 90 percent useful load category. (See **Figure 3-4** on the next page.) This chart requires the following inputs:

- Mean maximum daily temperature of the hottest month: July at 104.4°F
- The airport elevation: 1,510.1 feet above mean sea level (MSL)

By cross-referencing the temperature and elevation on the chart, the raw recommended runway length is approximately 11,000 feet.

Step 5: Apply any necessary adjustments to the obtained runway length.

The recommended runway length determined in Step 4 is based on no wind, a dry runway surface, and zero effective runway gradient; therefore, the following criteria are applied:

- Wet runway surface
- 0.81% effective runway gradient (66 feet of elevation difference for Runway 3-21)

To account for a wet/contaminated surface, the runway length obtained from the load performance chart used in Step 4 is increased by 15 percent or up to 7,000 feet for the 90 percent category, whichever is less.

The runway length obtained from Step 4 is also increased at the rate of 10 feet for each foot of elevation difference between the high and low points of the runway centerline. At SDL, this equates to an additional 90 feet of runway length, resulting in an adjusted runway length of 8,715 feet. **Table 3R** summarizes the data inputs and the final recommended runway lengths for SDL. To accommodate 100 percent of the fleet at 90 percent useful load, a runway length of 11,700 feet is recommended.

TABLE 3R | Runway Length Requirements

Airport Elevation	1,510.1' feet above mean sea level			
Average High Monthly Temperature	104.1°F (July)			
Runway Gradient	0.81% Runway 3-21 (66')			
Fleet Mix Category	Raw Runway Length from FAA AC	Runway Length With Gradient Adjustment	Wet Surface Landing Length for Jets (+15%)*	Final Runway Length
75% of fleet at 60% useful load	5,211'	5,871'	5,500'	5,900'
100% of fleet at 60% useful load	6,852'	7,512'	5,500'	7,500'
75% of fleet at 90% useful load	7,902'	8,562'	7,000'	8,600'
100% of fleet at 90% useful load	11,000'	11,660'	7,000'	11,700'

*Max 5,500' for 60% useful load and max 7,000' for 90% useful load in wet conditions

Source: FAA AC 150/5325-4B, Runway Length Requirements for Airport Design

As shown in the table, business jets that weigh less than 60,000 pounds operating at 60 percent useful load have adequate runway length available. When the useful load is 90 percent, available runway length becomes constraining, and operators must reduce weight.

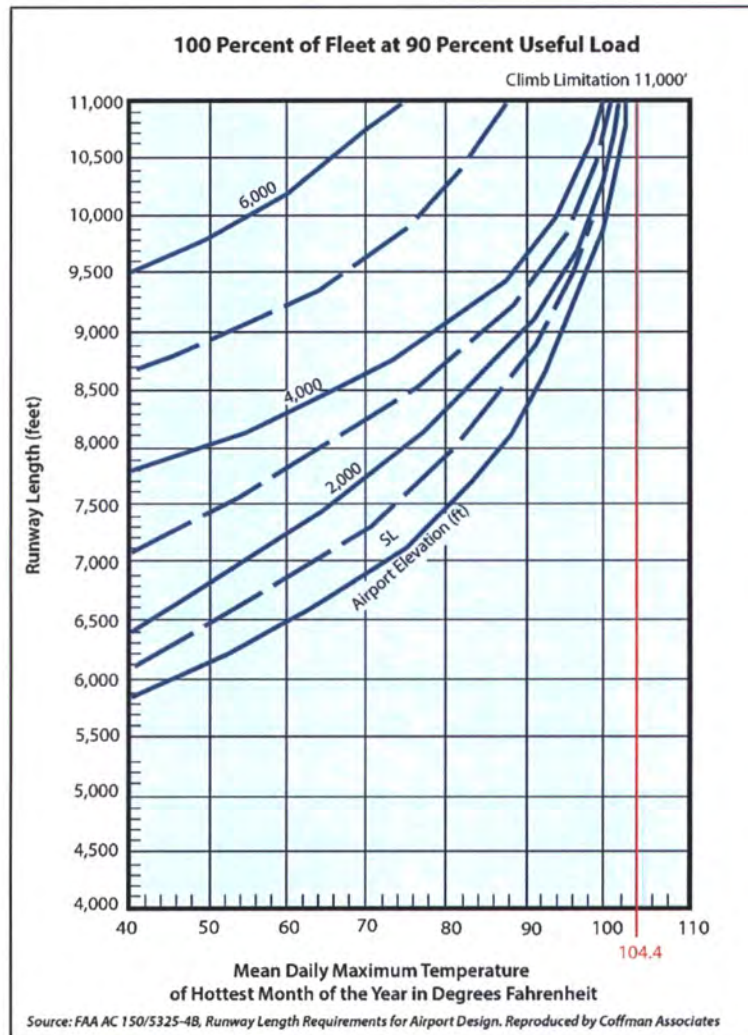


Figure 3-4 – Raw Runway Length for Business Jets

Runway Length Summary

According to FAA 150/5325-4B, *Runway Length Requirements for Airport Design*, individual aircraft flight planning manuals should be used to determine the optimal runway length. These manuals were consulted for several of the large business jets that operate at the airport. To accommodate these aircraft, a runway length between 7,500 feet and 10,000 feet is recommended.

UltraNav software, which calculates runway length needs for certain business jets based on the flight planning manuals, was also consulted. According to UltraNav, nearly all of the selected business jets can operate unrestricted within the current runway length. Under certain conditions, some airplanes will be weight-restricted, especially on a wet/contaminated runway.

Finally, the FAA-provided runway length methodology for business jets that weigh between 12,500 pounds and 60,000 pounds was also applied. This resulted in a recommended runway length of 11,700 feet. For SDL, this recommended length would be the optimal length to plan for; however, there are known limitations to extending the runway.

For planning purposes, the airport should maintain the maximum possible runway length. If there is an opportunity to add length, those should be examined as well. As a reliever airport, SDL should be able to accommodate the full range of general aviation aircraft, including the largest business jets.

RUNWAY WIDTH

Runway 3-21 is 100 feet wide, which is the standard for the approved critical aircraft (D-II-5000). A wider runway is only justified when there are 500 or more operations by aircraft with a MTOW of greater than 150,000 pounds is. No aircraft in the general aviation fleet greater than 150,000 pounds operate at SDL; therefore, the existing runway width should be maintained through the 20-year planning period.

RUNWAY SHOULDERS

The runway shoulders are an area adjacent to the defined edge of the paved runway. The shoulders facilitate drainage, provide blast protection, support emergency vehicles and/or aircraft, and provide a transition between the runway pavement and the adjacent surface.

The runway at Scottsdale Airport has 10-foot-wide paved shoulders, which meets the D-II design standard. They should be maintained at this width.

RUNWAY BLAST PADS

Blast pads are paved or prepared areas beyond the runway threshold that are intended to reduce erosion from prop wash and jet blast. Blast pads are not a required element of the runway system.

The FAA recommends blast pads under any of the following conditions:

- Runways with ADG-III as the critical aircraft
- Runways experiencing erosion of soil adjacent to the runway

- Runways with soil that is not suitable for turf establishment
- Locations experiencing wrong surface landings, to improve pilot visual cues to the runway ends

SDL has blast pads at each runway end. They are 150 feet long and 120 feet wide, which meets the D-II-5000 standard. The blast pads should be maintained through the planning period.

RUNWAY WEIGHT BEARING CAPACITY

An important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight. The weight bearing capacity ratings of a runway do not preclude operations by aircraft that weigh more; however, frequent activity by heavier aircraft can shorten the useful life of that pavement. The current published weight bearing capacity for Runway 3-21 is 45,000 pounds for single-wheel (S) type landing gear (S), 75,000 pounds for dual-wheel (D) type landing gear, and 95,000 pounds for two single wheels in tandem (2S).

All federally obligated airports must remain open to the public, and it is typically up to the pilot of an aircraft to determine if a runway can support the aircraft safely. An airport sponsor cannot restrict an aircraft from using the runway simply because its weight exceeds the published weight bearing capacity. On the other hand, the airport sponsor has an obligation to properly maintain and protect the useful life of the runway.

According to the FAA publication *Airport/Facility Directory*, "Runway strength-rating is not intended as a maximum allowable weight or as an operating limitation. Many airport pavements are capable of supporting limited operations with gross weights in excess of the published figures." The directory goes on to say that aircraft that exceed the pavement weight bearing capacity should contact the airport sponsor for permission to operate at the airport. This is the case at Scottsdale Airport, as the *Airport/Facility Directory* states that "Runway 3-21 is limited to 75,000 pounds (D) except with prior permission requested." Aircraft can operate with maximum gross weights in excess of 75,000 pounds and up to 100,000 pounds at the airport under one of these conditions:

- Up to 100,000 pounds on a prior permission required (PPR) basis
- With a placard that certifies they are operating at or below a weight of 75,000 pounds

The weight bearing capacity of a runway can change over time. Regular usage by heavier aircraft can decrease the weight bearing capacity, while periodic runway resurfacing or reconstructing can increase the weight bearing capacity. Given the high volume of large business jets that utilize the airport, future planning should consider providing a weight bearing capacity of 100,000 pounds (D).

As previously noted in **Table 3N**, in 2024, SDL experienced approximately 1,700 operations by aircraft with a maximum takeoff weight of greater than 75,000 pounds. It is unknown how many of these actually operated at a weight greater than 75,000 pounds.

During the 2015 master plan process, the aviation department and FAA determined that increasing the weight bearing capacity up to 100,000 pounds (D) may require the airport to meet D-III design standards. In the alternatives analysis, the feasibility of increasing the runway weight bearing capacity will be re-examined.

RUNWAY LINE-OF-SIGHT AND GRADIENT

The FAA has instituted various line-of-sight requirements to facilitate coordination among aircraft, as well as between aircraft and vehicles that are operating on active runways. This allows departing and arriving aircraft to verify the locations and actions of other aircraft and vehicles on the ground that could create conflicts.

Line-of-sight standards for an individual runway are based on the availability of a parallel taxiway. When a full-length parallel taxiway is available, thus facilitating faster runway exit times, any point five feet above the runway centerline must be mutually visible with any other point five feet above the runway centerline that is located at less than half the length of the runway. If a full-length parallel taxiway is not available, any two points five feet above the runway must be mutually visible for the whole length of the runway. Runway 3-21 meets the line-of-sight standard.

The surface gradient of a runway affects aircraft performance and pilot perception. The surface gradient is the maximum allowable slope for a runway. The maximum longitudinal grade for runways in approach categories C, D, and E, like Runway 3-21, is 1.5 percent; however, longitudinal grades that exceed 0.8 percent are not acceptable within the lesser of the following criteria:

- In the first and last quarter of the runway length
- The first and last 2,500 feet of the runway length

The runway slopes consistently from the Runway 3 end upward to the Runway 21 end with an elevation difference of 68 feet. The effective runway gradient is 0.81 percent. There is no gradient change in the first and last 2,500 feet of runway length.

Runway 3-21 meets the design standards for line-of-sight and gradient, which should both be maintained.

TAXIWAY DESIGN STANDARDS

The design standards associated with taxiways are determined by the taxiway design group (TDG) and the airplane design group (ADG) of the critical aircraft that would potentially use that taxiway. The critical aircraft that was approved by the FAA is ADG II, but it is known that there are frequent operations by aircraft classified as ADG III; therefore, it is prudent to understand the design standards for both ADG II and ADG III because these standards determine the separation distances that protect the ground movement of aircraft. **Table 3S** presents the taxiway design standards for ADG II and ADG III.

Taxiways typically provide access to the runway via either a parallel taxiway or connecting taxiways. Taxiways usually allow for faster ground movements than taxilanes. Taxiway ground movement speeds are generally between 15 and 35 miles per hour, while taxilane movement speeds are below 15 miles per hour. Taxilanes typically extend from taxiways to hangar areas and facilitate slower movement speeds than taxiways. As result, certain separation standards are different for taxiways and taxilanes. While taxiways should be planned to meet the critical aircraft standards, taxilanes can be designed to accommodate aircraft that will use them. For example, a taxilane leading to a row of small T-hangars only needs to meet the separation requirement for small aircraft, not larger critical aircraft.

TABLE 3S | Taxiway Design Standards

STANDARDS BASED ON WINGSPAN (ADG)		ADG II	ADG III
Taxiway/Taxilane Protection			
Taxiway Safety Area (TSA) width		79'	118'
Taxiway Object Free Area (TOFA) width		124'	171'
Taxilane Object Free Area (TLOFA) width		110'	158'
Taxiway/Taxilane Separation			
Taxiway Centerline to:			
Parallel Taxiway/Taxilane		101.5'	144.5'
Fixed or Movable Object		62'	85.5'
Taxilane Centerline to:			
Parallel Taxilane		94.5'	138'
Fixed or Movable Object		55'	79'
Wingtip Clearance			
Taxiway Wingtip Clearance		22.5'	26.5'
Taxilane Wingtip Clearance		15.5'	20'
STANDARDS BASED ON TDG		TDG 2B	TDG 3
Taxiway Width Standard		35'	50'
Taxiway Edge Safety Margin		7.5'	10'
Taxiway Shoulder Width		15'	20'
ADG = airplane design group			
TDG = taxiway design group			

Source: FAA AC 150/5300-13B, Airport Design

Taxiway Width Standards

All taxiways and taxilanes should be constructed at the standard uniform width that applies to them. All taxiways/taxilanes that serve the critical aircraft should be at least 35 feet wide, which is the standard associated with TDG 2B. As documented in the forecast chapter, there are some operations by aircraft with wider wheelbases that fall in TDG 3, which has a 50-foot-wide taxiway standard. In 2024, there were 148 such operations at SDL, 122 of which were by the Cessna Citation Bravo.

Typically, the FAA will support maintaining the existing width of taxiways until the pavement needs to be reconstructed, even if the taxiways exceed the design standard. When the taxiways are reconstructed, they are typically designed to meet the current taxiway width standard; however, at SDL, with a high number of large business jets operating at the airport, it is recommended that all existing taxiways be maintained at their current width (between 40 and 50 feet), at a minimum, and when reconstruction is needed, additional analysis be undertaken to determine if a wider taxiway would enhance safety.

The taxiway edge safety margin (TESM) is the distance from the outermost wheels of an aircraft to the edge of the taxiway/taxilane pavement. The intersection fillets may need to be widened to prevent the rear wheels of an aircraft from rolling off the paved surface when making turns. Several of the taxiway fillets at SDL have already been widened for this purpose, including Taxiways A1, B1, A3, B3, A5, A7, B7, A10, B10, A13, B13, A15, A16, and B16. The recommended development concept of this master plan will include any necessary modifications to taxiways to accommodate the TESM.

Taxiway shoulders are intended to prevent erosion or jet and prop wash from creating foreign object debris (FOD), which can damage aircraft. At a minimum, stabilized taxiway shoulders are recommended. For airports with critical aircraft of ADG III and larger, paved taxiway shoulders are recommended. The taxiway shoulders at SDL are paved, which should be maintained.

Taxiway/Taxilane Protection Surfaces

Taxiways and taxilanes have protective object-clearing surfaces. The taxiway safety area (TSA) has the same function as the RSA in that it is a surface level protective area. The taxiway/taxilane object free areas (TOFA/TLOFA) serve the same function as the ROFA, which is that of wingtip clearance. The TOFA is the most restrictive of the taxiway protective surfaces, the dimensions of which are a function of the applicable ADG.

All taxiways are surrounded by an object free area (TOFA). The TOFA and all object clearing surfaces are intended to be free of object penetration, except by required navigational aids, such as taxiway edge lighting, that are mounted on frangible bases. The TOFA is centered on the taxiway, the width of which is a function of the ADG of the airport critical aircraft. The FAA-approved critical aircraft is D-II; therefore, ADG II standards apply. The ADG II TOFA is 124 feet. This standard applies to any taxiway that could support ADG II aircraft, which includes all the taxiways at SDL.

As previously noted, SDL experiences frequent operations by ADG III aircraft; therefore, consideration will be given to the adequacy of all TOFA/TLOFAs. In some cases, it may be desirable to apply the ADG III TOFA/TLOFA standards to ensure proper separation of aircraft taxiing and parking, as well as distance to other fixed or movable objects. This analysis, which will be undertaken in the alternatives chapter, will be particularly important in locations with parallel taxiways/taxilanes to ensure proper wingtip clearance.

A taxilane also has an object free area (TLOFA), which is centered on the taxiway. The ADG II TLOFA is 110 feet wide. This standard applies to all on-airport taxilanes that are not designated with a letter A or B, including the apron edge taxilane between Taxiways A3 and A7 and the taxilane between Taxiways A15 and A16. The taxilanes that extend between Taxiways A7 and A8 and between Taxiways A9 and A15 are designed to ADG I standards, which include a TLOFA width of 79 feet, as centered on the taxilane.

Taxiway Separation to Parallel Taxiways/Taxilanes

FAA AC 150/5300-13B, *Airport Design*, provides guidance on the taxiway-to-parallel taxiway/taxilane separation standards. For ADG II, the separation standard from a taxiway to a parallel taxiway/taxilane is 101.5 feet, centerline to centerline. For ADG III, the separation standard is 144.5 feet, centerline to centerline.

There are three locations on the airfield with parallel taxiways/taxilanes:

- Taxiway A between Taxiway A3 and A7; 105 feet to the parallel taxiway/taxilane
- Taxiway A between Taxiway A9 and A16; 105 feet to the parallel taxiway/taxilane
- Taxiway B between Taxiway B9 and B10; 125 feet to the parallel taxiway/taxilane

Each of these parallel taxiway/taxilane locations currently meets the ADG II separation standard of 101.5 feet; however, the airport gets frequent activity by aircraft with ADG III wingspans. To fully protect these aircraft, the parallel taxiway/taxilane centerline should be 144.5 feet apart in each location. The standard wingtip clearance between ADG II aircraft is 22.5 feet and the standard wingtip clearance between ADG III aircraft is 26.5 feet. The combination of the wingspan (79 feet) plus the wingtip clearance (22.5 feet) equals the separation standard of 101.5 feet. For ADG III, the wingspan (118 feet) plus the wingtip clearance (26.5 feet) equals 144.5 feet, which is the separation standard.

If two ADG II (largest wingspan of 79 feet) aircraft pass each other on the parallel taxiway/taxilanes associated with Taxiway A, there would be 26 feet of wingtip clearance. This is calculated as the existing separation of 105 feet minus the wingspan (79 feet), which equals 26 feet. On Taxiway B, there would be 46 feet of wingtip clearance. This is calculated as the existing separation of 125 feet minus the wingspan (79 feet), which equals 46 feet. Both meet (and exceed) the 22.5-foot standard for wingtip clearance.

If two ADG III (largest wingspan of 118 feet) aircraft pass each other on the parallel taxiway/taxilanes associated with Taxiway A, there would be negative 13 (-13) feet of wingtip clearance. On Taxiway B there would be seven (7) feet of wingtip clearance. Obviously, neither of these meet the 26.5-foot standard for wingtip clearance.

Appendix J of FAA AC 150/5300-13B, *Airport Design*, provides a methodology by which taxiway/taxilane object free areas can be modified based on the wingspans of specific aircraft. Because SDL currently limits operations to aircraft with MTOWs below 100,000 pounds, and all of those aircraft have wingspans less than 100-feet, the acceptable modified separation distance between parallel taxiways and taxiway/taxilanes can be calculated. Assuming two aircraft with 100-foot wingspans, the minimum separation distance between the centerlines would be 126.5 feet. This is calculated as the wingspan (100 feet) plus the wingtip buffer for ADG III (26.5 feet).

In the alternatives chapter, various options to address the issue of parallel taxiway/taxilane separation will be examined.

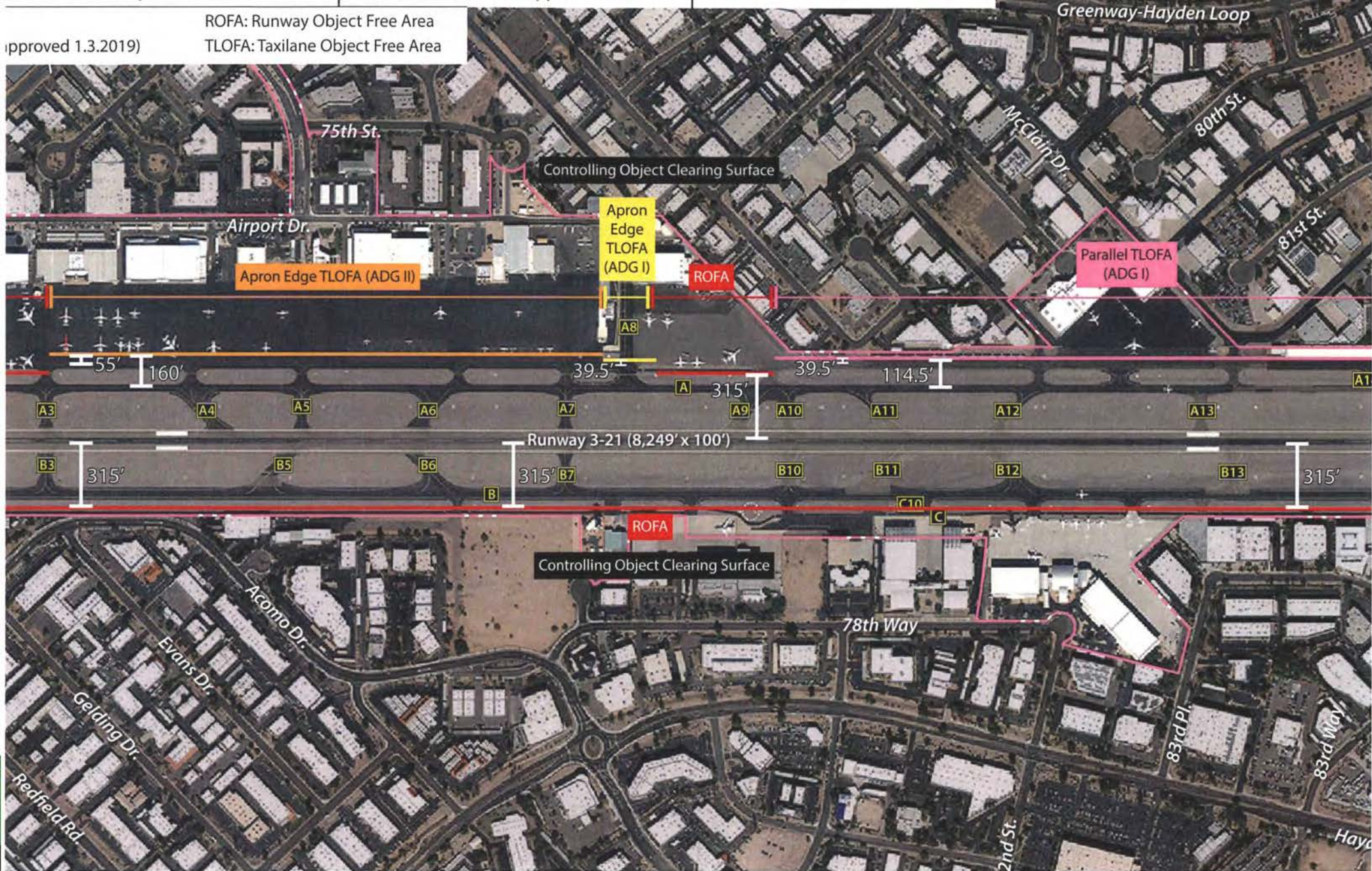
AIRCRAFT PARKING AREAS (FIXED OR MOVABLE OBJECTS)

According to FAA AC 150/5300-13B, *Airport Design*, aircraft parking areas are to be clear of object clearing surfaces, which are the ROFA, TOFA, TLOFA, OFZ, navigational aid critical areas, and approach/departure surfaces. Currently, all parking areas are clear of all object clearing surfaces. **Exhibit 3G** identifies the aircraft parking areas, where they can begin in relation to the runway, and what the controlling object clearing surface is for each.

- From the south end of the west side terminal apron to Taxiway A3, aircraft parking can begin at the outer edge of the ROFA, which is 315 feet from the runway centerline. The ROFA distance from the runway centerline is a function of the FAA-approved Modification of Standards that was approved on January 3, 2019.
- From Taxiway A3 to Taxiway A7, the controlling object clearing surface is the apron edge taxilane object free area (TLOFA). The TLOFA is 55 feet to either side, which is based on ADG II.
- From Taxiway A7 to A8, the controlling object clearing surface is the TLOFA edge. This section of the TLOFA is designed to ADG I standards; therefore, the west edge of the TLOFA is 39.5 feet from the taxilane centerline.
- From Taxiway A8 to A9, the controlling object clearing surface is the ROFA, which is 315 feet from the runway centerline. The ROFA distance from the runway centerline is a function of the FAA-approved Modification of Standards that was approved on January 3, 2019.

315' from runway centerline	ROFA based on FAA-approved MOS	315'
55' from apron edge taxilane centerline	Apron edge TLOFA (ADG II)	410'
39.5' from apron edge taxilane centerline	Apron edge TLOFA (ADG I)	394.5'
315' from runway centerline	ROFA based on FAA-approved MOS	315'
39.5' from apron edge taxilane centerline	Apron edge TLOFA (ADG I)	394.5'
55' from apron edge taxilane centerline	Apron edge TLOFA (ADG II)	440'
315' from runway centerline	ROFA based on FAA-approved MOS	315'

ROFA: Runway Object Free Area
TLOFA: Taxilane Object Free Area
(approved 1.3.2019)



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- From Taxiway A9 to A15, the controlling object clearing surface is the west edge of the TLOFA. This portion of the taxilane is designed to ADG I standards, which mandate 39.5 feet to either side of the taxilane centerline.
- From Taxiway A15 to A16, the controlling object clearing surface is the west edge of the TLOFA. This portion of the taxilane is designed to ADG II standards, which mandate 55 feet to either side of the taxilane centerline.
- For the length of the east side of the runway, aircraft parking areas can begin 315 feet from the runway centerline, which is the outer edge of the ROFA. The ROFA distance from the runway centerline is a function of the FAA-approved Modification of Standards that was approved on January 3, 2019.

Taxiway Design Considerations

FAA AC 150/5300-13B, *Airport Design*, provides guidance on taxiway design with a goal of enhancing safety by providing a taxiway geometry that reduces the potential for runway incursions. As previously noted, a runway incursion is defined as “any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.”

The following is a list of the taxiway design guidelines and the basic rationale behind each recommendation.

1. *Taxi Method*: Taxiways are designed for cockpit-over-centerline taxiing with pavement that is sufficiently wide to allow a certain amount of wander. On turns, enough pavement should be provided to maintain the edge safety margin from the landing gear. When constructing new taxiways, upgrading existing intersections should be undertaken to eliminate judgmental oversteering, which is when a pilot must intentionally steer the cockpit outside the marked centerline to ensure the aircraft remains on the taxiway pavement.
2. *Steering Angle*: Taxiways should be designed so the nose gear steering angle is no more than 50 degrees, which is the generally accepted value to prevent excessive tire scrubbing.
3. *Three-Node Concept*: To maintain pilot situational awareness, a taxiway intersection should provide a pilot with a maximum of three choices of travel direction. Ideally, these are right- and left-angle turns and a continuation straight ahead.
4. *Intersection Angles*: Turns should be designed to be 90 degrees wherever possible. For acute-angle intersections, standard angles of 30, 45, 60, 120, 135, and 150 degrees are preferred.
5. *Runway Incursions*: Taxiways should be designed to reduce the probability of runway incursions.
 - *Increase Pilot Situational Awareness*: A pilot who knows where they are on the airport is less likely to improperly enter a runway. Complexity leads to confusion; taxiway systems should be kept simple using the three-nodes concept.

- *Avoid Wide Expanses of Pavement:* Wide pavements require placement of signs far from a pilot's eye. This is especially critical at runway entrance points. Where a wide expanse of pavement is necessary, direct access to a runway should be avoided.
- *Limit Runway Crossings:* The taxiway layout can reduce the opportunity for human error. The benefits are twofold: through a simple reduction in the number of occurrences and a reduction in air traffic controller workload.
- *Avoid High-Energy Intersections:* These are intersections in the middle thirds of runways. By limiting runway crossings to the first and last thirds of a runway, the portion of the runway where a pilot can least easily maneuver to avoid a collision is kept clear.
- *Increase Visibility:* Right-angle intersections between taxiways and runways provide the best visibility. Acute-angle runway exits provide for greater efficiency in runway usage but should not be used as runway entrances or crossing points. A right-angle turn at the end of a parallel taxiway is a clear indicator to a pilot approaching a runway.
- *Avoid Dual-Purpose Pavements:* Runways used as taxiways and taxiways used as runways can lead to confusion. A runway should always be clearly identified as a runway, and only a runway.
- *Indirect Access:* Taxiways should not be designed to lead directly from an apron to a runway. Such configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway.
- *Hot Spots:* Confusing intersections near runways are more likely to contribute to runway incursions. These intersections must be redesigned when the associated runway is subject to reconstruction or rehabilitation. Other hot spots should be corrected as soon as practicable.

6. *Runway/Taxiway Intersections:*

- *Right Angle:* Right-angle intersections are the standard for all runway/taxiway intersections, except where there is a need for a high-speed exit. Right-angle taxiways provide the best visual perspective to a pilot approaching an intersection with the runway to observe aircraft in both the left and right directions. They also provide optimal orientation of the runway holding position signs so the signs are visible to pilots.
- *Acute Angle:* Acute angles should not be larger than 45 degrees from the runway centerline. A 30-degree taxiway layout should be reserved for high-speed exits. The use of multiple intersecting taxiways with acute angles creates pilot confusion and improper positioning of taxiway signage.
- *Large Expanses of Pavement:* Taxiways must never coincide with the intersection of two runways. Taxiway configurations with multiple taxiway and runway intersections in a single area create large expanses of pavement, making it difficult to provide proper signage, marking, and lighting.

7. *Taxiway/Runway/Apron Incursion Prevention*: Apron locations that allow direct access to a runway should be avoided. Pilot situational awareness should be increased by designing taxiways in a manner that forces pilots to consciously make turns. Taxiways that originate from aprons and form straight lines across runways at mid-span should be avoided.
- *Wide Throat Taxiways*: Wide throat taxiway entrances should be avoided. Such large expanses of pavement may cause pilot confusion and make lighting and marking more difficult.
 - *Direct Access from Apron to Runway*: Taxiway connectors that cross over a parallel taxiway and directly onto a runway should be avoided. A staggered taxiway layout that forces pilots to make a conscious decision to turn should be considered.
 - *Apron to Parallel Taxiway End*: Direct connection from an apron to a parallel taxiway at the end of a runway should be avoided.

Taxiway Design Considerations at SDL

The following taxiway geometry issues will be addressed in the alternatives analysis and are depicted on **Exhibit 3H**:

- Taxiways A3, A4, A5, A6, and A7 allow direct access from an apron area to the runway.
- Taxiways A7/B7 and A10/B10 allow runway crossings in the high-energy portion (middle third) of the runway.
- Taxiways A2, A4, A6, A9, A11, A12, B5, B6, B11, and B12 are angled taxiways.

None of these taxiway considerations for SDL are non-standard but they do not follow the current design recommendations. For example, the FAA has prioritized removing direct-access configurations, where feasible. Angled taxiways have been less of a priority and, in some cases, are justified by capacity needs at an airport. Even runway crossings may be needed if there is no appropriate alternative that does not diminish ground movement efficiency.

The alternatives chapter will examine possible taxiway geometry changes that would improve pilot situational awareness and reduce potential pilot confusion. Any changes will consider the practicality of each alternative in terms of cost and benefit.

HOLD APRONS

Hold aprons are an important feature at busy airports like SDL. Pilots can pull off the main taxiways onto a hold apron to perform final pre-flight checks and engine run-ups. These activities can take several minutes, so other aircraft that are ready for takeoff are able to proceed to the runway threshold for departure without delay.

Hold aprons are designed to allow other aircraft to bypass aircraft using the hold apron. Specifically, the location on a hold apron where aircraft park should be outside the TOFA for the taxiway. Because it is recommended that Taxiways A and B protect for the 171-foot-wide ADG III TOFA, the closest wing of a holding aircraft should be at least 85.5 feet from the taxiway centerline.

The hold aprons at the north and south ends of Taxiways A and B have a depth of 120 feet, which provides 34.5 feet of wingtip clearance to the TOFA; therefore, aircraft with wingspans of less than 69 feet will not penetrate the taxiway TOFA while using the hold bay.

Beyond the north end of Taxiway A is a hold bay complex that includes five channelized positions. A hold bay of this design is recommended, as it presents a uniform and predictable use of the space and provides the appropriate separation between wingtips.

NAVIGATIONAL AND APPROACH AIDS

Navigational aids are devices that provide pilots with guidance and position information when utilizing the runway system. Electronic and visual guidance to arriving aircraft enhances the safety and capacity of the airfield. Such facilities are vital to the success of the airport and provide additional safety for passengers using the air transportation system. While instrument approach aids are especially helpful during poor weather, they are often used by pilots conducting flight training and operating larger aircraft when visibility is good. SDL has the following navigational and approach aids.

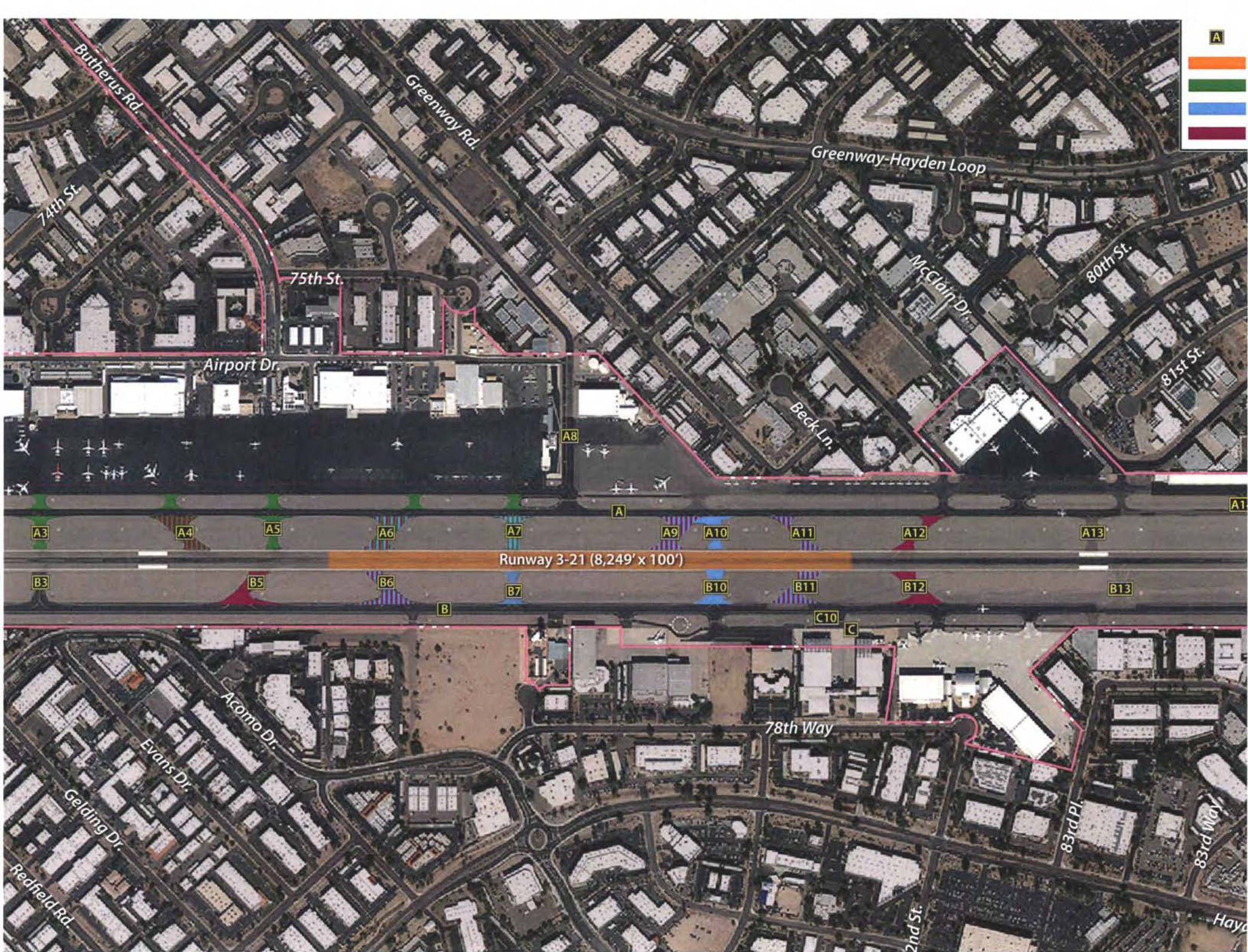
Instrument Approach Aids

Instrument approaches are categorized as either precision or non-precision. Precision instrument approach aids provide an exact course alignment and vertical descent path for an aircraft on final approach to a runway, while non-precision instrument approach aids provide only course alignment information. In the past, most existing precision instrument approaches in the United States have been the instrument landing system (ILS); however, with advances in global positioning system (GPS) technology, GPS is now used to provide both vertical and lateral navigation for pilots.

At Scottsdale Airport, there are six published instrument approaches (reference Exhibit 1L), all of which provide visibility minimums greater than or equal to one mile. Three are RNP approaches, which are available for specific aircraft with specific specialized equipment and performance monitoring. Use of RNP approaches requires specialized pilot training and a requirement to perform a missed approach if lateral or vertical navigation limits are exceeded, even if visibility is sufficient for a landing. As such, these instrument approach procedures are rarely used.

The other three instrument approaches are circling in nature; pilots cannot navigate directly to a runway end for landing. Instead, they navigate to the airport traffic pattern and then circle to land, assuming visibility minimums are met.

Busy reliever airports with high volumes of business jet activity, such as SDL, should be equipped with the most sophisticated instrument approach capability available. This may include ILS and/or GPS approaches with visibility minimums not lower than ½ mile.



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To date, neither type of approach has been implemented for two primary reasons:

1. The airspace in and around SDL is complex; activity related to Phoenix Deer Valley Airport (DVT) and Phoenix Sky Harbor International Airport (PHX) impacts activity at SDL.
2. Visual conditions apply nearly all the time, making the need for lower visibility minimums less important.

Nevertheless, nearly all pilots of business jets would utilize an instrument approach procedure (either ILS or GPS) regardless of the visibility conditions. While it is obvious to recommend better instrument approach capability for SDL, it will require extensive coordination with all airports and air traffic organizations responsible for the Phoenix region and may require consultation with national airspace experts within the FAA and other organizations, including the military.

Because the dimensions of certain airfield design standards, including the sizes of the RPZs, are a function of the instrument approach visibility minimums, the existing instrumentation is planned to be maintained. No new instrument approaches with visibility minimums below one mile will be recommended because below one mile is the threshold for various design standard changes.

Visual Approach Aids

To provide pilots with visual guidance information during landings, electronic visual approach aids are commonly provided at airports. Both landing thresholds are outfitted with two-box precision approach path indicator (PAPI-2) systems. The PAPIs are set to provide a 4.0-degree glidepath for obstacle clearance, which is higher than the standard 3.0-degree glide path. It is recommended that a four-box PAPI system ultimately be implemented on the runway; the PAPI-4s would better serve business jets that regularly use the airport because they are more visible for these faster approaching aircraft.

REILs are flashing strobe lights located at the outside edge of the landing threshold. REILs provide pilots with a quick indication of the location of the threshold. REILs are typically provided for lighted runways that serve business jet operations. REILs are currently available for approaches to both ends of the runway. The REILs should be maintained through the planning period.

Some airports are equipped with visual approach lighting systems (ALS). An ILS and any instrument approach with ½-mile visibility minimums are required to have an ALS, which are installed at airports with more frequent lower visibility conditions. SDL does not require an ALS and one is not planned because visibility minimums are not planned to be below one mile.

AIRFIELD LIGHTING, MARKING, AND SIGNAGE SYSTEMS

Airfield lighting, marking, and signage provide information to pilots to assist in ground movements, as well as in locating the airport at night.

The airport has a rotating beacon that projects a green light on one side and a white light on the other. Pilots can see the rotating beacon at night from a distance of up to 20 miles. The existing beacon is located on top of the airport operations center building on the west side of the airfield. This location is accessible and should be maintained.

The runway has white medium intensity runway edge lighting (MIRL). The last 2,000 feet of each end of the runway have amber lighting to indicate to pilots that the runway end is approaching. The taxiways (A, B, and all connectors) have blue medium intensity taxiway lighting (MITL). Both of these edge lighting systems are appropriate and should be maintained.

Runway markings are designed according to the type of straight-in instrument approaches available to each runway end. The runway has non-precision markings which include the threshold bar, threshold markings, runway designation, runway centerline, edge markings, and aiming point markings. Because both landing thresholds are displaced, there are additional markings leading to the threshold, which include lead-in arrows and four arrowheads at the landing threshold. These markings are appropriate for SDL and should be maintained.

The airfield is outfitted with a runway/taxiway signage system. The signage system includes runway and taxiway designations, hold positions, routing/directional signs, runway end and exit signs, and runway distance remaining signs. These systems should be maintained.

The taxiways and taxilanes have yellow centerline markings. The taxiways also have yellow edge markings. The parallel taxilanes have yellow edge markings on the east side of each centerline. The connecting taxiways leading to the runway are all enhanced centerline markings that add dashed yellow lines to both sides of the centerline leading to the hold bars. This is a feature typically reserved for commercial service airports; however, many reliever general aviation airports have installed them as a safety enhancement feature.

When the control tower is closed, pilots can use the common traffic advisory frequency (CTAF) (119.9 megahertz [MHz]) to activate the PAPIs, REILs, and MIRL. These systems will remain on for 15 minutes.

The existing lighting and marking systems are appropriate and should be maintained.

WEATHER AND COMMUNICATION AIDS

The airport has two windsocks. The primary windsock is lighted and located within the segmented circle, 85.5 feet from the Taxiway B centerline, which places it outside the existing ADG II TOFA and also outside an ADG III TOFA. The secondary windsock is located on the west side near Gate 5 and the Kilo GA hangars. Both windsocks should be maintained. The airport should consider another secondary windsock, to be located near the south end of the airport, as wind conditions can be different at different locations on the airfield.

The segmented circle provides traffic pattern information to pilots in the air. Most general aviation airports and airports with control towers that are not open 24 hours a day should have visible segmented circles. The segmented circle should be maintained.

The remote communication outlet is an unmanned remote aviation radio transceiver that is used to extend the communication range of air traffic control facilities. This communications equipment should be maintained.

The automated surface observation system (ASOS) is located at the south end of the airfield is located. The ASOS automatically records in-situ weather information and broadcasts it via the automated terminal information service (ATIS) to pilots via frequency 118.6 MHz. The ASOS collects temperature, dew point, wind speed, altimeter setting, visibility, sky condition, and precipitation. Typically, it is desirable to have the ASOS more centrally located; however, it cannot penetrate any of the object clearing surfaces. At SDL, there is not a viable location that is more centrally located, so the ASOS should be maintained in its current location.

AIRPORT TRAFFIC CONTROL TOWER

The 90-foot-tall FAA airport traffic control tower (ATCT) was constructed in 1989. The tower is open from 6:00 a.m. to 9:00 p.m. seven days a week. Tower personnel control the Class D airspace around SDL. The mid-field location of the tower is ideal and it provides clear visibility to all movement surfaces (i.e., the runway and parallel taxiways).

The ATCT is 36 years old and predates the *Americans with Disabilities Act of 1990*. The FAA may want to consider beginning planning for a replacement control tower in the near term, as it can take four to eight years to get a replacement tower constructed. The airport's responsibility is to provide adequate land area for the tower in a location that is acceptable. Presumably, the current site would be acceptable.

AIRSIDE SUMMARY

This airside facility requirements section covered the runway and taxiway systems, navigational aids, and lighting, marking, and signage. **Exhibit 3J** summarizes each of these airfield elements and indicates what should be done in the future.

LANDSIDE REQUIREMENTS

Landside facilities provide the essential interface between the airside facilities and ground access to and from the airport. The capacities of existing facilities have been examined against the projected requirements to gauge anticipated timing of needs. Included in the following analysis are aircraft hangars and storage, aircraft parking apron, general aviation terminal services, automobile parking, and support elements, such as fuel storage, perimeter fencing, and a potential replacement control tower.

AIRCRAFT STORAGE REQUIREMENTS

The demand for aircraft hangars typically depends on local climate, security, and owner preferences. The trend in general aviation aircraft, whether single- or multi-engine aircraft, is toward more sophisticated (and, consequently, more expensive) aircraft; therefore, many aircraft owners prefer enclosed hangar space to outside tiedowns.

The demand for aircraft storage hangars is dependent on the number and type of aircraft expected to be based at the airport in the future. For planning purposes, it is necessary to estimate hangar requirements based on forecasted operational activity; however, hangar development should be based on actual demand trends and financial investment conditions.

While the majority of aircraft owners prefer enclosed aircraft storage, a number of aircraft owners will still use outdoor tiedown spaces due to lack of hangar availability, hangar rental rates, and/or operational needs; therefore, enclosed hangar facilities do not need to be planned for each based aircraft.

Currently, there is approximately 500,000 square feet (sf) of hangar space on airport property. There are also 140 parcels in the airpark that have taxiway access. Through the long-term planning period, the forecast indicates the addition of up to 129 more based aircraft. The mix of based aircraft is anticipated to continue to include a higher percentage of larger business jets. For planning purposes, future hangar space needs are a function of providing 2,500 sf for smaller aircraft and 3,000 sf for larger aircraft.

It is estimated that an additional 394,000 sf of hangar space will be needed over the next 20 years. This hangar space may be accommodated on airport property and within the airpark.

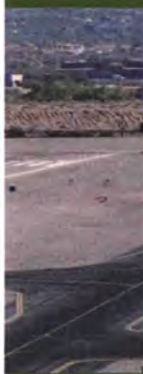
Redevelopment Opportunities

Scottsdale Airport is a mature facility and is fully developed with hangars. As a result, it may be more cost-effective to replace older structures with new and modern facilities. The landside alternatives (to be presented in the next chapter) will consider redevelopment of some hangars if doing so provides for the most efficient development plan.

AIRCRAFT PARKING APRON REQUIREMENTS

Aircraft parking aprons should provide for the locally based aircraft that are not stored in hangars, transient aircraft, and apron areas used for maintenance functions, such as temporary ramp space when moving aircraft around. The aprons at SDL are multi-use, meaning local and itinerant aircraft will both use the aprons—typically at the direction of the fixed base operator (FBO) line services—to maximize apron utilization. As documented in Chapter One, the main terminal apron encompasses approximately 131,000 square yards (sy). The northern portion of the terminal apron includes 24 tiedown positions for smaller aircraft. There are 22 additional tiedown positions north of the terminal area, adjacent to Taxiway A. The other apron areas are under private leaseholds, including the NetJets apron (20,000 sy), the Signature West apron (14,000 sy), and the Signature Main apron (24,000 sy). The total apron area is approximately 189,000 sy.

Table 3T presents the forecasted apron area needs based on standard industry models. The model is a function of busy day itinerant operations and the percentage of those aircraft that may be parked on an apron at one time. The result of the model shows there is a current need for 210,600 sy of aircraft parking apron; therefore, there is a current need for 21,600 sy of new aircraft parking apron. Over the next 20 years, approximately 67,000 sy of aircraft parking apron would be needed. In the alternatives chapter, opportunities to add additional aircraft parking apron will be examined.

	Critical Aircraft	D-II-2B	Maintain
	Runway Design Code	D-II-5000	Maintain
	Visibility Minimums	1-mile	Maintain
	Length x Width	8,249' x 100'	Maintain
	Pavement Weight-Bearing Capacity	45,000 lbs. (S) / 75,000 lbs. (D)	Consider improvement
	Shoulders	10'	Maintain
	Declared Distances	Yes	Review declared distances
	Hold Lines	152' from runway centerline	Evaluate hold lines
	RSA	400' feet wide/1,000' beyond ends	Maintain
	ROFA	630' wide/470' behind Rwy 21/500' behind Rwy 3	Maintain
	OFZ	400' wide/200' beyond ends/meets standard	Maintain
	RPZ	Some incompatible land uses	Remove incompatible land uses
	Width	40'-50'	Maintain existing
	Taxiway Geometry	High-energy crossings, direct access, angled taxiways	Evaluate each taxiway and provide recommendations, in accordance with standards
	Runway/Taxiway Separation	250'	Maintain
	Holding Aprons	Four hold aprons	Maintain
	Aircraft Parking Areas	Terminal, NetJet, Signature East + West	Maximize aircraft parking
	Taxilanes	Parallel taxilanes/apron edge taxilanes	Evaluate separation
	Control Tower	ATCT constructed in 1989	FAA to consider
	Weather Equipment	ASOS	Maintain
	Windsocks	Two (one lighted)	Add wind cone to second
	Visual Approach Aids	PAPI-2L REILs	Upgrade to PAPI-4L Maintain
	Instrument Approach Procedures	Circling and RNP	Consider SRMP for straight-in
	Universal Beacon	Rotating beacon	Maintain
	Runway Edge Lighting	MIRL	Maintain
	Taxiway Edge Lighting	MITL	Maintain
	Runway Markings	Non-precision markings	Maintain
	Hold Bar Location	152' from runway centerline	Maintain
	Signage	Lighted airfield signs	Maintain
	Distance Remaining Signs	Distance remaining signs	Maintain

ASOS - Automated Surface Observation System
ATCT - Airport Traffic Control Tower
ATIS - Automated Terminal Information System

MIRL - Medium Intensity Runway Lighting
MITL - Medium Intensity Taxiway Lighting
PAPI - Precision Approach Path Indicator

MOS -
S -
SRMP -

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TABLE 3T | Aircraft Parking Apron

Factor	Current Need	Short Term	Intermediate Term	Long Term
Busy Day Operations	531	567	586	623
Percentage of Itinerant Operations	79%	79%	80%	82%
Busy Day Itinerant Operations	418	451	470	509
Multiplier (% on ground at once)	35%	35%	35%	35%
Total Itinerant Aircraft Positions	146	158	165	178
Piston Aircraft Positions	29	32	33	36
Turbine Aircraft Positions	117	126	132	143
Total Itinerant Apron Area (sy):	210,600	227,100	236,900	256,600
sy = square yards				
Note: 800 sy per small plane; 1,600 sy per large plane				

AAM/UAM/EVTOL FACILITIES

Advanced air mobility (AAM), urban air mobility (UAM), and electric vertical takeoff and landing (eVTOL) vehicles are terms describing the emergence of a highly anticipated aviation market. This market will use highly automated to fully automated aircraft that will operate and transport passengers and cargo at low altitudes within urban and suburban areas. Within the next two years, several new aircraft are expected to be certified by the FAA for commercial use. These smaller aircraft offer passenger seating for up to six people and are typically battery-powered, have vertical takeoff capability, and fly like fixed-wing aircraft once airborne.

While nearly 100 companies are attempting to enter this emerging market, those closest to commercial viability are looking to establish commuter service in more densely populated markets. The business model is to ferry passengers between destinations, like Uber.

The FAA is currently in the process of developing infrastructure standards for airports to support AAM/UAM activity. In April 2023, the FAA published *Concept of Operations v.2.0 for Urban Air Mobility*. This document, which is a working analysis of the emergence of AAM/UAM, will continue to be updated and includes information about the likely infrastructure needs, including vertiports and vertistops. As this segment of transportation begins, operators are likely to use existing helicopter infrastructure. In March 2022, the FAA issued draft interim guidance via Engineering Brief 105, *Vertiport Design*, for the design and operation of facilities to support AAM/UAM activity. This Engineering Brief will be utilized to guide subsequent planning in this master plan for facilities to support AAM/UAM at SDL.

DRONES/UNMANNED AIRCRAFT SYSTEMS (UAS)

The proliferation of interest in and the use of UAS, or drones, has led to significant policy and regulatory adaptations to integrate these platforms into the airport environment. Operating UAS from airport property is complex. As of this writing (August 2025), the FAA continues to research best practices for UAS integration and has issued numerous publications to inform airport sponsors of various safety considerations.

The FAA organizes small UAS operators into three categories:

1. **Government, Public Safety, and Law Enforcement** | Government functions for authorized public aircraft operations often occur with a certificate of authorization (COA).
2. **Certificated Remote Pilots (Business, Commercial, Non-Profits)** | Most of these operations must comply with Part 107 rules, while operations for package delivery are regulated by Part 135 and operations for dispensing of chemicals or agricultural products are regulated by Part 137.
3. **Recreational/Model Aircraft or for Higher Education** | Operations strictly for enjoyment, fun, or education and research are permissible under U.S. Code (USC) 44809; however, recreational UAS operations are considered a non-aeronautical activity for purposes of airport access under the *Airport Improvement Program Grant Assurances*.

Additionally, airspace access should not be construed as access to the airport. Physical access to the airport is an approval granted by the airport sponsor and governing authority. As the owner/operator of the airport property, airport sponsors have the authority to approve or disapprove a UAS operation requesting access to operate at an airport.

An airport has discretion to permit drone/UAS activity on the airport. Operators may be outside entities or the airport itself (e.g., fence inspections). Typically, dedicated facilities are not required for drone operations; however, there could be a need in the future. Specific drone/UAS facilities are not planned to be incorporated into this master plan, but the airport sponsor should monitor any inquiries and follow the FAA-published best practices to ensure safety.

ELECTRIC CHARGING STATIONS

There is a growing demand for charging stations to support electric vehicles (EV) and aircraft and airports should consider these needs. There are three levels of EV charging:

- **Level 1:** a 120-volt outlet that takes days to fully charge
These have the least impact on existing electrical systems and are best for longer-term parking.
- **Level 2:** a 220-volt outlet that fully charges a vehicle within eight hours
These are the most common chargers in use today.
- **Level 3:** direct-current fast chargers that can fully charge an EV in about 30 minutes
These chargers have a significant impact on existing electrical sources. Good airport locations for these charging stations may be cell phone lots, taxi and rideshare lots, and short-term parking. The installation cost is higher than other charging station types, so airports must weigh the cost-benefit.

Additional study beyond this master plan should be undertaken to determine if the installation of any or all of the charging capability is beneficial. The potential impact on the electrical grid and the potential need to increase capacity at the airport should also be considered. Providing EV charging stations is one step airports can take when embracing sustainability initiatives.

Aircraft that operate on batteries alone are beginning to be utilized. Initially, the AAM/UAM market will have the need for recharging capability; ultimately, general aviation and commercial aircraft will have the need, as well. There are many unknowns when planning for aircraft charging. Planning for this capability will require an understanding of the charging equipment, the location of the charging equipment, and the size of aircraft to be charged. For a general aviation airport, an ideal location would be in proximity to a terminal building or FBO so pilots and passengers have a place to rest comfortably. There could be a need for expanded aircraft apron space near charging stations.

GENERAL AVIATION TERMINAL BUILDING SERVICES

General aviation (GA) terminal buildings generally provide several functions, such as flight planning, a pilots' lounge, airport management offices, and general circulation space. Many airports will also have leasable space in the terminal building for features such as a restaurant or concessions area, FBO line services, and other amenities. It is also common for FBOs to provide many of these services, which is the case at SDL.

The Business Aviation Center at SDL provides some of these functions; however, each FBO has dedicated space for pilots and passengers, including lounge areas, shower facilities, flight planning facilities, and line services.

The methodology used in estimating general aviation terminal facility needs is based on the number of airport users expected to utilize these facilities during the design hour. General aviation space requirements are based on providing 120 sf per design hour itinerant passenger. Design hour itinerant passengers are determined by multiplying design hour itinerant operations by the estimated number of passengers on the aircraft.

By the long-term planning period, approximately 21,505 sf of space should be available for terminal services. Today, the combination of the GA terminal building and FBO-provided terminal services is estimated at 17,000 sf. The calculations described above show the combination of the existing terminal building and the space provided by the FBOs is adequate through the long-term planning period. The existing terminal building is in the ideal location, central to the runway system and fronted by a large transient apron. Because the terminal building also serves as the first introduction travelers may have to the region, it should be maintained and remodeled as necessary to reflect the values of the community.

AUTOMOBILE PARKING

Airport planners should be cognizant of the need for vehicle parking space at general aviation airports. At the same time, parking needs are generally determined by hangar owners' needs. Those operating businesses may have a need for more parking, while private hangars may not have a need for any dedicated parking as their users park in their hangars when utilizing their aircraft. For this reason, it is inherently challenging to estimate future hangar needs.

Parking needs can be divided between transient airport users and locally based users. Transient users include visitors and those employed at the airport, while locally based users primarily include those attending to their based aircraft. Ideally, both user types would have access to dedicated vehicle parking

outside the fence; however, at general aviation airports, it is common for locally based aircraft owners to park in their hangars. Rather than attempt to determine a specific number of vehicle positions needed in the future, developers should include vehicle parking in their development plans, where necessary.

The managers of each FBO were interviewed early in the master planning process. Each indicated that customer vehicle parking was a significant issue. This problem is particularly acute for Atlantic Aviation because its facilities are used in support of the JSX scheduled charter flights.

The airport has considered the idea of constructing a parking structure in proximity to the Aviation Business Center. This concept will be examined in the alternatives chapter along with other opportunities to increase vehicle parking at the airport.

SUPPORT FACILITIES

Various facilities that do not logically fall within the airside or landside classification are examined in this support facilities section. These support facilities relate to the overall operations of the airport.

FUEL STORAGE

Fuel sales are primarily managed by the fuel providers on the airport, which own and operate their own fuel storage and delivery vehicles; therefore, it is a business decision if additional fuel storage capacity is needed. Among the FBOs, the existing total fuel capacity is:

- Jet A fuel – 135,000 gallons of static storage and 79,000 gallons of fuel truck storage
- AvGas fuel – 55,000 gallons of static storage and 5,000 gallons of fuel truck storage

In addition, there are currently 27 fuel farm facility permits for self-fueling of personal aircraft. Nearly all of these are off airport property in the airpark. Each permit may cover more than one aircraft owner.

Sustainable and Alternative Fuels

In recent years, there has been significant movement in the development of alternative and sustainable aviation fuels (SAFs). SAF is developed from a more sustainable source than traditional fossil fuels and has the effect of reducing emissions when compared to fossil fuels. In fact, each of the FBO's at SDL offer SAF through the Book & Claim process, which is essentially the ability to buy SAF credits at SDL without physically taking on the fuel. Alternative aviation fuels include unleaded AvGas, batteries, and hydrogen power. Generally, these aviation fuel options will require dedicated storage capacity and delivery vehicles; therefore, additional space may need to be reserved to support the installation of infrastructure to support alternative and sustainable fuel options at the airport.

PERIMETER FENCING

At general aviation airports, full perimeter fencing is not required like it is at commercial service airports. Perimeter fencing serves multiple purposes, including basic airfield security and wildlife deterrence. As

development occurs around general aviation airports, the need for full perimeter fencing becomes more necessary, especially for airports in developed environments, like SDL.

Perimeter fencing is used at airports primarily to secure the aircraft operational area. The physical barrier of perimeter fencing provides the following functions:

- Gives notice of the legal boundary of the outermost limits of a facility or security-sensitive area
- Assists in controlling and screening authorized entries into a secured area by deterring entry elsewhere along the boundary
- Supports surveillance, detection, assessment, and other security functions by providing a zone for installing intrusion-detection equipment and closed-circuit television (CCTV)
- Deters casual intruders from penetrating a secure area by presenting a barrier that requires an overt action to enter
- Demonstrates the intent of an intruder by their overt action of gaining entry
- Causes a delay in gaining access to a facility, thereby increasing the possibility of detection
- Creates a psychological deterrent
- Optimizes the use of security personnel while enhancing the capabilities for detection and apprehension of unauthorized individuals
- Demonstrates a corporate concern for facilities
- Limits inadvertent access to the aircraft operations area by wildlife

Scottsdale Airport's air operations areas are completely enclosed with six-foot-tall chain-link fence topped by three-strand barbed wire, eight-foot-tall chain-link fence, or other walls that are eight feet tall. Several access-controlled and manual gates associated with the fencing lead to different areas on the airfield.

In addition, there are six controlled-access gates leading to and from private entities located within designated areas associated with the Scottsdale Airpark. Certain parcels on the east side of the airfield are also located within the Scottsdale Airpark but are granted direct access to the airfield without having to enter through a controlled-access gate. These direct-access properties are required to maintain a security plan that demonstrates the ability to meet the functions listed above in order to enhance safety and security at Scottsdale Airport.

The airport should continuously monitor the condition of the perimeter barriers and fencing. Any deterioration or damage should be repaired or replaced as soon as possible.

AIRPORT ACCESS

Primary access to the airport is E Butherus Drive, which extends from the intersection with N Scottsdale Road. E Butherus Drive is a four-lane divided boulevard-type road that terminates at N Airport Drive immediately across from the Aviation Business Center. Airport Drive provides access to most on-airport facilities on the west side of the airfield. Various surface roads within the Scottsdale Airpark provide access to other aviation facilities on both sides of the airport.

Interior to the airport is a perimeter service road that is for the exclusive use of authorized airport staff. This interior road is not available to the public to move from one side of the airport to the other.

AIRPORT MAINTENANCE FACILITIES

In 2017, the airport constructed a new 10,000-sf Airport Operations Center. This two-story facility has eight vehicle bays and operations offices. All airport maintenance equipment is housed in this facility. This facility is in excellent condition and should be maintained through the planning period.

WASH RACKS

There is one aircraft wash rack on the airport. The public wash rack is on the north end of the airfield adjacent to the Kilo connected box hangars. This facility is adequate and should be maintained through the planning period.

AIRCRAFT RESCUE AND FIREFIGHTING FACILITIES (ARFF)

Airports that are certificated under Title 14 CFR Part 139 with a commercial operating certificate, are required to meet certain on-site firefighting capabilities. SDL is not a certified commercial service airport; therefore, it is not required to have on-site ARFF capability. The City of Scottsdale owns and maintains an ARFF-certified fire station at the airport to provide an additional level of safety for airport users. The station house has two ARFF crash trucks, is staffed 24 hours a day, and responds to both on-airport and off-airport emergencies.

The availability of ARFF services is a benefit to airport users; many charter and fractional aircraft operators will only use airports with ARFF capability. Several of these charter and fractional operators have invested significantly into facilities at SDL because of the availability of ARFF services. The airport and the City of Scottsdale should maintain ARFF services at the airport.

LANDSIDE SUMMARY

This section has documented the potential needs of the airport for landside facilities. The most prominent landside facility for general aviation airports is the aircraft storage hangars. Aircraft hangars range in size from small single-unit hangars to large corporate or FBO hangars. SDL currently provides a variety of hangar types. The on-airport hangar development areas are currently fully built out; therefore, the airport may want to identify older hangars that have reverted or are about to revert to airport ownership for potential redevelopment.

The airport is forecasted to need approximately 394,000 sf of new aircraft storage space within the next 20 years. This can be accommodated both on the airport (through redevelopment) or in the Scottsdale Airpark.

The airport has a high need for additional aircraft parking apron. Industry models resulted in an immediate need for an additional 21,600 sy of apron and a total long-term need of 67,600 sy. The airport and tenants will likely have to find a balance between offering hangar space and apron space. For example, it could be beneficial to remove an old hangar and replace it with apron space rather than a replacement hangar.

The terminal facilities at SDL are adequate. The airport provides the Aviation Business Center, which also contains event space and a popular restaurant. The FBOs provide traditional general services like line services, lounges, and pilot facilities. Each FBO facility is constructed to a high standard and represents the Scottsdale community well. If additional terminal space is needed, the FBOs will make that decision and investment.

Exhibit 3K summarizes the landside facility needs for the 20-year forecast period.

In the next chapter of this master plan, various development alternatives and hangar layout concepts will be presented. The alternatives will include accommodations for the identified needs.

SUMMARY

This chapter outlines airside and landside facility requirements for SDL for a 20-year planning period.

At its current length of 8,249 feet, Runway 3-21 meets the needs of most current airport users. The airport supports a wide range of aircraft types and sizes, including the largest business jets in the general aviation fleet. This capability is important, as SDL is a reliever airport. Analysis in this chapter showed that some operators would benefit from a longer runway, however, SDL is likely constrained from adding runway length.

The ROFA dimensions and the runway-to-taxiway separation standard have been modified based on an FAA approved Modification of Standards. During the master planning process is the appropriate time to revisit any MOS. The alternatives chapter will revisit the MOS in place at the airport.

On the landside, it is anticipated that the airport (including the Scottsdale Airpark) could need approximately 394,000 square feet of new aircraft hangar space. The airport is also in need of additional aircraft parking apron space. Opportunities to meet these needs will be examined in the alternatives chapter.

The following chapter will consider various airside and landside layouts to address forecasted growth at Scottsdale Airport.

	CURRENTLY AVAILABLE	20-YEAR PROJECTED NEED	DIFFERENCE
Aircraft Hangar Needs	Approx. 500,000 sf	Approx. 894,000 sf.	394,000 sf.
Aircraft Parking Apron Needs	189,000 sy.	256,600 sy.	67,600 sy.
Terminal Service Needs	17,000 sf.	21,500 sf.	4,500 sf.
Public Auto Parking	More needed currently	Consider parking structure/construct parking with each new hangar	
Fuel Storage Capacity			
Jet A	178,000 gallons	Based on FBO needs	
AvGas 100LL	58,100 gallons		
Perimeter Fencing	Chain-link fencing with barbed wire, various walls	Maintain full perimeter fencing and walls	
Maintenance Facilities	Airport Operations Center	Maintain	
Wash Racks	One public	Maintain	
ARFF Facility	On-airport	Maintain	





Chapter 4

Alternatives



Chapter 4

Alternatives



In the previous chapter, the aviation facilities required to satisfy airside and landside demand through the long-term planning period of the master plan were identified. In addition, several Federal Aviation Administration (FAA) standards were discussed that apply to airfield design. The next step in the planning process is to evaluate reasonable ways these facilities can be provided while also meeting design standards. The purpose of this chapter is to formulate and examine rational development alternatives that address the short-, intermediate-, and long-term planning horizon levels. Because there are a multitude of possibilities and combinations, it is necessary to focus on those opportunities that have the greatest potential for success. Each alternative provides a different approach to meeting existing and future facility needs; these layouts are presented for purposes of evaluation and discussion.

Some airports become constrained due to limited availability of space, while others may be constrained due to adjacent land use development or geographical features. Careful consideration should be given to the layout of future facilities and impacts to potential airfield improvements at Scottsdale Airport (SDL). Proper planning at this time can ensure the long-term viability of the airport for aviation and economic growth.



The primary goal of this planning process is to develop a feasible plan to meet the needs of the projected market demand over the next 20 years. The plan of action should be developed in a manner that is consistent with the future goals and objectives of the City of Scottsdale, airport leadership, and airport stakeholders, including users of the airport and the local community and region, all of whom have a vested interest in the development and operation of SDL.

The goal is to develop an underlying rationale that supports the recommended development plan, which will be presented in Chapter Five. Through this process, an evaluation of the highest and best uses of airport property will be made, while also weighing local development goals, efficiency, physical and environmental factors, capacity, and appropriate safety design standards.

The alternatives presented in this chapter have been formulated as potential ways to meet the overall program objectives for the airport, and to do so in a balanced manner. Through coordination with SDL management, the Planning Advisory Committee (PAC), and the public, an alternative (or combination of alternatives) will be refined and modified as necessary into a recommended development concept. Therefore, the planning considerations and future alternatives presented in this chapter can be considered as the starting points in the evolution of a recommended development concept for the future of SDL.

It should be noted that all the development alternatives presented in this chapter are conceptual in nature and are subject to further engineering refinement as the projects move to the implementation phase. All the alternatives represent a possible future condition. In fact, the recommended development concept, to be presented in the next chapter, is one option that may be further refined in the future.

PLANNING OBJECTIVES

A set of basic planning objectives has been established to guide the alternatives development process. It is the goal of this master planning effort to produce a development plan for the airport that addresses forecast aviation demand and meets FAA design standards to the greatest degree possible. The aviation department provides the overall guidance for the operation and development of the airport. It is of primary concern that SDL is marketed, developed, and operated for the betterment of the community and its users. The following basic planning principles and objectives will be utilized as general guidelines during this planning effort:

- To develop a safe, attractive, and efficient aviation facility in accordance with applicable federal, state, and local regulations;
- To preserve and protect public and private investments in existing airport facilities;
- To provide a means for the airport to grow as dictated by demand;
- To put into place a plan to ensure the long-term viability of the airport as well as to promote compatible land uses surrounding the airport;
- To develop a facility that is readily responsive to the changing needs of all aviation users;
- To be reflective and supportive of the long-term planning efforts currently applicable to the region;
- To develop a facility with a focus on self-sufficiency in both operational and developmental cost recovery; and,
- To ensure that future development is environmentally compatible.

The development alternatives are categorized into two functional areas: airside and landside. The airside relates to runways, taxiways, navigational aids, lighting and marking aids, etc., which require the greatest commitment of land area to meet the physical layout of an airport, as well as the required airfield safety standards. The design of the airfield also defines minimum separation distances from the runway and object clearance standards. These criteria are defined first to ensure the fundamental needs of SDL are met. The landside element includes terminal services, hangars, aircraft parking aprons, as well as utilization of remaining property to provide revenue support for the airport and to benefit the economic development and well-being of the region.

Each functional area interrelates and affects the development potential of the others. Therefore, all areas are examined individually, and then as a whole, to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors must be evaluated to determine if the investment in SDL will meet the needs of the surrounding area, both during and beyond the planning period of this study.

PREVIOUS AIRPORT PLANS

The previous master plan for SDL was completed in 2015 and had a forecast base year of 2012. **Exhibit 4A** shows the master plan concept from the 2015 master plan. It included numerous proposed development projects, many of which have been completed. It also included various redevelopment plans, including the now existing Aviation Business Center.

The airport layout plan (ALP) from the 2015 master plan has been updated several times. These updates included application of the FAA-approved Modification of Standard (MOS) detailed in Chapter Three, several through-the-fence taxilane connectors, and the completed reconfiguration of the north aircraft holding bays and of Taxiway A13.

The currently approved ALP and data sheet are shown on **Exhibit 4B**. The drawing graphically depicts both airside and landside recommendations based upon previous airport planning efforts that include:

- Planned new Taxiways B2, B9, and B15
- Planned new hangars at the south end of the terminal apron, one of which has been completed
- Redevelopment of certain hangar areas (south end – current Jet Aviation hangar)

The analysis presented in this chapter will revisit the recommendations presented on the ALP, as well as in the previous master plan. Since completion of the last master plan, the FAA has made significant modifications to airfield design standards, as outlined in the previous chapter. As such, some of the previous plan's elements may be carried over to this master plan, while others may be changed or removed from further consideration.

NO ACTION/NON-DEVELOPMENT ALTERNATIVES

The aviation department is charged with managing the airport for the economic betterment of the community and region. SDL is a vibrant facility with a substantial economic impact on the region.

An analysis of the economic benefit of the airport, completed in 2021, found that SDL generates more than \$1.0 billion annually in total economic output and nearly 5,970 jobs.

In any alternatives evaluation, a no-action option should be considered. Under a no-action plan, the airport would remain in its existing condition. No new development would be planned, and no significant investment would be made into existing infrastructure such as the runways, taxiways, and aprons. This would be inconsistent with the long-term goals of the FAA and the City of Scottsdale, which is to maintain a safe and effective facility that is compatible with the surrounding environment. SDL is an important economic engine for the region and choosing not to adequately maintain the facility would ultimately lead to a negative economic impact.

Relocation of services to another airport, or development of a new airport site, is another potential no-action alternative. Closing SDL and moving all aeronautical activity to other airports would not be in the best interest of the City of Scottsdale. More than \$1.0 billion in economic output would be lost. Therefore, closing SDL and relocating aviation service and aircraft to other airports is not considered viable.

The development of a new airport is a very complex and expensive option. A new site will require greater land area, duplication of investment in facilities, installation of supporting infrastructure that is already available at the existing site, and greater potential for negative impacts to natural, biological, and cultural resources. This master plan will not consider relocation of services or development of a new airport as viable alternatives.

The purpose of this master plan is to examine aviation needs at SDL over the course of the next 20 years. Therefore, this master plan will examine the needs of the existing airport and present a program of potential capital improvement projects to cover the scope of the plan. The airport is a lucrative business, transportation utility, and economic asset for the region. It can accommodate existing and future demand and should be developed accordingly to support the interests of residents and businesses which rely upon it. Ultimately, the final decision regarding development rests with the City of Scottsdale, ADOT, and the FAA on an individual project basis. The analysis to follow covers airside and landside development alternatives that consider an array of facility demands, including safety, capacity, access, and efficiency.

AIRSIDE ALTERNATIVES

The airside relates to the runway and taxiway system. The airside alternatives analysis will examine specific elements individually, then combine various viable solutions into several consolidated airside alternatives. The alternatives process often includes presenting options that are clearly not feasible to document exactly why those options should not be further considered. Ultimately, a decision will be made following consultation with the various airport stakeholders as to the most appropriate plan.

Exhibit 3J previously presented a summary of the primary airside planning considerations for the alternatives analysis. These considerations are the result of the findings of the aviation demand forecasts and facility requirements evaluations, as well as input from airport stakeholders.

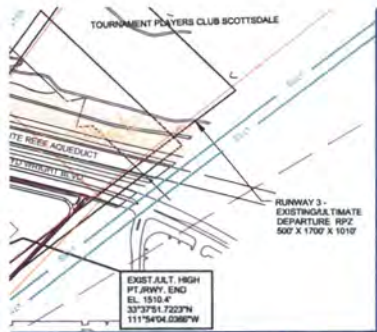
Category	Runway 3	Runway 21
TORA	8,249'	8,249'
TODA	8,249'	8,249'
ASDA	7,849'	8,069'
LDA	7,110'	7,669'
Total Pavement Length: 8,249'		
KEY	ASDA - Accelerate-Stop Distance Available	
	LDA - Landing Distance Available	
	TODA - Takeoff Distance Available	
	TORA - Take Off Run Available	

SCALE IN FEET

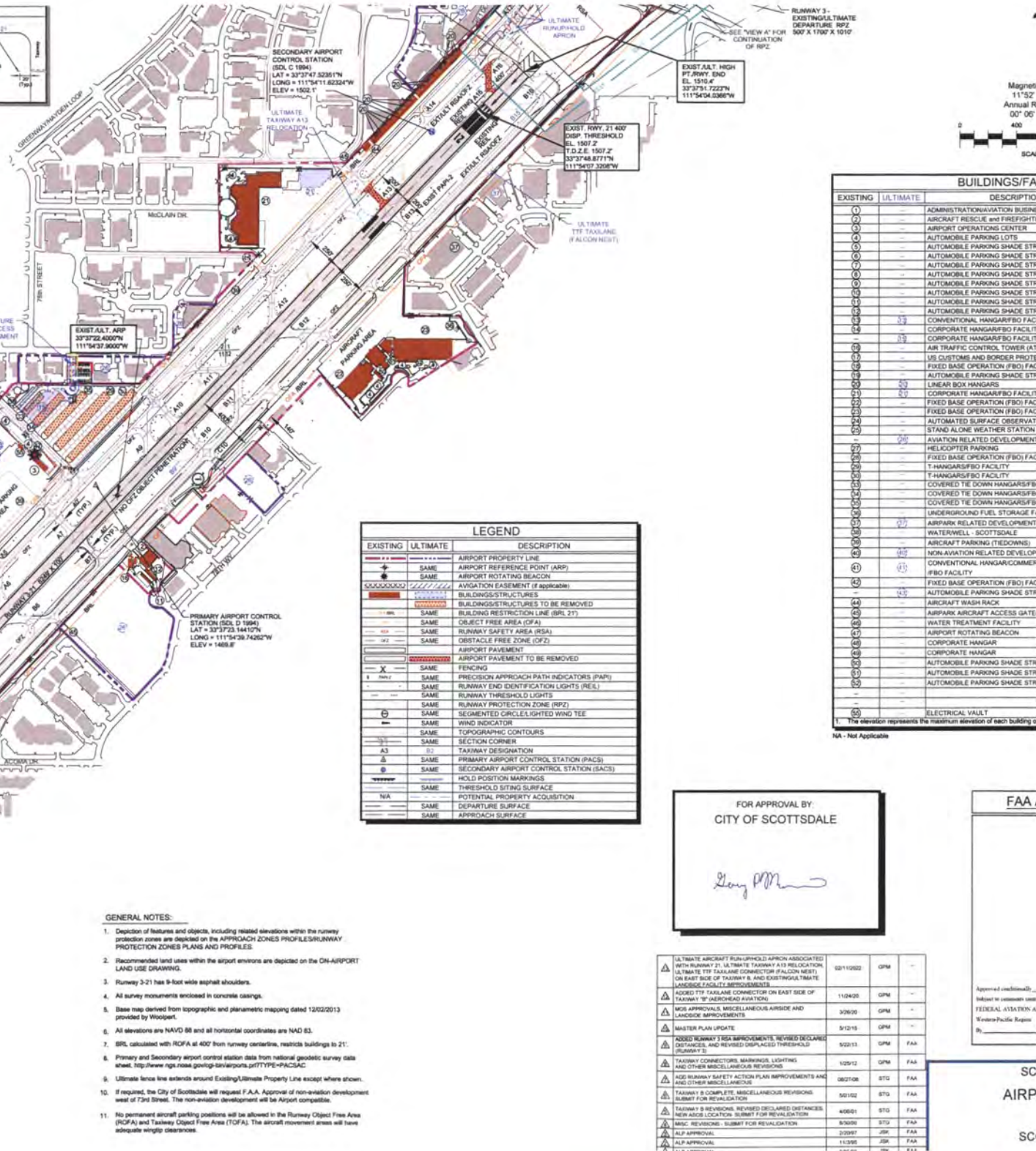


address
per FAA
Airport Design





"VIEW A"



EXISTING	ULTIMATE	DESCRIPTION
---	---	AIRPORT PROPERTY LINE
---	---	AIRPORT REFERENCE POINT (ARP)
---	---	AIRPORT ROTATING BEACON
---	---	AVIGATION EASEMENT (if applicable)
---	---	BUILDINGS/STRUCTURES
---	---	BUILDINGS/STRUCTURES TO BE REMOVED
---	---	BUILDING RESTRICTION LINE (BRL 21)
---	---	OBJECT FREE AREA (OFA)
---	---	RUNWAY SAFETY AREA (RSA)
---	---	OBSTACLE FREE ZONE (OFZ)
---	---	AIRPORT PAVEMENT TO BE REMOVED
---	---	FENCING
---	---	PRECISION APPROACH PATH INDICATORS (PAPI)
---	---	RUNWAY END IDENTIFICATION LIGHTS (REIL)
---	---	RUNWAY THRESHOLD LIGHTS
---	---	RUNWAY PROTECTION ZONE (RPZ)
---	---	SEGMENTED CIRCLED LIGHTED WIND TEE
---	---	WIND INDICATOR
---	---	TOPOGRAPHIC CONTOURS
---	---	SECTION CORNER
---	---	TAXIWAY DESIGNATION
---	---	PRIMARY AIRPORT CONTROL STATION (PACS)
---	---	SECONDARY AIRPORT CONTROL STATION (SACS)
---	---	THRESHOLD POSITION MARKINGS
---	---	POTENTIAL PROPERTY ACQUISITION
---	---	DEPARTURE SURFACE
---	---	APPROACH SURFACE

GENERAL NOTES:

- Depiction of features and objects, including related elevations within the runway protection zones are depicted on the APPROACH ZONES PROFILE/RUNWAY PROTECTION ZONES PLANS AND PROFILES.
- Recommended land uses within the airport environs are depicted on the ON-AIRPORT LAND USE DRAWING.
- Runway 3-21 has 9-foot wide asphalt shoulders.
- All survey monuments enclosed in concrete casing.
- Base map derived from topographic and planimetric mapping dated 12/02/2013 provided by Woodport.
- All elevations are NAVD 88 and all horizontal coordinates are NAD 83.
- SRL calculated with ROFA at 400' from runway centerline, restricts buildings to 21'.
- Primary and Secondary airport control station data from national geodetic survey data sheet. <http://www.ngs.noaa.gov/govt-srvs/airports/prtTYPE-PAC/SAC>
- Ultimate fence line extends around Existing/Ultimate Property Line except where shown.
- If required, the City of Scottsdale will request FAA Approval of non-aviation development west of 73rd Street. This non-aviation development will be Airport compatible.
- No permanent aircraft parking positions will be allowed in the Runway Object Free Area (ROFA) and Taxiway Object Free Area (TOFA). The aircraft movement areas will have adequate wingtip clearances.

FOR APPROVAL BY:
CITY OF SCOTTSDALE

Long PM

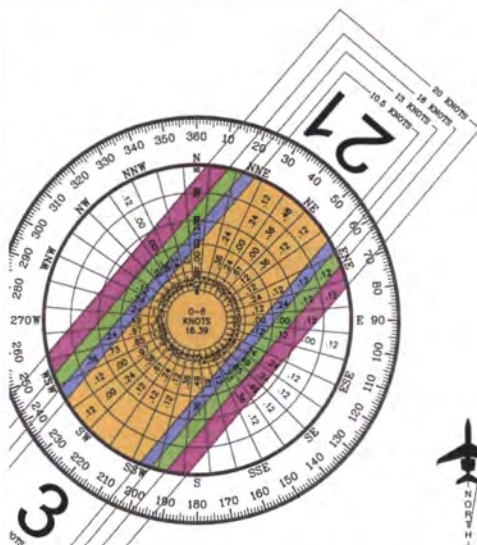
ULTIMATE AIRCRAFT RUN-UP/STOPPED APRON ASSOCIATED WITH RUNWAY 21; ULTIMATE TAXIWAY A13 RELOCATION; ULTIMATE TTF TAXIWAY CONNECTOR (IF ALCON NEXT) ON EAST SIDE OF TAXIWAY 8; AND EXISTING/ULTIMATE LANDSIDE FACILITY IMPROVEMENTS	02/11/2022	CPM	--
ADD TTF TAXIWAY CONNECTOR ON EAST SIDE OF TAXIWAY 8; AND EXISTING/ULTIMATE LANDSIDE FACILITY IMPROVEMENTS	11/04/20	CPM	--
MSR APPROVALS, MISCELLANEOUS AIRSIDE AND LANDSIDE IMPROVEMENTS	3/26/20	CPM	--
MASTER PLAN UPDATE	5/12/15	CPM	--
ADD RUNWAY 3 REA IMPROVEMENTS, RE-REVIEW DECLARED DISTANCES, AND RE-REVIEW DISPLACED THRESHOLD (RUNWAY 3)	5/22/13	CPM	FAA
FAA APPROVALS, MISCELLANEOUS AIRSIDE AND LANDSIDE IMPROVEMENTS	1/29/12	CPM	FAA
ADD RUNWAY SAFETY ACTION PLAN IMPROVEMENTS AND OTHER MISCELLANEOUS	08/27/08	STG	FAA
TAXIWAY 8 COMPLETE, MISCELLANEOUS REVISIONS, SUBMIT FOR RE-EVALUATION	06/10/02	STG	FAA
TAXIWAY 8 REVISIONS, RE-REVIEW DECLARED DISTANCES, NEW ADDS LOCATION, SUBMIT FOR RE-EVALUATION	4/06/01	STG	FAA
MISC. REVISIONS - SUBMIT FOR RE-EVALUATION	5/30/00	STG	FAA
ALP APPROVAL	2/20/97	JPM	FAA
ALP APPROVAL	11/23/95	JPM	FAA

Approved on condition...
Subject to comments from
FEDERAL AVIATION A
Western-Pacific Region
By: _____

SC
AIRP
SC

IFR WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 3-21	92.17%	95.17%	97.53%	98.93%



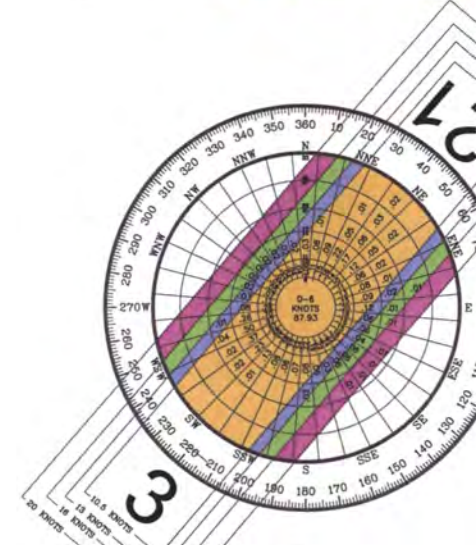
SOURCE:
NOAA National Climatic Center
Aberdeen, North Carolina
Scottsdale Airport
Scottsdale, Arizona
OBSERVATIONS:
804 UPS Observations
2002-2012

Magnetic Declination
11°52' East (2015)
Annual Rate of Change
00° 06' West (2015)



ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 3-21	99.22%	99.93%	99.91%	100%



SOURCE:
NOAA National Climatic Center
Aberdeen, North Carolina
Scottsdale Airport
Scottsdale, Arizona
OBSERVATIONS:
804 UPS Observations
2002-2012

	3	21	3	21
RUNWAY DESIGN CODE (RDC)	D-II-5000		SAME	
APPROACH REFERENCE CODE	8/II-5000		SAME	
DEPARTURE REFERENCE CODE	B/I		SAME	
RUNWAY AZIMUTH (TRUE)	43.99°	224.00°	SAME	SAME
RUNWAY BEARING (TRUE)	N 43°59'10.164" E		SAME	
APPROACH TYPE	NON-PRECISION	NON-PRECISION	SAME	SAME
PART 77 APPROACH CATEGORY	34:1	34:1	SAME	SAME
APPROACH VISIBILITY MINIMUMS	≥1 MILE	≥1 MILE	SAME	SAME
RUNWAY DEPARTURE SURFACE	40:1	40:1	SAME	SAME
TYPE OF AERONAUTICAL SURVEY REQUIRED	NON-VERTICALLY GUIDED		SAME	
THRESHOLD SITING SURFACE	20:1	20:1	SAME	SAME
DESIGN AIRCRAFT	GULFSTREAM IV		SAME	
DESIGN AIRCRAFT UNDERCARRIAGE WIDTH (FEET)	13.66'		SAME	
DESIGN AIRCRAFT WINGSPAN	77.83'		SAME	
DESIGN AIRCRAFT TAIL HEIGHT	24.42'		SAME	
RUNWAY LENGTH	8249'		SAME	
RUNWAY WIDTH	100'		SAME	
RUNWAY END ELEVATION	1444.3'	1510.4'	SAME	SAME
TOUCH DOWN ZONE ELEVATION	1469.4'	1507.2'	SAME	SAME
DISPLACED THRESHOLD	740'	400'	SAME	SAME
EFFECTIVE RUNWAY GRADIENT	0.81%		SAME	
MAXIMUM GRADIENT	0.96%		SAME	
RUNWAY SURFACE TYPE	ASPHALT		SAME	
RUNWAY PAVEMENT STRENGTH (in thousand lbs.) ³	45(S), 75(D)		SAME	
RUNWAY SURFACE TREATMENT	NONE		SAME	
RUNWAY LIGHTING	MIRL	MIRL	SAME	SAME
RUNWAY MARKING	NON-PRECISION	NON-PRECISION	SAME	SAME
VISUAL AND NAVIGATIONAL AIDS	PAPI-2 REILs GPS RNP VOR ROTATING BEACON		SAME	SAME
RUNWAY SAFETY AREA BEYOND STOP END ¹	1000'	1000'	SAME	SAME
RUNWAY SAFETY AREA WIDTH	400'		SAME	
OBJECT FREE AREA BEYOND STOP END ²	800'	800'	SAME	SAME
OBJECT FREE AREA WIDTH ²	1000'		SAME	
OBSTACLE FREE ZONE BEYOND STOP END (ACTUAL)	200'	200'	SAME	SAME
OBSTACLE FREE ZONE WIDTH	400'		SAME	
RUNWAY PROTECTION ZONE	500'x1700' x1010'	500'x1700' x1010'	SAME	SAME
TAXIWAY DESIGN GROUP (TDG)	TDG-2		SAME	
TAXIWAY WIDTH	40-50'		SAME	
TAXIWAY OBJECT FREE AREA WIDTH	131'		SAME	
TAXIWAY SAFETY AREA WIDTH	79'		SAME	
TAXIWAY WING TIP CLEARANCE	26'		SAME	
TAXIWAY CL TO FIXED OR MOVEABLE OBJECT	65.5'		SAME	
TAXIWAY LIGHTING	MTL		SAME	

¹ Based on the Declared Distances.

² Runway Object Free Area does not reflect existing conditions. Actual width is 630'. Actual distance beyond each runway end is 470' for Runway 3 and is 30' for Runway 21.

³ Pavement strengths are expressed in Single(S), Dual(D) wheel loading capacities.

LARED DISTANCES

	RUNWAY	
	3	21
ILABLE (TORA)	8249'	8249'
E AVAILABLE (TODA)	8249'	8249'
P DISTANCE AVAILABLE (ASDA)	7849'	8069'
E AVAILABLE (LDA)	7110'	7669'

RUNWAY END COORDINATES (NAD 83)	EXISTING	ULTIMATE
RUNWAY 3	Latitude 33°36'53.0202"N Longitude 111°59'11.7720"W	SAME
RUNWAY 21	Latitude 33°37'51.7223"N Longitude 111°54'04.0366"W	SAME
RUNWAY 3 DISPLACED THRESHOLD	Latitude 33°36'58.2827"N Longitude 111°55'05.7057"W	SAME
RUNWAY 21 DISPLACED THRESHOLD	Latitude 33°37'48.8771"N Longitude 111°54'07.3208"W	SAME

NOTE: Existing runway and ARP coordinates provided by the FAA's Aviation System Standards (AVN) (2015).

AIRPORT DATA

SCOTTSDALE AIRPORT (SDL)			
CITY: SCOTTSDALE, ARIZONA	COUNTY: MARICOPA COUNTY, ARIZONA	TOWNSHIP: 3 NORTH	CIVIL TOWNSHIP: N/A
RANGE: 4 EAST			EXISTING
NPAS SERVICE LEVEL			RELIEVER
STATE SERVICE ROLE			GENERAL AVIATION/RELIEVER
CRITICAL DESIGN AIRCRAFT			GULFSTREAM IV
AIRPORT REFERENCE CODE (ARC)			D-II
AIRPORT ELEVATION (ABOVE MEAN SEA LEVEL)			1510.3'
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH			104.8°F (July)
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	33°37'22.4000"N	
	Longitude	111°54'37.9000"W	
AIRPORT NAVIGATIONAL AIDS			PAPI-2 REILs GPS RNP VOR ROTATING BEACON
MISCELLANEOUS FACILITIES			LIGHTED WIND CONE ASOS ATCT

MODIFICATIONS OF AIRPORT DESIGN STANDARDS APPROVAL TABLE

ID (ON)	AFFECTED DESIGN STANDARD	STANDARD	EXISTING	DESCRIPTION OF MODIFICATION	SUBMITTAL DATE	APPROVAL DATE	APPROVAL NO.	AIRSPACE CASE NO.
	AC 150/5300-13A-Change 1	1,000'	470'	The airport's blast fence and perimeter service road as well as Frank Lloyd Wright Boulevard and Central Arizona Project (CAP) canal penetrate the ROFA beyond the departure end of Runway 3. It is not practicable to remove/relocate these facilities due to the environmental impacts, construction costs, and impacts to adjacent off-airport facilities.	10/29/2014	12/3/2018	SDL-MOS1	--
	AC 150/5300-13A-Change 1	1,000'	30'	The airport's perimeter service road as well as Redfield Road penetrate the ROFA beyond the departure end of Runway 21. It is not practicable to remove/relocate these facilities due to construction costs and impacts to adjacent off-airport facilities.	10/29/2014	12/3/2018	SDL-MOS1	--
th	AC 150/5300-13A-Change 1	800'	630'	Several on-airport and off-airport facilities penetrate the ROFA on the east and west sides of the runway system. It is not practicable to remove/relocate these facilities due to the environmental impacts, construction costs, and impacts to off-airport facilities.	10/29/2014	12/3/2018	SDL-MOS1	--
	AC 150/5300-13A-Change 1	300'	250'	The relocation of parallel Taxiways A and B would create significant impacts to on-airport and off-airport facilities. It is not practicable to relocate the taxiways due to property acquisition costs, reduced airfield efficiency and capacity, and impacts to off-airport facilities.	10/29/2014	12/3/2018	SDL-MOS3	--
	AC 150/5300-13A-Change 1	250'	152'	The holding position location is dependent on the runway-to-parallel taxiway separation. It is not practicable to relocate parallel Taxiways A and B. The Safety Risk Management Document (August 2013) further indicated that a hold position relocation change cannot be introduced into the National Airspace System with an acceptable level of risk.	10/29/2014	Pending	Pending	--
	AC 150/5300-13A-Change 1	400'	325'	Several on-airport and off-airport facilities penetrate the runway centerline to aircraft parking area on the east and west sides of the runway system. It is not practicable to remove/relocate these facilities due to reduced airfield efficiency and capacity, property acquisition costs, and impacts to off-airport facilities.	10/29/2014	12/3/2018	SDL-MOS4	--

ULTIMATE AIRCRAFT RUN-UP/STOP/TURN ASSOCIATED WITH RUNWAY 21 ULTIMATE TAXIWAY A13 RELOCATION, ULTIMATE T13 TAXIWAY CORRECTOR (PACON WEST) ON EAST SIDE OF TAXIWAY B, AND EXISTING/ULTIMATE AIRCRAFT FACILITY IMPROVEMENTS	01/12/2022	OPN	--
ADDED T13 TAXIWAY CORRECTOR ON EAST SIDE OF TAXIWAY "B" (AHEAD OF AVIATION)	11/24/20	OPN	--
ADDED APPROVALS MISCELLANEOUS AIRPORT AND LANDSIDE IMPROVEMENTS	5/26/20	OPN	--
MASTER PLAN UPDATE	5/12/18	OPN	--
ADDED RUNWAY 3 IMPROVEMENTS, REVISED DECLARED DISTANCES, AND REVISED DISPLACED THRESHOLD RUNWAY 3	5/22/13	OPN	FAA
TAXIWAY CORRECTOR, MARKINGS, LIGHTING AND OTHER MISCELLANEOUS	10/12/12	OPN	FAA
ADDED RUNWAY SAFETY ACTION PLAN IMPROVEMENTS AND OTHER MISCELLANEOUS	08/27/08	STG	FAA
TAXIWAY B COMPLETE MISCELLANEOUS REVISIONS SUBMIT FOR REVALUATION	5/1/02	STG	FAA
TAXIWAY B REVISIONS, REVISED DECLARED DISTANCES, NEW ASOS LOCATION, SUBMIT FOR REVALUATION	4/26/01	STG	FAA
MISC. REVISIONS, SUBMIT FOR REVALUATION	8/30/00	STG	FAA
ALP APPROVAL	2/20/97	OPN	FAA
ALP APPROVAL	11/13/95	OPN	FAA

SCOTTSDALE
AIRPORT
SCOTTSDALE

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RUNWAY DESIGN CODE (RDC)

As a reminder the RDC for a given runway is a function of the frequency of use of the runway by aircraft type (or family of aircraft with similar design characteristics) and the instrument approach visibility minimums. The established RDC then determines the applicable design standards for that runway.

The FAA-approved RDC for Runway 3-21 is D-II-5000, as detailed in the previous chapter. However, it was established that there are frequent operations by aircraft that fall within RDC D-III-5000. Over many years of study, it has been determined that the runway is incapable of fully meeting the design standards associated with D-III-5000. Because of this, the FAA has approved three Modifications of Standards (MOS) and approved the D-II-5000 RDC. Where feasible, the runway should be planned to accommodate the D-III-5000 design standards. Therefore, a review of each design standard is undertaken to determine if incremental improvements can be made toward the D-III-5000 design standards or if the status quo is more appropriate.

CONSIDERATION #1 – RUNWAY TO TAXIWAY SEPARATION

Both parallel taxiways are 250 feet, centerline to centerline, from Runway 3-21. The D-III standard is 400 feet, and the D-II standard is 300 feet. The FAA approved an MOS in 2019 for the parallel taxiways to remain in their current location. The analysis to follow will re-examine the feasibility of meeting the D-II standard of 300 feet because D-II is the FAA-approved RDC for the runway.

TABLE 4A | Runway/Taxiway Separation Standards

Design Element	Runway Design Standard		Currently Available
	D-III-5000 ¹	D-II-5000 ²	D-II-5000
Runway to Taxiway Separation	400'	300'	250' ³
¹ Operational critical aircraft			
² FAA approved critical aircraft (8/28/2025)			
³ FAA modification of standard approved on 1/3/2019			

Source: FAA AC 150/5300-13B, Airport Design

To meet the 300-foot standard for runway to taxiway separation, substantial reconfigurations of facilities on both the east and west sides of the runway system would be needed. These reconfigurations would significantly limit aircraft movements and staging, reduce airfield capacity, increase runway crossings, and incur substantial costs for private land and building acquisition and “buy-back” of airport property leaseholds.

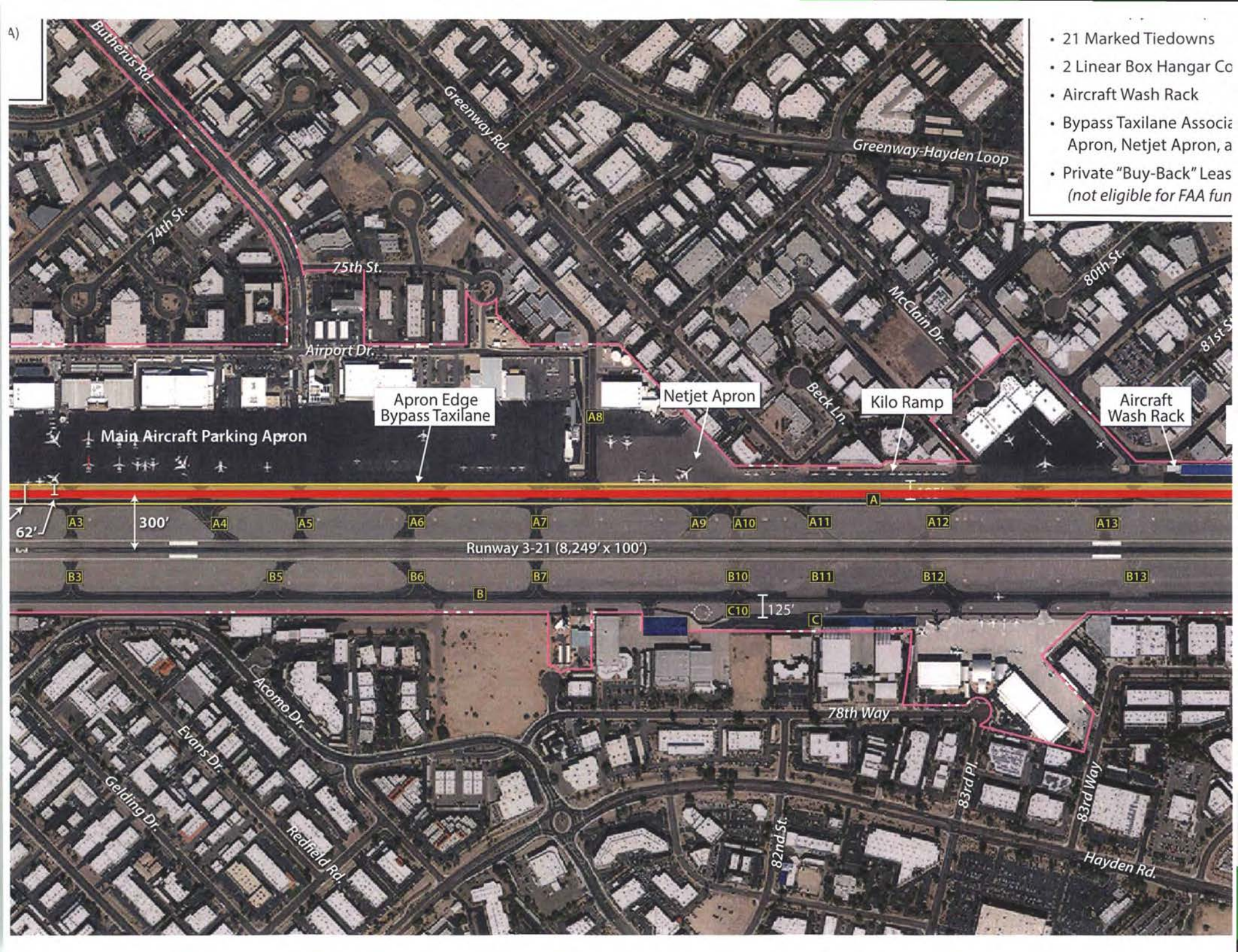
The first alternative considered is to relocate Taxiway A from 250 feet of separation from the runway to 300 feet, as shown on **Exhibit 4C**. This action would affect several facilities located on the west side of the taxiway because of the need to maintain a clear Taxiway Object Free Area (TOFA). The bypass taxilane associated with the main aircraft parking apron would need to be eliminated or shifted farther to the west. This would severely limit aircraft movements and staging associated with the fixed base operators (FBO) on the west side of the airfield, especially during times of significant aircraft activity and special event traffic. Two 14-unit linear box hangars on the north Kilo Ramp area would be affected, since aircraft access to the east-facing hangars would be impacted. Furthermore, aircraft staging on the

east side of the linear box hangar complexes could compromise the proposed TOFA. This property is currently being leased to a private entity. To remove the hangars (which were constructed in 2020-2021), the City would be required to “buy back” a portion of the leasehold, which is not eligible under Airport Improvement Program (AIP) funding. The “buy-back” cost of the specific portion of the leasehold is estimated at \$7 million. Farther south, the bypass taxilane adjacent to the Kilo aircraft apron would also need to be eliminated. A total of 21 marked tiedown positions on the Kilo aircraft apron would be affected since these tiedowns can only be accessed via the bypass taxilane. This would create additional strain on the main aircraft parking apron to accommodate locally based aircraft, in addition to the high volume of transient aircraft. Likewise, access to the aircraft wash rack would be impacted since the bypass taxilane would need to be eliminated on the Kilo aircraft ramp. A total of 22,585 square yards of apron space, which includes the bypass taxilane on the main aircraft parking apron and the Kilo aircraft apron, would need to be eliminated. Due to the build-out of existing landside facilities on the west side of the airport, the ability to relocate airfield infrastructure affected by the potential relocation of Taxiway A is not practicable.

Exhibit 4D shows the impact of relocating Taxiway B to a separation distance of 300 feet. It would result in even greater facility impacts on the east side of the taxiway in order to maintain a clear TOFA. A total of 107,476 square feet (2.47 acres) of off-airport property, which includes 14 private parcels, would be affected to maintain a clear TOFA associated with the Taxiway B relocation. Within these private parcels, five buildings would need to be removed and/or relocated. The estimated cost of purchasing the affected parcels and facilities to provide standard safety areas associated with the taxiway relocation is \$85.42 million. The City can also expect a litigious process in the event that it pursues the acquisition of these private parcels, given the significant investments that have been made. A total of 1,900 square yards of apron space would also need to be eliminated on the east side of Taxiway B, which would affect aircraft parking and staging associated with the fixed base operator (FBO) and airport-owned leaseholds on the east side of the airfield. The City would be required to “buy back” portions of these leaseholds, which are not eligible for FAA funding under the AIP. The “buy-back” cost of the specific portions of the leaseholds is estimated at \$1.76 million. The perimeter service on the east side of existing Taxiway B would also need to be removed. This road is important to airport operations and maintenance staff in addition to FBO personnel needing to provide services to aircraft staged on the east and west sides of the airport. The removal of this road would require additional runway crossings and contribute to reductions in airfield capacity and the overall efficiency of the National Airspace System (NAS). Due to the build-out of existing landside facilities on the east side of the airport, the ability to relocate airfield infrastructure affected by the potential relocation of Taxiway B is not practicable.

The alternative of relocating either Taxiway A or B, but not both, to 300 feet of separation is only an incremental improvement, as the untouched parallel taxiway would still be at 250 feet of separation. The following two alternatives consider the feasibility of shifting the runway 50 feet to either side of the current centerline and moving the impacted parallel taxiway to a separation of 300 feet. **Exhibits 4E and 4F** show these alternatives.

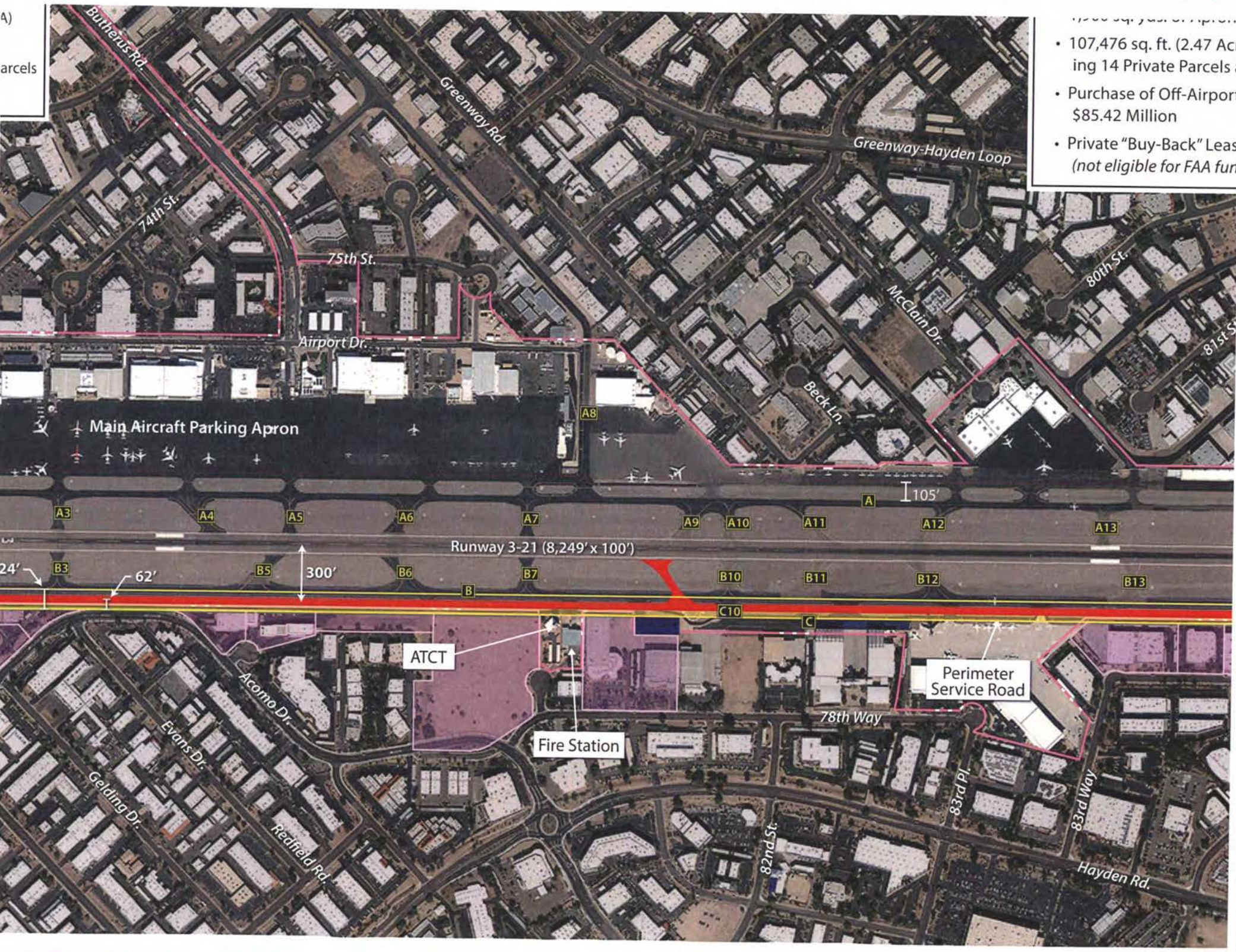
Both scenarios for shifting the runway and one of the taxiways would result in significant displacement of landside facilities, both on and adjacent to the airport, and would require the acquisition of private property as well as airport leasehold buy-backs. In addition, the removal of the perimeter access road would necessitate an increase in runway crossings. The alternatives involving the relocation of the



- 21 Marked Tiedowns
- 2 Linear Box Hangar Co
- Aircraft Wash Rack
- Bypass Taxiway Association Apron, Netjet Apron, a
- Private "Buy-Back" Lease (not eligible for FAA fund

A)

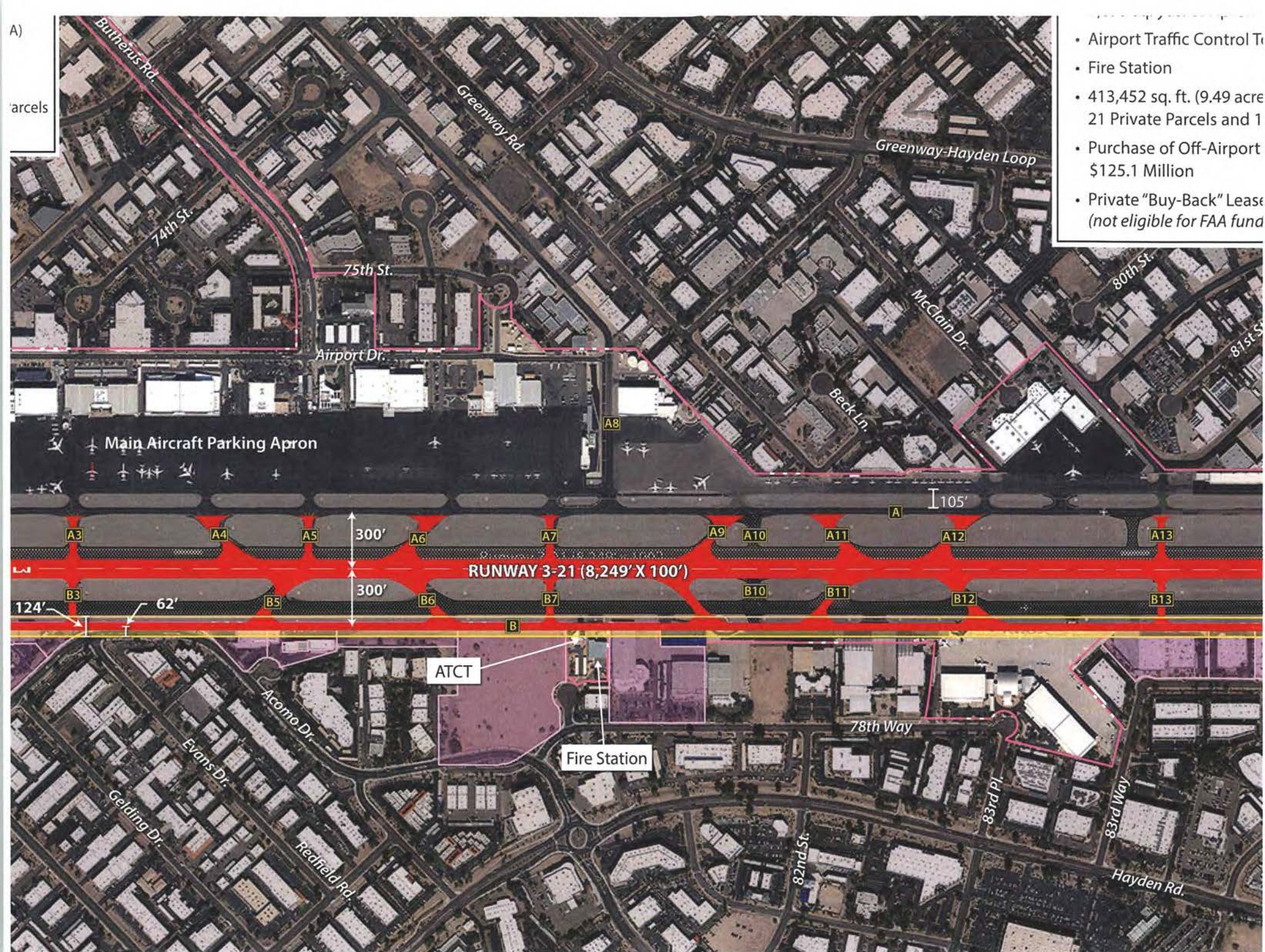
parcels



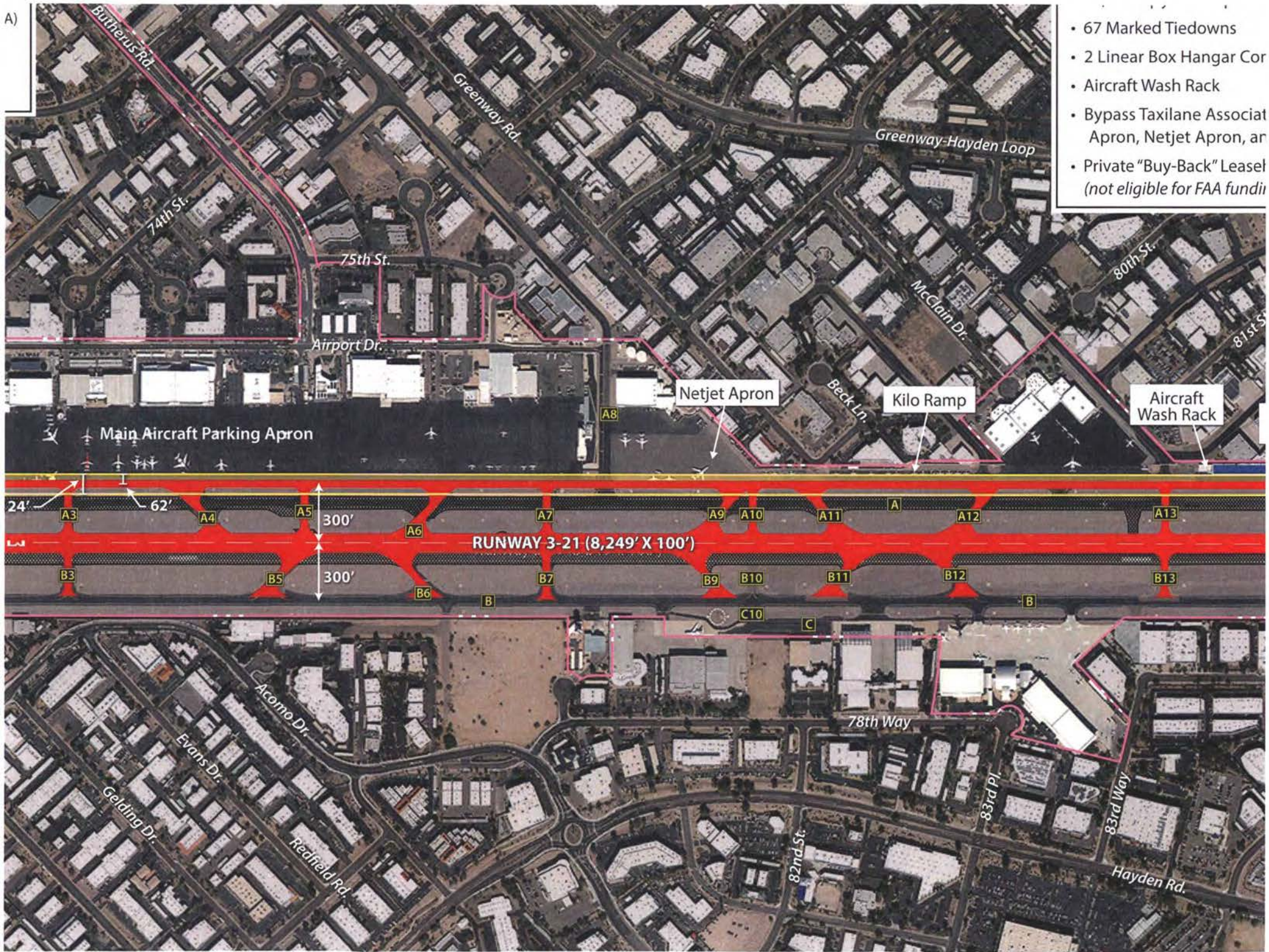
- 17,000 sq. ft. of property
- 107,476 sq. ft. (2.47 Acres) including 14 Private Parcels and
- Purchase of Off-Airport Property for \$85.42 Million
- Private "Buy-Back" Leases (not eligible for FAA funding)

A)

parcels



A)



runway and parallel Taxiway B would result in millions of dollars of property acquisition on the east side of the airport. Relocation of Taxiway A results in significant loss of the terminal apron, the NetJets apron, the Kilo apron, and the linear box hangars. Furthermore, the construction and environmental impacts and costs related to relocating Runway 3-21 would be very significant and take years to complete. **Table 4B** summarizes the primary impacts for each of the four alternatives considered for runway-to-taxiway separation.

TABLE 4B | Runway/Taxiway Alternatives Impacts

	Alt 1 Exhibit 4C	Alt 2 Exhibit 4D	Alt 3 Exhibit 4E	Alt 4 Exhibit 4F
Description	Shift Twy A to 300'	Shift Twy B to 300'	Shift Rwy and Twy B	Shift Rwy and Twy A
Apron Area Impacted (s.y.)	22,585	1,900	7,895	70,117
Tie-Downs Removed	21	NA	NA	67
Hangar/Buildings Removed	14 box hangars	5 buildings 2.47 acres/14 private parcels /\$85.42 million	16 buildings 9.49 acres/21 private parcels /\$125.1 million	14 box hangars
Private Land Acquisition Cost	NA			NA
Leasehold Buy-Back Cost ¹	\$7 million	\$1.76 million	\$4.61 million	\$7 million
Other Impacts	Wash rack, taxilane, terminal apron, NetJets apron, Kilo apron	Service road	ATCT, ARFF, service road	Wash rack, taxilane, terminal apron, NetJets apron, Kilo apron

¹Not eligible for FAA funding.

The alternatives discussed above are not seen as practicable and the current airfield configuration provides acceptable levels of safety based on operational activity at the airport. Under the current configuration, both the runway safety area (RSA) and runway obstacle free zone (ROFZ) meet design standards. In addition, there is adequate buffer between the wingtips of two ADG III aircraft (wingspan of 118 feet), which is 132 feet, and for ADG II aircraft (wingspans of 79 feet) the buffer is 171 feet. Furthermore, the current locations of the parallel taxiways provide for the appropriate TOFA of 124 feet and TSA of 79 feet for ADG II aircraft. It also provides the ADG III TOFA of 171 feet and TSA of 118 feet.

As noted previously, on January 3, 2019, the FAA approved an MOS, which permitted the parallel taxiways to remain at their current 250-foot separation distance. The airport has resubmitted this MOS via the FAA's Airport Data Information Portal (ADIP). This is the new process for documenting and maintaining MOS.

CONSIDERATION #2 – HOLD LINE LOCATION

The aircraft hold lines on taxiways leading to the runway are positioned 152 feet from the runway centerline. The standard distance for RDC D-II and D-III is 250 feet. Extensive analysis of this issue was undertaken during the 2015 master plan. That master plan also references a Safety Risk Management Document (SRMD) that addressed this issue. As noted previously in Chapter Three of this master plan, the SRMD concluded that a hold line change could not be introduced into the National Airspace System

(NAS) with an acceptable level of risk. Essentially, moving the hold lines would cause such congestion in the area airspace that it would cause more safety risks than it would solve. Any effort or recommendation to relocate the hold lines at SDL going forward should be vetted through another SRMD that includes regional airspace experts.

On the ground, the challenge of relocating the hold lines to the standard of 250 feet is obvious. The hold lines would be in the middle of both parallel taxiways since they too are 250 feet from the runway centerline. Holding aircraft would block other aircraft from passing behind them on the taxiway. At a busy airport like SDL, this situation would lead to significant congestion, and it would increase safety concerns.

To meet these typical requirements, the hold lines would need to be at least 200 feet from the runway centerline, since both the RSA and ROFZ are 400 feet wide as centered on the runway. However, the airport traffic control tower (ATCT) currently views the 152-foot hold lines as the acceptable hold location. No aircraft that are at a holding line are reported by ATCT as runway incursions. The current hold line location is essentially the dividing line between the active runway environment and the taxiway system.

CONSIDERATION #3 - RUNWAY SAFETY AREA DIMENSIONS

As discussed in detail in Chapter Three - Facility Requirements, the standard RSA is 500 feet wide, and it extends 1,000 feet beyond each runway end. At SDL, it is not feasible to provide the standard RSA. FAA guidance indicates that the width of the RSA may be reduced to 400 feet when the 500-foot standard cannot be met, therefore the RSA at SDL is 400 feet wide. The 1,000-foot standard length beyond the runway ends cannot be modified in its dimensions. Therefore, adjustments to the available runway length for takeoff and landing have been made through use of declared distances to provide the 1,000-foot RSA. Exhibit 3E previously showed this current configuration for the RSA.

To provide the 1,000-foot RSA behind Runway 3 (for arrivals and departures using Runway 21), the declared end of the runway is 180 feet short of the pavement end, and an additional 820 feet is available behind the pavement end. While it does appear that the RSA behind the Runway 3 pavement end could be extended to the full 1,000 feet, it likely needs to be reduced by 180 feet to either clear obstructions or for missed approach purposes.

To provide the 1,000-foot RSA behind the Runway 21 end (for arrivals and departures using Runway 3), the declared end of the runway is 400 feet short of the pavement end, and an additional 600 feet is available behind the pavement end. Due to the location of the perimeter service road, there is no space for additional RSA behind Runway 3.

The current RSA dimensions are the maximum available for the airfield at SDL and are planned to be maintained. If the airport were to engage in another SRMD study related to the hold line location as discussed above, they could also consider the implications of extending the RSA to the south behind Runway 3. The airspace factors that impact the hold line location would also impact the RSA length (and thus the declared runway length).

CONSIDERATION #4 – RUNWAY OBJECT FREE AREA DIMENSIONS

The current airfield geometry and airport property does not allow for the full runway object free area (ROFA) width of 800 feet. A perimeter service road, a blast fence, and Frank Lloyd Wright Boulevard limit the length beyond Runway 3 to 470 feet. The length beyond Runway 21 is limited to 30 feet due to the proximity to the airport's perimeter service road and Redfield Road.

To meet the ROFA standards for D-II design (800-foot width [400 feet either side of runway centerline] and 1,000-foot length beyond each runway end), substantial reconfigurations of facilities on both the east and west sides of the runway system would be needed. These reconfigurations would significantly limit aircraft movements and staging, reduce airfield capacity, increase runway crossings, and incur substantial costs on land acquisition and airport property "buy-back" leaseholds. The alternatives discussed below are not seen as practicable, and the current airfield configuration provides acceptable levels of safety based on operational activity at the airport.

The alternatives that were evaluated focused on two areas of the ROFA, which included the width on either side of Runway 3-21 as well as the length beyond each end of Runway 3-21. Obtaining the full width of the ROFA (400 feet either side of runway centerline) would require displacement of several facilities both on and off airport property. On the west side of the runway, 21 marked tiedown positions on the Kilo aircraft apron would need to be removed and/or relocated. Although no marked tiedown positions on the main aircraft parking apron would be situated in the ROFA, apron space is affected that would negatively impact the aircraft staging for fixed base operators (FBOs) and private entities. A total of 57,025 square yards of apron space would fall within the ROFA and be deemed unusable for aircraft parking. Furthermore, two linear box hangar complexes at the north end would be impacted.

Farther north, the tie-downs on the Kilo apron are at the edge of the 400-foot ROFA standard. Aircraft staging for the linear box hangars and aircraft wash rack would compromise the ROFA, therefore necessitating the removal of these facilities. These hangars were recently constructed in 2020-2021. To remove the hangars, the City would be required to "buy back" the leasehold, which is not eligible under Airport Improvement Program (AIP) funding. The "buy-back" cost of the leasehold is estimated at approximately \$7 million. There are no viable alternatives to relocate the affected facilities and apron space without the need for property acquisition.

On the east side of the runway, a total of 614,837 square feet (14.11 acres) of off-airport property that includes 20 private parcels and 7 buildings would be affected to meet ROFA width standards. The total acquisition cost associated with all parcels and facilities adjacent to the east side of the airport is estimated at \$117.18 million. The on-airport ATCT and fire station would also need to be relocated to meet the ROFA width standard. In addition, 8,370 square yards of apron space associated with the FBO (Signature) and other private operators would need to be displaced. Already constrained for apron space on the east side of the airport, the loss of additional parking area would negatively impact the ability of the FBO and airport property leaseholds on the east side of the airfield from being able to stage and park aircraft. Furthermore, the city would be required to "buy back" portions of two leaseholds on the east side of the airport, at an approximate cost of \$3 million. This cost is not eligible for FAA funding. There are no viable alternatives to relocate the affected facilities without the need for property acquisition. Finally, the removal of the perimeter access road adjacent to the east side of Taxiway B would require additional runway crossings associated with airport and FBO personnel. These runway crossings would reduce airfield capacity as well as the overall capacity and efficiency of the National Airspace System (NAS).

Alternatives that would meet ROFA standards beyond each runway end include the removal/relocation of Redfield Road and the perimeter service road for full southerly extension of the ROFA length. Removal/relocation of the blast fence, perimeter service road, Frank Lloyd Wright Boulevard, and the Central Arizona Project (CAP) canal would be needed for full northerly extension of the ROFA length. The environmental impacts and construction costs associated with relocating the roadways and CAP canal would be tremendous. The relocation of these facilities would create significant impacts to adjacent off-airport properties as well, including several commercial and industrial parcels adjacent to the southeast side of the airport and the golf course north of the airport.

Finally, the alternative of reducing runway length through declared distances was evaluated. Declared distances are currently implemented on the airfield to obtain full RSA standards associated with Runway 3-21. Decreasing the usable length of runway to gain additional ROFA would negatively impact aircraft operator needs, especially those associated with the significant number of jet aircraft operations that utilize the airport on a regular basis.

Through the analysis of alternatives discussed, the only practicable viable alternative is to modify the ROFA dimensions associated with Runway 3-21 as follows:

- 630 feet (width) – 315 feet on the east side and 315 feet on the west side
- 470 feet (length beyond runway end) – beyond Runway 3 end only
- 500 feet (length beyond runway end) – beyond Runway 21 end only

Exhibit 4G shows the extent of the standard D-II and D-III ROFA, and it shows the limits of the current ROFA based on an FAA-approved MOS dated January 3, 2019. The airport has resubmitted this MOS via the FAA's Airport Data Information Portal (ADIP). This is the new process for documenting and maintaining MOS.

CONSIDERATION #5 – DECLARED DISTANCES

Declared distances have been implemented at SDL to maximize runway length while meeting various design standards, primarily the RSA and ROFA, and for obstruction clearance. Without increasing the area beyond the runway ends available to be used for RSA and ROFA, the current declared distances reflect the maximum available runway length. Therefore, any change to the declared distances would require a regional airspace analysis, typically in association with an SRMD process. As a result, no changes are planned for the existing declared distances.

CONSIDERATION #6 - TAXIWAY/TAXILANE SEPARATION AND AIRCRAFT PARKING APRON

Between Taxiways A3 and A7, there is an apron edge taxilane situated on the east edge of the aircraft parking apron. The taxilane centerline is 105 feet from the centerline of parallel Taxiway A. When there are two aircraft with wide wingspans (+100'), there is little buffer space between the wingtips.

FAA AC 150/5300-13B, *Airport Design*, provides guidance on the separation standards. For ADG II, the separation standard from a taxiway to a parallel taxilane is 101.5 feet, centerline to centerline. For ADG

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III, the separation standard is 144.5 feet, centerline to centerline. The existing separation distance of 105 feet exceeds the ADG II design standard, but does not fully meet the ADG III design standard. However, there is 3.5 feet of buffer space with the current separation distance of 105 feet.

Taxiways and taxilanes have a surrounding object free area. For ADG II, the taxiway object free area (TOFA) is 124 feet wide (Taxiway A) and the taxilane object free area (TLOFA) is 110 feet, as centered on the taxiway. For ADG III, the TOFA is 171 feet wide (Taxiway A) and the TLOFA is 158 feet wide.

Aircraft are classified by the FAA, and one component of aircraft classification is based on the applicable airplane design group (ADG), which corresponds to the wingspan of aircraft. Based upon the applicable ADG of an aircraft, there are different design standards for separation distances. **Table 4C** summarizes the ADG of common business jets, most of which operate at SDL.

TABLE 4C | Airplane Design Groups

		Includes Wingspans Between:	Example Aircraft	Wingspan (feet)
ADG II	49'<79'	Cessna Citation V/Ultra/Encore	54.1	
		Citation Sovereign	63.1	
		Citation Latitude	72.3	
		Citation X	63.6	
		Challenger 350	68.9	
		Embraer 145	65.8	
		Falcon 900	63.4	
ADG III	79'<118'	Gulfstream 500	87.1	
		Gulfstream 550	93.5	
		Gulfstream 600	95.0	
		Gulfstream 650	99.6	
		Gulfstream 700/800	103.0	
		Global 5000/6000	94.0	
		Global 7500	104.3	
		Global 8000	104.0	
		Falcon 8X	86.4	
		Falcon 10X	110.4	
ADG: Airplane Design Group				

The airfield is currently designed around an ADG II critical aircraft. This means most of the design standards applied to the airfield are based on ADG II. However, the airport does get operations from business jets in ADG III with wider wingspans. At times, it is feasible that one of these wide wingspan aircraft could be on Taxiway A and another could be on the apron edge taxilane, and the available separation distance between the centerlines could lead to wingtips colliding. The following analysis is specifically intended to address the simultaneous use of Taxiway A and the apron edge taxilane by wide wingspan business jets.

Taxilane Alternatives

Because the taxiway and taxilane centerlines are 105 feet apart, if there are two aircraft with greater than 102.5 wingspans, their wingtips could collide. As an example, if there is a Global 7500 (105' rounded wingspan) on Taxiway A and another Global 7500 on the apron edge taxilane at the same time, their wings could collide if one of the aircraft slightly deviates from the centerline, because there is exactly 105 feet of separation between the centerlines currently. **Figure 4-1** shows how close the wingtips of two Global 7500 aircraft passing would be. Therefore, several alternatives are considered that would allow these aircraft to safely pass by each other. Each alternative is focused on the apron edge taxilane because it is more feasible to make changes to it, rather than Taxiway A, in the immediate term.

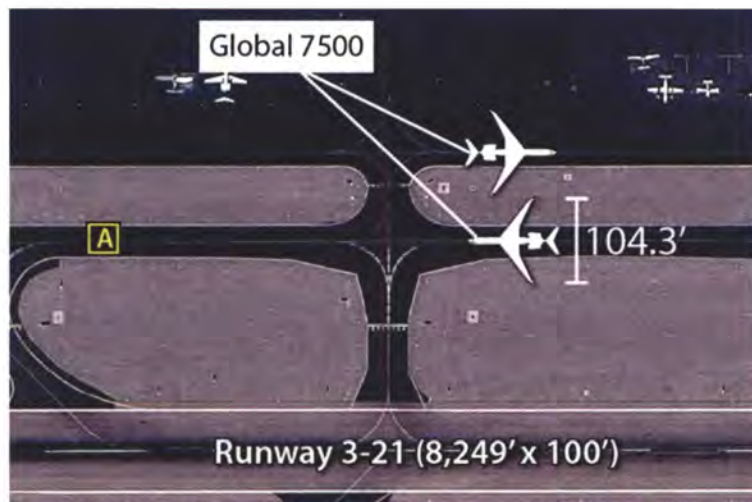


Figure 4-1: Taxiway A and Apron Edge Taxilane in Simultaneous Use by Two Global 7500 Aircraft

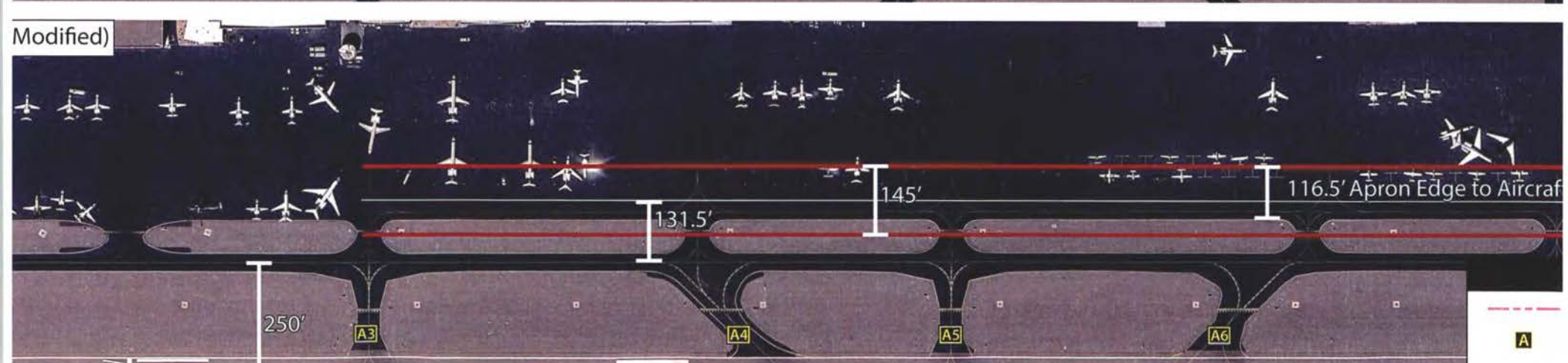
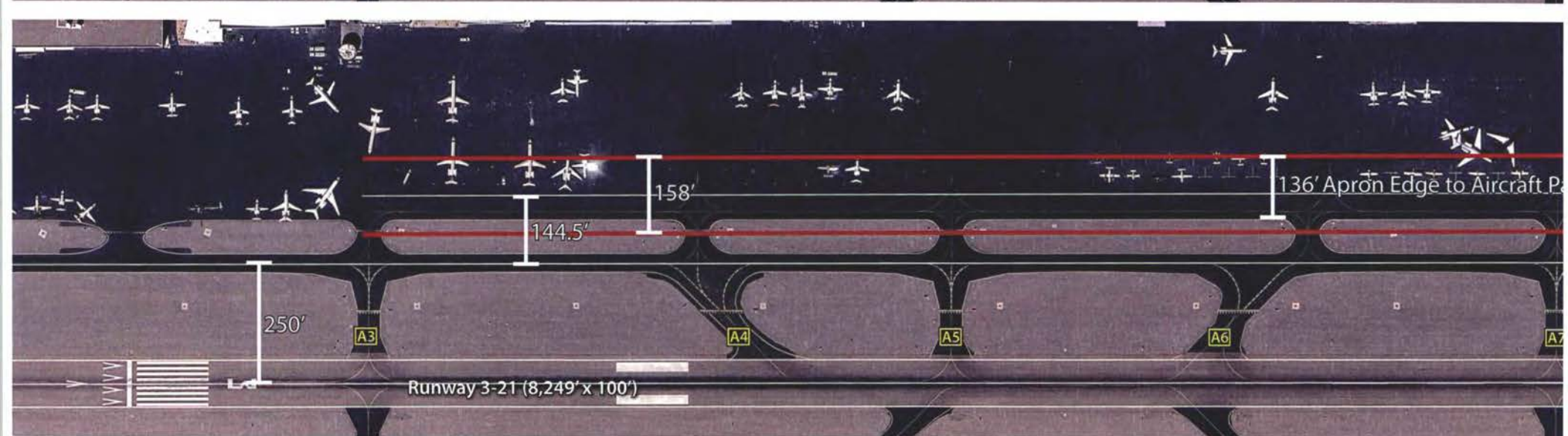
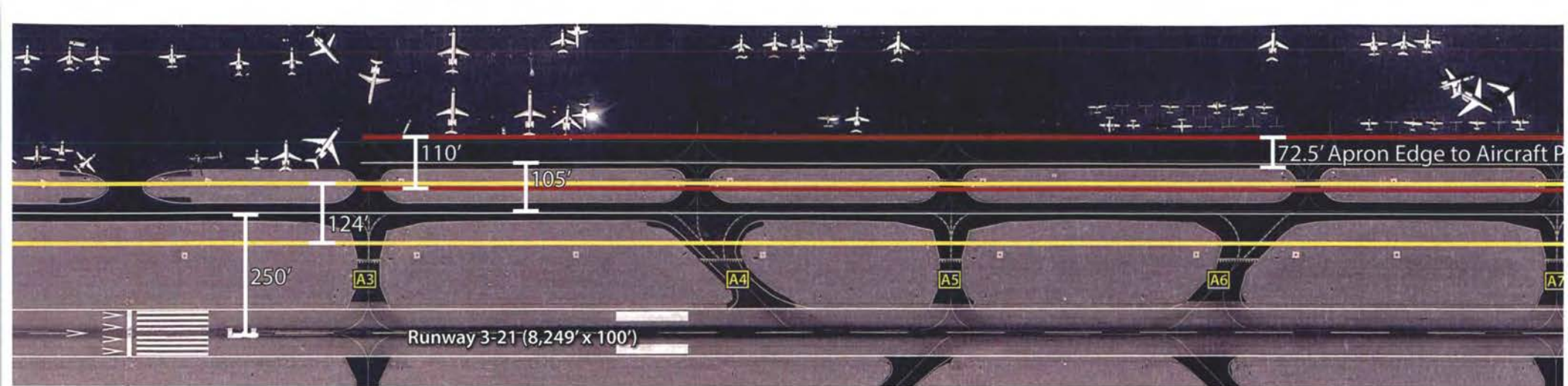
The taxiway and taxilane design standards are based on the ADG of the critical aircraft for the airport. Currently the critical aircraft is designated as ADG II (D-II). As such, the separation distance between Taxiway A and the apron edge taxilane not only meets this standard but exceeds it by 3.5 feet.

The TOFA, which applies to Taxiway A, is 124 feet wide. The TLOFA, which applies to the apron edge taxilane, is 110 feet wide. Both safety surfaces must be clear of penetrating objects except for required navigation aids like edge lighting mounted on frangible bases. Therefore, aircraft parking begins at the outside edge (west) of the TLOFA. Currently, that is 72.5 feet from the apron edge and 55 feet from the apron edge taxilane centerline.

The top panel of **Exhibit 4H** shows this existing condition.

Alternative 1: Meeting ADG III Separation Standards

The first alternative that should be considered is to fully meet the ADG III design standard. The ADG III separation standard between a taxiway and a taxilane is 144.5 feet. That means the apron edge taxilane would be shifted 39.5 feet to the west. The TLOFA for ADG III is 158 feet wide as centered on the taxilane.



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Therefore, the aircraft apron parking can begin 79 feet from the relocated apron edge taxilane centerline and 136 feet from the existing apron edge. A total depth of 63.5 feet of existing aircraft parking apron would be removed from service as compared to what is available today. This is calculated by subtracting the distance from the outer edge of the TLOFA in this alternative (136 feet) from the existing condition (72.5 feet). The middle panel of **Exhibit 4H** shows this alternative.

Alternative 2: Relocate the Taxilane Centerline to Maintain the Safety Margin

Appendix J of FAA AC 150/5300-13B, *Airport Design*, provides a methodology where taxiway/taxilane object free areas (TOFA/TLOFA) can be modified based on the wingspan of specific aircraft. The key safety margins are determined by the ADG of the aircraft. For ADG III aircraft, like the Global 7500, the lateral deviation is 10 feet and the safety buffer is 16.5 feet, for a total wingtip clearance of 26.5 feet for the TOFA. For the ADG III TLOFA the lateral deviation is eight feet, and the safety buffer is 12 feet.

For two Global 7500 aircraft to pass each other using Taxiway A and the apron edge taxilane, the taxiway to taxilane centerline should be a minimum of 131.5 feet apart (calculation: $105' + 26.5' = 131.5'$).

In addition to identifying the separation distance between Taxiway A and the apron edge taxilane, the TLOFA for the apron edge taxilane must be determined so that the wing of the Global 7500 will safely remain clear of parked aircraft.

Appendix J of FAA AC 150/5300-13B, *Airport Design*, presents a methodology where the TLOFA may be modified based on the wingspan of a specific aircraft. Based on this methodology, the TLOFA should be 145 feet wide for an ADG III aircraft with a 105-foot wingspan. This is calculated as half the wingspan + the lateral deviation + safety buffer ($52.5' + 8' + 12' = 72.5' \times 2 = 145'$). Therefore, the apron edge TLOFA can be reduced from the ADG III standard of 158 feet to 145 feet based on the 105-foot wingspan of the example aircraft. Under this scenario, aircraft on the apron should be parked no closer than 116.5 feet from the apron edge taxilane. This is calculated by adding 17.5 feet, which is the distance from the current apron edge to the taxilane centerline to the centerline shift distance of 26.5 feet, and half the TLOFA, which is 72.5 feet, for a total of 116.5 feet. The bottom panel of **Exhibit 4H** shows this alternative.

It should be noted that while FAA guidance does allow for a TLOFA based on a specific aircraft wingspan, it does not allow for modification of the lateral deviation and safety buffer standards. Therefore, the width of the TLOFA may be modified based on the specific aircraft, but the lateral deviation and safety buffer may not.

Table 4D summarizes the applicable taxiway/taxilane design standards by comparing them to the first two alternatives with the existing condition.

TABLE 4D | Taxiway/Taxilane Separation Standards

Standards	ADG II	ADG III
Taxiway A to Apron Edge Taxilane	101.5	144.5
Taxiway Object Free Area (TOFA)	124	171
Taxilane Object Free Area (TLOFA)	110	158
Taxilane to Fixed/Movable Object	55	79
Existing Condition		
Taxiway A to Apron Edge Taxilane	105	NA
Apron Edge TLOFA	110	NA
Apron Edge Taxilane Centerline to Fixed/Movable Object	55	NA
Apron Edge to Aircraft Parking	72.5	NA
ADG III Standard		
Taxiway A to Apron Edge Taxilane Centerline	NA	144.5
Apron Edge TLOFA	NA	158
Apron Edge Taxilane Centerline to Fixed/Movable Object	NA	79
Apron Edge to Aircraft Parking	NA	136
ADG III Standard Modified¹		
Taxiway A to Apron Edge Taxilane Centerline	NA	131.5
Apron Edge TLOFA	NA	145
Apron Edge Taxilane Centerline to Fixed/Movable Object	NA	72.5
Apron Edge to Aircraft Parking	NA	116.5

¹See Appendix J, FAA AC 150/5300-13B, Airport Design. Modification based on 105-foot wingspan.

Alternative 3: Remove the Taxilane Centerline

The apron edge taxilane centerline could be removed altogether to increase available space for parking aircraft. With no apron edge taxilane, aircraft would have to use Taxiway A to move north or south, which could increase congestion on Taxiway A. An additional 72.5 feet of apron depth would be available for aircraft parking.

Alternative 4: Letter of Agreement (LOA) with ATCT

This alternative would involve an agreement with ATCT personnel to not allow certain aircraft with wider wingspans to use the apron edge taxilane. For example, the LOA might say aircraft with wingspans greater than 100 feet must use Taxiway A to proceed north or south. The downside to this is a loss of ground movement efficiency, which could negatively impact overall airfield capacity.

CONSIDERATION #7 – TAXIWAY GEOMETRY

As discussed in Chapter Three – Facility Requirements, to improve pilot situational awareness and to prevent runway incursions, the FAA has outlined several recommendations for taxiway geometry. The following are applicable to SDL:

- Direct Access: Taxiways A3, A4, A5, A6, and A7 allow direct access from an apron area to the runway.

- High-Energy Runway Crossings: Taxiways A7/B7 and A10/B10 allow runway crossings in the high-energy portion (middle third) of the runway.
- Angled Taxiways: Taxiways A2, A4, A6, A9, A11, A12, B5, B6, B11, and B12 are angled taxiways.

None of these taxiway considerations for SDL is non-standard, but they do not follow the current design recommendations. For example, the FAA has prioritized removing direct-access configurations where feasible. Angled taxiways have been less of a priority and, in some cases, are justified by capacity needs at an airport. Even runway crossings may be acceptable if removal of them would significantly diminish ground movement efficiency.

Exhibit 4J shows some possible changes to the taxiway system that address these FAA recommendations for taxiway geometry. These are summarized as follows:

- Taxiway A2 is an existing angled taxiway. It is located at the far end of the runway for those landing on Runway 21. Because it is at the end of the runway, aircraft would be travelling very slow and would not benefit from an angled taxiway at this location. Therefore, this taxiway is reconfigured to 90 degrees, which will allow it to also serve as a bypass taxiway, affording pilots full peripheral views.
- Taxiway B2 does not currently exist, but when needed, it would serve as a bypass taxiway. The current ALP shows this future Taxiway B2 at an angle; however, an angled taxiway in this location is not beneficial because existing aircraft will have to turn backwards onto the parallel taxiway.
- The taxilanes (A3, A4, and A5) connecting the main terminal apron to Taxiway A are shown to be relocated for the purpose of eliminating the existing geometry that allows for direct access to the runway from an apron area. The new configuration will force pilots to make a turn onto parallel Taxiway A prior to turning again toward the runway environment. This is the recommended FAA procedure and geometry.
- Taxiway A7, between the runway and Taxiway A, is shown to be relocated to eliminate the taxiway crossing in the middle third of the runway. This portion was chosen for relocation over the taxilane portion leading to the apron because the taxilane appropriately directs pilots to the edge of the apron.
- Taxiway A10 is shown to be removed. This will eliminate the crossing taxiway located within the middle third of the runway. Taxiway A10 is close to both Taxiway A9 and A11 and may be redundant.
- Taxiway B15 is a planned future bypass taxiway. The current ALP shows this future Taxiway B15 at an angle; however, an angled taxiway in this location is not beneficial because existing aircraft will have to turn backwards onto the parallel taxiway.
- The remaining angled taxiways (A4, A6, A9, A11, A12, B5, B6, B11, and B12) are planned to remain. They provide for quick runway exits thus improving overall airfield capacity. They are also in appropriate locations to allow landing aircraft to exit quickly after slowing to an acceptable speed.
- The ALP currently shows a future Taxiway B9 that is angled and mirrors Taxiway A9.

CONSIDERATION #8 – RUNWAY VISUAL AIDS

Both ends of the runway at SDL are equipped with two-light precision approach path indicator (PAPI-2L) lighting. Busy general aviation airports with heavy business jet activity benefit from the more informative four light PAPI-4L system. It is recommended that the airport plan to upgrade to the PAPI-4L system.

CONSIDERATION #9 – RUNWAY PAVEMENT WEIGHT BEARING CAPACITY

The weight bearing capacity of a runway does not preclude operations by aircraft that weigh more; however, frequent activity by heavier aircraft can shorten the useful life of that pavement. FAA AIP Grant Assurance #11, Pavement Prevention Maintenance-Management, requires that airport sponsors maintain the useful life of any pavement partially funded with a federal investment. Repeated use of a runway by aircraft exceeding the actual pavement weight bearing capacity can shorten the useful life of the pavement.

The current published weight bearing capacity for Runway 3-21 is 45,000 pounds for single-wheel landing type gear (S) and 75,000 pounds for dual-wheel (D) type landing gear. Most small general aviation aircraft have landing gear struts with one wheel on each. Small business jets also may have a single-wheel landing gear strut. Most medium and large business jets have dual-wheel landing gear struts.

According to the FAA publication, Airport/Facility Directory, “Runway strength-rating is not intended as a maximum allowable weight or as an operating limitation. Many airport pavements are capable of supporting limited operations with gross weights in excess of the published figures.” The directory goes on to say that those aircraft exceeding the pavement weight bearing capacity should contact the airport sponsor for permission to operate at the airport. This is the case at Scottsdale Airport, as the Airport/Facility Directory states that “Runway 3-21 is limited to 75,000 pounds (D) except with prior permission requested.” Aircraft can operate with maximum gross weights in excess of 75,000 pounds and up to 100,000 pounds at the airport under these conditions:

- They can operate up to 100,000 pounds on a prior permission required (PPR) basis; or
- They can operate with a placard certifying they are operating at or below a weight of 75,000 pounds.

The weight bearing capacity of a runway can change over time. Regular usage by heavier aircraft can decrease the weight bearing capacity, while periodic runway resurfacing or reconstructing can increase the weight bearing capacity. Given the high volume of large business jets that utilize the airport, future planning should consider providing a pavement weight bearing capacity of at least 100,000 pounds (D).

During the 2015 master plan process, the aviation department and the FAA determined that increasing the weight bearing capacity up to 100,000 pounds (D) may require the airport to meet D-III design standards. As discussed previously, the airport cannot fully meet D-III design standards, and for runway-to-taxiway separation and runway object free area, FAA-approved modifications of standards are in place.

With more than 1,700 operations by these heavier aircraft, it is recommended that the weight bearing capacity be increased to accommodate them. While many of these aircraft will fall in ADG III, it is already

pass Taxiway (B2)
Taxilanes to Eliminate Direct Access
to Eliminate Direct Access
Eliminate Middle Third Runway Crossing
by B15

11, A12, B5, B6, B11, and B12 are maintained for
ment purposes.



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recognized that the airport cannot fully meet those standards, and there is not a direct relationship between the aircraft weight and the ADG III design standards. Therefore, the airport and the FAA should reconsider the feasibility of increasing the runway pavement weight bearing capacity so that the runway can maintain its useful life while accommodating the mix of aircraft that are using the airport on a regular basis.

CONSIDERATION #10 – NEXT GENERATION BUSINESS JETS

Numerous business jet operators and service providers at the airport have engaged airport management about the feasibility of allowing the newest generation of business jets to operate at SDL. Several of the newest business jets have a maximum takeoff weight (MTOW) greater than 100,000 pounds. **Table 4E** summarizes the length, wingspan, and maximum takeoff weight of these aircraft types.

TABLE 4E | Next Generation Business Jet Details

Aircraft	Length	Wingspan	MTOW
Gulfstream 700	109'10"	103'	107,600 lbs.
Gulfstream 800	99'9"	103'	105,600 lbs.
Global 7500	111'	104'	114,850 lbs.

MTOW: Maximum takeoff weight

Source: Aircraft specification manuals

Aircraft with a MTOW greater than 100,000 pounds are not permitted to use the airport because the weight exceeds the runway weight bearing capacity of 75,000 pounds. Regular use of a runway by aircraft that exceed the weight bearing capacity will shorten the useful life of the runway. Maintaining the useful life of a runway that has been constructed or maintained with federal funds is a grant assurance condition of that federal investment.

At SDL currently, there are many operations by aircraft that exceed the weight bearing capacity of the runway. Operations by these newest generation aircraft would add more of these types of operations to the runway, further reducing the useful life of the pavement.

SDL has evolved into an airport that has a significant impact on the local and regional economy. Operators of large business jets desire to use the airport. Airport staff will have to determine if they want to allow these heavier general aviation aircraft to use the airport. If they do, they risk the early deterioration of the airfield pavements in which there are federal investments. If they do not, the airport will not realize the positive economic impact that allowing these operations offers.

Another question related to the possibility of allowing the next generation of business jets to use the airport is the potential impact on the various design and separation standards. The runway-to-taxiway separation would not be impacted by the wider wingspan because the ATCT considers the hold line location to the demarcation line for runway incursions. Therefore, a holding aircraft would be 100 feet from the wing of an aircraft with a 104-foot wingspan on the runway, rather than the 102 feet currently permitted.

An aircraft with a 104-foot wingspan on the runway and one on a parallel taxiway would still have 146 feet of separation, rather than the 150 feet currently permitted.

Perhaps the most significant impact of allowing these next generation business jets with wider wingspans is the operation of the aircraft parking apron. Each aircraft would take up more space than is currently permitted, which would likely reduce apron parking capacity somewhat. Since it is the FBOs that manage the aircraft parking aprons, their opinion on permitting the wider wingspans to operate at the airport should be considered.

The Falcon 10X is a large next generation business jet that is currently in the assembly phase and is expected to enter service in 2027. This aircraft has a MTOW of 115,000 pounds, a wingspan of 110' 4", and a length of 109' 7". This aircraft would represent a more significant change in the airfield operating condition than the business jets with 104-foot wingspans and additional analysis, and evaluation should be undertaken in the future to assess the safety impact if it were allowed to operate at SDL in the future.

AIRSIDE SUMMARY

Scottsdale Airport has become one of the premier business airports in the country. As a reliever airport, it should be designed to accommodate all general aviation aircraft, including business jets, to the greatest extent possible. Under ideal circumstances, the runway would meet RDC D-III design standards. During the previous master plan, it was determined by the FAA that the airport could not fully meet the D-III design standards. As a result, the FAA approved several modifications of standards and approved a D-II RDC classification. Once again, for the current master plan project, the FAA reviewed the appropriate RDC and again concluded that the airport could not reasonably meet D-III design standards, therefore the FAA approved D-II classification.

The alternatives analysis has been presented in a manner to maximize compliance with D-III, then D-II design standards. The following design elements were covered:

1. Runway to Taxiway Separation: The D-III standard is 400 feet. The D-II standard is 300 feet. An FAA-approved MOS permits the existing 250-foot separation to remain.
2. Hold Line Location: The hold lines are 152 feet from the runway centerline. The D-II and D-III standard is 250 feet from the runway centerline. A previously completed SRMD indicated that the hold lines could not be relocated due to negative impacts to the regional airspace. Therefore, the ATCT personnel use the current hold line location as the safety area boundary. Holding aircraft are not incursions, but an aircraft that proceeds past the hold line toward the runway without ATCT clearance could be an incursion.
3. Runway Safety Area: Declared distances are in place so that the airport meets RSA design standards. The D-II and D-III RSA standard width is 500 feet; however, for D-II airports, a 400-foot-wide RSA is permissible, and SDL implements a 400-foot-wide RSA.
4. Runway Object Free Area: The standard D-III and D-II ROFA is 800 feet wide, extending 1,000 feet beyond the declared ends of the runway. At SDL, an FAA-approved MOS is in place. The MOS defines the ROFA width at 630 feet, extending 470 feet beyond the Runway 3 end and 500 feet beyond the Runway 21 end.
5. Declared Distances: Declared distances are implemented at SDL to maximize runway length and the various safety areas.

6. Taxiway/Taxilane Separation and Aircraft Parking Apron: Portions of main terminal apron have an edge taxilane that runs parallel to Taxiway A, and they are separated by 105 feet. The D-III separation standard is 144.5 feet. The D-II separation standard is 101.5 feet. Several alternatives to increase the separation between the apron edge taxilane and Taxiway A were presented.
7. Taxiway Geometry: The FAA has changed their recommendation for taxiway geometry over time. As a result, there are several taxiways that do not meet the current design guidelines. Consideration was given in this alternatives chapter to mitigate three primary issues:
 - Direct access from an apron to the runway: Taxiways A3, A4, A5, A6, and A7.
 - High-energy runway crossings: Taxiways A7/B7 and A10/B10.
 - Angled taxiways: Taxiways A2, A4, A6, A9, A11, A12, B5, B6, B11, B12.
8. Runway Visual Aids: Both ends of the runway are equipped with PAPI-2L. If feasible, it is recommended that they be upgraded to the more sophisticated PAPI-4L.
9. Runway Pavement Weight Bearing Capacity: Currently, the runway weight-bearing capacity of the runway is 45,000 pounds for single wheel landing gear and 75,000 pounds for dual-wheel landing gear. With prior permission, aircraft up to 100,000 pounds can operate at the airport. There are regular operations by aircraft with a maximum takeoff weight above these levels, which can reduce the useful life of the pavement. Therefore, the pavement weight bearing capacity is recommended to be increased to at least 100,000 pounds (D) to accommodate existing activity.
10. Next Generation Business Jets: Several models of new business jets exceed the 100,000-pound limit for operation at the airport. There is no design standard safety reason to prohibit these business jets from operating at the airport. It is recommended that the airport consider allowing slightly heavier aircraft or aircraft up to 114,999 pounds to operate, in response to evolving business aviation needs. The primary concern is the potential for increased wear on the runway pavement, which may shorten its useful life. However, this impact can be effectively managed through the airport's ongoing program of monitoring and routine maintenance.

LANDSIDE CONSIDERATIONS

Generally, landside issues are related to those facilities necessary or designed for the safe and efficient parking and storage of aircraft, movement of pilots and passengers to and from aircraft, airport support facilities, and overall revenue support functions. To maximize airport efficiency, it is important to locate facilities together that are intended to serve similar functions. The best approach to landside facility planning is to consider the development to be like that of a community where land use planning is the guide. For airports, the land use guide in the terminal area should generally be dictated by aviation activity levels.

HANGAR NEEDS

Scottsdale Airport is somewhat unusual in that many of the hangar facilities are located off airport property. The Scottsdale Airpark has approximately 140 parcels with taxiway access. While not all of these parcels have hangars, most do. In an FAA-funded master plan, only facility needs located on airport property may be considered.

There is approximately 500,000 square feet of aircraft hangar space on airport property currently. Previous analysis estimated that within the next 20 years, an additional 394,000 square feet of hangar space may be needed. Any new hangar facilities in the Airpark would reduce that estimated hangar need. Developing a plan for additional hangars on existing airport property is challenging, because nearly all on-airport property has already been developed with hangars, aprons, and taxiways. In addition, there is a need to balance hangar space versus apron space, both of which are deficient to meet projected demand.



Figure 4-2: Potential Locations for New Hangars

Figure 4-2 shows three potential locations for new hangar development. Each of these locations is current aircraft parking apron that is under tenant lease. Therefore, any development of these hangars would be at the discretion of the tenant.

APRON NEEDS

The FBOs manage the use of most of the public apron areas at the airport. During interviews, each FBO operator independently indicated an immediate need for additional aircraft parking apron areas. The challenge is that the airport is largely built out with hangars and aprons. As a result, there is a delicate balancing that must occur between providing hangar space or apron space. Any new hangar space constructed necessarily means there is less apron space.

Chapter Three – Facility Requirements presented apron space analysis, which concluded that approximately 67,000 square yards of apron space would be needed over the next 20 years. Some portion of the total apron need may be provided by private developers in the Airpark. There are no undeveloped areas at the airport that could be used for aircraft parking aprons. It is feasible that tenants could decide to remove an older hangar and replace it with aircraft parking apron.

AUTO PARKING NEEDS

There has long been an acute need for more vehicle parking at the airport. There are numerous airport businesses that serve the public and have a need for public parking. The challenge is that there is limited airport property available for expansion of vehicle parking. One avenue that may be available is for the airport to acquire private property and to convert that property to vehicle parking. One such area is surrounding the existing surface parking lot across the street from the Aviation Business Center. **Figure 4-3** shows this area.



Figure 4-3: Potential Surface or Structured Vehicle Parking

Another consideration is the possibility of acquiring land and building a multi-level parking garage. Such a facility could be revenue-producing as parking spaces could be leased to airport tenants to fulfill their overflow parking needs.

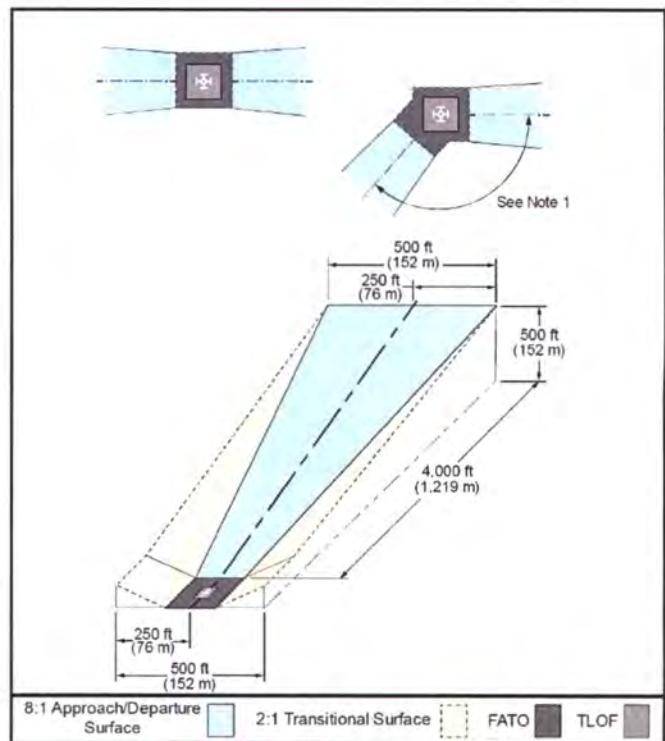
VERTIPORT CONSIDERATION

Some airports may want to consider a dedicated vertiport that can accommodate not only helicopters but also the newly emerging advanced air mobility (AAM) aircraft. Vertiport design is based on guidance in FAA Engineering Brief #105, *Vertiport Design*. This engineering brief is written for vertical takeoff and landing (VTOL) aircraft powered by electric motors. The vertiport design considerations are very similar to the guidance provided in FAA AC 150/5390-2D, *Heliport Design*. The size of the landing area and the associated safety areas are a function of the controlling dimensions of the aircraft, typically the smallest enclosing circle that can surround the aircraft. This is similar to heliport design where the circumference of the helicopter rotor defines the landing area.

Vertiports and heliports have approach and departure surfaces associated with the landing area. The preferred approach/departure surface is based on the predominant wind direction. Where a reciprocal approach/departure surface is not possible in the opposite direction, a minimum 135-degree angle should be used. **Figure 4-4** shows the dimensions of the approach/departure surfaces for vertiports.

The approach and departure surface are one and the same and they rise at a ratio of 8:1. The approach/departure surface can rise above other structures.

Having a dedicated vertiport is a choice that airport sponsors can make. The trigger to considering a dedicated heliport is when an airport experiences sustained high volumes of activity by helicopters (or future AAM aircraft) that creates a safety concern. Vertiports can enhance safety by directing arriving and departing vertical lift aircraft to a single location. From that location, they typically hover-taxi to/from their final location.



Note 1: The preferred approach/departure surface is based on the predominant wind direction. Where a reciprocal approach/departure surface is not possible in the opposite direction, use a minimum 135-degree angle between the two surfaces.

Figure 4-4: Vertiport Design Considerations

Vertiports can be restrictive in that they take up valuable ramp space and cause flights to go to/from a single location. Most airports will follow existing helicopter flight paths, which may be to a runway end, taxiway, or apron location, typically close to their final destination. This current operating procedure at SDL allows greater flexibility for operators and ATCT personnel.

Establishment of a vertiport also requires dedicated airspace. Thus, when the FAA performs an airspace analysis for any development in the vicinity of the airport, the vertiport could be restrictive to that particular development.

At SDL, there have not been any safety concerns regarding helicopter operations. If operations by helicopters or future AAM activity becomes a safety concern, then the airport should consider a dedicated vertiport at that time. For this master plan, a dedicated vertiport is not considered necessary and may not be necessary during the 20-year term of this study. Therefore, a dedicated vertiport is not planned to be included in the ALP.

REDEVELOPMENT OPPORTUNITIES

Airports that are more mature, meaning fully built out, need to consider opportunities for redevelopment of older and less efficient hangars and buildings. SDL has pursued several redevelopment

opportunities in the past. Redevelopment is necessary for the airport to maximize revenue and to address changes in the aviation industry, and more specifically, changes in the operating characteristics at SDL. The local changes are toward higher volumes of large business jets.

POTENTIAL PROPERTY ACQUISITION

The master plan is ultimately a long-term vision for the airport. Part of that vision may include acquisition of various adjacent land parcels to accommodate forecasted growth in activity. SDL is significantly constrained from accommodating the projected growth. The airport has identified several adjacent parcels that it feels SDL would benefit from owning and would position the airport for changes in demand at the airport. **Exhibit 4K** is a map that shows the parcels identified by the airport for potential acquisition. Land surrounding SDL is very valuable; so valuable that it may not be feasible for the airport to acquire any of these parcels. Nevertheless, if the opportunity arises to incrementally acquire adjacent properties, the airport should pursue them.

LANDSIDE SUMMARY

Scottsdale Airport is a mature aviation facility that is fully built out. It is also a facility that has transitioned to a significant degree to a business jet airport. There is still significant activity by operators of smaller aircraft and there are on-going flight training activities. Therefore, future landside planning for hangars, apron space, and vehicle parking is limited. There may be some opportunities for redevelopment of existing facilities or tenant construction on their leaseholds.

SUMMARY

This chapter is intended to present an analysis of various options that may be considered for specific airport elements. The need for alternatives is typically spurred by projections of aviation demand growth and/or by the need to resolve non-standard airport elements. FAA design standards are frequently updated with the intent of improving the safety and efficiency of aircraft movements on and around airports, which can lead to certain pavement geometries now being classified as non-standard when they previously met standards.

Several development alternatives related to both the airside and the landside have been presented. On the airside, the major considerations involve resolving non-standard safety area conditions on the airfield and improving airfield geometry to meet proper taxiway design standards. For the landside, alternatives were presented to consider additional aviation development on the east and west sides of the airport. As the airport already accommodates the full array of GA aircraft, and with the potential for increased operations and based aircraft, it will be important to clearly delineate development areas for facilities to accommodate airport users. This becomes even more critical with the potential introduction of AAM/UAM operations into the mix, and segregating operators by type of aircraft will contribute to operational safety and present a more organized and efficient airport.

The next step in the master plan development process is to arrive at a recommended development concept. Participation of the PAC and the public will be important considerations, and additional consultation with the FAA may also be required. Once a consolidated development plan is identified, a 20-year capital improvement program, with a list of prioritized projects tied to aviation demand and/or necessity, will be presented. Finally, a financial analysis will be presented to identify potential funding sources and to show airport management what local funds will be necessary to implement the plan.



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Meeting Date: June 23, 2026

Item No. WS01 – Scottsdale Airport Master Plan

PART 2