

PAGE
MUNICIPAL AIRPORT
AIRPORT MASTER PLAN






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ARIZONA
THE CENTER OF CANYON COUNTRY

DRAFT FINAL
AIRPORT MASTER PLAN

For

PAGE MUNICIPAL AIRPORT

Prepared for
City of Page, Arizona

By

Coffman Associates
Airport Consultants

In association with

C&S COMPANIES®

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INTRODUCTION






INTRODUCTION

The Page Municipal Airport Master Plan update provides an evaluation of the airport's aviation demand and an overview of the systematic development that will best meet those demands. The Federal Aviation Administration (FAA) recommends that airports update their master plan every 7 to 10 years, or as necessary to address local changes. The master plan establishes development objectives and provides a 20-year planning period that details specific study elements including airfield configuration, facility development, on-airport land use development recommendations, and support facilities. It also serves as a tool for evaluating airport improvement priorities as well as justifying the need for federal and state funding assistance. The last master plan prepared for Page Municipal Airport was completed in 2009. This master plan update is a necessary evaluation of the airport's existing conditions, capabilities and role, potential improvement needs, impact on the local economy, and value related to the national air transportation system.

The City of Page recognizes the importance of air transportation to the community as well as the associated challenges inherent in maintaining a safe and efficient airport environment. The cost of maintaining an airport is an investment which yields impressive benefits to the community. With a sound and realistic master plan, Page Municipal Airport can maintain its role as an important link to the national air transportation system for the region while maintaining the existing public and private investments in its facilities.

An important outcome of the master plan process is a recommended development plan that reserves sufficient space for future facility needs. Such planning will protect development areas and ensure they will be readily available when required. The intended outcome of this study is a detailed on-airport land use concept which outlines specific uses for all areas of airport property, including strategies for revenue enhancement.



STUDY OVERVIEW

The City of Page is responsible for funding capital improvements at the airport, as well as obtaining FAA and Arizona Department of Transportation – Aeronautics Group (ADOT) development grants. Additionally, the city oversees private entities' facility enhancements and infrastructure development on airport property to ensure compliance with federal, state, and local regulations. The master plan provides guidance for future development and justification for funding airport projects by the FAA and ADOT through an updated capital improvement program (CIP).

The airport master plan process will follow a systematic approach outlined by the FAA to identify existing and future airport needs in advance of actual need for improvements. This is done to ensure that city officials and airport staff can coordinate environmental reviews, project approvals, design, financing, and construction to minimize the negative effects of maintaining and operating inadequate or insufficient facilities. The intended result is a recommended development concept which outlines the proposed uses for separate areas of the airport.

The City of Page has contracted with C&S Companies (Page Municipal Airport's engineer) in association with Coffman Associates, Inc. (a national airport planning firm) to undertake the airport master plan. The study is prepared in accordance with FAA requirements, including Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, and (AC) 150/5300-13A, *Airport Design*.

MASTER PLAN GOALS AND OBJECTIVES

The primary objective of the Page Municipal Airport Master Plan is to develop and maintain a financially feasible, long-term development program which will satisfy aviation demand and be compatible with community development, other transportation modes, and the environment. The accomplishment of this objective requires the evaluation of the existing airport and a determination of which actions should be taken to maintain an adequate, safe, and reliable airport facility meeting the air transportation needs of the area. The completed master plan provides an outline of the necessary development and gives responsible officials notice of future needs to aid in planning, scheduling, and budgeting.

This master plan will provide guidance, through an updated CIP, to outline for the airport sponsor (City of Page) what investments may be required for the future development and maintenance of the airport facilities. The plan will consider and be coordinated with other planning studies in the area and with aviation plans developed by the FAA and ADOT. This study will also take into consideration historical planning documents including the *Page Municipal Airport Master Plan* (2009), as well as the most recently updated Airport Layout Plan (ALP) dated 2010.

Some specific goals of this master plan update are outlined below:

- Justify proposed development through the technical, economic, and environmental investigation of concepts and alternatives;
- Provide an effective graphic presentation of the development of the airport and anticipated land uses in the vicinity of the airport;
- Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term CIP;
- Propose an achievable financial plan to support the implementation schedule;
- Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before a development project is approved;
- Present a plan that adequately addresses the issues and satisfies local, state, and federal regulations;
- Research and evaluate socioeconomic factors likely to affect the air transportation demand in the region;
- Determine the projected facility needs of airport users through the year 2038, by which to support airport development alternatives;
- Recommend improvements that will enhance the airport's safety capabilities to the maximum extent possible;
- Recommend improvements that will enhance airport capacity to the maximum extent;
- Produce current and accurate airport base maps and ALP drawings;
- Establish a schedule of development priorities and a program for the improvements proposed in the master plan;
- Prioritize the airport capital improvement program and develop a detailed financial plan;
- Develop a robust and productive public involvement throughout the planning process; and

- Conduct an aeronautical survey that is compliant with Airport Geographic Information System (AGIS) standards and includes airspace and obstruction information submitted to and approved by the FAA.

This master plan will provide recommendations from which the City of Page may take action to improve the airport and all associated services important to public needs, convenience, and economic growth. The plan will benefit all residents of the area by providing a single comprehensive plan which supports and balances continued growth of aviation activities and the environmental preservation of the surrounding areas.

MASTER PLAN TASKS

The master plan for the airport specifically address the following tasks:

- Assist the City of Page through a Planning Advisory Committee (PAC), which is made up of a group of stakeholders including government representatives, airport users and tenants, local community leaders, in determining a vision for the airport;

- Conduct a series of public information workshops to allow the general public an opportunity to be informed on the airport and provide input related to the study process;

- Conduct a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis, identifying strengths, weaknesses, realistic markets, goals, resources, and strategies to move forward. This analysis will factor the strengths and weaknesses of the airport to include physical and operational features. The analysis will also present the same for competing airports in the region;

- Establish goals and priorities for the airport to meet the vision based on the realistic evaluation of the facility in terms of configuration, condition, amenities, location, competition, and forecasted aviation demand;

- Identify airfield alternatives based on goals and opportunities as well as applicable airport design standards. The analysis will include an evaluation of the airfield geometry to address potential runway incursion hot spots and nonstandard conditions in addition to providing recommendations for conformance and improvement;

- Provide a landside development plan that identifies areas for accommodating the forecasted growth of aviation, aviation-related businesses and, if appropriate, areas for non-aviation revenue-producing opportunities. Consideration will be given to the potential new or expanded aviation facilities, including, but not limited to aircraft storage hangar capacity, aircraft parking apron space, and support facilities;

- Access compatible land uses near the airport; and

- Prioritize pavement/facility preservation and rehabilitation recommendations in order of greatest overall positive impact.

BASELINE EXPECTATIONS

This type of study typically outlines some baseline expectations that will be used throughout the analysis. The baseline expectations for this study include:

- The airport will continue to operate as a publicly-owned, regional commercial service airport through the 20-year period;

- The airport will continue to serve commercial service operators and their passengers, general aviation tenants, and itinerant and/or local aircraft operations by general aviation, air taxi, and military operators;

- The aviation industry will grow through the planning period as projected by the FAA. Specifics of projected growth in the national commercial and general aviation industry are contained in Chapter Two - Forecasts of the master plan; and

- A federal and state airport improvement program will be in place through the planning period to assist in funding capital development needs.

MASTER PLAN ELEMENTS AND PROCESS

The Page Municipal Airport Master Plan is being prepared in a fashion pursuant to the scope of services that has been coordinated with the City and the FAA. The study has 11 specific elements that are intended to assist in the identification of future facility needs and provide supporting rational for their implementation. **Exhibit IA** provides a graphical depiction of the elements and process involved with the study.

Element 1 – Initiation includes the development of the scope of services, budget, and schedule. A PAC is also formed and study material will be assembled in a workbook format. General background information will be established that will include outlining the goals and objectives to be accomplished during the master plan.

Element 2 – Inventory summarizes facilities and operational data, area airspace, weather conditions, population and economic data, vicinity land uses, and environmental conditions of the airport and surrounding area. New aerial photography and planimetric mapping of the airport is also obtained to aid in

PROJECT WORK ELEMENTS

PAC #1

INVENTORY

- Airport facilities
- Airspace and air traffic control
- Area socioeconomic data
- Local planning and land use
- Airport access and parking, utilities, and aerial photography

WP

AVIATION DEMAND FORECASTS

- Based aircraft and fleet mix
- Annual operations
- Other aviation activity

WP

KEY:

PAC - Planning Advisory Committee

PIW - Public Information Workshop

WP - Working Paper

FACILITY REQUIREMENTS

- Taxiways
- Airfield capacity
- Hangar facilities
- Design categories
- Runway length and strength
- Support facilities
- Terminal building
- Aprons
- Navigational aids

WP

PAC #2 PIW #1

AIRPORT DEVELOPMENT ALTERNATIVES

- Evaluate development scenarios (airside, landside, support)

WP

PAC #3 PIW #2

RECOMMENDED MASTER PLAN CONCEPT/ ENVIRONMENTAL REVIEW

- Detailed master plan facility and land use plans
- Review evaluation of NEPA environmental categories
- Noise exposure

WP

FINANCIAL PLAN AND CAPITAL IMPROVEMENTS

- Airport Development schedule
- Cost estimates
- Funding sources

WP

PAC #4 PIW #3

AIRPORT LAYOUT PLANS

- Airport layout plan
- Landside drawing
- Recycling plan
- Airspace/approach drawings
- On-airport land use plan
- Property map
- Land use plan

FINAL DOCUMENTATION/DELIVERABLES

- Draft Master Plan Report
- Master Plan/ALP Approvals
- Final Master Plan Report
- Electronic Documentation



the study process. An AGIS survey is included in this element to ensure a detailed collection of airport and aeronautical data.

Element 3 – Forecasts examines the potential aviation demand for commercial passenger service, general aviation, air taxi, and military activity at the airport over a 20-year period. Specific indicators for based aircraft, aircraft operations, and peaking characteristics will be required to meet the projected aviation demand at the airport through the planning period.

Element 4 – Facility Requirements determines the available capacities of various facilities at the airport, whether they conform with FAA standards, and what facility updates or new facilities will be needed to comply with FAA requirements and/or projected 20-year demand.

Element 5 – Airport Alternatives considers a variety of solutions to accommodate projected airside and landside facility needs through the long-term planning period. An analysis is completed to identify the strengths and weaknesses of each proposed development alternative, with the intention of determining a single direction for development.

Element 6 – Master Plan Concept and Capital Financial Plan provides both a graphic and narrative description of the recommended plan for the use, development, and operation of the airport. A detailed CIP is included which defines the schedule and costs for the recommended development projects. In addition, an economic benefit analysis is conducted to measure and analyze the economic impacts of the airport.

Element 7 – Airport Layout Plan (ALP) Drawing Set is developed to depict existing and proposed facilities and provide the official ALP drawings that are produced as a result of the recommended development plan. These drawings are used by the FAA and ADOT in determining grant eligibility and funding.

Element 8 – Environmental Evaluation provides the city with proper guidance regarding, and compliance with, the *National Environmental Policy Act* (NEPA). Throughout the study process, environmental factors are evaluated that assess existing and future conditions on and adjacent to the airport. This preliminary environmental evaluation follows FAA guidelines in implementing NEPA. A recycling plan will also be prepared that explores existing recycling efforts at the airport and will outline opportunities to improve the diversion of waste from landfills.

Element 9 – Public Coordination and Communication provides opportunities to inform the public on the master plan process. Working papers are prepared at various milestones in the planning process. A series of PAC meetings and public information workshops are also planned during the process to discuss study findings.

Element 10 – Final Reports and Approvals provide documents which depict the findings of the study effort and present the study and its recommendations to appropriate local organizations. The final document incorporates the revisions to previous working papers prepared under earlier elements into a usable master plan document.

STUDY PARTICIPATION

The Page Municipal Airport Master Plan is a collaborative effort within the airport's community and region. This community includes local citizens and businesses, community organizations, city officials, airport users, airport tenants, and aviation organizations. As a component of the region, state, and national aviation system, the master plan is of importance to both state and federal agencies responsible for overseeing the air transportation system.

In order to assist in the development of the master plan, the City of Page has identified a group of stakeholders including government representatives, airport users and tenants, and local community leaders to act in an advisory role. In the development of the master plan, members of this PAC will meet four times at designated points during the study process to review study materials and provide comments to help ensure that a realistic, viable plan was developed. **Table IA** details organizations represented within the PAC.

Table IA
Planning Advisory Committee
Page Municipal Airport Master Plan

Representing Entities
Airport Administration
City of Page Planning and Zoning
City of Page Economic Development
City of Page City Council
City of Page City Manager's Office
Airport Advisory Board
Federal Aviation Administration
Arizona Department of Transportation - Aeronautics Group
Arizona Military Airspace Working Group
Arizona State Land Department
Arizona Pilots Association
Airport Tenants / Users

A series of open house public information workshops are also conducted as part of the study coordination effort. These workshops are designed to allow any and all interested parties to become involved and provide input concerning the master plan process. Notices of meeting times and locations are advertised through local media outlets. Draft working papers and other information related to the study can be found online at **https://page.airportstudy.com.**

SWOT ANALYSIS

A SWOT analysis is a strategic business planning tool used to identify **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats. This tool is applied to an action or a plan and used to identify the internal and external forces that may influence the goal or objective of the plan. For this study, a SWOT analysis will be applied to the airport within the confines of the master plan. As a result, it provides a continuous vision and direction for the development of Page Municipal Airport.

SWOT DEFINITIONS

This SWOT Analysis will group information into two categories:

- **Internal** - attributes of the airport and market area that may be considered strengths or weaknesses to the action, objective, or element.
- **External** - attributes of the aviation industry that may pose opportunities or threats to the action, objective, or element.

The SWOT further categorizes information into one of the following:

- **Strengths** - internal attributes of the airport that are helpful to achieving the action, objective, or element.
- **Weaknesses** - internal attributes of the airport that are harmful to achieving the action, objective or element.
- **Opportunities** - external attributes of the industry that are helpful to achieving the action, objective, or element.
- **Threats** - external attributes of the industry that are harmful to achieving the action, objective, or element.

SWOT ANALYSIS EXERCISE

The SWOT analysis for the airport is based upon information gathered during the first PAC meeting that was conducted in November of 2018. A summary of the results of the SWOT analysis exercise is shown in **Table IB**.

TABLE IB
SWOT Analysis
Page Municipal Airport Master Plan

	Strengths	Weaknesses
Internal	Location in proximity to tourism	Availability for vehicle parking
	Regional jet service	Rental car options
	Air tour operations	Runway length (ability to expand)
	Crosswind runway	Terminal layout/space
	Wide array of aviation services	Restroom facilities
	Airport cleanliness/upkeep	Residential encroachment
		Access to developable land
		No large hangar space
	Opportunities	**Threats**
External	Essential Air Service program	Essential Air Service program funding
	Demonstrating the city is a viable destination	Powerplant closure (December 2019)
	Other airline services	Pilot shortage
	Airline code sharing	Available housing for airport workers (air tour operators)
	Promotion of tourism	Geography/topography of land adjacent to airport
	Economy that serves the local area (tourism)	



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Chapter One

INVENTORY









INVENTORY

The inventory chapter for the Page Municipal Airport Master Plan is intended to give a summary of the existing facilities and conditions at the airport. Serving as a baseline for the preparation of the master plan, the inventory will outline the airport's current role in the national, regional, and local aviation systems, and provide an overview of the airport's physical and operational features. Specific, detailed information related to airport facilities, users, air traffic activity, land use, community socioeconomic data, and environmental conditions helps to provide an understanding of the future development potential for the facility.

The information outlined in this chapter provides a foundation for all subsequent chapters. Some of the information was obtained through on-site inspections of the airport and interviews with airport staff and tenants, as well as aerial and ground photography and project record drawings. Other useful sources of information include documents prepared by the Federal Aviation Administration (FAA), Arizona Department of Transportation – Aeronautics Group (ADOT), and City of Page. Also, pertinent online data has been collected as it relates to the airport and areas served by the airport. This inventory was conducted using the following sources of information:

- *Page Municipal Airport Master Plan,* June 2009
- *National Plan of Integrated Airport Systems,* October 2018
- Arizona *State Aviation System Plan Update*, October 2018
- City of Page website (*http://cityofpage.org)*
- Airport communication
- On-site visits
- Aerial and ground photography
- Interviews with airport staff, tenants, and users
- Federal, state, and local publications
- Project record drawings



AIRPORT SYSTEM PLANNING ROLES

Airport planning exists on many levels: national, state, and local. Each level has a different emphasis and purpose. On a national level, Page Municipal Airport 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, which was last updated and approved by the City of Page in 2009.

NATIONAL AIRPORT PLANNING

The nationwide system of airports, which exists today, is a direct result of federal policy that promotes the development of civil aviation. Most of the nation's network of existing airports were initially constructed by the federal government. Also, in most cases, their maintenance and developments are still primarily funded through various federal grant programs that aid communities in the care of their prospective airfields. As part of the continuing effort to maintain a thriving national airport system in the United States, representatives in Congress maintain a plan for development and maintenance of airports called the NPIAS.

Page Municipal Airport is classified in the current NPIAS (2019-2023) as a nonhub primary commercial service airport. This grouping includes 247 airports nationwide that individually provide regularly scheduled passenger commercial service and record less than 0.05 percent of total U.S. passenger enplanements but have more than 10,000 annual enplanements. Nonhub primary airports together account for three percent of all enplanements. These airports are also heavily used by general aviation aircraft, which is the case for Page Municipal Airport, and average 87 based aircraft. Primary airports identified in the NPIAS consist of 380 total airports that account for 99 percent of passenger enplanements, 36 percent of aircraft operations, and 61 percent of development.

STATE AIRPORT PLANNING

Page Municipal Airport is included in the 2018 update of the Arizona SASP. The purpose of SASP is to provide a framework for the integrated planning, operation, and development of Arizona's aviation assets. The SASP provides policy guidelines that promote and maintain a safe aviation system in the state, assess the state's airport capital improvement needs, and identify resources and strategies to implement the plan. The 2018 SASP provides important insight into how Arizona's airports can remain highly advanced, safe, and responsive to the public's needs today and throughout the 20-year planning horizon. The SASP identifies Page Municipal Airport as a Commercial Service – National Airport. **Table 1A** further details the state airport roles to include Page Municipal Airport's designation in bold.

TABLE 1A
State Airport Roles

Role	Role Parameters	Function
Commercial Service – International	International commercial service	Year-round scheduled commercial service to international destinations for people and cargo. High levels of activity with many jets and multi-engine propeller aircraft.
Commercial Service - National	**Domestic commercial service**	**Scheduled commercial service to domestic destinations for people and cargo. May provide seasonal scheduled commercial service to a limited number of inter-national destinations. Moderate to high levels of activity with jets and multiengine propeller aircraft.**
Reliever	FAA-designated airport that relieves congestion at a commercial service airport	Serves to relieve congestion at commercial service airports. Supports the national air system and provides access to markets across the U.S. Moderate to high levels of activity with jets and multi-engine propeller aircraft.
General Aviation - Community	250 instrument operations, 10 based aircraft or 1 based jet, and aircraft fuel	Support regional economies and provides access to markets in Arizona and nearby states. Moderate levels of activity with jets and multi-engine propeller aircraft.
General Aviation - Rural	2,500 operations or 10 based aircraft and aircraft fuel	Serve a supplemental role in local economies, primarily serving smaller business, recreational, and personal flying.
General Aviation - Basic	All other GA airports	Serve a limited role in the local economy, primarily serving recreational and personal flying.

Source: 2018 Arizona State Aviation System Plan Update

The SASP outlines three basic goals for the 67 public use airports located in Arizona. They are as follows:

1. **Safety and Security**
   Arizona should maintain a safe and secure airport system as measured by compliance with applicable safety and security standards, while supporting health and safety related services and activities.

2. **Fiscal Responsibility**
   Arizona should implement cost-effective investment strategies to meet current and projected demand, while remaining adequately accessible to Arizona citizens, visitors, and businesses.

3. **Economic Support**
   Arizona should advance a system of airports that promote Arizona's growth and development.

LOCAL AIRPORT PLANNING

Locally, the airport master plan is the primary planning document for an airport. The master plan is intended to provide a 20-year projection for airport development based on aviation demand forecasts. Page Municipal Airport's last master plan was approved/adopted in 2009. As time passes, the forecast element of a master plan becomes less reliable due to changes in aviation activity and/or the economy. The FAA recommends that airports update their master plan every 7 to 10 years, or as necessary, to address any significant changes that may have occurred during the timeframe.

Another component of the master plan is the Airport Layout Plan (ALP) drawing set. The ALP drawings are used to depict existing and future development on the airfield. The ALP for Page Municipal Airport was updated during the previous master plan effort.

AIRPORT HISTORY

The present-day Page Municipal Airport was originally developed in 1957 to aid in the construction of the Glen Canyon Dam. The airport was used primarily for the transportation of workers and supplies for the construction effort. As such, it was named the Glen Canyon Airport. The facility originally consisted of a 4,500-foot-long by 150-foot-wide runway (Runway 15-33). In 1960, crosswind Runway 7-25 was established as a 2,380-foot-long by 80-foot-wide gravel runway. In 1975, the newly incorporated City of Page acquired the airport land from the federal government and renamed the facility to Page Municipal Airport. Fast forward approximately 30 years, Runway 7-25 was paved in 2002 and currently provides 2,201 feet of length, and Runway 15-33 was extended to its current length of 5,950 feet in the mid-2000s.

Today, Page Municipal Airport provides facilities and activities to support commercial service, air tour/air taxi, general aviation, and emergency response operations. Currently, the airport accommodates several companies catering to the tourism industry in the area as well as a scheduled commercial passenger service airline.

AIRPORT ADMINISTRATION

Page Municipal Airport is owned and operated by the City of Page. The airport operations are managed and overseen by the Director of Public Works and the Public Works Department. The City of Page also employs a part-time designated airport administrative assistant.

A voluntary Airport Advisory Board is comprised of seven City Council-appointed citizens for staggered three-year terms. This board acts in an advisory and review capacity to the City Council regarding the operation and construction of the airport. It also advises the City Council in the establishment of the rules and regulations consistent with state and federal aviation authority.

CAPITAL IMPROVEMENTS

To assist in funding capital improvements, the FAA has provided funding assistance to Page Municipal Airport through the Airport Improvement Program (AIP). The AIP is the mechanism for funding federal grants through the Aviation Trust Fund, which was established in 1970 to provide funding for aviation capital investment programs and to finance the operation of the FAA. AIP funds support aviation development, facilities and equipment, and research and development. AIP funds are collected by imposing a user-based tax system. Taxes are collected by imposing fees on airline tickets and additional taxes on

aviation-related sales like aircraft fuel and aircraft parts. The airport sponsor, in this case the City of Page, is responsible for a small percentage of total project costs. ADOT also contributes to airport improvements by providing matches of the airport sponsor's share of the total project cost. In some instances, ADOT may fund a project through a state grant only.

Table 1B outlines the federal- and state-funded capital improvement projects which have taken place at Page Municipal Airport since 2007. Over $10 million in grant-aided capital improvement projects have been undertaken at the airport during this timeframe. Of this total, the airport has received approximately $9.57 million in federal grants and $669,448 in state grants. This has included funding for a variety of airport improvement projects, such as taxiway and aircraft parking apron construction, airfield lighting and signage improvements, and runway rehabilitations.

TABLE 1B
Capital Improvement History
Page Municipal Airport

Year	Grant Number	Project Description	Grant Amount
FEDERAL GRANTS			
2007	AIP 20	Construct Service Road; Implement Security Enhancements; Construct Heliport/Helipad	$1,021,612
2008	AIP 21	Improve Airport Drainage; Miscellaneous Airport Improvements; Install Guidance Signs; Rehabilitate Runway 15-33	$458,961
2009	AIP 22	Expand Aircraft Parking Apron; Strengthen Aircraft Parking Apron; Rehabilitate Runway 7-25	$186,552
2010	AIP 23	Expand Aircraft Parking Apron	1,181,488
2010	AIP 24	Expand and Strengthen Aircraft Parking Apron	$97,633
2011	AIP 25	Construct Aircraft Parking Apron; Rehabilitate Runway 7-25	$1,347,580
2012	AIP 26	Rehabilitate Aircraft Parking Apron; Rehabilitate Taxiway	$1,718,843
2013	AIP 27	Conduct Wildlife Hazard Assessment	$90,027
2014	AIP 28	Strengthen Aircraft Parking Apron	$1,080,721
2015	AIP 29	Construct Taxiway; Install Airfield Guidance Signs; Rehabilitate Runway 15-33 Lighting; Rehabilitate Taxiway Lighting	$918,555
2016	AIP 30	Construct Taxiway; Rehabilitate Aircraft Parking Apron	$241,542
2017	AIP 31	Construct Taxiway	$739,936
2018	AIP 32	Update Airport Master Plan Study	$486,938
Subtotal Federal Grants			**$9,570,388**
STATE GRANTS			
2007	7F39	Construct Service Road; Install Perimeter Fence; Construct Heliport/Helipad; Improve Airport Drainage; Construct Taxiway A2	$67,995
2007	7S16	Reconstruct Old Terminal Parking Lot	$179,718
2008	8F24	Security Enhancements; Construct Service Road (East Side); Construct heliport/helipad	$27,894
2009	9F05	Improve Airport Drainage (Design Only); Rehabilitate Runway 15-33; Miscellaneous Airport Improvements; Install Guidance Signs	$11,101
2009	9F55	Expand North Apron, including Relocation of T-Hangars (Design Only); Reconstruction of Runway 7-25 Intersection (Design Only); Strengthen Main Apron (Design Only)	$4,909

TABLE 1B (Continued)
Capital Improvement History
Page Municipal Airport

Year	Grant Number	Project Description	Grant Amount
STATE GRANTS (Continued)			
2010	10F34	Construct North Apron Expansion, including Relocation of T-Hangars (Design Only)	$31,719
2011	1F29	Construct North Apron Expansion, including Relocation of T-Hangars; Strengthen Apron - (Design Only)	$2,003
2012	2F96	Construct Runway 7-25 Reconstruction Project; Repair for Runway 15 Blast Pad; Marking Improvements; Design Apron Expansion and Strengthening Projects	$33,824
2013	3F2J	Pavement Reconstruction and Expansion of the Apron/Connector Taxiway; Taxiway A Safety Area Improvements	$81,135
2014	4F3F	Wildlife Hazard Assessment	$4,340
2015	5S3B	Design Taxiway from North Ramp to Runway 7 End	$85,414
2015	5S3J	Design Airfield Electrical Upgrades. Replace Edge Lights on Runway 15-33, Taxiway A, and Connector Taxiways; Replace Airfield Signage with LED Fixtures	$43,692
2015	5F2M	Construct Apron Strengthening	$46,419
2016	6F2N	Construct Taxiway; Rehabilitate Runway Lighting; Rehabilitate Taxiway Lighting; Install Airfield Guidance	$23,457
2017	7F2C	Construct New Partial Parallel Taxiway C (Design Only); Rehabilitate Apron (Design Only)	$6,356
2018	8M22	Construct Partial Taxiway C	$19,472
Subtotal State Grants			**$669,448**
TOTAL ALL GRANTS			**$10,239,836**

Source: FAA and ADOT Grant Records.

REGIONAL SETTING

The City of Page is in northern Arizona near the southern border of Utah in Coconino County. The city is perched atop Manson Mesa at an elevation of 4,300 feet above sea level and approximately 600 feet above Lake Powell. Coconino County is the largest county in Arizona and the second largest in the United States; it covers most of the northcentral part of the state. The area is sparsely populated and characterized by rugged terrain, including large mountains and deep canyons. Approximately 38 percent of Coconino County is Native American Reservation with Navajo, Hopi, Paiute, Havasupai, and Hualapai tribes inhabiting the area. Coconino County draws visitors from around the world and is home to many scenic attractions, the most popular being Grand Canyon National Park. Other attractions include Lake Powell, Horseshoe Bend, Antelope Canyon, Oak Creek Canyon, and many more. The nearest metropolitan areas are Flagstaff, Arizona, which is 120 miles south; Phoenix, Arizona located 235 miles south; Las Vegas, Nevada located 215 miles west; and Albuquerque, New Mexico located 285 miles to the southeast.

Today, Page is a popular tourist destination in Arizona due to its proximity to Lake Powell and many other local outdoor attractions. Lake Powell is the second largest man-made lake in the United States. Lake

Powell and Glen Canyon National Recreation Area average bringing over three million tourists to the area annually. Page is also home to several other northern Arizona tourist destinations, with the most visited attractions including Horseshoe Bend, which brings visitors a breathtaking view of the lower Colorado River, and Antelope Canyon, which is perhaps the most famous slot canyon in the United States.

AIRPORT LOCATION

Page Municipal Airport is located one mile east of the city's central business district (CBD) and on the northeast side of the city's boundary. Residential development is located adjacent to the west side of the airport. The north, south, and east sides of the airport are met with sloping terrain.

The airport is accessible by road via South 10th Avenue and Sage Avenue. The airport consists of approximately 555 acres of property owned by the City of Page. **Exhibit 1A** depicts the airport's location in the region.

TRANSPORTATION NETWORK

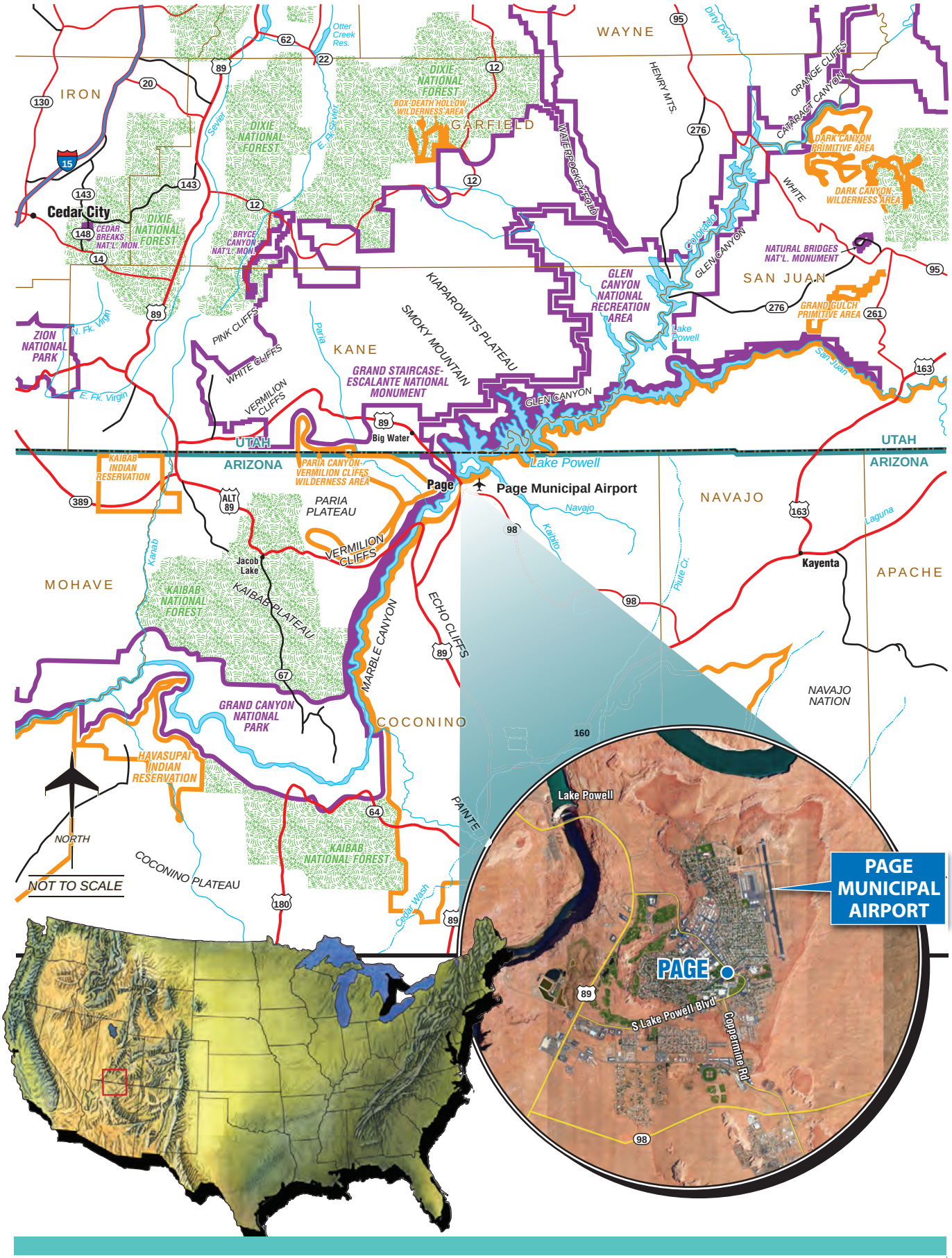
The City of Page is accessible via U.S. Highway 89 and Arizona State Highway 98. U.S. Highway 89 runs primarily north/south in the vicinity of Page. It provides access to the City of Flagstaff and Interstate 40 farther south and connects to rural regionalized settings in Utah to the north and west. Arizona State Highway 98 extends southeast of the City of Page and provides access to rural settings, eventually connecting to U.S. Highway 160.

REGIONAL CLIMATE AND WEATHER CONDITIONS

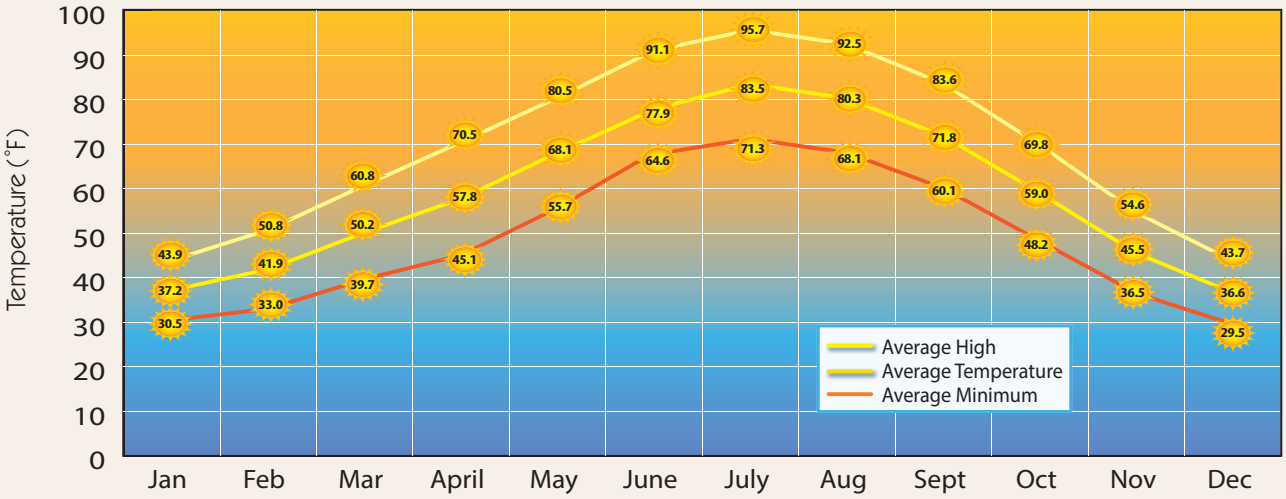
Weather conditions must be considered in the planning and development of an airport. Temperature is a significant factor in determining runway length needs, while local wind patterns can affect the operation and capabilities of the runway system. The need for navigational aids and lighting can be determined by the visibility and cloud ceiling conditions.

At an elevation of approximately 4,316 feet mean sea level (MSL), Page Municipal Airport offers a high desert climate. Page's location on the southern edge of the Great Basin Desert on the Colorado Plateau creates overall dry conditions due to being in the rain shadow of the mountains of California and too far north to get consistent North American monsoons. Climates such as this tend to be semi-arid and support little to no vegetation. Summers are hot with infrequent showers and thunderstorms, usually occurring in the summer months. The spring and fall are typically drier, and winters are usually mild with occasional rain and snow.

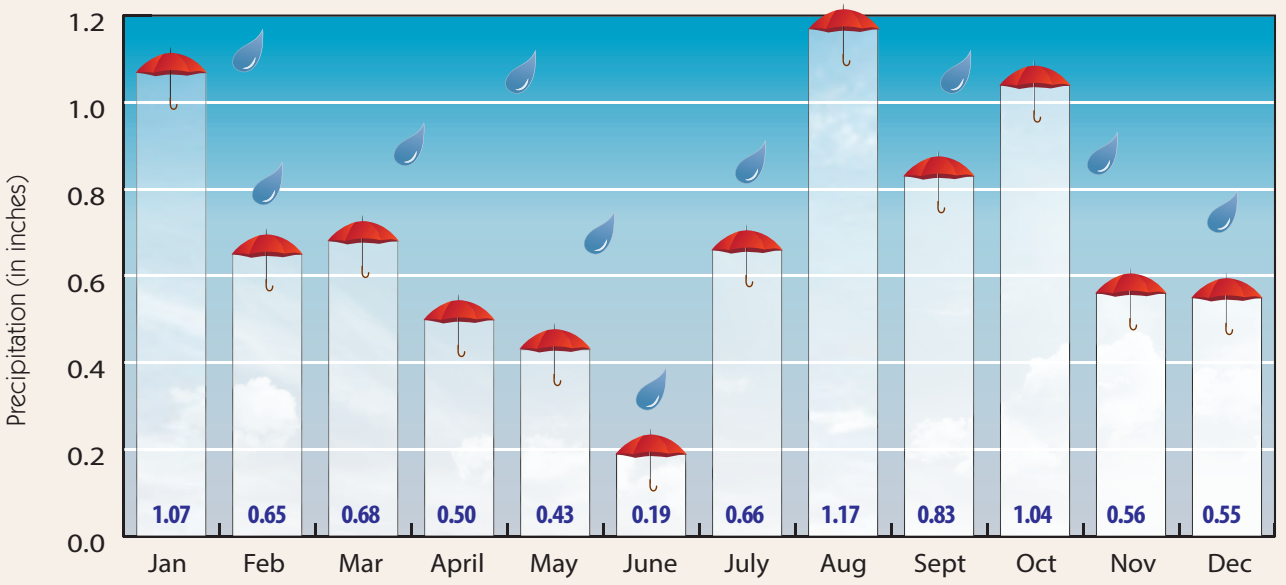
Exhibit 1B lists climate data for Page Municipal Airport and the surrounding region. The National Oceanic Atmospheric Administration (NOAA) notes an average annual high temperature of 95.7 degrees


WAYNE
IRON
GARFIELD
KANE
SAN JUAN
MOHAVE
COCONINO
NAVAJO
APACHE
UTAH
ARIZONA
Cedar City
Page
Page Municipal Airport
Lake Powell
Big Water
Kayenta
DIXIE NATIONAL FOREST
BOX-DEATH HOLLOW WILDERNESS AREA
ZION NATIONAL PARK
CEDAR BREAKS NAT'L. MON.
BRYCE CANYON NAT'L. MON.
GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT
GLEN CANYON NATIONAL RECREATION AREA
NATURAL BRIDGES NAT'L. MONUMENT
GRAND GULCH PRIMITIVE AREA
DARK CANYON PRIMITIVE AREA
DARK CANYON WILDERNESS AREA
KAIBAB INDIAN RESERVATION
PARIA CANYON-VERMILION CLIFFS WILDERNESS AREA
PARIA PLATEAU
VERMILION CLIFFS
KAIBAB NATIONAL FOREST
KAIBAB PLATEAU
GRAND CANYON NATIONAL PARK
HAVASUPAI INDIAN RESERVATION
COCONINO PLATEAU
KIAPAROWITS PLATEAU
SMOKY MOUNTAIN
PINK CLIFFS
WHITE CLIFFS
MARBLE CANYON
ECHO CLIFFS
GLEN CANYON
HENRY MTS.
ORANGE CLIFFS
CATARACT CANYON
WATERPOCKET FOLD
NAVAJO NATION
Otter Creek Res.
Sevier
E. Fk. Sevier
N. Fk. Virgin
E. Fk. Virgin
Virgin
Paria
Kanab
Navajo
Kaibito
Piute Cr.
Laguna
Colorado
White
San Juan
Dirty Devil
NORTH
NOT TO SCALE
PAGE
PAGE MUNICIPAL AIRPORT
S Lake Powell Blvd
Coppermine Rd

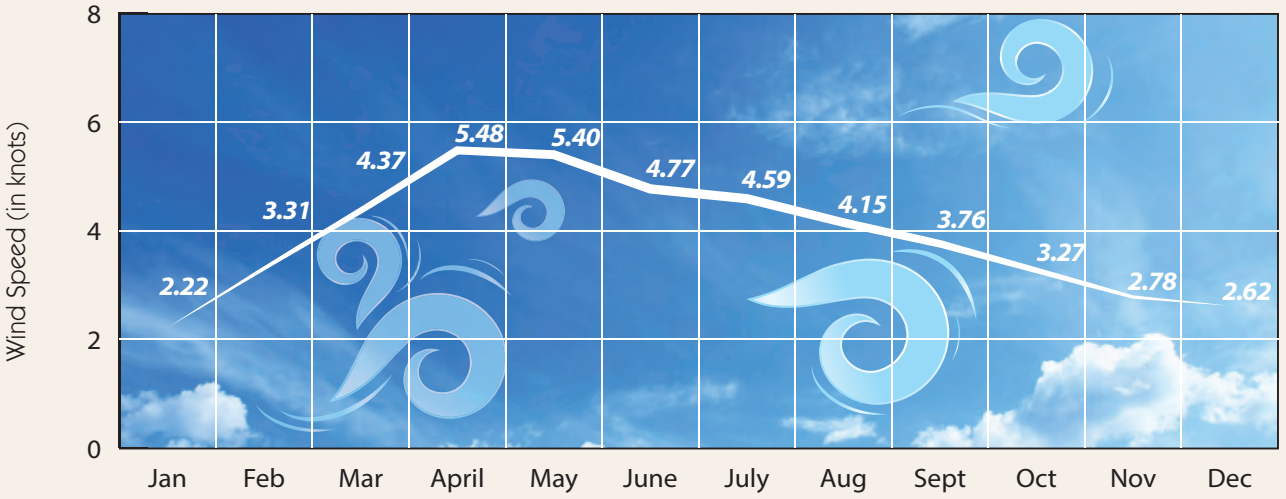
MONTHLY TEMPERATURES



MONTHLY PRECIPITATION



MONTHLY WIND DATA



Source: NOAA temperature and precipitation climate normal, Station ID: GHCND:USW00013964 (1981-2010).

Fahrenheit (F) in the month of July and an average annual low temperature of 29.5 degrees F in December. Average precipitation is 8.33 inches annually. Historical data shows August as the month in which the most precipitation occurs in the region. Wind patterns in the region range from the southwest in the spring and summer months to the northwest in the winter months, with peak average wind speeds occurring in the springtime.

There are three basic types of weather conditions recognized by the aviation community. These conditions are known as visual meteorological conditions (VMC), instrument meteorological conditions (IMC), and poor visibility conditions (PVC). In VMC, a pilot may elect to fly under visual flight rules (VFR), which means he/she takes responsibility for his/her own separation from other aircraft traffic. If conditions are not favorable for VFR flight, such as conditions that exist under IMC, a pilot must fly under instrument flight rules (IFR) and file an instrument flight plan. Flying in IMC would make it necessary for the pilot to rely on instrumentation to safely conduct a flight under these conditions. IMC indicates that cloud ceilings are below 1,000 feet above the ground and visibility is less than three miles. Any weather conditions with minimums less than IMC are known as poor visibility conditions (PVC).

At Page Municipal Airport, VMC occurs 97.13 percent of the time. IMC and PVC conditions combined occur less than three percent of the time. A breakdown of this weather condition data is available in **Table 1C**.

TABLE 1C
Weather Conditions
Page Municipal Airport

Condition	Cloud Ceiling	Visibility	Percent of Total
VMC	>1000' AGL	> 1 statute mile	97.13%
IMC	>500' AGL to <1000' AGL	1-3 statute miles	1.76%
PVC	< 500' AGL	< 1 statute mile	1.11%

VMC - Visual Meteorological Conditions
IMC - Instrument Meteorological Conditions
PVC - Poor Visibility Conditions
AGL - Above Ground Level

Source: NOAA National Climatic Data Center (January 2008 - December 2017)

AIRPORT ACTIVITY

Aviation activity records are essential for determining required facilities, and they help to determine eligibility for federal funding. The most important components to consider when assessing aviation activity at Page Municipal Airport are aircraft operations, passenger enplanements, and based aircraft. It is also important to analyze historical activity levels to aid in projecting future trends. Combining this data will enhance the airport's ability to plan for the potential future facility demands.

AIRCRAFT OPERATIONS

Aircraft operations (takeoffs and landings) are a primary indicator of aeronautical activity at Page Municipal Airport. Aircraft operations are classified as local or itinerant. Local operations often consist of touch-and-go or pilot training activity. Itinerant operations consist of aircraft that arrive from or depart to destination airports outside the local operating area.

Aircraft operations can be separated into four general categories: air carrier, air taxi, general aviation, and military. Due to the absence of an airport traffic control tower (ATCT) at the airport, it can be difficult to maintain an accurate count of the airport's operations. An estimated account of annual activity is available via the FAA *Terminal Area Forecast* (TAF) publication. The most current data estimates that Page Municipal Airport has approximately 17,200 operations per year. The TAF provides a breakdown of estimated operation totals for the airport by type. Chapter Two of the master plan will provide a more detailed account of aircraft operations for the airport. The following provides a description of the categories of aircraft operations detailed above.

- **Air Taxi** – operations associated with aircraft originally designed to have less than 60 passenger seats or a cargo payload of less than 18,000 pounds and carries cargo or mail on either a scheduled or charter basis, and/or carries passengers on an on-demand basis or limited scheduled basis. Scheduled commercial service operations and air tour operations at Page Municipal Airport have historically been counted as air taxi operations.

- **Air Carrier** – operations defined as those conducted commercially by aircraft having a seating capacity of 60 or more seats and a cargo payload capacity of more than 18,000 pounds. There are currently no air carriers operating at the airport by definition of an air carrier operation.

- **General Aviation** – civil aviation operations other than scheduled air services and nonscheduled air transport operations for hire. Although Page Municipal Airport is categorized as a primary commercial service airport, it caters to general aviation activities and the majority of its operations fall in this category.

- **Military** – operations conducted by aircraft and helicopters with a military designation.

COMMERCIAL AIR SERVICE

The City of Page and Contour Airlines have recently re-introduced scheduled commercial air service to the airport with the support of the U.S. Department of Transportation (DOT) through the Essential Air Service (EAS) program. The EAS program was put into place to guarantee that small communities that were served by certificated air carriers before airline deregulation maintain a minimal level of scheduled air service. The DOT is mandated to provide eligible EAS communities with access to the National Air Transportation System. This is generally accomplished by subsidizing two round trips a day with 30- to 50-seat aircraft, or additional frequencies with aircraft with 9 seats or fewer, usually to a large- or

medium-hub airport. The DOT currently subsidizes commuter and certificated air carriers to serve approximately 60 communities in Alaska and 115 communities in the lower 48 contiguous states that otherwise would not receive any scheduled air service.

Beginning in August 2018, Contour Airlines initiated scheduled commercial service from Page Municipal Airport to Phoenix Sky Harbor International Airport, utilizing the 30-passenger seat Embraer ERJ-135 jet aircraft. In November 2018, Contour Airlines added flights to/from Las Vegas, also utilizing the ERJ-135. **Table 1D** presents the flight schedule for Contour Airlines as of April 2019.

Prior to Contour Airlines, the airport was served with scheduled passenger service through Great Lakes Airlines, utilizing the 19-seat Beech 1900D turboprop aircraft. Great Lakes Airlines ceased operations at the airport in March 2018.

TABLE 1D
Flight Schedule (April 2019)
Page Municipal Airport

CONTOUR AIRLINES							
Flight Number	Departure	To	Frequency	Flight Number	Arrival	From	Frequency
3307	6:30 a.m.	Phoenix	M, F	3308	9:00 a.m.	Phoenix	M, F
3303	4:20 p.m.	Phoenix	Daily	3304	7:00 p.m.	Phoenix	Daily
3301	9:40 a.m.	Las Vegas	Daily	3302	3:50 p.m.	Las Vegas	Daily

Source: Contour Airlines

PASSENGER ENPLANEMENTS

A passenger enplanement includes any revenue passengers that board an aircraft for a fare at the airport. This statistic is important in that it is utilized by the FAA to determine the annual level of entitlement funding to the airport under the AIP. Currently, an airport must reach 10,000 annual enplanements to be eligible for a minimum one million dollars in annual entitlement funds. Airline passenger enplanements are influenced by many factors, including the number of airlines serving the airport, air tour activities, frequency of daily departures, types of aircraft used, and diversity of services offered.

As previously detailed, commercial airline service at the airport conducted by Contour Airlines generates passenger enplanements. The airport is also host to several air tour service providers that account for passenger enplanement activities. It should be noted that air tour service is seasonal in nature, with more flights being offered during the summer months and fewer flights in the winter months. Grand Canyon Airlines, American Aviation, and Westwind Air Service currently provide air tour services at the airport.

Passenger enplanements are recorded by the airlines and air tour operators and reported to the FAA and airport staff. **Table 1E** presents historical enplanement levels at Page Municipal Airport since 2013.

During this timeframe, the airport has experienced an average of 41,200 annual enplanements. Of this total, approximately 90 percent of enplanements have been associated with air tour activities.

TABLE 1E
Passenger Enplanements
Page Municipal Airport

	Enplanements by Type		
Year	Scheduled Airline	Air Tour/Air Taxi	Total
2013	5,926	34,913	40,839
2014	3,746	40,412	44,158
2015	2,742	38,072	40,814
2016	3,425	34,493	37,918
2017	4,134	33,466	37,600
2018*	3,118	43,000	46,118

The airport did not have scheduled airline activity from April through July of 2018.
Source: Airport Records; Bureau of Transportation Statistics

BASED AIRCRAFT

Identifying the current number of based aircraft is important to the master planning analysis. An accurate number of based aircraft helps planners determine existing demand for facilities at the airport, including aircraft storage needs, parking apron space, pilot and passenger services, and other support facilities. **Table 1F** provides a summary of based aircraft for Page Municipal Airport as reported by airport management. A presented in **Table 1F**, there are currently 68 reported aircraft based at the airport, which includes single engine piston, multi-engine piston, turboprop, and helicopter aircraft. Although the airport has historically had jets based at the airport, it currently does not.

TABLE 1F
Based Aircraft
Page Municipal Airport

Single Engine	57
Multi-Engine	7
Helicopter	2
Jet	0
Turboprop	2
Total	**68**

Source: Airport Records

TITLE 14 CFR 139 CERTIFICATION

An airport must have an Airport Operating Certificate (AOC) if it is serving air carrier aircraft with more than 9 seats or serving unscheduled air carrier aircraft with more than 30 passenger seats. Title 14 Code of Federal Regulations (CFR) Part 139 describes the requirements for obtaining and maintaining an AOC. This includes meeting various regulations codified under the CFR.

Under Part 139, airports are classified in the following categories based on the type of air carrier operations served:

- **Class I Airport** – an airport certificated to serve scheduled operations of large air carrier aircraft (more than 30 seats) that can also serve unscheduled passenger operations of large air carrier

aircraft and/or scheduled operations of small air carrier aircraft (more than 9 seats but less than 31 seats).

- **Class II Airport** – an airport certificated to serve scheduled operations of small air carrier aircraft and the unscheduled passenger operations of large air carrier aircraft. A Class II airport cannot serve scheduled large air carrier aircraft.

- **Class III Airport** – an airport certificated to serve scheduled operations of small air carrier aircraft. A Class III airport cannot serve scheduled or unscheduled large air carrier aircraft.

- **Class IV Airport** – an airport certificated to serve unscheduled passenger operations of large air carrier aircraft. A Class IV airport cannot serve scheduled air carrier aircraft regulated under 14 CFR Part 121.

Page Municipal Airport is classified as a Class III CFR Part 139 commercial service airport. This designation supports the regularly scheduled operations of aircraft conducting commercial passenger services at the airport. Part 139 regulations (which implemented provisions of the *Airport and Airway Development Act of 1970*, as amended on November 27, 1971) set standards for: the marking and lighting of areas used for operations; firefighting and rescue equipment and services; the handling and storing of hazardous materials; the identification of obstructions; and safety inspection and reporting procedures. It also requires airport operators to have an FAA-approved Airport Certification Manual (ACM).

The ACM defines the procedures to be followed in the routine operation of the airport and for response to emergency situations. The ACM is a working document that is reviewed annually by an FAA Certification Inspector and updated as necessary. It reflects the current condition and operation of the airport and establishes the responsibility, authority, and procedures as required. There are required sections for the ACM covering administrative detail and procedural detail. The current, FAA-approved ACM for Page Municipal Airport was last updated in 2018 and includes sections related to:

- General Information
- Airport Information
- Snow & Ice Control Plan
- Aircraft Rescue & Firefighting
- Hazardous Materials
- Traffic & Wind Direction Indicators
- Airport Emergency Plan
- Self-Inspection Program
- Pedestrian and Ground Vehicles
- Obstructions
- Protection of NAVAIDS
- Public Protection
- Wildlife Hazard Management
- Maintenance and Inspection Program (multiple sections)

AIRPORT FACILITIES INVENTORY

This section provides a description of the existing facilities at Page Municipal Airport. These facilities can be divided into two distinct categories: airside and landside. Airside facilities include those directly

associated with aircraft operations, such as runways, taxiways, lighting, signage, weather, and navigational aids. Landside facilities include those necessary to provide a safe transition from surface to air transportation and support aircraft servicing, maintenance, and operational safety on the ground.

AIRSIDE FACILITIES

Airside facilities are depicted and detailed on an aerial photograph for visual reference on **Exhibit 1C**. A summary of facility data is discussed in the following sections.

Runways

The airport is served by two intersecting runways. Runway 15-33 is the airport's primary runway, while Runway 7-25 is designated as the airport's secondary or crosswind runway. Runway 15-33 is 5,950 feet long and 150 feet wide and is oriented northwest-southeast. There is a 1.2 percent gradient sloping upward to the south. The runway is constructed of asphalt and is reported to be in good condition by the official FAA Form 5010-1 *Airport Master Record* publication. Runway 7-25 is 2,201 feet long by 75 feet wide and is positioned in a northeast-southwest orientation. The runway is paved in asphalt and slopes upward to the east at a 0.2 percent gradient. It is important to note that the Runway 7 threshold is displaced 588 feet.



Runway 15-33

Each runway has a designated strength rating. Runway strength ratings are calculated based upon aircraft weight and landing gear configuration. The landing gear configurations are categorized by number of wheels on each main landing gear strut. Additional wheels per landing gear strut allow the aircraft's weight to be distributed more evenly and, in turn, increases the runway's capability to withstand increasingly heavier aircraft. The landing gear configurations are as follows: single wheel loading (SWL), dual wheel loading (DWL), and dual tandem wheel loading (DTWL). Runway 15-33 is strength-rated for up to 65,000 SWL, 90,000 DWL, and 190,000 pounds DTWL. Runway 7-25 has a published strength rating of 12,500 pounds SWL.

Taxiways

The taxiway system at Page Municipal Airport consists of parallel, connector, and entrance/exit taxiways as depicted on **Exhibit 1C**. Parallel taxiways are primarily designed to efficiently and quickly route aircraft between the runway and the transient and local aircraft tie-down and hangar storage areas.

Taxiway A is the parallel taxiway that serves the full length of Runway 15-33 and features five connector taxiways that provide access to the runway. The taxiway is 40 feet wide and has an estimated weight-bearing capacity of 65,000 pounds. Taxiways A1, A2, and A5 are standard 90-degree connector taxiways that also measure 40 feet in width. Taxiways A3 and A4 are acute angle (high-speed) exit taxiways, which are set at a 45-degree angle to the runway and are 75 feet wide. It should be noted that a portion of Runway 7-25 also serves as a connection point linking Runway 15-33 and Taxiway A. Taxiway A also contains hold aprons near the thresholds of both ends of Runway 15-33. The hold aprons are used as a staging area for aircraft to perform pre-flight equipment checks before taking flight. Taxiway A is situated 300 feet west of Runway 15-33 (centerline to centerline).



Taxiway A and South Hold Apron

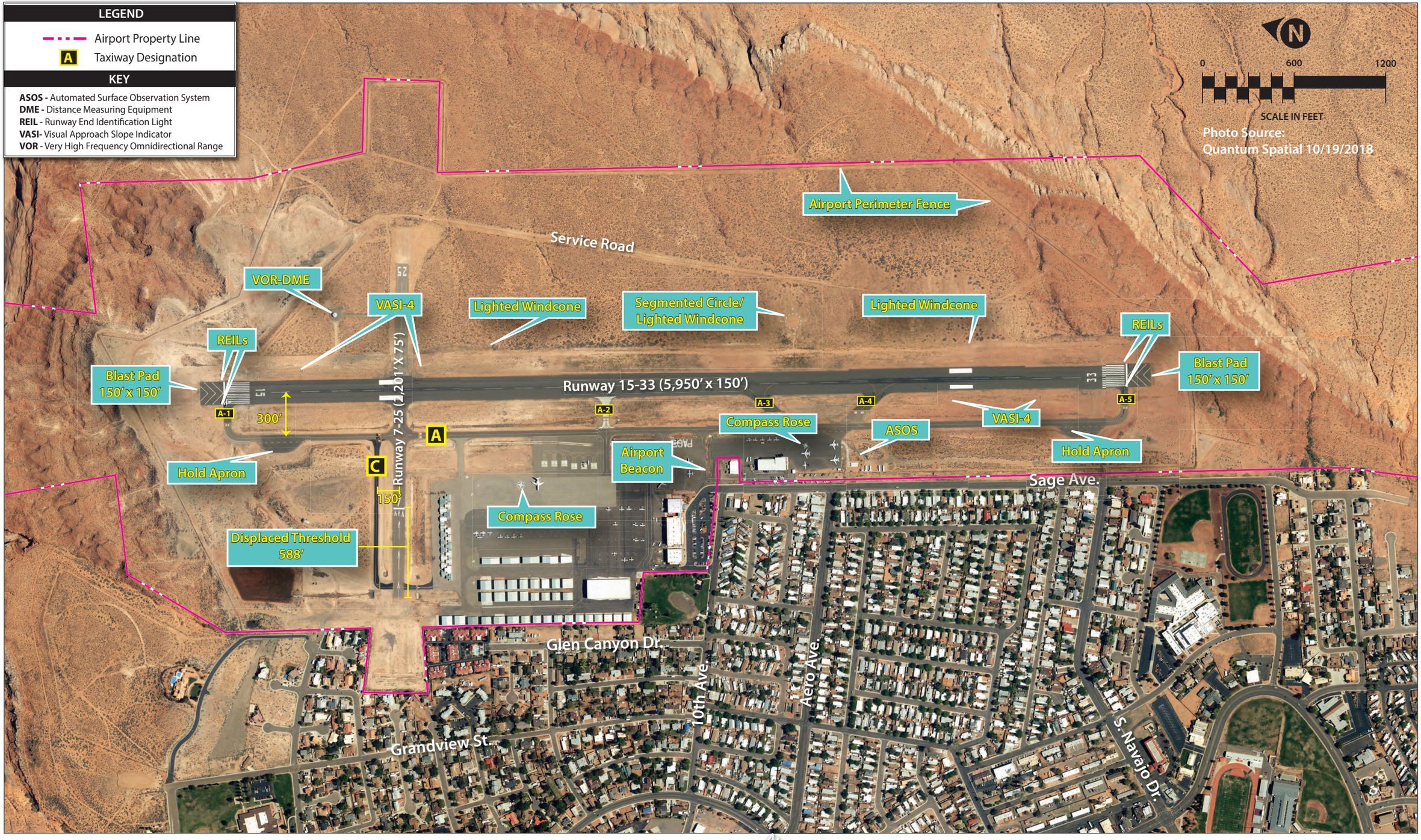
Taxiway C is newly constructed, extends west from Taxiway A, and serves as a partial parallel taxiway for Runway 7-25. This taxiway enhances airfield safety and efficiency by discontinuing the need for aircraft to back-taxi on Runway 7-25 for takeoff and/or landing operations. Taxiway C also provides a connection extending south of Runway 7 to the general aviation hangars situated in the northwest corner of the landside area. Taxiway C is approximately 1,000 feet long and measures 25 feet wide. It is located 150 feet north of Runway 7-25 (centerline to centerline).

Pavement Markings

Pavement markings aid in the movement of aircraft along the airport surfaces and identify closed or hazardous areas on the airport. Runway 15-33 is equipped with non-precision markings that include the runway centerline, designations, threshold bars, aiming points, and aircraft hold lines on each end of the runway. Each end of Runway 15-33 is also equipped with blast pads that are dimensioned 150 feet long by 150 feet wide and are marked with chevrons. Blast pads are to reduce the erosive effects of jet blast and propeller wash from departing aircraft. Runway 7-25 has basic runway markings which identify the runway centerline and threshold



Pavement Markings


LEGEND
Airport Property Line
A Taxiway Designation
KEY
ASOS - Automated Surface Observation System
DME - Distance Measuring Equipment
REIL - Runway End Identification Light
VASI- Visual Approach Slope Indicator
VOR - Very High Frequency Omnidirectional Range
N
0
600
1200
SCALE IN FEET
Photo Source:
Quantum Spatial 10/19/2018
Airport Perimeter Fence
Service Road
VOR-DME
VASI-4
REILs
Lighted Windcone
Segmented Circle/
Lighted Windcone
Lighted Windcone
REILs
Blast Pad
150'x 150'
Runway 15-33 (5,950' x 150')
Blast Pad
150'x 150'
15
33
A-1
A-2
A-3
A-4
A-5
300'
Runway 7-25 (7,201' X 75')
A
Compass Rose
ASOS
VASI-4
Hold Apron
Airport
Beacon
Hold Apron
C
150'
Compass Rose
Displaced Threshold
588'
Sage Ave.
Glen Canyon Dr.
10th Ave.
Aero Ave.
S. Navajo Dr.
Grandview St.

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designation. As previously noted, a displaced threshold is identified by large arrows leading up to the Runway 7 landing threshold.

Taxiway and taxilane centerline markings are provided to assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway/taxilane edges. Taxiway markings at Page Municipal Airport include centerline and aircraft hold line positions on the entrance/exit taxiways serving each runway. The hold line positions function to alert pilots that they are about to enter the runway environment. The location of hold lines is established by the design aircraft for the runway. The hold line positions associated with Runway 15-33 are currently marked 200 feet from the runway centerline. For Runway 7-25, the hold line positions are located 125 feet from the runway centerline.



Compass Rose

There are two compass roses located at the airport. One is located on the north side of the main aircraft parking apron and another is located farther south, adjacent to the Lake Powell Jet Center fixed base operator (FBO) facility. The compass roses can be used by pilots to ensure that an aircraft's magnetic compass is calibrated accurately. Aircraft movement areas on various parking aprons are identified with centerline markings. Aircraft tie-down positions are identified on various apron surfaces as well.

Airfield Lighting and Signage

Airfield lighting and signage extends an airport's usefulness into the nighttime hours and during periods of poor visibility conditions. A variety of lighting and signage systems are installed at Page Municipal Airport for these purposes. These lighting systems, categorized by function, are summarized as follows.



Airport Rotating Beacon

- **Identification Lighting:** The location of an airport at night is universally identified by a rotating beacon. The rotating beacon at Page Municipal Airport projects two beams of light at equal intervals, one white and one green, 180 degrees apart, which communicates to pilots not only the airport's location, but also its designation as a civil public use lighted land-based airport. The airport beacon is situated southeast of the terminal building, approximately 600 feet west of Runway 15-33.

- **Runway and Taxiway Lighting:** Runway and taxiway edge lighting utilize light fixtures placed near the edge of a pavement to define the lateral limits of the pavement. This is essential for safe operations during night and/or times of poor visibility in order to maintain safe and efficient access to and from runways and taxiways.

  Runway 15-33 is equipped with medium intensity runway lights (MIRL). Each end of the runway is also equipped with threshold lighting to identify the landing threshold. Threshold lighting consists of specially designed light fixtures placed near the end of the runway that have multicolored lenses that appear either red or green depending on the position at which they are viewed. The green portion of the fixture is turned toward the approach surface and is intended to be seen by approaching aircraft, while the red portion is visible to aircraft that have landed and are approaching the runway's opposite threshold. Runway 7-25 is not equipped with any type of lighting and is, therefore, not available for nighttime use.



Taxiway C Elevated Edge Reflectors

  Taxiway A is equipped with medium intensity taxiway lighting (MITL) at each runway exit. Taxiway lights are blue in order to distinguish them from the MIRL, which are white. Taxiway C is equipped with elevated taxiway edge reflectors.

- **Runway End Identification Lighting:** Runway end identification lights (REILs) provide rapid and positive identification of the approach end of a runway. The system consists of two synchronized flashing lights, located laterally on each side of the runway threshold, facing the approaching aircraft. An REIL system has been installed on each end of Runway 15-33.

- **Visual Glide Slope Approach Aids:** Visual approach aids consist of a series of lights that guide pilots to the runway at a prescribed glide angle, typically a three-degree glide slope, unless an obstacle exists that must be avoided. Runway 15-33 is equipped with four light visual approach slope indicators (VASI-4) located on the left side of each runway.


Runway End Identification Lights (REIL)

- **Pilot-Controlled Lighting:** The airport's lighting system is connected to a pilot-controlled lighting system (PCL). The PCL system allows pilots to activate the MIRL on Runway 15-33 with the use of the aircraft's radio transmitter via the common traffic advisory frequency (CTAF). Pilots may select the lighting intensity level by keying the microphone in accordance with the low, medium, or high setting.

- **Airfield Signage:** The airport has a runway/ taxiway signage system that assists pilots in identifying their location on the airfield and directing them to their desired location. The presence of runway/taxiway signage is an essential component of a surface movement guidance control system necessary for the safe and efficient operation of the airport. The signage system installed at Page Municipal Airport includes runway/taxiway designation, holding positions, routing/directional, and runway distance remaining, runway end, and exits.



Airfield Signage


Visual Approach Slope Indicators (VASI-4) serving Runway 33

Weather and Communications Aids

Page Municipal Airport is equipped with three lighted windcones and one segmented circle which provide pilots with information about wind conditions and traffic pattern usage. These facilities are positioned strategically on the airfield where they can be utilized effectively. All three of the windcones are located on the east side of Runway 15-33. The segmented circle is situated approximately 400 feet east of Runway 15-33 in a desirable midfield location. One of the three lighted windcones is co-located with the segmented circle.

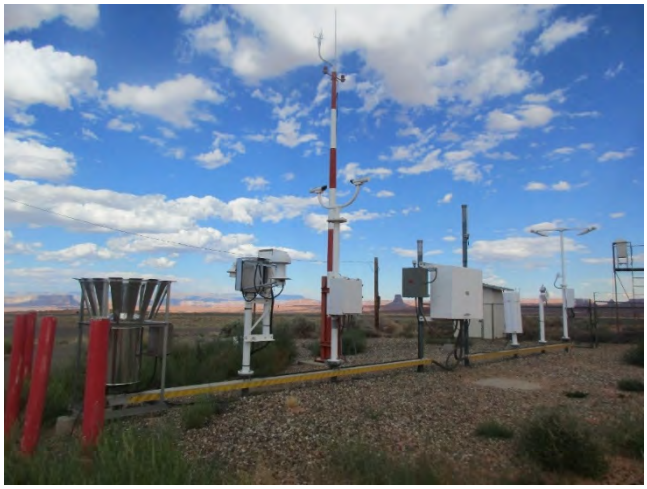

Segmented Circle and Lighted Windcone

The airport is also equipped with an automated surface observation system (ASOS). The ASOS automatically records weather conditions, such as temperature, dew point, wind speed, altimeter setting, visibility, sky condition, and precipitation. This information is transmitted at regular intervals on radio frequency 120.625 MHz or via a local phone number (928-645-1228).

As a non-towered airport, communications among users of the airport are conducted via the CTAF (122.8 MHz). Pilots use the CTAF to maintain separation by making position reports to air traffic in the vicinity of Page Municipal Airport.

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 navigational aids available at Page Municipal Airport include a very high frequency omni-directional range with distance measuring equipment (VOR/DME). The VOR provides azimuth readings to pilots of properly equipped aircraft by transmitting a radio signal at every degree to provide 360 individual navigational courses to/from the facility, and DME is able to provide distance information to aircraft that are equipped with the necessary instrumentation. The pilot can determine their course and distance with this ground-based navigational aid. The VOR/DME is located approximately 600 feet northeast of the intersection between Runways 15-33 and 7-25 at the airport.



Automated Surface Observation System (ASOS)



Very High Frequency Omni-directional Range (VOR) / Distance Measuring Equipment (DME) Facility

GPS is another navigational aid that is available to pilots utilizing Page Municipal Airport. GPS was initially developed by the United States Department of Defense for military navigation around the world. GPS does not require a ground-based facility. GPS uses satellites placed in orbit around the earth to transmit electronic radio signals, which pilots of properly equipped aircraft use to determine location, altitude, speed, distance to or from an airport facility, and other navigational information.

LANDSIDE FACILITIES

At a commercial service airport such as Page Municipal Airport, the landside facilities often include a terminal building, administrative offices, fixed base operators (FBOs), specialized aviation service operators (SASOs), aircraft storage hangars, aircraft parking aprons, and various support facilities, such as

fuel storage, vehicle parking, aircraft rescue and firefighting (ARFF), and fences/gates. The landside facilities at the airport are identified on **Exhibit 1D**.

Terminal Building

The terminal building at Page Municipal Airport is located midfield, west of Taxiway A, and adjacent to the main aircraft parking apron. The two-story terminal building was constructed in 1994 and contains approximately 10,000 square feet of space. The second floor is a partial balcony and provides administrative office space for airport personnel and includes a conference room. The lower level is used primarily as office space and customer service counter space for the airport's commercial tenants and their customers. This includes multiple on-airport businesses associated with several air tour companies, rental car service, FBOs, and the scheduled commercial airline service provider. The Transportation Security Administration (TSA) also has dedicated passenger screening, baggage checkpoint, and secured passenger holding areas in the terminal building. **Exhibit 1E** provides a detailed terminal building layout.



Terminal Service Counter

Vehicle Parking

The main entrance to the terminal vehicle parking area is accessible from the corner of Sage Avenue and South 10th Avenue. The terminal parking area provides a four-lane, one-way entrance onto airport property and provides access to the terminal building and two of the airport's FBOs. There are 84 standard vehicle parking spaces, 15 of which are dedicated for rental cars and three handicapped accessible spaces. There are also five larger parking spaces for bus/RV parking. Parking for buses and taxicabs is also provided along the front curb of the terminal building.

Additional parking is available west of the Lake Powell Jet Center FBO accessible via Sage Avenue. In this area, there are 41 marked vehicle parking spaces, two of which are handicap accessible. Several spaces in this area are reserved for rental cars as well. A gated long-term parking area is also available directly to the south.


Terminal Vehicle Parking

Terminal Apron

The terminal apron is located east of the terminal building and serves air tour operations and scheduled commercial service providers. This apron is primarily used for enplaning and deplaning commercial service and air tour passengers. There are three designated air tour parking spaces on the south side of the apron. In the center of the apron near the terminal building, there is a designated secured parking box marked restricted and is intended for use by commercial airline service providers only. The terminal apron encompasses approximately 11,000 square yards.



Terminal Building and Terminal Apron Area



Terminal Apron designated for Scheduled Commercial Service

General Aviation Aprons

There are two designated aircraft parking apron areas at Page Municipal Airport, as depicted on **Exhibit 1D**. The main general aviation parking apron is located west of Taxiway A near midfield and extends farther north adjacent to Runway 7-25. There are 85 individual marked aircraft tie-down spaces, as well as several unmarked large aircraft parking spaces. This apron area also includes the majority of the airport's private aircraft storage hangars. The main apron provides access to the general aviation service providers and FBO hangars. Local air tour operations are also conducted on the southeast corner of the main general aviation apron near the terminal building. The main general aviation apron encompasses 73,600 square yards and is the largest apron area on the airport. The south general aviation apron is located adjacent to the Lake Powell Jet Center FBO and consists of approximately 15,900 square yards and 11 marked aircraft parking spaces.



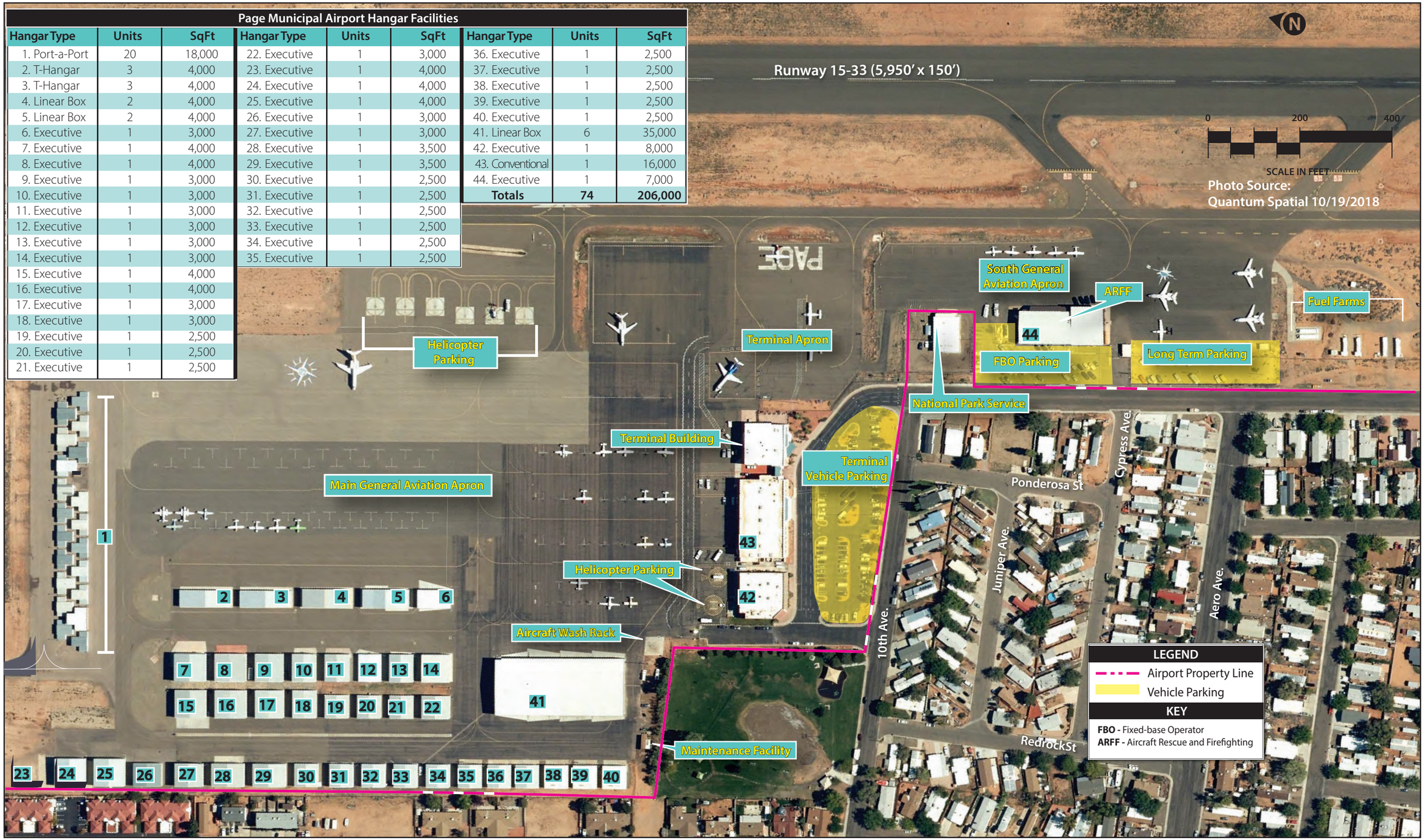
Main General Aviation Apron



South General Aviation Apron

Page Municipal Airport Hangar Facilities

Hangar Type	Units	SqFt	Hangar Type	Units	SqFt	Hangar Type	Units	SqFt
1. Port-a-Port	20	18,000	22. Executive	1	3,000	36. Executive	1	2,500
2. T-Hangar	3	4,000	23. Executive	1	4,000	37. Executive	1	2,500
3. T-Hangar	3	4,000	24. Executive	1	4,000	38. Executive	1	2,500
4. Linear Box	2	4,000	25. Executive	1	4,000	39. Executive	1	2,500
5. Linear Box	2	4,000	26. Executive	1	3,000	40. Executive	1	2,500
6. Executive	1	3,000	27. Executive	1	3,000	41. Linear Box	6	35,000
7. Executive	1	4,000	28. Executive	1	3,500	42. Executive	1	8,000
8. Executive	1	4,000	29. Executive	1	3,500	43. Conventional	1	16,000
9. Executive	1	3,000	30. Executive	1	2,500	44. Executive	1	7,000
10. Executive	1	3,000	31. Executive	1	2,500	**Totals**	**74**	**206,000**
11. Executive	1	3,000	32. Executive	1	2,500			
12. Executive	1	3,000	33. Executive	1	2,500			
13. Executive	1	3,000	34. Executive	1	2,500			
14. Executive	1	3,000	35. Executive	1	2,500			
15. Executive	1	4,000						
16. Executive	1	4,000						
17. Executive	1	3,000						
18. Executive	1	3,000						
19. Executive	1	2,500						
20. Executive	1	2,500						
21. Executive	1	2,500						



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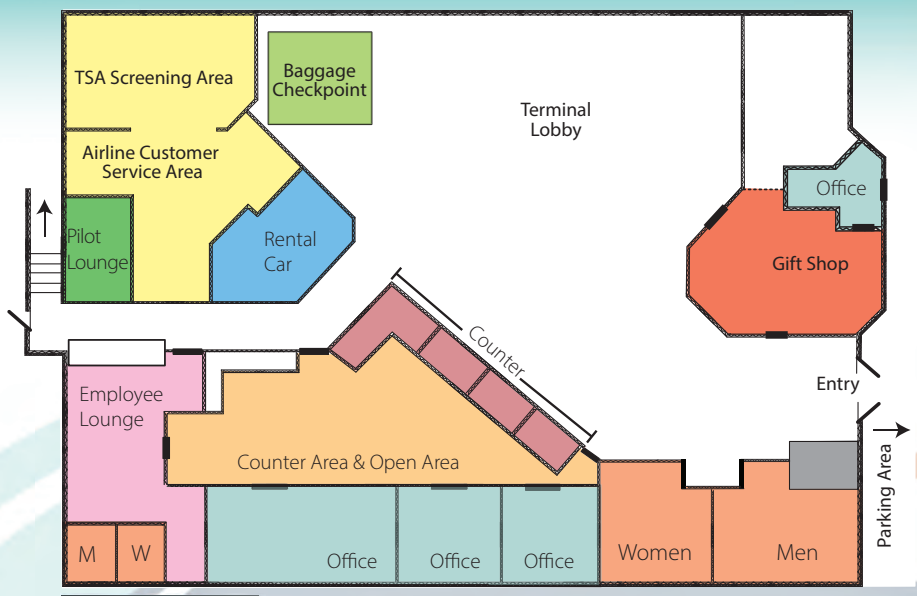
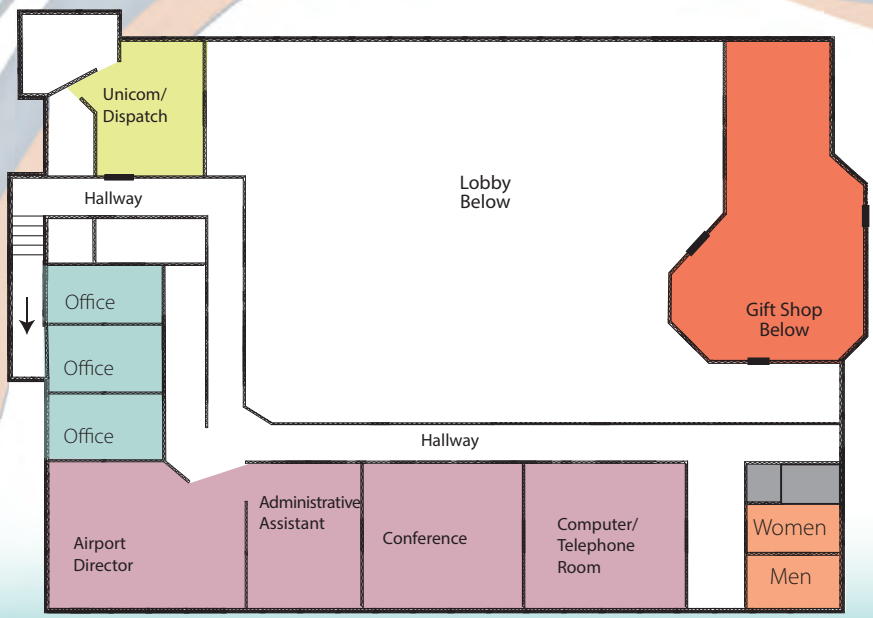


LOWER LEVEL



UPPER LEVEL

LEGEND

- Restrooms
- Elevator Shaft
- Administration
- Operations

NOT TO SCALE



Exhibit 1E
TERMINAL BUILDING LAYOUT

Lastly, a designated helicopter parking apron is located east of the main apron adjacent to Taxiway A. There are six individual helipads which can be utilized by either transient helicopter traffic or local commercial air tour operations. The helicopter parking apron is approximately 7,500 square yards.



Helicopter Parking

Aircraft Hangars

Hangar facilities at Page Municipal Airport are comprised of conventional hangars, executive hangars, T-hangars, and port-a-port hangars. Conventional hangars provide a large open space, free from roof support structures, and have the capability to store several aircraft simultaneously. Conventional hangars are often utilized by airport businesses, such as FBOs and large aircraft maintenance providers and are typically 10,000 square feet or larger.



Executive Box Hangar

Executive box hangars provide the same type of aircraft storage as conventional hangars but are less than 10,000 square feet. These hangars are normally utilized by individual owners to store larger multi-engine or turbine aircraft, several smaller aircraft, or by smaller airport businesses

T-hangars and linear box hangars provide for separate single aircraft storage units within a larger hangar complex. Port-a-port hangars are individual, fully enclosed, smaller hangars that provide storage for only one small aircraft and they are used primarily as private storage. Port-a-port hangars are also portable and, therefore, not permanently fixed to the apron surface.



T-Hangars

As detailed on **Exhibit 1D**, Page Municipal Airport features several different types of aircraft storage facilities. The largest individual aircraft storage building is a conventional hangar measuring approximately 16,000 square feet and is utilized by an FBO. The facility contains several offices, storage rooms, restrooms, and aircraft hangar space. There are two large executive hangars on the field that are also utilized by FBOs, totaling approximately 15,000 square feet. They are used primarily for aircraft maintenance, storage, and office space for the businesses.



Port-a-Port Hangars

Private aircraft storage includes 35 individual executive hangars that provide approximately 106,000 square feet of storage space. There is also one large linear box hangar complex with six individual units offering a total of approximately 35,000 square feet of storage space. Two additional linear box hangars provide four more individual units and total 8,000 square feet. Two T-hangar complexes offering six individual hangars, measuring approximately 8,000 square feet of storage space, are also provided. There are 20 individual port-a-port hangars on the airport, providing approximately 18,000 square feet of aircraft storage space. All total, Page Municipal Airport currently has 74 individual hangar units allowing for approximately 206,000 square feet of available aircraft hangar, maintenance, office, and storage space.



Lake Powell Jet Center



Classic Aviation



American Aviation

General Aviation Services

Those businesses that choose to locate on airport property or adjacent to the airport provide a significant impact not only to the airport, but also to the region. Encouraging businesses to locate in the vicinity of an airport is a good practice for a number of reasons. First, the business will benefit from being near a commerce and transportation hub. Second, the community will benefit because the airport will develop a buffer of industry and manufacturing that will restrict incompatible land uses, such as residential housing, from locations too close to the airport. Third, business development on and around airports can generate a direct revenue stream to the airport. Some airports have done this successfully, leading the airport to self-sufficiency.

Page Municipal Airport's three FBOs offer a full range of other aviation services to general aviation users and tenants, including aircraft fueling, aircraft maintenance, avionics repair, air medical, rental cars, aircraft parking, leased hangar space, flight instruction, and pilot planning/lounge areas. These FBOs include:

- Lake Powell Jet Center
- Classic Aviation
- American Aviation

Commercial Service / Air Tour Services

As previously detailed, scheduled commercial passenger service is provided by Contour Airlines with service to Phoenix Sky Harbor International Airport and McCarran International Airport in Las Vegas. Air tour activities also make up a significant portion of aviation activity at the airport. Air tour operators include:

- Grand Canyon Airlines
- Westwind Air Service
- American Aviation

The general, commercial service, and air tour operators listed above play an important role to the overall activity and vitality of the airport. As airport tenants, they support the airport financially and draw aviation activity to the area.

Fuel Farm Facilities

There are currently three fuel farms located on the airport that store aviation fuel. The fuel farms are individually owned and operated by the FBOs. All three fuel farm facilities are located south of the general aviation apron area, adjacent to the east side of Sage Avenue. Each FBO owns two 12,000-gallon above-ground fuel storage tanks, one designated for 100LL fuel and one for Jet A fuel. Each facility conforms to appropriate local and national fire regulations and safety codes applicable to fuel facilities.



Fuel Farms

Lake Powell Jet Center operates four fueling trucks. One truck has a capacity of 800 gallons to deliver 100LL, and three trucks are dedicated to the delivery of Jet A. Of these three trucks, one has a storage capacity of 2,000 gallons and two have a storage capacity of 3,000 gallons.

Classic Aviation operates five fueling trucks. Three of these trucks are dedicated to the delivery of Jet A fuel, with two providing for 2,000-gallon capacities and one providing a 1,000-gallon capacity. The remaining two trucks are for 100LL delivery and have storage capacities of 650 and 1,000 gallons. At this time, American Aviation did not provide data on its fueling trucks.

Maintenance Facilities

The airport operations and maintenance staff offices are located in a modular building on the west side of the airport near the large linear box hangar complex. This area also provides space for equipment storage.

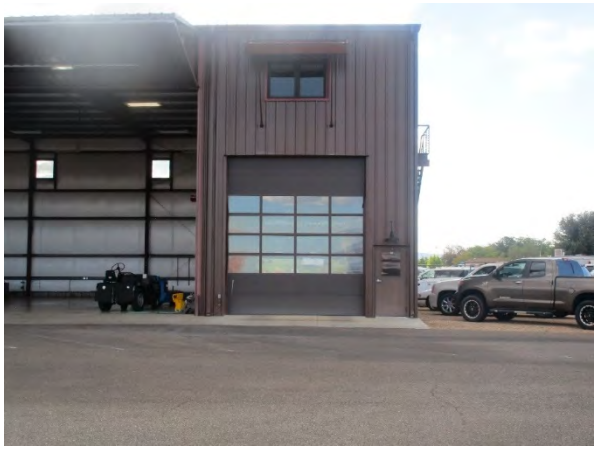


Airport Maintenance Facility

Aircraft Rescue and Firefighting (ARFF)

As a certified airport under Title 14 CFR Part 139, Page Municipal Airport is required to provide ARFF services during scheduled airline operations. Each certified airport maintains equipment and personnel based on an ARFF index established according to the length of aircraft and scheduled daily flight frequency. There are five indices, designated as A through E, with A applicable to the smallest aircraft and E the largest.

Page Municipal Airport is required to meet ARFF Index A according to its current Airport Certification Manual. This is based on the current scheduled air carrier aircraft, including the ERJ-135 with 30 passenger seats. Index B ARFF equipment is available upon request. ARFF vehicles are housed in a bay facility connected to the north side of the Lake Powell Jet Center. ARFF operations are provided by the City of Page Fire Department. ARFF is available 24 hours per day, 7 days per week. ARFF personnel receive initial and recurrent training annually. At least one ARFF vehicle is capable of responding from the ARFF bay facility to the mid-point of Runway 15-33 within three minutes and initiate discharge of an extinguishing agent.



Airport Rescue and Firefighting Facility

ARFF equipment meeting Index A requirements at the airport consists of the following:

Primary ARFF Vehicle: 2005 Rosenbauer – General Division Panther Index B ARFF Vehicle

- 1,500 gallons water
- 500 Pounds Purple-K dry chemical
- BC and Purple K dry chemical extinguishers

Backup ARFF Vehicle: 1982 Chrysler four-wheel drive, one-ton rated vehicle with compartment body.

- 100 gallons AFFF premix, nitrogen propelled – discharge rate minimum 5 lbs./second
- Fire Boss 450 lb. Purple-K dry chemical
- Two portable 40BC fire extinguishers

Aircraft Wash Rack

An aircraft wash rack is located on the west side of the airport adjacent to the airport operations and maintenance storage area. This facility allows for aircraft owners to wash their aircraft and was constructed to ensure proper drainage of run-off water and cleaners.

National Park Service Hangar

The National Park Service occupies a small hangar southeast of the terminal building. The hangar provides for approximately 3,500 square feet of storage space to house a small single engine aircraft owned and operated by the National Park Service. It should be noted that this hangar facility is not located on airport property.

Vehicle Airfield Access and Perimeter Fencing

Page Municipal Airport is surrounded with a six-foot security fence with three-strand barbed-wire across the top. The fencing does not always follow the airport property line due to some of the more rugged terrain around the airport, as well as airport layout and infrastructure development. A series of vehicle access gates are also located in various locations serving the airport.



Vehicle Access Gate



Perimeter Fencing

Utilities

The availability and capacity of the utilities serving the airport are factors in determining the development potential of the airport, as well as the land immediately adjacent to the facility. Utility availability is a critical element when considering future expansion capabilities for both airside and landside components. The following utility providers serve the airport:

- Water and Sewer – City of Page
- Propane – Southwest Gas
- Electricity – Page Electric Utility

PAVEMENT MANAGEMENT PROGRAM

Preservation of pavements at airports is one of the largest challenges faced by federal, state, and local governments. ADOT monitors pavement conditions at airports through its Airport Pavement Preservation Program (APPP). Pavements are inspected on a three-year cycle and are assigned a rating of 0-100, with 100 being excellent condition based on the pavement condition index (PCI). It is a statistical measure and requires manual survey of the pavement. PCI is an accepted method of visually assessing pavement conditions. PCI surveying processes and calculation methods have been standardized for both roads and airport pavements. It is widely used in transportation civil engineering.

Exhibit 1F depicts the pavement conditions based on ADOT's Page Municipal Airport Pavement Management Report dated November 2017. Runway 15-33 was found to be in very good condition, having a PCI rating above 90. Runway 7-25 possesses PCI ratings ranging from the high 70s to high 80s. Certain aircraft parking aprons, namely the terminal apron and portions of the main general aviation apron, exhibit PCI ratings of less than 50. Overall, the airport's pavements are in serviceable condition. Conditions must continue to be monitored and maintained in order to extend the pavement's useful life and structural integrity.

ARIZONA AIRPORT PAVEMENT MANAGEMENT SYSTEM

Grant assurances for projects funded under the FAA AIP require a pavement maintenance system be utilized. To meet this requirement and ensure that the limited pavement maintenance funds are spent in the most cost-effective manner, ADOT developed the Airport Pavement Management System (APMS) in 2003.

The program provides pavement evaluation, design services, construction administration, and construction management at more than 60 airports statewide. The system prioritizes preventative maintenance projects with the greatest benefit for pavement dollar expended. The system also identifies pavement sections that require rehabilitation based on their PCI.

TABLE 1G
APMS Construction Costs

Year	Annual Cost ($)
2013	$5,252,543
2014	$4,801,721
2015	$6,304,774
2016	$4,675,111
Total	$21,034,149

Source: Arizona Airport Pavement Management System 2017

Between 2013 and 2016, 39 airports in Arizona received pavement maintenance projects through the APMS program. The total APMS construction costs during this time period are presented in **Table 1G.**

As of May 2017, the ADOT suspended APMS rehabilitations through 2018 due to funding shortfalls. PCI evaluations will continue to monitor the status of airport pavements in Arizona. The program has resumed in fiscal year 2019 and is funded at $5 million per year for 5 years for a total of $25 million dollars.

AREA AIRSPACE

The *Federal Aviation Administration 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 environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. airspace, including air navigational facilities; airports and landing areas; aeronautical charts; associated rules, regulations, and procedures; technical information; and personnel and material. System components shared jointly with the military are also included as part of this system.

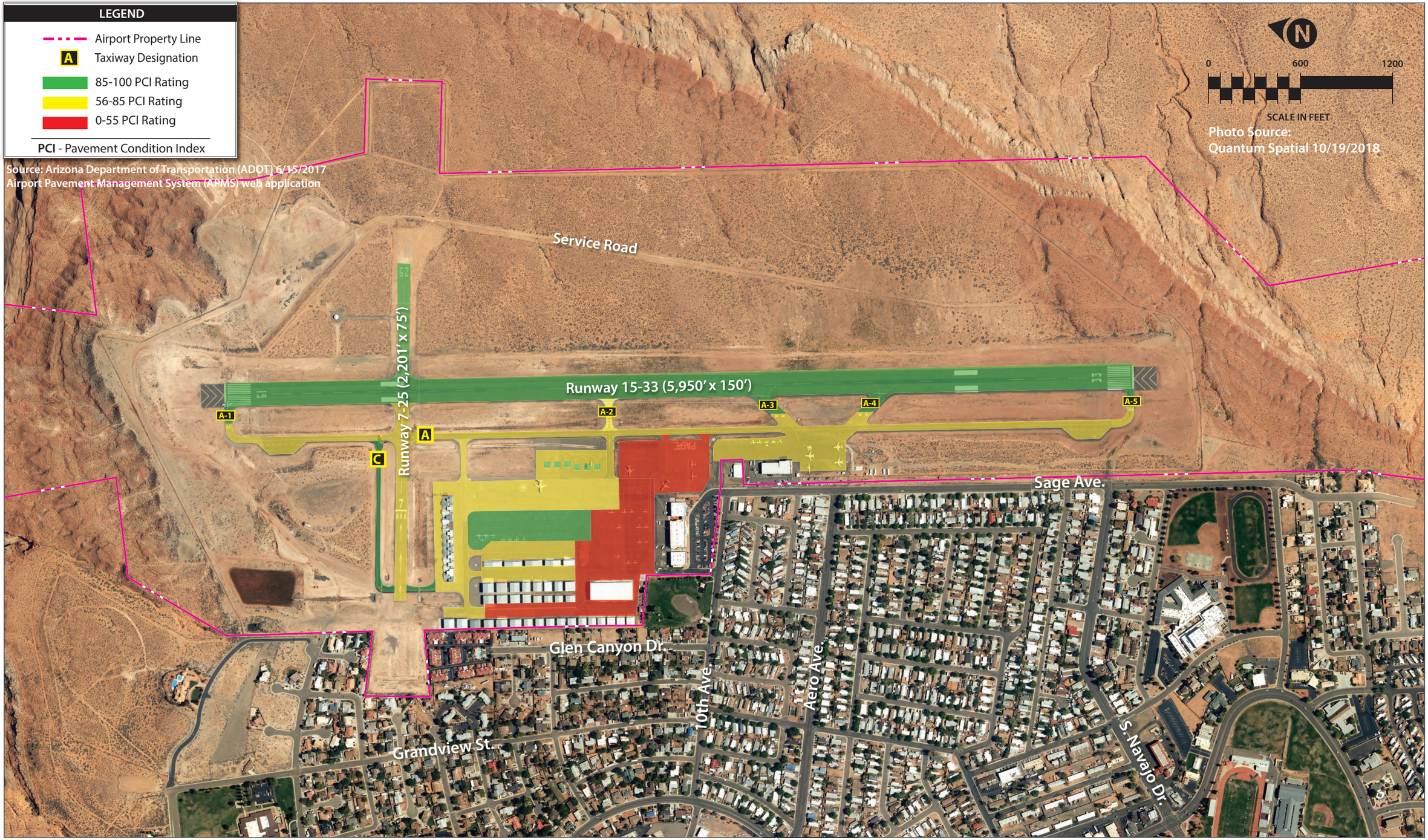
AIRSPACE STRUCTURE

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides for categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G as described below. **Exhibit 1G** generally illustrates each airspace type in three-dimensional form. Airspace within the vicinity of Page Municipal Airport is depicted on **Exhibit 1H**.

Class A: Class A airspace is controlled airspace and includes all airspace from 18,000 feet mean sea level (MSL) to Flight Level 600 (approximately 60,000 feet MSL). This airspace is designated in Federal Aviation Regulation (F.A.R) Part 71.193 for positive control of aircraft. The Positive Control Area (PCA) allows flights governed only under instrument flight rules (IFR) operations. The aircraft must have special radio and navigational equipment, and the pilot must obtain clearance from an air traffic control (ATC) facility to enter Class A airspace. In addition, the pilot must possess an instrument rating.

Class B: Class B airspace is controlled airspace surrounding high-activity commercial service airports (i.e., Phoenix Sky Harbor International Airport). 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 major airports. In order to fly within Class B airspace, an aircraft must be equipped with special radio and navigation equipment and must obtain clearance from air traffic control. A pilot is required to have at least a private pilot certificate or be a student pilot who has met the requirements of F.A.R. Part 61.95, which requires special ground and flight training for the Class B airspace. Aircraft are also required to utilize a Mode C transponder within a 30 nautical mile range of the center of the Class B airspace. A mode C transponder allows the ATCT to track the location and altitude of the aircraft.

Class C: Class C airspace is controlled airspace surrounding lower-activity commercial service (i.e., Tucson International Airport) and some military airports. The FAA has established Class C airspace at 120 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 major airports. To operate inside Class C


LEGEND
Airport Property Line
A Taxiway Designation
85-100 PCI Rating
56-85 PCI Rating
0-55 PCI Rating
PCI - Pavement Condition Index
Source: Arizona Department of Transportation (ADOT) 6/15/2017
Airport Pavement Management System (APMS) web application
N
0
600
1200
SCALE IN FEET
Photo Source:
Quantum Spatial 10/19/2018
Service Road
Runway 15-33 (5,950' x 150')
Runway 7-25 (2,201' x 75')
A-1
A-2
A-3
A-4
A-5
A
C
Sage Ave.
Glen Canyon Dr.
10th Ave.
Aero Ave.
S. Navajo Dr.
Grandview St.

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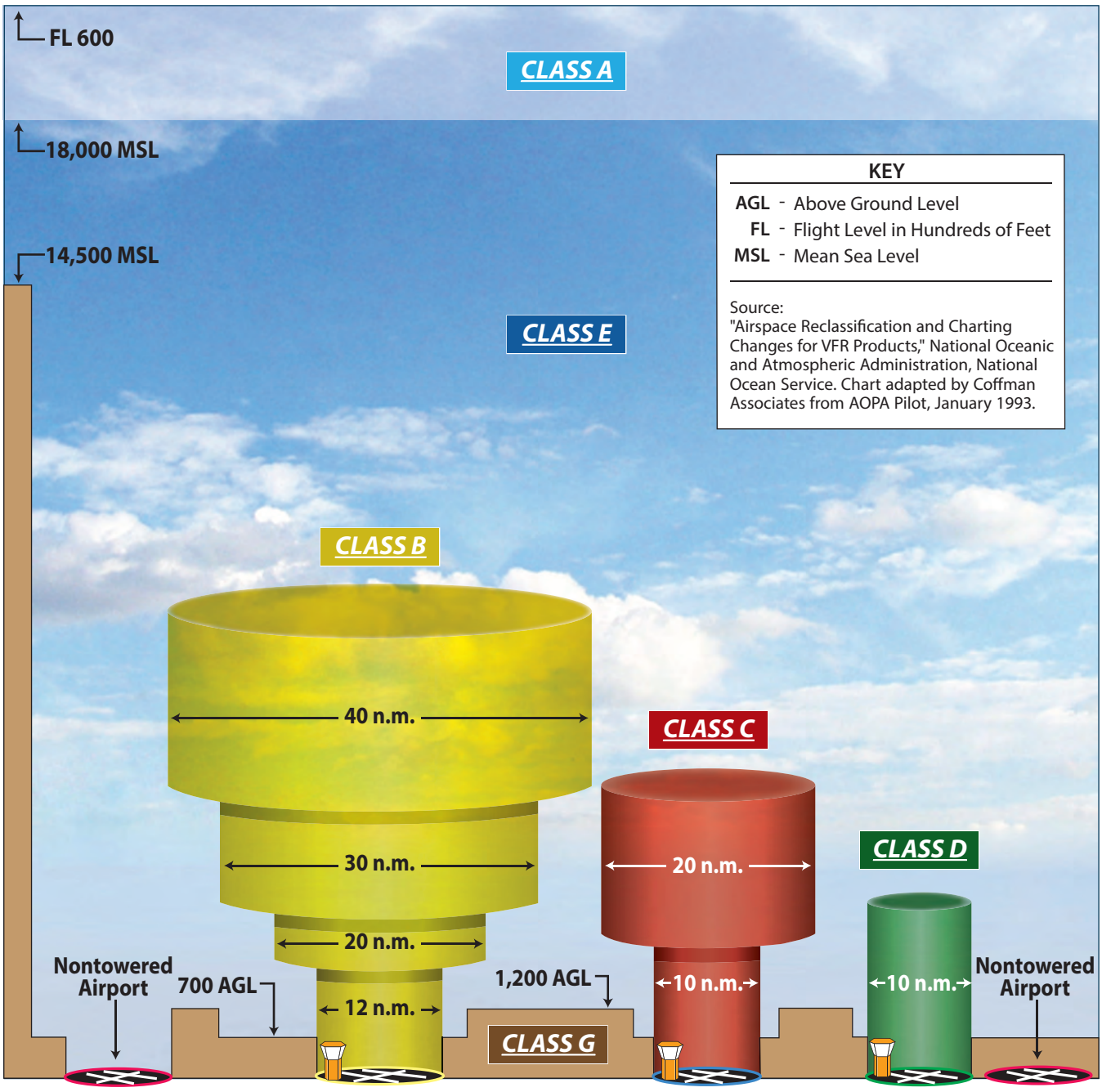
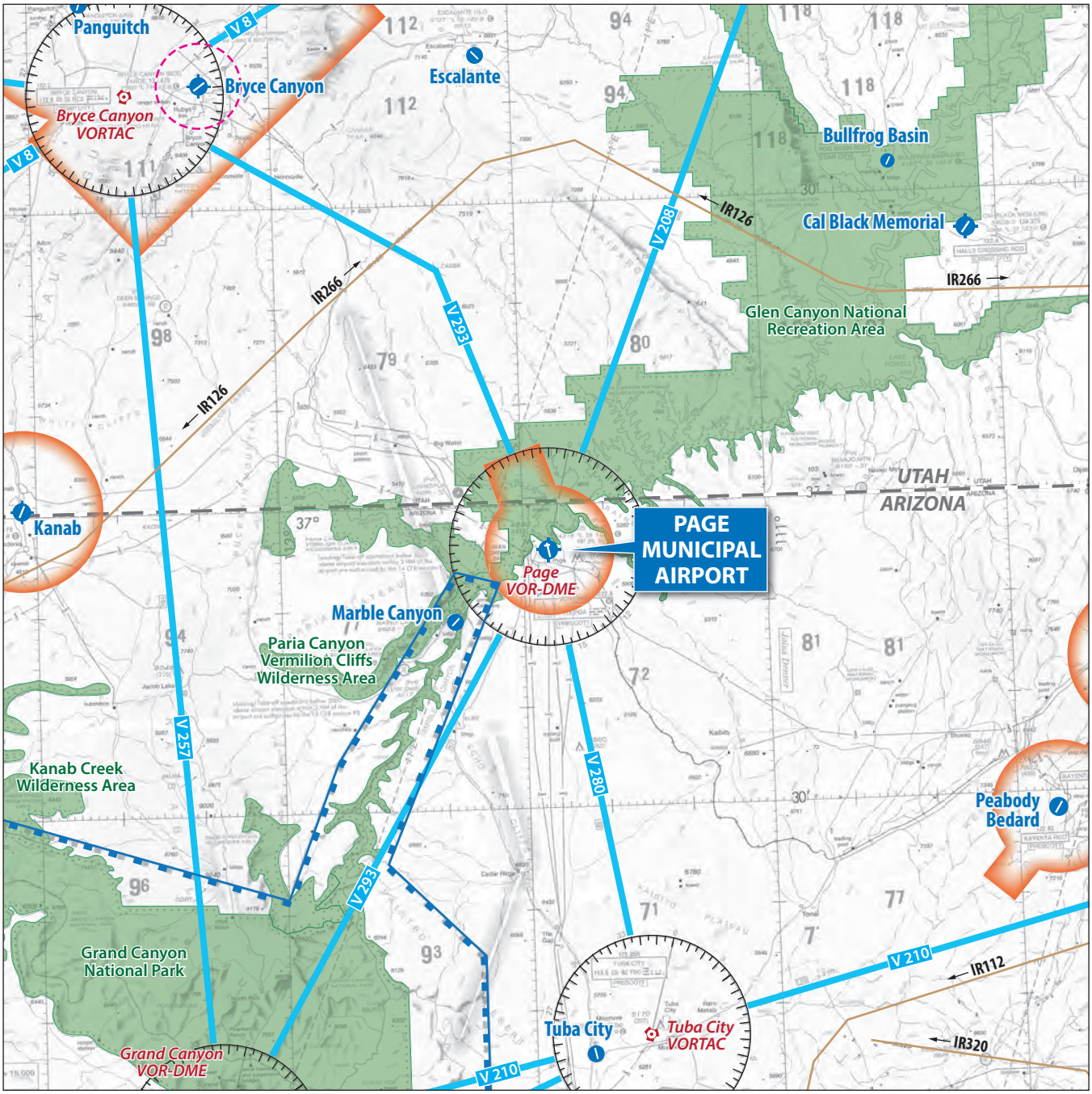


DEFINITION OF AIRSPACE CLASSIFICATIONS

CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600.
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.



LEGEND

- Airports with hard-surfaced runways 1,500' to 8,069' in length
- VORTAC
- Compass Rose
- Wilderness Area
- Class E Airspace with floor 700' above surface
- Class E Airspace with floor to surface
- Military Training Routes
- Victor Airways
- The airspace overlying the Grand Canyon National Park below 18,000 ft. MSL is subject to special air traffic rules.

Source: US Department of Commerce, National Oceanic and Atmospheric Administration; Las Vegas, August 16, 2018; Denver, July 19, 2018

airspace, the aircraft must be equipped with a two-way radio, an encoding transponder, and the pilot must have established communication with the ATC.

Class D: Class D airspace is controlled airspace surrounding most airports with an operating ATCT and not classified under B or C airspace designations. The Class D airspace typically constitutes a cylinder with a horizontal radius of four or five nm from the airport, extending from the surface up to a designated vertical limit, 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.

All aircraft operating within Classes A, B, C, and D airspace must be in constant contact with the ATC facility responsible for that airspace sector.

Class E: Class E airspace is controlled airspace surrounding an airport that encompasses all instrument approach procedures and low-altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with the appropriate air traffic control facility when operating in Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio contact with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist.

Class G: Class G airspace is uncontrolled airspace typically in overtop rural areas that does not require communication with an air traffic control facility. Class G airspace lies between the surface and the overlaying Class E airspace (700 to 1,200 feet above ground level [AGL]). While aircraft may technically operate within this Class G airspace without any contact with the ATC, it is unlikely that many aircraft will operate this low to the ground. Furthermore, F.A.R. Part 91.119, Minimum Safe Altitudes, specify minimum altitudes for flight.

Airspace within the vicinity of Page Municipal Airport is depicted on **Exhibit 1H**. The airport is in Class G airspace, with Class E airspace directly above with a floor 700 feet above the surface extending to Class A airspace.

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. Special use airspace identifies for other users the areas where these non-standard operations may be occurring by outlining active times and/or altitudes to provide separation information in the area. Most special use airspace is designated on FAA aeronautical charts. The special use airspace in the vicinity of Page Municipal Airport is depicted on **Exhibit 1H**.

Victor Airways: Victor airways are for aircraft arriving or departing the regional area and navigating by using very high frequency omni-directional range (VOR) facilities. This system of federal airways,

referred to as victor airways, has been established. Victor airways are corridors of airspace eight miles wide that extend upward from 12,000 feet AGL to 18,000 feet MSL and extend between VOR facilities. There are victor airways in the vicinity of Page Municipal Airport, and they are identified with blue lines marked with a "V" preceding a designation number.

Military Training Routes: Military Training Routes (MTRs) are designated airspace established for use by high performance military aircraft to train below 10,000 feet AGL and in excess of 250 knots. There are visual (VR) and instrument (IR) designated MTRs. MTRs with no segment above 1,500 feet AGL will be designated with the 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. The arrows on the route show the direction of travel. There are numerous MTRs in the region due to the existence of military activity and operations areas.

Wilderness Areas: Several wilderness areas exist in proximity to Page Municipal Airport. Aircraft are requested to maintain a minimum altitude of 2,000 feet AGL over National Park areas, which include all wilderness areas and breeding grounds. FAA Advisory Circular (AC) 91-36C defines the surface as the highest terrain within 2,000 feet laterally of the route of flight or the uppermost rim of the canyon or valley. The nearest wilderness areas include the Paria Canyon Vermilion Cliffs Wilderness Area and Glen Canyon National Recreation Area.

A Special Federal Aviation Regulation (SFAR) is also in effect southwest of the airport that pertains to overflights associated with the Grand Canyon National Park. SFAR 50-2 establishes a Special Flight Rules Area (SFRA) that exceeds the boundaries of the Grand Canyon National Park, extending southwest of the City of Page to Lake Mead, Nevada. It impacts airspace below 18,000 feet MSL. Pilots intending to fly within SFAR 50-2 should refer to the Grand Canyon VFR aeronautical chart for more information.

AIRSPACE CONTROL

Page Municipal Airport is located in Class G airspace meaning that there are no ground-based ATC facilities on the airfield. This means that pilots operating under VFR are responsible for their own traffic separation. Pilots will give position reports when in the vicinity of the airport to all other air traffic monitoring the CTAF.

Aircraft operating at the airport under IFR are separated by an offsite air traffic control center (ARTCC). Page Municipal Airport is served by Denver Center ARTCC.

INSTRUMENT APPROACH PROCEDURES

An instrument approach procedure (IAP) is defined as a series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach

to a landing, or to a point from which a landing may be made visually. There are three categories of IAPs: precision approach (PA), approach with vertical guidance (APV), and non-precision approach (NPA).

Precision Approach: A PA uses a navigation system that provides both course and glidepath deviation. There are no published PAs available at Page Municipal Airport.

Approach with Vertical Guidance: An APV also uses a navigation system for both course and glidepath deviation, but not to the same standards as a precision approach. There are two APV approach procedure available for use at Page Municipal Airport. The RNAV (GPS) Runway 15 and RNAV (GPS) Runway 33 approaches feature a localizer performance with vertical guidance (LPV) component that allows pilots of properly equipped aircraft to descend to a decision altitude.

Non-Precision Approach: An NPA uses a navigation system for course deviation but does not provide glidepath information. The other approach procedures at the airport are considered NPAs and include components associated with the RNAV (GPS) Runway 15, RNAV (GPS) Runway 33, and VOR-B.

The FAA creates and publishes airport-specific instrument approach procedures designed to each individual airport environment and available navigational aids. The capability of an instrument approach procedure is defined by the visibility and the cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance a pilot must be able to see in order to complete the approach. A cloud ceiling is defined as the height of the lowest layer of clouds, above the surface, that are either broken or overcast. If the observed visibility and/or cloud ceiling are below the prescribed minimums for the approach, the pilot cannot complete the approach. **Exhibit 1J** contains the FAA-approved instrument approach procedures, including approach speed categories and the associated weather minimums.

All instrument approaches available at Page Municipal Airport also provide circling minimums, which allow pilots the flexibility to land on the runway end more closely aligned with the prevailing wind conditions. This flexibility typically requires circling approaches to have higher visibility and cloud ceiling minimums than the straight-in approaches. The reason for this is to allow sufficient visibility and ground clearance to navigate visually from the approach to the desired runway end for landing. Therefore, any circling approach is considered a non-precision approach.

LOCAL OPERATING PROCEDURES

The traffic pattern at the airport is maintained to provide the safest and most efficient use of the airspace. A standard left-hand traffic pattern is used for Runways 7 and 15, and a right-hand traffic pattern is utilized for Runways 25 and 33. The reason for the traffic pattern configuration is to discourage aircraft from overflying residential areas that are west of the airport.

The traffic pattern altitude is 5,316 feet MSL or 1,000 feet above ground level (AGL). The recommended helicopter traffic pattern altitude is 500 feet AGL. It is recommended that Runway 7-25 only be utilized when winds are strong out of the east or west.

REGIONAL AIRPORTS

A review of public use airports within the vicinity of Page Municipal Airport has been made to identify and distinguish the type of air service provided in the area surrounding the airport. Information pertaining to each airport was obtained from the FAA Form 5010-1, *Airport Master Record*. There are two public use airports within 50 nautical miles of Page Municipal Airport. Information on these airports is provided below. **Exhibit 1K** further details vicinity airport facilities**.**

- **Marble Canyon Airport (L41)**
  Marble Canyon Airport is located approximately 12 miles southwest of Page Municipal Airport at an elevation of 3,603 feet MSL. Marble Canyon Airport is served by a single runway that is 3,715 feet long by 35 feet wide. Its runway condition is listed in good condition, but no runway weight-bearing information is given. Marble Canyon Airport is privately owned and is not included in the NPIAS but is available for public use. There is one based aircraft on the field and the airport estimates less than 3,000 operations per year. The airport does not have fueling or maintenance services available.

- **Tuba City Airport (T03)**
  Tuba City Airport is approximately 50 nautical miles south of Page Municipal Airport at an elevation of 4,513 feet MSL. Tuba City Airport is served by one runway that is 6,230 feet in length by 75 feet wide. The runway is paved in asphalt and is reported to be in fair condition with non-precision markings. Runway 15-33 features MIRL and a two-box VASI on each end. The runway weight-bearing capacity is listed as 12,500 pounds SWL. Tuba City Airport is included in the NPIAS and is classified as a “General Aviation- Basic” airport. The airport is owned and operated by the Navajo Nation Department of Transportation. There are no aviation services available at the airport.

AREA LAND USE AND ZONING

Land use surrounding Page Municipal Airport can have a significant impact on airport operations and growth. The following will identify federal governance of airport land, existing land uses, and local zoning in the vicinity of the airport, as well as the future potential growth opportunities available to promote airport sustainability. By understanding land use issues surrounding the airport, more appropriate recommendations can be made for the future of the airport.

PAGE, ARIZONA | AL-5108 (FAA) | 18032

RNAV (GPS) RWY 15

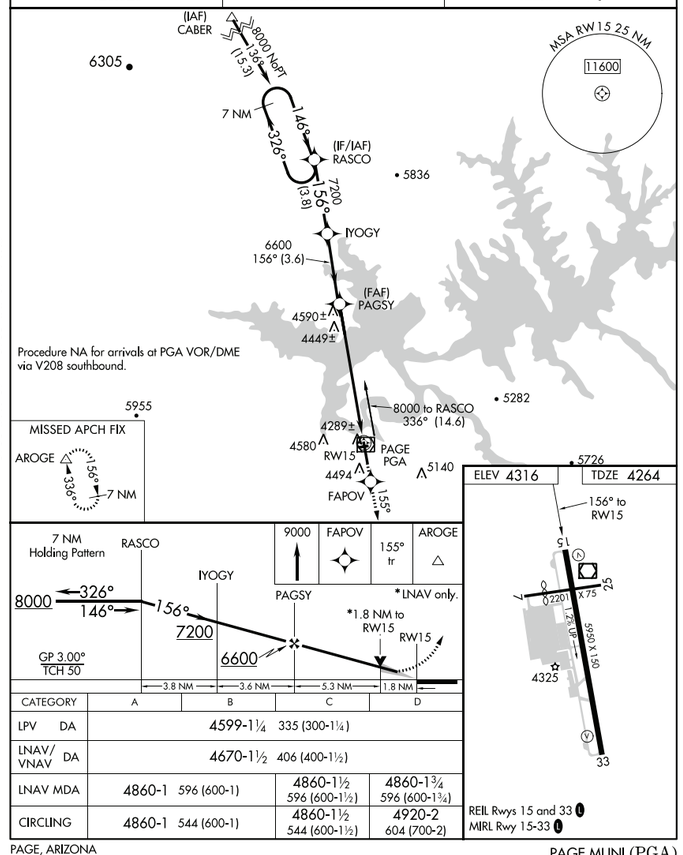
PAGE MUNI (PGA)

WAAS	APP CRS	Rwy Idg	TDZE	Apt Elev
CH 45604 W15A	156°	5950	4264	4316

For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -23°C (-9°F) or above 41°C (105°F). DME/DME RNP-0.3 NA. Circling NA to Rwy 7-25

MISSED APPROACH: Climb to 9000 direct FAPOV and via 155° track to AROGE and hold, continue climb-in-hold to 9000.

ASOS	DENVER CENTER	UNICOM
120.625	127.55 256.875	122.8 (CTAF)



CATEGORY	A	B	C	D
LPV DA	4599-1¼ 335 (300-1¼)			
LNAV/ VNAV DA	4670-1½ 406 (400-1½)			
LNAV MDA	4860-1 596 (600-1)	4860-1½ 596 (600-1½)	4860-1¾ 596 (600-1¾)	
CIRCLING	4860-1 544 (600-1)	4860-1½ 544 (600-1½)	4920-2 604 (700-2)	

PAGE, ARIZONA
Orig 14FEB08

36°56'N-111°27'W

PAGE MUNI (PGA)
RNAV (GPS) RWY 15

SW-4, 19 JUL 2018 to 16 AUG 2018

PAGE, ARIZONA | AL-5108 (FAA) | 18032

RNAV (GPS) RWY 33

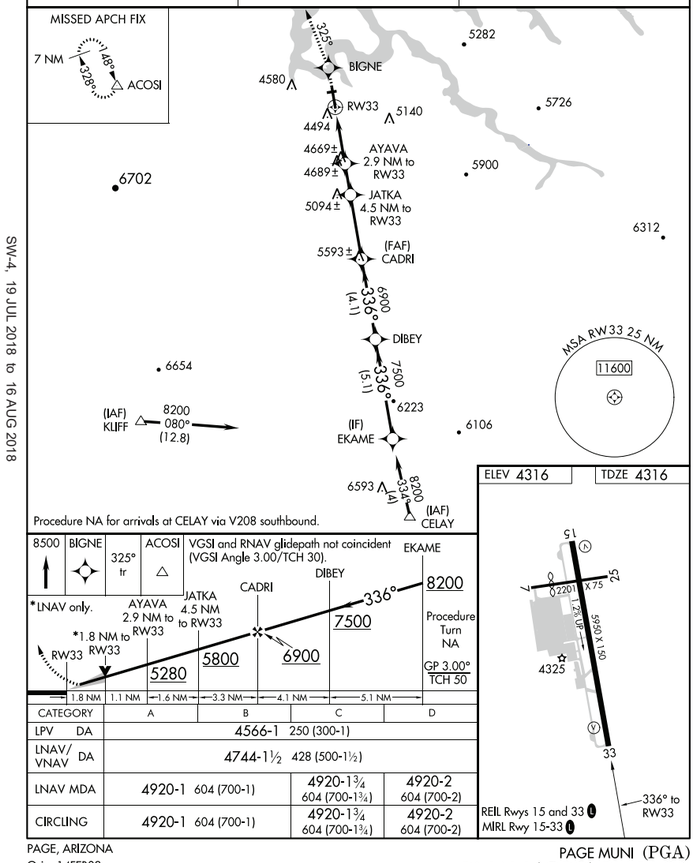
PAGE MUNI (PGA)

WAAS	APP CRS	Rwy Idg	TDZE	Apt Elev
CH 69204 W33A	336°	5950	4316	4316

For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -23°C (-9°F) or above 41°C (105°F). DME/DME RNP-0.3 NA. Circling NA to Rwy 7-25.

MISSED APPROACH: Climb to 8500 direct BIGNE and via 325° track to ACOSI and hold, continue climb-in-hold to 8500.

ASOS	DENVER CENTER	UNICOM
120.625	127.55 256.875	122.8 (CTAF)



CATEGORY	A	B	C	D
LPV DA	4566-1 250 (300-1)			
LNAV/ VNAV DA	4744-1½ 428 (500-1½)			
LNAV MDA	4920-1 604 (700-1)	4920-1¾ 604 (700-1¾)	4920-2 604 (700-2)	
CIRCLING	4920-1 604 (700-1)	4920-1¾ 604 (700-1¾)	4920-2 604 (700-2)	

PAGE, ARIZONA
Orig 14FEB08

36°56'N-111°27'W

PAGE MUNI (PGA)
RNAV (GPS) RWY 33

SW-4, 19 JUL 2018 to 16 AUG 2018

PAGE, ARIZONA | AL-5108 (FAA) | 18032

VOR-B

PAGE MUNI (PGA)

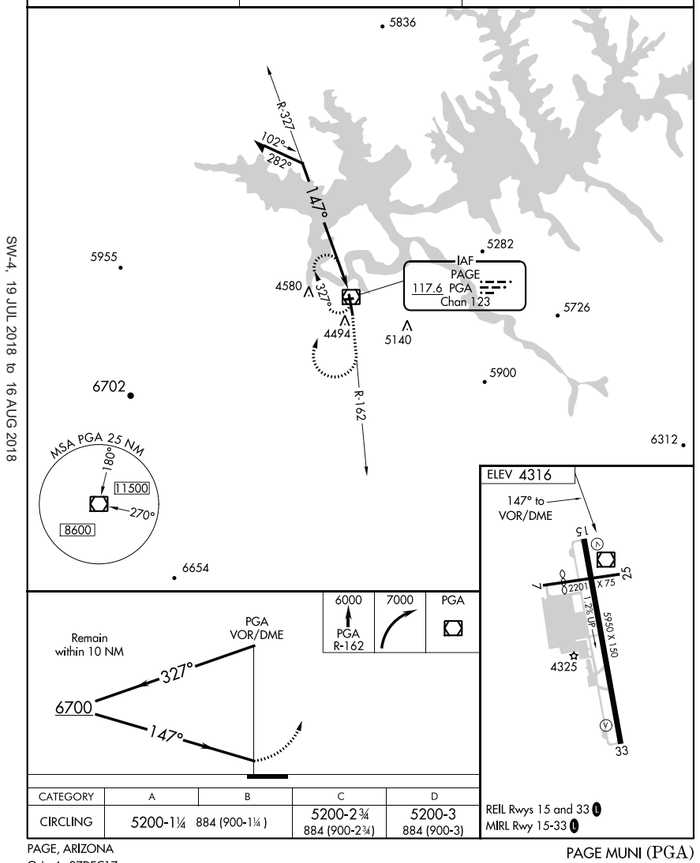
VOR/DME PGA	APP CRS	Rwy Idg	TDZE	Apt Elev
117.6 Chan 123	147°	N/A	N/A	4316

NA

Circling not authorized to Rwy 7-25.

MISSED APPROACH: Climb on the PGA R-162 to 6000, then climbing right turn to 7000 direct PGA VOR/DME and hold.

ASOS	DENVER CENTER	UNICOM
120.625	127.55 256.875	122.8 (CTAF)



CATEGORY	A	B	C	D
CIRCLING	5200-1¼ 884 (900-1¼)		5200-2¾ 884 (900-2¾)	5200-3 884 (900-3)

PAGE, ARIZONA
Orig-A 07DEC17

36°56'N-111°27'W

PAGE MUNI (PGA)
VOR-B

SW-4, 19 JUL 2018 to 16 AUG 2018

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MARBLE CANYON (L41)



NPIAS Classification ..... **N/A**
GA Asset Study ..... **N/A**
Location from PGA..... **12 nm**
Elevation ..... **3,603' MSL**
Weather Reporting..... **N/A**
ATCT ..... **N/A**
Annual Operations..... **2,700**
Based Aircraft..... **1**

Primary Runway	3-21
Length (ft.)	3,715
Width (ft.)	35
Pavement Strength (pounds)	
SWL	N/A
DWL	N/A
DTW	N/A
DDTWL	N/A
Lighting	N/A
Marking	Centerline Only
Approach Aids	N/A
Instrument Approach	N/A

Services Provided: No services

TUBA CITY AIRPORT (T03)



NPIAS Classification ..... **General Aviation**
GA Asset Study ..... **Basic**
Location from PGA..... **50 nm**
Elevation ..... **4,513' MSL**
Weather Reporting..... **N/A**
ATCT ..... **N/A**
Annual Operations..... **250**
Based Aircraft..... **0**

Primary Runway	15-33
Length (ft.)	6,230
Width (ft.)	75
Pavement Strength (pounds)	
SWL	12,500 lbs
DWL	N/A
DTW	N/A
DDTWL	N/A
Lighting	MIRL
Marking	Non-Precision
Approach Aids	VASI-2
Instrument Approach	N/A

Services Provided: No services

KEY

MSL : Mean Sea Level
MIRL: Medium Intensity Runway Lighting
VASI: Visual Approach Slope Indicator
SWL: Single Wheel Load
DWL: Dual Wheel Load
DTW: Dual Tandem Wheel Load
DDTWL: Double Dual Tandem Wheel Load
N/A: Not Applicable



FEDERAL LAND USE LEGISLATION 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 these laws and regulations. Additionally, Title 14 CFR Part 77 and Part 150 address land uses on and around public use airports. The following is a summary of the federal laws and regulations related to land use compatibility and zoning surrounding airports.

Airport and Airway Improvement Act of 1982 - United States Code (USC), Title 49

One way that land use compatibility is controlled is through federal mandates, such as the *Airport and Airway Improvement Act of 1982,* which establishes grant assurances and allows the FAA to regulate airport land use indirectly. Airports that do not comply with grant assurances (obligations) set forth by the law are not eligible to receive federal grant funding. The objective of enforcing land use restrictions is to protect designated areas for the maintenance of operationally safe and obstruction-free airport activity. Airports rely heavily upon federal funding to stay operational and safe. Therefore, it is important that airports comply with FAA regulations and grant assurances. There are two FAA grant assurances that deal specifically with airport land use compatibility.

Grant Assurance 20 - Hazard Removal and Mitigation

Grant Assurance 20 states, "It 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 - Compatible Land Use

Grant Assurance 21 states, "It will 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. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which federal funds have been expended."

Title 14 of the Code of Federal Regulations (CFR), Part 77 Objects Affecting Navigable Airspace

Part 77 defines a series of imaginary surfaces surrounding airports. The imaginary surfaces consist of the approach zone, conical zones, transitional zones, and horizontal zones. Objects such as trees, towers, buildings, or roads which penetrate any of these surfaces are considered by the FAA to be an obstruction to air navigation. Current City of Page ordinances adhere to and support the height restriction guidelines as set forth in 14 CFR Part 77. Height restrictions can be accomplished through height and hazard zoning, avigation easements, or fee simple acquisition. **Exhibit 1L** depicts a model example of the application of the Part 77 criteria.

Title 14 of the Code of Federal Regulations (CFR), Part 150 Airport Noise Compatibility Planning

Part 150 prescribes the procedures, standards, and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving or disproving those programs. This part also identifies those land uses which are normally compatible with various levels of exposure to noise by individuals. It provides technical assistance to airport operators, in conjunction with other local, state, and federal authorities, to prepare and execute appropriate noise compatibility planning and implementation programs.

Airport Land Use Compatibility Planning - FAA Advisory Circular (AC) 150/5060-6

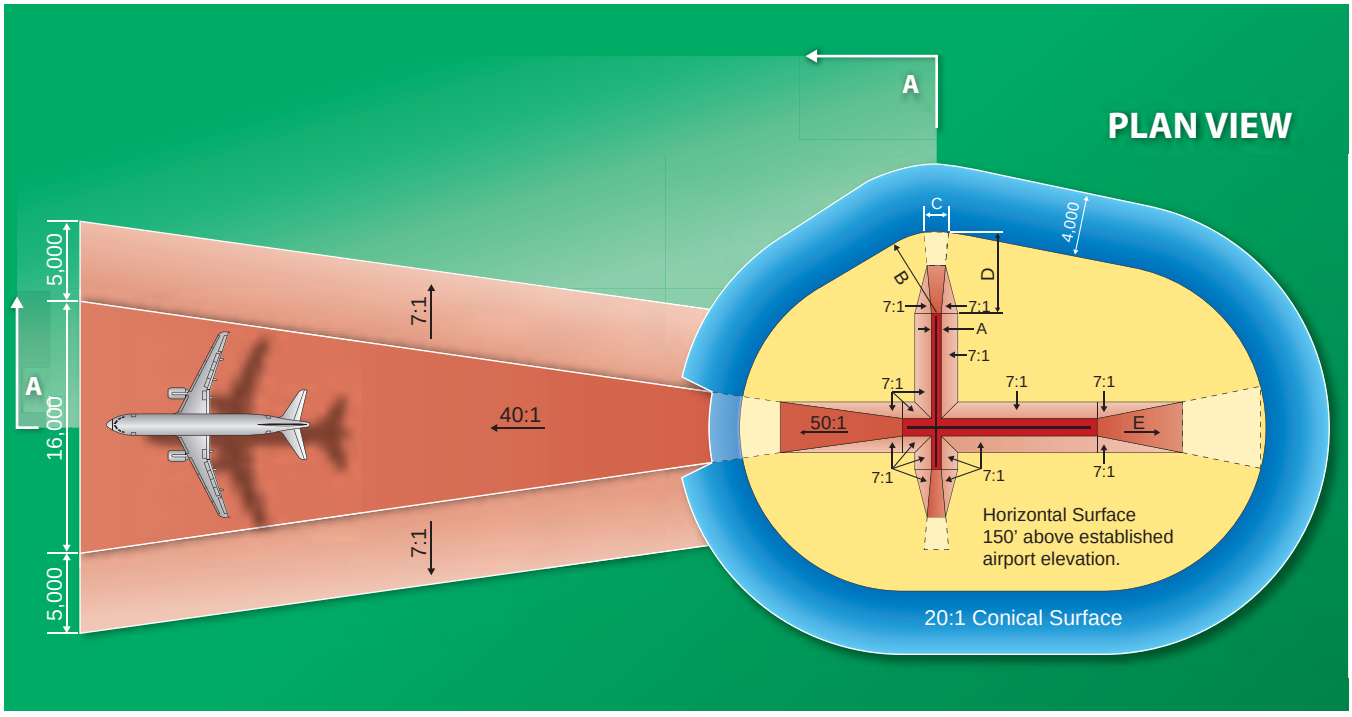
This document guides the development of a compatibility plan to ensure the environs surrounding an airport are not developed in a manner that could pose a risk to the airport's operations. This document specifically addresses land use and noise issues.

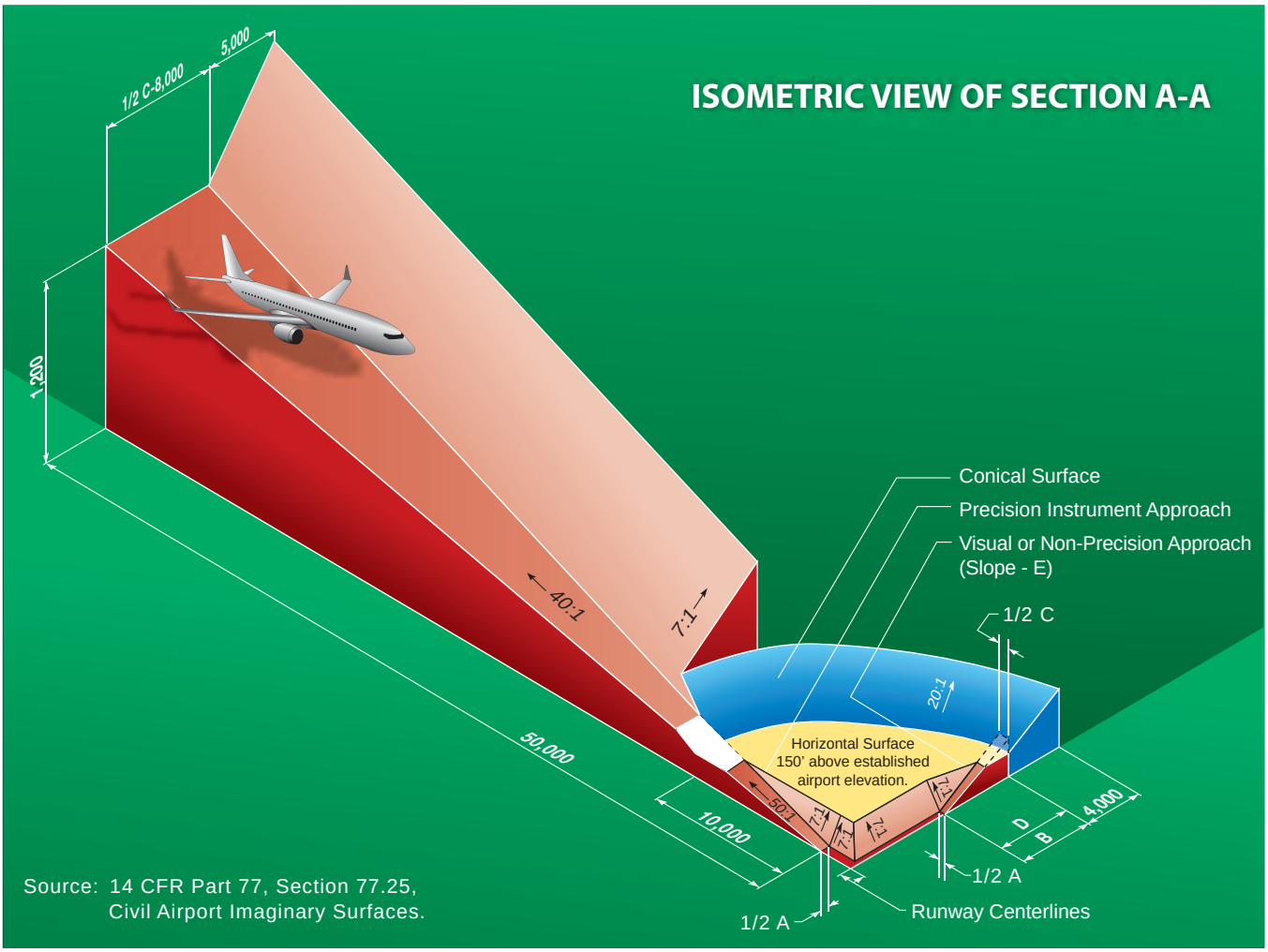
Airport Design - FAA Advisory Circular (AC) 150/5300-13A

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.

LAND USE AND ZONING

Page Municipal Airport is located within the corporate boundaries of the City of Page. Existing land uses immediately surrounding the airport include mainly vacant land to the north, east, and south. These areas include uninhabitable land due to steep terrain and other physical features. Currently, areas directly west of the airport property line are zoned and being utilized as residential housing. Under ideal conditions, the development immediately surrounding an airport would be controlled and limited to compatible land uses. Compatible land uses would include light and heavy industrial development and


PLAN VIEW
A
5,000
A
16,000
5,000
7:1
40:1
7:1
C
4,000
B
D
7:1
7:1
A
7:1
7:1
7:1
7:1
50:1
E
7:1
7:1
7:1
Horizontal Surface
150' above established
airport elevation.
20:1 Conical Surface


ISOMETRIC VIEW OF SECTION A-A
5,000
1/2 C-8,000
1,200
40:1
7:1
50,000
10,000
Conical Surface
Precision Instrument Approach
Visual or Non-Precision Approach
(Slope - E)
1/2 C
20:1
Horizontal Surface
150' above established
airport elevation.
50:1
7:1
7:1
7:1
7:1
D
B
4,000
1/2 A
1/2 A
Runway Centerlines
Source: 14 CFR Part 77, Section 77.25,
Civil Airport Imaginary Surfaces.

some commercial development. Land use zoning is the most common land use control. The City of Page has in place a zoning plan for areas adjacent to the Page Municipal Airport. **Exhibit 1M** details the existing zoning map for the City of Page and areas adjacent to the airport.

SOCIOECONOMIC CHARACTERISTICS

Socioeconomic characteristics of an airport's surrounding area can provide valuable information to derive an understanding of the dynamics of growth near an airport. This information is crucial in determining aviation demand level requirements, as most aviation demand is directly related to the socioeconomic conditions of the surrounding region. Statistical analysis of population, employment, and income trends outline the economic strength of a region and can help determine the ability of the area to sustain a strong economy in the future. The forecast chapter of this master plan will be used to provide a better understanding of the roles that socioeconomic factors play, while the information in the following sections will serve as an introduction to socioeconomic trends in the study area.

POPULATION

Population is a key socioeconomic factor to consider when planning for future airport needs. Historical and forecast population trends provide an indication of the potential of the region to sustain growth in aviation activity. Population data for the City of Page, Coconino County, and the State of Arizona are discussed to provide past and present population metrics of the region in which the airport serves. Since 2005, the City of Page has grown in population at a compound annual growth rate (CAGR) of 0.58 percent, which is a slower rate than both Coconino County (1.29 percent) and Arizona (1.82 percent). Page has grown at a slightly slower growth rate than that of the United States, which has a CAGR of 0.86 percent during the same time period. **Table 1H** presents these historical population statistics.

TABLE 1H
Historical Population Statistics

	2000	2005	2010	2015	2018	CAGR
City of Page	6,809	7,110	7,395	7,498	7,553	0.58%
Coconino County	116,733	127,025	134,624	139,076	146,902	1.29%
State of Arizona	5,160,586	5,839,077	6,408,312	6,817,565	7,139,552	1.82%
United States	282,162,385	295,516,553	309,348,139	320,898,756	328,910,940	0.86%

CAGR: Compound Annual Growth Rate
Source: Arizona Office of Economic Opportunity

EMPLOYMENT

Analysis of an area's employment base can provide valuable insight into the overall well-being of the region. Regional economic situations can have a tremendous effect on a community's economic health. Some indicators of a region's economic health include availability of jobs, variety of employment

opportunities, and types of wages provided by local employers. Employment data for the region is calculated by analyzing the number of employees in the area. **Table 1J** gives historical employment data for Mohave County, the State of Arizona, and the United States since 2005. Total employment in Coconino County has grown at a CAGR of 1.41 percent since 2005, which is slower than the state growth rate but higher than the national growth rate over this time period. The City of Page and Coconino County have been able to sustain an economy that provides a variety of employment options serving multiple industries. The city's close proximity to the greater Glen Canyon National Recreation Area makes it a hub for tourism and recreation, bolstering employment in the area. The community also provides retail shopping, entertainment, food service, medical, industrial, education, government, and many more employment opportunities for its residents.

TABLE 1J
Historical Employment Statistics

	2000	2005	2010	2015	2018	CAGR
Coconino County	69,832	74,680	76,443	83,836	89,899	1.41%
State of Arizona	2,801,525	3,224,378	3,184,488	3,551,091	3,867,486	1.81%
United States	165,519,154	172,557,438	173,034,709	190,422,800	202,637,900	1.13%
CAGR: Compound Annual Growth Rate						
Source: Woods & Poole Complete Economic Demographic Data Source (2018)						

PER CAPITA PERSONAL INCOME

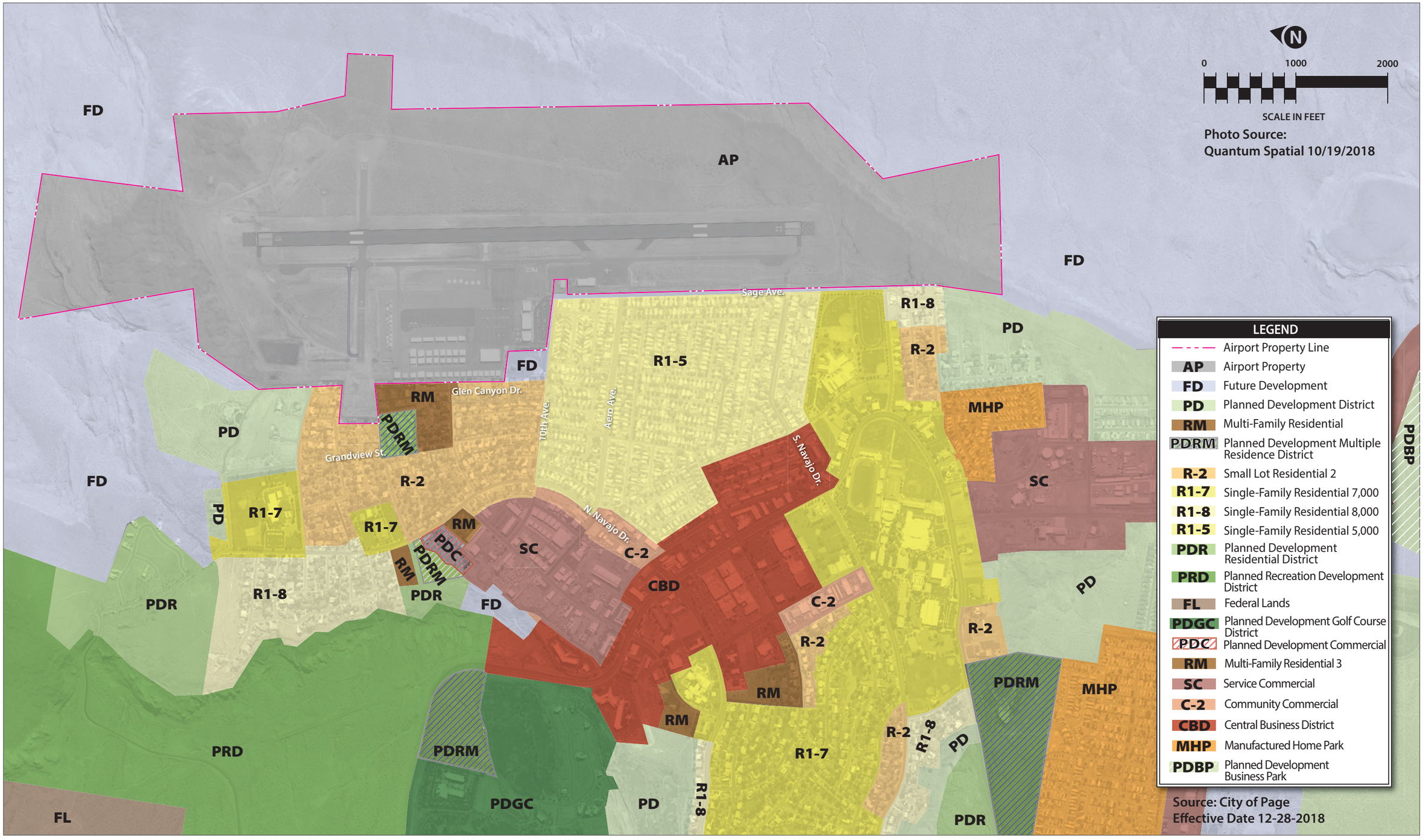
Table 1K presents per capita personal income (PCPI) for Coconino County, the State of Arizona, and the United States. PCPI is determined by dividing the total economic output by population. In order for PCPI to grow, income growth must outpace population growth significantly. Arizona's PCPI has increased 2.80 percent annually since 2005. Coconino County PCPI has outpaced Arizona and the national average with a growth rate of 3.53 percent.

TABLE 1K
Historical Per Capita Personal Income (adjusted to 2018 dollars)

	2000	2005	2010	2015	2018	CAGR
Coconino County	$23,760	$29,356	$33,895	$41,469	$44,369	3.53%
State of Arizona	$26,232	$32,228	$33,558	$39,641	$43,132	2.80%
United States	$30,603	$35,904	$40,277	$48,450	$52,920	3.09%
CAGR: Compound Annual Growth Rate						
Source: Woods & Poole Complete Economic and Demographic Data (2018)						

ENVIRONMENTAL INVENTORY

This environmental inventory identifies potential environmental sensitivities, based on the 14 environmental impact categories outlined in FAA's Order 1050.1F, *Environmental Impacts: Policies and Procedures*, that should be considered when planning future improvements at the airport.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AP
FD
PD
R1-8
R-2
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RM
PDRM
MHP
SC
C-2
CBD
R1-7
PDR
PRD
PDGC
PDC
PDBP
FL
Sage Ave.
Glen Canyon Dr.
Grandview St.
10th Ave.
Aero Ave.
S. Navajo Dr.
N. Navajo Dr.
LEGEND
Airport Property Line
AP Airport Property
FD Future Development
PD Planned Development District
RM Multi-Family Residential
PDRM Planned Development Multiple Residence District
R-2 Small Lot Residential 2
R1-7 Single-Family Residential 7,000
R1-8 Single-Family Residential 8,000
R1-5 Single-Family Residential 5,000
PDR Planned Development Residential District
PRD Planned Recreation Development District
FL Federal Lands
PDGC Planned Development Golf Course District
PDC Planned Development Commercial
RM Multi-Family Residential 3
SC Service Commercial
C-2 Community Commercial
CBD Central Business District
MHP Manufactured Home Park
PDBP Planned Development Business Park
Source: City of Page
Effective Date 12-28-2018

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- Air Quality
- Biological Resources (including fish, wildlife, and plants)
- Climate
- Coastal Resources
- *Department of Transportation Act*, Section 4(f)
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Compatible Land Use
- Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Visual Effects (including light emissions)
- Water Resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers)

It was determined that the following resources are not present with the airport environs or cannot be inventoried because they are evaluated as part of project implementation:

- Resources Not Present
    - Coastal Resources (Coastal Barriers and Coastal Zones) – the airport is inland and not subject to any coastal restrictions.
    - Farmlands – No prime farmland or farmland of statewide importance was identified on airport property.
    - Wild and Scenic Rivers – There are no designated wild and scenic rivers within the vicinity of the airport. The closest designated river is the East Fork Virgin River in Utah, approximately 80 miles west-northwest.
- Resources Not Inventoried
    - Visual effects (including light emissions) – the City of Page or surrounding environs are not designated as a dark sky place.
    - Natural resources and energy supply

AIR QUALITY

The concentration of various pollutants in the atmosphere describes the local air quality. The significance of a pollution 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-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants, which include: Ozone (O_3), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Oxide (NO_x), Particulate matter (PM_{10} and $PM_{2.5}$), and Lead (Pb).

Based on federal air quality standards, a specific geographic area can be classified as either an "attainment," "maintenance," or "non-attainment" area for each pollutant. The threshold for non-attainment designation varies by pollutant. The airport is in Coconino County, Arizona, which is designated as an attainment area for all federal criteria pollutants.[1]

BIOLOGICAL RESOURCES

Biotic 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 requirements contained within Section 7 of the *Endangered Species Act* (ESA). This Act was put into place to protect animal or plant species whose populations are threatened by human activities. Along with the FAA, the USFWS reviews projects to determine if a significant impact to these protected species will result with implementation of a proposed project. Significant impacts occur when the proposed action could jeopardize the continued existence of a protected species or would result in the destruction or adverse modification of federally designated critical habitat in the area.

A Biological Evaluation (BE) was prepared for the AMP by SWCA Environmental Consultants (SWCA), which identified 27 federally listed threatened or endangered species which have the potential to occur in the vicinity of the airport. These species, along with habitat requirements, are noted in **Table 1L** below:

TABLE 1L
Federally Listed Species Potentially Occurring Near Page Municipal Airport
Coconino County, Arizona

Species Name	Scientific Name	Federal Status	Range / Habitat Requirements
Mammals			
Black-footed ferret	*Mustela nigripes*	Endangered; experimental, non-essential population	Found in grasslands plains on mountain basins in association with prairie dogs.
Mexican wolf	*Canis Lupus baileyi*	Endangered	Habitat includes oak and pine-juniper savannahs in foothills and mixed conifer woodlands.
Birds			
California condor	*Gymnogyps californianus*	Endangered; experimental, non-essential population	Nesting sites are in caves, crevices, and potholes in isolated regions of the Southwest. Historically, habitat range for California condors are limited primarily to southcentral California, southern Utah, southern Nevada, and northern Arizona. Because this species is in danger of extinction throughout all or a significant portion of its range, experimental populations were reintroduced into northern Arizona as an effort to preserve the species. This experimental population has a "non-essential" designation (NEP), meaning the population is not essential to the continued survival of the species.

[1] https://www3.epa.gov/airquality/greenbook/anayo_az.html

TABLE 1L (Continued)
Federally Listed Species Potentially Occurring Near Page Municipal Airport
Coconino County, Arizona

Species Name	Scientific Name	Federal Status	Range / Habitat Requirements
Birds (Continued)			
Mexican spotted owl	*Strix Occidentalis Lucida*	Threatened	Found in mature montane forests and woodlands and steep, shady, wooded canyons, and can be found in mixed-conifer and pine-oak vegetation habitat. Typically will nest in older forests of mixed-conifers or ponderosa pine.
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Habitat includes dense riparian habitats along streams, rivers, and other wetlands where cottonwood, willow, boxelder, saltcedar, Russian olive, buttonbush, and arrowweed are present. Nesting habitat is in thickets of trees and shrubs that are 13' to 23' tall, among dense, homogeneous foliage.
Yellow-billed cuckoo	*Coccyzus americanus*	Threatened	The yellow-billed cuckoo uses a variety of riparian habitats and appears to require large blocks of riparian habitat for breeding.
Reptiles			
Northern Mexican garter snake	*Thamnophis eques megalops*	Threatened	The Northern Mexican garter snake prefers to live at elevations of 3,000 ft. to 5,000 ft. and is considered a riparian obligate. This snake primarily lives in the following general habitat types: 1) source-area wetlands, 2) large river riparian woodlands and forests, and 3) streamside gallery forests.
Amphibians			
Chiricahua leopard frog	*Rana chiricahuensis*	Threatened	Found in springs, livestock tanks, and streams in the upper portions of watersheds at elevations of 3,281 – 8,890 feet.
Fishes			
Apache trout	*Oncorhynchus apache*	Threatened	Occurs in small, cold, high-gradient streams through mixed-conifer forests and mountain meadows.
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered, experimental, non-essential population	Occurs in rivers with high silt content, warm water, turbulence, and varied flow by season under 4,000 feet elevation.
Gila chub	*Gila intermedia*	Endangered	Tends to inhabit smaller streams, ciénagas, and artificial impoundments ranging in elevation from 2,000 to 5,500 feet.
Gila trout	*Oncorhynchus gilae*	Threatened	Inhabits small, high mountain streams.
Humpback chub	*Gila cypha*	Endangered	Occurs at elevations typically below 4,000 feet in a variety of riverine habitats, especially canyon areas with fast currents, deep pools, and boulder habitat. In Arizona, habitat would occur in the Grand and Marble Canyon portions of the main stem of the Colorado and lower Little Colorado Rivers.
Little Colorado spinadace	*Lepidomeda vittata*	Threatened	Habitat includes streams and is found in pools with water flowing over fine gravel or silt-mud substrate.
Loach minnow	*Tiaroga cobitis*	Endangered	A bottom dwelling species found in small to large perennial creeks and rivers, typically in shallow turbulent riffles with cobble substrate and swift currents.
Razorback sucker	*Xyrauchen texanus*	Endangered	Habitat includes backwaters, flooded bottomlands, pools, side channels, and other slower-moving habitats.
Spikedace	*Meda fulgida*	Endangered	Typically found in moderate to large perennial streams, where it lives in moderate- to fast-velocity waters over gravel and rubble bedrock.

TABLE 1L (Continued)
Federally Listed Species Potentially Occurring Near Page Municipal Airport
Coconino County, Arizona

Species Name	Scientific Name	Federal Status	Range / Habitat Requirements
Fishes (Continued)			
Virgin river chub	*Gila seminuda (=robusta)*	Endangered	Commonly found in deep, swift waters with sand and gravel bottoms and boulders or other cover.
Woundfin	*Plagopterus argentissimus*	Endangered, experimental, non-essential population	Habitat for this species includes shallow, warm, turbid, fast-flowing rivers.
Snails			
Kanab ambersnail	*Oxyloma haydeni kanavensis*	Endangered	Found in semiaquatic vegetation watered by springs or seeps at the base of sandstone or limestone cliffs. Grass or sedge cover is also necessary.
Flowering Plants			
Brady's pincushion cactus	*Pedicactus bradyi*	Endangered	Grows on benches and terraces at 3,850 – 4,500 feet elevation in the Navajoan Desert near Marble Gorge
Fickeisen plains cactus	*Pediocactus peeblesianus* var. *fickeiseniae*	Endangered	This cactus is found on gravelly limestone or gravelly loam in desert scrub.
Navajo sedge	*Carex specuicola*	Threatened	This plant occurs at Seep Springs on vertical cliffs of pink-red Navajo sandstone.
San Francisco peaks ragwort	*Packera franciscana*	Threatened	Habitat includes alpine tundra above southwestern spruce-fir or bristlecone pine forests on talus slopes.
Sentry milk-vetch	*Astragalus cremnophylax* var. *cremnophylax*	Endangered	This small flowering plant grows on a white layer of Kaibab limestone with little or no soil, in unshaded openings in the piñon-juniper-cliffrose plant community.
Siler pincushion cactus	*Pediocactus (=Echinocactus, =Utahia) sileri*	Threatened	This cactus is found in red or gray gypsiferous badlands and sandy soil high in soluble salts.
Welsh's milkweed	*Asclepias welshii*	Threatened	Habitat includes sparsely vegetated, semi-stabilized sand dunes derived from Navajo sandstone.

Source: SWCA Environmental Consultants; December 2018

Critical habitat for the razorback sucker has been identified within 10 miles of the airport.

In addition to the ESA, the *Migratory Bird Treaty Act* (MBTA) is also applicable at the airport as much of the study area constitutes habitat for birds protected under this Act. The BE identified protected bird species on the field visit: the white-crowned sparrow (*Zonotrichia leucophrys*), horned lark (*Eremphila alpestris*), common raven (*Corvus corax*), mountain bluebird (*Sialia currucoides*), rock wren (*Salpinctes obsoletus*), and yellow-rumped warbler (*Setophaga coronate*). The BE noted both bald eagles and golden eagles may occur in the vicinity of the airport for brief periods during migration.

CLIMATE

The EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2016* found that the transportation sector, which includes aviation, accounted for 28.5 percent of U.S. greenhouse gas (GHG) emissions in 2016. Of this, aviation contributed 168.0 million metric tons (MMT) of carbon dioxide equivalent (CO_2e),

or nearly nine percent of all transportation emissions.[2, 3] Transportation sources include cars, trucks, ships, trains, and planes. Most of the GHG emissions from transportation are CO_2 emissions resulting from the combustion of petroleum-based products in internal combustion engines. Relatively insignificant amounts of methane (CH_4), hydrofluorocarbon (HFC), and nitrous oxide (N_2O) are emitted during fuel combustion.

From 1990 to 2016, total transportation emissions increased. The upward trend is largely due to increased demand for travel; however, much of this travel was done in passenger cars and light-duty trucks. In addition to transportation-related emissions, **Figure 1** shows all GHG emissions sources in the U.S. in 2016.

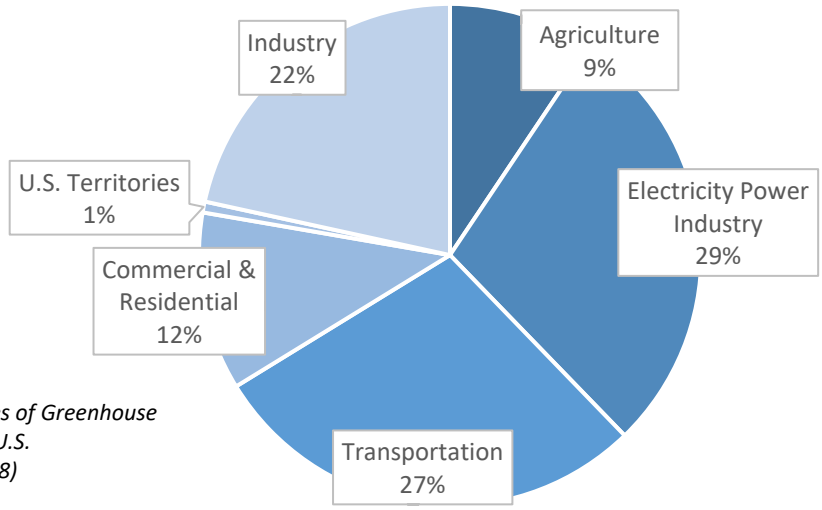


***Figure 1**: 2016 Sources of Greenhouse Gas Emissions in the U.S.*
Source: U.S. EPA (2018)

Increasing concentrations of GHGs can affect global climate by trapping heat in the Earth's atmosphere. Scientific measurements have shown that Earth's climate is warming, with concurrent impacts, including warmer air temperatures, rising sea levels, increased storm activity, and greater intensity in precipitation events. This climate change is a global phenomenon that can also have local impacts (Intergovernmental Panel on Climate Change, 2014). GHGs, such as water vapor (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and ozone (O_3), are both naturally occurring and anthropogenic (man-made).

Research established a direct correlation between fuel combustion and GHG emissions. GHGs from anthropogenic sources include CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). CO_2 is the most important anthropogenic GHG because it is a long-lived gas that remains in the atmosphere for up to 100 years.

Information regarding the climate in Page, including wind, temperature, and precipitation, were addressed earlier in this chapter.

[2] Aviation activity consists of emissions from jet fuel and aviation gasoline consumed by commercial aircraft, general aviation, and military aircraft.
[3] Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016, Table 2-13 (available: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2016)

DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(f)

Section 4(f) of the DOT Act, which was recodified and renumbered as Section 303(c) of 49 USC, provides that the Secretary of Transportation will not approve any program or project that requires the use of any publicly owned land from historic sites, public parks, 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.

The following list summarizes the nearest properties of each type that may be protected under Section 4(f) of the DOT Act:

- National Register of Historic Places
  - Lee's Ferry, 7.51 miles west-southwest of the airport
  - Navajo Steel Arch Highway Bridge, 12.05 miles west-southwest of the airport
- Recreation Areas
  - Glen Canyon National Recreation Area, adjacent to the airport to the north
  - Lake Powell National Golf Course, 0.74 miles west of the airport
- Wilderness Areas
  - Paria Canyon-Vermilion Cliffs Wilderness, 7.11 miles west of the airport
  - Saddle Mountain Wilderness, 41.73 miles southwest of the airport
- Wildlife Refuge – Desert National Wildlife Refuge, 193.28 miles west of the airport
- Local Park
  - Golliard's Park, adjacent to west of the airport
  - John C Page Park, 0.44 miles west of the airport
  - Page Sports Complex, 1.12 miles southwest of the airport

HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

Federal, state, and local laws regulate hazardous materials use, storage, transport, and disposal. These laws may extend to past and future landowners of properties containing these materials. In addition, disrupting sites containing hazardous materials or contaminates may cause significant impacts to soil, surface water, groundwater, air quality, and the organisms using these resources. According to the EPA's *EJSCREEN*, there are no Superfund or brownfield sites within five miles of the airport.[4]

The Page Transfer Station, a solid waste landfill, was identified less than two miles south of the airport.

[4] https://ejscreen.epa.gov/mapper/

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

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

The Navajo Nation Reservation is located less than one mile east of the airport. As part of the AMP, SWCA conducted an on-site archaeological survey of airport property and identified possible sites of cultural significance. These sites include new two archaeological sites, 26 isolated occurrences (IOs) of artifacts, and three possible shrines. The new archaeological sites consist of lithic scatter and are not eligible for the National Register of Historic Places (NRHP).

The IOs noted during the SWCA site visit are as follows:

- 22 IOs are prehistoric sites consisting of flakes stone debitage, a stone masonry structure, and a set of Moki steps in the sandstone.
- Three IOs are historic-era sites consisting of automobile parts, cans, and glass fragments.
- One IO consists of a rock pile intermixed with prehistoric and historic or modern materials which could not be assigned a temporal or cultural affiliation.

These IOs are not eligible for the NRHP.

The possible shrines identified on the field visit may be significant to Native American tribes which have traditionally inhabited the area. The possible shrines consist of upright stones, Moki steps, and a rectangular rock feature. While no artifacts associated with these possible shrines could provide a cultural or temporal affiliation, they could possibly hold traditional cultural importance to Native American groups.

No other sites were identified within the vicinity of the airport.

LAND USE

Land uses around the airport were described earlier in this chapter and are displayed on **Exhibit 1L**.

NOISE AND COMPATIBLE LAND USE

Federal land use compatibility guidelines are established under 14 CFR Part 150 (Part 150), *Airport Noise Compatibility Planning*. According to 14 CFR Part 150, residential land uses and schools are noise-sensitive land uses that are not considered compatible with a 65 decibel (dB) Day-Night Average Sound Level (DNL). Other noise-sensitive land uses (such as religious facilities, hospitals, or nursing homes), if located within a 65 dB DNL contour, are generally compatible when an interior noise level reduction of 25 dB is incorporated into the design and construction of the structure. Special consideration also needs to 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 (FAA 2015). No Part 150 study has been conducted for the airport.

Noise-sensitive land uses near the airport consist primarily of residential uses to the west. Land use north of the airport is a recreation area, and east and south of the airport are currently undeveloped land. Other nearby noise-sensitive land uses in the vicinity of the airport include:

- Schools
  - Lake View Primary School is located 0.17 miles west
  - Page Middle School is located 0.10 miles west-southwest
  - Page High School is located 0.34 miles west-southwest
  - Desert View Intermediate School is located 0.68 miles west-southwest
- Hospitals / Nursing Homes
  - Banner Page Hospital is located 0.78 miles west
  - Beehive Homes Assisted Living is located 1.38 miles southwest
- Religious Facilities
  - The following facilities are located southwest of the airport along S. Lake Powell Blvd., and range between 0.25 miles – 0.67 miles from airport property:
    - First Baptist Church
    - Lake Powell Nazarene Church
    - First Assembly of God
    - Page Community United Methodist Church
    - The Church of Jesus Christ of Latter-day Saints
    - Kingdom Hall of Jehovah's Witnesses
    - St. David's Episcopal Church
    - First Southern Baptist Church
    - Immaculate Heart of Mary Catholic Church
  - Faith Bible Chapel is located 1.44 miles southwest

The City of Page Zoning Ordinance (revised January 1, 2019) delineates both an Airport Property District (AP) and overlay zones for the airport. The AP district and overlay zones are intended to protect land use patterns for the long-term growth of the airport and airport-related businesses and industries. Permitted uses in the AP district include airport structures and facilities necessary for airport operations,

FBOs, heliports, tourism operations, and ground school training. Other uses proposed in this district require approval of a conditional use permit, special event permit, or temporary use permit. [5]

Two overlay zones are applicable to the airport. The first is the Airport Approach Zone Overlay (AA), which is intended to limit land use to industrial, commercial, recreational, and restricted residential uses. The other overlay zone, Airport Clear Zone Overlay (ACZ), applies to land "immediately off the end of Runways 33 and 07," and is intended to protect life and property. All proposed uses in the AA and ACZ overlays require approval of a conditional use permit, special event permit, or temporary use permit.

SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

General socioeconomic information, such as population and economic trends, were addressed earlier in this chapter. However, FAA Order 1050.1F specifically requires that a federal action causing disproportionate impacts to an environmental justice population (i.e., a low-income or minority population), be considered, as well as an evaluation of environmental health and safety risks to children. With an approximate population of 9,200 within five miles of the airport, 61 percent of that population is considered minority, while 33 percent is considered low-income. Likewise, according to *EJSCREEN*, seven percent of the population is under the age of five.

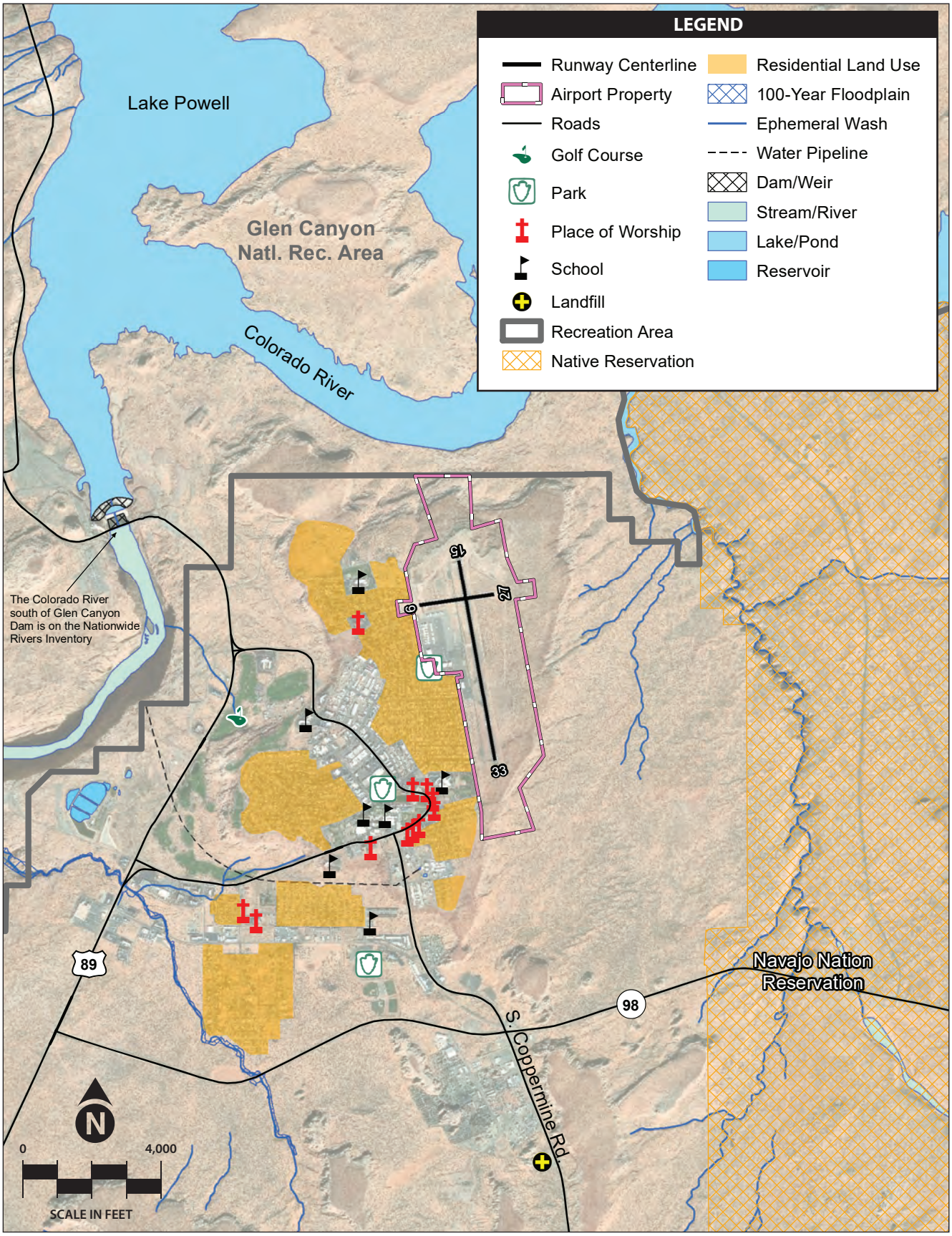
WATER RESOURCES

The City of Page provides the stormwater infrastructure for the airport. The city prepared a Storm Water Pollution Prevention Plan (SWPPP), which identified two major objectives: 1) identify sources of pollution potentially affecting the quality of stormwater discharge; and 2) ensure implementation measures minimize and control pollutants in stormwater discharges associated with activities conducted at the airport. In the State of Arizona, stormwater management is regulated on both the federal and state levels. Arizona Pollutant Discharge Elimination System (AZPDES) requirements apply to stormwater discharges associated with industrial activities at the airport and was reviewed by the FAA. Potential point sources for pollution identified in the SWPPP includes, but is not limited to, aircraft fueling and washing, runway maintenance, and aircraft deicing/anti-icing activities. If any airport activities cause potential impact on local waters, they are properly addressed and, if necessary, the City of Page Fire Department is contacted.

Water resources near the airport are depicted on **Exhibit 1N**.

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*. Wetlands are defined in Executive Order (EO) 11990, *Protection of Wetlands*, as "those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal

[5] https://cityofpage.org/images/homepage_pdfs/Zoning-Code-Final-Version-Dec18-648-18.pdf



Source: ESRI Basemap Imagery (2016), USDA, FEMA, Google.

circumstances does or would support a prevalence of vegetation or aquatic life that requires saturated or seasonably saturated soil conditions for growth and reproduction." Wetlands can include swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mud flats, 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 flooding or frequent saturation (hydrophytes), and soils that are saturated enough to develop anaerobic conditions during the growing season (hydric).

According to USFWS, which manages the National Wetlands Inventory on behalf of all federal agencies, no wetlands are identified on airport property. It is important to note that this information is based on a review of unknown dated aerial photography and may no longer represent current conditions. Additionally, based on information from the NRCS-WSS, there are no hydric soils present on airport property.

Floodplains. EO 11988 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. Based on a review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panel (map number 04005C0400G dated September 3, 2010), the airport and surrounding environs have been identified as Zone X, defined as an area of minimal flood hazard.

Surface Waters. The *Clean Water Act* (CWA) provides the authority to establish water quality standards, control discharges, develop waste treatment management plans and practices, prevent or minimize the loss of wetlands, and regulate other issues concerning water quality. Water quality concerns affiliated with 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, Congress has mandated (under the CWA) the National Pollutant Discharge Elimination System (NPDES). The Arizona Department of Environmental Quality has authorization to administer the NPDES program in the state, tribal lands excluded. The Arizona Pollutant Discharge Elimination System (AZPDES) permit mandates certain procedures required to prevent contamination of water bodies from stormwater runoff.

Examples of direct impacts to surface waters include any in-water work resulting from expansion of an existing FAA facility adjacent to surface waters, or a withdrawal of water from a surface water for construction or operations. Antelope Creek, Lake Powell, and the Colorado River, located within the vicinity of the airport, are listed as impaired waters under Section 303(d) of the CWA. A review of the National Hydrography Dataset, published by the United States Geological Survey, indicates there are no drainage channels on airport property.

Wild and Scenic Rivers. *The National Wild and Scenic Rivers Act* 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 closest designated Wild and Scenic River is a portion of the East Fork Virgin River in Utah, approximately 80 miles west-northwest of the airport.[6]

[6] https://rivers.gov/wsr-act.php

The Nationwide River Inventory (NRI) is a list of over 3,400 rivers or river segments that appear to meet the minimum *National Wild and Scenic Rivers Act* eligibility requirements based on their free-flowing status and resource values. The development of the NRI resulted from Section 5(d)(1) in the *National Wild and Scenic Rivers Act*, directing Federal agencies to consider *potential* wild and scenic rivers in the comprehensive planning process.[7] The Colorado River south of the Glen Canyon Dam, which is in the vicinity of the airport, is on the NRI.

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 to 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. The airport is over the Colorado Plateaus aquifer; however, there is no sole source aquifer within the vicinity of the airport. The airport is underlain by sandstone rock that retains only a minimal portion of the intergranular pore space that was present before the rock was consolidated, and the hydraulic conductivity is low to moderate. Because the hydraulic conductivity of sandstone is low to moderate, these types of aquifers tend to provide large amounts of water.[8]

ENVIRONMENTAL INVENTORY SOURCES

A variety of resources were used during the inventory process. The following listing reflects a compilation of these sources.

U.S. Environmental Protection Agency, Currently Designated Nonattainment Areas for All Criteria Pollutants: https://www3.epa.gov/airquality/greenbook/anayo_az.html

U.S. Environmental Protection Agency, *EJSCREEN:* http://www.epa.gov/ejscreen

FEMA Flood Map Service Center: https://msc.fema.gov/portal/search?AddressQuery=page%20municipal%20airport#searchresultsanchor

Natural Resources Conservation Service, Web Soil Survey:
http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

U.S. Fish and Wildlife Service Information, Planning and Consultation System: https://ecos.fws.gov/ipac/

U.S. Fish and Wildlife Service National Wetlands Inventory: http://www.fws.gov/wetlands/Data/Mapper.html

USGS National Map: http://nationalmap.gov/

[7] https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm
[8] https://water.usgs.gov/ogw/aquifer/101514-wall-map.pdf



page
ARIZONA
THE CENTER OF CANYON COUNTRY

Chapter Two

FORECASTS









FORECASTS

An important factor in facility planning begins with defining the expected needs of the airport over a specified planning period. In airport master planning, this involves projecting potential aviation activity for a 20-year timeframe. For Page Municipal Airport, aviation demand forecasting will consider projections for scheduled commercial passenger service, air tour activities, based aircraft, and annual aircraft operations by annualized totals and by specific categories. These will serve as the basis for facility planning and needs of the airport through the year 2038.

The objective of forecasting is to predict the magnitude of change expected over the next two decades. 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 any degree of certainty. Therefore, it is important to remember that forecasts serve as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. The FAA reviews individual airport forecasts with the objective of comparing them to its *Terminal Area Forecast* (TAF) and the *National Plan of Integrated Airport Systems* (NPIAS). In addition, aviation activity forecasts provide important input to the benefit-cost analyses associated with airport development, and FAA reviews these analyses when federal funding requests are submitted.



Only two components of a master plan are approved by the FAA: the aviation demand forecasts and the Airport Layout Plan (ALP). The ALP will be updated later in this study. FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, dated December 4, 2004, states that forecasts should be:

- Realistic;
- Based on the latest available data;
- Reflective of current conditions at the airport;
- 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 consists of a series of basic steps that vary in complexity depending on the issues to be addressed and the type of airport being studied. The steps include a review of the previous forecasts, determination of data needs, identification of data sources, collection of the data, selection of forecast methods, preparation of the forecasts, and evaluation and documentation of the results. FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, outlines seven standard steps involved in the forecast process, including:

1. **Identify Aviation Activity Measures:** The level and type of the aviation activities likely to impact facility needs. For general aviation, this typically includes based aircraft and operations.

2. **Review Previous Airport Forecasts:** May include the FAA *Terminal Area Forecast*, state or regional system plans, and previous master plans.

3. **Gather Data:** Determine what data is required to prepare the forecasts, identify data sources, and collect historical and forecast data.

4. **Select Forecast Methods:** There are several appropriate methodologies and techniques 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 judgement.

5. **Apply Forecasts Methods and Evaluate Results:** Prepare the actual forecasts and evaluate for reasonableness.

6. **Summarize and Document Results:** Provide supporting text and tables as necessary.

7. **Compare Forecasts Results with FAA's TAF:** Follow guidance in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*. In part, the order indicates that the forecasts should not vary significantly (more than 10 percent) from the TAF. When there is a greater than 10 percent variance, supporting documentation should be supplied to the FAA.

The following forecast analysis for Page Municipal Airport was produced following these basic guidelines. Existing forecasts are examined and compared against current and historic 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 permit airport management to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

NATIONAL AVIATION TRENDS AND FORECASTS

The forecasts developed for the airport must consider national, regional, and local aviation trends. The following section describes these trends. This information is utilized both in statistical analysis and to aid the forecast preparer in making any manual adjustments to the forecasts as necessary.

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for the large air carriers, regional/commuter air carriers, general aviation, and FAA workload measures. The forecasts are prepared to meet budget and planning needs of the FAA and to 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 2018-2038*, published in March 2018. The FAA primarily uses the economic performance of the United States 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 the FAA Aerospace Forecasts.

Since its deregulation in 1978, the U.S. commercial air carrier industry has been characterized by boom-to-bust cycles. The volatility associated with these cycles was thought by many to be a structural feature of an industry that was capital intensive but cash poor. However, the Great Recession of 2007-09 marked a fundamental change in the operations and finances of U.S. airlines. Air carriers fine-tuned their business models to minimize losses by lowering operating costs, eliminating unprofitable routes, and grounding older, less fuel-efficient aircraft. To increase operating revenues, carriers initiated new services that customers were willing to purchase and started charging separately for services that were historically bundled in the price of a ticket. The industry experienced an unprecedented period of consolidation with three major mergers in five years. These changes, along with capacity discipline exhibited by carriers, have resulted in an eighth consecutive year of profitability for the industry in 2017. Looking ahead, there is optimism that the industry has been transformed from that of a boom-to-bust cycle to one of sustainable profits.

ECONOMIC ENVIRONMENT

According to the FAA forecast report, as the economy recovers from the most serious economic downturn and slow recovery since the Great Depression, aviation will continue to grow over the long run. Fundamentally, demand for aviation is driven by economic activity. As economic growth picks up, so will

growth in aviation activity. The FAA forecast calls for passenger growth over the next 20 years to average 1.9 percent annually. The uptick in passenger growth in 2016-2017 will continue into 2018 spurred on by favorable economic conditions in the U.S. and the world. The price of oil is projected to rise from around $48 per barrel in 2017 to $51 in 2018 and continue to rise, exceeding $100 by 2030 and approaching $119 by 2038.

U.S. economic performance in 2017 was estimated to have grown in real gross domestic product (GDP) to 17.0 trillion (inflation adjusted to 2009 dollars) and was forecast to grow at an average annual growth rate of 2.0 percent through 2038. Although the U.S. economy has managed to avoid a recession, a prolonged period of faster economic growth (e.g., > 3.0 percent) may not be forthcoming. Additional potential headwinds for the global economy include uncertainty surrounding Brexit in the United Kingdom, recessions in Russia and Brazil, inconsistent performance in other emerging economies, an economic downturn in China, and a lack of further stimulus in the advanced economies.

U.S. TRAVEL DEMAND

Mainline and regional carriers offer domestic and international passenger service between the U.S. and foreign destinations, although regional carrier international service is confined to the border markets in Canada, Mexico, and the Caribbean. According to FAA, four distinct trends are shaping today's commercial air carrier industry: (1) easing capacity discipline; (2) steady growth of seats per aircraft; (3) increasing competitive pressure due to ultra-low-cost carrier expansion; and (4) continued reliance on ancillary revenues.

With the approval of the Alaska Airlines/Virgin America merger, the outlook for further consolidation via mergers and acquisitions appears to be limited. There are now six major mainline airlines: American, Delta, United, Southwest, Alaska/Virgin, and JetBlue, which accounted for more than 85 percent of the U.S. airline industry capacity and traffic. It is highly unlikely that the U.S. Government will approve any further mergers among these due to anti-trust regulations. In 2005, there were 12 major mainline airlines.

One of the most striking outcomes of industry restructuring has been the unprecedented period of capacity discipline (achieving higher passenger loads through scheduled flight and fleet mix consolidation), especially in domestic markets. Between 1978 and 2000, available seat miles (ASMs) in domestic markets increased at an average annual rate of four percent per year, recording only two years of decline. Even though domestic ASMs shrank by 6.9 percent in fiscal year (FY) 2002 following the events of September 11, 2001, growth resumed, and by FY 2007, domestic ASMs were 3.6 percent above the FY 2000 level. Since 2009, U.S. domestic ASMs have increased at an average rate of 2.1 percent per year, while revenue passenger miles (RPMs) have grown 2.8 percent per year.

In 2017, mainline carriers provided nine percent more capacity than they did in 2007, while carrying 11.8 percent more passengers. Capacity flown by the regional group has decreased by 2.8 percent over the same period (with passengers carried down 5.1 percent).

The regional market has continued to shrink as the regionals compete for even fewer contracts with the remaining dominant carriers; this has meant slow growth in enplanements and yields. The regionals have less leverage with the mainline carriers than they have had in the past and are facing large pilot shortages and tighter regulations regarding pilot training. Labor costs are also increasing as carriers raise wages to combat the pilot shortage. Their capital costs have increased in the short-term as they continue to replace their 50-seat regional jets with more fuel-efficient 70-seat jets. However, this move to the larger aircraft will prove beneficial in the future due to lower unit costs.

Another continuing trend is that of ancillary revenues. Carriers generate ancillary revenues by selling products and services beyond that of an airplane ticket to customers. This includes the unbundling of services previously included in the ticket price, such as checked bags and on-board meals, and by adding new services, such as boarding priority and internet access. Although U.S. passenger carriers posted record net profits in 2016, profits declined in 2017 on rising fuel, labor costs, and flat yields.

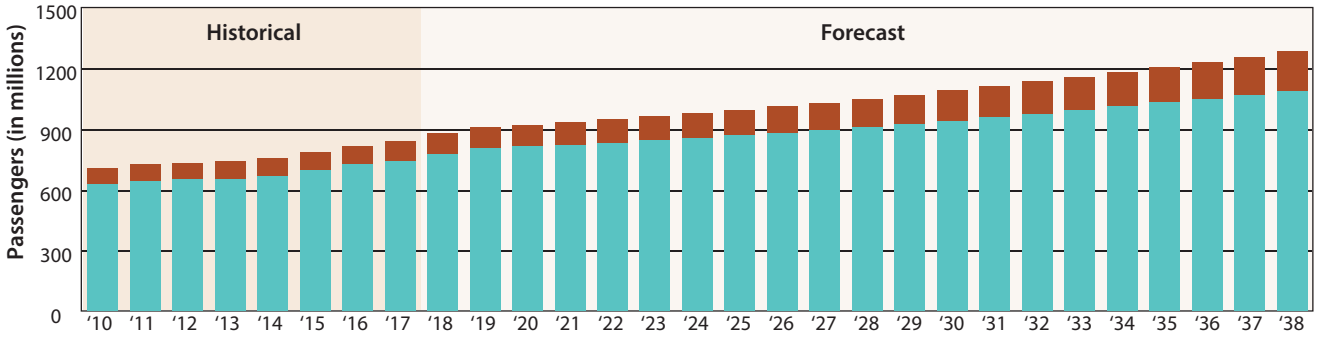
FAA COMMERCIAL AIR CARRIER FORECASTS

U.S. commercial air carriers' total number of domestic departures rose in 2016 for the first time since 2007, but then pulled back in 2017 and are about 18 percent below the 2007 level. ASMs, RPMs, and enplanements all grew in each of the past six years; these trends underlie the expanding size of aircraft and higher load factors. In 2017, the domestic load factor came off a historic high reached the year before, but at 84.5 percent, remains near the peak for commercial air carriers. System capacity growth was up 2.9 percent in 2017, with U.S. carriers prioritizing domestic capacity over the international market. U.S. carrier domestic capacity growth will exceed their international capacity growth in 2018, but carriers will start expanding capacity in international markets faster than domestic markets beginning in 2019. This trend is projected to continue through 2038.

Supported by a growing U.S. and world economy, year-over-year RPM growth is forecast to be 2.4 percent on average over the period from 2018-2038. Over the same time, system capacity growth averages 2.3 percent per year and system enplanements are projected to increase an average of 1.9 percent a year, with mainline carriers growing at 2.0 percent a year – slightly higher than their regional counterparts (up 1.6 percent). By 2038, U.S. commercial air carriers are projected to fly 1.884 trillion ASMs and transport 1.284 billion enplaned passengers – a total of 1.596 trillion passenger miles. Planes will remain crowded, with load factors projected to grow to 84.7 percent in 2038 (up 1.2 points compared to the beginning of the forecast period in 2017).

Increases in passenger volume and traffic offset flat yields, along with higher ancillary revenues and relatively low fuel prices, and resulted in U.S. carriers being solidly profitable in 2017. Over the long term, the FAA sees a competitive and profitable aviation industry characterized by increasing demand for air travel and airfares growing more slowly than inflation, reflective of a growing U.S. and global economy. **Exhibit 2A** presents the annual historical and forecast enplanement totals for both large air carriers and commuter airlines in the U.S. as forecast by the FAA.

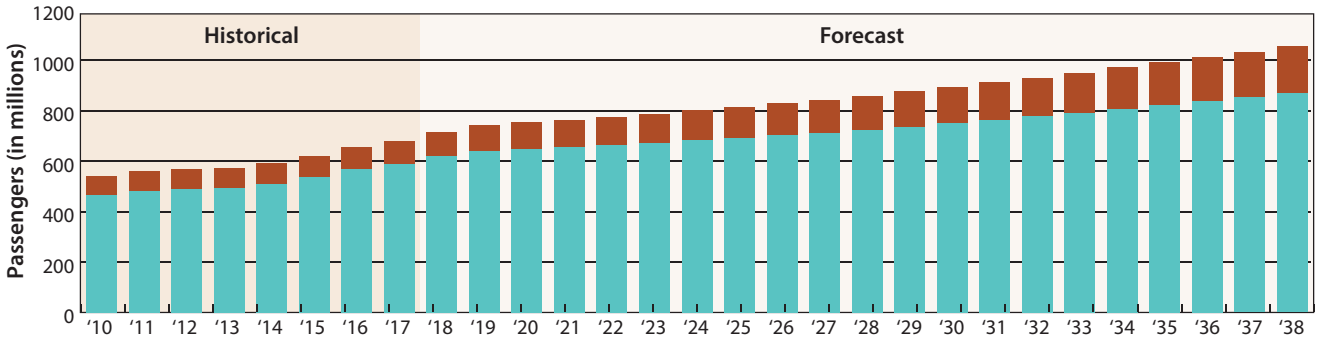
U.S. AIR CARRIER PASSENGER ENPLANEMENTS



SOURCE	2017	2023	2028	2038	AAGR 2018-2038
Domestic Revenue Enplanements	743	844	909	1,090	1.7%
International Revenue Enplanements	97	119	140	194	3.3%
TOTAL	840	964	1,050	1,284	1.9%

Note: All figures measured in millions

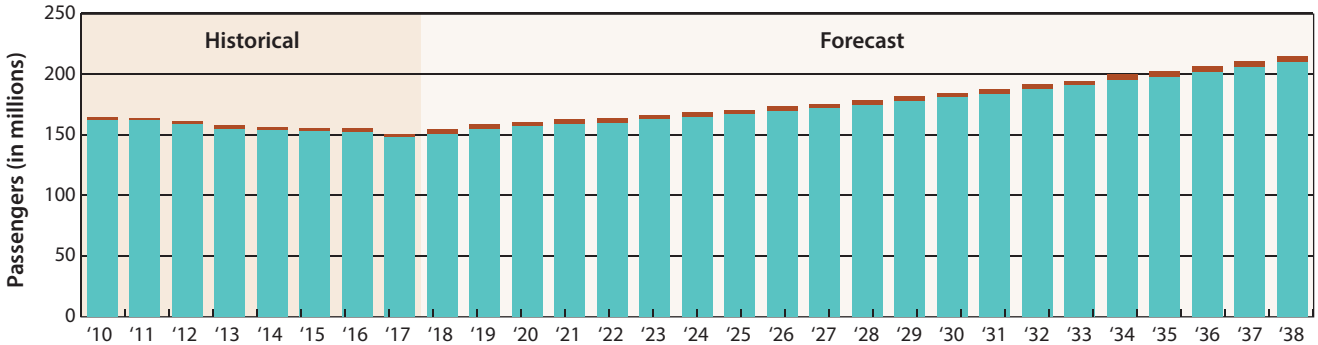
U.S. MAINLINE AIR CARRIER PASSENGER ENPLANEMENTS



SOURCE	2017	2023	2028	2038	AAGR 2018-2038
Domestic Revenue Enplanements	595	682	734	880	1.7%
International Revenue Enplanements	93	115	136	189	3.3%
TOTAL	689	797	871	1,069	2.0%

Note: All figures measured in millions

U.S. REGIONAL AIR CARRIER PASSENGER ENPLANEMENTS



SOURCE	2017	2023	2028	2038	AAGR 2018-2038
Domestic Revenue Enplanements	148	163	175	210	1.6%
International Revenue Enplanements	3	4	4	5	1.6%
TOTAL	152	166	179	215	1.6%

Note: All igures measured in millions. Totals may not equal due to rounding.
Source: *FAA Aerospace Forecast - Fiscal Years 2018-2038*

FAA COMMERCIAL AIRCRAFT FLEET FORECAST

The number of aircraft in the U.S. commercial fleet is forecast to increase from 7,141 in 2017 to 8,290 in 2038 fueled by increased demand for air travel and air cargo. The number of jets in the fleet is forecast to add 45 new jets a year as carriers continue to remove older, less fuel-efficient narrow body aircraft. The narrow body fleet (including E-series aircraft at JetBlue and C-series at Delta) is projected to grow 27 aircraft a year as carriers replace the 757 fleet, current technology 737, and A320 family of aircraft with the next generation MAX and Neo families. The regional carrier fleet is forecast to decline by 120 aircraft by 2038 as carriers remove 50-seat regional jets and retire older, small turboprop and piston aircraft, while adding 70-90 seat regional jets, especially the E-2 family, after 2020. By 2030, only a handful of 50-seat regional jets will remain in the fleet. By 2038, the number of jets in the regional carrier fleet totals 1,910, up from 1,644 in 2017. Turboprop/piston aircraft in the fleet is forecast to shrink by 79 percent by 2038. **Exhibit 2B** presents the FAA commercial aircraft fleet forecast through 2038.

AIR TAXI OPERATIONS FORECASTS

According to the current *FAA Aerospace Forecasts - Fiscal Years 2018-2038*, national air taxi operations are projected to be stable, but experience a slight decrease of 0.06 percent over the course of the planning period. The primary reason for the projected decrease is the transition by commuter airlines to larger aircraft with more than 60 passenger seats, which will then be counted as air carrier operations as opposed to air taxi operations. While air taxi operations that are performed by commuter airlines are decreasing, air taxi by business and charter jets is expected to continue to grow. For purposes of this study, air taxi operations at Page Municipal Airport include scheduled commercial service as well as air tour activity.

FAA GENERAL AVIATION FORECASTS

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, light sport, experimental, and others (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. From 2010 through 2013, the FAA undertook an effort to have all aircraft owners re-register their aircraft. This effort resulted in a 10.5 percent decrease in the number of active general aviation aircraft, primarily in the piston category.

The long-term outlook for general aviation is favorable, led by gains in turbine aircraft activity. The active general aviation fleet is not forecast to grow significantly in the next 20 years, adding just 1,040 new aircraft to the fleet by 2038. While steady growth in both 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 FAA's forecast.

In 2017, the FAA estimated there were 146,670 piston-powered aircraft in the national fleet. The total number of piston-powered aircraft in the fleet is forecast to decline by 0.8 percent from 2018-2038, resulting in 124,320 by 2038. This includes -1.0 percent annually for single engine pistons and -0.4 percent for multi-engine pistons.

Total turbine aircraft are forecast to grow at an annual growth rate of 2.0 percent through 2038. The FAA estimates there were 30,905 turbine-powered aircraft in the national fleet in 2017, and there will be 46,160 by 2038. This includes annual growth rates of 1.7 percent for turboprops, 2.2 percent for business jets, and 1.9 percent for turbine helicopters.

While comprising a much smaller portion of the general aviation fleet, experimental aircraft, typically identified as home-built aircraft, are projected to grow annually by 0.8 percent through 2038. The FAA estimates there were 27,865 experimental aircraft in 2017, and these are projected to grow to 33,105 by 2038. Sport aircraft are forecast to grow 3.6 percent annually through the long term, growing from 2,585 in 2017 to 5,440 by 2038. **Exhibit 2C** presents the historical and forecast U.S. active general aviation aircraft.

The FAA also forecasts total operations based upon activity at control towers across the U.S. Operations are categorized as air carrier, air taxi/commuter, general aviation, and military. General aviation operations, both local and itinerant, declined significantly with the Great Recession and subsequent slow recovery. Through 2038, total general aviation operations are forecast to grow 0.3 percent annually. Air taxi/commuter operations are forecast to decline by 2.1 percent through 2028, and then increase slightly through the remainder of the forecast period. Overall, air taxi/commuter operations are forecast to decline by 0.6 percent annually from 2018 through 2038.

GENERAL AVIATION AIRCRAFT SHIPMENTS AND REVENUE

The 2007-09 economic recession has had a negative impact on general aviation aircraft production, and the industry has been slow to recover. Aircraft manufacturing declined for three straight years from 2008 through 2010. According to the General Aviation Manufacturers Association (GAMA), there is optimism that aircraft manufacturing will stabilize and return to growth, which has been evidenced since 2011. **Table 2A** presents currently available historical data related to general aviation aircraft shipments.

Worldwide shipments of general aviation airplanes increased in 2017, with a total of 2,324 units delivered around the globe, compared to 2,268 units in 2016. However, worldwide general aviation billings were lower than the previous year. In 2017, $20.2 billion in new general aviation aircraft were shipped, but year-end results were mixed across the market segments. North America is the largest market for general aviation aircraft. The Asian-Pacific region is the second largest market for piston-powered aircraft, Latin America is the second largest market for turboprops, and Europe is the second largest market for business jets.

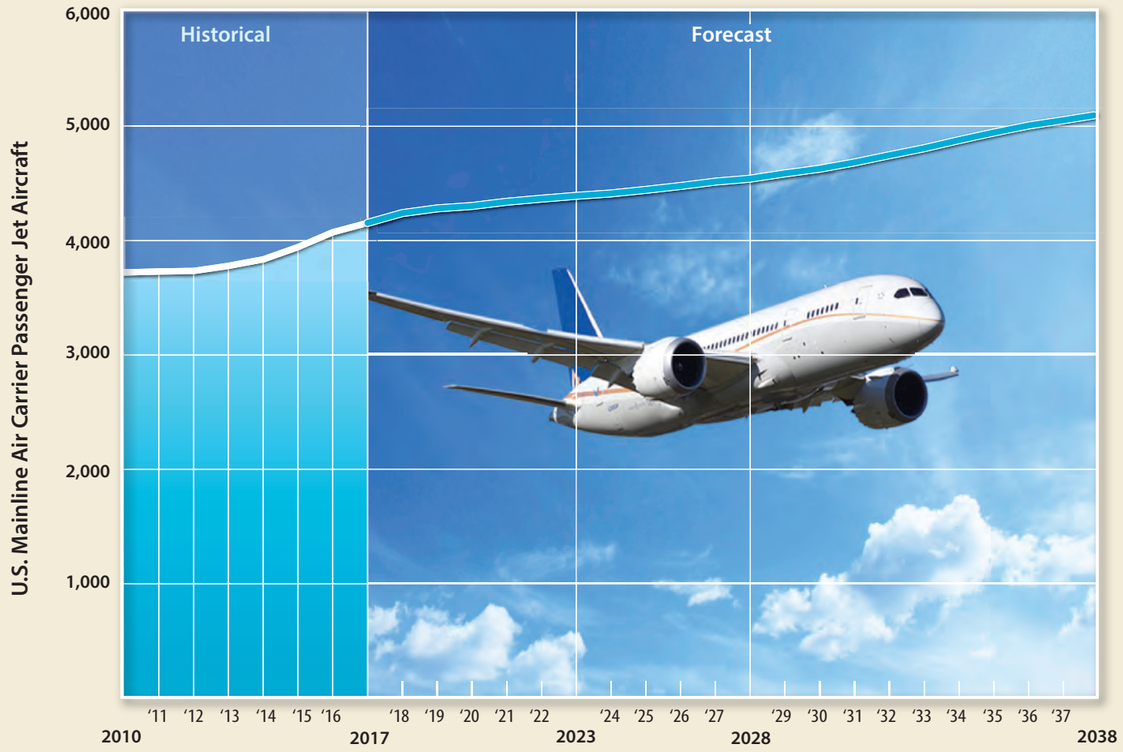
U.S. MAINLINE AIR CARRIER PASSENGER JET AIRCRAFT

	2017	2023	2028	2038	AAGR 2018-2038
Large Narrow Body					
2 Engine	3,539	3,710	3,844	4,190	0.7%
3-4 Engines	1	1	0	0	N/A
Large Wide Body					
2 Engine	517	601	619	833	2.3%
3-4 Wide Body Engines	0	0	0	0	N/A
Total Large Jets	**4,057**	**4,312**	**4,463**	**5,023**	**1.0%**
Total Regional Jets	**98**	**80**	**79**	**78**	**-1.1%**
Total Mainline Passenger Jets	**4,155**	**4,392**	**4,542**	**5,101**	**0.9%**

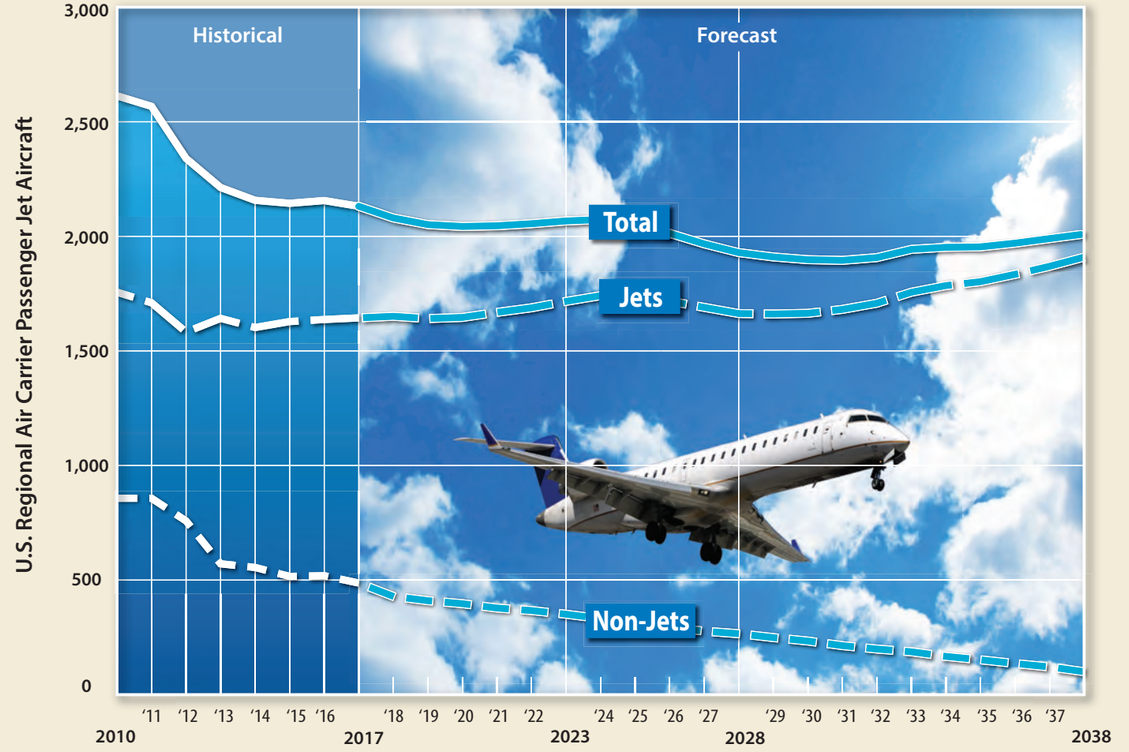
U.S. REGIONAL AIR CARRIERS PASSENGER AIRCRAFT

	2017	2023	2028	2038	AAGR 2018-2038
Less than 30 Seats					
Turboprop	396	278	200	49	-9.3%
31-40 Seats					
Turboprop	26	20	14	4	-8.8%
Over 40 Seats					
Turboprop	65	53	52	48	-0.7%
Jet	1,644	1,716	1,663	1,910	0.7%
Non-Jet Total	**487**	**351**	**266**	**101**	**-7.0%**
Jet Total	**1,644**	**1,716**	**1,663**	**1,910**	**0.7%**
Total Regional Passenger Aircraft	**2,131**	**2,067**	**1,929**	**2,011**	**-0.2%**

Total Mainline Passenger Jets



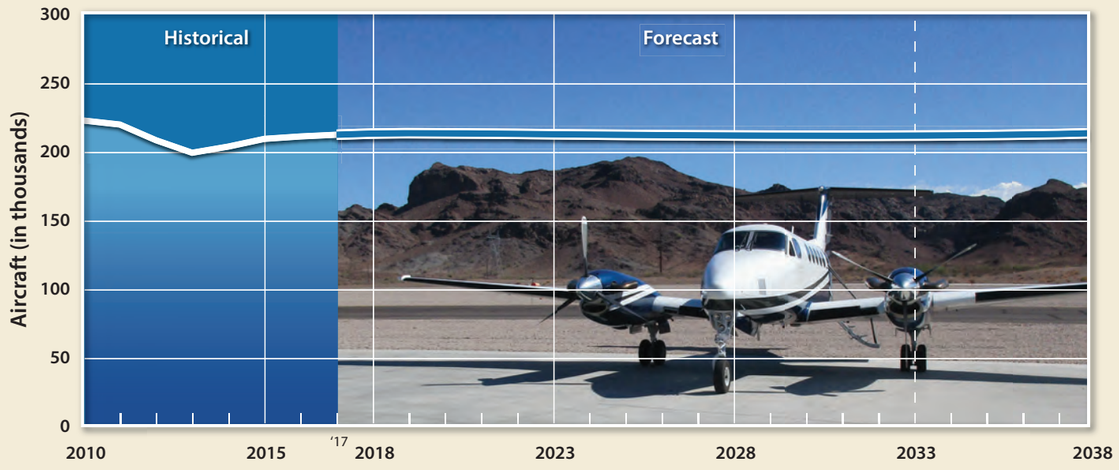
Total Regional Passenger Aircraft



Source: FAA Aerospace Forecast - Fiscal Years 2018-2038

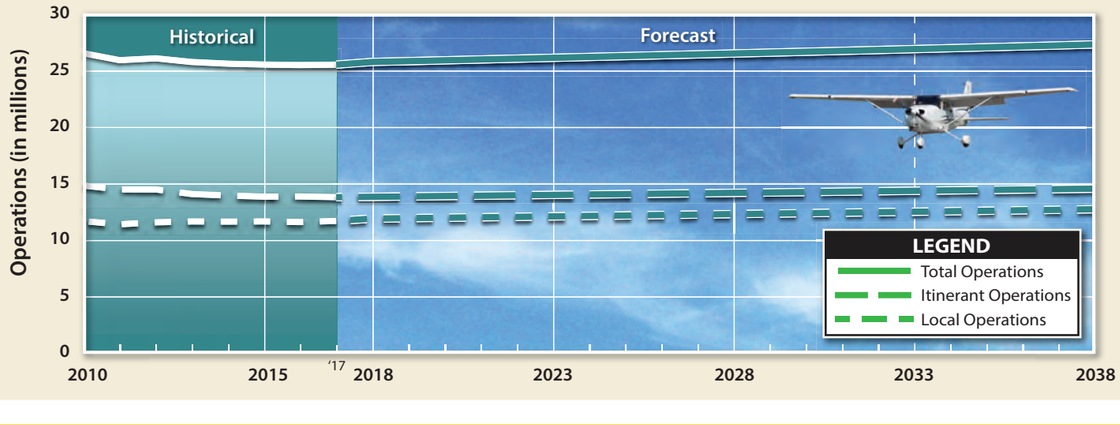
U.S. ACTIVE GENERAL AVIATION AIRCRAFT

	2017E	2023	2028	2038	AAGR 2018-2038
Fixed Wing					
Piston					
Single Engine	130,330	125,330	118,740	107,800	-1.0%
Multi-Engine	12,935	12,720	12,465	11,845	-0.4%
Turbine					
Turboprop	9,430	9,025	9,870	12,855	1.7%
Turbojet	14,075	16,220	18,120	22,195	2.2%
Rotorcraft					
Piston	3,405	3,750	4,035	4,675	1.5%
Turbine	7,400	8,375	9,200	11,110	1.9%
Experimental					
	27,865	29,595	30,980	33,105	0.8%
Sport Aircraft					
	2,585	3,330	3,995	5,440	3.6%
Other					
	5,025	5,045	5,060	5,065	0.0%
Total Pistons	146,670	141,800	135,240	124,320	-0.8%
Total Turbines	30,905	33,620	37,190	46,160	2.0%
Total Fleet	213,050	213,390	212,465	214,090	0.0%



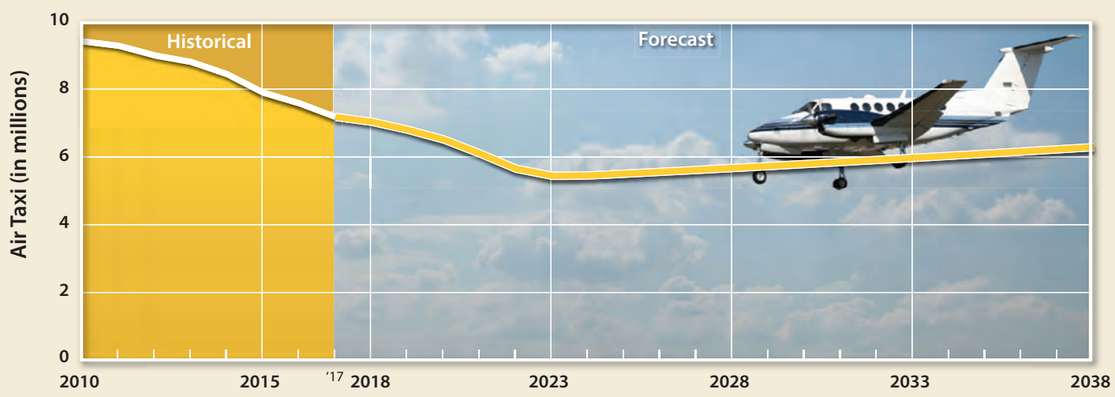
U.S. GENERAL AVIATION OPERATIONS

	2017E	2023	2028	2038	AAGR 2018-2038
Itinerant					
	13,838,029	14,039,925	14,217,031	14,587,442	0.3%
Local					
	11,731,596	12,135,595	12,338,286	12,763,556	0.3%
Total GA Operations	**25,569,625**	**26,175,520**	**26,555,317**	**27,350,998**	**0.3%**



U.S. AIR TAXI

	2017E	2023	2028	2038	AAGR 2018-2038
Air Taxi/Commuter Operations					
Itinerant	7,179,301	5,442,448	5,671,740	6,287,749	-0.6%



Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.
Source: *FAA Aerospace Forecast - Fiscal Years 2018-2038*

Business Jets: Business jet deliveries grew from 667 units in 2016 to 676 units in 2017. The North American market accounted for 63.8 percent of business jet deliveries, which is a 1.8 percent increase in market share compared to 2016.

Turboprops: Turboprop shipments were down from 582 in 2016 to 563 in 2017. North America's market share of turboprop aircraft dropped by 3.6 percent in the last year, while the European, Asian-Pacific, and Latin American markets increased their market share.

Pistons: In 2017, piston airplane shipments grew to 1,085 units over last year's shipment of 1,019 units for a 6.5 percent increase. However, North America's market share of piston aircraft deliveries dropped from 69.6 percent in 2016 to 65.6 percent in 2017. The Asian-Pacific market saw the largest increase in market share at 3.2 percent growth.

TABLE 2A
Annual General Aviation Airplane Shipments
Manufactured Worldwide and Factory Net Billings

Year	Total	SEP	MEP	TP	J	Net Billings ($millions)
1994	1,132	544	77	233	278	3,749
1995	1,251	605	61	285	300	4,294
1996	1,437	731	70	320	316	4,936
1997	1,840	1043	80	279	438	7,170
1998	2,457	1508	98	336	515	8,604
1999	2,808	1689	112	340	667	11,560
2000	3,147	1,877	103	415	752	13,496
2001	2,998	1,645	147	422	784	13,868
2002	2,677	1,591	130	280	676	11,778
2003	2,686	1,825	71	272	518	9,998
2004	2,962	1,999	52	319	592	12,093
2005	3,590	2,326	139	375	750	15,156
2006	4,054	2,513	242	412	887	18,815
2007	4,277	2,417	258	465	1,137	21,837
2008	3,974	1,943	176	538	1,317	24,846
2009	2,283	893	70	446	874	19,474
2010	2,024	781	108	368	767	19,715
2011	2,120	761	137	526	696	19,042
2012	2,164	817	91	584	672	18,895
2013	2,353	908	122	645	678	23,450
2014	2,454	986	143	603	722	24,499
2015	2,331	946	110	557	718	24,129
2016	2,268	890	129	582	667	21,092
2017	2,324	936	149	563	676	20,197

SEP - Single Engine Piston; MEP - Multi-Engine Piston; TP - Turboprop; J - Turbofan/Turbojet
Source: General Aviation Manufacturers Association, *2017 Annual Report*

RISKS TO THE FORECASTS

While the FAA is confident that its forecasts for aviation demand and activity can be achieved, this hinges on a number of factors, including the strength of the global economy, security (including the threat of international terrorism), and price of oil. Higher oil prices could lead to further shifts in consumer spending away from aviation, dampening a recovery in air transport demand. In the long term, the FAA foresees a competitive and profitable industry characterized by increasing demand for air travel and airfares growing more slowly than inflation.

AIRPORT 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 airport can accommodate. The service area is determined primarily by evaluating the location of competing airports, their capabilities, their services, and their 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. For Page Municipal Airport, the primary role is to accommodate scheduled commercial service, air tour, and general aviation demand in the region.

The service area for an airport is a geographic 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, which influence aviation demand at the airport. Moreover, aviation demand will be impacted by the proximity of competing airports, the surface transportation network, and the strength of commercial airline and/or general aviation services provided by an airport and competing airports.

SCHEDULED COMMERCIAL SERVICE/AIR TOUR SERVICE AREA

The commercial service area of an airport is defined by the airport's proximity to other facilities that provide similar services. For Page Municipal Airport, another important factor influencing its service area is the recreation and tourism generated from Horseshoe Bend, Antelope Canyon, and Glen Canyon National Recreation Area (GCNRA), which encompasses Lake Powell. Attracting between three and four million visitors annually, these attractions help define the airport's commercial service area. As the nearest commercial service airport to the attractions in the area, Page Municipal Airport is uniquely positioned to serve tourism to the area given the scheduled commercial service and air tour activities associated with the airport. Additionally, direct flights to the airport from two leading large hub airports in the region (Phoenix Sky Harbor International Airport and Las Vegas McCarran International Airport) also add a level of convenience to long distance travelers destined for the City of Page and surrounding region.

Coconino County is the largest county in the state and second largest county in the U.S., but it is also one of the most sparsely populated. Much of the county is dedicated to Native American lands, National Parks, National Forests, and recreation areas. The City of Page is also one of only six incorporated communities in the county. Page residents make up approximately 19 percent of the county's total population. According to the Arizona Commerce Authority, 66 percent of the county's total population live in these incorporated communities with the majority (approximately 51 percent) of all county residents living in Flagstaff. The remaining 44 percent live on native American reservations or in unincorporated areas.

Page Municipal Airport is one of three commercial service airports in Coconino County. The nearest commercial service airport is Flagstaff Airport, which is approximately 130 miles to the south. It currently provides daily scheduled commercial service to Phoenix, Dallas, and Denver utilizing a range of regional jets. The other airport in the county, Grand Canyon National Park Airport, serves a wide range of commercial passengers via air tour flights. In the past, the airport has accommodated scheduled commercial service but does not currently do so.

These two airports limit Page Municipal Airport's service area to the south and west from a commercial service perspective. Other airports in the region, including St. George Regional Airport and Cedar City Regional Airport in Utah, also limit the airport's service area to the north and west. On a broader scale, the large hub airports in Phoenix and Las Vegas serve to limit the airport's secondary service area. Although these airports are located over four hours from Page Municipal Airport, many travelers will fly directly to these airports due to convenience and elect to drive to areas nearby to Page, especially given the vast recreational and tourism attractions that are located between both large cities and Page itself.

With the factors mentioned above, Page Municipal Airport's primary commercial service area includes the City of Page, north-central Coconino County, and portions of southern Utah. This includes the areas associated with strong recreational and tourism opportunities in the area.

GENERAL AVIATION SERVICE AREA

The primary purpose of defining a general aviation service area is to identify the geographic area from which an airport will derive its general aviation demand. As such, the service area generally represents where most based aircraft come from. It is not unusual for some based aircraft to be registered outside the region or even outside the state. Most pilots base their aircraft at an airport because of the convenience of the airport to their residence or their place of business; however, some aircraft owners have other priorities, such as runway length, specific services, hangar availability, airport congestion, etc., and may elect to base their aircraft at a more distant location.

The general aviation service area is smaller than the commercial service area. Typically, the service area for regionalized airports ranges from 30 to 50 miles. The proximity and level of aviation services are the primary defining factors when describing the general aviation service area. A description of airports

within an approximately 50-nautical mile (nm) radius of Page Municipal Airport was discussed in Chapter One. Two public-use airports were included in this proximity to Page Municipal Airport.

As in any business enterprise, the more attractive the facility is in terms of service 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 facilities and services are adequate and/or competitive, some level of aviation activity might be attracted to the airport from more distant locales. The corporate aviation component of the service area can extend farther, depending on the competing airports.

Page Municipal Airport's location makes the airport an important facility serving the needs of aviation in the city, county, and region. Existing airport facilities, including a primary 5,950-foot runway, instrument approach capabilities, high quality aviation service providers, and abundant hangar space, situates the airport as a significant airport in the region. For planning purposes, the primary general aviation service area for the airport will be the City of Page. General aviation airports serving other population centers in the region will effectively limit its service area.

SOCIOECONOMIC TRENDS

The socioeconomic conditions for the area provide an important baseline for preparing aviation demand forecasts. Local socioeconomic variables such as population, employment, and income are indicators for understanding the dynamics of the county and, in particular, the trends in aviation growth. Socioeconomic data for the City of Page, Coconino County, and the State of Arizona were obtained from the Arizona Office of Economic Opportunity and Woods & Poole Complete Economic and Demographic Data prepared in 2018. **Table 2B** presents local, regional, and state socioeconomic statistics.

Table 2B
Socioeconomic Projections
Page Municipal Airport

	Historical			Projections			
	2005	2018	CAGR	2023	2028	2038	CAGR
City of Page							
Population	7,110	7,553	0.47%	8,193	8,398	8,640	0.67%
Coconino County							
Population	127,025	146,902	1.12%	153,813	159,256	166,756	0.64%
Employment	74,680	89,899	1.44%	99,380	108,972	126,973	1.74%
PCPI	$29,356	$44,369	3.23%	$54,589	$69,953	$116,511	4.95%
State of Arizona							
Population	5,924,476	7,076,199	1.38%	7,703,431	8,342,791	9,675,325	1.58%
Employment	3,224,378	3,867,486	1.41%	4,261,040	4,658,032	5,414,296	1.70%
PCPI	$32,228	$43,132	2.27%	$53,019	$67,864	$113,059	4.94%

CAGR- Compound Annual Growth Rate
PCPI- Per Capita Personal Income
Sources: Woods and Poole Complete Economic and Demographic Data, Arizona Office of Economic Opportunity

POPULATION

Total resident population for the City of Page was 7,553 in 2018. The population of Coconino County in 2018 is estimated at 146,902. Page residents make up approximately 19 percent of the county's total population. As presented in **Table 2B**, the city is projected to grow to 8,640 by 2038, representing a 0.67 percent compound annual growth rate (CAGR). The population for the county is forecast to increase to 166,756 by 2038, representing a 0.64 percent CAGR over the planning period. For comparative purposes, population for the state of Arizona is included and has experienced a 1.38 percent CAGR since 2005, with a strong projected CAGR of 1.58 percent over the planning period.

EMPLOYMENT

Historical and forecast employment data for Coconino County and the state of Arizona are also presented in **Table 2B**. Between 2005 and 2018, Coconino County employment grew by an average of 1.44 percent annually. This growth rate was higher than the state's overall growth rate of 1.41 percent. Through the next 20 years, the county's employment is forecast to grow faster than has been experienced since 2005. It is also expected to continue to slightly outpace employment growth projected for the state.

PER CAPITA PERSONAL INCOME

Table 2B also compares per capita personal income (PCPI), adjusted to 2018 dollars, for the county and state. Coconino County's adjusted PCPI for 2018 was $44,369, slightly higher than the state of Arizona's PCPI, which was $43,132. The county is projected to continue to show gains in PCPI through the planning period, increasing at 4.95 percent annually.

AVIATION FORECAST METHODOLOGY

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth. However, the judgement of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and assessment of the local situation, is important in the final determination of the preferred forecast.

By developing several projections for each aviation demand indicator, a reasonable planning envelope, or range of forecasts, will emerge. The selected forecast may be one of the individual projections based on the local conditions. The selected forecast will almost always fall within the planning envelope. Some combination of the following forecasting techniques is utilized to develop the planning envelope for each demand indicator.

Trend line projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical demand 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 much the same way as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections.

Market share analysis involves a historical review of aviation 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.

Historical growth analysis is a simple forecasting method in which the historical annual growth rate is identified and then extended out to forecast years. This analysis method assumes factors that impacted growth in the past will continue into the future.

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

Regression analysis is a statistical technique that yields an r-squared (r^2) value which shows the level of the correlation between variables. If the r^2 value is greater than 0.95, it indicates a strong predictive reliability.

Beyond five years, the predictive reliability of the forecasts can diminish. Therefore, it is prudent for the airport to reassess the assumptions originally made and revise the forecasts based on the current airport and industry conditions. Facility and financial planning usually require at least a 10-year review since it often takes several years to complete a major facility development program.

Another consideration is that technological advances in aviation have historically altered, and will continue to change, the growth rates in aviation demand over time. The most obvious example is the impact of jet aircraft on the aviation industry, which resulted in a growth rate that far exceeded expectations. Such changes are difficult, if not impossible, to predict and there is no mathematical way to estimate their impacts. It is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

Forecasts of aviation demand for Page Municipal Airport have been developed by utilizing statistical methods, available existing forecasts, and analyst expertise. The following section presents the aviation demand forecasts and includes activity in two broad categories: based aircraft and annual operations.

AVIATION FORECASTS

The following forecast analysis examines each of the aviation demand categories expected at Page Municipal Airport over the next 20 years. Each segment will be examined individually, and then collectively, to provide an understanding of the overall aviation activity at the airport through 2038.

For a non-hub, primary commercial service airport, commercial passenger enplanements, operations, and general aviation activities associated with based aircraft and operations are the most basic indicators of future demand. Future facility requirements, such as improved airport facilities like runways and taxiways, terminal building component spaces, aircraft storage hangars, and apron areas, are derived from these projections. The remainder of this chapter will examine differing aviation demand segments based on the airport's service area and other influential factors.

The need for airport facilities at Page Municipal Airport can best be determined by accounting for forecasts of future aviation demand. Forecasts for airport activities include the following:

SCHEDULED COMMERCIAL SERVICE

- Annual Enplaned Passengers
- Annual Operations and Fleet Mix

AIR TOUR

- Annual Enplaned Passengers
- Annual Operations

GENERAL AVIATION

- Based Aircraft
- Based Aircraft Fleet Mix
- Annual Operations

MILITARY

- Annual Operations

PEAKING CHARACTERISTICS

- Enplanement Peaks
- Annual Operations Peaks

The following sections will examine historical trends with regard to these categories of activity and project future demand for these segments of aviation activity at the airport. These forecasts will become the basis for planning future facilities, both airside and landside, at the airport.

SCHEDULED COMMERCIAL SERVICE FORECASTS

As previously detailed, Page Municipal Airport is a primary commercial service airport as defined by the FAA. As of August 2018, the airport has had scheduled passenger service provided by a single carrier, Contour Airlines, which is a regional commuter carrier. Contour Airlines provides service to Phoenix and to Las Vegas utilizing the Embraer ERJ-135 regional jet, which is a 30-seat commuter aircraft.

To evaluate commercial service demands and the facilities necessary to properly accommodate present and future commercial activity, two basic elements must be forecast: annual enplaned passengers and annual commercial operations. Annual enplaned passengers serve as the most basic indicator of demand for commercial service activity. The annual number of enplanements is the figure utilized by the FAA to determine various entitlement funding levels for commercial service airports. The term "enplanement" refers to a passenger boarding a flight. In the case of Page Municipal Airport, enplanements refer to passengers on air tour flights offered by on-site commercial operators as well as enplanements of passengers utilizing the airport's scheduled commercial airline service.

HISTORICAL SCHEDULED COMMERCIAL SERVICE ACTIVITY

Scheduled commercial service at Page Municipal Airport has been available through multiple airlines since the mid-1980s. Passenger enplanement numbers have fluctuated over the years in part due to flight schedule changes and aircraft seating capacities. Seating capacities vary based on the types of aircraft an operator utilizes. Page Municipal Airport never had scheduled commercial service offering more than 19 seats until Contour Airlines began offering regional jet service with a seating capacity for 30 passengers in August 2018. This new service provides flights to Phoenix Sky Harbor International Airport and Las Vegas McCarran International Airport. The Spring 2019 schedule has a daily departure to each airport, with an additional flight to Phoenix on Mondays and Fridays.

Great Lakes Airlines provided scheduled commercial service from 2000 until March of 2018, when the airline announced that they would be suspending operations. During the time that Great Lakes served the airport, they offered three to four daily flights and averaged between 2,000 and 7,000 enplanements per year. When service ceased, the airport experienced a five-month period with no scheduled commercial service, until Contour Airlines began operating in August of the same year.

In order to adjust for the period without service and more accurately estimate current enplanements level, this master plan extrapolated enplanement and operations data based upon the months that Contour Airlines has been operating. The extrapolated data estimates that if Contour Airlines had operated for the entirety of 2018, annual scheduled commercial service enplanements would have totaled approximately 9,600. For purposes of this master plan 9,600 annual enplanements will be utilized as the base year enplanement level.

SCHEDULED COMMERCIAL SERVICE ENPLANEMENTS FORECAST

The first step involved in updating an airport's forecasts includes reviewing previous forecasts in comparison to actual activity levels to determine what changes, if any, may be necessary. The next step is to then consider any new factors that could impact the forecasts, such as changes in regional socioeconomic conditions, tourism, or commercial aviation trends.

Previous Enplanement Forecasts

Existing forecasts such as the previous 2009 *Page Municipal Airport Master Plan*, the 2018 Arizona *State Aviation System Plan* (SASP) Update, and the FAA TAF have been reviewed. These forecasts include scheduled commercial service, air tour, and "other" air taxi enplanements. The previous master plan forecast projected a total enplanement growth rate of 4.14 percent annually over its planning period, which was from 2006 to 2025, predicting 62,500 total enplanements by 2025. The FAA TAF currently estimates 18,110 total enplanements and forecasts this number to grow to 29,111 by 2038, equating to an annual growth rate of 2.52 percent. The SASP uses 2016 as its base year and uses the 2016 TAF projection for its enplanement forecast. The SASP forecast yields 23,999 enplanements by 2036 for a growth rate of 2.45 percent. These forecasts are well below the currently reported enplanement levels when factoring scheduled commercial service and air tour operations. It should also be noted that at the time of these forecasts the airport was experiencing fewer enplanements than it is currently. This can be attributed to Contour's regional jet service that started in 2018.

Market Share of Park Visitors

Perhaps one of the most significant drivers of aviation activity at Page Municipal Airport is tourism in the area. There are a number of notable attractions supporting tourism in the area. Historical park visitor data was obtained from the National Park Service (NPS) to compare with historical enplanements in order to establish a market share comparison. The NPS's records of park visitors have been compiled monthly since 1964. Forecast data for future park visitors was not available. Therefore, a trend analysis was performed, in which historical data collected was used to establish a growth trend projection. In 1998, GCNRA had 2,442,990 visitors. This number has increased to 4,219,441 visitors by 2018. During this time period, there were peaks and lulls, but the average annual growth of park visitors over the 20-year period has averaged an increase of approximately 88,000 visitors per year. This linear growth rate trend was utilized to create a projection for park visitors over the next 20 years. Applying this growth rate yielded 4.7 million visitors in the five-year timeframe, 5.2 million visitors in the 10-year timeframe, and 6 million visitors by 2038. These projections can be used as an indicator for tourism growth in the area and applied to market share projections based on enplanements related to scheduled commercial service. The enplaned percentage of park visitors was found to be 0.0023 percent in 2018. This can be described as the market share of total park visitors enplaned in 2018. The resulting forecast detailed on **Table 2C** considers the airport maintaining a constant market share of park visitors through the planning period of the master plan. This forecast yields 13,700 enplanements by 2038.

Table 2C
Scheduled Commercial Service Enplanement Forecasts
Page Municipal Airport

Year	PGA Scheduled Enplanements	GCNRA Park Visitors	Enplaned % of Visitors	Page Population	Travel Propensity Factor	U.S. Regional Air Carrier Domestic Enplanements	PGA Market Share
2006	5,718	1,885,378	0.0030	7,018	0.81	152,200,000	0.00376%
2007	5,297	1,894,114	0.0028	7,057	0.75	156,200,000	0.00339%
2008	5,187	1,947,507	0.0027	7,086	0.73	159,100,000	0.00326%
2009	4,707	1,960,345	0.0024	7,122	0.66	154,000,000	0.00306%
2010	5,795	2,124,467	0.0027	7,253	0.80	161,700,000	0.00358%
2011	5,659	2,270,817	0.0025	7,369	0.77	161,700,000	0.00350%
2012	6,264	2,061,328	0.0030	7,346	0.85	159,000,000	0.00394%
2013	5,926	1,991,924	0.0030	7,395	0.80	155,500,000	0.00381%
2014	3,746	2,368,452	0.0016	7,582	0.49	154,000,000	0.00243%
2015	2,742	2,495,093	0.0011	7,668	0.36	153,000,000	0.00179%
2016	3,425	3,239,525	0.0011	7,607	0.45	152,000,000	0.00225%
2017	4,134	4,574,940	0.0009	7,665	0.54	148,000,000	0.00279%
2018	9,600*	4,219,441	0.0023	7,640	1.26	151,000,000	0.00636%
Constant Market Share Park Visitors (CAGR-1.79%)							
2023	10,700	4,700,000	0.0023	8,193	1.31	163,000,000	0.00656%
2028	11,800	5,200,000	0.0023	8,398	1.41	175,000,000	0.00674%
2038	13,700	6,000,000	0.0023	8,640	1.59	210,000,000	0.00652%
Constant Travel Propensity Factor (CAGR-0.64%)							
2023	10,300	4,700,000	0.0022	8,193	1.26	163,000,000	0.00632%
2028	10,600	5,200,000	0.0020	8,398	1.26	175,000,000	0.00606%
2038	10,900	6,000,000	0.0018	8,640	1.26	210,000,000	0.00519%
Constant Market Share U.S. Regional Airline Enplanements (CAGR-1.68%)							
2023	10,400	4,700,000	0.0022	8,193	1.27	163,000,000	0.00636%
2028	11,100	5,200,000	0.0021	8,398	1.32	175,000,000	0.00636%
2038	13,400	6,000,000	0.0022	8,640	1.55	210,000,000	0.00636%
Increasing Market Share U.S. Regional Airline Enplanements (CAGR-3.53%) – *Selected Forecast*							
2023	**12,200**	4,700,000	0.0026	8,193	1.49	**163,000,000**	**0.00748%**
2028	**14,600**	5,200,000	0.0028	8,398	1.74	**175,000,000**	**0.00834%**
2038	**19,200**	6,000,000	0.0032	8,640	2.22	**210,000,000**	**0.00914%**
2009 Master Plan Projected Growth Rate (CAGR-5.36%)							
2023	12,500	4,700,000	0.0027	8,193	1.53	163,000,000	0.00767%
2028	16,200	5,200,000	0.0031	8,398	1.93	175,000,000	0.00926%
2038	27,300	6,000,000	0.0046	8,640	3.16	210,000,000	0.01300%

*2018 base year enplanement estimate extrapolated from six months of Contour Airline service.
Sources: FAA Aerospace Forecast (2018-2038), Arizona Office of Economic Opportunity, National Park Service Records, Coffman Associates analysis

Travel Propensity Factor

There are a variety of local factors that affect the potential for passengers within an area. A key statistic to consider is the relationship of the airport's enplanements with the populace it serves. The ratio of enplanements to population is termed the travel propensity factor (TPF). The TPF is predominantly impacted by the proximity of an airport to other regional airports with higher levels of service or "hub" airports. Regional airports with higher TPF ratios tend to be located farther from hub airports in relatively isolated areas. These airports generally have a service area that extends into adjacent, well populated regions or have some type of air service advantage that attracts more of those passengers that might otherwise choose to drive to a more distant hub airport. Generally, the higher the TPF, the more likely air travelers are to utilize the local airport's commercial service option. Page Municipal Airport is an airport that is isolated by long distances from any other hub airports. Similar airports, upon introducing regional jet service, have experienced major growth in enplanements. For planning purposes, the enplanement trends experienced during the latter half of 2018 were applied to the entire year to provide a calculated years' worth of commercial service activity, from which future projections will be evaluated. As presented on **Table 2C**, the TPF in 2018 was calculated to be 1.26 percent.

An enplanement forecast has been developed that compares the relationship between the population of the city and the airport enplanement levels. As population increases, it is reasonable to expect the need and demand for commercial service to grow. Page Municipal Airport provides a level of convenience to residents of the area that cannot be matched by other airports or by other transportation modes. Thus, it is reasonable to assume that the airport could remain attractive to local travelers as long as reliable air service and competitive air fares are offered. Moreover, improvements to airline services, such as additional flights, could increase the airport's attractiveness to local and regional travelers.

An enplanement forecast developed utilizing the TPF is included in **Table 2C**. The forecast considers the airport maintaining a constant share of the estimated 2018 TPF (1.26). This forecast results in a relatively flat growth of enplanements for the period, estimated at 10,900 by 2038. This small growth can be attributed to the forecast slow growth in population for the City of Page during the 20-year period of the master plan.

Market Share of U.S. Regional Airline Enplanements

The next forecasting method employed was a consideration of the airport's market share of U.S. regional airline enplanements. National forecasts of U.S. regional enplanements are compiled each year by the FAA and consider the state of the economy, fuel prices, and prior year developments. According to the most recent publication, *FAA Aerospace Forecast – Fiscal Years 2018-2038*, regional passenger enplanements are forecast to increase at an average rate of 1.6 percent over the 20-year forecast period.

Two enplanement forecasts have been developed as a market share of U.S. domestic regional airline enplanement forecasts. As shown in **Table 2C**, the first considers the airport maintaining a constant market share based upon enplanement totals being extrapolated from the second half of 2018 and

applied to the whole year (.00636 percent). This projection would mirror projected growth for the U.S. regional airlines and yields 13,400 enplanements by the end of the planning period. A second forecast considers Page Municipal Airport gaining market share through the planning period as the existing level of service takes hold and captures a higher percentage of the flying public in the region as well as an increasing number of visitors expected to traverse the region. This projection yields 19,200 enplanements by 2038.

Previous Master Plan Growth Rate

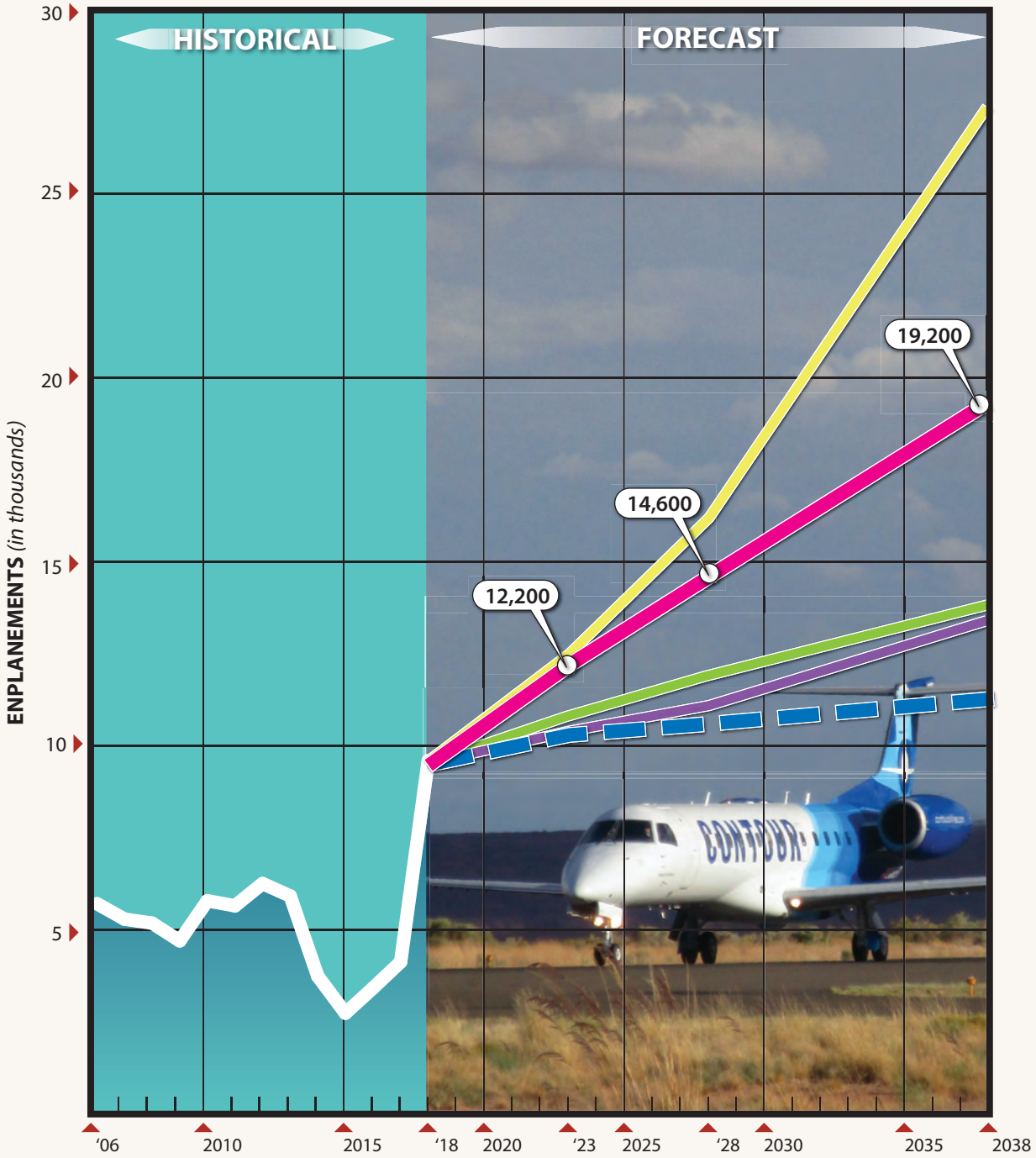
The previous airport master plan forecasted that scheduled commercial service enplanements would climb from approximately 6,100 enplanements in 2006 to 17,500 by 2025, which would represent a 5.36 percent CAGR. While this growth rate has not yet been achieved, it is likely a symptom of the economic recession experienced from 2007-2009. The tourism industry experienced a decline during that time period but has largely recovered. By applying the previous master plan's growth rate to the current enplanement totals, the forecast yields 27,300 enplanements by 2038. This is considered an aggressive growth rate given the current conditions, but it does provide a high-end forecast to develop a planning envelope.

Scheduled Commercial Enplanement Forecast Summary

Several enplanement projections were developed. **Table 2C** and **Exhibit 2D** further detail these projections. As can be seen, a long-term planning envelope has emerged, ranging from a 2038 high of approximately 27,300 annual enplanements to a low of approximately 10,900 annual enplanements. The constant TPF projection of enplanements represents the low end of the forecast envelope, while the previous master plan growth rate projection forms the upper end of the envelope. This forecast envelope represents the area in which future enplanements should be found.

The selected forecast for planning purposes considers the increasing market share of U.S. regional enplanements projection to be the most reasonable. As such, the selected forecast yields 12,200 enplanements by 2023 and increases to 19,200 enplanements by 2038. This represents a growth rate of 3.53 percent annually. This selected forecast relies on continued improvements to the national and regional economies and growth in socioeconomic conditions for the region that can support air service. Moreover, as the City of Page's tourism market continues to grow, there will be more demand for commercial air service to the area from major hub cities like Phoenix and Las Vegas.

In addition, airline service improvements would likely be necessary to yield enplanements as projected. While it is uncertain if the airport can attract another airline, improvements to existing airline service will create a higher demand. As such, this projection may require additional daily flights to accommodate the increased demand.



Sources: FAA Aerospace Forecast (2018-2038), Arizona Office of Economic Opportunity, National Park Service records, Coffman Associates analysis

LEGEND

- Constant Market Share Park Visitors (CAGR - 1.79%)
- Constant Travel Propensity Factor (CAGR - 0.64%)
- Constant Market Share Regional Airline Enplanements (CAGR - 1.68%)
- **Increasing Market Share Regional Airline Enplanements(CAGR - 3.53%) - *Selected Forecast***
- 2009 Master Plan Projected Growth Rate (CAGR - 5.36%)

The FAA will consider the master plan forecasts in comparison to the TAF. The FAA prefers the short-term forecast to be within five percent of the TAF and the intermediate-term to be within ten percent of the TAF. Adequate explanation and justification should be provided if the forecast deviates beyond those percentages. As discussed earlier in this chapter, the TAF combines scheduled commercial service enplanements, air tour enplanements, and all other air taxi enplanements in their forecast. The master plan is tasked with a more specific breakdown of enplanement forecasts, which will be presented in this chapter. When the individual enplanement forecasts have been chosen, they will then be presented as a total enplanement forecast for comparison to the TAF.

SCHEDULED COMMERCIAL SERVICE OPERATIONS AND FLEET MIX FORECAST

In addition to passenger enplanements, several other factors affect forecasts of airline operations. The number of operations that can be anticipated can be derived from the average ratio of passenger enplanements per departure. The type of aircraft in the commercial airline fleet serving the airport is an important component of airport planning. Not only is the commercial airline fleet mix serving the airport helpful in determining the number of commercial airline operations at the airport, it also aids in defining many other key planning parameters, such as the critical aircraft serving the airport.

A projection of scheduled commercial service fleet mix for Page Municipal Airport has been developed by reviewing commercial service aircraft serving the airport. As previously mentioned, Contour Airlines currently utilizes 30-seat Embraer ERJ-135 jet aircraft for its commercial service operations at the airport.

The boarding load factor (BLF) is defined as the ratio of passengers boarding an aircraft and the seating capacity of the aircraft. The yearly BLF is presented in **Table 2D** for 2018. Two columns are represented for 2018. One represents the actual reported operations and fleet mix for the year based on a mixture of scheduled commercial service activities conducted by Great Lakes Airlines and Contour Airlines, and accounts for only eight months of commercial service operations split between the two separate operators. The actual number of seats per departure is calculated to be 26.1 with a BLF of 34.2 percent, which yields approximately 8.9 enplanements per departure. This column is used as a reference point and is not representative of what the airport will experience in the future with regional jet service provided by Contour Airlines, which operates a consistent flight schedule with daily flights to two major hub cities. The second column features the extrapolated operations and enplanement data detailed earlier in this chapter. The average number of departure seats is calculated at 30, as the airport is consistently served by the ERJ-135 aircraft which has a 30-seat configuration.

Utilizing the commercial service activity assumptions previously discussed for 2018, the BLF is 40 percent for the year. It is projected that the ERJ-135 will continue to provide commercial airline service to the airport given the favorable route structure and adequate number of departures currently offered daily. As a result, the number of annual departures and average seats per departure will remain consistent through the short-term and intermediate-term periods. When taking into consideration that annual enplanements are projected to increase to approximately 19,200 during the next 20 years, the future BLF is forecast to increase to 55 percent by 2028. Future projections also consider the potential entry of

larger aircraft models having between 40 and 59 seats, or possibly even larger aircraft having 60 or more seats. Regional jets with seating capacities of 50 seats or less are no longer being manufactured and eventually will be retired from the fleet. As a result, the forecasts for Page Municipal Airport consider this expectation. As presented in the table, annual airline operations are forecast to increase from 700 (actual) and 1,600 (extrapolated) in 2018, to 1,700 by 2038.

Table 2D
Scheduled Commercial Service Fleet Mix and Operations Forecast
Page Municipal Airport

	Actual		Forecast		
Fleet Mix Seating Capacity	**2018**	**2018***	**2023**	**2028**	**2038**
60+	0.0%	0.0%	0.0%	0.0%	33.0%
40-59	0.0%	0.0%	0.0%	0.0%	67.0%
20-39	64.3%	100.0%	100.0%	100.0%	0.0%
10-19	35.7%	0.0%	0.0%	0.0%	0.0%
< 10	0.0%	0.0%	0.0%	0.0%	0.0%
Totals					
Seats/Departure	26.1	30.0	30.0	30.0	56.6
Boarding Load Factor	34.2%	40.0%	50.0%	55.0%	40.0%
Enplanements/ Departure	8.9	12.0	15.0	16.5	22.6
Annual Enplanements*	3,118	9,600	12,200	14,600	19,200
Annual Departures*	350	800	810	880	850
Annual Operations*	700	1,600	1,620	1,760	1,700

*Extrapolated from operations data provided by Contour Airlines

AIR TOUR FORECASTS

Historically, the vast majority of commercial service activity at Page Municipal Airport has been air tour/sightseeing flights. These are primarily for scenic tours of Lake Powell and the Grand Canyon and are currently conducted by three air tour operators from Page Municipal Airport that include:

- American Aviation
- Grand Canyon Scenic Airlines
- Westwind Air Service

Since 2008, air tour enplanements have been responsible for approximately 87 percent of the reported passenger enplanements at Page Municipal Airport. During this timeframe, air tour enplanements reached their highest point, most recently in 2018 with over 43,000 enplanements. There are two existing forecasts to consider: the TAF and the forecasts contained in the 2009 master plan.

As previously discussed, the FAA TAF forecast is published annually and is utilized by the FAA as a starting point for considering the reasonableness of master plan forecasts. This forecast is included as a portion of total air taxi enplanements along with any scheduled commercial service and "other" air taxi

enplanements. The TAF forecast projects an annual growth rate of 2.45 percent in passenger enplanements, which yields 29,111 total enplanements over the next 20 years. As stated, this includes scheduled commercial service and air tour enplanements, and as a result, is difficult to compare to just air tour enplanements for this analysis.

The other existing forecast that must be considered is the enplanement forecast developed previously for the airport. The previous master plan, completed in 2009, predicted that air tour enplanements would grow by four percent annually from 21,608 enplanements in 2006 to 45,000 enplanements by 2025. The actual growth of air tour enplanements has outpaced the previous master plan forecast, and it can be expected that as long as tourism in the area remains strong, there is potential for even more growth.

AIR TOUR ENPLANEMENTS

Table 2E presents the history of air tour passenger enplanements at Page Municipal Airport since 2008. During this timeframe, the airport has consistently recorded at least 32,000 air tour enplanements each year, with fluctuations from year to year. The peak year over this time period was 2018, when the airport experienced 43,000 air tour enplanements.

Scenic air tour enplanements are driven by tourism in the area. As previously discussed, GCNRA park visitor counts provide a strong and trackable indicator of tourism to the area. In order to develop a forecast for potential air tour enplanements, the ratio of air tour enplanements to park visitors was examined. The resulting percentage was then used to create several projections based upon the growth in visitors that the park is likely to realize over the 20-year planning period.

The first two projections presented in **Table 2E** consider the market share of visitors that will take air tours from Page Municipal Airport. The first considers maintaining a constant market share of 0.0102 percent of park visitors. This would yield 61,200 air tour enplanements by 2038, representing a 1.78 percent CAGR through the planning period. The second expects a modest increase in the market share of park visitors. This would result in 68,400 air tour enplanements by 2038, for a 2.35 percent annual growth rate over the next 20 years.

A more aggressive projection is based on recapturing a higher percentage of visitors as experienced in previous years. The average market share of visitors enplaned between 2008 and 2018 was determined to be 0.0148 percent. This projection would result in 88,800 enplanements by 2038, for a growth rate of 3.69 percent annually.

The FAA TAF air taxi enplanement forecast for Page Municipal Airport primarily consists of air tour enplanements. The TAF base data is lower than the reported enplanements, so an adjustment has been made by applying the TAF growth rate to the current air tour enplanements. The FAA TAF forecasts enplanements to grow from 18,110 in 2018 to 28,675 by 2038, for an annual growth rate of 2.45 percent.

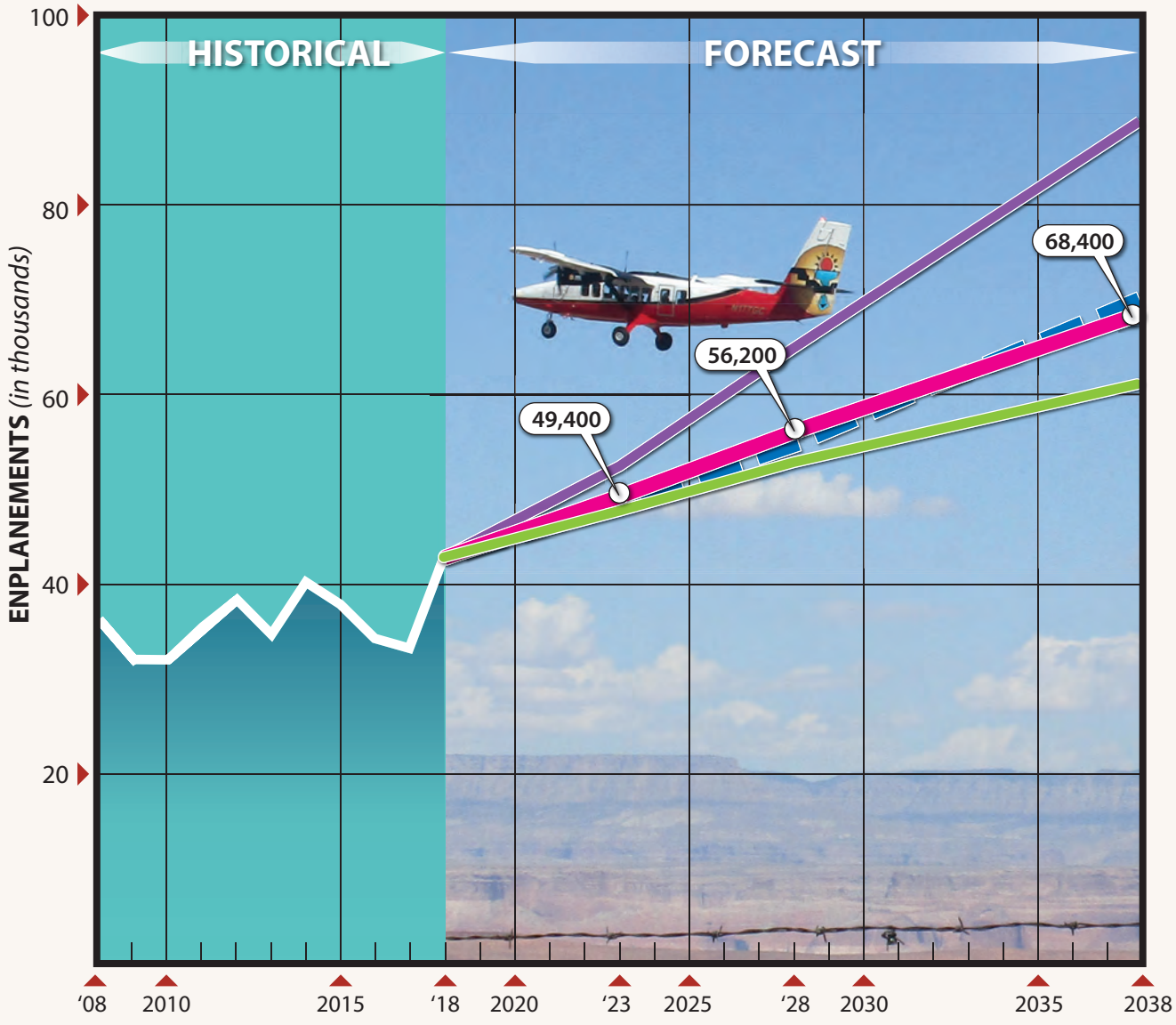
Applying that growth rate to the actual 2018 enplanements reported by the airport results in 69,800 enplanements projected for 2038.

Table 2E
Air Tour Enplanements Forecasts
Page Municipal Airport

Year	Park Visitors	PGA Air Tour Enplanements	Enplaned % of Visitors
2008	1,947,507	36,480	0.0187
2009	1,960,345	32,286	0.0165
2010	2,124,467	32,250	0.0152
2011	2,270,817	35,696	0.0157
2012	2,061,328	38,563	0.0187
2013	1,991,924	34,913	0.0175
2014	2,368,452	40,412	0.0171
2015	2,495,093	38,072	0.0153
2016	3,239,525	34,493	0.0106
2017	4,574,940	33,466	0.0073
2018	4,219,441	43,020	0.0102
Constant Market Share (CAGR-1.78%)			
2023	4,700,000	47,900	0.0102
2028	5,200,000	53,000	0.0102
2038	6,000,000	61,200	0.0102
Increasing Market Share (CAGR-2.35%) – *Selected Forecast*			
2023	**4,700,000**	**49,400**	**0.0105**
2028	**5,200,000**	**56,200**	**0.0108**
2038	**6,000,000**	**68,400**	**0.0114**
Recapture Visitor Percentage (CAGR-3.69%)			
2023	4,700,000	52,600	0.0112
2028	5,200,000	65,000	0.0125
2038	6,000,000	88,800	0.0148
2019 FAA TAF Growth Rate (CAGR-2.45%)			
2023	4,700,000	48,600	0.0103
2028	5,200,000	54,800	0.0105
2038	6,000,000	69,800	0.0116

Source: Airport Records, National Park Service Records, Coffman Associates analysis

The adjusted TAF forecast is very similar to the increasing market share projection. For planning purposes, the increasing market share projection was selected as the most reasonable, as presented in **Table 2E**. **Exhibit 2E** further details the air tour enplanement forecasts. Based on the projected increase of visitors to the region and a strong a commitment from air tour operators to continue to operate at the airport, this is a realistic forecast for purposes of future planning.



Source: Airport records, National Park Service records, and Coffman Associates analysis

LEGEND

- Constant Market Share Park Visitors (CAGR - 1.78%)
- **Increasing Market Share Park Visitors (CAGR - 2.35%) - *Selected Forecast***
- Recapture Park Visitor Percentage (CAGR - 3.69%)
- 2019 FAA TAF Growth Rate (CAGR - 2.45%)

Exhibit 2E
AIR TOUR ENPLANEMENT FORECASTS

AIR TOUR OPERATIONS AND FLEET MIX

As with scheduled commercial service activity, the number of air tour operations can be derived from the average ratio of passenger enplanements per departure. The type of aircraft in the fleet serving the airport is an important component. Historically, air tour operators report their enplanement counts to the airport; however, certain years in the past have lacked complete operations data. Therefore, some assumptions must be made. Based on the reported enplanements dating back to 2008, the seating capacity of the aircraft utilized by each operator, and the average load factors of those operators reporting operations, an estimate of average enplanements per departure was developed for 2018.

Table 2F presents the commercial service operations and an estimate of average enplanements per departure. The 5.6 enplanements per departure in 2018 was projected to grow over the planning period. Based on the selected forecast for air tour enplanements of 69,800 by 2038, the airport should expect 21,820 air tour operations by 2038.

Table 2F
Non-Scheduled Air Tour Operations
Page Municipal Airport

	2018	2023	2028	2038
Non-Scheduled Air Tour Enplanements	43,020	48,600	54,800	69,800
Average Enplanements per Departure	5.6	5.8	6	6.4
Air Tour Departures	7,680	8,380	9,130	10,910
Air Tour Operations	15,360	16,760	18,260	21,820

Source: Airport Records; Coffman Associates analysis

GENERAL AVIATION FORECASTS

General aviation (GA) is the term used to describe a diverse range of aviation activities which includes all segments of the aviation industry, with the exception of commercial air carriers and military. GA is the largest component of the national aviation system and includes common activities such as pilot training, recreational flying, agricultural applications, medical support, and other business and corporate uses. GA aircraft can range from small glider and single engine aircraft to large turboprop and jet aircraft. In fact, some larger commercial airline aircraft models such as the Boeing 737, known as the Boeing Business Jet (BBJ), have been converted to private GA uses. Moreover, many retired military aircraft are now in service with GA functions.

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

BASED AIRCRAFT FORECAST

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft for the airport, other general aviation activities and demand can be projected. The process of developing forecasts of based aircraft begins with an analysis of aircraft ownership in the primary general aviation service area through a review of historical aircraft registrations.

Analysis presented earlier indicates that the City of Page is the primary service area for general aviation demand. Aircraft ownership trends for the primary service area typically dictate the based aircraft trends for an airport.

Determining the number of based aircraft at an airport can be a challenging task. Aircraft storage can be somewhat transient in nature, meaning aircraft owners can and do move their aircraft. Some aircraft owners may store their aircraft at an airport for only part of the year. For many years, the FAA did not require based aircraft records; therefore, historical records are often incomplete or nonexistent. Page Municipal Airport is also unique because of its seasonal transient population and strong tourism market.

For the purposes of this study, an aircraft shall be considered based if space (hangar, tiedown, etc.) on the airport is leased on a monthly or longer basis, for the purposes of storing an aircraft for an extended period of time.

The current based aircraft count at the airport was compiled as reported by airport management. Based on airport records, including specified aircraft registration numbers in 2018, there are currently 68 based aircraft. Historical based aircraft records prior to 2015 were not available; therefore, this data was obtained from the FAA TAF.

Table 2G
Based Aircraft Market Share Forecasts
Page Municipal Airport

Year	Airport Based Aircraft	U.S. Active General Aviation Aircraft	Market Share of Registered Aircraft
2010	81	223,370	0.0363%
2012	73	209,034	0.0349%
2014	54	204,408	0.0264%
2016	54	211,794	0.0255%
2017	54	213,050	0.0253%
2018	68	213,905	0.0318%
Constant Market Share of Registered Aircraft (CAGR-0.00%)			
2023	68	213,390	0.0318%
2028	68	212,465	0.0318%
2038	68	214,090	0.0318%
Increasing Market Share of Registered Aircraft (CAGR- 0.90%)			
2023	70	213,390	0.0330%
2028	74	212,465	0.0350%
2038	81	214,090	0.0380%

Sources: FAA Terminal Area Forecast (January 2018); Airport records; Coffman Associates analysis

It should be noted that several regression and time-series analyses were considered. Because of the incomplete historical data associated with based aircraft and inconsistent trends in certain reporting forecasts, regression and time-series analyses did not result in reliable forecasts. As a result, these analytical methods were not considered further, and several market share and ratio projection forecasts have been developed. **Table 2G** presents market share projections of U.S. general aviation aircraft.

The first method used to project based aircraft considers the airport's historic share of based aircraft compared to the total number of registered general aviation aircraft in the United States. As shown, the airport captured 0.0318 percent of aircraft registered in the country in 2018. The first market share forecast of based aircraft as a share of total U.S. aircraft assumes that Page Municipal Airport will maintain its share of the market at a constant rate of 0.0318 percent. As the total number of registered aircraft fluctuates slightly, this projection yields no growth in the number of based aircraft at Page Municipal Airport. The second projection assumes the airport's market share will increase throughout the planning period. The increasing share projection yields 81 based aircraft by 2038, resulting in a growth rate of 0.90 percent annually.

Table 2H presents trends comparing the number of based aircraft with the population of the City of Page. A constant ratio of based aircraft per 1,000 city residents results in based aircraft growing at the same rate as the population. As shown in the table, in 2018 there were 8.9 based aircraft per 1,000 city residents. This forecast yields a total based aircraft count of 77 by 2038, which represents an annual growth rate of 0.62 percent. An increasing ratio projection yields 88 based aircraft by 2038, equating to a 1.30 percent annual growth rate. Page is the second largest incorporated community in Coconino County, and as such, it can be expected to see more growth than other more rural communities in the county. The presence of an airport could also serve to attract more aircraft owners and pilots to the community. When a modest increasing ratio of aircraft per 1,000 city residents is applied, the forecast yields 88 based aircraft on the airport by 2038. The selected forecast predicts that by 2038, a total of 88 based aircraft could be achieved.

Table 2H
Based Aircraft Forecast per Population Forecasts
Page Municipal Airport

Year	Airport Based Aircraft	Page Population	Aircraft per 1,000 City Residents
2010	81	7,395	11.17
2012	73	7,346	9.94
2014	54	7,582	7.12
2016	54	7,607	7.10
2017	54	7,665	7.15
2018	68	7,553	8.90
Constant Ratio per 1,000 City Residents (CAGR-0.62%)			
2023	73	8,193	8.90
2028	75	8,398	8.90
2038	77	8,640	8.90
Increasing Ratio per 1,000 City Residents (CAGR-1.30%) – *Selected Forecast*			
2023	**74**	**8,193**	**9.05**
2028	**80**	**8,398**	**9.50**
2038	**88**	**8,640**	**10.20**

Source: Arizona Office of Economic Opportunity; Coffman Associates analysis

Existing forecasts for Page Municipal Airport were also reviewed to include the FAA TAF. The 2019 TAF is the FAA's most current forecast of activity for the airport and calls out 54 based aircraft in 2018. The FAA TAF utilizes a constant, or flat projection, of based aircraft through the planning period. The TAF based aircraft is considered unreasonable for two reasons. First, the projection maintains a flat forecast of 54 based aircraft, which is 14 aircraft fewer than are currently reported to be based at the airport. Second, Page Municipal Airport has been experiencing growth in based aircraft and operations accordingly to historical records of activity.

Table 2J presents a summary of the based aircraft forecasts, including the selected based aircraft forecast for the master plan. Also included in the table are some comparative forecasts including the TAF/SASP growth rate projection and the previous master plan growth rate projection applied to current based aircraft counts. **Exhibit 2F** illustrates the planning envelop developed by the based aircraft forecasts.

Table 2J
Based Aircraft Forecasts Summary
Page Municipal Airport

Projections	2023	2028	2038
Market Share of U.S Active General Aviation Aircraft			
Constant Market Share (CAGR- 0.00%)	68	68	68
Increasing Market Share (CAGR- 0.90%)	70	74	81
Based Aircraft per 1,000 Page Residents			
Constant Ratio Projection (CAGR- 0.62%)	73	75	77
Increasing Ratio Projection (CAGR- 1.30%) - *Selected Forecast*	**74**	**80**	**88**
Comparative Forecasts			
Previous Master Plan Growth Rate (CAGR- 1.96%)	85	95	115
TAF/SASP Based Aircraft Projected Growth Rate (CAGR- 0.00%)	68	68	68

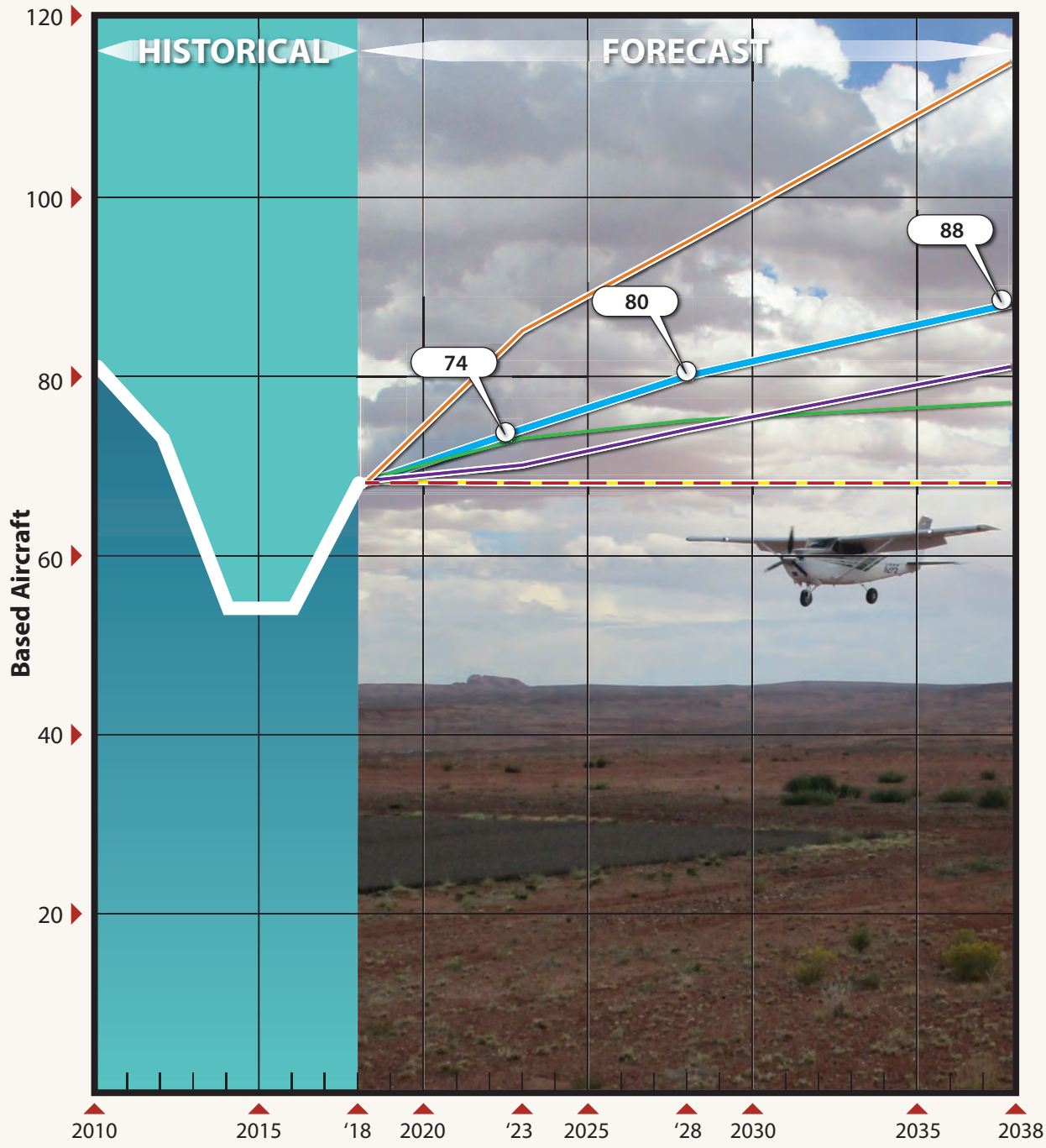
Source: FAA Aerospace Forecast (2018-2038), ADOT- SASP Update (2018), Based Aircraft-Airport Records, Coffman Associates Analysis

BASED AIRCRAFT FLEET MIX

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

The based aircraft fleet mix at Page Municipal Airport, as presented in **Table 2K**, was compared to the existing and forecast U.S. general aviation fleet mix trends as presented in *FAA Aerospace Forecasts - Fiscal Years 2018-2038*. The FAA expects business jets will continue to be the fastest growing general aviation aircraft type in the future. The airport is well-positioned to accommodate business jets in the future; however, smaller single engine piston-powered aircraft will continue to dominate the overall fleet mix.

According to airport records, there are currently no jets based at the airport. National trends in general aviation indicate significant growth in jets, turboprops, and helicopters. As such, the future based aircraft fleet mix for the airport considers growth in these segments. The airport is forecast to increase to six based jets by 2038. Turboprop aircraft are forecast to increase from two to eight by 2038. Helicopters based at the airport are forecast grow from two to five over the next 20 years. Single engine piston aircraft are forecast to increase over the 20-year forecast period, but at a slower rate when compared with jets, turboprops, and helicopters. Multi-engine piston aircraft are forecast to decline, similar to projected national trends during the next 20 years.



Source: FAA Aerospace Forecast (2018-2038), ADOT- SASP Update (2018), Based Aircraft - Airport records, Coffman Associates analysis

LEGEND

Market Share of U.S Active General Aviation Aircraft
- Constant Market Share (CAGR - 0.00%)
- Increasing Market Share (CAGR - 0.90%)

Comparative Forecast
- Previous Master Plan Growth Rate (CAGR - 1.96%)
- TAF/SASP Based Aircraft Projected Growth Rate (CAGR - 0.00%)

Based Aicraft per 1,000 Page Residents
- Constant Ratio Projection (CAGR - 0.62%)
- **Increasing Ratio Projection (CAGR - 1.30%) - *Selected Forecast***

TABLE 2K
Based Aircraft Fleet Mix
Page Municipal Airport

	Existing		Forecast						
Aircraft Type	2018	Percent	2023	Percent	2028	Percent	2038	Percent	Net Change
Single Engine	57	83.8%	59	79.7%	61	76.3%	64	72.7%	7
Multi-Engine	7	10.3%	6	8.1%	5	6.3%	5	5.7%	-2
Turboprop	2	2.9%	4	5.4%	6	7.5%	8	9.1%	6
Jet	0	0.0%	2	2.7%	4	5.0%	6	6.8%	6
Helicopter	2	2.9%	3	4.1%	4	5.0%	5	5.7%	3
Totals	**68**	**100.0%**	**74**	**100.0%**	**80**	**100.0%**	**88**	**100.0%**	20

Source: Airport Records; Coffman Associates analysis

GENERAL AVIATION OPERATIONS

Aircraft operations are classified as either local or itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Local operations are usually characterized by training operations. Itinerant operations are those performed by aircraft with a specific origin or destination at another airport, and these types of operations typically increase with business use, tourism, or other special aviation activities.

In recent years prior to 2018, the airport was estimated to have averaged approximately 8,300 annual general aviation operations according to the FAA TAF. There is no air traffic control tower (ATCT) at Page Municipal Airport, therefore, actual operation counts are not available. The FAA TAF provides a static projection of 7,300 annual itinerant general aviation operations and 1,000 local general aviation operations throughout the planning period. While researching actual operational data collected through the Traffic Flow Management System Count (TFMSC), which tracks operations of aircraft which have filed a flight plan to or from Page Municipal Airport, the research suggests that there are more than 8,300 annual general aviation operations being conducted at the airport. As such, the master plan has utilized an FAA-approved statistical methodology for estimating general aviation operations using local variables to update the operations count. This method, the *Model for Estimating General Aviation Operations at Non-Towered Airports*, was prepared for the FAA Statistics and Forecasts Branch in July 2001. This report develops and presents a regression model for estimating general aviation operations at non-towered airports. The model was derived using a combined data set for small towered and non-towered general aviation airports and incorporates a dummy variable to distinguish the two airport types. In addition, the report applies the model to estimate activity at 2,789 non-towered general aviation airports contained in the FAA TAF. The estimate of annual general aviation operations at Page Municipal Airport was computed using the most applicable recommended equation dealing with non-towered airports. Independent variables used in the equations include airport characteristics (i.e., number of based aircraft, number of flight schools), population totals, and geographic location. The equation yielded an annual general aviation operation estimate of 13,200 in 2018. As a result, a baseline estimate derived from the model of 13,200 general aviation operations will be utilized for the purposes of this master plan.

Local and itinerant operations percentages were derived from the FAA TAF estimates, which represents itinerant operations being the vast majority of total general aviation operations. It is estimated that itinerant operations comprise approximately 92 percent of total general aviation activity, with local general aviation operations making up the remaining eight percent. As such, total general aviation operations will be presented utilizing a 92 percent itinerant to eight percent local split.

Table 2L presents annual general aviation operations as a ratio per based aircraft at the airport. As shown in the table, the 2018 estimate of 13,200 annual general aviation operations equates to 194 operations per based aircraft. Two different forecasts were conducted for general aviation operations. First, a constant number of operations per based aircraft was used to project aircraft operations by applying 194 operations per based aircraft, which yielded 17,100 operations by 2038. The second forecast increases the number of operations per based aircraft throughout the planning period. Typically, higher operations per based aircraft are experienced at airports with higher numbers of local operations that support activities such as flight training. Increasing the operations per based aircraft ratio yields 18,900 general aviation operations by 2038. As a comparison, **Table 2L** includes the SASP and the TAF projections which provide a static rate and represents no future growth in general aviation activity.

TABLE 2L
General Aviation Operations Forecasts
Page Municipal Airport

Year	Based Aircraft	Itinerant Operations	Local Operations	Total General Aviation Operations	Operations per Based Aircraft
2008	80	9,882	600	10,482	131
2010	81	9,271	1,000	10,271	127
2012	73	7,300	1,000	8,300	114
2014	54	7,300	1,000	8,300	154
2016	54	7,300	1,000	8,300	154
2017	54	7,300	1,000	8,300	154
2018	68	12,200	1,000	13,200	194
Constant Operations per Based Aircraft (CAGR - 1.30%)					
2023	74	13,210	1,150	14,360	194
2028	80	14,280	1,240	15,520	194
2038	88	15,700	1,370	17,070	194
Increasing Operations per Based Aircraft (CAGR - 1.81%) – *Selected Forecast*					
2023	***74***	***13,610***	***1,190***	***14,800***	***200***
2028	***80***	***15,090***	***1,310***	***16,400***	***205***
2038	***88***	***17,390***	***1,510***	***18,900***	***215***
SASP/TAF Operations Forecast Growth Rate (CAGR - 0.00%)					
2023	68	12,200	1,000	13,200	194
2028	68	12,200	1,000	13,200	194
2038	68	12,200	1,000	13,200	194

Source:
[1]2018 State Aviation System Plan (SASP)
[2]FAA Terminal Area Forecast (January 2018); Airport Records

The FAA projects an increase in aircraft utilization and the number of general aviation hours flown nationally through the long-term planning period of this study. This trend, along with the projected growth in based aircraft and the fact that the airport serves a popular tourist destination, support growth in annual general aviation operations during the planning period. The selected forecast results in 18,900 annual general aviation operations by 2038 and accounts for an increase in operations per based aircraft. This represents a CAGR of 1.81 percent. Local and itinerant operation splits are projected to remain constant with itinerant operations outpacing local operations. **Exhibit 2G** presents the general aviation operations forecasts for both local and itinerant operations at Page Municipal Airport.

OTHER AIR TAXI AND MILITARY FORECASTS

Other air taxi operations can encompass a wide variety of aviation activity, including general aviation for hire, commuter cargo, air ambulance, and some corporate operations such as fractional ownership. Since the scheduled commercial service operations and the air tour operations have been individually forecast, for the purposes of this study, other air taxi operations have been included as part of the general aviation operations forecast.

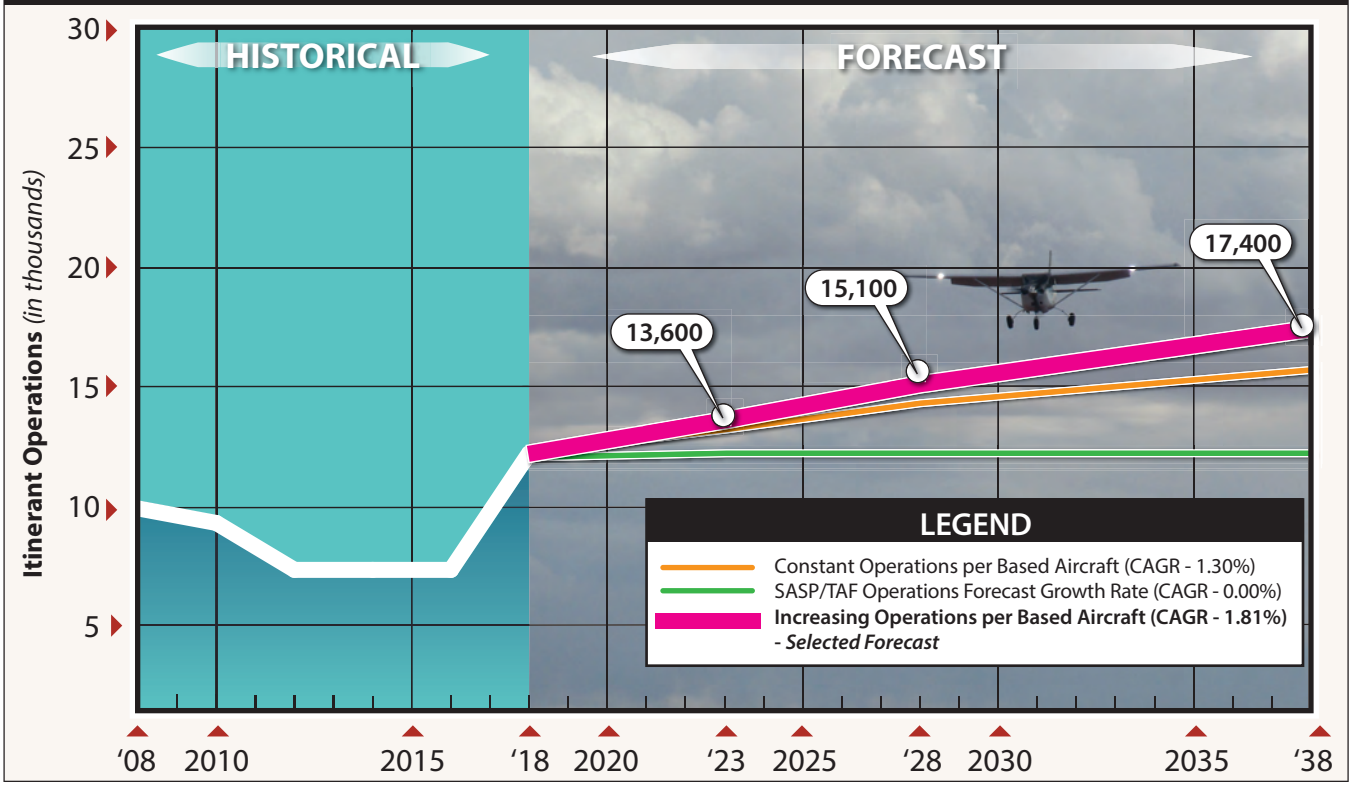
Military activity accounts for a very small portion of operational activity at the airport, according to the FAA TAF. The TAF estimates 100 military operations per year at Page Municipal Airport. For planning purposes, a constant of 100 total itinerant operations annually will be utilized in forecasting. This is consistent with typical industry practices for projecting military operations given the unpredictable nature of military activity.

ANNUAL INSTRUMENT APPROACHES

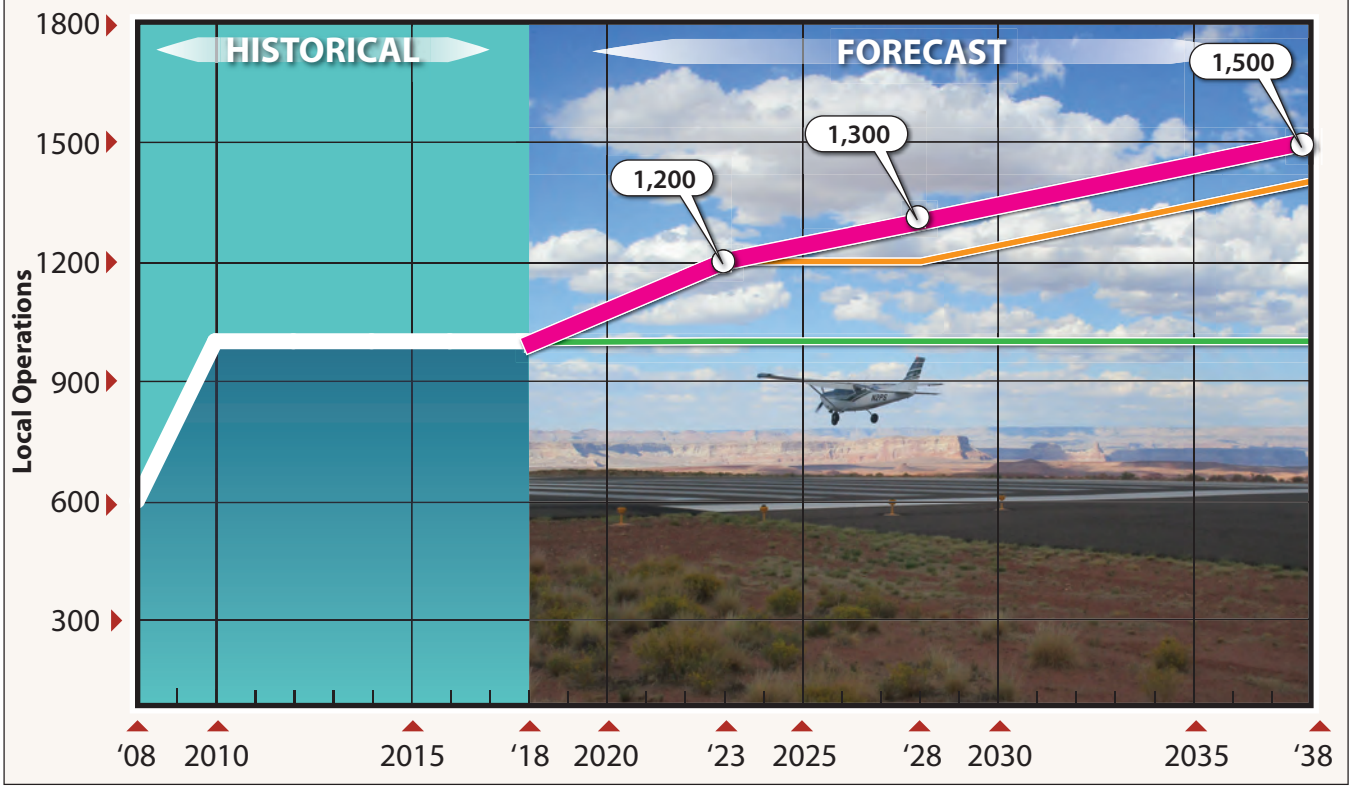
Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. An instrument approach is defined by the FAA as "an approach to an airport with intent to land by an aircraft in accordance with an instrument flight rules (IFR) flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

Actual instrument approach data is not available for Page Municipal Airport; therefore, an estimate of AIAs was calculated for the planning period using an industry standard of 2.5 percent of itinerant operations. Air tour operations will be excluded because these operations typically occur in visual flight rules (VFR) conditions. The projected number of AIAs in 2023 is 348, in 2028 it is 424, and by 2038 the number is 480 approaches.

GENERAL AVIATION ITINERANT OPERATIONS FORECASTS



GENERAL AVIATION LOCAL OPERATIONS FORECASTS



Source: 2018 State Aviation System Plan (SASP), FAA Terminal Area Forecast (February 2019), Airport records

FORECAST SUMMARY

Exhibit 2H provides a summary of the aviation forecasts prepared in this chapter. The next step in the planning process is to assess the capacity of the existing facilities to determine what upgrades may be necessary to meet future demands. The forecasts developed here will be taken forward in the next chapter and broken down as necessary for use in facility needs planning.

COMPARISON TO THE FAA TAF

The FAA will review the forecast presented in this master plan for consistency with the TAF. The local FAA Airports District Office (ADO) or Regional Airports Division are responsible for forecast approvals. When reviewing a sponsor's forecast, FAA must ensure that that the forecast is based on reasonable planning assumptions, uses current data, and is developed using appropriate forecast methods. Forecasts of based aircraft and annual aircraft operations are consistent with the TAF if they differ by less than 10 percent in the five-year period and 15 percent in the 10-year forecast period. If the forecast is not consistent with the TAF, differences must be resolved if the forecast is to be utilized for FAA decision-making. **Table 2M** presents the direct comparison of the master planning forecasts with the TAF published in January 2019. The reason the FAA allows this differential is because the TAF forecasts are not meant to replace forecasts developed locally (i.e., this master plan). While the TAF can provide a point of reference, their purpose is much broader in defining FAA national workload measures.

Table 2M
Comparison to the 2019 FAA Terminal Area Forecast
Page Municipal Airport

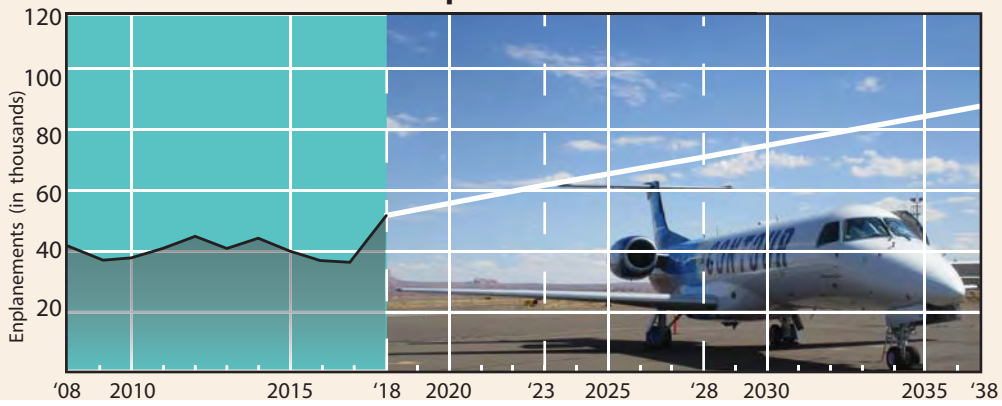
	2018	2023	2028	2038	CAGR
Enplanements (Scheduled Commercial Service and Air Tour)					
Master Plan Forecast	52,620	61,600	70,800	87,600	2.58%
FAA TAF	18,110	20,377	22,942	29,111	2.40%
% Difference	97.6%	100.6%	102.1%	100.2%	
Air Taxi Operations (Scheduled Commercial Service and Air Tour)					
Master Plan Forecast	16,090	18,380	20,020	23,520	1.92%
FAA TAF	8,761	8,761	8,761	8,761	0.00%
% Difference	59.0%	70.9%	78.2%	91.4%	
Total Operations (Air Taxi, General Aviation, Military)					
Master Plan Forecast	30,260	33,280	36,520	42,520	1.72%
FAA TAF	17,161	17,161	17,161	17,161	0.00%
% Difference	55.2%	63.9%	72.1%	85.0%	
Based Aircraft					
Master Plan Forecast	68	74	80	88	1.30%
FAA TAF	54	54	54	54	0.00%
% Difference	23.0%	31.3%	38.8%	47.9%	

CAGR- Compound Annual Growth Rate
Source: Coffman Associates analysis

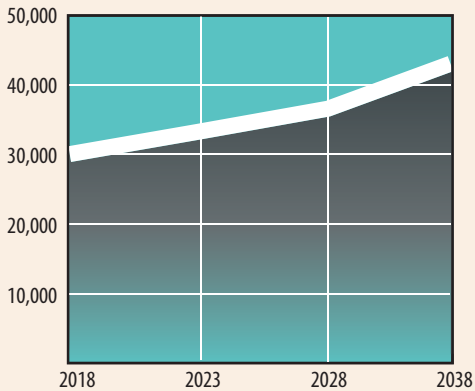
The master plan forecast for passenger enplanements far exceeds the 10 to 15 percent tolerances of the TAF for the five- and 10-year timeframes as described above. For the five-year timeframe, the master plan forecasts passenger enplanement levels that are 100.6 percent higher than the TAF. For the 10-year timeframe, the difference increases to 102.1 percent. Overall, the master plan calls for reasonable growth in passenger enplanements through 2038, increasing at 2.58 percent annually, whereas the TAF

	2018	2023	2028	2038
ANNUAL ENPLANEMENTS				
Scheduled Commercial Service	9,600	12,200	14,600	19,200
Air Tour	43,020	49,400	56,200	68,400
Total	**52,620**	**61,600**	**70,800**	**87,600**
ANNUAL OPERATIONS				
ITINERANT				
Scheduled Commercial Service	1,600	1,620	1,760	1,700
Air Tour	15,360	16,760	18,260	21,820
General Aviation	12,140	13,610	15,090	17,390
Military	100	100	100	100
Total Itinerant	**29,200**	**32,090**	**35,210**	**41,010**
LOCAL				
General Aviation	1,060	1,190	1,310	1,510
Total Local	**1,060**	**1,190**	**1,310**	**1,510**
Total	**30,260**	**33,280**	**36,520**	**42,520**
ANNUAL INSTRUMENT APPROACHES				
Total	**N/A**	**383**	**424**	**480**
BASED AIRCRAFT				
Single Engine	57	59	61	64
Multi-Engine	7	6	5	5
Turboprop	2	4	6	8
Jet	0	2	4	6
Helicopter	2	3	4	5
Total	**68**	**74**	**80**	**88**

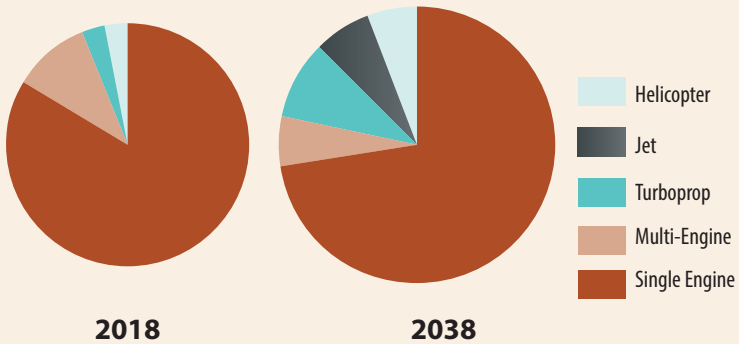
Annual Enplanements Forecast



Annual Operations Forecast



Based Aircraft Fleet Mix



considers a 2.40 percent CAGR. The main difference between the master plan forecast and TAF lies with the baseline 2018 enplanement number. The master plan enplanements forecast selected in this analysis is reasonable based on the actual activity and demand for scheduled commercial service and air tour services.

The TAF estimates a total of 17,161 operations were conducted at the airport in 2018. Of those operations, 8,300 were considered general aviation operations. The remaining 8,761 operations included in the total are made up of military, air taxi, and commuter operations. The TAF does not provide a forecast for any commercial air carrier activity (60+ passenger seats). This number is well below the reported air taxi operations associated with air tour activities as reported by airport staff, as well as scheduled commercial service operations. As detailed earlier in the chapter, the scheduled commercial service operations for 2018 was estimated based upon limited historical data from Contour Airlines during 2018.

The total annual base year operations detailed in this analysis are 55.2 percent higher than the base year estimate. The master plan total operations projection is 63.9 percent higher than the TAF in the five-year timeframe and 72.1 percent higher in the 10-year timeframe. The primary reason for this is that the TAF has estimated operations at a much lower number than what is being experienced at the airport according to airport records. In addition, the TAF utilizes a flat line forecasting technique which contributes to the increasing percentage difference over the planning period.

The based aircraft forecasts also begin with a discrepancy between the TAF and what the airport is reporting. The airport reports 68 based aircraft when the TAF estimates that they have only 54 based aircraft. This discrepancy represents a 23.0 percent difference. While the TAF projects a no-growth scenario for based aircraft, the master plan forecasts based aircraft to increase at a 1.30 percent annual growth rate. Again, this difference exceeds FAA tolerances and will need to be reviewed.

PEAKING CHARACTERISTICS

Many airport facility needs are related to the levels of activity during peak periods. The peak periods that will be used in development facility requirements for this study are as follows:

- **Peak Month** – The calendar month when peak aircraft operations occur.
- **Design Day** – The average day in the peak month. This indicator is derived by dividing the peak month operations by the number of days in a month.
- **Busy Day** – The busy day of a typical week in the peak month. This peaking factor is used primarily to determine transient ramp parking requirements.
- **Design Hour** – The peak hour of the design day of the peak month.

It is important to note that only the peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. However, they do represent reasonable planning standards that can be applied without overbuilding or being too restrictive. **Table 2N** outlines the peak baseline and forecast peaking characteristics for Page Municipal Airport.

Without an ATCT, accurate operational information related to aircraft activity is not available to directly determine peak operational activity at the airport. Therefore, peak period forecasts have been determined according to trends experienced at similar airports and by examining historical operational counts completed at the airport.

TABLE 2N
Peaking Characteristics
Page Municipal Airport

	2018	2023	2028	2038
SCHEDULED COMMERCIAL SERVICE ENPLANEMENTS				
Annual	9,600	12,200	14,600	19,200
Peak Month	1,440	1,830	2,190	2,880
Design Day	46	59	71	93
Design Hour	24	30	34	45
AIR TOUR ENPLANEMENTS				
Annual	43,020	49,400	56,200	68,400
Peak Month	6,453	7,410	8,430	10,260
Design Day	208	239	272	331
Design Hour	41	45	49	56
SCHEDULED COMMERCIAL SERVICE OPERATIONS				
Annual	1,600	1,620	1,760	1,700
Peak Month	160	162	176	170
Design Day	5	5	5	5
Design Hour	2	2	2	2
AIR TOUR OPERATIONS				
Annual	15,360	16,760	18,260	21,820
Peak Month	2,150	2,346	2,556	3,055
Design Day	69	76	82	99
Design Hour	9	10	11	13
GENERAL AVIATION OPERATIONS				
Annual	13,200	14,800	16,400	18,900
Peak Month	1,716	1,924	2,132	2,457
Design Day	55	62	69	79
Busy Day	69	78	86	99
Design Hour	8	9	10	12

Source: Coffman Associates analysis

SCHEDULED COMMERCIAL SERVICE PEAKING

In general, airport capacity and facility needs related to specific activity types will typically consider the levels of activity during a peak or design period. Determination of peaking characteristics related to commercial activity is important for the planning and design of the passenger terminal building, as well as associated facilities and services. The analysis is commonly utilized as a basis for determining the appropriate size of the terminal building and the functional areas therein. Terminal building elements

include hold rooms, security checkpoints, concessions, restrooms, baggage claim area, etc. The airline peaking characteristics also relate to aircraft gates and apron space.

Given that current scheduled commercial passenger service provided by Contour Airlines is relatively new to the airport, there is limited data available to determine historic passenger and operations statistics associated with the regional jet service. It is known that passenger peaking activity at Page Municipal Airport occurs during the summer months, which comprise the peak tourist period for the region. According to historical records from previous airline activities, the peak month for scheduled commercial service passengers represented approximately 15 percent of the annual enplaned passengers. The design day is based upon the average day of the peak month, as activity during the peak month tends to be distributed relatively evenly through any given week.

Hourly passenger activity is examined as a percentage of the daily activity. At smaller airports, this can be impacted by the number of flights and the aircraft seats available during the design hour. With a single arrival during the design hour, the current design hour passenger demand was considered to be approximately 50 percent of the daily demand. This percentage, which is projected to fluctuate, should decline slightly over time as traffic increases.

AIR TOUR PEAKING

Similar to scheduled commercial service, the peak months for air tour operations is during the summer months. The peak month is estimated at 15 percent of total air tour enplanements. The design day is based upon the average of the peak month, also similar to scheduled commercial service activities.

Hourly activity is also examined as a percentage of the daily activity. Air tour activities generally occur over a 10- to 12-hour period each day. A peaking factor of 13 percent was applied to determine the design hour operations. Design hour enplanements was estimated at approximately 20 percent of the current daily activity, with this percentage likely to decrease as activity increases.

GENERAL AVIATION PEAKING

Typically, the peak month of general aviation activity at an airport accounts for approximately 10 to 15 percent of the airport's annual operations. For planning purposes, peak month operations have been estimated at 13 percent of annual operations at Page Municipal Airport. The design day operations were calculated by dividing the peak month by 30. The design day is primarily used in airfield capacity calculations.

The busy day provides information for use in determining aircraft parking requirements. The busiest day of each week accounts for approximately 18 percent of weekly operations. To determine the typical busy day, the design day is multiplied by 1.25, which represents approximately 18 percent of the days in a week. Design hour operations were determined at 15 percent of the design day operations.

AIRCRAFT/AIRPORT/RUNWAY CLASSIFICATION

The FAA has established several aircraft classifications systems that group aircraft types based on their performance (approach speed in landing gear 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 based primarily upon the characteristics of the aircraft which are currently in use or are expected to be in use an airport. The critical design aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft type or a composite aircraft representing a collection of aircraft. The design aircraft is classified by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). FAA AC 150/5300-13A, Change 1, *Airport Design*, describes the following airplane classification systems, the parameters of which are presented on **Exhibit 2J**.

Aircraft Approach Category (AAC): A grouping of aircraft based on a reference landing speed referred to as (VREF) if specified, or if VREF is not specified, 1.3 times the stall speed (VSO) at the aircraft's maximum certified landing weight may be substituted. VREF, VSO, and the maximum certificated landing weight are established for each aircraft by the certification authority of the country of registry.

The ACC 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 ACC, categorized by letters A through E, is the aircraft approach category and relates to aircraft approach speed. The ACC mostly 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 runway/taxiway separation standards.

Airplane Design Group (ADG): The ADG, categorized by a roman numeral I through VI, is a classification of aircraft which relates to aircraft wingspan or tail height (physical characteristic). When the aircraft wingspan and tail height fall into different categories, the higher group is used. ADG influences design standards for taxiway safety area (TSA), taxiway/taxilane object free area (TOFA), apron wingtip clearance, and various separation distances.

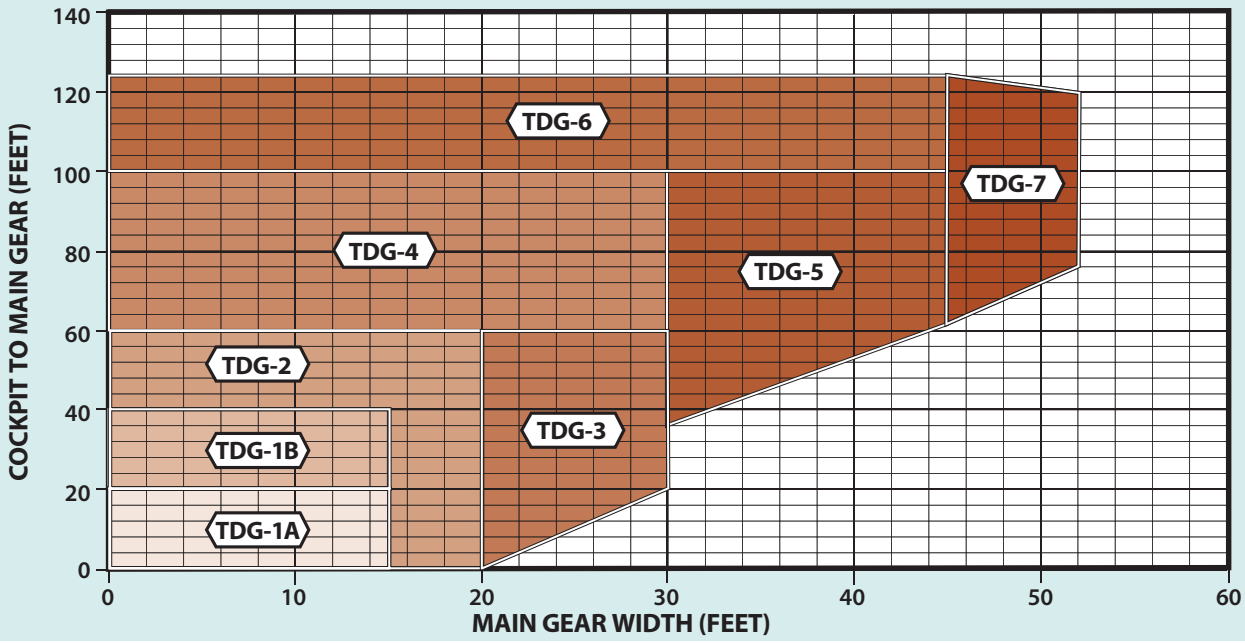
Taxiway Design Group (TDG): A classification of aircraft based on outer-to-outer main gear width (MGW) and cockpit to main gear (CMG) distance. The TDG relates to the undercarriage dimensions of the design aircraft. The taxiway design elements determined by the application of the TDG include the taxiway width, taxiway edge safety margin, taxiway shoulder width, taxiway fillet dimensions, and in some cases the separation distance between parallel taxiways. Other taxiway elements, such as the taxiway safety area (TSA), taxiway object free area (TOFA), taxiway separation to parallel taxiway or fixed or movable objects, and taxiway wingtip clearances are determined solely based on the wingspan (ADG)

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

TAXIWAY DESIGN GROUP (TDG)



KEY

RVR: Runway Visual Range

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

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 2K summarizes the classification of the most common aircraft in the national fleet today. It should be noted that helicopters are not assigned an AAC or ADG given their unique operating characteristics. As such, they are not considered when determining an airport's critical design aircraft.

AIRPORT AND RUNWAY CLASSIFICATION

These classifications, along with the aircraft classifications defined previously, are used to determine the appropriate FAA design standards to which the airport facilities are to be designed and built.

Runway Design Code (RDC): A code signifying the design standards to which the runway is to be designed and built. The RDC is based upon 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 design standards that apply. 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 visibility minimums expressed by RVR values in feet of 1,200 (⅛-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 should read "VIS" for runways designed for visual approach use only.

Airport Reference Code (ARC): An airport designation that signifies the airport's highest RDC, minus the 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 utilize the airport safely. The current ALP for Page Municipal Airport, which will be updated as part of this master plan, identifies an existing ARC of B-II and an ultimate ARC of D-II.

Approach Reference Code (APRC): A code signifying the current operational capabilities of a runway and associated parallel taxiway with regard to landing operations. Like the RDC, the APRC is composed of the same three components: the ACC, ADG, and the RVR. The APRC describes the current operational capabilities of the runway under certain meteorological conditions where no special operating procedures are necessary, as opposed to the RDC which is based upon planned development with no operational component. The APRC for a runway is established based upon a minimum runway to taxiway centerline separation.

Departure Reference Code (DPRC): A code signifying 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 is



A-I

- Beech Baron 55
- **Beech Bonanza**
- Cessna 150
- Cessna 172
- Cessna Citation Mustang
- Eclipse 500/550
- Piper Archer
- Piper Seneca



C-II, D-II

- **Cessna Citation X (750)**
- Gulfstream 100, 200,300
- Challenger 300/600
- ERJ-135, 140, 145
- CRJ-200/700
- Embraer Regional Jet
- Lockheed JetStar
- Hawker 800



B-I

- Beech Baron 58
- Beech King Air A90/100
- Cessna 402
- **Cessna 421**
- Piper Navajo
- Piper Cheyenne
- Swearingen Metroliner
- Cessna Citation I (525)



C-III, D-III *Less than 100,000 lbs.*

- ERJ-170
- CRJ 705, 900
- Falcon 7X
- **Gulfstream 500**, 550, 650
- Global Express, Global 5000
- Q-400



B-II

- Super King Air 200
- Cessna 441
- DHC Twin Otter
- Super King Air 350
- Beech 1900
- Citation Excel (560), Sovereign (680)
- Falcon 50, 900, 2000
- **Citation Bravo (550)**
- Embraer 120



C-III, D-III *Over100,000 lbs.*

- ERJ-90
- Boeing Business Jet
- B-727
- **B-737**-300, **700,** 800
- MD-80, DC-9
- A319, A320



A-III, B-III

- DHC Dash 7
- **DHC Dash 8**
- DC-3
- **Global Express**, Global 5000
- Fairchild F-27
- ATR 72



C-IV, D-IV

- **B-757**
- B-767
- C-130 Hercules
- DC-8-70
- MD-11



C-I, D-I

- Beech 400
- **Lear** 31, **35,** 45, 60
- Israeli Westwind



D-V

- **B-747-400**
- B-777
- B-787
- A-330, A-340

composed of two components: ACC and ADG. A runway may have more than one DPRC depending of the parallel taxiway separation distance.

CRITICAL DESIGN AIRCRAFT

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently utilizing or are expected to utilize the airport. The critical design aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft or a composite aircraft representing 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 likely to use the airport. Any operation of an aircraft that exceeds design criteria of an airport may result in either an unsafe operation or a lesser safety margin; however, it is not the usual practice to base airport design on an aircraft that uses the airport infrequently.

The design aircraft is defined as the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make 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 since the design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure that the short-term development does not preclude the reasonable long-range potential needs of the airport.

According to FAA AC 150/5300-13A, *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 design aircraft must be realistic in nature and supported by current data and realistic projections.

AIRPORT CRITICAL DESIGN AIRCRAFT

The FAA maintains the *Traffic Flow Management System Count* (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 carrier and air taxi), general aviation, and military aircraft. Due to factors such as incomplete flight plans and limited radar coverage, TFMSC data does not account for all aircraft activity at an airport by a given aircraft type. Therefore, it is likely there are more operations at the airport than are captured by this methodology. TFMSC data is available for activity at Page Municipal Airport and was utilized in this analysis.

Since turboprop and jet aircraft are larger and faster, they will typically have a greater impact on airport design standards than smaller aircraft. The following analysis will focus on itinerant activity by these larger turbine aircraft categories.

Current Critical Design Aircraft

Exhibit 2L presents the TFMSC turbine aircraft activity at Page Municipal Airport for the last 10 years. As can be seen, the airport experiences activity by a full range of turboprops and business jets, including some of the largest in the national fleet.

Over the course of the sample period, the greatest number of operations in any single design family combined was 39,616 in B-II. In fact, these operations accounted for approximately 58 percent of the logged turbine aircraft activity during the 10-year timeframe. Representative turbine aircraft included in the B-II category include several models of the King Air, Cessna Citation, and Falcon jets.

Over the past 10 years, the airport has averaged 4,930 annual turbine operations in AAC B, 645 in AAC C, and 240 in AAC D. In fact, the airport experienced a significant increase in AAC C and D activity in 2018, accounting for over 950 and 400 operations in these categories, respectively. The increase in AAC C operations can be attributed to the initiation of scheduled regional jet service by Contour Airlines utilizing the Embraer ERJ-135. The airport also experienced an increase in larger business jet operations in AAC D, including various Gulfstream models. **Overall, AAC C has well over 500 annual operations; thus, the master plan will consider AAC C as the current critical design AAC.**

Since 2009, the airport has averaged nearly 5,200 annual operations by turbine aircraft in ADG II. Turbine aircraft in ADG III have also constituted a significant number of operations, averaging approximately 350 annually during the same timeframe. In fact, since 2013, the airport has experienced very strong growth in ADG III activity, increasing from under 100 operations in 2013 to nearly 300 operations in 2018. The use of larger business jets, including the Bombardier Global 5000 and Global Express, Falcon 7X/8X, and Gulfstream 500/600, help make up these ADG III operations. **Given the current activity at the airport, the master plan will consider ADG II as the current critical design ADG.**

As a result, the master plan will utilize the current ARC of C-II for Page Municipal Airport.

Ultimate Critical Design Aircraft

Page Municipal Airport has exhibited a long-term trend of significant turboprop and jet aircraft activity. The aircraft utilize the airport on a regular basis and constitute a substantial number of operations. The aviation demand forecasts indicate the potential for continued growth in jet and turboprop activity at the airport. This includes a forecast increase in based turboprop and business jet aircraft as well as the potential for enhanced commercial passenger service through the 20-year planning horizon. The type and size of these aircraft (especially jets) using the airport regularly can impact the design standards to

ARC	Turbine Aircraft Model	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
A-I	Cirrus Vision Jet	0	0	0	0	0	0	0	0	2	34
	Eclipse 400/500	12	22	28	50	44	60	34	32	34	80
	Epic Dynasty	0	0	2	0	4	4	2	10	12	24
	Kodiak Quest	0	2	2	10	4	2	10	0	0	0
	Lancair 4	2	0	0	0	0	0	0	0	0	0
	Lancair Evolution/Legacy	0	4	0	12	14	12	10	12	12	8
	Piper Malibu/Meridian	28	48	122	146	148	188	176	142	204	188
	Socata TBM 7/850/900	44	34	48	36	84	70	58	50	210	128
	TOTAL	86	110	202	254	298	336	290	246	474	462
A-II	Cessna Caravan	22	20	14	30	24	34	28	10	10	8
	De Havilland Twin Otter	6	36	10	8	22	6	44	30	16	26
	Pilatus PC-12	224	330	380	724	772	776	940	966	1,022	1,136
	TOTAL	252	386	404	762	818	816	1,012	1,006	1,048	1,170
A-III	De Havilland Dash 7	2	0	0	0	0	0	0	4	2	8
	TOTAL	2	0	0	0	0	0	0	4	2	8
B-I	Aero Commander 680	0	14	0	0	0	0	0	0	0	0
	Beechjet 400	42	108	124	106	60	52	78	90	146	108
	Cessna 425 Corsair	62	42	40	26	18	18	8	14	12	24
	Cessna 526 Jet Trainer	8	10	4	12	0	0	0	0	0	0
	Citation CJ1	28	42	76	84	62	80	126	206	204	116
	Citation I/SP	24	10	10	36	10	18	8	20	16	14
	Citation M2	0	0	0	0	0	0	0	0	4	28
	Citation Mustang	18	22	44	52	70	48	50	74	62	82
	Falcon 10	0	0	4	10	4	0	8	4	10	4
	Hawker 1000	0	8	2	6	4	16	8	10	10	8
	Honda Jet	0	0	0	0	0	0	0	0	6	40
	King Air 90/100	642	578	422	194	126	94	94	96	184	74
	Mitsubishi MU-2	108	98	68	100	102	100	70	72	18	22
	Phenom 100	4	44	112	98	112	218	208	166	228	194
	Piaggio Avanti	32	44	96	70	14	14	14	2	4	6
	Piper Cheyenne	100	120	72	66	10	8	40	32	34	60
	Premier 1	26	32	34	48	28	44	34	32	24	20
	Rockwell Sabre 40/60	8	8	8	0	6	0	0	4	4	0
	Swearingen SJ-30	0	0	0	4	0	0	0	0	0	2
	T-6 Texan	0	2	40	22	72	10	10	10	26	6
	TOTAL	1,102	1,182	1,156	934	698	720	756	832	992	808
B-II	Aero Commander 690	10	28	28	28	20	20	20	0	6	0
	Beech 1900	2,188	2,196	2,852	3,554	2,684	1,860	1,696	2,020	2,220	442
	Cessna Conquest	28	8	10	12	12	12	22	4	20	30
	Challenger 300	12	42	56	78	66	88	126	272	252	336
	Citation CJ2/CJ3/CJ4	78	88	104	98	62	136	170	190	252	274
	Citation II/SP/Latitude	50	144	416	114	90	36	62	76	90	96
	Citation V/Sovereign	546	610	628	730	644	642	652	674	674	628
	Citation X	40	48	82	64	72	84	60	70	70	94
	Citation XLS	72	138	104	126	128	154	146	172	186	188
	Dornier 328	0	0	14	0	10	6	26	24	24	12
	Embraer EMB-110/120	0	0	0	0	14	0	2	0	0	0
	Falcon 20/50	4	4	22	48	36	38	32	26	14	24
	Falcon 2000	34	64	46	82	48	56	84	52	62	88
	Falcon 900	26	30	12	20	22	40	28	36	42	86
	Hawker 4000	0	0	6	0	6	8	12	0	8	12
	King Air 200/300/350	138	188	212	210	288	328	328	252	358	366
	King Air F90	10	12	0	4	2	6	0	2	0	2
	Phenom 300	0	0	6	14	18	48	88	80	118	168
	Pilatus PC-24	0	0	0	0	0	0	0	0	0	4
	Shorts 330/360	4	0	0	2	0	0	0	0	0	0
	Swearingen Merlin	44	70	52	56	54	52	44	40	30	18
	TOTAL	3,284	3,670	4,650	5,240	4,276	3,614	3,598	3,990	4,426	2,868
B-III	Bombardier Global 5000	0	2	2	4	2	16	20	30	32	44
	Bombardier Global Express	2	16	24	10	34	14	40	50	30	36
	C-2 Greyhound	0	0	0	0	0	2	0	0	0	4
	De Havilland Dash 8 Series	2	0	0	0	4	0	0	0	0	0
	Falcon 7X/8X	0	0	0	12	0	0	14	6	22	16
	Grumman E-2 Hawkeye	6	0	0	0	0	0	0	0	0	0
	Saab 2000	0	0	0	0	0	6	0	0	0	0
	TOTAL	10	18	26	26	40	38	74	86	84	100
C-I	BAe HS 125 Series	0	8	0	0	4	8	0	4	0	0
	Learjet 20 Series	2	2	2	4	2	0	2	0	0	0
	Learjet 31	26	28	2	0	4	14	26	8	36	12
	Learjet 40 Series	22	46	32	32	34	52	34	36	38	50
	Learjet 50 Series	6	22	0	14	2	10	4	0	4	10
	Learjet 60 Series	10	24	32	48	52	32	54	54	84	54
	Westwind II	4	8	4	12	4	2	4	0	0	2
	TOTAL	70	138	72	110	102	118	124	102	162	128
C-II	Beech Starship	0	0	4	0	0	0	0	0	0	0
	Bombardier CRJ 100/200/700	2	2	2	0	2	0	6	0	0	0
	Challenger 600/604	20	14	36	30	46	38	58	56	104	64
	Citation III/VI	18	20	52	22	34	48	60	48	26	28
	Embraer 500/450 Legacy	0	0	0	0	0	0	0	0	8	6
	Embraer ERJ-135/140/145	4	28	16	2	10	36	22	18	36	588
	Gulfstream 100/150	34	16	10	24	24	10	20	44	36	26
C-II	Gulfstream 280	0	0	0	0	0	6	2	0	8	4
	Gulfstream G-III	8	18	10	4	14	14	16	10	12	32
	Hawker 800	28	70	82	74	120	72	104	86	70	62
	Learjet 70 Series	0	0	0	0	0	0	8	12	6	18
	Lockheed Jetstar	2	0	0	0	0	0	0	0	0	0
	TOTAL	116	168	212	156	250	224	296	274	306	828
C-III	Airbus A319/320/321	2	2	10	6	2	0	0	0	0	0
	Boeing 737 (200 thru 700 series)	0	0	12	0	0	0	2	2	4	0
	Mcdonnell Douglas DC-9	674	696	716	268	0	0	0	0	0	0
	Mcdonnell Douglas MD-81/82/87/90	2	0	0	0	0	0	0	0	0	0
	P-3 Orion	0	2	0	0	0	0	0	0	0	2
	TOTAL	678	700	738	274	2	0	2	2	4	2
C-IV	Airbus A300/310	2	0	0	8	0	0	0	0	0	0
	Boeing 707	2	0	0	0	0	0	0	2	0	0
	Boeing C-17	0	0	2	0	0	0	0	0	2	0
	C-130 Hercules	0	0	0	4	2	2	2	12	16	8
	TOTAL	4	0	2	12	2	2	2	14	18	8
D-I	Learjet 35/36	8	24	26	22	32	14	20	6	16	22
	TOTAL	8	24	26	22	32	14	20	6	16	22
D-II	Gulfstream 200	12	44	102	70	54	68	44	56	42	62
	Gulfstream 450	20	66	58	124	76	132	110	118	138	154
	Gulfstream G-IV	0	2	0	0	2	0	0	0	0	0
	TOTAL	32	112	160	194	132	200	154	174	180	216
D-III	Boeing 737 800/900	4	6	0	0	0	0	0	0	0	0
	Gulfstream 500/600	26	28	40	28	32	56	72	68	78	176
	TOTAL	30	34	40	28	32	56	72	68	78	176
D-IV	Mcdonnell Douglas DC-8/10	6	4	6	0	0	0	0	0	0	0
	Mcdonnell Douglas MD-11	0	2	2	8	0	0	0	0	0	0
	TOTAL	6	6	8	8	0	0	0	0	0	0

TURBINE ARC CODE SUMMARY

ARC	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
A-I	86	110	202	254	298	336	290	246	474	462
A-II	252	386	404	762	818	816	1012	1,006	1,048	1,170
A-III	2	0	0	0	0	0	0	4	2	8
B-I	1,102	1,182	1,156	934	698	720	756	832	992	808
B-II	3,284	3,670	4,650	5,240	4,276	3,614	3,598	3,990	4,426	2,868
B-III	10	18	26	26	40	38	74	86	84	100
C-I	70	138	72	110	102	118	124	102	162	128
C-II	116	168	212	156	250	224	296	274	306	828
C-III	678	700	738	274	2	0	2	2	4	2
C-IV	10	8	6	22	2	2	2	14	18	8
C-V	0	2	2	0	0	0	0	0	0	0
D-I	8	24	26	22	32	14	20	6	16	22
D-II	32	112	160	194	132	200	154	174	180	216
D-III	30	34	40	28	32	56	72	68	78	176
D-IV	6	6	8	8	0	0	0	0	0	0
D-V	0	2	6	2	0	0	0	0	0	0
TOTAL	5,686	6,560	7,708	8,032	6,682	6,138	6,400	6,804	7,790	6,796

TURBINE AIRCRAFT APPROACH CATEGORY SUMMARY

AAC	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
A	340	496	606	1,016	1,116	1,152	1,302	1,256	1,524	1,640
B	4,396	4,870	5,832	6,200	5,014	4,372	4,428	4,908	5,502	3,776
C	874	1,016	1,030	562	356	344	424	392	490	966
D	76	178	240	254	196	270	246	248	274	414
TOTAL	5,686	6,560	7,708	8,032	6,682	6,138	6,400	6,804	7,790	6,796

TURBINE AIRPLANE DESIGN GROUP SUMMARY

ADG	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
I	1,266	1,454	1,456	1,320	1,130	1,188	1,190	1,186	1,644	1,420
II	3,684	4,336	5,426	6,352	5,476	4,854	5,060	5,444	5,960	5,082
III	720	752	804	328	74	94	148	160	168	286
IV	16	14	14	30	2	2	2	14	18	8
V	0	4	8	2	0	0	0	0	0	0
TOTAL	5,686	6,560	7,708	8,032	6,682	6,138	6,400	6,804	7,790	6,796

Note: ARC - Airport Reference Code AAC - Aircraft Approach Category ADG - Airplane Design Group

Source: Traffic Flow Management System Counts

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be applied to the airport system. Therefore, it is important to understand what type of aircraft may use the airport in the future. Factors such as population, employment, and tourism growth in the airport's service area, proximity to and level of service at other airports, and development at the airport can influence future activity.

The majority of aircraft operations at the airport throughout the planning period of this master plan are expected to be by aircraft within AACs B and C and within ADGs I and II. However, the trend toward manufacturing of a larger percentage of medium and large business jets, those in AACs C and D and ADG II and III, may lead to greater utilization of these aircraft at Page Municipal Airport through the long-term planning period. As previously detailed, the airport has been experiencing an increase in use by these aircraft over the past few years, most recently accommodating over 400 aircraft in AAC D in 2018. Additionally, the potential emergence of larger commercial service aircraft, including the 70- and 90-seat regional jets, could impact the airport's future fleet mix, especially from the standpoint of introducing larger ADG III aircraft.

As such, the ultimate critical design aircraft for Page Municipal Airport is best described as ARC D-III.

RUNWAY DESIGN CODE

Each runway at an airport is assigned an RDC. The RDC relates to specific FAA design standards that should be planned in relation to each runway, regardless of whether the airport currently meets the appropriate design standards (to be discussed in Chapter Three).

Runway 15-33

Runway 15-33 is the primary runway and should be designed to accommodate the critical design aircraft. This runway is 5,950 feet long by 150 feet wide and has instrument approach capabilities providing visibility minimums as low as one mile serving each runway end. **The master plan will utilize an existing RDC of C-II-5000 for Runway 15-33.** As stated previously, ultimate planning should consider the increased use of larger business and commercial aircraft at the airport. Furthermore, the airport achieving visibility minimums down to ¾-mile would be advantageous for commercial service operations. **As a result, the ultimate RDC for Runway 15-33 is D-III-4000.**

Runway 7-25

Runway 7-25 is the crosswind runway, which is 2,201 feet long by 75 feet wide. It is not provided with instrument approach capabilities. Given the length of the runway, it is primarily utilized by small general aviation aircraft weighing less than 12,500 pounds. **As such, the existing RDC for Runway 7-25 is B-I (Small Aircraft) – VIS. The RDC is planned to remain B-I (Small Aircraft) – VIS ultimately.**

AIRPORT DESIGN SUMMARY

Table 2P summarizes the design aircraft components to be applied at the airport. The ultimate RVR (visibility) component for Runway 15-33 may change based on analysis and recommendations regarding potential instrument approach capability. The APRC and DPRC are also depicted for the runway system.

TABLE 2P
Design Aircraft Parameters
Page Municipal Airport

Runway Design Parameters	Runway Design Code (RDC)	Approach Reference Code (APRC)	Departure Reference Code (DPRC)
EXISTING			
Runway 15-33 (300' runway/taxiway separation)	C-II-5000	B/III/5000 D/II/5000	B/III D/II
Runway 7-25 (150' runway/taxiway separation)	B-I (Small Aircraft) - VIS	B/I(S)/VIS	B/I(S)
ULTIMATE			
Runway 15-33 (400' runway/taxiway separation)	D-III-4000	D/IV/4000* D/V/4000*	D/IV* D/V*
Runway 7-25 (150' runway/taxiway separation)	B-I (Small Aircraft) - VIS	B/I(S)/VIS	B/I(S)

*Based on potential runway/taxiway separation distance (400 feet) meeting RDC D-III standards
Source: FAA AC 150/5300-13A, Change 1, *Airport Design*

SUMMARY

Page Municipal Airport is a significant aviation facility that serves a vital function for the regional area. This chapter has outlined the various activity levels that might reasonably be anticipated over the next 20 years at the airport.

The fleet mix operations, or type and frequency of aircraft use, is important in determining facility requirements and environmental impacts. While single engine piston-powered aircraft are expected to continue to represent the majority of based aircraft, the long-term forecast considers that most of the growth in based aircraft will be seen in turboprop and jet aircraft. In addition, scheduled commercial service and air tour activities (enplanements and operations) have been analyzed for further input into identifying future facility needs.

The next step in the master plan process is to use the forecasts to determine development needs for the airport through 2038. Chapter Three will address airside elements, such as safety areas, runways, taxiways, lighting, and navigational aids, as well as landside requirements, including terminal area, hangars, aircraft aprons, and support services. The remaining portions of the master plan will lay out how that growth can be accommodated in an orderly, efficient, and cost-effective manner.



page
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Chapter Three

FACILITY REQUIREMENTS






FACILITY REQUIREMENTS

Proper airport planning requires the translation of forecast aviation demand into the specific types and quantities of facilities that can adequately serve the identified demand. This chapter will analyze the existing capacities of Page Municipal Airport facilities. The existing capacities will then be compared to the forecast activity levels prepared in Chapter Two to determine the adequacy of existing facilities, as well as to identify if deficiencies currently exist or may be expected to materialize in the future. The chapter will present the following elements:

- Planning Horizon Activity Levels
- Airfield Capacity
- Airport Physical Planning Criteria
- Airside and Landside Facility Requirements

As indicated in Chapter One, airport facilities include both airside and landside components. Airside facilities include those that are related to the arrival, departure, and ground movement of aircraft. These components include:

- Runways
- Taxiways
- Navigational and Approach Aids
- Airfield Lighting, Marking, and Signage



Landside facilities are needed for the interface between air and ground transportation modes. These components include:

- Terminal Services
- Aircraft Hangars
- Aircraft Parking Aprons
- Airport Support Facilities

The objective of this effort is to identify, in general terms, the adequacy of existing airport facilities, outline what new facilities may be needed, and determine when these may be needed to accommodate forecast demands. Having established these facility requirements, alternatives for providing these facilities will be evaluated to determine the most practical, cost-effective, and efficient means for implementation.

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

- Advisory Circular (AC) 150/5300-13A, *Airport Design*
- AC 150/5060-5, *Airport Capacity and Delay*
- AC 150/5325-4B (and Draft 4C), *Runway Length Requirements for Airport Design*
- Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*
- FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*

DEMAND-BASED PLANNING HORIZONS

An updated set of aviation demand forecasts for Page Municipal Airport has been established and was detailed in Chapter Two. These activity forecasts include passenger enplanements, annual aircraft operations, based aircraft, aircraft fleet mix, and peaking characteristics. With this information, specific components of the airfield and landside system can be evaluated to determine their capacity to accommodate future demand.

Cost-effective, efficient, and orderly development of an airport should rely more upon actual demand at an airport than on a time-based forecast figure. In order to develop a master plan that is demand-based rather than time-based, a series of planning horizon milestones have been established that take into consideration the reasonable range of aviation demand projections. The planning horizons are the short term (years 1-5), the intermediate term (years 6-10), and the long term (years 11-20).

It is important to consider that the actual activity at the airport may be higher or lower than what the annualized forecast portrays. By planning according to activity milestones, the resultant plan can accommodate unexpected shifts or changes in the area's aviation demand by allowing airport management the flexibility to make decisions and develop facilities based upon need 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. **Table 3A** presents the short-, intermediate-, and long-term planning horizon milestones for each aircraft activity level forecasted in Chapter Two.

TABLE 3A
Aviation Demand Planning Horizons
Page Municipal Airport

	Base Year (2018)	Short Term (1-5 Years)	Intermediate Term (6-10 Years)	Long Term (11-20 Years)
ENPLANED PASSENGERS				
Scheduled Commercial Service	9,600	12,200	14,600	19,200
Air Tour	43,020	49,400	56,200	68,400
TOTAL ENPLANED PASSENGERS	***52,620***	***61,600***	***70,800***	***87,600***
BASED AIRCRAFT				
Single Engine	57	59	61	64
Multi-Engine	7	6	5	5
Turboprop	2	4	6	8
Jet	0	2	4	6
Helicopter	2	3	4	5
TOTAL BASED AIRCRAFT	***68***	***74***	***80***	***88***
ANNUAL OPERATIONS				
Itinerant				
Scheduled Commercial Service	1,600	1,620	1,760	1,700
Air Tour	15,360	16,760	18,260	21,820
General Aviation	12,140	13,610	15,090	17,390
Military	100	100	100	100
Total Itinerant	**29,200**	**32,090**	**35,210**	**41,010**
Local				
General Aviation	1,060	1,190	1,310	1,510
Total Local	**1,060**	**1,190**	**1,310**	**1,510**
TOTAL OPERATIONS	***30,260***	***33,280***	***36,520***	***42,520***

Source: Coffman Associates analysis

AIRFIELD CAPACITY

An airport's airfield 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 aircraft operations near or surpass the ASV, delay factors increase exponentially. The airport's ASV was examined utilizing FAA AC 150/5060-5, *Airport Capacity and Delay*.

FACTORS AFFECTING ANNUAL SERVICE VOLUME

This analysis takes into account specific factors about the airfield in order to calculate the airport's ASV. These various factors are depicted in **Exhibit 3A**. The following describes the input factors as they relate to Page Municipal Airport and include airfield layout, weather conditions, aircraft mix, and operations.

- **Runway Configuration –** The existing airfield configuration consists of dual runways supported by parallel taxiways. Runway 15-33 is 5,950 feet long and 150 feet wide. Runway 7-25 is 2,201 feet long and 75 feet wide.

- **Runway Use –** Runway use in capacity conditions will be controlled by wind and/or airspace conditions. For Page Municipal Airport, the direction of takeoffs and landings is typically determined by the speed and direction of the wind. It is generally safest for aircraft to takeoff and land into the wind, avoiding a crosswind (wind that is blowing perpendicular to the travel of the aircraft) or tailwind components during these operations.

  Based upon available wind data, winds are predominately out of the south/southwest during the spring and summer months and typically out of the northwest during the winter months. Runway 15-33 is used most often, especially given the fact that it better supports the majority of aircraft operating at the airport. Runway 7-25 is utilized by small aircraft when strong crosswind conditions necessitate its use. The availability of instrument approaches is also considered. Each end of Runway 15-33 supports straight-in instrument approach capabilities. Runway 7-25 can only be utilized during daytime, visual weather conditions.

- **Exit Taxiways –** Exit taxiways have a significant impact on airfield capacity since the number and location of exits directly determine the occupancy time of an aircraft on the runway. The airfield capacity analysis gives credit to taxiway exits located within the prescribed range from a runway's threshold. This range is based upon the mix index of the aircraft that use the runways. Based upon mix, only exit taxiways between 2,000 feet and 4,000 feet from the landing threshold count in the exit rating at Page Municipal Airport. The exits must be at least 750 feet apart to count as separate exit taxiways. Utilizing these criteria, Runway 15-33 is credited with two exit taxiways in each direction. Runway 25 is credited with one exit taxiway. There is no exit taxiway provided within the prescribed range detailed above for aircraft landing on Runway 7.

- **Weather Conditions –** Weather conditions can have a significant impact on airfield capacity. Airport capacity is usually highest in clear weather when flight visibility is at its 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 and air traffic vectoring. The increased distance between aircraft reduces the number of aircraft which can operate at the airport during any given period, thus reducing overall airfield capacity.

AIRFIELD LAYOUT

Runway Configuration



Runway Use



Number of Exits





WEATHER CONDITIONS

VMC- Visual Meteorological Conditions



IMC- Instrument Meteorological Conditions



PVC- Poor Visibility Conditions



OPERATIONS

Arrivals



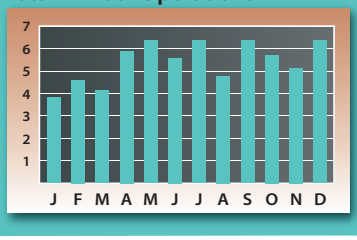
Departures



Touch-and-Go Operations



Total Annual Operations



AIRCRAFT MIX

Category A & B Aircraft


Single Engine


Small Turboprop


Twin Piston

Category C Aircraft

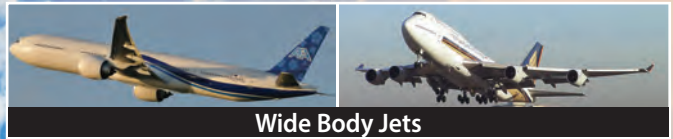

Business Jet


Regional Jet


Commuter


Commercial Jet

Category D Aircraft


Wide Body Jets

According to meteorological data collected from the on-airport automated surface observation system (ASOS), the airport operates under visual meteorological conditions (VMC) approximately 97 percent of the time. VMC exist whenever the cloud ceiling is greater than 1,000 feet above ground level (AGL) and visibility is greater than three statute miles. Instrument meteorological conditions (IMC) are defined when cloud ceilings are between 500 and 1,000 feet AGL or visibility is between one and three miles. According to the weather observations, IMC prevailed less than two percent of the time. Poor visibility conditions (PVC) apply for cloud ceilings below 500 feet and visibility minimums below one mile. PVC conditions occur approximately one percent of the year. **Table 3B** summarizes the weather conditions experienced at the airport over a 10-year period of time.

TABLE 3B
Weather Conditions
Page Municipal Airport

Condition	Cloud Ceiling	Visibility	Percent of Total
VMC	≥ 1,000' AGL	> 3 statute miles	97.13%
IMC	≥ 500' AGL to < 1,000' AGL	1-3 statute miles	1.76%
PVC	< 500' AGL	< 1 statute mile	1.11%

VMC- Visual Meteorological Conditions
IMC- Instrument Meteorological Conditions
PVC- Poor Visibility Conditions
AGL- Above Ground Level
Note: Weather observations obtained from Needles Airport.

Source: NOAA - National Climate Data Center, Airport Observations (January 2008 – December 2017)

- **Aircraft Mix** – The aircraft mix for the capacity analysis is defined in terms of four aircraft classifications. Classes A and B consist of small- and medium-sized propeller and some jet aircraft, all weighing 12,500 pounds or less. These aircraft are associated primarily with general aviation activity, but do include some air taxi, air cargo, and commuter aircraft. The majority of aircraft operations at Page Municipal Airport are those in Classes A and B. Class C consists of aircraft weighing between 12,500 pounds and 300,000 pounds. These aircraft include most business jets and some turboprop aircraft which utilize the airport on a regular basis. In addition, the Embraer ERJ-135 jet aircraft operated by Contour Airlines is included in Class C. Class D aircraft consist of aircraft weighing more than 300,000 pounds. The airport does not experience operations by Class D aircraft.

- **Percent Arrivals** – The percentage of arrivals as they relate to total operations of the airport is important in determining airfield capacity. Under most circumstances, the lower the percentage of arrivals, the higher the hourly capacity. The aircraft arrival-departure percentage split is typically 50/50, which is the case at Page Municipal Airport.

- **Touch-and-Go Activity** – 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. As previously discussed in Chapter Two, these operations are normally associated with general aviation training activity

and classified as a local operation. A high percentage of touch-and-go traffic normally results in a higher operational capacity because one landing and takeoff occurs within a shorter time period than individual operations. Touch-and-go operations at Page Municipal Airport account for approximately less than five percent of total annual operations. A similar percentage is expected in the future.

- **Peak Period Operations** – Average daily operations and average peak hour operations during the peak month are utilized for the airfield capacity analysis. Operations 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.

CAPACITY ANALYSIS CONCLUSIONS

Given the factors outlined above, the existing and ultimate airfield ASV ranges between 150,000 and 200,000 annual operations. The ASV does not indicate a point of absolute gridlock for the airfield; however, it does represent the point at which operational delay for each operation will increase exponentially. The current operational level for the airport represents approximately 20 percent of the airfield's ASV, if the ASV is considered at the low end of the typical range of 150,000 annual operations. By the long-term planning period, total annual operations are expected to represent approximately 28 percent of the airfield's ASV.

FAA Order 5090.3B, *Field Formation of the National Plan of Integrated Airport Systems* (NPIAS), indicates that improvements for airfield capacity purposes should be considered once operations reach 60 to 75 percent of the ASV. This is an approximate level to begin the detailed planning of the capacity improvements. At the 80 percent level, the planned improvements should be made. While no significant capacity improvements will be necessary, options to improve airfield efficiency will still be considered as part of this master plan.

AIRSIDE FACILITY REQUIREMENTS

Airside facilities include those facilities related to the arrival, departure, and ground movement of aircraft. The adequacy of existing airside facilities at Page Municipal Airport has been analyzed from many perspectives, including:

- Runways
- Safety Area Design Standards
- Runway Separation Standards
- Taxiways
- Navigational and Approach Aids
- Airfield Lighting, Marking, and Signage

Airside facility requirements are based primarily upon the Runway Design Code (RDC) for each runway. Analysis in Chapter Two identified the existing RDC as RDC C-II-5000 for Runway 15-33 and RDC B-I (Small Aircraft) – VIS for Runway 7-25. Ultimately, the RDC for Runway 15-33 is anticipated to be D-III-4000. Runway 7-25 will remain as a B-I (Small Aircraft) – VIS runway for the duration of the planning period.

RUNWAYS

Runway conditions, such as orientation, length, width, and pavement strength, were analyzed at Page Municipal Airport. From this information, requirements for runway improvements were determined for the airport.

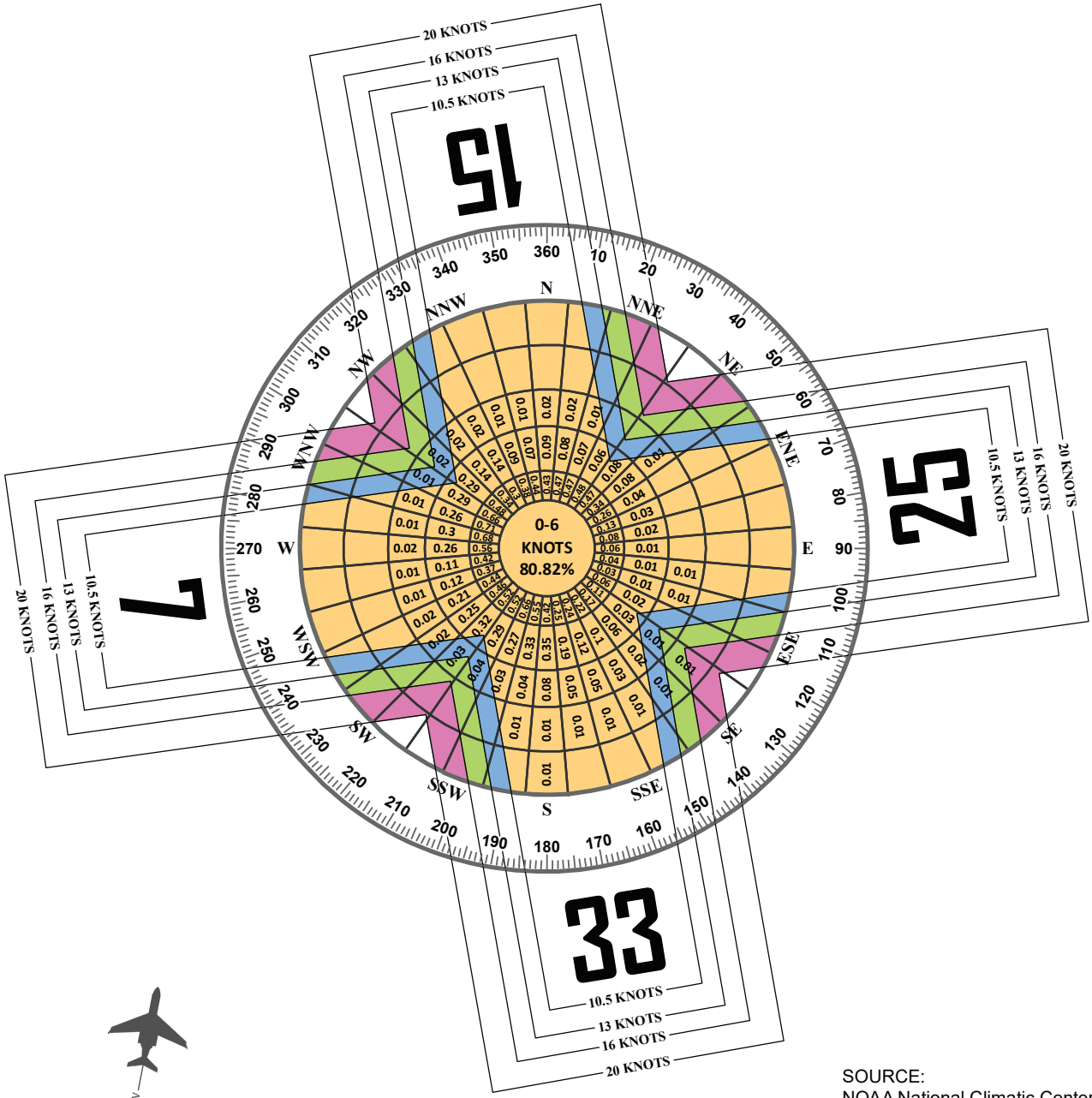
Runway Orientation

Key considerations in the runway configuration of an airport involve the orientation for wind coverage and the operational capacity of the runway system. FAA AC 150/5300-13A, *Airport Design*, recommends that a crosswind runway should be made available when the primary runway orientation provides less than 95 percent wind coverage for any aircraft forecast to use the airport on a regular basis.

The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding 10.5 knots (12 mph) for ARC A-I and B-I; 13 knots (15 mph) for ARC A-II and B-II; 16 knots (18 mph) for ARC A-III, B-III, and C-I through D-II; and 20 knots (23 mph) for ARC C-III through D-IV.

The previous 10 years of wind data was obtained from the on-airport ASOS and has been analyzed to identify wind coverage provided by the existing runway orientations. At Page Municipal Airport, the orientation of Runway 15-33 provides 97.76 percent coverage for the 10.5-knot component, 98.98 percent coverage for 13 knots, and greater than 99 percent coverage for 16- and 20-knot components. Runway 7-25 provides 96.98 percent coverage for the 10.5-knot crosswind component, 98.31 percent coverage for 13 knots, and greater than 99 percent coverage for 16 knots or greater. The combination of both runways provides for greater than 99 percent coverage for 10.5 knots and greater. Under instrument flight rule (IFR) weather conditions, Runway 15-33 provides 97.50 percent coverage for 10.5 knots, 98.48 percent coverage for 13 knots, and greater than 99 percent coverage for 16 knots and greater, while Runway 7-25 provides 98.06 percent coverage for 10.5-knot crosswinds, 98.73 percent coverage for 13-knot crosswinds, and greater than 99 percent coverage for 16 knots and greater. The combination of both runways provides for greater than 99 percent coverage for 10.5 knots or greater under IFR conditions. Thus, the two runways at the airport provide adequate wind coverage for all-weather and IFR conditions. **Exhibit 3B** presents both the all-weather and IFR wind roses for the airport.

ALL WEATHER WIND COVERAGE				
Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 15-33	97.76%	98.98%	99.83%	99.97%
Runway 7-25	96.98%	98.31%	99.44%	99.83%
All Runways	99.68%	99.94%	99.99%	100.00%

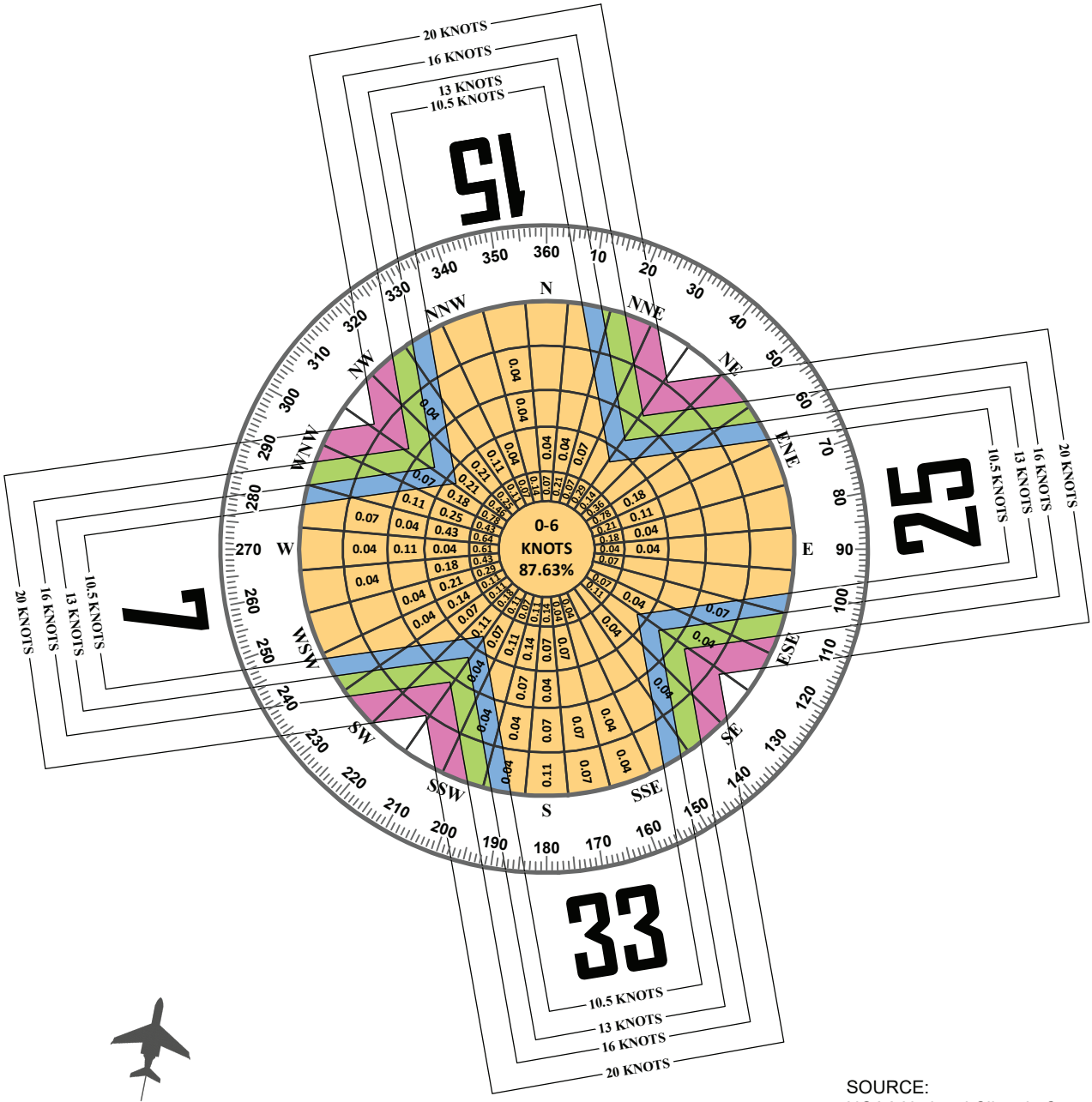


Magnetic Declination
10° 34' 00" East (Aug. 2018)
Annual Rate of Change
00° 06' 00" West (Aug. 2018)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Page Municipal Airport
Page, AZ

OBSERVATIONS:
97,766 All Weather Observations
Jan. 1, 2008 - Dec, 31 2017

IFR WIND COVERAGE				
Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 15-33	97.50%	98.48%	99.43%	99.76%
Runway 7-25	98.06%	98.73%	99.19%	99.36%
All Runways	99.64%	99.90%	99.99%	100.00%



Magnetic Declination
10° 34' 00" East (Aug. 2018)
Annual Rate of Change
00° 06' 00" West (Aug. 2018)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Page Municipal Airport
Page, AZ

OBSERVATIONS:
2,806 IFR Observations
Jan. 1, 2008 - Dec, 31 2017

Runway Length

AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length needs. A draft revision of this AC is currently available (150/5325-4C) and the FAA is utilizing the draft revision in most cases when evaluating runway length needs for airports.

The determination of runway length requirements for the airport is based on five primary factors:

- Mean maximum temperature of hottest month
- Airport elevation
- Runway gradient
- Critical aircraft type expected to use the runway
- Stage length of the longest nonstop destination (specific to larger aircraft)

The mean maximum daily temperature of the hottest month for Page Municipal Airport is 95.7 degrees Fahrenheit (F), which occurs in July. The airport elevation is 4,316 feet mean sea level (MSL). The runway elevation difference is approximately 70 feet for Runway 15-33, which equates to a 1.2 percent gradient change. For Runway 7-25, the elevation difference between ends is approximately seven feet, which leads to a 0.5 percent gradient change. As such, both runways conform to FAA design standards for gradient.

Airplanes operate on a wide variety of available runway lengths. Many factors will govern the sustainability of runway lengths for aircraft, such as elevation, temperature, wind, aircraft weight, wing flap settings, runway condition (wet or dry), runway gradient, vicinity airspace obstructions, and any special operating procedures. Airport operators can pursue policies that maximize the sustainability of the runway length. Policies such as area zoning and height and hazard restricting can protect an airport's runway length. Airport ownership (fee simple easement) of land leading to the runway ends reduces the possibility of natural growth or man-made obstructions. Planning of runways should include an evaluation of aircraft types expected to use the airport now and in the future. Future planning should be realistic and supported by the FAA-approved forecasts and should be based on the critical design aircraft (or family of aircraft).

General Aviation Aircraft

The majority of operations at Page Municipal Airport are conducted using smaller single engine piston-powered aircraft weighing less than 12,500 pounds. Following guidance from AC 150/ 5325-4B, to accommodate 95 percent of these small aircraft with less than 10 passenger seats, a runway length of 5,600 feet is recommended. For 100 percent of these small aircraft, a runway length of 5,900 feet is recommended. For small aircraft with 10 or more passenger seats, 5,900 feet of runway length is also recommended.

The airport is also utilized by aircraft weighing more than 12,500 pounds, including small- to medium-sized business jet aircraft. Runway length requirements for business jets weighing less than 60,000 pounds have also been calculated. These calculations take into consideration the runway gradient and landing length requirements for contaminated runways (wet). Business jets tend to need greater runway length when landing on a wet surface because of their increased approach speeds. AC 150/5325-4B stipulates that runway length determination for business jets consider a grouping of airplanes with similar operating characteristics. The AC provides two separate "family groupings of airplanes," each based upon their representative percentage of aircraft in the national fleet. The first grouping is those business jets that make up 75 percent of the national fleet, and the second group is those making up 100 percent of the national fleet. **Table 3C** presents a partial list of common aircraft in each aircraft grouping. A third group considers business jets weighing more than 60,000 pounds. Runway length determination for these aircraft must be based on the performance characteristics of the individual aircraft.

TABLE 3C
Business Jet Categories for Runway Length Determination

75 Percent of the National Fleet	MTOW (lbs.)	75-100 Percent of the National Fleet	MTOW (lbs.)	Greater than 60,000 Pounds	MTOW (lbs.)
Lear 35	20,350	Lear 55	21,500	Gulfstream II	65,500
Lear 45	20,500	Lear 60	23,500	Gulfstream IV	73,200
Cessna 550	14,100	Hawker 800XP	28,000	Gulfstream V	90,500
Cessna 560XL	20,000	Hawker 1000	31,000	Global Express	98,000
Cessna 650 (VII)	22,000	Cessna 650 (III/IV)	22,000	Gulfstream 650	99,600
IAI Westwind	23,500	Cessna 750 (X)	36,100		
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*

Table 3D presents the results of the runway length analysis for business jets developed following the guidance provided in AC 150/5325-4B. To accommodate 75 percent of the business jet fleet at 60 percent useful load, a runway length of 7,200 feet is recommended. This length is derived from a raw length of 6,500 feet that is adjusted, as recommended, for runway gradient and consideration of landing length needs on a contaminated runway (wet and slippery). To accommodate 100 percent of the business jet fleet at 60 percent useful load, a runway length of 10,400 feet is recommended.

Utilization of the 90 percent category for runway length determination is generally not considered by the FAA unless there is a demonstrated need at an airport. This could be documented activity by a business jet operator that flies out frequently with heavy loads. To accommodate 75 percent of the business jet fleet at 90 percent useful load, a runway length of 9,300 feet is recommended. To accommodate 100 percent of business jets at 90 percent useful load, a runway length of 11,700 feet is recommended.

TABLE 3D
Runway Length Requirements
Page Municipal Airport

Airport Elevation	4,316 feet MSL			
Average High Monthly Temperature	95.7 degrees F (July)			
Runway Gradient (Runway 15-33)	70 feet			
Fleet Mix Category	**Raw Runway Length from FAA AC**	**Runway Length with Gradient Adjustment (+700')**	**Wet Surface Landing Length for Jets (+15%)***	**Final Runway Length**
95% of small airplanes (less than 10 seats)	5,600’	N/A	N/A	5,600’
100% of small airplanes (less than 10 seats)	5,900’	N/A	N/A	5,900’
100% of small airplanes (10+ seats)	5,900	N/A	N/A	5,900’
75% of fleet at 60% useful load	6,500’	7,200’	5,500'	7,200’
100% of fleet at 60% useful load	9,700’	10,400’	5,500’	10,400’
75% of fleet at 90% useful load	8,600’	9,300’	7,000’	9,300’
100% of fleet at 90% useful load	11,000’	11,700’	7,000'	11,700’
*Max 5,500' for 60% useful load and max 7,000' for 90% useful load in wet condition.				
Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*				

Another method to determine runway length requirements for aircraft at Page Municipal Airport is to examine aircraft flight planning manuals under conditions specific to the airport. Several aircraft were analyzed for takeoff length required with a design temperature of 95.7 degrees F at a field elevation of 4,316 feet MSL. **Exhibit 3C** provides a detailed runway length analysis for several of the most common turbine aircraft in the national fleet. This data was obtained from Ultranav software, which computes operational parameters for specific aircraft based on flight manual data. The analysis includes the maximum takeoff weight (MTOW) allowable and the percent useful load from 60 percent to 100 percent. This analysis shows that the length of 5,950 feet on Runway 15-33 presents weight restrictions for many aircraft beginning at 60 percent useful load. The average takeoff length needed for all turbine aircraft analyzed at 60 percent useful load is 6,500 feet. Many turboprop King Air models and smaller Cessna Citation business jet models that were analyzed can operate at 60, 70, and 80 percent useful loads under existing conditions at the airport.

Larger business jets, to include models of the Gulfstream, Global, Hawker, and Citation aircraft require more than 5,950 feet to meet 60 percent useful load requirements, especially during the summer months when the airport experiences hot temperatures. Furthermore, the majority of turbine aircraft analyzed are climb-limited at higher useful load percentages when factoring the airport’s elevation and maximum temperature.

Exhibit 3C also presents the runway length required for landing under three operational categories: Title 14 Code of Federal Regulations (CFR) Part 25, CFR Part 135, and CFR Part 91k. CFR Part 25 operations are those conducted by individuals or companies which own their aircraft. CFR Part 135 applies to all for-hire charter operations, including most fractional ownership operations. CFR Part 91k includes operations in fractional ownership which utilize their own aircraft under direction of pilots specifically assigned to said aircraft. The landing length analysis shows an average landing length of 3,600 feet for aircraft operating under CFR Part 25 during dry runway conditions, an average of 4,500 feet for aircraft

operating under Part 91k during dry runway conditions, and an average of 5,900 feet for aircraft operating under Part 135 during dry runway conditions. Under wet runway conditions, an average landing length of 5,200 feet is needed for Part 25, 6,500 feet is needed for Part 91k, and over 8,500 feet is needed for Part 135. It is important to note that wet runway conditions are rare at the airport.

Commercial Aircraft

Runway length needs for commercial service aircraft must factor the local operating conditions described above and the load carried. The aircraft load is dependent upon the payload of passengers and/or cargo and the amount of fuel it has on board. For departures, the amount of fuel varies depending upon the length of non-stop flight or trip length.

The current commercial fleet mix includes an Embraer ERJ-135 regional jet. An analysis in Chapter Two considered the potential of enhanced commercial activity at Page Municipal Airport in the future, including the utilization of larger commercial service aircraft. **Table 3E** presents the runway length needs for various commercial jet aircraft utilizing each aircraft's operating manual and adjusting for the mean maximum temperature of 95.7 degrees F.

TABLE 3E
Runway Length Requirements for Select Commercial Service Aircraft
Page Municipal Airport

		Runway Length (feet) Needed at % Payload				
Aircraft Name	**MTOW (lbs.)**	**60%**	**70%**	**80%**	**90%**	**100%**
Embraer ERJ-135 ER	44,092	5,600	6,400	7,300	7,900	O/L
Embraer ERJ-140 ER	45,415	4,600	5,200	5,600	6,100	7,100
Bombardier CRJ-200	53,000	6,100	6,900	7,500	8,200	8,900
Bombardier CRJ-700	75,000	5,300	5,600	6,400	7,700	8,600
Boeing 737-300	135,000	5,700	6,500	7,800	9,900	O/L
Boeing 737-500	133,500	5,400	6,400	7,500	8,600	O/L
Boeing 737-700	154,500	6,000	7,200	8,400	9,600	O/L
Boeing 737-800	174,200	6,700	7,800	8,500	9,700	13,700
Boeing 737-900	174,200	7,600	9,200	10,500	13,200	O/L
Boeing Business Jet 1	171,000	5,900	7,000	7,800	9,600	O/L
Boeing Business Jet 2	174,200	6,700	8,100	9,200	11,600	O/L
McDonnell Douglas MD-81	140,000	6,400	7,300	8,400	10,500	O/L
Airbus A319	145,505	4,300	4,900	5,200	5,500	5,900
Airbus A320	157,630	4,400	5,000	5,500	6,100	6,800

MTOW - Maximum Takeoff Weight
O/L - Outside Operating Limits per Aircraft Planning Manual
All MTOWs from aircraft operating manuals
Runway length calculation assumptions: 4,316' MSL field elevation; 95.7 degrees F ambient temperature

Source: Aircraft Planning Manuals

This analysis shows that aircraft including the ERJ-35, ERJ-140, CRJ-700, certain models of the Boeing 737, and Airbus A319 and A320 are capable of operating at 60 percent useful loads on the current runway

Aircraft Name	MTOW (lbs.)	Payload (lbs.)	Takeoff Lengths Required: 60 % Useful Load Takeoff Weight (lbs.)	60 % Useful Load Takeoff Field Length (ft.)	70% Useful Load Takeoff Weight (lbs.)	70% Useful Load Takeoff Field Length (ft.)	80 % Useful Load Takeoff Weight (lbs.)	80 % Useful Load Takeoff Field Length (ft.)	90 % Useful Load Takeoff Weight (lbs.)	90 % Useful Load Takeoff Field Length (ft.)	100 % Useful Load Takeoff Weight (lbs.)	100 % Useful Load Takeoff Field Length (ft.)
Beech 1900D	17,120	6,120	14,672	5,736	15,284	**6,171**	15,896	**6,619**	16,508	**7,110**	17,120	**7,610**
Beechjet 400A	16,300	5,315	14,174	**6,116**	14,706	**O/L**	15,237	**O/L**	15,769	**O/L**	16,300	**O/L**
Challenger 601	45,100	18,850	37,560	**8,450**	39,445	**O/L**	41,330	**O/L**	43,215	**O/L**	45,100	**O/L**
Challenger 300	38,850	15,000	32,850	**6,999**	34,350	**7,693**	35,850	**8,445**	37,350	**9,325**	38,850	**O/L**
Challenger 604/605	48,200	21,015	39,794	**7,596**	41,896	**8,418**	43,997	**9,369**	46,099	**O/L**	48,200	**O/L**
Citation (525A) CJ2	12,375	4,575	10,545	4,945	11,003	5,394	11,460	5,932	11,918	**O/L**	12,375	**O/L**
Citation 560 XL	20,000	7,300	17,080	5,908	17,810	**6,565**	18,540	**O/L**	19,270	**O/L**	20,000	**O/L**
Citation CJ3	13,870	5,110	11,826	4,649	12,337	5,348	12,848	**6,061**	13,359	**7,067**	13,870	**8,230**
Citation II (550)	13,300	5,100	11,260	5,094	11,770	5,721	12,280	**6,400**	12,790	**7,210**	13,300	**8,010**
Citation III	21,500	9,689	17,624	**8,312**	18,593	**O/L**	19,562	**O/L**	20,531	**O/L**	21,500	**O/L**
Citation Mustang	8,645	3,085	7,411	**O/L**	7,720	**O/L**	8,028	**O/L**	8,337	**O/L**	8,645	**O/L**
Citation Sovereign	30,300	12,150	25,440	4,785	26,655	5,322	27,870	**5,988**	29,085	**6,897**	30,300	**8,280**
Citation V (Model 560)	15,900	6,226	13,410	4,676	14,032	5,101	14,655	5,559	15,277	**6,041**	15,900	**O/L**
Citation X	35,700	13,236	30,406	**8,063**	31,729	**9,130**	33,053	**O/L**	34,376	**O/L**	35,700	**O/L**
Falcon 2000	35,800	13,050	30,580	**8,331**	31,885	**9,089**	33,190	**O/L**	34,495	**O/L**	35,800	**O/L**
Falcon 2000	35,800	13,050	30,580	**8,331**	31,885	**9,089**	33,190	**O/L**	34,495	**O/L**	35,800	**O/L**
Falcon 50 EX	41,000	18,000	33,800	**6,468**	35,600	**7,223**	37,400	**O/L**	39,200	**O/L**	41,000	**O/L**
Falcon 7X	70,000	33,400	56,640	**6,654**	59,980	**7,622**	63,320	**8,579**	66,660	**9,529**	70,000	**O/L**
Falcon 900A	46,500	23,920	36,932	**6,490**	39,324	**O/L**	41,716	**O/L**	44,108	**O/L**	46,500	**O/L**
Global 5000	92,500	41,660	75,836	**6,153**	80,002	**6,879**	84,168	**7,640**	88,334	**O/L**	92,500	**O/L**
Global Express	98,000	46,800	79,280	**6,751**	83,960	**7,602**	88,640	**O/L**	93,320	**O/L**	98,000	**O/L**
Global XRS	98,000	46,800	79,280	**6,750**	83,960	**7,601**	88,640	**O/L**	93,320	**O/L**	98,000	**O/L**
Gulfstream 100	24,650	10,015	20,644	**6,983**	21,646	**7,781**	22,647	**8,620**	23,649	**O/L**	24,650	**O/L**
Gulfstream 150	26,100	11,000	21,700	**6,885**	22,800	**O/L**	23,900	**O/L**	25,000	**O/L**	26,100	**O/L**
Gulfstream 200	35,450	15,250	29,350	**O/L**	30,875	**O/L**	32,400	**O/L**	33,925	**O/L**	35,450	**O/L**
Gulfstream 300	72,000	29,139	60,344	**6,207**	63,258	**6,799**	66,172	**7,650**	69,086	**8,725**	72,000	**O/L**
Gulfstream 350	70,900	28,000	59,700	5,910	62,500	**6,485**	65,300	**7,172**	68,100	**7,890**	70,900	**8,685**
Gulfstream 450	74,600	31,400	62,040	**6,380**	65,180	**7,142**	68,320	**7,950**	71,460	**8,860**	74,600	**9,894**
Gulfstream 550	91,000	42,300	74,080	**6,629**	78,310	**7,977**	82,540	**9,720**	86,770	**O/L**	91,000	**O/L**
Gulfstream IIB	69,700	31,550	57,080	**6,096**	60,235	**6,747**	63,390	**O/L**	66,545	**O/L**	69,700	**O/L**
Gulfstream III	69,700	31,900	56,940	**6,068**	60,130	**6,725**	63,320	**O/L**	66,510	**O/L**	69,700	**O/L**
Gulfstream IV	74,600	30,700	62,320	**6,599**	65,390	**O/L**	68,460	**O/L**	71,530	**O/L**	74,600	**O/L**
Gulfstream V	90,500	42,100	73,660	**6,569**	77,870	**7,847**	82,080	**9,340**	86,290	**O/L**	90,500	**O/L**
Hawker 1000	31,000	13,000	25,800	**O/L**	27,100	**O/L**	28,400	**O/L**	29,700	**O/L**	31,000	**O/L**
Hawker 4000	39,500	15,800	33,180	**6,358**	34,760	**7,313**	36,340	**8,722**	37,920	**O/L**	39,500	**O/L**
Hawker 800XP	28,000	11,750	23,300	**O/L**	24,475	**O/L**	25,650	**O/L**	26,825	**O/L**	28,000	**O/L**
Hawker 900 XP	28,000	11,500	23,400	5,761	24,550	**6,356**	25,700	**O/L**	26,850	**O/L**	28,000	**O/L**
King Air 200 GT	12,500	3,720	11,012	4,383	11,384	4,630	11,756	4,747	12,128	**O/L**	12,500	**O/L**
King Air 350	15,000	5,115	12,954	5,435	13,466	5,664	13,977	5,911	14,489	**6,348**	15,000	**O/L**
King Air C90GTi	10,100	3,150	8,840	3,300	9,155	3,545	9,470	3,816	9,785	4,086	10,100	4,356
Lear 31A	17,000	5,786	14,686	**6,225**	15,264	**6,862**	15,843	**7,672**	16,421	**8,716**	17,000	**O/L**
Lear 35A	19,600	8,800	16,080	**O/L**	16,960	**O/L**	17,840	**O/L**	18,720	**O/L**	19,600	**O/L**
Lear 40	21,000	7,400	18,040	**7,971**	18,780	**O/L**	19,520	**O/L**	20,260	**O/L**	21,000	**O/L**
Lear 45	21,500	7,500	18,500	**9,257**	19,250	**O/L**	20,000	**O/L**	20,750	**O/L**	21,500	**O/L**
Lear 55	21,500	8,607	18,057	**O/L**	18,918	**O/L**	19,779	**O/L**	20,639	**O/L**	21,500	**O/L**
Lear 60	23,500	8,728	20,009	**8,805**	20,882	**O/L**	21,754	**O/L**	22,627	**O/L**	23,500	**O/L**
Premier 1A	12,500	3,900	10,940	**8,172**	11,330	**9,453**	11,720	**O/L**	12,110	**O/L**	12,500	**O/L**
Westwind I	22,850	9,850	18,910	**O/L**	19,895	**O/L**	20,880	**O/L**	21,865	**O/L**	22,850	**O/L**
Westwind II	23,500	10,250	19,400	**O/L**	20,425	**O/L**	21,450	**O/L**	22,475	**O/L**	23,500	**O/L**

Runway length calculation assumptions: 4,316' MSL field elevation; 95.7° F ambient temperature; 1.2% runway gradient

Red/bold numeric values exceed existing runway length

Aircraft Name	MLW (lbs.)	Landing Lengths Required: CFR Part 25 Dry (ft.)	CFR Part 25 Wet (ft.)	CFR Part 135 Dry (.6) (ft.)	CFR Part 135 Wet (.6) (ft.)	CFR Part 91K Dry (.8) (ft.)	CFR Part 91K Wet (.8) (ft.)
Beech 1900D	16,765	3,609	4,150	**6,015**	**6,917**	4,511	5,188
Beechjet 400A	15,700	No Data	No Data	No Data	No Data	No Data	No Data
Challenger 601	36,000	3818	4,581	**6,363**	**7,635**	4,773	5,726
Challenger 300	33,750	2,857	5,476	4,762	**9,127**	3,571	**6,845**
Challenger 604/605	38,000	3,141	5,046	5,235	**8,410**	3,926	**6,308**
Citation (525A) CJ2	11,500	4,371	**6,310**	**7,285**	**10,517**	5,464	**7,888**
Citation 560 XL	18,700	4,579	**7,214**	**7,632**	**12,023**	5,724	**9,018**
Citation CJ3	12,750	4,331	**6,087**	**7,218**	**10,145**	5,414	**7,609**
Citation II (550)	12,700	3,074	**7,428**	5,123	**12,380**	3,843	**9,285**
Citation III	19,000	5,695	**8,392**	**9,492**	**13,987**	7,119	**10,490**
Citation Mustang	8,000	3,844	5,565	**6,407**	**9,275**	4,805	**6,956**
Citation Sovereign	27,100	4,154	5,824	**6,923**	**9,707**	5,193	**7,280**
Citation V (Model 560)	15,200	4,186	**6,232**	**6,977**	**10,387**	5,233	**7,790**
Citation X	31,800	**5,975**	**9,050**	**9,958**	**15,083**	7,469	**11,313**
Falcon 2000	33,000	3,421	3,935	5,702	**6,558**	4,276	4,919
Falcon 2000	33,000	3,421	3,935	5,702	**6,558**	4,276	4,919
Falcon 50 EX	35,715	3,194	3,673	5,323	**6,122**	3,993	4,591
Falcon 7X	62,400	3,215	3,697	5,358	**6,162**	4,019	4,621
Falcon 900A	42,000	3,870	4,450	**6,450**	**7,417**	4,838	5,563
Global 5000	78,600	2,898	3,333	4,830	5,555	3,623	4,166
Global Express	78,600	2,891	3,325	4,818	5,542	3,614	4,156
Global XRS	78,600	2,891	3,325	4,818	5,542	3,614	4,156
Gulfstream 100	20,700	4,236	**7,402**	**7,060**	**12,337**	5,295	**9,253**
Gulfstream 150	21,700	4,038	**6,067**	**6,730**	**10,112**	5,048	**7,584**
Gulfstream 200	30,000	4,452	5,119	**7,420**	**8,532**	5,565	**6,399**
Gulfstream 300	66,000	3,437	3,953	5,728	**6,588**	4,296	4,941
Gulfstream 350	66,000	3,577	4,114	**5,962**	**6,857**	4,471	5,143
Gulfstream 450	66,000	3,577	**7,178**	**5,962**	**11,963**	4,471	**8,973**
Gulfstream 550	75,300	3,052	**6,497**	5,087	**10,828**	3,815	**8,121**
Gulfstream IIB	58,500	3,498	4,022	5,830	**6,703**	4,373	5,028
Gulfstream III	58,500	3,498	**6,704**	5,830	**11,173**	4,373	**8,380**
Gulfstream IV	66,000	3,930	**7,532**	**6,550**	**12,553**	4,913	**9,415**
Gulfstream V	75,300	3,071	3,532	5,118	5,887	3,839	4,415
Hawker 1000	25,000	3,253	4,553	5,422	**7,588**	4,066	5,691
Hawker 4000	33,500	4,066	4,676	**6,777**	**7,793**	5,083	5,845
Hawker 800XP	23,350	2,925	4,823	4,875	**8,038**	3,656	**6,029**
Hawker 900 XP	23,350	2,925	4,732	4,875	**7,887**	3,656	**5,915**
King Air 200 GT	12,500	1,401	No Data	2,335	No Data	1,751	No Data
King Air 350	15,000	3,439	3,955	5,732	**6,592**	4,299	4,944
King Air C90GTi	9,600	1,595	No Data	2,658	No Data	1,994	No Data
Lear 31A	16,000	3,462	5,539	5,770	**9,232**	4,328	**6,924**
Lear 35A	15,300	3,613	5,058	**6,022**	**8,430**	4,516	**6,323**
Lear 40	19,200	3,312	4,378	5,520	**7,297**	4,140	5,473
Lear 45	19,200	3,317	4,378	5,528	**7,297**	4,146	5,473
Lear 55	18,000	3,862	**6,180**	**6,437**	**10,300**	4,828	**7,725**
Lear 60	19,500	4,148	5,755	**6,913**	**9,592**	5,185	**7,194**
Premier 1A	11,600	3,950	5,245	**6,583**	**8,742**	4,938	**6,556**
Westwind I	19,000	2,670	3,070	4,450	5,117	3,338	3,838
Westwind II	19,000	2,620	3,020	4,367	5,033	3,275	3,775

MLW - Maximum Landing Weight **O/L** - Climb Limited - Out of Limits **MTOW** - Maximum Takeoff Weight



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length during the hottest periods of the year. Beginning at 70 percent useful loads and higher, most of these aircraft require additional runway length. At 80 percent useful load, only the ERJ-140 and Airbus A319 and A320 need less than the existing length offered on Runway 15-33. The forecast commercial fleet could include more operations by the Embraer E-jet family of aircraft, such as the ERJ-140, and Bombardier CRJ-700. Widebody aircraft, such as the Boeing 737, are not anticipated to operate at the airport on a regular basis.

Overall, this analysis shows that many commercial service aircraft would be weight-restricted and require additional runway length to operate at higher percentage useful loads. Short trip lengths, such as Las Vegas and Phoenix, which Contour Airlines currently operates, will continue to be able to operate on the existing runway length utilizing smaller regional jets but will be weight-restricted during the warmer months of the year.

Runway Length Summary

Many factors are considered when determining appropriate runway length for safe and efficient operations of aircraft at Page Municipal Airport. The airport should strive to accommodate commercial service aircraft and turbine aircraft to the greatest extent possible as demand would dictate. Runway 15-33 is currently 5,950 feet long and can accommodate many of these aircraft under moderate loading conditions, especially with shorter trip lengths and during cool to warm temperatures. It is the hotter days and longer trip lengths that can limit business jets and commercial service aircraft at Page Municipal Airport. The farthest non-stop commercial destination is currently Phoenix (PHX), at 211 nautical miles, which is conducted with the ERJ-135.

Justification for any runway extension to meet the needs of commercial or turbine aircraft would require regular use on the order of 500 annual itinerant operations. This is the minimum threshold required to obtain FAA grant funding assistance. The current Airport Layout Plan (ALP) for Page Municipal Airport includes an extension to 8,400 feet for Runway 15-33. This length was derived from the 2004 *Page Municipal Airport Feasibility Study* which determined that 8,400 feet is the maximum runway platform that could be graded given the significant terrain issues beyond each end of the runway. This platform would entail not only the runway surface but also any necessary allowance to meet appropriate runway safety requirements.

Analysis in the next chapter will examine potential extensions on Runway 15-33 to better accommodate the needs of turbine aircraft during the 20-year planning period of this master plan, while taking into account appropriate safety design standards (these standards will be detailed later in this chapter). Given the terrain issues beyond each runway end, incremental extensions will be evaluated that could provide operating enhancements for larger aircraft utilizing the airport. In addition, the 8,400-foot runway platform on the currently approved ALP will also be re-evaluated.

At 2,201 feet, Runway 7-25 is capable of accommodating small general aviation piston-powered aircraft only. The 588-foot displaced threshold on Runway 7 further limits its operational capabilities. The runway

length analysis described above indicates that its existing length falls short of meeting operational thresholds for small aircraft. The currently approved ALP includes a 600-foot easterly extension on this runway. While Runway 7-25 is not designed or planned to accommodate larger aircraft on a routine basis, analysis in the next chapter will re-evaluate the extension shown on the current ALP.

Runway Width

Runway width design standards are primarily based on the critical aircraft but can also be influenced by the visibility minimums of published instrument approach procedures. For Runway 15-33, existing RDC C-II design criteria stipulate a runway width of 100 feet. At 150 feet, the current width of the runway exceeds the standard. Ultimate RDC D-III design criteria calls for a width of 100 feet for design aircraft with maximum certificated takeoff weights of 150,000 pounds or less. If the runway is served by aircraft with maximum certificated takeoff weights of more than 150,000 pounds, D-III standards call for a 150-foot wide runway. For Runway 7-25, RDC B-I (Small Aircraft) standards stipulate a runway width of 60 feet. The runway is currently 75 feet wide, exceeding the standard.

As detailed earlier in this study, the ultimate critical design aircraft for Runway 15-33 could include larger jets associated with scheduled commercial service and business use. The 150 feet of width will continue to provide added safety enhancements for these operations. As such, it is recommended that the existing width of Runway 15-33 be maintained in the future. It is important to note that if the airport does not experience regular use by large aircraft weighing more than 150,000 pounds in the future, the FAA could elect to fund maintenance of up to 100 feet in width while the remaining width would need to be covered by the Arizona Department of Transportation – Aeronautics Group (ADOT) and/or through a local funding source such as the City of Page.

Runway 7-25, at 75 feet wide, also exceeds the current and ultimate design standard for runway width. It is recommended that the runway remain at 75 feet in width through the long-term planning horizon which would serve to maintain a higher level of operational safety. Ultimately, the FAA could elect to fund maintenance of up to 60 feet in width and the remaining width would need to be covered by ADOT and/or through a local funding source.

Pavement Strength

An important feature of airfield pavement is its ability to withstand repeated use by aircraft. The FAA reports the pavement strength for Runway 15-33 at 65,000 pounds single wheel loading (SWL), 90,000 pounds dual wheel loading (DWL), and 190,000 pounds dual tandem wheel loading (DTWL). This strength rating refers to the configuration of the aircraft landing gear. For example, SWL indicates an aircraft with a single wheel on each landing gear. For Runway 7-25, the strength rating is 12,500 pounds SWL.

The strength rating of a runway does not preclude aircraft weighing more than the published strength rating from using the runway. All federally obligated airports must remain open to the public, and it is typically up to the pilot of the aircraft to determine if a runway can support their aircraft safely. An airport sponsor cannot restrict an aircraft from using the runway simply because its weight exceeds the published strength rating. On the other hand, the airport sponsor has an obligation to properly maintain the runway and protect the useful life of the runway, typically for 20 years.

According to the FAA publication, *Chart Supplement*, "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 *Chart Supplement* goes on to say that those aircraft exceeding the pavement strength should contact the airport sponsor for permission to operate at the airport.

The strength rating of a runway can change over time. Regular usage by heavier aircraft can decrease the strength rating, while periodic runway resurfacing can increase the strength rating. The current runway strength is adequate to accommodate a large majority of aircraft that currently operate at the airport and are forecast to continue utilizing the airport in the future. The current ALP calls for maintaining the published pavement strength on primary Runway 15-33. The published pavement strength should continue to accommodate the mix of aircraft forecast to utilize the airport in the future. As such, consideration should be given to maintaining the existing pavement strength on Runway 15-33. Runway 7-25 should be maintained at 12,500 pounds SWL as it will continue to accommodate small general aviation aircraft only.

The FAA has recently moved to implementing the International Civil Aviation Organization (ICAO) pavement classification number (PCN) for identifying strength of airport pavements. The PCN is a five-part code 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 a number of engineering factors, such as aircraft geometry and pavement usage.
2) Pavement Type: Expressed as either R for rigid pavement (most typically concrete) or F for flexible pavement (most typically asphalt).
3) Subgrade Strength: Expressed as A (High), B (Medium), C (Low), 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, like un-compacted soil.
4) Maximum Tire Pressure: Expressed as W (Unlimited/No Pressure Limit), X (High/254 psi), Y (Medium/181 psi), or Z (Low/72 psi), this 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), this indicates how the pavement was tested.

According to the FAA Form 5010-1 *Airport Master Record* publication, the PCN for Runway 15-33 is expressed as 15/F/C/W/T. This means that the underlying pavement's value, indicating load-carrying capacity is: 15 (unitless), flexible (asphalt), low strength, has an unlimited/no tire pressure restriction, and was calculated through a technical evaluation. The PCN for Runway 7-25 is expressed as 2/F/D/Y/T. The PNC values for this runway indicate a loading capacity of 2, with flexible pavement (asphalt), ultra-low strength, has a medium-valued tire pressure restriction, and was calculated through a technical evaluation.

While the pavement strength rating is not the maximum weight limit, aircraft weighing more than the certified strength should only operate on the runway on an infrequent basis. Frequent use by aircraft heavier than the pavement rating is not recommended as it will increase the rate of pavement degradation and shorten the lifespan of the pavement.

Runway Blast Pads

A runway blast pad is a surface adjacent to the end of the runway provided to reduce the erosive effect of jet blast and propeller wash. At Page Municipal Airport, each end of Runway 15-33 is provided with a blast pad that is 150 feet long by 150 feet wide. The blast pad dimensions on both runway ends exceed the design standards for RDCs C-II and D-III. These dimensions should be maintained through the long-term planning period as long as the runway remains 150 feet wide. In the event that blast pads are implemented on Runway 7-25, they should be dimensioned at 60 feet long by 80 feet wide to meet RDC B-I (Small Aircraft) standards.

SAFETY AREA DESIGN STANDARDS

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

The entire RSA, ROFA, and ROFZ must be under the direct ownership of the airport sponsor to ensure these areas remain free of obstacles and can be readily accessed by maintenance and emergency personnel. RPZs should also be under airport ownership. An alternative to outright ownership of the RPZ is the purchase of avigation easements (acquiring control of designated airspace within the RPZ) or having sufficient land use control measures in place which ensure the RPZ remains free of incompatible development. The various airport safety areas are presented on **Exhibit 3D**. **Table 3F** presents the FAA design standards as they apply to each runway at Page Municipal Airport both now and in the future.

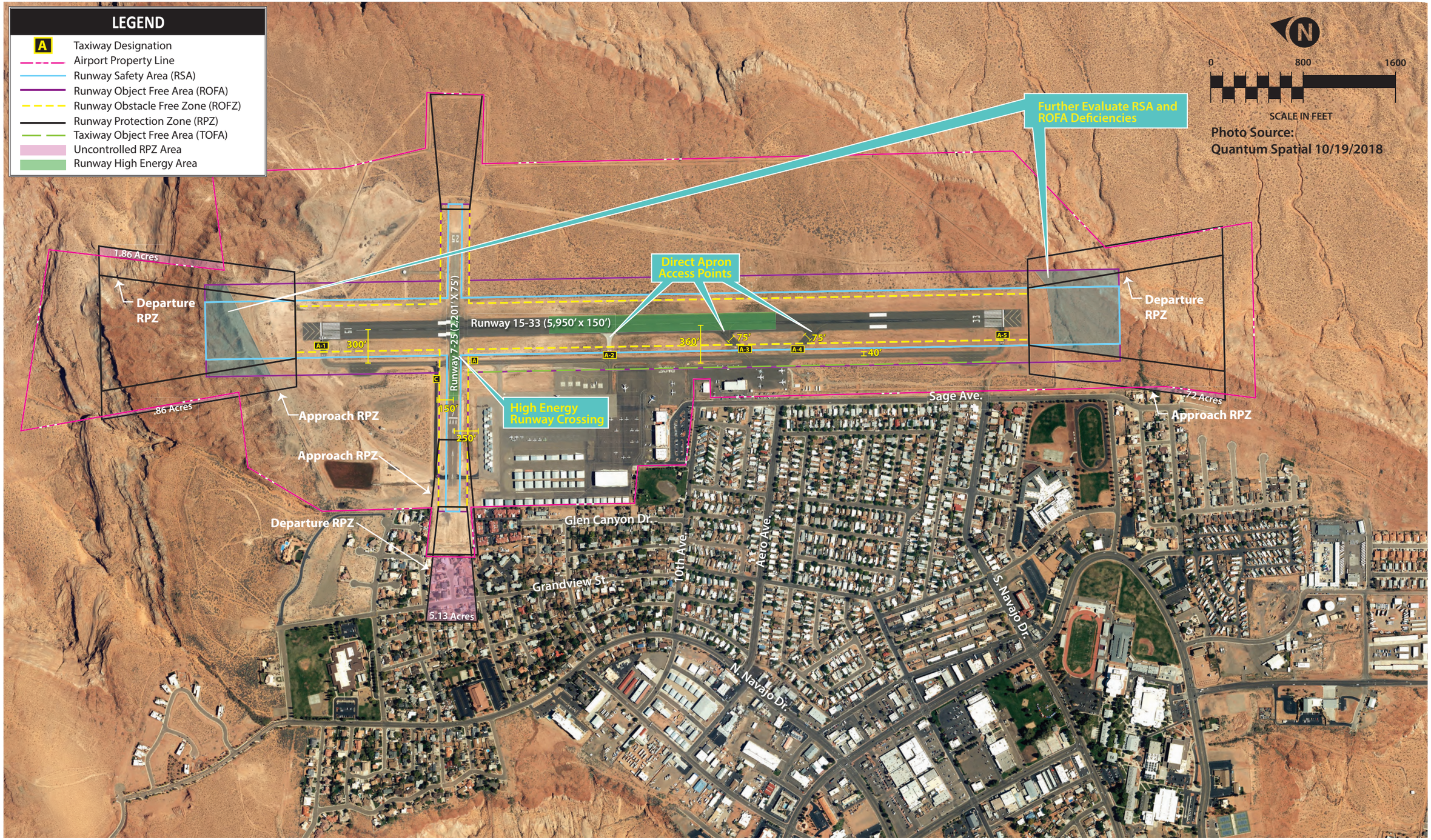
LEGEND
A Taxiway Designation
Airport Property Line
Runway Safety Area (RSA)
Runway Object Free Area (ROFA)
Runway Obstacle Free Zone (ROFZ)
Runway Protection Zone (RPZ)
Taxiway Object Free Area (TOFA)
Uncontrolled RPZ Area
Runway High Energy Area
N
0
800
1600
SCALE IN FEET
Photo Source:
Quantum Spatial 10/19/2018
Further Evaluate RSA and ROFA Deficiencies
Direct Apron Access Points
Runway 15-33 (5,950' x 150')
Runway 7-25 (2,201' X 75')
High Energy Runway Crossing
1.86 Acres
Departure RPZ
.86 Acres
Approach RPZ
Approach RPZ
Departure RPZ
5.13 Acres
.72 Acres
Approach RPZ
Departure RPZ
300'
360'
75'
75'
±40'
150'
250'
A-1
A-2
A-3
A-4
A-5
Sage Ave.
Glen Canyon Dr.
Grandview St.
10th Ave.
Aero Ave.
S. Navajo Dr.
N. Navajo Dr.

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TABLE 3F
Runway Design Standards
Page Municipal Airport

	Runway 15-33 (Existing/Operational)	Runway 15-33 (Ultimate)	Runway 7-25 (Existing/Ultimate)
Runway Design Code	C-II-5000	D-III-4000	B-I (Small Aircraft) - VIS
Visibility Minimums	≥ 1 mile (both ends)	≥ ¾ mile (both ends)	Visual only (both ends)
Runway Design			
Runway Width	150	150[1]	75[2]
Blast Pad Length/Width	150 x 150	150 x 140[3]	60 x 80[4]
Runway Protection			
Runway Safety Area			
Width	400	500	120
Length Beyond Departure End	1,000	1,000	240
Length Prior to Threshold	600	600	240
Runway Object Free Area			
Width	800	800	250
Length Beyond Departure End	1,000	1,000	240
Length Prior to Threshold	600	600	240
Runway Obstacle Free Zone			
Width	400	400	250
Length Beyond Runway End	200	200	200
Approach Runway Protection Zone			
Inner Width	500	1,000	250
Outer Width	1,010	1,510	450
Length	1,700	1,700	1,000
Departure Runway Protection Zone			
Inner Width	500	500	250
Outer Width	1,010	1,010	450
Length	1,700	1,700	1,000
Runway Separation			
Runway Centerline to:			
Hold Line Position	200[5]	293[6]	125
Parallel Taxiway	300	400	150
Aircraft Parking Apron	400	500	125

[1] For airplanes with maximum certificated takeoff weight of 150,000 pounds or less, the standard runway width is 100 feet.
[2] For RDC B-I (Small Aircraft) with not lower than ¾-mile visibility minimums, the standard runway width is 60 feet.
[3] For airplanes with maximum certificated takeoff weight of 150,000 pounds or less, the standard blast pad width is 140 feet.
[4] There are currently no blast pads on either end of Runway 7-25.
[5] Hold line positions for RDC C-II are to be located 250 feet from runway centerline.
[6] This distance is increased one foot for each 100 feet above sea level over 250 feet.
Note: All dimensions in feet unless otherwise noted.

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

Runway Safety Area

The RSA is defined in FAA AC 150/5300-13A, *Airport Design,* as a "surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of undershoot, overshoot, or

excursion from the runway." The RSA is centered on the runway and dimensioned in accordance to the approach speed of the critical design 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 such as runway edge lights or approach lights.

The FAA has placed a higher significance on maintaining adequate RSA at all airports. Under Order 5200.8, effective October 1, 1999, the FAA established the *Runway Safety Area Program.* The Order states, "The objective of the Runway Safety Area Program is that all RSAs at federally-obligated airports…shall conform to the standards contained in AC 150/5300-13, *Airport Design*, to the extent practicable." Each Regional Airports Division of the FAA is obligated to collect and maintain data on the RSA for each runway at the airport and perform airport inspections.

For RDC C-II design, the FAA calls for the RSA to be 400 feet wide and extend 1,000 feet beyond the runway ends. Analysis in the previous section indicated that Runway 15-33 should be planned to accommodate aircraft in RDC D-III. The RSA for RDC D-III is 500 feet wide and extends 1,000 feet beyond each runway end. It should be noted that only 600 feet of RSA is needed prior to the landing threshold on each runway end under RDC C-II and D-III standards. The RDC B-I (Small Aircraft) RSA dimensions for Runway 7-25 are 120 feet wide extending 240 feet beyond the end of the runway.

An examination of the RSA for Runway 15-33 indicates that the existing RSA based on aircraft RDC C-II design is not met. On the north side of the runway, the airport's perimeter fence penetrates the RSA beginning approximately 540 feet beyond the runway end. Beyond the perimeter fence, the terrain drops significantly and does not meet RSA gradient standards. On the south side of the runway, the airport's perimeter fence obstructs the existing RSA beginning approximately 400 feet from the landing threshold. Similar to the north end, there is a steep decline in terrain beyond the fencing that does not meet RSA standards. Under ultimate RDC D-III design, the RSA widens to 500 feet and includes similar deficiencies noted above. A more detailed evaluation of RSA obstructions associated with fencing and terrain (grade) will be made when survey data is obtained as part of this master plan. For Runway 7-25, the corresponding RSA appears to be free of non-standard conditions and obstructions.

Runway Object Free Area

The ROFA is "a two-dimensional ground area, surrounding runways, taxiways, and taxilanes, which is clear of objects except for objects whose location is fixed by function (i.e., airfield lighting)." 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 ROFA is centered on the runway, extending out in accordance to the critical design aircraft utilizing the runway.

For RDC C-II and D-III design, the FAA calls for the ROFA to be 800 feet wide, extending 1,000 feet beyond each runway end. Like the RSA, only 600 feet is needed prior to the landing threshold. Runway 15-33 currently contains ROFA deficiencies associated with the airport's perimeter fencing beyond each runway end. Due to the terrain falling away from the runway on both ends, the ROFA standards are more

readily met beyond the perimeter fencing. In addition, portions of aircraft parking aprons and areas of rising terrain west of parallel Taxiway A obstruct the ROFA. Similar to the RSA, a more detailed evaluation of the ROFA will be made when survey data is obtained.

RDC B-I (Small Aircraft) design standards call for the ROFA to be 250 feet wide and extend 240 feet beyond the end of the runway. Applying these standards to Runway 7-25 does not result in any significant non-standard ROFA conditions or obstructions. Certain areas of minor vegetation, especially east of the intersection of Runways 15-33 and 7-25, could create penetrations to the ROFA associated with the crosswind runway.

Runway Obstacle Free Zone

The ROFZ is an imaginary surface which precludes object penetrations, including taxiing and parked aircraft. The only allowance for ROFZ obstructions is navigational aids mounted on frangible bases which are fixed in their location 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 approach minimums could be increased.

For all runways serving aircraft over 12,500 pounds, the ROFZ is 400 feet wide, centered on the runway, and extends 200 feet beyond the runway ends. This standard applies to Runway 15-33 at Page Municipal Airport. For Runway 7-25, a smaller ROFZ applies since the runway is served by aircraft weighing 12,500 pounds or less. In this case, the ROFZ is dimensioned at 250 feet wide and extends 200 feet beyond the runway ends. Under current evaluation with available data, there are no ROFZ obstructions at the airport. Future planning should maintain the ROFZ for the appropriate runway type.

Runway Protection Zone

The RPZ is a trapezoidal area centered on the runway, beginning 200 feet beyond the runway end. The RPZ has been established by the FAA to provide an area clear of obstructions and incompatible land uses, to enhance the protection of people and property on the ground. The RPZ is comprised of the central portion of the RPZ and the controlled activity area. The central portion of the RPZ extends from the beginning to the end of the RPZ, is centered on the runway, and is the width of the ROFA. The controlled activity area is any remaining portions of the RPZ. The dimensions of the RPZ vary per the visibility minimums serving the runway and the type of aircraft (design aircraft) operating on the runway.

While the RPZ is intended to be clear of incompatible objects or land uses, some uses are permitted with conditions and other land uses are prohibited. According to AC 150/5300-13A, the following land uses are permissible within the RPZ:

- Farming that meets the minimum buffer requirements;
- Irrigation channels, as long as they do not attract birds;

- 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 requirements, as applicable; and
- Unstaffed navigational aids (NAVAIDs) and facilities, such as required for airport facilities that are fixed by function in regard to the RPZ.

Any other land uses considered within RPZ land owned by the airport sponsor must be evaluated and approved by the FAA Office of Airports. The FAA has published *Interim Guidance on Land Uses within a Runway Protection Zone* (September 2012), which identifies several potential land uses that must be evaluated and approved prior to implementation. The specific land uses requiring FAA evaluation and approval include:

- Buildings and structures. Examples include, but are not limited to residences, schools, churches, hospitals or other medical care facilities, commercial/industrial buildings, etc.
- Recreational land use. Examples include, but are not limited to golf courses, sports fields, amusement parks, other places of public assembly, etc.
- Transportation facilities. Examples include, but are not limited to:
    - Rail facilities - light or heavy, passenger or freight,
    - Public roads/highways, and
    - Vehicular parking facilities.
- Fuel storage facilities (above and below ground).
- Hazardous material storage (above and below ground).
- Wastewater treatment facilities.
- Above-ground utility infrastructure (i.e., electrical substations), including any type of solar panel installations.

The *Interim Guidance on Land within a Runway Protection Zone* states, "RPZ land use compatibility also is often complicated by ownership considerations. Airport owner control over the RPZ land is emphasized to achieve the desired protection of people and property on the ground. Although the FAA recognizes that in certain situations the airport sponsor may not fully control land within the RPZ, the FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses."

Currently, the RPZ review standards are applicable to any new or modified RPZ. The following actions or events could alter the size of an RPZ, potentially introducing an incompatibility:

- 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; and/or
- A local development proposal in the RPZ (either new or reconfigured).

Since the interim guidance only addresses a new or modified RPZ, existing incompatibilities are generally (but not always) grandfathered under certain circumstances. While it is still necessary for the airport

sponsor to take all reasonable actions to meet the RPZ design standard, FAA funding priority for certain actions, such as relocating existing roads in the RPZ, will be determined on a case-by-case basis.

RPZs have been further designated as approach and departure RPZs. The approach RPZ is a function of the Aircraft Approach Category (AAC) and approach visibility minimums associated with the approach runway end. The departure RPZ is a function of the AAC and departure procedures associated with the runway. For a particular runway end, the more stringent RPZ requirements (usually associated with the approach RPZ) will govern the property interests and clearing requirements that the airport sponsor should pursue.

As shown on **Exhibit 3D**, the airport owns the majority of property contained within the proposed RPZs. The existing RPZs associated with Runway 15-33 that correspond to not-lower-than-one-mile approaches are fully contained on airport property. The ultimate approach RPZs associated with a not-lower-than ¾-mile approach extend slightly beyond existing airport property, encompassing approximately 2.72 acres of uncontrolled property north of the runway and 0.72 acres of uncontrolled property south of the runway. On Runway 7-25, the departure RPZ associated with Runway 25 extends west of the airport over residential development and Grandview Street. All total, approximately 5.13 acres of uncontrolled property is included within this RPZ.

Whenever possible, the airport should maintain positive control over the RPZs through fee simple acquisition; however, avigation easements can be pursued if fee simple acquisition is not feasible. Structures and buildings within the RPZ will need to be evaluated by the FAA to determine if they need to be removed or if they can remain within the RPZ. Public roadways, as previously mentioned, can be grandfathered by the FAA if no changes to the runway are made.

RUNWAY SEPARATION STANDARDS

There are several other standards related to separation distances from runways. Each of these is designed to enhance the safety of the airfield.

Runway/Taxiway Separation

The design standard for the separation between runways and parallel taxiways is a function of the critical design aircraft and the instrument approach visibility minimum. The separation standard for RDC C-II with not lower than ¾-mile visibility minimums is 300 feet from the runway centerline to the parallel taxiway centerline. Parallel Taxiway A is 300 feet from Runway 15-33; therefore, the current location of the taxiway meets the design standard. The separation standard for RDC D-III is 400 feet from the runway centerline to the parallel taxiway centerline. As such, parallel Taxiway A falls short of the ultimate D-III standard. The existing terrain and landside infrastructure in place on the west side of Runway 15-33 would make the relocation of parallel Taxiway A farther west a costly endeavor in meeting RDC D-III standards.

Partial parallel Taxiway C is 150 feet from the Runway 7-25 centerline, so the existing condition meets the existing/ultimate design standard for this runway which is 150 feet.

Hold Line Position Separation

Hold line position markings are placed on taxiways leading to runways. When instructed, pilots are to stop short of the holding position marking line. For Runway 15-33, hold line position markings are situated at least 200 feet from the runway centerline. For RDC C-II standards, hold lines should be located 250 feet from the runway centerline. Runway 7-25 holding position markings are situated at a distance of 125 feet from the centerline, which meets the standard for RDC B-I (Small Aircraft) design.

According to FAA AC 150/5300-13A, Change 1, *Airport Design*, the holding position marking line location may need to be increased based on an airport's elevation and the RDC of the runway. For RDC D-III, the holding position marking line should be increased one foot for every 100 feet above sea level. With Page Municipal Airport's elevation at 4,316 feet MSL, the holding position lines for Runway 15-33 should be increased to 293 feet from the runway centerline in order to meet RDC D-III standards.

Aircraft Parking Area Separation

Under existing conditions, aircraft parking areas should be at least 400 feet from the Runway 15-33 centerline and 125 feet from the Runway 7-25 centerline. Currently, aircraft parking areas west of Runway 15-33 are located approximately 360 feet from the runway centerline, which falls short of the 400-foot separation standard. Furthermore, in the event that Runway 15-33 transitions to ultimate RDC D-III standards, the separation requirement increases to 500 feet. Aircraft parking areas in relation to Runway 7-25 currently exceed the 125-foot separation standard. The master plan will further analyze the impacts to aircraft parking and provide potential solutions to better adhere to the standard.

TAXIWAYS

The design standards associated with taxiways are determined by the Taxiway Design Group (TDG) or the ADG of the critical design aircraft. As determined previously, the applicable ADG for Runway 15-33 is currently ADG II. Ultimate planning should conform to ADG III for the runway. Runway 7-25 should be evaluated for existing/ultimate ADG I standards for taxiway design. **Table 3G** presents the various taxiway design standards related to ADGs I, II, and III.

TABLE 3G
Taxiway Dimensions and Standards
Page Municipal Airport

STANDARDS BASED ON WINGSPAN	*ADG I*	*ADG II*	*ADG III*
Taxiway Protection			
Taxiway Safety Area width (feet)	49	79	118
Taxiway Object Free Area width (feet)	89	131	186
Taxilane Object Free Area width (feet)	79	115	162
Taxiway Separation			
Taxiway Centerline to:			
Fixed or Movable Object (feet)	44.5	65.5	93
Parallel Taxiway/Taxilane (feet)	70	105	152
Taxilane Centerline to:			
Fixed or Movable Object (feet)	39.5	57.5	81
Parallel Taxilane (feet)	64	97	140
Wingtip Clearance			
Taxiway Wingtip Clearance (feet)	20	26	34
Taxilane Wingtip Clearance (feet)	15	18	27
STANDARDS BASED ON TDG	*TDG 1A/1B*	*TDG 2*	*TDG 3*
Taxiway Width Standard (feet)	25	35	50
Taxiway Edge Safety Margin (feet)	5	7.5	10
Taxiway Shoulder Width (feet)	10	15	20

ADG: Airplane Design Group
TDG: Taxiway Design Group

Source: FAA AC 150/5300-13A, Change 1, *Airport Design*

Currently, portions of parallel Taxiway A do not meet appropriate ADG II taxiway object free area (TOFA) due to the location of aircraft parking areas adjacent to the west side of the taxiway system. Furthermore, ADG III TOFA standards are not met along several areas adjacent to the parallel taxiway.

The table also shows those taxiway design standards related to TDG. The TDG standards are based on the Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance of the critical design aircraft expected to use those taxiways. Different taxiway and taxilane pavements can and should be planned to the most appropriate TDG design standards based on usage.

The current taxiway design for Runway 15-33 should be TDG 2. As such, the taxiways on the airfield should be at least 35 feet wide. Ultimate planning also accounts for TDG 3. Taxiway design associated with TDG 3 calls for a 50-foot width; however, many aircraft that fall within ADG III may only constitute a TDG 2 standard. For Runway 7-25, TDG 1A/1B standards apply.

The current taxiway system associated with Runway 15-33 is composed of varying taxiway widths. Parallel Taxiway A serving Runway 15-33 is 40 feet wide. Entrance/exit Taxiways A1, A2, and A5 are also 40 feet wide. Taxiways A3 and A4 are 75 feet wide. Partial parallel Taxiway C serving Runway 7-25 as well as the entrance/exit taxiways serving the Runway 7 threshold end are 25 feet wide. In the event the airport transitions to a larger design aircraft exhibiting TDG 3 qualities, parallel Taxiway A and

entrance/exit Taxiways A1, A2, and A5 should be widened to 50 feet. Taxiways associated with Runway 7-25 should provide at least 25 feet of width.

All taxiway widths on the airfield should at least be maintained unless financial constraints dictate. As such, the width could remain until such time as rehabilitation is needed and financial resources to support such are not available. FAA grant availability can only be provided if the project meets eligibility thresholds as determined by the FAA.

Taxiway Design Considerations

FAA AC 150/5300-13A, Change 1, *Airport Design*, provides guidance on recommended taxiway and taxilane layouts to enhance safety by avoiding runway incursions. 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 taxiway system at Page Municipal Airport generally provides for the efficient movement of aircraft; however, AC 150/5300-13A, Change 1, *Airport Design*, provides recommendations for taxiway design. 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 being sufficiently wide to allow a certain amount of wander. On turns, sufficient 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 where the pilot must intentionally steer the cockpit outside the marked centerline in order to assure the aircraft remains on the taxiway pavement.
2. **Steering Angle**: Taxiways should be designed such that the nose gear steering angle is no more than 50 degrees, the generally accepted value to prevent excessive tire scrubbing.
3. **Three-Node Concept**: To maintain pilot situational awareness, taxiway intersections should provide a pilot a maximum of three choices of travel. Ideally, these are right and left angle turns and a continuation straight ahead.
4. **Intersection Angles**: Turns should be designed to 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 he/she is on the airport is less likely to enter a runway improperly. Complexity leads to confusion. Keep taxiway systems simple using the "three-node" 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, avoid direct access to a runway.

- *Limit Runway Crossings*: The taxiway layout can reduce the opportunity for human error. The benefits are twofold – through simple reduction in the number of occurrences and through a reduction in air traffic controller workload.
- *Avoid "High Energy" Intersections*: These are intersections in the middle third of runways. By limiting runway crossings to the first and last thirds of the runway, the portion of the runway where a pilot can least maneuver to avoid a collision is kept clear.
- *Increase Visibility*: Right-angle intersections, both 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 entrance or crossing points. A right-angle turn at the end of a parallel taxiway is a clear indication of 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*: Do not design taxiways 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 they 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 into a runway should be avoided. Increase pilot situational awareness by designing taxiways in such a manner that forces pilots to consciously make turns. Taxiways originating from aprons and forming a straight line 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 makes lighting and marking more difficult.

- *Direct Access from Apron to a Runway*: Avoid taxiway connectors that cross over a parallel taxiway and directly onto a runway. Consider a staggered taxiway layout that forces pilots to make a conscious decision to turn.
- *Apron to Parallel Taxiway End*: Avoid direct connection from an apron to a parallel taxiway at the end of a runway.

FAA AC 150/5300-13A, Change 1, *Airport Design*, states that "existing taxiway geometry should be improved whenever feasible, with emphasis on designated 'hot spots.'" To the extent practicable, the removal of existing pavement may be necessary to correct confusing layouts. The FAA has not identified any "hot spots" at the airport.

For the most part, the taxiway system at Page Municipal Airport meets the recommended design and geometry standards set forth by the FAA. There are certain non-standard conditions that include:

- Taxiways A2, A3, and A4 provide for direct access from an aircraft parking apron to Runway 15-33; and
- Parallel Taxiway A intersects Runway 7-25 in the high-energy area.

In the alternatives chapter, potential solutions to these non-standard conditions will be presented. Analysis in the next chapter will also consider improvements which could be implemented on the airfield to minimize runway incursion potential, improve efficiency, and conform to FAA standards for taxiway design. Any future taxiways planned will also take into consideration the taxiway design standards.

Taxilane Design Considerations

Taxilanes are distinguished from taxiways in that they do not provide access to or from the runway system directly. Taxilanes typically provide access to hangar areas. As a result, taxilanes can be planned to varying design standards depending on the type of aircraft utilizing the taxilane. For example, a taxilane leading to a T-hangar area only needs to be designed to accommodate those aircraft typically accessing the T-hangar.

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 enhance the safety and capacity of the airfield. Such facilities are vital to the success of an airport and provide additional safety to 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. Page Municipal Airport employs the following navigational aids.

Instrument Approach Aids

Instrument approaches are categorized as either precision approaches or non-precision approaches. Precision instrument approaches 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, it is now used to provide both vertical and lateral navigation for pilots.

Page Municipal Airport has straight-in instrument approach capabilities to each end of Runway 15-33. These include area navigation (RNAV) GPS approaches. The RNAV GPS approach to Runway 15 provides for visibility minimums as low as one mile and cloud ceilings as low as 300 feet. The RNAV GPS approach serving Runway 33 allows for visibility minimums as low as one mile with 300-foot cloud ceilings. A very high frequency omni-directional range (VOR) approach is a circling approach only, allowing for minimums to any runway end at the airport. Analysis in the next chapter will consider improvements necessary for enhancing instrument approach capabilities to the runway system, with a focus on lowering approach visibility minimums down to ¾-mile.

Visual Approach Aids

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual guidance information during landings to the runway, electronic visual approach aids are commonly provided at airports. Currently, both ends of Runway 15-33 are served by a four-box visual approach slope indicator (VASI-4). These approach aids should be maintained through the planning period. In the event that the VASI-4 systems need to be replaced, future planning should consider a four-box precision approach path indicator (PAPI-4) on each runway end.

Runway end identification lights (REILs) are flashing lights located at the runway threshold end that facilitate rapid identification of the runway end at night and during poor visibility conditions. REILs provide pilots with the ability to identify the runway thresholds and distinguish the runway end lighting from the other lighting on the airport and in the approach areas. The FAA indicates that REILs should be considered for all lighted runway ends not planned for more sophisticated approach lighting systems. There are currently REIL systems on each end of Runway 15-33. These systems should be maintained through the long-term planning period.

Weather Reporting Aids

Page Municipal Airport has three wind cones and a segmented circle. The wind cones provide information to pilots regarding wind speed and direction. Typically, one wind cone is centralized on the airfield system and often co-located within a segmented circle, which is the case at Page Municipal Airport. The segmented circle consists of a system of visual indicators designed to provide traffic pattern

information to pilots. The segmented circle/lighted wind cone at the airport is located midfield east of Runway 15-33.

The airport is equipped with an ASOS, which provides weather observations 24 hours per day. The system updates weather observations every minute, continuously reporting significant weather changes as they occur in real time. This information is then transmitted via a designated radio frequency at regular intervals. Aircraft in the vicinity of the airport can receive the weather information via 120.625 MHz. This system should be maintained through the planning period.

AIRFIELD LIGHTING, MARKING, AND SIGNAGE

There are several lighting and pavement marking aids serving pilots using the airport. These aids assist pilots in locating an airport and runway at night or in poor visibility conditions. They also serve aircraft navigating the airport environment on the ground when transitioning to/from aircraft parking areas to the runway.

Airport Identification Lighting

The location of the airport at night is universally identified by a rotating beacon. For civil airports, a rotating beacon projects two beams of light, one white and one green, 180 degrees apart. To pilots approaching the airport, the beacon appears as a flashing light which is alternating between white and green. The rotating beacon at Page Municipal Airport is approximately 250 feet southeast of the terminal building.

Runway and Taxiway Lighting

Runway lighting provides the pilot with positive identification of the runway and its alignment. Runway 15-33 is served by medium intensity runway lighting (MIRL). Lighting on this runway should be maintained through the planning period. Runway 7-25 is not equipped with runway lighting, as it is utilized during the daytime only.

Medium intensity taxiway lighting (MITL) has been installed on Taxiway A, as well as the entrance and exit taxiways connected to Runway 15-33. This system is vital for safe and efficient ground movements and should be maintained through the planning period. Partial parallel Taxiway C is equipped with elevated edge reflectors. The elevated edge reflectors should be adequate for future planning on this taxiway.

Planning should consider MITL on future taxiways that directly support Runway 15-33 at the airport. At a minimum, planning should also consider edge reflectors on more remote taxiways and taxilanes serving landside development areas.

Pavement Markings

Runway markings are typically designed to the type of instrument approach available on the runway. FAA AC 150/5340-1K, *Standards for Airport Markings*, provides guidance necessary to design airport markings.

Runway 15-33 is served by non-precision markings. This aids in accommodating the RNAV GPS approaches to the runway and provides enhanced identification for both ends of the runway. These runway markings should be maintained through the long-term planning horizon. Runway 7-25 contains basic runway markings, which are adequate for existing and ultimate conditions.

Airfield Signs

Airfield identification signs assist pilots in identifying their location on the airfield and directing them to their desired location. Lighted signs are installed on the runway and taxiway system on the airfield. The signage system includes runway and taxiway designations, holding positions, routing/directional, runway exits, and runway distance remaining. All these signs should be maintained throughout the planning period.

A summary of the airside facilities at Page Municipal Airport are presented on **Exhibit 3E**.

LANDSIDE FACILITY REQUIREMENTS

Landside facilities are those necessary for the handling of aircraft and passengers while on the ground. These facilities provide the essential interface between the air and ground transportation modes. The capacity of the various components of each element was examined in relation to projected demand to identify future landside facility needs. At Page Municipal Airport, this includes components for commercial service and general aviation needs such as:

- Passenger Terminal Facilities
- General Aviation Facilities
- Support Facilities

PASSENGER TERMINAL FACILITIES

Components of the passenger terminal complex include the terminal building, gate positions, and apron area. This section identifies the facilities required to meet the airport's needs through the planning period.

The review of the capacity and requirements for various terminal complex functional areas was performed with guidance from FAA AC 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*. Terminal capacity and requirements were evaluated and developed for the following functional areas:

- Airline ticketing and operations
- Departure facilities
- Baggage claim
- Terminal services
- Public use areas and security
- Administration/Support
- Ground access

As previously discussed, Page Municipal Airport accommodates varying operational functionalities as it relates to passenger activity. Air tour activities associated with fixed-wing and helicopter operators carry different terminal requirements versus those needed for scheduled commercial service operators. As a result, this section separates the two types of operations and presents terminal facility needs for each. The first examines the scheduled commercial service facility requirements and the second examines facility needs for air tour activities forecast for this study. Depending on further evaluation to be made during the study process, the terminal facility needs could be served by one terminal facility or separate facilities. Currently, passenger activities associated with both scheduled commercial service and air tour operations are combined in the airport terminal building. The current facility provides approximately 8,100 square feet of space on the lower level that is dedicated to these activities. Based on observations and coordination with airport staff and tenants, the space offered in the existing terminal facility is inadequate to accommodate the activities associated with scheduled commercial service and air tour operations.

Facility requirements were updated to reflect the short-, intermediate-, and long-term planning horizons for enplanement milestones. For scheduled commercial service requirements, the forecast levels of 12,200, 14,600, and 19,200 annual enplanements were considered for the three planning horizons. For air tour operator facility requirements, this included the levels of 49,400, 56,200, and 68,400 annual enplaned passengers.

Scheduled Commercial Service Facility Requirements

The requirements for a terminal to serve scheduled airlines are more in line with a traditional commercial service passenger terminal. The short-term horizon would represent the minimum facility needs that should be planned for the short-term forecast of 12,200 enplanements related to scheduled airline activities. **Exhibit 3F** summarizes the facility requirements for scheduled airline activities projected through the long-term planning period of the master plan.

	AVAILABLE	SHORT TERM	LONG TERM
RUNWAYS		**Runway 15-33**	
	RDC C-II-5000 based on operational demand	RDC C/D-II-5000	RDC D-III-4000
	5,950' x 150'	Examine potential runway extension	Potential runway extension
	Blast Pad - 150' x 150' on both runway ends	Maintain	Maintain
	65,000 lbs. SWL / 90,000 lbs. DWL / 190,000 lbs. DTWL	Maintain	Maintain
	Non-standard RSA and ROFA	Evaluate RSA and ROFA to appropriate safety design standards for RDC C-II	Evaluate RSA and ROFA to appropriate safety design standards for RDC D-III
	RPZs: 100% owned/controlled	Maintain	Consider acquisition of all RPZ property associated with RDC D-III-4000 standards
		Runway 7-25	
	RDC B-I (Small Aircraft) - VIS	Maintain	Maintain
	2,201' x 75'	Maintain	Examine potential runway extension
	12,500 lbs. SWL	Maintain	Maintain
	Standard safety areas	Maintain	Maintain
	Runway 25 Departure RPZ extends beyond existing airport property to the west	Consider acquisition of Departure RPZ property west of airport	Maintain
	No blast pads	Consider 60' x 80' blast pads on both runway ends	Maintain
TAXIWAYS		**Runway 15-33**	
	All taxiways 40' - 75' wide	All taxiways at least 35' wide	All taxiways at least 35' and not greater than 50' wide
	Runway/Parallel Taxiway separation - 300'	Maintain	Evaluate Runway/Parallel Taxiway separation at 400'
	Hold apron serving both runway ends	Maintain	Maintain
	Direct apron access allowed via Taxiways A2, A3, and A4	Examine taxiway system for safety, efficiency, and proper geometry	Examine taxiway system for safety, efficiency, and proper geometry
	TOFA penetrations west of Taxiway A	Examine taxiway system for safety	Examine taxiway system for safety
		Runway 7-25	
	All taxiways at least 25' wide	Maintain	Maintain
	Runway/Parallel Taxiway separation - 150'	Maintain	Maintain
	Taxiway A intersects runway high-energy area	Examine taxiway system for safety, efficiency, and proper geometry	Examine taxiway system for safety, efficiency, and proper geometry
NAVIGATIONAL AND APPROACH AIDS			
	RNAV (GPS) Approach - Runway 15-33	Maintain / Evaluate 3/4-mile visibility minimums	Maintain
	VOR-B Approach (circling only)	Maintain	Maintain
	ASOS	Maintain	Maintain
	Lighted Wind Cones	Maintain	Maintain
	Segmented Circle	Maintain	Maintain
	VASI-4 - Runway 15-33	Maintain	Consider PAPI-4 - Runway 15-33
	REILs - Runway 15-33	Maintain	Maintain
	Rotating Beacon	Maintain	Maintain
LIGHTING, MARKING, AND SIGNAGE		**Runway 15-33**	
	MIRL with LED technology	Maintain	Maintain
	MITL - Parallel and Entrance/Exit Taxiways with LED technology	Maintain	Maintain
	Non-Precision markings	Maintain	Maintain
	Hold line positions - 200' from runway centerline	Evaluate relocating hold line positions to 250'	Evaluate relocating hold line positions to 293'
	Lighted airfield location, directional, and distance remaining signage (LED technology)	Maintain	Maintain
		Runway 7-25	
	No runway lighting - daytime use only	Maintain	Maintain
	Elevated edge reflectors on taxiways	Maintain	Maintain
	Basic markings	Maintain	Maintain
	Hold line positions - 125' from runway centerline	Maintain	Maintain
	Lighted airfield location and directional signage (LED technology)	Maintain	Maintain

KEY

ASOS - Automated Surface Observation System
DTW - Dual Tandem Wheel Loading
DWL - Dual Wheel Loading
GPS - Global Positioning System
LED - Light Emitting Diode
MIRL - Medium Intensity Runway Lighting
MITL - Medium Intensity Taxiway Lighting
PAPI - Precision Approach Path Indicator
RDC - Runway Design Code
REILs - Runway End Identification Lights
RNAV - Area Navigation
ROFA - Runway Object Free Area
RPZ - Runway Protection Zone
RSA - Runway Safety Area
SWL - Single Wheel Loading
TOFA - Taxiway Object Free Area
VASI - Visual Approach Slope Indicator

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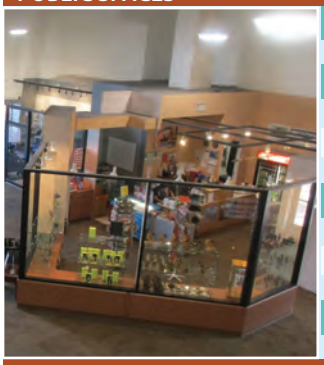
			Short Term	Intermediate Term	Long Term
DEPARTURES PROCESSING					
	***Ticket Counters***				
	Agent Positions	#	2	2	2
	Frontage	LF	12	12	12
	Area	SF	130	130	130
	Ticket Lobby				
	Queuing Area	SF	150	170	230
	TSA Baggage Check	SF	240	240	240
	Outbound Baggage	SF	580	580	580
	Airline Ticket Office	SF	250	250	250
	Ticket Lobby Circulation	SF	140	140	140
	Public Area				
	Circulation	SF	1,680	1,900	2,520
	Security Stations				
	Number	#	1	1	1
	Queuing Area	SF	100	110	140
	Station Area	SF	360	360	360
	TSA Administration/Operations	SF	700	700	700
CONCOURSE FACILITIES					
	***Passenger Holdrooms***				
	Gates	#	1	2	2
	Holdroom Area	SF	850	1,320	1,480
	Airline Operations	SF	1,000	1,000	1,000
	Concourse Circulation				
	Circulation Area	SF	260	400	440
ARRIVALS PROCESSING					
	***Baggage Claim***				
	Passengers Claiming Bags	85%	26	29	38
	Claim Display Frontage	LF	20	20	30
	Claim Device Floor Area	SF	100	100	150
	Inbound Baggage	SF	320	320	480
	Baggage Service Office	SF	40	40	60
	Claim Lobby				
	Area Excl. Device Area	SF	610	690	910
	Circulation Area	SF	360	410	550
PUBLIC SPACES					
	***Restrooms***				
	Area	SF	290	330	430
	Concessions				
	Food & Beverage	SF	150	180	230
	Retail	SF	60	70	100
	Support	SF	40	50	70
	Rental Car				
	Counter Frontage LF	6	7	9	
	Counter and Office Area	SF	90	100	140
	Counter Queuing Area	SF	50	50	70
	Airport Administration				
	Administration/Operations	SF	500	500	700
FUNCTIONAL AREA TOTAL					
	Total Programmed Functional Area	SF	9,050	10,140	12,100
BUILDING SYSTEMS/SUPPORT					
	Mechanical/HVAC	SF	360	410	480
	General Circulation/Stairwells/Storage	SF	910	1,010	1,210
TOTAL TERMINAL AREA					
	Gross Building Area	***SF***	***10,320***	***11,560***	***13,790***

LF - Linear Feet SF - Square Feet

The first destination for enplaning passengers in the terminal building is usually the airline ticket counter. The ticketing area consists of the ticket counters, queuing area for passengers in line at the counters, and the ticket lobby which provides circulation.

The ticket lobby should be arranged so that the enplaning passenger has immediate access and clear visibility to the individual airline ticket counters upon entering the building. Circulation patterns should allow the option of bypassing the counters with minimum interference. Provisions for seating should be minimal to avoid congestion and to encourage passengers to proceed to the gate area. Airline ticket counter frontage, counter area, counter queuing area, ticketing lobby, and airline office and operations area requirements for each potential enplanement level have been calculated. The amount of space needed in this area could be reduced with extensive curb and/or parking lot check-in options.

Ground level loading and unloading of passengers would be appropriate for Page Municipal Airport through the long-term planning horizon, with up to two departure gates possibly needed. Without an adequate number of gates, airline schedules may need to be coordinated to avoid overlapping arriving or departing aircraft.

The number of gates required to accommodate the combined peak hour activity and the aircraft seating capacities determine secure passenger hold room capacity requirements. Hold rooms should be sized to provide adequate space and area for the largest group of people that can use each gate. Introducing larger commercial aircraft capable of seating more than 50 passengers could likely trigger the need for additional hold room area.

The passenger arrival process consists primarily of those facilities and functions that reunite arriving passengers with their checked baggage. The existing baggage claim area in the terminal building is limited and forecasts call for a significant increase in the size of the current baggage claim handling and lobby/pick-up area through the long-term.

The public lobby is where passengers or visitors may comfortably relax while waiting for arrivals or departures. In today's environment, visitors must remain out of the secure departure areas, so a public lobby is important. At Page Municipal Airport, since most passengers will not be local, the amount of space needed for a public lobby area will be limited.

Unlike fixed-wing air tour operations, space for security passenger screening will be needed for scheduled airline activities. A single security screening station should be adequate through the long-term planning horizon.

Public spaces include passenger and visitor-orientated amenities, concessions, restrooms, and rental car facilities. These space requirements, in addition to other support needs such as airport administration and operations, are outlined in **Exhibit 3F**. Given that the airport primarily caters to tourists, demand for rental cars and shuttle services could be higher than the typical airport with similar forecasted enplanement levels.

Building support facilities include all miscellaneous spaces at the airport, including mechanical, telephone, business centers, walls/structures, and general circulation. As other components of the airport increase in size, so will supporting spaces.

As indicated, an approximate 10,300 square-foot terminal could accommodate the short-term enplanement projection of 12,200. With a long-term projection of 19,200 annual enplanements, planning should consider allowing for 13,790 square feet of terminal floor space. The alternatives analysis to be conducted later in this study will explore options for the airport to meet potential scheduled commercial service airline demands.

Air Tour Facility Requirements

Currently, fixed-wing air tour operations are conducted from the existing terminal building. As previously mentioned, the existing airport terminal building provides for approximately 8,100 square feet of floor area on the lower level. The majority of this space is utilized for activities associated with air tour operations. **Exhibit 3G** presents a functional breakdown of the future demand requirements for the terminal building in order to meet projected air tour enplanements.

It is important to note that the functional space requirements for air tour operations do not include security screening as these flights typically do not operate under Title 14 CFR Part 139. The need for passengers to carry baggage is also minimal with these types of operations; therefore, baggage handling and claim functions are not factored into terminal facility needs for air tour operations.

As air tour passenger enplanements are forecast to increase through the long-term planning period, the space requirements for terminal facilities is expected to increase. In the short-term planning horizon, this could grow to approximately 10,000 square feet, and by the long term, approximately 12,730 square feet of terminal area will be needed to support air tour activities.

Terminal Building Access Requirements

The passenger terminal building serves as the primary interface between air and ground transportation. Ground access to the terminal area is an important consideration as access and convenience can positively influence the development of an airport.

The capacity of the airport access and terminal area roadways is the maximum number of vehicles that can pass over a section of a lane or roadway during a given time period. It is normally preferred that a roadway operates below capacity to provide reasonable flow and minimize delay to the vehicles using it. Access to/from Page Municipal Airport, and more specifically to the terminal area, was detailed in Chapter One. Access to the terminal building is provided by a four-lane, one-way road that leads to the terminal building curb.

		Short Term	Intermediate Term	Long Term
DEPARTURES PROCESSING				
Ticket Counters				
Agent Positions	#	4	4	5
Frontage	LF	24	24	30
Area	SF	250	250	320
Ticket Lobby				
Queuing Area	SF	240	260	300
Airline Ticket Office	SF	500	500	630
Ticket Lobby Circulation	SF	280	280	350
Public Area				
Waiting Lobby/Circulation	SF	790	860	980
CONCOURSE FACILITIES				
Passenger Holdrooms				
Gates	#	5	5	6
Holdroom Area	SF	1,930	1,990	2,340
Airline Operations	SF	3,000	3,300	3,900
Concourse Circulation				
Circulation Area	SF	580	600	700
PUBLIC SPACES				
Restrooms				
Area	SF	430	470	540
Concessions				
Food & Beverage	SF	160	180	220
Retail	SF	100	110	140
Support	SF	80	90	110
Rental Car				
Counter Frontage	LF	3	3	3
Counter and Office Area	SF	40	40	50
Counter Queuing Area	SF	20	20	30
Airport Administration				
Administration/Operations	SF	450	490	560
FUNCTIONAL AREA TOTAL				
Total Programmed Functional Area	***SF***	***8,840***	***9,440***	***11,160***
BUILDING SYSTEMS/SUPPORT				
Mechanical/HVAC	SF	350	380	450
General Circulation/Stairwells/Storage	SF	890	940	1,120
TOTAL TERMINAL AREA				
Gross Building Area	***SF***	***10,080***	***10,760***	***12,730***

LF - Linear Feet
SF - Square Feet

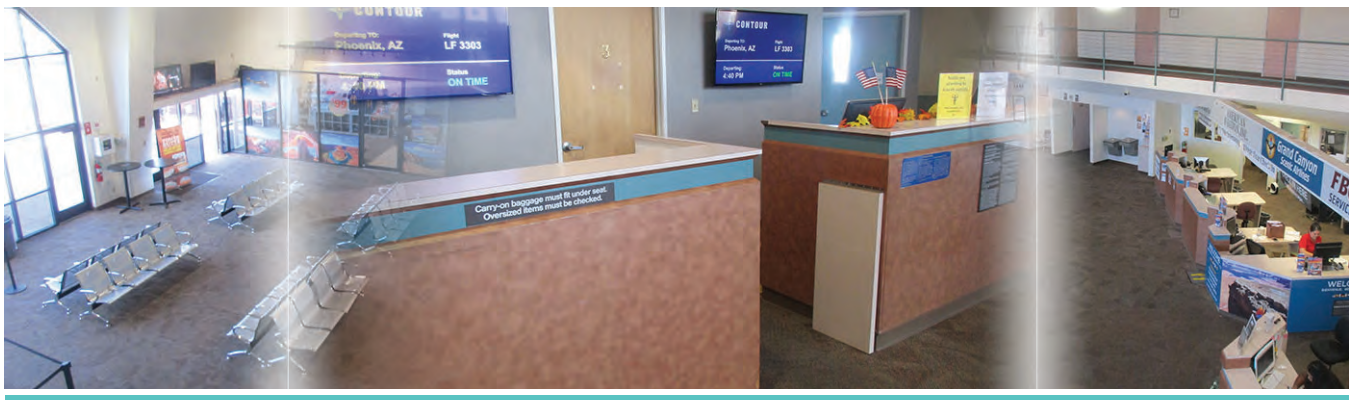


Exhibit 3G
AIR TOUR TERMINAL FACILITY REQUIREMENTS

The curb element is the interface between the terminal building and the ground transportation system. The length of curb required for the loading and unloading of passengers and baggage is determined by the type and volume of ground vehicles anticipated in the peak period on the design day.

A typical problem for terminal curb capacity is the length of dwell time for vehicles utilizing the curb. At airports where the curb front has not been strictly patrolled, vehicles have often been parked at the curb while the driver and/or riders are inside the terminal checking in, greeting arriving passengers, or awaiting baggage pick-up. Since most curbs are not designed for vehicles to remain curbside for more than two to three minutes, capacity problems can ensue. Since the events of September 11, 2001, most airports police the curb front much more strictly for security reasons. This alone has reduced the curb front capacity problems at most airports.

The existing terminal building curb is approximately 180 feet in length. The mix at the curb during peaking periods can include buses, shuttles, and individual vehicles. The existing and projected terminal curb needs at Page Municipal Airport for scheduled commercial service activities are presented in **Table 3H**. The current length is adequate through the long-term planning horizon.

TABLE 3H
Scheduled Commercial Service Curb and Parking Requirements
Page Municipal Airport

	Short Term	Intermediate Term	Long Term
Annual Enplanements	12,200	14,600	19,200
Terminal Curb Length (ft)	70	80	100
Parking Spaces			
Vehicle Parking	20	23	31
Shuttle Parking	1	2	2
Rental Car Ready/Return	14	17	22
Employee Parking	5	6	6
Total Parking	**40**	**48**	**61**

Source: Coffman Associates analysis

Vehicle parking in the passenger terminal area of the airport includes those spaces utilized by passengers, visitors, and employees of the terminal complex. Parking spaces can be classified as public, employee, and rental car.

Public parking is located in surface lots in the terminal area. This parking area currently contains approximately 90 spaces for individual vehicle parking and five marked spaces for buses. It should be noted that the vehicle parking spaces in the terminal area serve activities related to scheduled commercial service, air tour, and general aviation operations.

As an airport located in a remote tourist location, most passengers utilizing the airport are visitors in the area. As a result, the ratio of public parking to enplaned passengers will be lower than might be expected in typical airport settings. The scheduled airline terminal area parking requirements can be expected to have a much higher rental car requirement as many destination passengers will be looking for transportation in order to tour the area. In doing so, space for buses and shuttles is projected to be much less than those associated with air tour activities. As presented on **Table 3J**, total parking requirements for the long term are projected at approximately 60 spaces made up of several parking functions including individual, buses and shuttles, rental car, and employee.

Table 3J presents the curb and parking requirements associated with air tour activities. Parking requirements associated with air tour operations were based upon a ratio to peak hour passengers. These would involve persons visiting the area that drive and park at the airport to take part in an air tour. Bus parking is another component to consider in parking requirements as large groups of individuals often arrive at the airport via a bus or shuttle in order to take an air tour. Space is currently provided in the terminal area to accommodate these buses or shuttles. The requirements for these operations are based upon a ratio of design day passengers that will utilize buses or shuttles. Since most individuals utilizing air tours already have other ground transportation on arrival, rental car requirements associated with this activity are limited.

TABLE 3J
Air Tour Curb and Parking Requirements
Page Municipal Airport

	Short Term	Intermediate Term	Long Term
Annual Enplanements	49,400	56,200	68,400
Terminal Curb Length (ft)	120	130	170
Parking Spaces			
Vehicle Parking	57	62	71
Shuttle Parking	4	5	6
Rental Car Ready/Return	7	8	10
Bus Parking	6	7	8
Employee Parking	9	9	11
Total Parking	**83**	**91**	**106**

Source: Coffman Associates analysis

From this analysis, the existing terminal area falls short of accommodating parking requirements for scheduled commercial service and air tour operations combined. The alternatives phase of the Master Plan will further evaluate options to meet potential parking requirements outlined in this chapter based on the functional uses previously detailed.

GENERAL AVIATION ACTIVITIES

General aviation facilities are those necessary for handling general aviation aircraft, passengers, and cargo while on the ground. This section is devoted to identifying future general aviation facility needs during the planning period for the following types of facilities normally associated with general aviation terminal areas.

- General Aviation Terminal Services
- Aircraft Hangars
- Aircraft Parking Aprons

General Aviation Terminal Services

The general aviation terminal facilities at an airport are often the first impression of the community that corporate officials and other visitors will encounter. General aviation terminal facilities at an airport provide space for passenger waiting, pilot's lounge, flight planning, concessions, management, storage, and many other various needs. This space is not necessarily limited to a single, separate terminal

building, but can include space offered by fixed base operators (FBOs) and other specialty operators for these functions and services. At Page Municipal Airport, general aviation terminal services are primarily provided by the three FBOs on the airfield: Lake Powell Jet Center, Classic Aviation, and American Aviation. Most general aviation terminal activities utilize space provided by the FBOs. The airport terminal building can also cater to basic general aviation functions. However, it is primarily utilized for scheduled commercial service and air tour activities and, as such, was not included as part of these calculations.

The methodology used in estimating general aviation terminal facility needs was based on the number of airport users expected to utilize general aviation facilities during the design hour. Space requirements for terminal facilities were based on providing 125 square feet per design hour itinerant passenger. A multiplier of 2.7 in the short term, increasing to 3.0 in the long term, was also applied to terminal facility needs to better determine the number of passengers associated with each itinerant aircraft operation. This increasing multiplier indicates an expected increase in larger aircraft operations through the long term. These operations typically support larger turboprop and jet aircraft, which can accommodate an increasing passenger load factor. Such is the case at Page Municipal Airport, as the airfield is expected to experience an increase in larger aircraft operations through the long-term planning period.

Table 3K outlines the space requirements for general aviation terminal services at Page Municipal Airport through the long-term planning period. As shown in the table, up to 4,500 square feet of space could be needed in the long term for general aviation passengers. The amount of space currently offered by the FBO is unknown; however, their respective facilities currently provide space for several general aviation functions. These spaces include designated areas for a passenger waiting lobby, flight planning, pilot lounge, restroom facilities, and other amenities. Other specialty aviation operators on the airfield also provide space for pilots and passengers. It can be assumed that adequate services and space are provided to accommodate their customers.

TABLE 3K
General Aviation Terminal Area Facilities
Page Municipal Airport

	Currently Available	Short-Term Need	Intermediate-Term Need	Long-Term Need
General Aviation Services Facility Area (s.f.)	N/A	3,000	3,600	4,500
General Aviation Design Hour Passengers		24	29	36
Passenger Multiplier		2.7	2.8	3.0
General Aviation Vehicle Parking Spaces	125[1]	61	69	80

N/A - Approximate terminal space offered by FBOs is unknown.
[1]Approximate number of total marked vehicle parking spaces at the airport including the terminal building which shares parking for scheduled commercial service, air tour, and general aviation activities.
Source: Coffman Associates analysis

General aviation vehicular parking demands have also been determined for Page Municipal Airport. Space determinations for passengers were based on an evaluation of existing airport use, as well as standards set forth to help calculate projected terminal facility needs.

The parking requirements of based aircraft owners and tenants should also be considered. Although some owners prefer to park their vehicles in their hangar, safety can be compromised when automobile and aircraft movements are intermixed. For this reason, separate parking requirements, which consider one-half of based aircraft at the airport, were applied to general aviation automobile parking space requirements. Utilizing this methodology, parking requirements for general aviation activity call for approximately 61 spaces in the short term, increasing to approximately 80 spaces in the long-term planning horizon. It is estimated that there are 125 marked vehicle parking spaces at Page Municipal Airport currently serving various airport activities, including the FBOs as well as commercial service and air tour functions. Future consideration in the master plan will be given to providing vehicle parking to support additional general aviation development potential as well as better segregation of vehicle parking, distinguishing general aviation activities from scheduled commercial service and air tour activities.

Additionally, the airport terminal building parking area provides 192 vehicle parking spaces for airport staff, visitors, rental cars, and employees of service providers located in the terminal building. The terminal parking area is not included in this analysis.

Aircraft Hangars

Utilization of hangar space varies as a function of local climate, security, and owner preference. The trend in general aviation aircraft is toward more sophisticated (and consequently, more expensive) aircraft; therefore, many aircraft owners prefer enclosed hangar space as opposed to outside tiedowns.

The demand for aircraft storage hangars is dependent upon 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 upon forecast operational activity. However, hangar development should be based upon actual demand trends and financial investment conditions.

While most aircraft owners prefer enclosed aircraft storage, several based aircraft will still use outdoor tiedown spaces, usually due to lack of available hangar space, high hangar rental rates, or operational needs. Therefore, enclosed hangar facilities do not necessarily need to be planned for each based aircraft. At Page Municipal Airport, approximately 80 percent of based aircraft utilize hangar space, while the remaining 20 percent are stored outside on aircraft parking aprons.

As discussed in Chapter One, hangar types vary greatly in size and function. T-hangars, linear box hangars, and port-a-port hangars are popular with aircraft owners that need to store one private aircraft. These hangars often provide individual spaces within a larger structure or in standalone portable buildings. There is an estimated 69,000 square feet of storage space at the airport comprised of T-hangars, linear box hangars, and port-a-port hangars. For determining future aircraft storage needs, a planning standard of 1,200 square feet per aircraft is utilized for these types of hangars.

Executive box hangars are open space facilities with no interior supporting structure. These hangars can vary in size between 1,500 and 2,500 square feet, with some approaching 10,000 square feet. They are

typically able to house single engine, multi-engine, turboprop, and jet aircraft, as well as helicopters. Executive box hangar space at Page Municipal Airport is estimated at 121,000 square feet. For future planning, a standard of 2,500 square feet per aircraft is utilized for executive box hangars.

Conventional hangars are the large, open space facilities with no supporting interior structure. These hangars provide for bulk aircraft storage and are often utilized by airport businesses, such as an FBO or an aircraft maintenance operator. Conventional hangars are generally larger than executive box hangars and can range in size from 10,000 square feet to more than 20,000 square feet. Often, a portion of a conventional hangar is utilized for non-aircraft storage needs, such as maintenance or office space. There is one conventional hangar at Page Municipal Airport totaling approximately 16,000 square feet. For future planning needs, 1,500 square feet per single engine aircraft is utilized for conventional hangars. For multi-engine, turboprop, and helicopters, 2,500 square feet is utilized. For jet aircraft, a planning standard of 5,000 square feet per aircraft is used. Since portions of the hangars are known to be used for aircraft maintenance servicing, requirements for maintenance/service hangar area were estimated using a planning standard of 125 square feet per based aircraft. In total, there is currently approximately 206,000 square feet of hangar, maintenance, and office space provided on the airport.

Future hangar requirements for the airport are summarized in **Table 3L**. While some based aircraft will continue to utilize aircraft parking apron space as opposed to enclosed hangar space, the overall percentage of aircraft seeking hangar space is projected to increase during the long-term planning period.

TABLE 3L
Aircraft Hangar Requirements
Page Municipal Airport

	Currently Available	Short-Term Need	Intermediate-Term Need	Long-Term Need
Total Based Aircraft	68	74	80	88
Aircraft to be Hangared	53	60	67	76
Hangar Area Requirements				
T-Hangar, Linear Box Hangar, Port-a-Port Hangar (s.f.)	69,000	71,100	73,200	78,000
Executive Box Hangar Area (s.f.)	121,000	126,000	131,000	136,000
Conventional Hangar Area (s.f.)	16,000	27,500	39,000	50,500
Maintenance Area (s.f.)	--	7,500	15,900	25,400
Total Hangar Area (s.f)	**206,000***	**232,100**	**259,100**	**289,900**

Note: *Includes total hangar and maintenance area currently at the airport
Source: Coffman Associates analysis

The analysis shows that future hangar requirements indicate a potential need for over 289,900 square feet of hangar storage space through the long-term planning period. This includes a mixture of hangar area, with the largest needs projected in the executive box hangar and conventional hangar categories. Due to the projected increase in based aircraft, annual general aviation operations, and hangar storage needs, facility planning will consider additional hangars at the airport. It is expected that the aircraft storage hangar requirements will continue to be met through a combination of hangar types.

It should be noted that hangar requirements are general in nature and based upon the aviation demand forecasts. The actual need for hangar space will further depend on the usage within the hangars. For example, some hangars may be utilized entirely for non-aircraft storage, such as maintenance; yet from a planning standpoint, they have an aircraft storage capacity. Therefore, the needs of an individual user may differ from the calculated space necessary.

Aircraft Parking Aprons

The aircraft parking apron is an expanse of paved area intended for aircraft parking and circulation. FAA Advisory Circular 150/5300-13A, *Airport Design*, suggests a methodology by which transient apron requirements can be determined from knowledge of busy day operations. The number of itinerant parking spaces required was determined to be approximately 25 percent of the busy day itinerant operations for general aviation operations. A planning standard of 800 square yards per aircraft was applied to determine future transient apron requirements for single and multi-engine piston aircraft. For business jets, which oftentimes are much larger, a planning standard of 1,600 square yards per aircraft position was used. In addition, Page Municipal Airport has aircraft that use outside aircraft tiedowns for storage. It is assumed that these aircraft require less space than transient aircraft; therefore, a planning standard of 650 square yards per aircraft was applied. For local tiedown needs, an additional 10 spaces were identified for maintenance activities. Apron parking requirements are presented in **Table 3M**. Transient apron parking needs are divided into business jet needs and smaller single and multi-engine aircraft needs.

TABLE 3M
Aircraft Parking Apron Requirements
Page Municipal Airport

	Currently Available	Short-Term Need	Intermediate-Term Need	Long-Term Need
Local Aircraft Parking		24	23	22
Transient General Aviation		20	22	25
Jet/Turboprop Aircraft Parking		10	12	15
Total Apron Area (s.y.)	**89,500**	**47,600**	**51,800**	**58,300**

Source: Coffman Associates analysis

Currently, existing general aviation aircraft parking aprons at the airport total approximately 89,500 square yards of space and provide 96 marked aircraft parking positions. This includes city tiedowns as well as tiedowns associated with FBOs and other specialty aviation operators. As shown in the table, the apron area currently available is adequate and will remain adequate through the long-term planning period.

In addition to fixed-wing aircraft parking, areas should also be dedicated for helicopter parking. Helicopters also operate on various apron areas shared by fixed-wing aircraft. Helicopter operations should be segregated to the extent practicable to increase safety and efficiency of aircraft parking aprons.

Designated helicopter parking spaces can be found on the terminal apron. Long-term facility planning should continue to account for helicopter parking.

A summary of the general aviation landside facilities previously discussed is presented on **Exhibit 3H**.

SUPPORT FACILITIES

Various other landside facilities that play a supporting role in overall airport operations have also been identified. These support facilities include:

- Aircraft Rescue and Firefighting (ARFF)
- Aviation Fuel Storage
- Perimeter Fencing and Gates

Aircraft Rescue and Firefighting

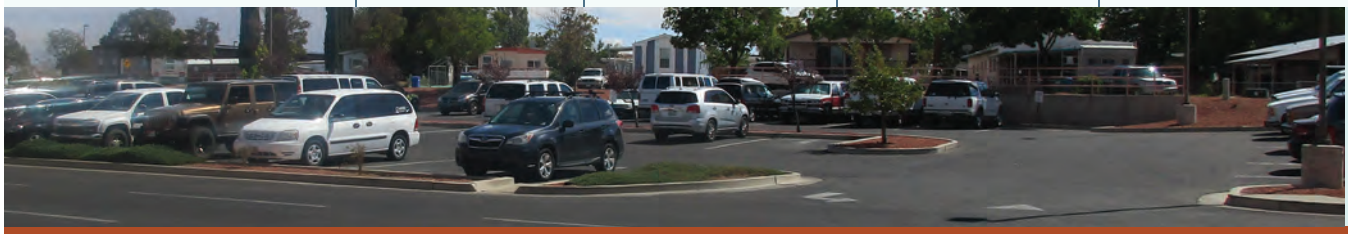
Requirements for aircraft rescue and firefighting (ARFF) services at an airport are established under Title 14 CFR Part 139, which applies to the certification and operation of airports served by any scheduled or unscheduled passenger operation of an air carrier using an aircraft with nine or more passenger seats. Paragraph 139.315 establishes ARFF Index ratings based on the length of the largest aircraft with an average of five or more daily departures.

The following indicates the requirements for each ARFF Index and the associated equipment requirements:

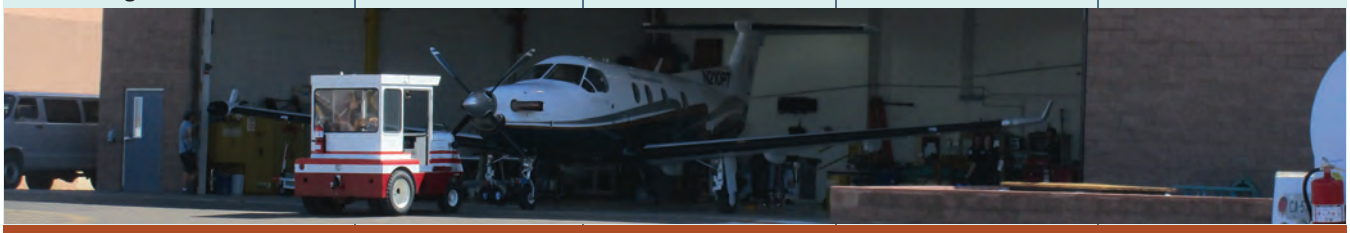
- **Index A** - Includes aircraft less than 90 feet in length (Saab 340, Embraer ERJ-135).
- **Index B** - Includes aircraft at least 90 feet but less than 126 feet in length (Embraer ERJ-145, Bombardier CRJ-700, Boeing 737).
- **Index C** - Includes aircraft at least 126 feet but less than 159 feet in length (MD-83, Boeing 757).
- **Index D** - Includes aircraft at least 159 feet but less than 200 feet in length (Boeing 767).
- **Index E** - Includes aircraft at least 200 feet in length (Boeing 747).

The Page Municipal Airport ARFF facility must currently provide Index A for airline service (ERJ-135) according to the Airport Certification Manual. Index B could be applicable in the long-term planning period if the airport were to accommodate daily departures with aircraft between 90 feet and 126 feet in length, such as the ERJ-145 series. **Table 3N** presents the vehicle requirements and capacities for each index level. The existing ARFF facility provides desirable access to the airfield system.

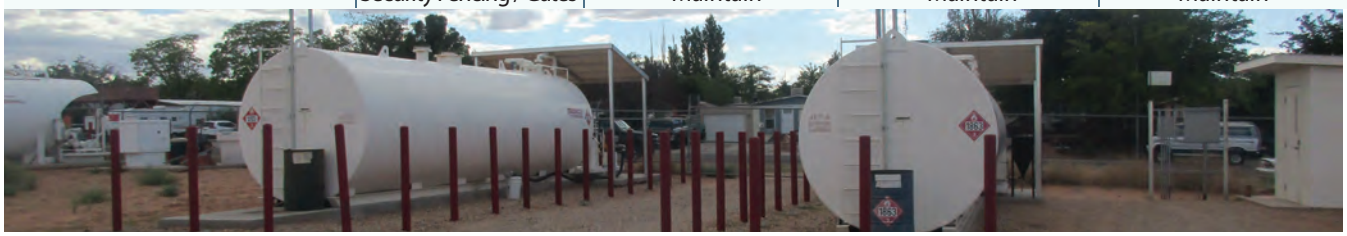
	AVAILABLE	SHORT TERM	INTERMEDIATE TERM	LONG TERM
GENERAL AVIATION TERMINAL SERVICES				
General Aviation Services Facility Area (s.f.)	N/A	3,000	3,600	4,500
General Aviation Vehicle Parking Spaces	125[1]	61	69	80



AIRCRAFT STORAGE HANGAR REQUIREMENTS				
Total Based Aircraft	68	74	80	88
Aircraft to be Hangared	53	60	67	76
T-Hangar/Linear Box Hangar/ Port-a-Port Hangar (s.f.)	69,000	71,100	73,200	78,000
Executive Box Hangar (s.f.)	121,000	126,000	131,000	136,000
Conventional Hangar (s.f.)	16,000	27,500	39,000	50,500
Maintenance Area (s.f.)	--	7,500	15,900	25,400
Total Hangar Area (s.f.)	**206,000**[2]	**232,100**	**259,100**	**289,900**



AIRCRAFT PARKING APRON REQUIREMENTS				
Local Aircraft Parking	--	24	23	22
Transient General Aviation Parking	--	20	22	25
Jet/Turboprop Aircraft Parking	--	10	12	15
Total Apron Area (s.y.)	**89,500**	**47,600**	**51,800**	**58,300**
SUPPORT FACILITIES				
Fuel Storage - 100LL	38,450 gallons	Based on Fixed Base Operator Aircraft Demand		
Fuel Storage - Jet A	50,000 gallons			
	ARFF - Index A	ARFF - Index A	ARFF - Index A	Consider ARFF - Index B
	Security Fencing / Gates	Maintain	Maintain	Maintain



[1]Approximate number of total marked vehicle parking spaces at the airport including the terminal building which shares parking for scheduled commercial service, air tour, and general aviation activities

[2]Includes total hangar and maintenance area currently at airport

TABLE 3N
ARFF Index Requirements

Index	Aircraft Length	Requirements
Index A	<90'	1. One ARFF vehicle with 500 lbs. of sodium-based dry chemical or 2. One vehicle with 450 lbs. of potassium-based dry chemical and 100 lbs. of water and AFFF for simultaneous water and foam application
Index B	90'-126'	1. One vehicle with 500 lbs. of sodium-based dry chemical and 1,500 gallons of water and AFFF or 2. Two vehicles, one with the requirements for Index A and the other with enough water and AFFF for a total quantity of 1,500 gallons
Index C	126'-159'	1. Three vehicles; one having Index A, and two with enough water and AFFF for all three vehicles to combine for at least 3,000 gallons of agent or 2. Two vehicles; one with Index B and one with enough water and AFFF for both vehicles to total 3,000 gallons
Index D	159'-200'	1. One vehicle carrying agents required for Index A and 2. Two vehicles carrying enough water and AFFF for a total quantity by the three vehicles of at least 4,000 gallons
Index E	>200'	1. One vehicle with Index A and 2. Two vehicles with enough water and AFFF for a total quantity of the three vehicles of 6,000 gallons

AFFF: Aqueous Film-Forming Foam
ARFF: Aircraft Rescue and Firefighting

Source: Title 14 Code of Federal Regulations Part 139

Aviation Fuel Storage

There are three fuel farms located on the airport that currently store fuel for aviation use. All three fuel farms are owned, operated, and maintained by the FBOs.

Lake Powell Jet Center owns one 12,000-gallon capacity 100LL storage tank and one 12,000-gallon Jet A storage tank. Both tanks are aboveground. Lake Powell Jet Center offers full-service fueling capabilities via trucks to deliver fuel to aircraft.

Classic Aviation also owns a fuel farm, which includes two aboveground storage tanks. A 12,000-gallon 100LL storage tank and a 12,000-gallon capacity Jet A storage tank are available. Classic Aviation also offers full-service fueling capabilities via trucks to deliver fuel to aircraft.

American Aviation owns a third fuel farm on the airport. Similar to the other FBOs, this fuel farm consists of a 12,000-gallon capacity 100LL storage tank and a 12,000-gallon capacity Jet A storage tank. Both are aboveground. American Aviation offers full-service fueling, but the storage capabilities of their trucks is unknown.

As presented in **Table 3P**, there is 51,750 gallons of fuel storage capacity on airport property utilized for the re-sale of fuel for commercial aviation activities. Approximately 52 percent of the storage capacity is dedicated to Jet A fuel.

TABLE 3P
Airport Fuel Storage Capacity
Page Municipal Airport

	Tank Storage Capacity (Gallons)	Truck Storage Capacity (Gallons)	Total Storage Capacity (Gallons)
100LL (Avgas)	36,000	2,450*	38,450
Jet A	36,000	14,000*	50,000

*Does not include truck storage capacity for American Aviation
Source: Airport Records

Fuel storage requirements are typically based upon keeping a two-week supply of fuel during an average month; however, more frequent deliveries can reduce the fuel storage capacity requirements. Generally, fuel tanks should be of adequate capacity to accept a full refueling tanker, which is approximately 8,000 gallons, while maintaining a reasonable level of fuel in the storage tank. Future aircraft demand experienced by the FBOs will determine the need for additional fuel storage capacity. It is important that airport personnel work with the FBOs to plan for adequate levels of fuel storage capacity through the long-term planning period of this study.

Perimeter Fencing and Gates

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 legal boundary of the outermost limits of the 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 the aircraft operations areas on the airport;
- Creates a psychological deterrent;
- Demonstrates a corporate concern for facilities; and
- Limits inadvertent access to the aircraft operations area by wildlife.

Page Municipal Airport operations areas are completely enclosed by a six-foot chain-link fence topped by three-strand barbed-wire. The fence does not always follow the airport property line due to the physical terrain of the area and the layout of the airport property. A series of controlled access gates are also available for use at the airport.

SUMMARY

This chapter has outlined the safety design standards and facilities required to meet potential aviation demand projected at Page Municipal Airport for the next 20 years. In an effort to provide a more flexible master plan, the yearly forecasts from Chapter Two have been converted to planning horizon levels. The short term roughly corresponds to a 5-year timeframe, the intermediate term is approximately 10 years, and the long term is 20 years. By utilizing planning horizons, airport management can focus on demand indicators for initiating projects and grant requests rather than on specific dates in the future.

In Chapter Four, potential improvements to the airside and landside systems will be examined through a series of airport development alternatives. Most of the alternatives discussion will focus on those capital improvements that would be eligible for federal and state grant funds. Other projects of local concern will also be presented. Ultimately, an overall airport development plan that presents a vision beyond the 20-year scope of this master plan will be developed for Page Municipal Airport.



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Chapter Four

AIRPORT ALTERNATIVES









AIRPORT ALTERNATIVES

In the previous chapter, airside and landside facilities required to satisfy the demand through the long-range planning period were identified. The next step in the planning process is to evaluate reasonable ways these facilities can be provided. There can be numerous combinations of design alternatives, but the alternatives presented here are those with the perceived greatest potential for implementation.

Any development proposed for a master plan is evolved from an analysis of projected needs for a set period of time. Though the needs were determined by utilizing industry-accepted statistical methodologies, unforeseen future events could impact the timing of the needs identified. The master planning process attempts to develop a viable concept for meeting the needs caused by projected demands for the next 20 years. However, no plan of action should be developed which may be inconsistent with the future goals and objectives of the City of Page, which has a vested interest in the development and operation of Page Municipal Airport.

The development alternatives for the airport can be categorized into two functional areas: the **airside** (runways, navigational aids, taxiways, etc.) and **landside** (terminal, hangars, apron, and support facilities). Within each of these areas, specific capabilities and facilities are required or desired. In addition, the utilization of airport property to provide revenue support and to benefit the economic development and well-being of the local area must be considered.



Each functional area interrelates and affects the development potential of the others. Therefore, all areas are examined individually and then coordinated as a whole to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors on the airport must be evaluated to determine if the investment in the airport will meet the needs of the City of Page, both during and beyond the 20-year planning period.

The alternatives considered later in this chapter will be evaluated by a variety of methods to determine which of the alternatives will best fulfill the local aviation needs. With this information, as well as input from various airport stakeholders, a final master plan concept can evolve into a realistic development plan.

NON-DEVELOPMENT ALTERNATIVES

Prior to the presentation of development alternatives, there are several non-development options that should be considered. Non-development alternatives include a "no-build" or "do-nothing" alternative, development of a replacement airport at a new location, or closure of the existing airport and the transfer of services to another existing airport. The following will present a discussion of the three primary non-development alternatives and the impact of pursuing each.

NO-BUILD/DO-NOTHING ALTERNATIVE

The no-build alternative essentially considers making no new capital investments in the airport. Limited maintenance and upkeep would continue so that the airport remains safe for aviation activity. No new hangars or apron area would be planned to be built by the airport sponsor; however, this would not, and could not, include the prohibition of hangar construction by a private entity. The obvious result of the no-build alternative is that the airport would be unable to meet the forecast demand for aviation services in the area.

The primary reason a community might choose a no-build alternative is to ultimately not be bound by the grant assurances associated with the acceptance of airport development grants. As described in the previous section, grant assurances are part of the grant package contract that the airport sponsor commits to when accepting a development grant from the Federal Aviation Administration (FAA). As such, airport sponsors are bound to maintain the useful life of the facilities developed or equipment acquired for an airport development project. Useful life is a term not to exceed twenty (20) years from the date of acceptance of a grant offer of federal (FAA) funds for a project. There is no limit on the duration of the terms, conditions, and assurances with respect to real property acquired with federal funds.

The airport has received more than $10.2 million in development grants since 2007. These grants represent a direct economic stimulus that has lasting positive economic impacts. The no-build alternative

means that the airport would forgo future grants for airport development, which would have a negative economic impact which, over time, would become more noticeable.

The City of Page has a vested interest in maintaining and improving airport facilities for general aviation and commercial users. Without a commitment to ongoing improvement of the airport, users of the airport will be constrained from taking full advantage of the airport's air transportation capabilities.

The unavoidable consequence of the no-build alternative is that the capability of the airport would diminish over time. Its ability to serve the community as a commercial service and general aviation airport would deteriorate. This would lead to diminished activity levels and would ultimately negatively impact the local and regional economy. Safety concerns would arise, especially if routine maintenance were deferred and the liability for damage to aircraft or accidents would increase. The long-term consequences of the no-build alternative would be to reduce the quality of the existing airport facilities over time. This scenario is inconsistent with the long-term goals of the FAA and Arizona Department of Transportation – Aeronautics Group (ADOT), which are to enhance local and interstate commerce. This alternative would negatively affect the long-term viability of the airport and its services to the City of Page.

TRANSFER OF AVIATION SERVICES

The alternative of shifting aviation services to another existing airport or development of a new airport site was also found to be an undesirable alternative. The development of a new airport is a very complex and expensive alternative. The idea of relocating the airport to a different location has been studied in several previous planning efforts, including the *Page Municipal Airport Site Selection Study* (1992) and *Page Municipal Airport: Airport Feasibility Study* (2004). Between these two studies, 16 alternate airport sites, as depicted on **Exhibit 4A**, were evaluated, and each study resulted in the same conclusion: the City of Page should continue to develop the existing airport site to meet the needs of the city and the surrounding northern Arizona region. A new site will require substantial land area, duplication of investment in airport facilities, installation of supporting infrastructure that is already available, and significant environmental impacts.

Cost estimates for the development of a new airport facility could range from a minimum of approximately $500 million up to $1 billion. Furthermore, the City of Page, FAA, and ADOT have all contributed significant improvements at the airport in recent years. In addition, it would take at least 10 years to construct a new airport given the planning, environmental clearances, design, and funding to implement such a facility.

Finally, another option is to transfer all services to another existing airport. There are very few airports in the area capable of serving aircraft operations currently taking place at Page Municipal Airport. The City of Page is the second largest population center in Coconino County behind only Flagstaff. The city is very rural and is situated in a unique location near Lake Powell and the Glen Canyon National Recreation Area, which draws a significant amount of tourism to the airport. The nearest commercial service airport is St. George Regional Airport (St. George, Utah), which is approximately 100 miles west of Page. The

next closest commercial service airport is in Flagstaff, Arizona, which is 130 miles south of Page. Both airports are over two hours' drive time from Page. The nearest airport offering air tours is Grand Canyon National Park Airport, which is 67 nautical miles to the southwest. As for general aviation activity, there are limited small general aviation airports in the vicinity, such as Marble Canyon Airport and Tuba City Airport. These airports lack adequate based aircraft storage space and provide limited services. Page Municipal Airport in its current location uniquely serves to connect the City of Page and its residents to the national airspace system. The continuing growth expected in the area demonstrates the need for a highly functional and convenient airport.

Based upon the aviation demand forecasts developed in Chapter Two, it has been determined that the airport can accommodate projected future demand in its current location. As a result, the transfer of aviation services is not a viable option for Page Municipal Airport.

NON-DEVELOPMENT ALTERNATIVES SUMMARY

The purpose of this master plan is to examine aviation needs at Page Municipal Airport over the course of the next 20 years. Therefore, this master plan will examine the needs of the existing airport and will present a program of recommended capital improvement projects to cover the scope of the plan. Nonetheless, various non-development alternatives may be considered by the airport sponsor.

Information pertaining to the three most common non-development alternatives has been presented. These are the no-build alternative, relocate/replacement alternative, and transfer of services alternative. This evaluation is not intended as a recommendation to pursue one of these alternatives; instead, it is for informational purposes only. If the airport sponsor were to pursue one of these alternatives, additional study beyond the scope of this master plan would be required.

Two of the three non-development alternatives would lead to the closure, or a significantly reduced operation, of the existing airport. There is a lengthy process to obtain approval for this course of action. As outlined, the primary hindrance to considering airport closure is the fact that airports have accepted federal development grants that include certain grant assurances, one of which is to maintain the improvement for its useful life (20 years). If an airport is closed in the interim, then the sponsor could be required to refund all or a portion of the past federal investment. Moreover, private investments by any airport operator would also require some form of repayment based on negotiated lease terms.

REVIEW OF PREVIOUS AIRPORT MASTER PLAN

The following is a summary of major facility recommendations from the previous master plan, which was completed in 2009. The Airport Layout Drawing (ALD), depicted on **Exhibit 4B**, further outlines airside and landside recommendations based upon previous airport planning. Major recommendations include the following.

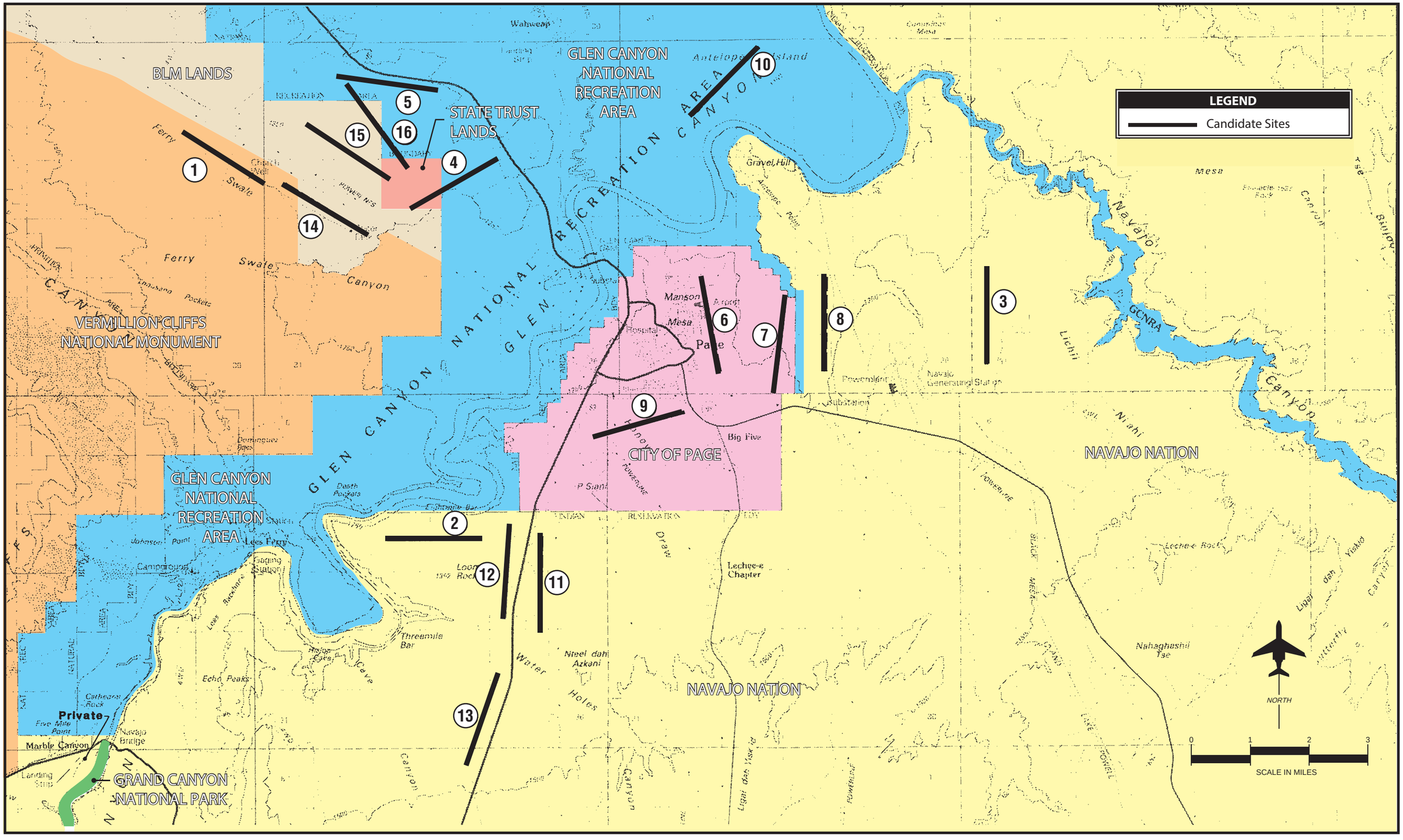

Exhibit 4A
2004 AIRPORT FEASIBILITY STUDY — ALTERNATE AIRPORT SITES

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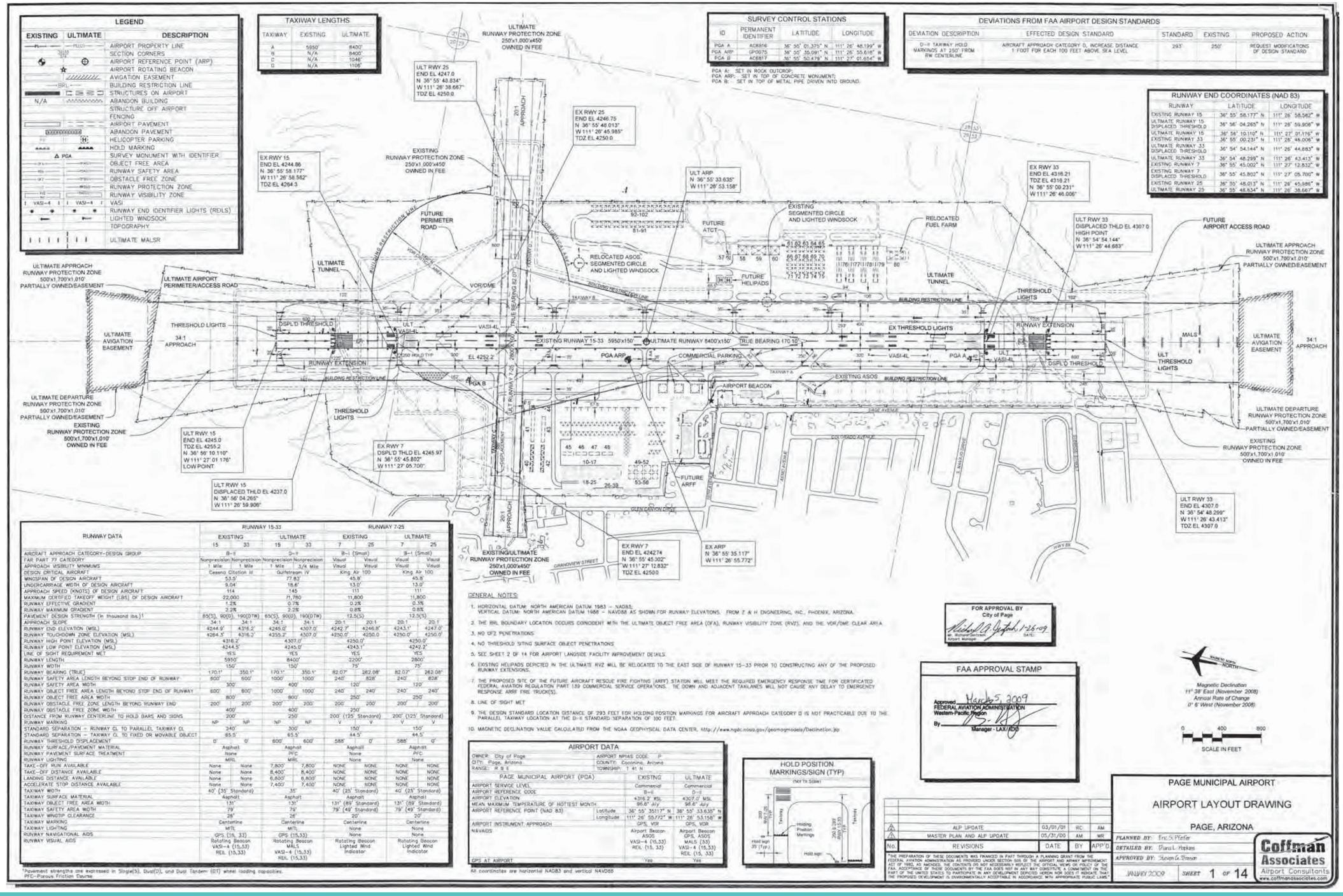

LEGEND		
EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		SECTION CORNERS
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
		BUILDING RESTRICTION LINE
		STRUCTURES ON AIRPORT
N/A		ABANDON BUILDING
		STRUCTURE OFF AIRPORT
		FENCING
		AIRPORT PAVEMENT
		ABANDON PAVEMENT
		HELICOPTER PARKING
		HOLD MARKING
Δ PGA		SURVEY MONUMENT WITH IDENTIFIER
		OBJECT FREE AREA
		RUNWAY SAFETY AREA
		OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE
		RUNWAY VISIBILITY ZONE
VASI-4	VASI-4	VASI
		RUNWAY END IDENTIFIER LIGHTS (REILS)
		LIGHTED WINDSOCK
		TOPOGRAPHY
		ULTIMATE MALSR

TAXIWAY LENGTHS		
TAXIWAY	EXISTING	ULTIMATE
A	5950'	8400'
B	N/A	8400'
C	N/A	1046'
D	N/A	1106'

SURVEY CONTROL STATIONS			
ID	PERMANENT IDENTIFIER	LATITUDE	LONGITUDE
PGA A	AC8816	36° 55' 01.375" N	111° 26' 48.199" W
PGA ARP	GP0075	36° 55' 35.091" N	111° 26' 55.618" W
PGA B	AC8817	36° 55' 50.479" N	111° 27' 01.654" W

PGA A: SET IN ROCK OUTCROP;
PGA ARP: SET IN TOP OF CONCRETE MONUMENT;
PGA B: SET IN TOP OF METAL PIPE DRIVEN INTO GROUND.

DEVIATIONS FROM FAA AIRPORT DESIGN STANDARDS				
DEVIATION DESCRIPTION	EFFECTED DESIGN STANDARD	STANDARD	EXISTING	PROPOSED ACTION
D-II TAXIWAY HOLD MARKINGS AT 250' FROM RW CENTERLINE	AIRCRAFT APPROACH CATEGORY D, INCREASE DISTANCE 1 FOOT FOR EACH 100 FEET ABOVE SEA LEVEL	293'	250'	REQUEST MODIFICATIONS OF DESIGN STANDARD

RUNWAY END COORDINATES (NAD 83)		
RUNWAY	LATITUDE	LONGITUDE
EXISTING RUNWAY 15	36° 55' 58.177" N	111° 26' 58.562" W
ULTIMATE RUNWAY 15 DISPLACED THRESHOLD	36° 56' 04.265" N	111° 26' 59.906" W
ULTIMATE RUNWAY 15	36° 56' 10.110" N	111° 27' 01.176" W
EXISTING RUNWAY 33	36° 55' 00.231" N	111° 26' 46.006" W
ULTIMATE RUNWAY 33 DISPLACED THRESHOLD	36° 54' 54.144" N	111° 26' 44.883" W
ULTIMATE RUNWAY 33	36° 54' 48.299" N	111° 26' 43.413" W
EXISTING RUNWAY 7	36° 55' 45.002" N	111° 27' 12.832" W
EXISTING RUNWAY 7 DISPLACED THRESHOLD	36° 55' 45.802" N	111° 27' 05.700" W
EXISTING RUNWAY 25	36° 55' 48.013" N	111° 26' 45.986" W
ULTIMATE RUNWAY 25	36° 55' 48.834" N	111° 26' 38.667" W

RUNWAY DATA	RUNWAY 15-33				RUNWAY 7-25			
	EXISTING		ULTIMATE		EXISTING		ULTIMATE	
	15	33	15	33	7	25	7	25
AIRCRAFT APPROACH CATEGORY–DESIGN GROUP	B–II		D–II		B–I (Small)		B–I (Small)	
FAR PART 77 CATEGORY	Nonprecision	Nonprecision	Nonprecision	Nonprecision	Visual	Visual	Visual	Visual
APPROACH VISIBILITY MINIMUMS	1 Mile	1 Mile	1 Mile	3/4 Mile	Visual	Visual	Visual	Visual
DESIGN CRITICAL AIRCRAFT	Cessna Citation III		Gulfstream IV		King Air 100		King Air 100	
WINGSPAN OF DESIGN AIRCRAFT	53.5'		77.83'		45.8'		45.8'	
UNDERCARRIAGE WIDTH OF DESIGN AIRCRAFT	9.04'		18.6'		13.0'		13.0'	
APPROACH SPEED (KNOTS) OF DESIGN AIRCRAFT	114		145		111		111	
MAXIMUM CERTIFIED TAKEOFF WEIGHT (LBS) OF DESIGN AIRCRAFT	22,000		71,780		11,800		11,800	
RUNWAY EFFECTIVE GRADIENT	1.2%		0.7%		0.2%		0.3%	
RUNWAY MAXIMUM GRADIENT	2.2%		2.2%		0.8%		0.8%	
PAVEMENT DESIGN STRENGTH (in thousand lbs.)[1]	85(S), 90(D), 190(DTW)		85(S), 90(D), 190(DTW)		12.5(S)		12.5(S)	
APPROACH SLOPE	34:1	34:1	34:1	34:1	20:1	20:1	20:1	20:1
RUNWAY END ELEVATION (MSL)	4244.9'	4316.2'	4245.0'	4307.0'	4242.7'	4246.8'	4243.1'	4247.0'
RUNWAY TOUCHDOWN ZONE ELEVATION (MSL)	4284.3'	4316.2'	4255.2'	4307.0'	4250.0'	4250.0	4250.0'	4250.0'
RUNWAY HIGH POINT ELEVATION (MSL)	4316.2'		4307.0'		4250.0'		4250.0'	
RUNWAY LOW POINT ELEVATION (MSL)	4244.5'		4245.0'		4243.1'		4242.2'	
LINE OF SIGHT REQUIREMENT MET	YES		YES		YES		YES	
RUNWAY LENGTH	5950'		8400'		2200'		2800'	
RUNWAY WIDTH	150'		150'		75'		75'	
RUNWAY BEARING (TRUE)	170.1°	350.1°	170.1°	350.1°	82.07°	262.08°	82.07°	262.08°
RUNWAY SAFETY AREA LENGTH BEYOND STOP END OF RUNWAY	600'	600'	1000'	1000'	240'	828'	240'	828'
RUNWAY SAFETY AREA WIDTH	300'		400'		120'		120'	
RUNWAY OBJECT FREE AREA LENGTH BEYOND STOP END OF RUNWAY	600'	600'	1000'	1000'	240'	240'	240'	240'
RUNWAY OBJECT FREE AREA WIDTH	800'		800'		250'		250'	
RUNWAY OBSTACLE FREE ZONE LENGTH BEYOND RUNWAY END	200'	200'	200'	200'	200'	200'	200'	200'
RUNWAY OBSTACLE FREE ZONE WIDTH	400'		400'		250'			
DISTANCE FROM RUNWAY CENTERLINE TO HOLD BARS AND SIGNS	200'		250'		200' (125' Standard)		200' (125' Standard)	
RUNWAY MARKING	NP	NP	NP	NP	V	V	V	V
STANDARD SEPARATION – RUNWAY CL TO PARALLEL TAXIWAY CL	240'		300'		150'		150'	
STANDARD SEPARATION – TAXIWAY CL TO FIXED OR MOVABLE OBJECT	85.5'		85.5'		44.5'		44.5'	
RUNWAY THRESHOLD DISPLACEMENT	0'	0'	600'	600'	588'	0'	588'	0'
RUNWAY SURFACE/PAVEMENT MATERIAL	Asphalt		Asphalt		Asphalt		Asphalt	
RUNWAY PAVEMENT SURFACE TREATMENT	None		PFC		None		PFC	
RUNWAY LIGHTING	MIRL		MIRL		None		None	
TAKE–OFF RUN AVAILABLE	None	None	7,800'	7,800'	NONE	NONE	NONE	NONE
TAKE–OFF DISTANCE AVAILABLE	None	None	8,400'	8,400'	NONE	NONE	NONE	NONE
LANDING DISTANCE AVAILABLE	None	None	6,800'	6,800'	NONE	NONE	NONE	NONE
ACCELERATE STOP DISTANCE AVAILABLE	None	None	7,400'	7,400'	NONE	NONE	NONE	NONE
TAXIWAY WIDTH	40' (25' Standard)		35'		40' (25' Standard)		40' (25' Standard)	
TAXIWAY SURFACE MATERIAL	Asphalt		Asphalt		Asphalt		Asphalt	
TAXIWAY OBJECT FREE AREA WIDTH	131'		131'		131' (89' Standard)		131' (89' Standard)	
TAXIWAY SAFETY AREA WIDTH	79'		79'		79' (49' Standard)		79' (49' Standard)	
TAXIWAY WINGTIP CLEARANCE	26'		26'		20'		20'	
TAXIWAY MARKING	Centerline		Centerline		Centerline		Centerline	
TAXIWAY LIGHTING	MITL		MITL		None		None	
RUNWAY NAVIGATIONAL AIDS	GPS (15,33)		GPS (15,33)		None		None	
RUNWAY VISUAL AIDS	Rotating Beacon VASI–4 (15,33) REIL (15,33)		Rotating Beacon MALS VASI–4 (15,33) REIL (15,33)		Rotating Beacon Lighted Wind Indicator		Rotating Beacon Lighted Wind Indicator	

[1]Pavement strengths are expressed in Single(S), Dual(D), and Dual Tandem (DT) wheel loading capacities.
PFC–Porous Friction Course

GENERAL NOTES:

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983 – NAD83;
VERTICAL DATUM: NORTH AMERICAN DATUM 1988 – NAVD88 AS SHOWN FOR RUNWAY ELEVATIONS. FROM Z & H ENGINEERING, INC., PHOENIX, ARIZONA.
2. THE RPZ BOUNDARY LOCATION OCCURS COINCIDENT WITH THE ULTIMATE OBJECT FREE AREA (OFA), RUNWAY VISIBILITY ZONE (RVZ), AND THE VOR/DME CLEAR AREA.
3. NO OFZ PENETRATIONS.
4. NO THRESHOLD SITING SURFACE OBJECT PENETRATIONS.
5. SEE SHEET 2 OF 14 FOR AIRPORT LANDSIDE FACILITY IMPROVEMENT DETAILS.
6. EXISTING HELIPADS DEPICTED IN THE ULTIMATE RVZ WILL BE RELOCATED TO THE EAST SIDE OF RUNWAY 15–33 PRIOR TO CONSTRUCTING ANY OF THE PROPOSED RUNWAY EXTENSIONS.
7. THE PROPOSED SITE OF THE FUTURE AIRCRAFT RESCUE FIRE FIGHTING (ARFF) STATION WILL MEET THE REQUIRED EMERGENCY RESPONSE TIME FOR CERTIFICATED FEDERAL AVIATION REGULATION PART 139 COMMERCIAL SERVICE OPERATIONS. TIE DOWN AND ADJACENT TAXILANES WILL NOT CAUSE ANY DELAY TO EMERGENCY RESPONSE ARFF FIRE TRUCK(S).
8. LINE OF SIGHT MET.
9. THE DESIGN STANDARD LOCATION DISTANCE OF 293 FEET FOR HOLDING POSITION MARKINGS FOR AIRCRAFT APPROACH CATEGORY D IS NOT PRACTICABLE DUE TO THE PARALLEL TAXIWAY LOCATION AT THE D–II STANDARD SEPARATION OF 300 FEET.
10. MAGNETIC DECLINATION VALUE CALCULATED FROM THE NOAA GEOPHYSICAL DATA CENTER, http://www.ngdc.noaa.gov/geomagmodels/Declination.jsp

AIRPORT DATA			
OWNER: City of Page	AIRPORT NPIAS CODE: P		
CITY: Page, Arizona	COUNTY: Coconino, Arizona		
RANGE: R 9 E	TOWNSHIP: T 41 N		
PAGE MUNICIPAL AIRPORT (PGA)		EXISTNG	ULTIMATE
AIRPORT SERVICE LEVEL		Commercial	Commercial
AIRPORT REFERENCE CODE		B–II	D–II
AIRPORT ELEVATION		4316.2' MSL	4307.0' MSL
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		96.6° JULY	96.6° JULY
AIRPORT REFERENCE POINT (NAD 83)	Latitude	36° 55' 35117" N	36° 55' 33.635" N
	Longitude	111° 26' 55.727" W	111° 26' 53.158" W
AIRPORT INSTRUMENT APPROACH NAVAIDS		GPS, VOR	GPS, VOR
		Airport Beacon ASOS VASI–4 (15,33) REIL (15, 33)	Airport Beacon GPS, ASOS MALS (33) VASI–4 (15,33) REIL (15, 33)
GPS AT AIRPORT		Yes	Yes

All coordinates are horizontal NAD83 and vertical NAVD88

HOLD POSITION MARKINGS/SIGN (TYP)
(NOT To Scale)

FOR APPROVAL BY City of Page
Mr. Richard Gertsch, Airport Manager
DATE: 1-26-09

FAA APPROVAL STAMP
Approved March 5, 2009
FEDERAL AVIATION ADMINISTRATION
Western-Pacific Region
By
Manager - LAX/650

Magnetic Declination 11° 38' East (November 2008)
Annual Rate of Change 0° 6' West (November 2008)

0 400 800
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D
2	ALP UPDATE	03/01/01	RC	AM
1	MASTER PLAN AND ALP UPDATE	05/31/00	AM	WR

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA AND DO NOT CONSTITUTE A STANDARD, SPECIFICATION OR REGULATION. FAA DOES, HOWEVER, REVIEW AND APPROVE THAT PART OF THE UNITED STATES' CONTRIBUTE IN FAA DEVELOPMENT DEFINED HEREIN. IT DOES INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

PAGE MUNICIPAL AIRPORT

AIRPORT LAYOUT DRAWING

PAGE, ARIZONA

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Diana L. Hopkins
APPROVED BY: Steven G. Brown

JANUARY 2009 SHEET 1 OF 14

Coffman Associates
Airport Consultants
www.coffmanassociates.com

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Runway 15-33

1. Comply with ultimate airport reference code (ARC) D-II design standards.
2. Extension of 1,225 feet on each end to achieve an overall runway length of 8,400 feet. This platform would require significant fill and grading, and declared distances would need to be applied to meet FAA design standards.
3. Install a roadway to provide access to the east side of the airport.
4. Improved instrument approach capabilities to include installation of a medium intensity approach lighting system (MALS) on Runway 33 to allow for visibility minimums down to ¾-mile.

Runway 7-25

1. An extension of 600 feet to the east to achieve an overall length of 2,800 feet.
2. Install partial parallel taxiways to meet ARC B-I (small aircraft) design standards.
3. Install Taxiway C to serve the northwest side of Runway 7-25.

Taxiways

1. Install entrance/exit taxiway from the north general aviation apron to the end of Runway 7-25.
2. Install medium intensity taxiway lighting (MITL) on each new taxiway.
3. Construction of a full-length parallel taxiway (Taxiway B) on the east side of Runway 15-33.
4. Extend Taxiway A to the ultimate ends of Runway 15-33.

Property/Easement Acquisition

The *Page Municipal Airport Master Plan* (2009) recommended property acquisitions due to the proposed expansion of both runways. Land acquisitions would be required to protect the runway protection zones (RPZs) from incompatible land uses. The land immediately to the south and east of the airport is owned by the City of Page. The City had indicated that the land for the RPZs could be transferred to the airport. The areas included in the plan were an 11.5-acre parcel needed for the Runway 33 RPZ and MALS and a 6.9-acre parcel needed for the Runway 25 RPZ. The Runway 15 RPZ would also extend slightly beyond existing airport property and encompass a small area of the Glen Canyon National Recreation Area. An avigation easement was recommended for this small corner of the RPZ.

AIRPORT ALTERNATIVE CONSIDERATIONS

Exhibit 4C presents both airside and landside alternative considerations that will be specifically addressed in this analysis. These issues are the result of the findings of the aviation demand forecasts and facility requirements evaluations, and they include input from the Planning Advisory Committee (PAC) and other interested stakeholders.

AIRSIDE CONSIDERATIONS

- Meet RDC D-III-4000 design standards on Runway 15-33
- Analyze future need for crosswind Runway 7-25
- Improved instrument approach capabilities on Runway 15-33
- Taxiway geometry improvements
- Runway/taxiway separation to meet D-III design standards
- Relocate hold lines to 293' to meet D-III design standards
- Runway extension alternatives to accomodate larger/heavier aircraft
- Consider runway shoulder width recommendations on primary Runway 15-33
- Addition of redesigned aircraft holding bays

LANDSIDE CONSIDERATIONS

- Expansion and/or relocation of commercial service terminal facilities
- Expanded commercial passenger vehicle parking lots
- Stand alone air tour facility and parking
- Dedicated general aviation terminal and vehicle parking needs
- Identify space for new hangar development
- Identify locations suitable for airport maintenance facility
- Identify additional airport access points/road circulation



Airside and landside functional areas are interrelated, and each affects the development potential of the other. Therefore, all areas must be examined and then coordinated as a whole to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors on the existing airport must be evaluated to determine if the investment in the airport will meet the needs of the surrounding area, both during and beyond the planning period of this study.

The remainder of this chapter will describe various development alternatives for airside and landside facilities.

AIRSIDE PLANNING CONSIDERATIONS

Airside facilities are, by nature, the focal point and require the greatest commitment of land area to meet the physical layout of the airport, as well as the required airfield safety standards. Because of their primary role and the fact that they physically dominate airport land use, airfield facility needs are often the most critical factor in the determination of viable airport development alternatives.

Airside issues relate to those airport elements that contribute to the safe and efficient transition of aircraft and passengers from air transportation to the landside facilities at the airport. In particular, the runway system requires the greatest commitment of land area to meet the physical layout of the system, as well as the required FAA safety and design standards. Moreover, the design of the airfield system defines minimum building set-back distances from the runway and object clearance standards. Planning must factor and balance many airside items, including meeting FAA design parameters of the established design aircraft, instrument approach capability, airfield capacity, runway length, taxiway layouts, and pavement strengths. Each of these elements was analyzed in the previous chapters. The alternatives will examine airside improvement opportunities to meet design standards and/or capacity constraints. These criteria should be defined first to ensure that the fundamental needs of the airport are met. Therefore, airside development alternatives will be analyzed prior to detailing landside development alternatives.

AIRPORT DESIGN CRITERIA

Applicable standards for airport design are outlined in FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*, Change 1. The design of airfield facilities is primarily based on the physical and operational characteristics of aircraft using the airport. As discussed in Chapter Three, a Runway Design Code (RDC) is applied to each runway at an airport in order to identify the appropriate design standards for the runway and associated taxiway system. Analysis in the previous chapter indicated that the RDC for Runway 15-33 at Page Municipal Airport is currently C-II-5000. The airfield should be planned to accommodate some of the most demanding commercial service and general aviation business jet aircraft in the national fleet, such as the Embraer ERJ-135, Citation III, Challenger 600, Gulfstream G-III, and others. In addition, the runway is certified for commercial service aircraft operations under the airport's Title 14 Code of Federal Regulations (CFR) Part 139. If the airport were to experience a significant enhancement in

commercial passenger service in the future, larger regional jets, such as the CRJ 200/700, could be introduced to the airport's fleet mix. Runway 15-33 provides the longest available runway length (5,950 feet) and the lowest instrument approach minimums serving the airport (one mile). Alternative analysis will evaluate facility development that could meet ultimate RDC D-III-4000 standards on primary Runway 15-33.

Crosswind Runway 7-25 provides an important role in serving aircraft operations when the primary runway is closed for maintenance or emergencies and when strong crosswinds dictate their use. This runway only serves small general aviation aircraft due to the runway length (2,201 feet). The critical design aircraft for this runway is in the B-I (small aircraft) category. Aircraft within this classification weigh less than 12,500 pounds. An example of one of the most demanding aircraft utilizing the runway would be a Cessna 208 Caravan. As such, the RDC for Runway 7-25 is planned to meet B-I (small aircraft)-VIS standards.

As mentioned, Runway 7-25 is a much shorter runway and is used as a secondary or crosswind runway on the airfield. It is not certified to accommodate commercial service aircraft operations. Wind data has indicated that the primary runway is able to satisfy the needs of the airport regarding crosswind requirements. Therefore, the FAA has indicated that it may not continue to fund improvements on this runway; however, the City of Page and ADOT may decide to partner to maintain the runway as needed. As such, the master plan considers both alternatives: 1) the continued operation of this runway to serve smaller general aviation aircraft, and 2) the closure of the runway. **Table 4A** summarizes the planned RDCs for each runway.

TABLE 4A
Runway Design Codes (RDCs)
Page Municipal Airport

Runway	Existing RDC	Ultimate RDC
15-33	C-II-5000	D-III-4000
7-25	B-I (small aircraft)- VIS	B-I (small aircraft)-VIS

RUNWAY LENGTH

In Chapter Three, a detailed runway length analysis indicated that alternatives should evaluate additional runway length in order to accommodate larger jet aircraft activity. Most aircraft can currently operate at Page Municipal Airport but may be weight-restricted due to the current runway length under certain conditions, such as high temperatures or wet runway surface conditions. The runway extension alternatives result in various options for ultimate runway length. The alternatives also take into consideration the surrounding terrain constraints and safety area requirements. It was determined through previous planning that the maximum available runway platform that could be achieved with the runway's current orientation, with a reasonable amount of terrain grading to meet the applicable RSA standards, is 8,400 feet. The following alternatives explore several methods of using this platform and other incremental extensions to best meet existing and future operations at Page Municipal Airport. The goal of these alternatives is the presentation of several options so that utility can be weighed against costs. As discussed in Chapter Three, justification for any runway extension to meet the needs of a specific operator would

require regular use at a threshold of 500 itinerant operations annually in order to obtain FAA grant funding assistance.

RUNWAY/TAXIWAY/AIRCRAFT PARKING APRON SEPARATION

Separation distances between a runway and various areas on the airfield are primarily a function of the critical design aircraft and instrument approaches that are provided. Parallel Taxiway A, located on the west side of Runway 15-33, currently has a separation of 300 feet from the runway (centerline to centerline). The runway-to-taxiway separation standard for ultimate RDC D-III-4000 is 400 feet. As such, under ultimate conditions, the separation standard is not currently met. Alternatives discussed later in this chapter will further evaluate the effects of increasing separation between Runway 15-33 and parallel Taxiway A.

Separation standards also apply to Runway 15-33 and various aircraft parking areas on the airfield. For RDC D-III-4000, aircraft parking areas must be located at least 500 feet from the runway centerline. Several marked aircraft parking positions on the apron currently provide only 350 feet of separation from the runway centerline. The alternatives to follow also consider meeting these runway and aircraft parking separation standards.

TAXIWAY DESIGN

Taxiway design is based on the critical design aircraft utilizing the taxiway system. Common design issues have included parallel taxiway separation from the runway, taxiway width, and overall system efficiency. FAA AC 150/5300-13A has instituted standards for taxiways, some of which impact planning for Page Municipal Airport. Most of the new or updated standards were enacted to mitigate the potential for runway incursion events. Changes were also aimed at improving pilot situational awareness. Chapter Three detailed the recently updated taxiway design considerations.

Page Municipal Airport is served by a taxiway system that includes parallel, connector, and entrance/exit taxiways serving both runways on the airfield. While the existing taxiway system meets certain FAA design standards, there are some issues that should be addressed. The following are the taxiway geometry concerns will be addressed in the alternatives to follow:

- Taxiways A2, A3, and A4 provide direct access to the runway system from an aircraft parking apron.

- Taxiways A3 and A4 are not aligned at 90-degree angles to the respective runway.

HOLD LINE MARKINGS

The current hold line markings on taxiways associated with Runway 15-33 are located 250 feet from the runway centerline. The standard for hold lines associated with ultimate RDC D-III-4000 standards is 250 feet, plus one foot for each additional 100 feet above sea level. Since the airport is situated at 4,316 feet mean sea level (MSL), 43 feet is added to the hold line distance. Planning should consider relocating the hold lines on the taxiways to 293 feet from the runway centerline to meet ultimate design standards.

HOLDING BAYS

The FAA has provided updated guidance on the configuration of holding aprons/bays. This guidance recommends that holding bays be designed to allow aircraft to bypass one another to taxi to the runway. The construction of new holding bays is being proposed on several alternatives that would serve both ends of primary Runway 15-33. No holding bays/bypass taxiways are being proposed on Runway 7-25.

VISUAL APPROACH AIDS

Visual approach aids provide glide path information to pilots on visual approach to the runway for landing. Visual approach aids are typically provided for instrument-capable runway ends that do not already have an approach lighting system.

A four-box visual approach slope indicator (VASI-4) is installed on each end of Runway 15-33. These approach aids should remain throughout the planning period. If replacement of the VASI is necessary, consideration should be given to replacing the system with a four-box precision approach path indicator (PAPI) system.

Runway 15-33 also is equipped with runway end identification lights (REILs). These systems should continue to be maintained through the long-term planning period. Runway 7-25 is a visual daytime use runway and is not equipped with any type of visual approach aid.

AIRFIELD LIGHTING

Runway 15-33 is equipped with medium intensity runway lighting (MIRL). The airport should consider removing the incandescent airfield lighting and signage systems and replacing them with light emitting diode (LED) technology. These lighting upgrades could be undertaken in the event of a reconstruction/rehabilitation project associated with various pavements on the runway and taxiway system. LED lighting has many advantages, including lower energy consumption and longer lifetimes. Runway 7-25, as previously discussed, is a daytime-only runway and does not have, nor is planned to have, MIRL.

INSTRUMENT APPROACH CONSIDERATIONS

Page Municipal Airport has non-precision instrument approaches serving Runway 15-33 that provide course guidance and, in some cases, vertical descent information to pilots of properly equipped aircraft. Area navigation (RNAV) global positioning system (GPS) approaches are provided on Runway 15-33, allowing for not lower than one-mile visibility minimums. In addition, a very high frequency omnidirectional range (VOR) circling approach is available for use with 1¼-mile visibility minimums.

Analysis in the previous chapter indicated that the plan should consider the implementation of a straight-in instrument approach procedure on Runway 15-33 that would provide not lower than ¾-mile visibility minimums to support commercial aircraft operations. The alternatives will consider lower visibility minimums to the primary runway and the resulting impacts.

RUNWAY PROTECTION ZONES

If the airport cannot fully control the entirety of the RPZ, the RPZ land use standards have recommendation status for that portion of the RPZ not controlled by the airport owner. In essence, this means that the FAA can require a change to the runway environment so as to properly secure the entirety of the RPZ in meeting land use compatibility requirements. The FAA has always held that residences, businesses, and similar uses are prohibited from the RPZ. Objects such as public roads, however, have been allowed. FAA's new guidance does not readily allow for public roads in the RPZ.

Portions of the RPZs associated with Runways 15-33 and 7-25 extend beyond airport property. The majority of these areas encompass vacant land; however, the departure RPZ associated with Runway 25 extends over approximately 5.13 acres of residential property. As previously discussed in Chapter Three, since the new RPZ guidance addresses new or modified RPZs, existing incompatibilities such as these can be grandfathered under certain conditions. Any change to the RPZ could require full compliance. Alternatives discussed later in this chapter will evaluate the effects of the RPZs when considering improvements to safety areas associated with various runways on the airfield.

SAFETY AREAS

The design of airfield facilities includes both the pavement areas to accommodate takeoff/landing and ground operations of aircraft, as well as the required safety areas to protect operational areas and keep them free of obstructions that could affect the safe operation of aircraft at the airport. The safety areas include the runway safety area (RSA), runway object free area (ROFA), and runway obstacle free zone (ROFZ), as previously discussed in Chapter Three. **Exhibit 4D** depicts RSA and ROFA incompatibilities for primary Runway 15-33.

Runway Safety Area

For Runway 15-33, with an existing RDC of C-II-5000, the standard RSA is 500 feet wide, but 400 feet is considered permissible. For the ultimate RDC D-III-4000, the standard RSA is 500 feet wide. Under both RDCs, the RSA extends 1,000 feet beyond each runway end. Only 600 feet of RSA is needed prior to the landing threshold on each runway end under existing and ultimate standards.

RSA standards are not currently being met on Runway 15-33 due to incompatibilities which include perimeter fencing located on both ends of Runway 15-33. The fence obstructs the RSA beginning at 540 feet beyond the end of Runway 15 and 400 feet beyond the end of Runway 33. Additionally, beyond the perimeter fencing on both ends of the runway, the terrain grade drops off significantly. The terrain inside the RSA must meet grading requirements to qualify as usable RSA. The allowable transverse slope for RSAs range from three to five percent. Since runways and taxiways commonly intersect with one another, these grades would apply in the direction parallel to the runway centerline, as well as transverse to the runway centerline. These standards also apply to grading work for navigational aid facilities within the RSA, such as PAPI foundations or footings. The maximum allowable grade within the RSA, beginning 200 feet beyond the runway ends and extending to 1,000 feet beyond the runway ends, is five percent. As outlined on **Exhibit 4D**, the Runway 15-33 RSA does not currently meet the minimum allowable grading requirements to meet existing or ultimate design standards.

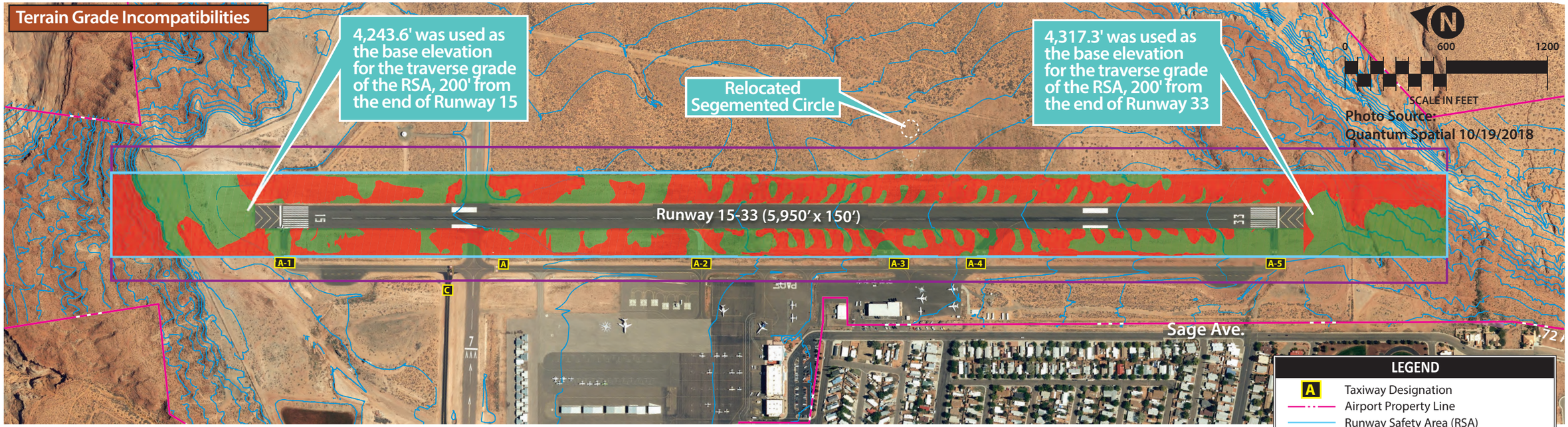
The alternatives follow the guidelines outlined in FAA Order 5200.8, *Runway Safety Area Program*, to include:

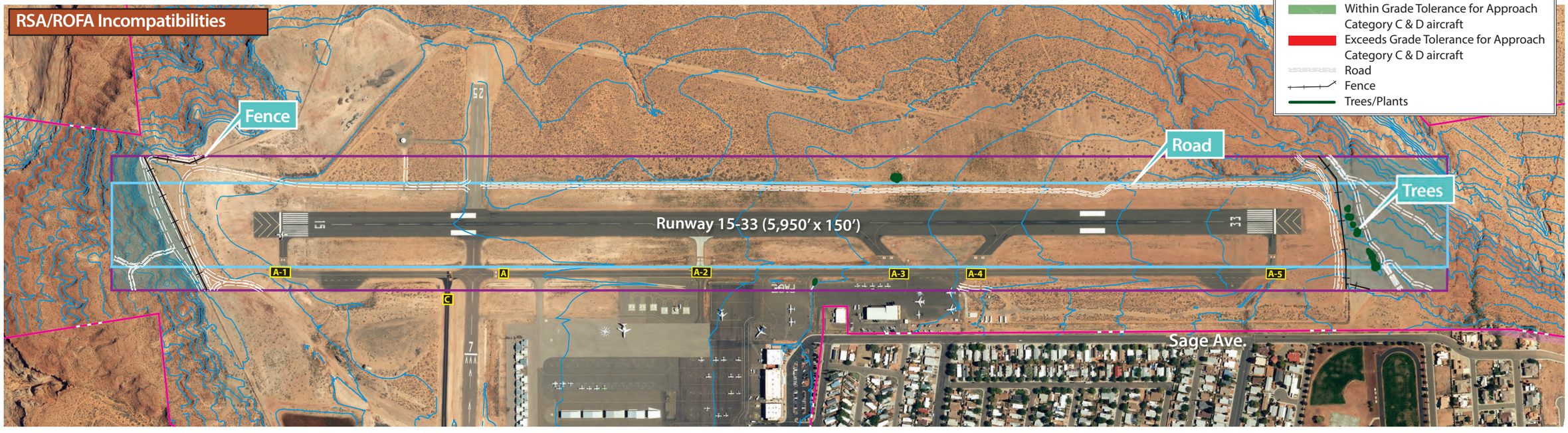
"The first alternative that must be considered in every case is constructing the traditional graded runway safety area surrounding the runway. Where it is not practicable to obtain the entire safety area in this manner, as much as possible should be obtained. Then the following alternatives shall be addressed in the supporting documentation…:

a. *Relocation, shifting or realignment of the runway.*
b. *Reduction in runway length where the existing runway length exceeds that which is required for the existing or projected design aircraft.*
c. *A combination of runway relocation, shifting, grading, realignment, or reduction.*
d. *Declared distances.*
e. *Engineered Materials Arresting System (EMAS)."*

Declared Distances

When airports are constrained by off-airport development or terrain, airport operators will employ the use of displaced thresholds and declared distances to provide the RSA and ROFA required to meet the FAA safety area design standards. Declared distances are the effective runway lengths that the airport operator declares available for take-off run, take-off distance, accelerate-stop distance, and landing


Terrain Grade Incompatibilities
4,243.6' was used as the base elevation for the traverse grade of the RSA, 200' from the end of Runway 15
Relocated Segemented Circle
4,317.3' was used as the base elevation for the traverse grade of the RSA, 200' from the end of Runway 33
N
0
600
1200
SCALE IN FEET
Photo Source:
Quantum Spatial 10/19/2018
Runway 15-33 (5,950' x 150')
15
33
A-1
A
A-2
A-3
A-4
A-5
C
Sage Ave.
LEGEND
A Taxiway Designation
Airport Property Line
Runway Safety Area (RSA)
Runway Object Free Area (ROFA)
10-Foot Contour Lines
Within Grade Tolerance for Approach Category C & D aircraft
Exceeds Grade Tolerance for Approach Category C & D aircraft
Road
Fence
Trees/Plants


RSA/ROFA Incompatibilities
Fence
Road
Trees
Runway 15-33 (5,950' x 150')
15
33
A-1
A
A-2
A-3
A-4
A-5
C
Sage Ave.

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distance available. Pilots utilize these measurements in their runway length calculations. The four declared distances are defined as the following:

Takeoff run available (TORA) - The length of the runway declared available and suitable to accelerate from brake release to lift-off, plus safety factors.

Takeoff distance available (TODA) - The TORA plus the length of any remaining runway or clearway beyond the far end of the TORA available to accelerate from brake release past lift-off, to start of take-off climb, plus safety factors.

Accelerate stop distance available (ASDA) - The length of the runway plus stop-way declared available and suitable to accelerate from brake release to take-off decision speed, and then decelerate to a stop, plus safety factors.

Landing distance available (LDA) - The distance from the threshold to complete the approach, touch-down, and decelerate to a stop, plus safety factors.

The TORA and TODA are often equal to the actual runway length, which is currently the case at Page Municipal Airport. The ASDA and the LDA are the primary considerations in determining the runway length available for use by aircraft, as these calculations must consider providing the RSA and ROFA to standard in operational calculations. The ASDA and LDA can be figured as the usable portions of the runway length less the distance required to maintain adequate safety areas beyond the ends of the runway or prior to the landing threshold. By regulation, a full 1,000 feet of RSA and ROFA must be available at the far end of a departure operation in the ASDA calculation. For LDA calculations, 600 feet of RSA and ROFA is required prior to the landing threshold, and 1,000 feet of RSA and ROFA is required beyond the far end of the landing operation.

Runway Object Free Area

Similar to RSA deficiencies, the northwest side of Runway 15-33 and the southeast side of the primary runway lack proper ROFA to meet existing and future RDCs. The Runway 15 ROFA is obstructed 540 feet beyond the end of the runway by perimeter fencing. The same obstructions penetrate the ROFA associated with Runway 33, starting 400 feet beyond the end of the runway.

As depicted on **Exhibit 4D**, the segmented circle should be relocated outside the ROFA. It is currently situated 400 feet east of Runway 15-33. The airport should plan its relocation to be at least 500 feet from the runway centerline. While it is recommended that a segmented circle be situated outside the ROFA, it can be situated in a “fixed by function” manner if deemed appropriate by the FAA.

Runway Visibility Zone

Runway visibility requirements facilitate coordination among aircraft and between aircraft and vehicles that are operating on active runways at non-towered airports. This visibility allows airport users to visually verify movement of aircraft and vehicles on the ground that could create a conflict.

The runway visibility zone (RVZ) is defined as an area formed by imaginary lines connecting the two runways' visibility points. At airports with intersecting runways like Page Municipal Airport, the visibility points are any point five feet above the runway centerline in the RVR that is mutually visible from any other point five feet above the centerline of the crossing runway inside the RVR.

AIRSIDE ALTERNATIVES

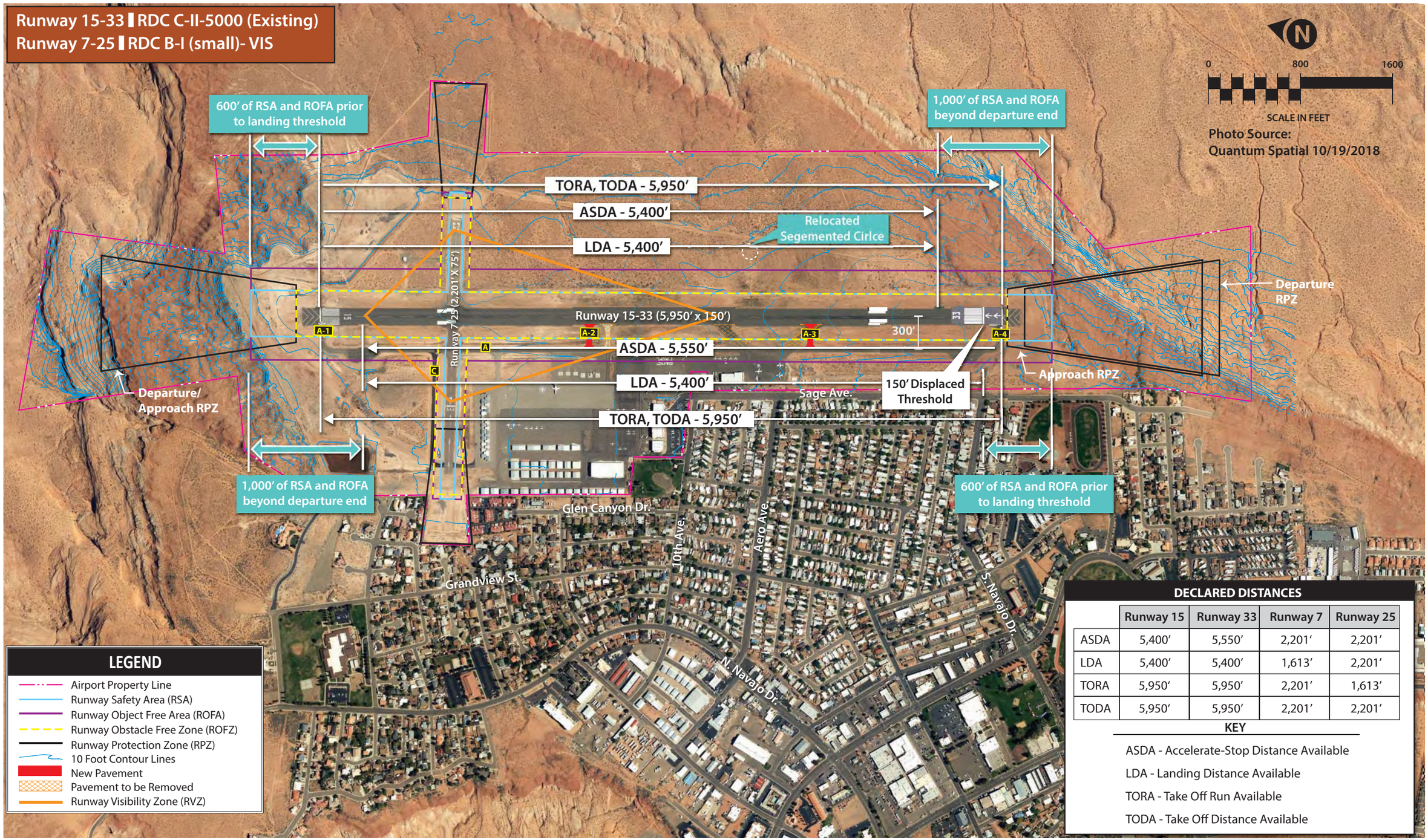
The subsections to follow analyze airside alternatives and focus on several key components related to satisfying existing RDC C-II-5000 or ultimate RDC D-III-4000 design standards, including mitigating non-standard safety areas associated with the existing and ultimate RSA and ROFA, non-standard airfield taxiway geometry, ultimate runway-to-taxiway separation standards, improved instrument approach capabilities, and expanding the capabilities of the runway environment to meet the projected needs of larger and heavier aircraft. Several of the following alternatives will have elements that do not change between alternatives. The first alternative in which an option is presented will describe the change and the reason that it is being considered. If an identical proposed alternative is carried forward into another alternative, a description of that option will not be presented again. All proposed alternatives are outlined in detail and are supported by the corresponding exhibits. These alternatives are to be considered and discussed as possibilities for meeting current and future aviation demand at Page Municipal Airport. The alternatives are created for analysis as part of the planning process. Certain aspects presented on one alternative or another can be adapted to form what will become the recommended master plan concept, which will be presented in the next chapter of the master plan.

As part of this alternatives evaluation, C&S Companies has provided an engineering analysis, as well as total project cost estimates for each airside alternative. C&S Companies is providing engineering support for the master plan and is familiar with Page Municipal Airport, having been involved with the design and construction of several capital projects on the airfield in recent past.

AIRSIDE ALTERNATIVE 1

Airside Alternative 1, depicted on **Exhibit 4E,** is focused on meeting existing RDC C-II-5000 design standards. This alternative considers the addition of a 150-foot displaced threshold on the approach end of Runway 33 and implementing declared distances on Runway 15-33 in order to achieve proper RSA and ROFA beyond each of the runway ends with a minimal amount of earthwork required to meet the RSA grading requirements. Under this scenario, the resulting declared distances for Runway 15-33 would represent a reduction in usable runway length for ASDA and LDA. These changes would serve to bring

Runway 15-33 | RDC C-II-5000 (Existing)
Runway 7-25 | RDC B-I (small)- VIS



LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- 10 Foot Contour Lines
- New Pavement
- Pavement to be Removed
- Runway Visibility Zone (RVZ)

DECLARED DISTANCES

	Runway 15	Runway 33	Runway 7	Runway 25
ASDA	5,400′	5,550′	2,201′	2,201′
LDA	5,400′	5,400′	1,613′	2,201′
TORA	5,950′	5,950′	2,201′	1,613′
TODA	5,950′	5,950′	2,201′	2,201′

KEY

ASDA - Accelerate-Stop Distance Available

LDA - Landing Distance Available

TORA - Take Off Run Available

TODA - Take Off Distance Available

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the primary runway into compliance with C-II-5000 design standards but would effectively reduce the runway's capability to serve larger/heavier aircraft that may require the additional runway length.

This alternative also mitigates the RPZ incompatibility associated with existing Runway 7-25. The departure RPZ for Runway 25 extends beyond the airport property over densely populated residential areas. In order to remove the RPZ from the incompatible area, the TORA for Runway 25 should be reduced to 1,613 feet. The declared distances presented on **Exhibit 4E** reflect a reduced TORA on Runway 25.

Alternative 1 also addresses several taxiway geometry issues by proposing the removal of the existing Taxiways A2, A3, and A4. Taxiway A2 would be replaced in a location to the north that does not provide direct access to the aircraft parking apron, and Taxiway A4 should be reoriented to create a 90-degree angle intersection. This reorientation would also prevent direct access to the runway. Under this alternative, existing Taxiway A3 would be removed.

This and all subsequent airside alternatives depict the relocation of the segmented circle to the east of its present location in order to remove it from the existing and ultimate ROFA. The RVZ is also depicted in Alternative 1 and will be shown in any subsequent alternative in which there are intersecting runways.

Preliminary Engineering Analysis

Demolishing existing taxiway connectors A2, A3, and A4 and constructing proposed taxiway connectors A2 and A3 will require the temporary closure of Runway 15-33, while working within the safety area of the runway. Removing existing lighting and signage will require that temporary cables are used to ensure that the lighting and signage that are to remain will not be affected. Phasing of the demolition and construction will need to accommodate for uninterrupted access to and from Runway 15-33 and the apron while the runway is open.

Estimated Total Project Cost: $947,000

AIRSIDE ALTERNATIVE 2

The second alternative, depicted on **Exhibit 4F**, also focuses on meeting existing RDC C-II-4000 design standards. The primary difference between the two alternatives is the addition of an Engineered Materials Arresting System (EMAS) bed to each end of Runway 15-33. EMAS allows the length of the RSA and ROFA beyond the departure ends of the runway to be reduced from 1,000 feet to 600 feet, while preserving the runway's capabilities and maintaining useable runway length. The primary reason for the addition of EMAS is to reduce the amount of fill and grading required beyond the ends of the runway to meet full RSA standards, while still providing adequate runway length and allowing for a safe and compliant runway environment. EMAS provides a safety enhancement, while requiring less land disturbance and lower construction costs.

The lengths of EMAS beds are tailored to meet the needs of the airport based on the size and weight of the airport's critical design aircraft. In this case, a length of 300 feet is required to meet the needs of the ultimate critical design aircraft. Due to the steep terrain grade beyond the Runway 33 end, the 150-foot displaced landing threshold that was proposed in Alternative 1 is also presented in this alternative. The displaced threshold is proposed to provide the 600 feet of RSA and ROFA required prior to the landing threshold. As a result, declared distances will again need be implemented. Under this scenario, certain declared distances associated with Runway 15-33 will be equal to the total runway length of 5,950 feet; however, the LDA for aircraft landing on Runway 33 is reduced by 150 feet to account for the displaced threshold, and the ASDA and LDA for aircraft operating on Runway 15 are also reduced by 150 feet, resulting in 5,800 feet of declared distance.

Airfield geometry issues are addressed in this alternative and include the removal and relocation of the taxiways as described previously in Alternative 1.

Preliminary Engineering Analysis

Demolishing existing taxiway connectors A2, A3, and A4 and constructing proposed taxiway connectors A2 and A3 will require the temporary closure of Runway 15-33 while working within the safety area of the runway. Removing existing lighting and signage will require that temporary cables are used to ensure that the lighting and signage that are to remain will not be affected. Phasing of the demolition and construction will need to accommodate for uninterrupted access to and from Runway 15-33 and the apron while the runway is open.

Construction of the EMAS and striping of Runway 15-33 will require the temporary closure of the runway and/or the implementation of temporary displaced threshold markings since work on the EMAS will be within the safety areas of the runway ends. Temporary closure of Runway 7-25 will be required when striping work of Runway 15-33 is within the safety areas of Runway 7-25. Construction of the EMAS will require a significant amount of fill on both ends of Runway 15-33 due to the dramatic existing grade.

Estimated Total Project Cost: $23,511,000

AIRSIDE ALTERNATIVE 3

Airside Alternative 3 focuses on meeting the ultimate RDC D-III-4000 on primary Runway 15-33. As depicted on **Exhibit 4G**, this alternative takes into consideration previous planning efforts that identified a maximum gradable runway platform of 8,400 feet via 1,225-foot extensions on each end of Runway 15-33. Under this scenario, the use of declared distances would again be necessary to provide the required RSA and ROFA beyond the runway ends. The landing thresholds would need to be displaced by 600 feet on both runway ends. To achieve the required 1,000 feet of extended RSA and ROFA for aircraft departing the runway, that distance would have to be subtracted from the total runway length. As such, the

Runway 15-33 ▌RDC C-II-5000 (Existing)
Runway 7-25 ▌RDC B-I (small)- VIS

N

0 800 1600

SCALE IN FEET

Photo Source:
Quantum Spatial 10/19/2018

600′ of RSA and ROFA prior to landing threshold and beyond the runway end

600′ of RSA and ROFA prior to landing threshold and beyond the runway end

Relocated Segemented Cirlce

TORA, TODA - 5,950′

ASDA, LDA - 5,800′

300′ EMAS

Runway 15-33 (5,950′ x 150′)

Runway 7-25 (2,201′ X 75′)

300′

300′ EMAS

Departure RPZ

Approach RPZ

LDA - 5,800′

TORA, TODA, ASDA - 5,950′

Sage Ave.

150′ Displaced Threshold

Departure/ Approach RPZ

Glen Canyon Dr.

10th Ave.

Aero Ave.

S. Navajo Dr.

Grandview St.

N. Navajo Dr.

LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- 10 Foot Contour Lines
- New Pavement
- Pavement to be Removed
- Runway Visibility Zone (RVZ)
- EMAS (Engineered Materials Arresting System)

DECLARED DISTANCES

	Runway 15	Runway 33	Runway 7	Runway 25
ASDA	5,800′	5,950′	2,201′	2,201′
LDA	5,800′	5,800′	1,613′	2,201′
TORA	5,950′	5,950′	2,201′	1,613′
TODA	5,950′	5,950′	2,201′	2,201′

KEY

ASDA - Accelerate-Stop Distance Available

LDA - Landing Distance Available

TORA - Take Off Run Available

TODA - Take Off Distance Available

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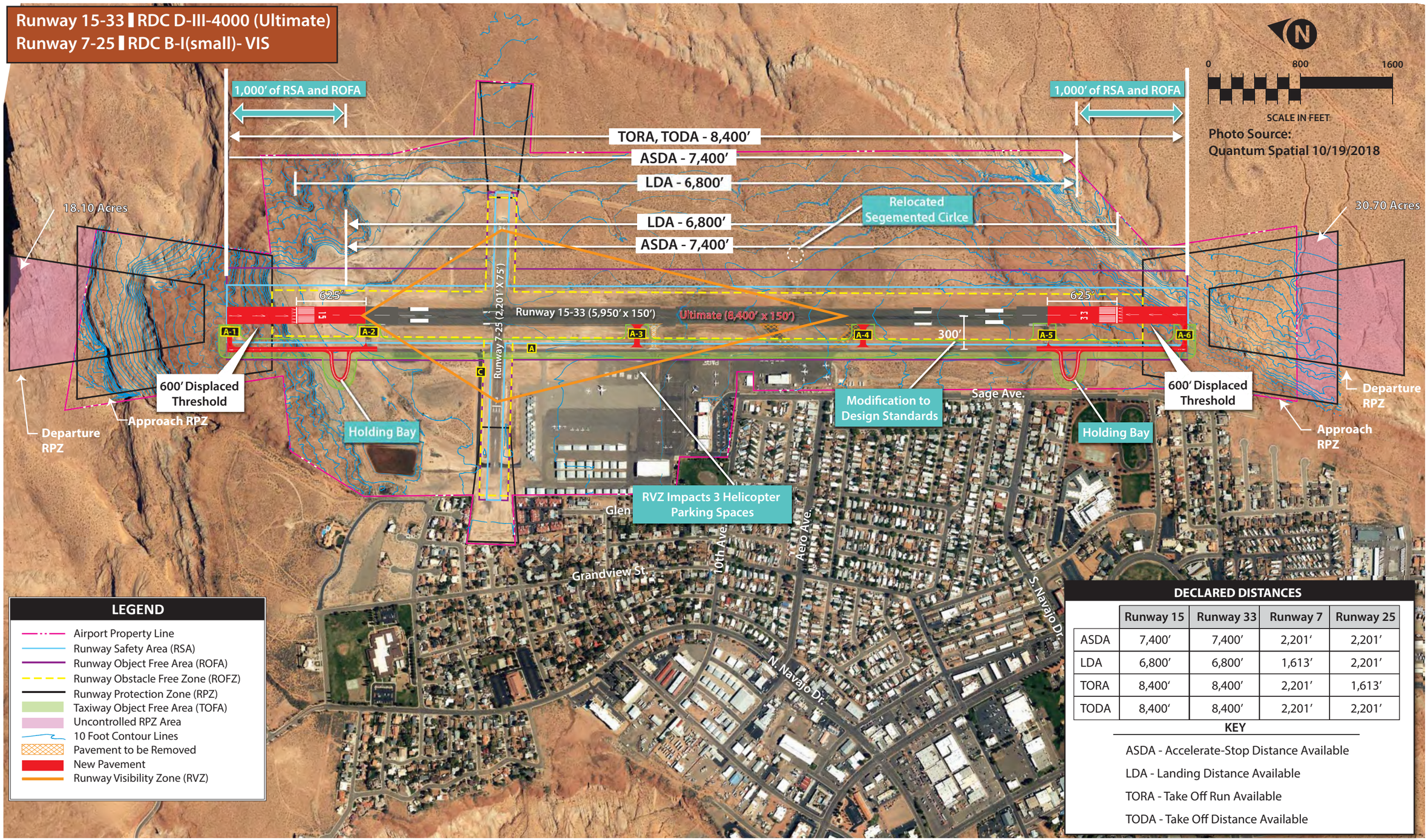
Runway 15-33 ▌RDC D-III-4000 (Ultimate)
Runway 7-25 ▌RDC B-I(small)- VIS



LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- Taxiway Object Free Area (TOFA)
- Uncontrolled RPZ Area
- 10 Foot Contour Lines
- Pavement to be Removed
- New Pavement
- Runway Visibility Zone (RVZ)

DECLARED DISTANCES

	Runway 15	Runway 33	Runway 7	Runway 25
ASDA	7,400'	7,400'	2,201'	2,201'
LDA	6,800'	6,800'	1,613'	2,201'
TORA	8,400'	8,400'	2,201'	1,613'
TODA	8,400'	8,400'	2,201'	2,201'

KEY

ASDA - Accelerate-Stop Distance Available

LDA - Landing Distance Available

TORA - Take Off Run Available

TODA - Take Off Distance Available

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resulting ASDA for each runway would be 7,400 feet of runway usable for aircraft on takeoff. The resulting LDA would be calculated at 6,800 feet available for landing aircraft on both runways.

In order to meet RDC D-III-4000 design standards, the FAA stipulates that the separation distance between the runway centerline and the parallel taxiway centerline must be a minimum of 400 feet. Runway 15-33 is currently separated from parallel Taxiway A by a distance of 300 feet. The 300-foot separation meets the design standard associated with existing RDC C-II-5000. The relocation of Taxiway A and its associated taxiway object free area (TOFA) would have a significant impact on the airport's existing infrastructure. The TOFA associated with Airplane Design Group (ADG) III aircraft measures 186 feet wide centered on the taxiway centerline. The impact to existing infrastructure will be further detailed in the following alternatives. This alternative assumes that the FAA could approve a modification to design standard to allow the airport to maintain the 300-foot separation distance currently provided.

Also shown on **Exhibit 4G** is the addition of two holding bays, also known as bypass taxiways. These bypass taxiways are intended to replace the existing holding aprons with holding areas that are compliant with updated taxiway geometry guidance. The RVZ associated with this runway configuration would also impact three helicopter parking locations west of Runway 15-33.

Enhanced instrument approach procedures providing not less than ¾-mile visibility for Runway 15-33 are also introduced on **Exhibit 4G**. The approach RPZs associated with this enhancement extend beyond the airport's property line in some areas. These areas are on vacant land and do not encroach upon any incompatible development.

Alternative 3 proposes no changes to Runway 7-25. The runway will remain at its current length and width and maintain RDC B-I (small aircraft) – VIS design standards. Similar to the previous alternatives, the FAA may require the implementation of declared distances on Runway 7-25 to mitigate the departure RPZ incompatibilities associated with Runway 25. This results in the Runway 25 TORA being reduced to 1,613 feet.

Preliminary Engineering Analysis

Demolishing existing taxiway connectors A2, A3, and A4 and constructing proposed taxiway connectors A1, A3, A4, and A6 will require the temporary closure of Runway 15-33 while working within the safety area of the runway. Removing existing lighting and signage and installing the new runway and taxiway lighting and signage will require that temporary cables are used to ensure that the lighting and signage that are to remain will not be affected. Phasing of the demolition and construction will need to accommodate for uninterrupted access to and from Runway 15-33 and the apron while the runway is open.

Extending both ends of Runway 15-33 and Taxiway A will require a significant amount of fill and will require temporary closures of Runway 15-33, Runway 7-25, and sections of Taxiway A. Because of the temporary closure requirements, coordination on phasing with the airport is critical to allow undisturbed access to at least one of the runways at any given time. Work within the safety areas of the runways and

Taxiway A can be phased to take place during nighttime closures to reduce the impact on airport operations.

Estimated Total Project Cost: $19,682,000

AIRSIDE ALTERNATIVE 4

Airside Alternative 4, depicted on **Exhibit 4H**, presents another option in which Page Municipal Airport can grow to accommodate future need. This alternative again focuses on extending the runway to better serve the community, airport users, and larger aircraft operations, while meeting ultimate RDC D-III-4000 design standards. This alternative utilizes the maximum runway platform described in the previous alternative. Alternative 4 employs the use of EMAS beds in order to reduce the amount of RSA needed beyond the runway ends. This runway configuration results in a total runway length of 7,200 feet. This scenario does not require the use of declared distances. In order to provide the 600 feet of RSA necessary, the runway blast pads are extended to 300 feet, which exceeds the standard blast pad length and are not necessary. To illustrate the need for a properly graded surface, however, they are included on the exhibit.

Exhibit 4H also depicts the relocation of Taxiway A to provide the necessary 400 feet of separation from Runway 15-33. As shown on the exhibit, the relocation of Taxiway A has the potential to impact approximately 27,000 square yards of aircraft parking apron, 13 marked aircraft tiedown positions, three helicopter parking spaces, and both existing aircraft holding bays. No marked aircraft parking can be situated inside the TOFA, reducing the amount of aircraft parking apron space available to the fixed base operator (FBO). The new taxiway location also reduces the amount of apron available near the commercial service and air tour terminal. Several new connector taxiways providing access from Runway 15-33 to Taxiway A are included. The acute-angled taxiways and taxiways providing direct access from the aircraft parking apron to the runway are removed and replaced in accordance with taxiway design standards.

Alternative 4 considers the closure of Runway 7-25. It is assumed in this alternative that the runway would be deemed ineligible to receive federal funds for its maintenance, based on the prevailing wind conditions at the airport. Runway 15-33 currently meets the 95 percent wind coverage that the FAA requires at federally funded airports. The closure of Runway 7-25 would allow for new areas of redevelopment for useful airport infrastructure.

Preliminary Engineering Analysis

Demolishing Runway 7-25, the existing taxiway connectors A2, A3, and A4, and constructing proposed Taxiway A and taxiway connectors A1, A2, A3, A4, A5, and A6 will require the temporary closure of Runway 15-33 while working within the safety area of the runway. Removing existing lighting and signage and installing the new runway and Taxiway A lighting and signage will require that temporary cables are used to ensure that the lighting and signage that are to remain will not be affected.

Runway 15-33 | RDC D-III-4000 (Ultimate)
Runway 7-25 | Closed

1.58 Acres

300' EMAS

Close Runway 7-25

Relocated Segemented Cirlce

11.17 Acres

300' EMAS

Runway 15-33 (5,950' x 150')

Ultimate (7,200' x 150')

400'

A-1 A-2 A-3 A-4 A-5 A-6

A

C

Holding Bay

Sage Ave.

Glen Canyon Dr.

N

0 800 1600

SCALE IN FEET

Photo Source:
Quantum Spatial 10/19/2018

LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- Taxiway Object Free Area (TOFA)
- Uncontrolled RPZ Area
- 10 Foot Contour Lines
- New Pavement
- EMAS (Engineered Materials Arresting System)
- Pavement to be Removed

Detail of TOFA Impacts



Taxiway Object Free Area Impacts

- Approximately 27,000 square yards of aircraft parking apron
- 13 marked aircraft tie-down positions
- 3 helicopter parking spaces
- 2 existing aircraft holding bays

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Extending both ends of Runway 15-33 and constructing the EMAS will require a significant amount of fill and will require temporary closure of Runway 15-33 and/or temporary displaced threshold markings. Shifting Taxiway A to the west will have a significant impact on aircraft parking space on the south apron since the proposed Taxiway A will be taking up a portion of the apron space. Phasing for this alternative is critical to allow as much uninterrupted access to Runway 15-33 and the apron as possible. Demolition of Taxiway A and the portion of the apron can be staggered to allow for sections of proposed Taxiway A to be constructed, allowing for aircraft operations on portions of existing and proposed Taxiway A at the same time, while the remainder of both are either being constructed or demolished. A majority of the grade where proposed Taxiway A is located will not require fill due to the existing apron grade; however, the ends of Taxiway A outside the apron limits will require a large amount of fill. A portion of Taxiway C will also need to be demolished.

Existing drainage patterns on and off the airport will be affected due to the new paved areas and, therefore, an extensive drainage study will be needed. Grading and drainage improvements will be required to allow for positive drainage. Runoff from the airport must be contained on the airport. Because of this, the capacity of the existing drainage basin on the airport may need to be increased or new drainage basins may need to be constructed on the airport to contain the runoff and avoid discharge into the surrounding areas. With the significant upgrade to the lighting system, a new electrical vault may be required.

Estimated Total Project Cost: $42,921,000

AIRSIDE ALTERNATIVE 5

Airside Alternative 5, depicted on **Exhibit 4J**, is another option for providing the runway-to-taxiway separation necessary to meet RDC D-III-4000 design standards. This alternative proposes the construction of a new runway 100 feet to the east of the existing runway, creating the required 400-foot runway-to-taxiway separation. Under this scenario, existing Taxiway A would remain in its current location, allowing infrastructure west of Taxiway A to remain. The larger TOFA associated with a critical design aircraft in the ADG III category would still have an impact on several aircraft tiedowns adjacent to Taxiway A. The newly constructed Runway 15-33 would be 7,200 feet long and 100 feet wide. The FAA also recommends that runways serving aircraft weighing up to 150,000 pounds be equipped with 20-foot runway shoulders. Like the previous airside alternatives that include a runway extension, significant grading work will need to be performed in order to create the ultimate 8,400-foot runway platform necessary. EMAS is utilized once again to minimize RSA grading. Because the runway will move 100 feet east of its current location, Alternative 5 also proposes the addition of holding bays on both ends of Runway 15-33. Holding bays provide a location for aircraft to prepare for departure and/or bypass other aircraft.

Another impact of the relocation of the runway in this alternative would be the VOR facility, currently located northeast of the intersection of Runways 15-33 and 7-25. Its existing location would impact the ROFA associated with the runway relocation. As such, this alternative proposes the relocation of the

VOR outside the proposed ROFA. This project would require significant coordination with the FAA, given the facility's ownership and operation.

Several connector taxiways must be removed and replaced to address the taxiway geometry issues as previously discussed. Runway 7-25 is assumed to be closed in this alternative.

Preliminary Engineering Analysis

Demolition and reconstruction of the shifted and extended Runway 15-33 will need to be completed prior to demolishing Runway 7-25 to allow for near uninterrupted operations at the airport. The extended areas of Taxiway A, Runway 15-33, and the EMAS for Runway 15-33 require a significant amount of fill and, with the complete demolition of existing Runway 15-33, a large amount of the cut and demolished material can be used as fill. With the removal and replacement of the entire runway lighting and signage system, a new electrical vault will likely be needed. Relocating the runway will also require new PAPIs to be installed and an FAA flight check will be needed. As detailed above, the VOR will also need to be relocated and will require specific coordination with the FAA.

Existing drainage patterns on and off the airport will be affected due to the new paved areas and, therefore, an extensive drainage study will be needed. Grading and drainage improvements will be required to allow for positive drainage. Runoff from the airport must be contained on the airport. Because of this, the capacity of the existing drainage basin on the airport may need to be increased or new drainage basins may need to be constructed to contain the runoff and avoid discharge into the surrounding areas.

Estimated Total Project Cost: $46,361,000

AIRSIDE ALTERNATIVE 6

Airside Alternative 6, shown on **Exhibit 4K**, considers a relocation and re-orientation of the primary runway to a north/south (18-36) runway orientation. A significant amount of property would need to be acquired in order to implement this alternative, to include approximately 122.7 acres of vacant land northeast of the airport that would encompass a combination of RSA, ROFA, and RPZ. This runway orientation meets the minimum 95 percent total wind coverage requirement and allows the full runway length to remain on the airport site's natural plateau. Like the previous alternatives, fill and grade will be required to provide for the RSA and ROFA. This alternative assumes that proper RSA can be graded to meet runway safety area standards on the south end of the runway. The ultimate runway, under this scenario, is constructed to be 6,800 feet in length and 100 feet wide with 20-foot runway shoulders. This alternative allows the airport to remain in its current location where significant investment has been made in the airport's infrastructure over the years, while creating a more capable runway environment that meets ultimate RDC D-III-4000 design standards. A full-length parallel taxiway is provided and is separated from the runway by 400 feet. A significant benefit to the relocation/reorientation of the

Runway 15-33 | RDC D-III-4000 (Ultimate)
Runway 7-25 | Closed

N

0 800 1600

SCALE IN FEET

Photo Source:
Quantum Spatial 10/19/2018

Relocated VOR

Close Runway 7-25

Relocated Segemented Cirlce

4.51 Acres

12.79 Acres

300' EMAS

300' EMAS

Runway 15-33 (7,200'x 100')

400'

A-1 A-2 A-3 A-4 A-5 A-6 A-7

Holding Bay

Holding Bay

Taxiway Object Free Area
impacts 13 aircraft tie-down positions

Sage Ave.

Glen Canyon Dr.

Grandview St.

10th Ave.

Aero Ave.

S. Navajo Dr.

N. Navajo Dr.

LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- Taxiway Object Free Area (TOFA)
- Uncontrolled RPZ Area
- 10 Foot Contour Lines
- New Pavement
- EMAS (Engineered Materials Arresting System)
- Pavement to be Removed

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Runway 18-36 | RDC D-III-4000 (Ultimate)
Runway 15-33 | Closed
Runway 7-25 | Closed

N
0 800 1600
SCALE IN FEET
Photo Source:
Quantum Spatial 10/19/2018

122.7 Acres
400'
Holding Bay
Runway 18-36 (6,800' x 100')
Assume proper RSA/ROFA grade
Holding Bay
Sage Ave.
Glen Canyon Dr.
10th Ave.
Aero Ave.
Grandview St.

LEGEND
- Taxiway Designation
- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- Taxiway Object Free Area (TOFA)
- Property to be Acquired
- 10 Foot Contour Lines
- Pavement to be Removed
- New Pavement

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primary runway is the space that is made available for additional development of the airport property. The relocation would also serve to insulate the nearby residential areas from aircraft noise.

As previously discussed, the wind coverage requirement is met by this runway orientation. As such, the need to maintain or replace crosswind Runway 7-25 is not necessary under this scenario. Therefore, Runway 7-25 is planned to be closed in this alternative.

Preliminary Engineering Analysis

Obtaining the fill material required for this alternative will be the biggest challenge due to the low level of the existing grade in the proposed runway and taxiway area. The proposed taxiway connectors span a long distance from the apron area to the proposed taxiway and a majority of that span will also require a large amount of fill. Existing drainage patterns on and off the airport will be dramatically affected due to the new paved areas and; therefore, an extensive drainage study will be needed. Runoff from the airport must be contained on the airport. Because of this, the capacity of the existing drainage basin on the airport may need to be increased or new drainage basins constructed to contain the runoff and avoid discharge into the surrounding areas.

A majority of the new runway, taxiway, and taxiway connectors can be constructed while the airport is in full operation because most of it is outside the safety areas of the existing runways.

Being that the new runway and taxiway are located so far east of the terminal and apron area, a significant amount of electrical updates and work, including upgrading the vault, will be required, along with new PAPIs. An FAA flight check will be required once the PAPIs are constructed. Extensive electrical work will be needed to include the new runway, taxiway, and taxiway connectors into the electrical circuit.

Land re-designation is a critical component to this alternative as well. The City owns the land located to the east of the current airport property limit where the proposed runway, taxiway, and taxiway connectors will be constructed; thus, the City will need to re-designate that land as airport property. Once the necessary land is dedicated as airport property, fencing relocation and a new perimeter service road will be required.

Estimated Total Project Cost: $85,981,000

AIRSIDE ALTERNATIVES SUMMARY

The airside development considerations have focused on several elements that include mitigating safety area deficiencies, improving existing and future taxiway development on the airfield, enhancing instrument approach capabilities to the runway system, and analyzing other ancillary airfield support items. These alternatives will be considered by the PAC, airport management, the City of Page, and the general public. Following discussion and review with these entities, a recommended airside development

concept will be drafted and presented in the next chapter. Striking a balance between providing the most benefit to airfield safety and capacity and impacts to the surrounding community is the challenge for any airfield alternatives discussion. No single alternative may satisfy all stakeholder needs; however, finding a compromise that allows the airport to continue to meet the needs of its users and grow as an economic engine, while minimizing negative impacts to the community, is the goal.

Each of the airfield alternatives, including the do-nothing alternative, are summarized and compared in **Table 4B**.

TABLE 4B
Airside Alternatives Summary
Page Municipal Airport

Airside Alternatives	RDC	RSA/ROFA/RPZ Standards Met	Property Acquisition	Runway Length	Estimated Project Cost
Do-Nothing	C-II-5000	No	0 acres	5,950'	$0
Airside Alternative 1	C-II-5000	Yes	0 acres	5,950'	$947,000
Airside Alternative 2	C-II-5000	Yes	0 acres	5,950'	$23,511,000
Airside Alternative 3	D-III-4000	Yes	48.8 acres	8,400'	$19,682,000
Airside Alternative 4	D-III-4000	Yes	12.8 acres	7,200'	$42,921,000
Airside Alternative 5	D-III-4000	Yes	17.3 acres	7,200'	$46,361,000
Airside Alternative 6	D-III-4000	Yes	122.7 acres	6,800'	$85,981,000

Source: C&S Engineering and Coffman Associates analysis

LANDSIDE PLANNING CONSIDERATIONS

The purpose of this section is to identify and evaluate landside development alternatives at Page Municipal Airport to meet projected demand based upon analysis outlined in Chapter Three. Generally, landside issues are related to those facilities necessary or desired 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. Land use planning considerations will focus on strategies following a philosophy of separating activity levels. 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. Due to the layout and availability of land at Page Municipal Airport, consideration will also be given to non-aviation uses that can provide additional revenue support to the airport and support economic development for the region.

AVIATION ACTIVITY LEVELS

The aviation development areas should be divided into high, medium, and low activity levels. The high activity area should be planned and developed to provide aviation services on the airport. An example of the high activity area is the terminal building and adjoining aircraft parking apron, which provides

tiedown locations and circulation for aircraft. In addition, hangars used for FBOs, flight departments, or storing many aircraft would be considered a high activity use area. The best location for high activity areas is along the flight line near midfield, for ease of access to all areas on the airfield. All major utility infrastructure would need to be provided to these areas.

The medium activity use category primarily includes smaller turbine aircraft that may desire their own executive hangar storage on the airport. The best location for medium activity use is off the immediate flight line, but still readily accessible to the airfield. Due to an airport's layout and other existing conditions, if this area is to be located along the flight line, it is best to keep it out of the midfield area, so as not to cause congestion with transient aircraft utilizing the airport. Parking and utilities, such as water and sewer, should also be provided in this area.

The low activity use category defines the area for storage of smaller single and multi-engine piston aircraft. Low activity users are personal or small business aircraft owners who prefer individual space in linear box hangars or T-hangars. Low activity areas should be located in less conspicuous areas. This use category will require electricity, but generally does not require water or sewer utilities.

In addition to the functional compatibility of the aviation development areas, the proposed development concept should provide a first-class appearance for the airport. As previously mentioned, the airport serves as a very important link to the entire region. Consideration to aesthetics should be given high priority in all public areas, as the airport can serve as the first impression a visitor may have of the community.

In order to allow for maximum development of the airport, while keeping with mandated safety design standards, it is very important to devise a plan that allows for the orderly development of airport facilities. Typically, airports will reserve property adjacent to the runway system for aviation-related activity exclusively. This will allow for the location of taxiways, aprons, and hangars.

COMMERCIAL TERMINAL EXPANSION/RELOCATION

As outlined in Chapter Three, the existing terminal measures approximately 8,100 square feet. The terminal area recommended to adequately serve the projected number of passengers in the short term is 10,300 square feet and is calculated to be 13,700 square feet in the long term. These projections only account for the space necessary for scheduled service. The airport terminal also currently serves air tour passengers in the same space. The facility needs for terminal area related to air tour operations are also considered in the following sections. Areas that may need expansion include baggage claim, ticketing/check-in, security screening, departure holdroom facilities, concessions, restrooms, and general circulation spaces. The landside alternatives to follow present several options that range from expanding the existing terminal to the construction of a new terminal building to meet demand.

When considering a new terminal facility, it is important to remember that the terminal is often the first impression air travelers have of the area. A functional and attractive terminal facility can be needed to

secure and build air travelers' favorable opinion of the surrounding area, particularly business leaders who may be investing in communities adjacent to an airport.

Terminal Siting Considerations

FAA Advisory Circular (AC) 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*, identifies a number of basic considerations that affect the location of a terminal building. The primary considerations include the following:

1. **Runway Configuration:** The terminal site should be located to minimize aircraft taxiing distances and active runway crossings.

2. **Airfield Access:** The terminal site should consider the layout of terminal aprons and access taxilanes or taxiways and apply recommended airfield design standards to reduce the probability of runway incursions.

3. **FAA Geometric Design Standards and Airspace:** The terminal location needs to assure adequate distance from present and future aircraft operational areas and remain clear of imaginary airspace surfaces.

4. **Access to Highway Network:** The terminal should be located to provide the most direct/shortest routing to the access transportation system.

5. **Expansion Potential:** The long-term viability of the terminal is dependent upon the ability of the site to accommodate expansion of the terminal beyond forecast requirements.

6. **Existing and Planned Facilities:** The terminal site should consider the existing and planned locations of other airport facilities and equipment so as not to interfere with line-of-sight or other operational restrictions associated with these facilities.

7. **Terrain:** Topographical conditions should be considered in the selection of a terminal site.

Consideration in the alternatives' analysis is given to a terminal location that best meets the criteria listed above, while considering existing airport infrastructure investment and future development potential, while also being able to best segregate general aviation and commercial service activities.

AIR TOUR FACILITY REQUIERMENTS

Currently, commercial air tour terminal activities are conducted in the same location as scheduled airline operations. The existing terminal building provides approximately 8,100 square feet of floorspace on the lower level. The upper level is used as office space for airport administration. Air tours currently account

for most of the enplanements at Page Municipal Airport, and this number is forecast to grow, as is the need for terminal facility space related to the operations. As outlined in Chapter Three, to meet the forecasted long-term need, approximately 12,730 square feet of terminal area will be needed to support air tour activities. In the future, air tour operations can be separated from commercial service terminal areas to relieve congestion in these areas. As such, landside alternatives will present options for separate locations for a dedicated air tour facility and the commercial service terminal, as well as an option for the expansion of the existing terminal.

VEHICLE PARKING

As operations and enplanements at the airport grow, the number of vehicle parking spaces will need to increase. The existing lot provides 125 spaces by the terminal. This location is not easily expanded due to the surrounding development constraints. Currently, the parking lot is being utilized by all types of airport users, which creates a strained parking situation. As such, new areas for vehicle parking must be examined. Separating parking areas for scheduled commercial service passengers, air tour passengers, rental car customers, and general aviation users would help to alleviate congestion in the terminal parking lot. New areas suitable for vehicle parking will be identified as part of the landside facilities development analysis.

HANGAR DEVELOPMENT

Analysis in Chapter Three indicated that the airport should plan for the construction of additional aircraft hangars over the next 20 years, as demand dictates. Hangar development takes on a variety of sizes corresponding with several different intended uses.

Commercial general aviation activities are essential to providing the necessary services on an airport. This includes privately owned businesses involved with, but not limited to, air tours, aircraft rental and flight training, aircraft charters, aircraft maintenance, line service, and aircraft fueling. These types of operations are commonly referred to as FBOs or specialized aviation service operators (SASOs). The facilities associated with businesses such as these typically include conventional type hangars that are able to hold several aircraft. High levels of activity often characterize these operations with a need for apron space for the storage and circulation of aircraft. These facilities are best placed along ample apron frontage with good visibility from the runway system for transient aircraft. Utility services are needed for these types of facilities, as well as vehicle parking areas.

Aircraft hangars used for the storage of smaller aircraft primarily involve T-hangars or linear box hangars. Since storage hangars often have lower levels of activity, these types of facilities can be located away from the primary apron areas in more remote locations of an airport. Limited utility services are needed for these areas.

Other types of hangar development can include executive/box hangars for accommodating either one larger aircraft or multiple smaller aircraft. These types of hangars can be used by corporations with company-owned aircraft or by an individual or group of individuals with multiple aircraft. These hangar areas typically require all utilities and segregated roadway access. **Table 4C** summarizes the aircraft hangar types and corresponding size and aviation uses that are typically associated with each facility.

TABLE 4C
Aircraft Hangar Types

Hangar Type	Typical Size	Aviation Uses
Conventional	Clear span hangars greater than 10,000 square feet	FBOs, SASOs, and other commercial aviation activities resulting in high activity uses
Executive/Box	Clear span hangars less than 10,000 square feet	SASOs, flight departments, and private aircraft storage resulting in medium-to-high activity uses
T-Hangar/Linear Box/Shade Hangar	Individual storage spaces offering 1,200-1,500 square feet	Private aircraft storage resulting in low activity uses

FBO – Fixed Base Operator
SASO – Specialized Aviation Service Operator

Currently, there is approximately 206,000 square feet of hangar space provided on the airport, made up of a combination of hangar types. Future planning indicates a potential need for approximately 289,900 square feet of hangar space through the long-term planning period. With a potential need for 83,900 square feet of new hangar space, a wide range of hangar types could provide the space needed. According to the facility requirements analysis in Chapter Three, the largest demand for hangars will be in the conventional and executive hangar categories.

REVENUE SUPPORT LAND USES

As part of this master plan, consideration is being given to portions of airport property to be utilized for non-aviation purposes. As can be seen from the analysis of facility needs conducted so far, significant portions of airport property are needed to help satisfy existing and projected aviation demand. Prudent planning, however, will evaluate various land uses that could be developed for non-aviation purposes that would be compatible with aviation-related activity in order to further support and enhance the airport's self-sufficiency.

It should be noted that the airport does not have the approval to use undeveloped property for non-aviation purposes at this time. Specific approval from the FAA will be required to utilize undeveloped property for non-aviation uses. This planning document does not gain approval for non-aviation uses, even if these uses are ultimately shown in the master plan and on the airport layout plan (ALP). A separate request justifying the use of airport property for non-aviation uses will be required. This study can be a source for developing that justification.

An environmental determination will also be required. While FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* states that a release of an airport sponsor from federal obligations is

normally categorically excluded and would not require an Environmental Assessment (EA), the issuance of a categorical exclusion is not automatic, and the FAA must determine that no extraordinary circumstances exist at the airport. Extraordinary circumstances would include a significant environmental impact to any of the environmental resources governed by federal law. An EA may be required if there are extraordinary circumstances. The generalized land use alternatives to follow outline areas on the airport which could be planned and ultimately developed for non-aviation related uses.

BUILDING RESTRICTION LINE

The building restriction line (BRL) identifies suitable building area locations on the airport. The BRL encompasses the RPZs, the ROFA, navigational aid critical areas, areas required for terminal instrument procedures, and other areas necessary for meeting airport line-of-sight criteria.

Two primary factors contribute to the determination of the BRL: type of runway (utility or other-than-utility) and the capability of the instrument approaches. Runway 15-33 is considered an "other-than-utility" runway, which is intended to be used by aircraft in the "other than utility category" or "large aircraft" category with a gross weight greater than 12,500 pounds.

The BRL is the product of Title 14 CFR Part 77 transitional surface clearance requirements. These requirements stipulate that no object be located in the primary surface, defined as being no closer than 250 feet from a non-precision instrument runway centerline and not closer than 500 feet to a runway served by a precision instrument approach. For Page Municipal Airport, the current primary surface is 500 feet wide (250 feet on either side of the runway centerline). The proposed ultimate primary surface is 1,000 feet wide (500 feet on either side of the runway centerline). From the primary surface, the transitional surface extends outward at a slope of one vertical foot to every seven horizontal feet.

The location of the BRL is dependent upon the selected allowable structure height. Traditionally, the BRL is set at a point where the transitional surface is 20 feet or 35 feet above runway elevation. A 20-foot BRL associated with a one-mile minimum approach visibility to Runway 15-33 does not interfere with any existing or proposed airport infrastructure. However, a 20-foot BRL associated with a ¾-mile approach increases the size of the primary surface significantly. In turn, the BRL would interfere with several existing and proposed buildings. As a result, if the airport decided to pursue a ¾-mile visibility approach to Runway 15-33, the BRL would need to be complied with. It should be noted that the landside alternatives to follow depict a 20-foot BRL in association with a not lower than one-mile visibility instrument approach.

LANDSIDE ALTERNATIVES

The intent of this analysis is to present alternatives that meet the long-term landside facility needs of the airport. These alternatives take into account the airside considerations detailed earlier in the chapter, such as separation between Runway 15-33 and parallel Taxiway A, as well as ultimate placement of

the runway system. Property on the west side of Runway 15-33 has been utilized to its full potential as this is where most of the airport's developable property can be found. This area of the airport currently supports all landside development and existing utilities and infrastructure. It is important that the alternatives also consider ultimate facility needs and potential development of the east side of Runway 15-33. Due to terrain constraints, consideration has been given to the expense and difficulty of bringing access to the east side of Runway 15-33. Any future east side development would be accessible via the selected access roads proposed in this section. The alternatives are meant to be conceptual development plans aimed at meeting the needs of aviation and additional support functions.

The discussion of alternatives to follow provide a breakdown of aviation demand segments and are separated into categories based upon airfield location. West side development refers to any development west of Runway 15-33, while east side development refers to any proposed development east of Runway 15-33. Holding bays that comply with updated FAA standards for ADG III aircraft are provided in various locations on each alternative.

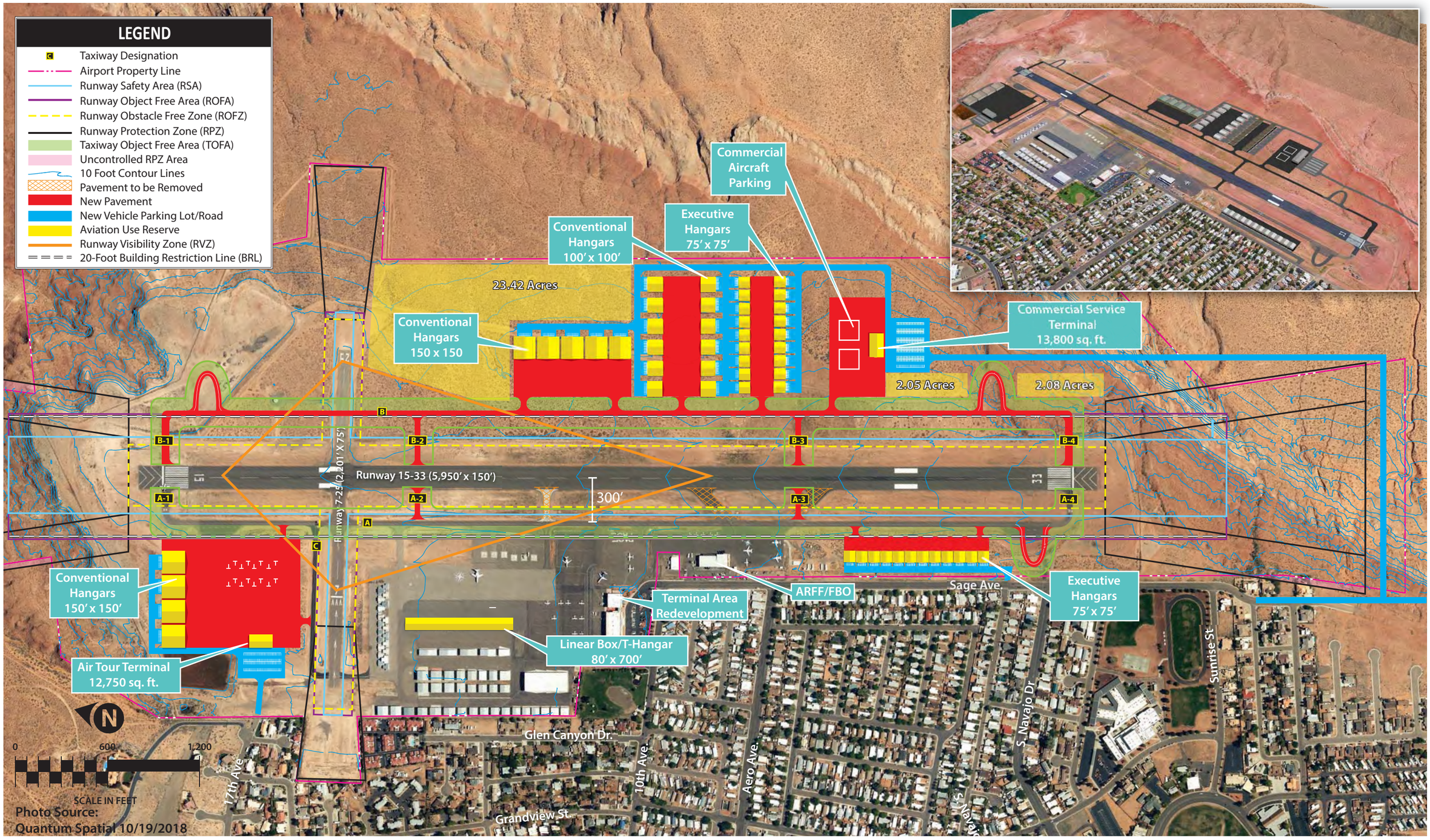
The alternatives to be presented are not the only options for development. In some cases, a portion of one alternative could be combined with another. Also, some development concepts could be replaced with others. The final recommended plan serves only as a guide for the airport to aid in the strategic planning of available properties. Many times, airport operators change their plan to meet the needs of specific users. The goal in analyzing landside development alternatives is to focus future development so that airport property can be maximized. The landside element of the recommended master plan concept may be one of these alternatives or, more likely, a combination of elements from each. Input from the PAC and the public is integral to determining the landside vision for the airport.

LANDSIDE ALTERNATIVE 1

Landside Alternative 1, depicted on **Exhibit 4L**, presents a scenario in which both runways at the airport remain active and considers development potential on both sides of Runway 15-33. This alternative also maintains parallel Taxiway A in its current location, which adheres to proper runway-to-parallel taxiway separation under the existing RDC detailed earlier in the chapter; however, it falls short of the 400-foot requirement for the ultimate RDC and would require a Modification to Design Standard from the FAA in the event that Runway 15-33 were to transition to a D-III design.

Terminal Area

- A new 13,800 square foot commercial service terminal building is proposed east of Runway 15-33 along with a 25,300 square yard commercial service apron. Vehicle parking for the commercial service terminal provides approximately 200 vehicle parking spaces.
- A new 12,750 square foot air tour terminal and 60,000 square foot vehicle parking area that provides approximately 125 parking spaces is accessible via 17th Avenue in the northwest area of the airport.


LEGEND
Taxiway Designation
Airport Property Line
Runway Safety Area (RSA)
Runway Object Free Area (ROFA)
Runway Obstacle Free Zone (ROFZ)
Runway Protection Zone (RPZ)
Taxiway Object Free Area (TOFA)
Uncontrolled RPZ Area
10 Foot Contour Lines
Pavement to be Removed
New Pavement
New Vehicle Parking Lot/Road
Aviation Use Reserve
Runway Visibility Zone (RVZ)
20-Foot Building Restriction Line (BRL)
Commercial Aircraft Parking
Conventional Hangars 100′ x 100′
Executive Hangars 75′ x 75′
Conventional Hangars 150 x 150
23.42 Acres
Commercial Service Terminal 13,800 sq. ft.
2.05 Acres
2.08 Acres
Runway 15-33 (5,950′ x 150′)
Runway 7-25 (2,201′ x 75′)
300′
Conventional Hangars 150′ x 150′
Air Tour Terminal 12,750 sq. ft.
Terminal Area Redevelopment
ARFF/FBO
Linear Box/T-Hangar 80′ x 700′
Executive Hangars 75′ x 75′
Sage Ave.
Glen Canyon Dr.
Grandview St.
17th Ave.
10th Ave.
Aero Ave.
S. Navajo Dr
Sunrise St
0
600
1,200
SCALE IN FEET
Photo Source:
Quantum Spatial 10/19/2018

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- In the event that a new commercial service terminal development east of Runway 15-33 is not pursued, the existing terminal area can be expanded to serve as a dedicated scheduled commercial service terminal. If a new commercial service terminal is built, the existing terminal can be redeveloped, as needed, for general aviation or other aviation support use.

West Side Development

- On the southwest side of Runway 15-33, 12 executive hangars measuring 5,600 square feet each are proposed. Designated parking areas for each hangar are provided and are accessible via Sage Avenue.
- On the existing apron, a linear box/T-hangar complex is proposed to increase small aircraft storage capacity at the airport. The proposed hangar has the capacity for 35 small aircraft and would provide approximately 56,000 square feet of storage space.
- Northwest of Runway 7-25 is the addition of a large apron area that can support a relocated air tour terminal facility as detailed previously.
- Four large conventional hangars are also located on the northwest apron, each one providing 22,500 square feet of aircraft storage space. Each conventional hangar is provided with designated vehicle parking areas providing 10 vehicle parking spaces for each hangar. The conventional hangars would be accessible via 17th Avenue.

East Side Development

Development on the east side of the Runway 15-33 assumes that vehicle access can be achieved by extending Sage Avenue south and then east to remain outside of the ultimate RPZ for Runway 33.

- Eighteen (18) 5,600 square foot executive box hangars are proposed north of the proposed commercial service terminal area. Each hangar is provided with vehicle access and five vehicle parking spaces.
- Twelve (12) 10,000 square foot conventional hangars are proposed north of the executive hangars. These conventional hangars are also provided with vehicle access and individual vehicle parking areas providing nine parking spaces for each hangar.
- Farther north, parallel to Runway 15-33, is an area planned for five 22,500 square foot conventional hangars. These hangars could accommodate high activity level aviation operations.

Aviation Reserve

Three areas on the airport are reserved for potential aviation use and include one 23.42-acre parcel to the northeast and two smaller two-acre parcels to the southeast. These parcels could be utilized to satisfy future aviation activities as demand would dictate.

LANDSIDE ALTERNATIVE 2

Landside Alternative 2, presented on **Exhibit 4M**, accounts for several changes to the airside environment which has a significant impact on the landside development. The first major difference on this alternative is the closure of the crosswind runway. With Runway 7-25 closed, more property on the west side of Runway 15-33 is available for development. Another major difference in this alternative is the relocation of Taxiway A to provide 400 feet of runway-to-taxiway separation necessary to meet ultimate RDC D-III-4000 design standards, which will impact existing airport infrastructure such as aircraft parking apron and helicopter operations areas. Full-length parallel Taxiway B is planned on the east side of Runway 15-33 to also provide 400 feet of separation.

Terminal Areas

- This alternative maintains the existing airport terminal as a multi-purpose commercial service and air tour terminal. Using the existing terminal footprint, a terminal expansion to 18,200 square feet is proposed to better serve commercial service and air tour operations.

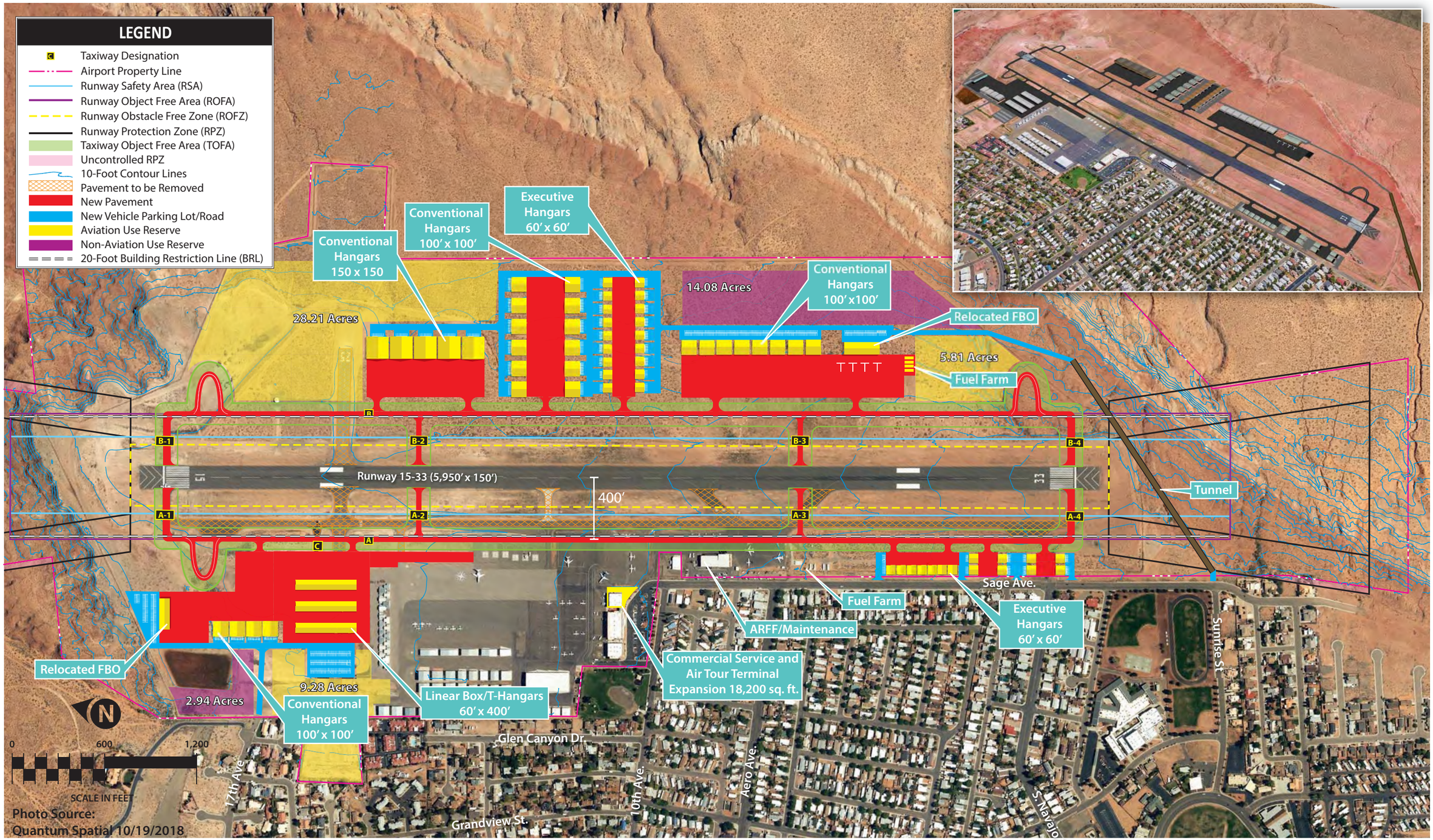
West Side Development

- Development southwest of Runway 15-33 consists of fifteen (15) 3,600 square foot executive box hangars. Access to these hangars is provided via Sage Avenue.
- On the northwest corner of the airfield, several linear box and/or T-hangar complexes are shown. They are served by a large vehicle parking area west of the apron that provides ample vehicle parking spaces. Access to the parking area is provided via 17th Avenue.
- The general aviation apron continues to the north and serves four 10,000 square foot conventional hangars.
- A building on the northwest apron area is proposed for relocation of FBO services that could be displaced due to the relocation of Taxiway A to meet RDC D-III-4000 separation standards. This location provides a large portion of apron for transient aircraft parking and a large vehicle parking area.

East Side Development

Access to the east side of the airfield in this alternative is provided by a tunnel built in a way that will not interfere with the safety areas or RPZs beyond the ends of the runway. The tunnel begins at the corner of Sage Avenue and Sunrise Street.

- Another location is proposed for the relocation of a displaced FBO. On the southeast end of Runway 33, a new FBO complex including four parking positions marked for larger turbine aircraft are provided. Also shown on the exhibit is a new fuel farm adjacent to the aircraft parking apron.


LEGEND
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Runway Protection Zone (RPZ)
Taxiway Object Free Area (TOFA)
Uncontrolled RPZ
10-Foot Contour Lines
Pavement to be Removed
New Pavement
New Vehicle Parking Lot/Road
Aviation Use Reserve
Non-Aviation Use Reserve
20-Foot Building Restriction Line (BRL)
Conventional Hangars 150 x 150
Conventional Hangars 100' x 100'
Executive Hangars 60' x 60'
28.21 Acres
14.08 Acres
Conventional Hangars 100' x100'
Relocated FBO
5.81 Acres
Fuel Farm
TTTT
Runway 15-33 (5,950' x 150')
400'
Tunnel
Sage Ave.
Executive Hangars 60' x 60'
Fuel Farm
ARFF/Maintenance
Commercial Service and Air Tour Terminal Expansion 18,200 sq. ft.
Relocated FBO
9.28 Acres
2.94 Acres
Conventional Hangars 100' x 100'
Linear Box/T-Hangars 60' x 400'
0
600
1,200
SCALE IN FEET
Photo Source:
Quantum Spatial 10/19/2018
Glen Canyon Dr.
17th Ave.
10th Ave.
Aero Ave.
Grandview St.
Sunrise St.

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- North of the proposed FBO are eight 10,000 square foot conventional hangars sharing the east side transient aircraft parking apron.
- Additional aircraft storage is provided in the form of 18 executive hangars (3,600 square feet each), 12 conventional hangars (10,000 square feet each), and five larger conventional hangars (22,500 square feet each). Each individual hangar is provided with road access and vehicle parking.

Aviation / Non-Aviation Reserve

Similar to Landside Alternative 1, there are multiple areas designated for aviation use reserve including a 28.21-acre parcel in the northeast area of the airport, a 5.8-acre parcel in the southeast quadrant of the airport, and a 9.28-acre parcel in the northwest area. Two non-aviation reserve parcels are included with this alternative, one in the northwest area and the other in the southeast area of the airport.

LANDSIDE ALTERNATIVE 3

Exhibit 4N details Landside Alternative 3 and assumes that the airport sponsor and the FAA elect to relocate and re-orientate the primary runway as described previously in Airside Alternative 6**.** Existing Runways 15-33 and 7-25 would be closed and portions of existing Taxiway A would remain. This alternative proposes that vehicle access is provided through areas that are currently being used as active aircraft operations areas. However, because vehicle traffic cannot be mixed with aircraft movement areas, aircraft access will be restricted. Aircraft will be able to gain access to all apron areas on either side of the roadway via the redesigned taxiway system. A portion of existing Taxiway A must be closed in order to provide vehicle access. Much of the existing landside infrastructure supporting aircraft hangars and FBO/SASO activities could remain. All development in this alternative will be west of the relocated runway. As such, an advantage to this alternative is the ability to provide additional landside development potential without having to plan for roadway access to the east of the runway environment.

Terminal Areas

- A new 27,000 square foot commercial service and air tour terminal along with two commercial aircraft parking spaces are provided. The construction of new aircraft parking apron is provided west of the relocated runway in the midfield area.
- Vehicle access to the commercial terminal parking area is provided by extending a roadway east of Sage Avenue near the existing terminal area.

Hangar Development

- Hangar development in the form of 20 executive hangars (5,625 square feet each) are provided south of the proposed commercial service and air tour terminal facility and would be afforded direct access to a large circulation area and ultimate parallel taxiway serving the relocated runway system.
- Several linear box/T-hangar complexes providing 180 individual units (1,600 square feet each) are proposed north of the terminal area.
- Six large conventional hangars (22,500 square feet each) are provided with vehicle access and eight parking spaces each via a proposed 17th Avenue entrance. This proposed hangar complex and access would be allowed only if Runway 7-25 were to close.

Aviation / Non-Aviation Reserve

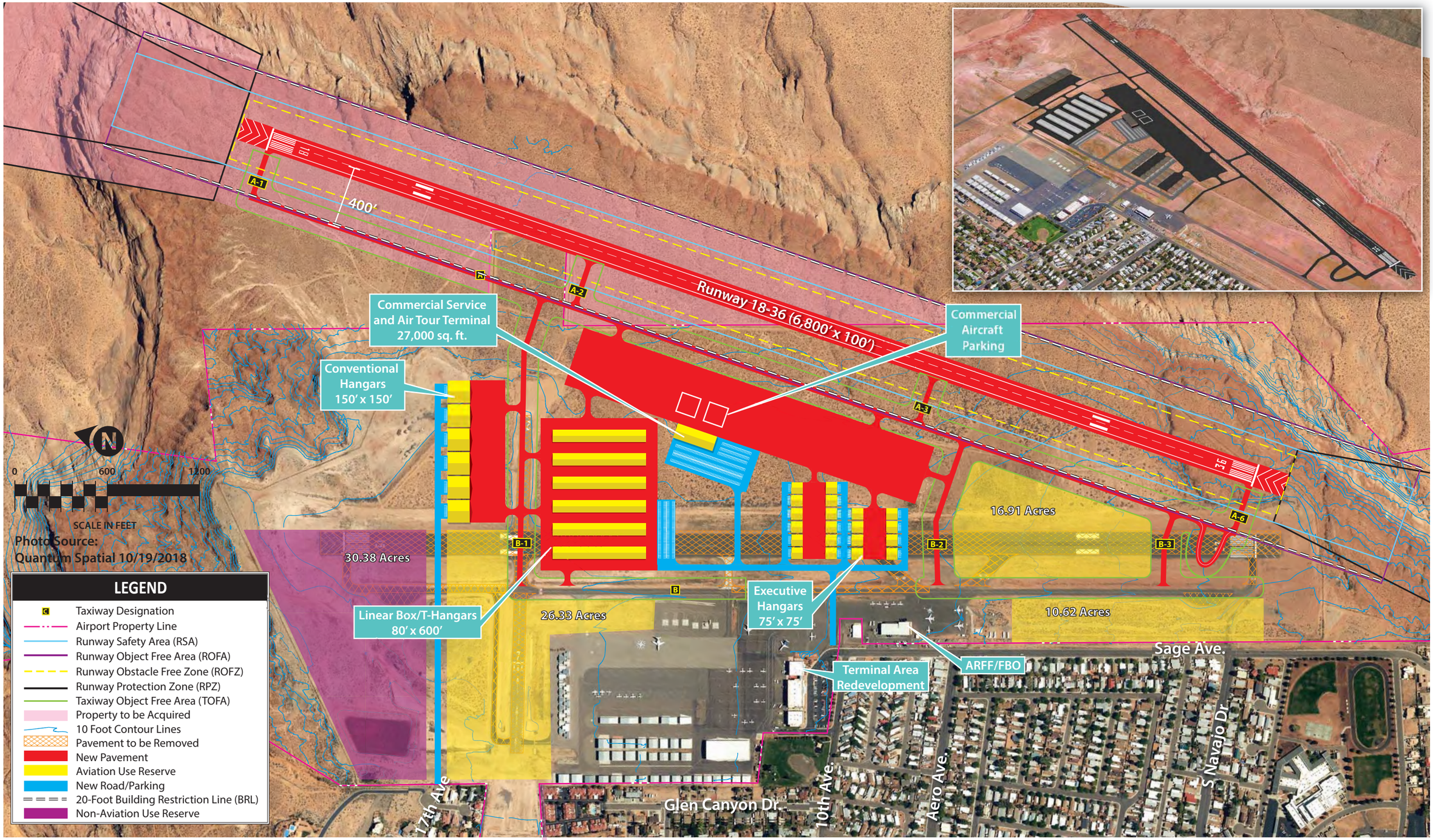
Landside Alternative 3, given its greatly expanded airport land use area, also identifies several large areas for aviation and non-aviation reserve and include a 26.33-acre parcel to the north of the existing apron, a 16.91-acre parcel adjacent to Taxiway A near the approach end of Runway 36, and a 10.62-acre parcel along Sage Avenue that could potentially be developed for future aviation use as demand dictates. A 30.38-acre non-aviation parcel is also depicted in the northwest quadrant of the airport. This area is considered for non-aviation use since it is not afforded aircraft access due to the extension of a vehicle roadway.

LANDSIDE ALTERNATIVES SUMMARY

The landside alternatives previously detailed accommodate an array of aviation activities that either currently occur or could be expected to occur at Page Municipal Airport in the future. As with many of the alternatives detailed in this chapter, airport staff should continually monitor the demand that is occurring on the airfield and in the region to help determine the potential need for enhanced landside facilities, both aviation and non-aviation related. Each of the development options considers a long-term vision that would, in some cases, extend beyond the 20-year scope of this master plan. It is beneficial to provide a long-term vision for the airport for future generations.

ALTERNATIVES SUMMARY

Planning future development of both the airside and landside is important because individual actions taken in one area can impact the potential for other options in the future. Therefore, it is important to examine the alternative development options in order to maximize the opportunities of Page Municipal Airport.


Runway 18-36 (6,800' x 100')
400'
A-1
A-2
A-3
A-6
B-1
B-2
B-3
B
Commercial Service and Air Tour Terminal 27,000 sq. ft.
Conventional Hangars 150' x 150'
Commercial Aircraft Parking
Linear Box/T-Hangars 80' x 600'
Executive Hangars 75' x 75'
Terminal Area Redevelopment
ARFF/FBO
30.38 Acres
26.33 Acres
16.91 Acres
10.62 Acres
0
600
1200
SCALE IN FEET
Photo Source:
Quantum Spatial 10/19/2018
LEGEND
Taxiway Designation
Airport Property Line
Runway Safety Area (RSA)
Runway Object Free Area (ROFA)
Runway Obstacle Free Zone (ROFZ)
Runway Protection Zone (RPZ)
Taxiway Object Free Area (TOFA)
Property to be Acquired
10 Foot Contour Lines
Pavement to be Removed
New Pavement
Aviation Use Reserve
New Road/Parking
20-Foot Building Restriction Line (BRL)
Non-Aviation Use Reserve
17th Ave
Glen Canyon Dr.
10th Ave.
Aero Ave.
Sage Ave.
S Navajo Dr

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Several development alternatives related to both the airside and landside have been presented. The process utilized in assessing these alternatives involved a detailed analysis of short- and long-term requirements as well as future growth potential. After review and input from the PAC, airport management, the City of Page, and interested local citizens, a recommended development concept for Page Municipal Airport to include a detailed capital improvement program and environmental overview will be presented in the next phase of this study.



page
ARIZONA
THE CENTER OF CANYON COUNTRY

Chapter Five

MASTER PLAN CONCEPT









MASTER PLAN CONCEPT

The airport master planning process for Page Municipal Airport has evolved through the development of forecasts of aviation demand, an assessment of facility needs, and an evaluation of airport development alternatives. The planning process has included the development of draft working papers which were presented to the Planning Advisory Committee (PAC) in coordination meetings beginning in November 2018. The PAC, which represents a cross-section of airport tenants, users, and government agencies, has provided valuable input into the planning process and contributed to the final master plan recommendations.

In the previous chapter, several development alternatives were considered for future airside and landside development. These alternatives have been refined and combined into a final recommended development concept. The following narrative will provide an overview of the recommendations, while the next chapter (Chapter Six) provides a proposed schedule for development priorities, estimated costs, and potential funding sources. The final product being approved by the FAA will be the Airport Layout Plan (ALP) which is a scaled, graphical presentation of the existing and future airport facilities, their location on the airport campus, with pertinent clearance and dimensional information. The ALP drawings are presented in Appendix C of this document.

One of the objectives of the master plan is to allow decision-makers the ability to adjust development goals based on actual demand. If demand slows, development of the airport (beyond routine safety and maintenance projects) could be minimized. If aviation demand accelerates, development could be



expedited. Any plan can account for limited development, but the lack of a plan for accelerated growth can sometimes be challenging. Therefore, to ensure flexibility in planning and development to respond to unforeseen needs, the master plan concept considers the full and balanced development potential for the airport.

MASTER PLAN CONCEPT

The recommended master plan concepts present a short-term and long-term configuration for the airport, which preserves and enhances the role of the airport, while meeting FAA design and safety standards to the extent practicable. It is important to note that the concept provides for anticipated facility needs over the next 20 years and establishes a vision and direction for facility needs beyond the 20-year planning period of this study. The recommended concept provides a roadmap for meeting the needs of the various airport operators including commercial service, general aviation, air tour, air cargo, and other specialized aviation activities. The goal of this plan is to ensure the airport can continue to serve, and even improve, in its role of serving the City of Page and surrounding region. Due to the unique circumstances specific to Page Municipal Airport, the master plan concept has been separated into short-term and long-term development concepts. The short-term concept is focused on compliance with the existing Runway Design Code (RDC) C-II-4000 design standards while the long-term concept focuses on meeting ultimate RDC D-III-4000 design standards.

While the master plan concept makes recommendations for the future of Page Municipal Airport, it is important to continue to obtain local perspective and input on important development goals and objectives as the process moves toward completion. The following sections describe the master plan concept, in detail.

RUNWAY DIMENSIONAL STANDARDS

The FAA has established design criteria to define the physical dimensions of runways and taxiways, as well as the imaginary surfaces surrounding them which protect the safe operation of aircraft at the airport. These design standards also define the separation criteria for the placement of landside facilities.

Analysis conducted in Chapter Two concluded that the current RDC for Runway 15-33 is RDC C-II-5000, based on the Embraer ERJ-135 jet, which is utilized by Contour Airlines. Due to increased business jet traffic and the potential future transition of the commercial service fleet to the Embraer EMB-175. The anticipated critical design aircraft is the Gulfstream G650. Therefore, the ultimate RDC is D-III-4000.

Runway 7-25 meets RDC B-I(small aircraft)-VIS design standards exclusively serving small aircraft (those weighing 12,500 pounds or less). Since the primary runway meets the 95 percent coverage requirement for crosswind conditions, Runway 7-25 is not eligible for AIP funding, which means the City cannot attain grant funding for its continued maintenance. For this reason, the ultimate plan is to close Runway 7-25.

Table 5A summarizes the existing and ultimate design standards for both runways. In addition to the physical and operational components of an aircraft, the RDC also considers the instrument approach capabilities for each runway expressed in runway visual range (RVR) values. For Runway 15-33, the RVR value of 5,000 indicates approach visibility minimums not lower than 1-mile. Future planning considers enhanced approach visibility minimums greater than ¾-mile or an RVR value of 4,000 on Runway 15-33.

TABLE 5A
Ultimate Runway Design Codes
Page Municipal Airport

Runway	Existing Runway Design Code	Planned Runway Design Code*
15-33	C-II-5000	D-III-4000
7-25	B-I(small aircraft)-VIS	Closed

* The ultimate Airport Reference Code (ARC) for Page Municipal Airport is D-III based upon the most demanding RDC associated with Runway 15-33.

SHORT-TERM AIRSIDE DEVELOPMENT CONCEPT

The short-term development concept outlines the projects needed to comply with existing RDC C-II-5000 design standards on Runway 15-33. Runway 15-33 currently meets RDC B-II-5000 standards. Meeting RDC C-II-5000 standards requires increased safety design standards that must be complied with to maintain a safe and efficient airport environment. The RDC for Runway 7-25 will remain B-I(small aircraft)-VIS in the short-term. The short-term airside development concept is depicted on **Exhibit 5A.**

RUNWAY SAFETY ENHANCEMENTS

Runway Safety Area (RSA) – RDC C-II-5000 and D-III-4000 design standards requires the RSA for Runway 15-33 to be 500 feet wide and extend 1,000 feet beyond the ends of the runway. On the Runway 15 end, 600 feet of RSA beyond the runway end can be achieved by placing fill material and grading the terrain. On the Runway 33 end, 450 feet of RSA beyond the runway end can be achieved by placing fill material and grading the terrain. Extreme sloping terrain make it infeasible both from a construction and financing standpoint to meet RSA grading standards beyond these areas. As a result, declared distances are applied to provide the remaining RSA length needed to meet standards. Declared distances effectively reduce the useful runway length for takeoff and landing to provide the additional RSA length needed to meet standards. The resulting declared distances for Runway 15-33 in the short-term concept are detailed on **Exhibit 5A**.

On the Runway 15 end, the takeoff distance available (TODA) and takeoff run available (TORA), which do not account for RSA standards, are the full 5,950 feet of the runway pavement. The runway's Accelerate Stop Distance Available (ASDA) and Landing Distance Available (LDA), which both account for RSA standards, reduce the full length by 550 feet to 5,400 feet to provide 1,000 feet of RSA at the far end of the runway. On the Runway 33 end, the TODA and TORA are both the full runway length of 5,950 feet. The Runway 33 ASDA reduces the full length by 400 feet to 5,550 feet to meet the 1,000 feet of

RSA are the far end of the runway and the LDA is reduced by an additional 150 feet to 5,400 feet to account for the 150-foot displaced threshold.

Runway Object Free Area (ROFA) – Under the existing and ultimate design standards for Runway 15-33, the ROFA is 800 feet wide and extends 1,000 feet beyond the ends. The declared distances applied to meet RSA standards beyond the runway ends also apply to the ROFA where it extends beyond the runway end. In addition, the airport's windcone/segmented circle and 13 aircraft parking positions are currently located within the ROFA. The plan is to remove or relocate the windcone/segmented circle east of its current location so that it is entirely outside of the ROFA and eliminate the parking positions.

TAXIWAY GEOMETRY IMPROVEMENTS

The following taxiway improvements are recommended to improve overall operational safety of the airfield:

Taxiways A3 and A4 are acute-angled exit taxiways from Runway 15-33 that also provide direct access from an apron area to the runway. These conditions are non-standard design where acute-angled exits restrict a pilot's line of sight when compared to a standard 90-degree taxiway intersection and direct access points increase the potential for runway incursions. It is recommended that A3 be removed and A4 reconstructed at a 90-degree angle so that it no longer provides direct access from the apron to the runway. As a result of eliminating Taxiway A3, Taxiway A4's future designation becomes A3. Taxiway A2 also provides for direct access from an apron to Runway 15-33. It is recommended that A2 be relocated to the north to eliminate the direct access point. The replacement taxiways are strategically located to provide the most efficient taxiway exit utilization percentages for current and future aircraft operating at the airport.

HOLDING BAYS

The airport has two holding aprons located along Taxiway A. These holding aprons are a traditional design consisting of a wide pavement area that allows aircraft to pull aside and perform pre-flight engine checks. The traditional design for these holding aprons is now considered non-standard since the wide expansive pavement area make signage and lighting more difficult for pilots to see, which can lead to pilot confusion, particularly near the entrance of a runway. In 2014, the FAA changed the holding bay design standard to incorporate clearly marked entrance/exits with independent parking areas separated by an island that allow aircraft to safely bypass each other while also decreasing the amount of pavement. As detailed on **Exhibit 5A**, holding bays that meet FAA-recommended guidance are planned at each end of Taxiway A near the runway thresholds.

Runway 15-33 ▌RDC C-II-5000
Runway 7-25 ▌B-I {Small Aircraft}-VIS

N

0 800 1600
SCALE IN FEET

Photo Source:
Quantum Spatial 10/19/2018

Relocated Segmented Circle

150′ Displaced Threshold

Departure RPZ

600′

Runway 15-33 (5,950′ x 150′)

300′

600′

Runway 7-25 (7,201′ X 75′)

A-1 A-2 A-3 A-4

Holding Bay

Departure/ Approach RPZ

Approach RPZ

Holding Bay

Sage Ave.

Taxiway Geometry Improvements

Glen Canyon Dr.

17th Ave.

10th Ave.

Aero Ave.

S. Navajo D

Grandview St.

5.13 Acres

LEGEND

- Taxiway Designation
- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- Taxiway Object Free Area (TOFA)
- 10-Foot Contour Lines
- Pavement to be Removed
- 20-Foot Building Restriction Line (BRL)
- Runway Visibility Zone (RVZ)
- New Pavement
- Uncontrolled RPZ

Detail of ROFA Impacts

Runway Object Free Area Impacts

- 13 aircraft tie-down positions affected by existing RDC C-II ROFA

A-2 300′ A-3

0 400
SCALE IN FEET

DECLARED DISTANCES

	Runway 15	Runway 33	Runway 7	Runway 25
ASDA	5,400′	5,550′	2,201′	2,201′
LDA	5,400′	5,400′	1,613′	2,201′
TORA	5,950′	5,950′	2,201′	2,201′
TODA	5,950′	5,950′	2,201′	2,201′

KEY

ASDA - Accelerate-Stop Distance Available
LDA - Landing Distance Available
TORA - Take Off Run Available
TODA - Take Off Distance Available

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LONG-TERM MASTER PLAN DEVELOPMENT CONCEPT

The long-term master plan development concept outlines the projects needed to bring the airport into compliance with the ultimate RDC D-III-4000 design standards for Runway 15-33. This change comes with its own set of increased safety design standards that must be complied with to maintain a safe and efficient airport environment. The following sections outline the development goals for the remainder of the planning period, which in this case is the year 2038. The long-term projects are intended enhance the airport safety and ensure compliance with existing design standards associated with RDC D-III-4000. The long-term master plan development concept is depicted on **Exhibit 5B.**

RUNWAY 7-25

As previously discussed, Runway 15-33 provides adequate crosswind wind coverage that a crosswind runway is not necessary to meet FAA standards. As such, federal AIP funding to maintain the runway could be discontinued. If the City of Page elected to use local funding to maintain the runway it could remain operational. The master plan recommendation, in coordination with city staff and the planning advisory committee, is that Runway 7-25 be closed and repurposed as a taxiway to create additional landside development opportunities.

RUNWAY TO TAXIWAY SEPARATION

Taxiway A is located 300 feet west from the Runway 15-33 centerline. This separation distance meets existing RDC C-II-5000 design standards. However, to meet RDC D-III-4000 design standards, the separation distance increases to 400 feet. To meet this standard while also maintaining the existing airport facilities west of Runway 15-33, it is recommended that the runway be shifted 100 feet to the east of its current location. A result of shifting the runway 100-feet to the east is that the existing VOR facility would be located within the ROFA. Therefore, it is also recommended that the VOR facility be relocated east so that it is outside the ROFA.

RUNWAY WIDTH

The current width of Runway 15-33 is 150 feet. The standard runway width for runways accommodating RDC D-III aircraft below 150,000 pounds maximum certificated takeoff weight is 100 feet. When the airport undertakes the relocation of the runway to meet the 400-foot runway/taxiway separation standard, the runway should be constructed to a width of 100 feet.

RUNWAY 15-33 EXTENSION

A runway length analysis presented in chapter three of this study has indicated a need for a 7,200-foot runway length at Page Municipal Airport to better serve commercial operations and business jet activity. Any extension to the runway must also consider RSA requirements beyond the end of the runway. Steep terrain off both ends of the existing runway is a significant constraint to a runway extension. However, once the runway is relocated 100 feet to the east, there will be a platform capable of accommodating a 7,200-foot long runway. A standard 1,000-foot long RSA off both ends of the runway cannot be achieved due to the steep terrain so it is recommended that engineering material arresting system (EMAS) beds be placed at the ends of the runway. EMAS beds allow the RSA beyond the runway end to be reduced from 1,000 feet to only 300 feet and an additional 300 feet of EMAS bed for a total of 600 feet beyond each runway end. Constructing the new runway with EMAS beds still requires filling and grading terrain but the amount of fill needed is reduced by using EMAS beds.

TAXIWAY A EXTENSIONS AND HOLDING BAYS

Taxiway A would also need to be extended on each end to provide access to the extended relocated runway. Relocated taxiway holding bays are included on the long-term master plan concept, as well. As detailed on **Exhibit 5B**, holding bays that meet FAA-recommended guidance are planned at each end of extended Taxiway A near the runway thresholds. The holding bays provide locations for aircraft to perform engine run-up procedures, while allowing aircraft to bypass each other, if necessary.

HOLD LINE MARKINGS

The existing holding position markings associated with Runway 15-33 are located 250 feet from the runway centerline, which meets RDC C-II-5000 design standards. In the ultimate condition, the holding position markings need to be relocated to 293 feet from the runway centerline to meet RDC D-III-4000 design standards.

APPROACH/DEPARTURE PROTECTION AND INSTRUMENT APPROACHES

The FAA recommends that the airport sponsor control the entire runway protection zone (RPZ) property, preferably by fee simple ownership. When fee simple ownership is not feasible, positive land use measures should be implemented to protect an airport from encroachment by incompatible land uses or obstructions.

The master plan concept proposes enhanced approach procedures which would allow for instrument approaches with visibility minimums lower than 1-mile but greater than ¾-mile. As depicted on **Exhibit 5B**, portions of the ultimate approach RPZ associated with Runway 15-33 extend beyond airport property encompassing approximately 4.51 acres of property on the approach end of Runway 15 and

Runway 15-33 | RDC D-III-4000
Runway 7-25 | Closed

N

0 800 1600
SCALE IN FEET

Photo Source:
Quantum Spatial 10/19/2018

4.51 Acres
Approach RPZ
Relocated VOR
1,000′ 500′
Close Runway 7-25
Relocated Segemented Cirlce
300′ EMAS
Runway 15-33 (7,200′ x 100′)
400′
A-1 A-2 A-3 A-4 A-5
Approach RPZ
~12.79 Acres
300′ EMAS
Depature RPZ
Holding Bay
Depature RPZ
Conventional Hangars 150′ x 150′
FBO/SASO Building
Conventional Hangars 100′ x 100′
T-Hangar/Linear Box Hangar 50′ x 600′
Executive Box Hangars 80′ x 80′
Convert Runway to Taxiway
Commercial Service/ Air Tour Terminal 18,200 sq. ft.
Additional Vehicle Parking
Commercial Service / Air Tour Terminal Dedicated Vehicle Parking (Reconfigured)
Sage Ave.
Executive Box Hangars 60′ x 60′
Fire Station / ARFF Facility
Holding Bay
17th Ave
10th Ave
Grandview St.
Aero
S. Navajo
N. Navajo Dr.

DECLARED DISTANCES

	Runway 15	Runway 33
ASDA	7,200′	7,200′
LDA	7,200′	7,200′
TORA	7,200′	7,200′
TODA	7,200′	7,200′

KEY
ASDA - Accelerate-Stop Distance Available
LDA - Landing Distance Available
TORA - Take Off Run Available
TODA - Take Off Distance Available

LEGEND
- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- Taxiway Object Free Area (TOFA)
- Acquire RPZ Property Interest
- 10-Foot Contour Lines
- New Pavement
- Engineered Materials Arresting System (EMAS)
- Pavement to be Removed
- Ultimate Building
- New Road/Parking
- 20-Foot Building Restriction Line (BRL)
- Relocated VOR Critical Area

Taxiway Object Free Area Impacts
- 13 aircraft tie-down positions eliminated
- 1 helicopter parking position eliminated

Detail of TOFA Impacts



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approximately 12.79 acres on the approach end of Runway 33. Acquiring the uncontrolled RPZ through fee simple property acquisition would be the preferred option to mitigate any ultimate RPZ incompatibilities, but an avigation easement from the controlling entity would also suffice.

BUILDING RESTRICTION LINE

Although achieving the lowest instrument approach visibility minimums is advantageous for airport operations, there are multiple safety area requirements tied to the minimums associated with the runway's instrument approach procedure(s). As a result, impacts to the airport environment imposed by the ultimate instrument approach visibility minimums need to be addressed. The runway type and capability of the instrument approach minimums contribute to the determination of the building restriction line (BRL), which is a product of Title 14 Code of Federal Regulations (CFR) Part 77 primary and transitional surface clearance requirements and identifies suitable building locations on the airport.

Given that the strength rating for Runways 15-33 is over 12,500 pounds, they are classified as "other than utility" runways under Part 77. The width of the primary surface for other-than-utility visual and non-precision instrument runways having minimums greater than ¾-statute mile is 500 feet (250 feet to each side of runway centerline). The width of the primary surface serving other-than-utility runways having minimums of ¾-statute mile or lower is 1,000 feet (500 feet to each side of runway centerline). The recommended concept for current and long-term planning at Page Municipal Airport considers instrument approach procedures having greater than ¾-mile serving Runway 15-33. Thus, the primary surface will be maintained at 500 feet wide. The transitional surface then extends out and up from the edge of the primary surface at a ratio of seven feet laterally for every one-foot increase. Based upon these criteria and using a planned building height, the BRL or obstructions to the BRL can be determined. **Exhibit 5B** presents the ultimate 20-foot BRL separation at 390 feet from runway centerline for Runway 15-33 based upon the instrument approach capabilities of each runway and the selected allowable structure height of 20 feet.

LANDSIDE DEVELOPMENT CONCEPT

The primary goal of the landside development recommendations is to provide adequate areas for commercial and general aviation-related development (even beyond the 20-year planning period) in a manner which will work in conjunction with planned changes in the ultimate airfield configuration. To the extent possible, areas which are served by existing infrastructure will be initially developed to minimize development costs and maximize revenue to the airport. Vehicular access must serve all these areas efficiently while maintaining a secure airfield.

Landside components include terminal buildings, hangars, aircraft parking aprons, and aviation support services, as well as the utilization of remaining airport property to provide revenue support and benefit the economic well-being of the regional area. The primary goal of landside facility planning is to provide adequate terminal facilities and aircraft storage space to meet forecast needs, while also maximizing

operational efficiencies and land uses. Also important is identifying the overall land use classification of airport property in order to preserve the aviation purpose of the facility well into the future. **Exhibit 5B** presents the view of the planned landside development for Page Municipal Airport.

There are numerous facility layout concepts that could be considered. Several potential layouts were presented in the previous chapter that could support hangar development and placement of aviation support facilities. The master plan concept provides an approach to the layout of proposed landside facilities which attempts to maximize potential aviation development space on the airfield. Focus is given to designate areas for future executive and conventional hangar development as the airport is experiencing greater levels of demand for aviation activities associated with these types of facilities; however, hangar development associated with smaller general aviation aircraft storage (T-hangars and linear box hangars) is also proposed in the concept. The major landside developments recommended in the master plan concept include the following:

- Expansion of the existing terminal facility to accommodate potential future commercial passenger service as demand dictates;
- Create additional apron north of Taxiway C to encourage private development of conventional hangars for large aircraft storage;
- Construct additional access taxilanes and aircraft parking apron in the northwest quadrant of the airport to allow aircraft access to future aviation-related development areas;
- Identify areas suitable for additional aircraft storage hangars around existing infrastructure;
- Designate aviation development that can accommodate a range of general aviation infrastructure and activities in currently vacant parcels on the airport;
- Reconfigure existing parking areas to accommodate vehicles more efficiently and develop additional vehicle parking areas; and
- Development of a City Fire Station which provides aircraft rescue and firefighting (ARFF) support on the airport.

COMMERCIAL SERVICE AND AIR TOUR TERMINAL FACILITY EXPANSION

Page Municipal Airport has an 8,100 square foot terminal building designed for commercial passenger service. The terminal building now serves commercial airline service, commercial air tour service, airport administrative offices, rental car activities, gift shop, and provides space for a pilot lounge for airport users. Additional terminal space is needed to meet the needs of airport users and commercial tenants. The enplanement forecast developed to plan for the airport's future called for approximately 13,800 square feet of terminal infrastructure needed to accommodate long-term demand. A terminal expansion would be necessary to provide additional areas for passenger ticketing, security checking point, baggage claim, and secure passenger hold rooms to accommodate commercial passenger needs. As a result, a 10,100 square foot terminal expansion has been depicted on the master plan concept, which would provide a total of 18,200 square feet of terminal space, which would more than double the existing terminal area.

Chapter three also calculated terminal space recommended for air tours in addition to commercial service terminal area requirements. The approved long-term enplanement forecasts for air tours is 68,400 annual enplanements, which calculates to approximately 12,700 square feet. The total when the two are combined is 26,500 square feet of total terminal area. This is recommended to meet the long-term needs of the airport. However, because all commercial operations are currently co-located in one building it is assumed that less space is required for common areas such as restrooms, seating areas, and office spaces. Therefore, the master plan concept proposes a terminal expansion to 18,200 square feet to meet the current demand for both commercial airline passengers and air tour passengers in the short-term. When and if additional terminal space is needed to meet long-term demand the two types of operations could either be separated into two separate facilities, perhaps in a location on the proposed northwest apron area. Or, if the City would prefer to keep the commercial operations co-located, another option would be to convert the conventional hangar space to the west of the existing terminal into additional passenger service area. A new larger terminal building could also be constructed in place of existing terminal to accommodate the long-term commercial operations. A detailed terminal design study could be conducted to determine the best course of action for the airport.

The vehicle parking lot adjacent to the terminal building is planned to be reconfigured in order to use the space more efficiently and add vehicle parking capacity. An area west of the airport terminal vehicle parking area that is vacant and currently being used as an overflow parking area can also be marked to create more parking capacity. The master plan concept has reserved this area for future terminal vehicle parking.

AIRCRAFT PARKING APRONS

While airfield elements, such as safety areas, must meet design standards associated with the applicable RDC, landside elements can be designed to accommodate specific categories of aircraft. For example, a taxilane into a T-hangar area only needs to meet the taxiway object free area (TOFA) width standard for smaller single and multi-engine piston aircraft expected to utilize the taxilane, not those standards for the larger transport jets representing the overall critical aircraft for the airport. Therefore, The existing apron and taxiways on the west side of Runway 15-33 should ultimately meet the standards for aircraft with wingspans in the Aircraft Design Group (ADG) III category, while some areas intended for smaller GA aircraft can remain designed to support ADG I or ADG II aircraft.

Several aircraft parking aprons are proposed including two separate expansions of the existing main aircraft parking apron totaling approximately 13,000 square yards. Also, Northwest apron with vehicle access adjacent to Taxiway C which is approximately 18,000 square yards, and the larger northwest general aviation apron which is approximately 27,000 square yards. The southwest apron adjacent to Sage Avenue measures approximately 4,500 square yards. The total new apron space proposed is approximately 62,500 square yards.

AVIATION DEVELOPMENT POTENTIAL

The master plan concept depicts future landside development potential on vacant land in the northwest area of the airport, as well as on and adjacent to existing apron areas north of the terminal building. As illustrated on **Exhibit 5B**, several areas are available for future aviation development, as demand would dictate, that could accommodate aircraft storage hangars, additional aircraft parking apron space, and other specialty aviation service operators (SASOs). As previously detailed, proposed hangar development takes the form of many hangar types that can accommodate the full array of general aviation activities, ranging from private aircraft storage to large-scale aircraft service operations.

Chapter Three outlined potential aircraft storage needs of over 83,000 square feet of additional hangar space that could be needed throughout the long-term planning period based upon the aviation demand forecasts. The proposed hangar development set aside in the master plan concept exceeds the amount of space needed for hangar development; therefore, the layout presented can represent a vision for the airport that extends beyond the scope of this study.

As previously detailed, the recommended landside development plan only serves as a guide for the airport which will aid the City of Page in the strategic planning of airport property moving forward. These proposed development areas can be reconfigured as necessary to meet future demand and development needs.

The recommended master plan concept depicted on **Exhibit 5B** proposes the location of certain hangar types by following the philosophy of separation of activity levels as discussed in Chapter Four. The plan depicts hangar development items that include the following:

- Construction of a (50’ x 600’) 30,000 square foot T-hangar/linear box hangar complex on the main aircraft parking apron for private aircraft storage.
- Development of additional apron space north of Taxiway C to allow for the development of up to seven (100’ x 100’) 10,000 square foot conventional hangars for a total of 70,000 square feet.
- Further north an additional apron is proposed with three clear-span (150’ x 150’) 22,500 square foot conventional hangars totaling 67,500 square feet that could be utilized for FBO or SASO activities.
- The construction of seven (60’ x 60’) 3,600 square foot executive box hangars between Taxiway A and Sage Avenue would provide additional private aircraft storage totaling 25,200 square feet.
- An extension of the main apron to the north also provides space for seven (80’ x 80’) 6,400 square foot executive box hangars totaling 44,800 square feet.

All together 237,500 square feet of additional aircraft storage is depicted on **Exhibit 5B**.

GENERAL AVIATION PARKING

The master plan concept provides additional vehicle parking for general aviation users adjacent to the proposed hangar developments and adjacent to general aviation facilities such as the proposed FBO/SASO facility, which is accessed via 17th Avenue.

ENVIRONMENTAL OVERVIEW

An analysis of potential environmental impacts associated with proposed airport projects is an essential consideration in the master plan process. The primary purpose of this discussion is to review the proposed short- and long-term master plan concept and associated capital program at the airport to determine whether projects identified could, individually or collectively, significantly impact existing environmental resources. The information contained in this section was obtained from previous studies, official internet websites, and analysis by the consultant.

Construction of any and all improvements depicted on the short-term and long-term recommended concept plan will require compliance with the *National Environmental Policy Act* (NEPA) *of 1969*, as amended. This includes privately funded projects and those projects receiving federal funding. For projects not categorically excluded under FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). In instances where significant environmental impacts are expected, as determined by the FAA, an Environmental Impact Statement (EIS) may be required. While this portion of the master plan is not designed to satisfy the NEPA requirements, it provides a preliminary review of environmental issues that may need to be considered in more detail within the environmental review processes. It is important to note that the FAA is ultimately responsible for determining the level of environmental documentation required for airport actions.

The environmental inventory provided in Chapter One offers baseline information about the airport environs. This section provides an overview of the potential impacts on existing resources that could result from the implementation of the planned improvements outlined on **Exhibit 5A** and **Exhibit 5B**.

POTENTIAL ENVIRONMENTAL CONCERNS

Table 5B summarizes potential environmental concerns associated with the implementation of both the short- and long-term recommended master plan development concept for Page Municipal Airport. Analysis under NEPA includes direct, indirect, and cumulative impacts. Direct impacts are caused by the action and occur at the same time and place (see 40 Code of Federal Regulations [CFR] § 1508.8(a)). Examples of direct impacts include:

- Construction of a facility or runway in a wetland which results in the loss of a portion of the wetland; or
- Noise generated by the proposed action or alternative(s) which adversely affects noise-sensitive land uses.

Indirect impacts are caused by an action, although are later in time or farther removed in distance and are reasonably foreseeable (see 40 CFR § 1508.8(b)). Indirect impacts may include growth-inducing impacts and other effects related to induced changes in the pattern of land use, population density or growth rate, and related impacts on air and water and other natural systems, including ecosystems (see 40 CFR § 1508.8(b)).

Cumulative impacts are those that take into consideration the environmental impact of past, present, and future actions. Cumulative impacts will vary based on the project type, geographic location, potential to impact resources, and other factors such as the current condition of potentially affected impact categories.

TABLE 5B
Summary of Potential Environmental Concerns
Page Municipal Airport

Environmental Impact Category	FAA Order 1050.1F Significance Threshold/Factors to Consider	Potential Concern
Air Quality	**Threshold: The action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the United States (U.S.) Environmental Protection Agency (EPA) under the *Clean Air Act*, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.**	**No Impact.** Although the projected increase in operations over the short- and long-term recommended concept plan will result in additional emissions, Coconino County currently meets federal NAAQS standards. Therefore, general conformity review per the *Clean Air Act* is not required. According to the most recent FAA *Aviation Emissions and Air Quality Handbook* (2015), an emissions inventory under NEPA may be necessary for any proposed action that will result in a reasonably foreseeable increase in emissions due to plan implementation. For construction emissions, a qualitative or quantitative emissions inventory under NEPA may be required, depending on the type of environmental review needed for development projects outlined in the recommended master concept plan.
Biological Resources	**Threshold: The U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS) determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species, or would result in the destruction or adverse modification of federally designated critical habitat.** FAA has not established a significance threshold for non-listed species. However, factors to consider are if an action would have the potential for: ▪ Long term or permanent loss of unlisted plant or wildlife species;	<u>For federally listed species</u> **Potential Impact.** According to a biological field survey performed by SWCA Environmental Consultants, Inc. (SWCA) in December 2018, twenty-seven endangered or threatened species were identified with the potential to be present within the vicinity of the airport. However, according to the biological field survey, these species are unlikely to occur at the airport, with exception to the California condor (*Gymnogyps californianus*). The airport is within the area where the California condor was reintroduced. According to the field survey, condors have been observed south of Glen Canyon Dam and west of the airport. It is likely the condor will avoid the airport due to aviation activity, but it is possible the condor could forage for carrion at the airport. No

	▪ Adverse impacts to special status species or their habitats; ▪ Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or ▪ Adverse impacts on a species' reproductive rates, non-natural mortality, or ability to sustain the minimum population levels required for population maintenance.	suitable nesting habitat for the California condor is present at the airport. It is unlikely the 12 aquatic species, such as fish, snails, or amphibians, will be located at the airport due to the lack of habitat. Development activities will have no effect on protected aquatic species. <u>For designated critical habitat</u> **No Impact.** There are no areas of critical habitat that will be affected by development proposed in the short- or long-term concept plan. <u>For non-listed species</u> **Potential Impact.** Non-listed species of concern include those protected by the *Migratory Bird Treaty Act*. There are presently fourteen non-listed species of concern that could be impacted by activities at the airport. Habitat to support breeding for these species may be near project areas, therefore, the potential for impacts to migratory birds should be evaluated on a project-specific basis. For both the short- and long-term concept plan, pre-construction nesting surveys may be required prior to implementation of projects.
Coastal Resources	FAA has not established a significant threshold for Coastal Resources. Factors to consider are if an action would have the potential to: ▪ Be inconsistent with the relevant state coastal zone management plan(s); ▪ Impact a coastal barrier resources system unit; ▪ Pose an impact to coral reef ecosystems; ▪ Cause an unacceptable risk to human safety or property; or ▪ Cause adverse impacts to the coastal environment that cannot be satisfactorily mitigated.	**No Impact.** The airport is not located within a designated Coastal Zone.
Climate	FAA has not established a significance threshold for Climate; refer to FAA Order 1050.1F's, *Desk Reference*, for the most up-to-date methodology for examining impacts associated with climate change. The Council on Environmental Quality issued the *Federal Greenhouse Gas Accounting and Reporting Guidance* (Federal Protocol), drafted in response to E.O. 13514, *Federal Leadership in Environment, Energy, and*	<u>Short-Term Concept Plan</u> **No Impact.** GHG emission impacts are not anticipated during the implementation of the short-term concept plan. GHG emissions associated with construction equipment and vehicles importing soil for the projects depicted on **Exhibit 5A**, such as relocating connector Taxiway A-2, realigning and relocating connector Taxiway A-3, constructing two holding bays off Taxiway A, and enhancing the Runway Safety Areas (RSAs), will be temporary and

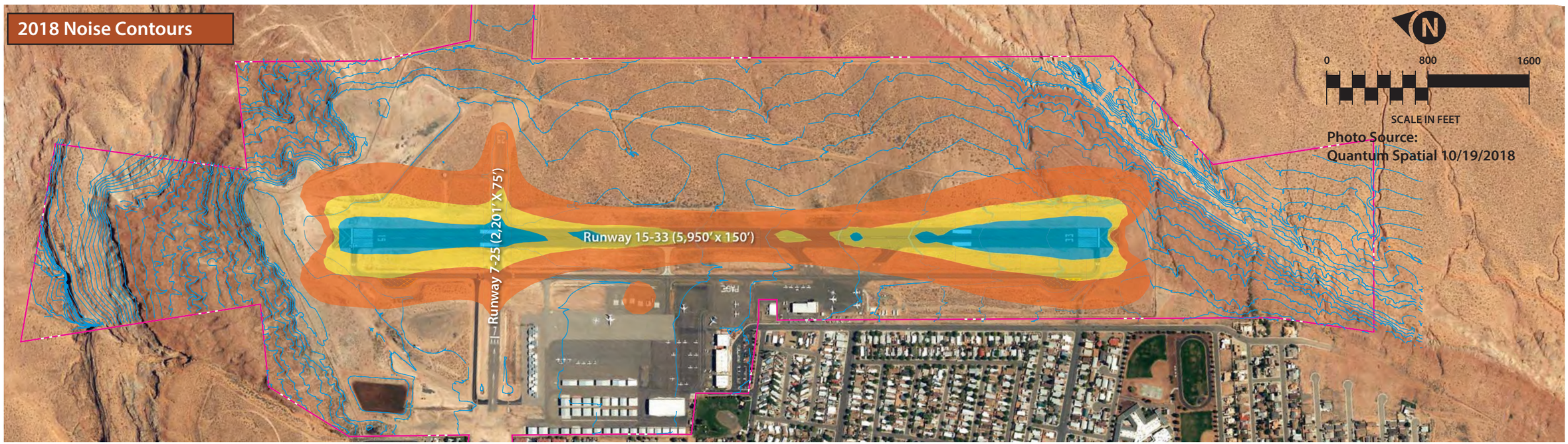
	Economic Performance, and E.O. 13693, *Planning for Federal Sustainability*, is the guide for the federal government on official GHG calculation and reporting. As outlined in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, the Federal Protocol sets standards for federal agencies, such as FAA and FAA actions, to report greenhouse gas (GHGs) emissions in a standard metric. The Federal Protocol recommends the following considerations: 1. Proposed action and alternative(s) will not increase GHG emissions compared to the no action alternative. 2. Proposed action or alternative(s) will result in an increase of GHG emissions over the no action alternative.	only associated with that project. Long-Term Concept Plan **Potential Impact.** An increase in GHG emissions could occur over the 20-year planning horizon of the recommended concept plan as a result of anticipated airport growth and an increase of critical aircraft previously discussed in Chapter 3. Project-specific analysis may be required per the FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, based on the parameters of the individual projects.
Department of Transportation (DOT) Act: Section 4(f)	**Threshold: The action involves more than a minimal physical use of a Section 4(f) resource or constitutes a "constructive use" based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource. Resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; and publicly or privately owned land from an historic site of national, state, or local significance. Substantial impairment occurs when the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished.**	Short-Term Concept Plan **Potential Impact.** The following Section 4(f) resources are directly adjacent to the airport, identified on Exhibit 1N: ▪ Glen Canyon National Recreation Area (adjacent to northern airport boundary) ▪ Golliard Park (adjacent to western property boundary by terminal) The RSA grading and connector taxiway improvements delineated in the recommended short-term concept plan will remain entirely on airport property, and therefore the physical use of these parks will not result. However, due to the proximity of these resources to the airport, constructive use may need to be evaluated at the outset of projects outlined in the short-term recommended concept plan to determine whether these improvements are not so severe that the activities, features, or attributes that quality the property for protection under Section 4(f) are substantially impaired. The FAA is responsible to consult with all appropriate federal, state, and local officials having jurisdiction over the affected Section 4(f) properties, and bears responsibility to prepare a Section 4(f) evaluation. If necessary, the Section 4(f) compliance process can involve the preparation of a Section 4(f) statement, which evaluates other feasible alternatives.

		Long-Term Concept Plan **Impact.** The long-term recommended development plan includes acquiring approximately 4.5 acres of RPZ property interest of the Glen Canyon National Recreation Area north of the Runway 15 end, by either a transfer of real property or by an avigation easement. Either action will result in the permanent physical use of a portion of a Section 4(f) resource. As part of an NEPA action associated with the property, the airport will be responsible for completing a Section 4(f) Evaluation for FAA review. Upon receipt of the Section 4(f) Evaluation, the FAA will consider the views of each official having jurisdiction of the resource. Upon review, the FAA will make a determination of the impact level to the Section (F) resource. For NEPA purposes, the FAA is responsible for complying with Section 4(f) even if impacts are less than significant.
Farmlands	**Threshold: The total combined score on Form AD-1006, *Farmland Conversion Impact Rating*," ranges between 200 and 260.** (Form AD-1006 is used by the U.S. Department of Agriculture, Natural Resources Conservation Service [NRCS] to assess impacts under the *Farmland Protection Policy Act* (FPPA).) FPPA applies when airport activities meet the following conditions: ▪ Federal funds are involved; ▪ The action involves the potential for the irreversible conversion of important farmlands to non-agricultural uses. Important farmlands include pastureland, cropland, and forest considered to be prime, unique, or statewide or locally important land; or ▪ None of the exemptions to FPPA apply. These exemptions include: o When land is not considered "farmland" under FPPA; such as land already developed or already irreversibly converted. These instances include when land is designated as an urban area by the U.S. Census Bureau or the existing footprint includes rights-of-way. o When land is already committed to urban development. o When land is committed to water storage. o The construction of non-farm structures necessary to support farming operations.	**No Impact.** Soils at the airport and surrounding land proposed for acquisition to implement the long-term concept plan identified in **Exhibit 5B** are not classified as prime farmland or farmland of statewide importance by the NRCS. Therefore, no impact to important farmlands will result from airport activities identified in both the short-term and long-term recommended development concept plans.

	o The construction/land development for national defense purposes.	
Hazardous Materials, Solid Waste, and Pollution Prevention	FAA has not established a significance threshold for Hazardous Materials, Solid Waste, and Pollution Prevention. However, factors to consider are if an action would have the potential to: ▪ Violate applicable federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management; ▪ Involve a contaminated site; ▪ Produce an appreciably different quantity or type of hazardous waste; ▪ Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity; or ▪ Adversely affect human health and the environment.	The airport has an existing fuel farm south of the aircraft rescue and fire fighting (ARFF) facility, and provides opportunity for aircraft maintenance activities that could involve fossil fuels or other types of hazardous materials or wastes; these operations are regulated and monitored by the appropriate regulatory agencies, such as the U.S. EPA, the Arizona Department of Environmental Quality (ADEQ), and Coconino County. <u>Short-Term Concept Plan</u> **Potential Impact.** Airport improvements outlined in the short-term recommended concept plan could generate a minimal amount solid waste from the demolition of Connector Taxiways A-2 and A-3. Fossil fuels for construction equipment for the improvements delineated on the **Exhibit 5A** will be required. <u>Long-Term Concept Plan</u> **Potential Impact.** The long-term concept plan (**Exhibit 5B**) does not anticipate land uses that will produce an appreciably different quantity or type of hazardous waste. However, should this type of land use be proposed, further NEPA review and/or permitting will be required. There are no known hazardous materials or waste contamination sites currently on airport property. Since land acquisition is proposed on the concept plan to protect the interest of the RPZ, an Environmental Due Diligence Audit (EDDA) will be required as part of the land acquisition process.
Historical, Architectural, Archaeological, and Cultural Resources	FAA has not established a significance threshold for Historical, Architectural, Archaeological, and Cultural Resources. Factors to consider are if an action would result in a finding of "adverse effect" through the Section 106 process. However, an adverse effect finding does not automatically trigger preparation of an EIS (i.e., a significant impact).	The airport is located within the vicinity of the Navajo Nation Reservation. A cultural survey performed by SWCA, dated December 2018, indicates the presence of possible shrines essential to regional Native American tribe history on airport property. Sacred sites are considered significant cultural resources and are protected under the American Indian Religious Freedom Act (AIRFA). AIRFA requires federal agencies to consider the impact of their actions on religious sites and objects which are important to Native Americans, regardless of the eligibility for the NRHP. Religious and sacred sites are typically identified through consultation with tribes. Per Executive Order (E.O.) 13175, *Consultation and Coordination with Indian Tribal Governments*, coordination is undertaken

		by FAA as part of government-to-government consultation with federally recognized tribes. Short-Term Concept Plan **Potential Impact.** The short-term concept plan (**Exhibit 5A**), which involves relocating connector Taxiway A-2, realigning and relocating connector Taxiway A-3, constructing two holding bays off Taxiway A, and enhancing the Runway Safety Areas (RSAs), could potentially impact those shrines identified by SWCA, specifically a shrine north of the Runway 15 end. This shrine is located on a steep slope proposed to be filled and graded to accommodate the RSA design standards for an RDC C-II airport. The cultural significance of these shrines will be determined under the government-to-government consultation process with regional Native American tribes outlined in E.O. 13175. Long-Term Concept Plan **Potential Impact.** Under the long-term concept plan (**Exhibit 5B**), Runway Protection Zone (RPZ) property interest acquisition of approximately 17.3 acres, landside development, and relocating the runway centerline 100 ft to the east are proposed. RPZ interest property acquisition is proposed on the long-term concept plan and could be in the form of the transfer of real property or obtaining an avigation easement to protect the adjusted RPZ once the runway is relocated. If the transfer of real property is pursued, compliance per FAA's Advisory Circular (AC) 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects* is required by the airport. Similar to the short-term concept plan, Native American shrines identified on airport property significant to local tribes could be affected by airport activities, such as the relocation of Runway 15-33 and adjusted RPZs. Therefore, the cultural significance of the shrines will need to be determined under the government-to-government consultation process between the FAA and regional Native American tribes outlined in E.O. 13175.
Land Use	FAA has not established a significance threshold for Land Use. There are also no specific independent factors to consider. The determination that significant impacts exist is normally dependent on the significance of other impacts.	Short-Term Concept Plan **Potential Impact.** The short-term development concept plan outlined in **Exhibit 5A** involves relocating connector Taxiway A-2, realigning and relocating connector Taxiway A-3, constructing two

		holding bays off Taxiway A, and enhancing the RSAs. The projects proposed could potentially affect cultural resources previously outlined under the "Historical, Architectural, Archaeological, and Cultural Resources" previously discussion of this section. The proposed actions depicted in the short-term concept plan will not affect other historical or archaeological properties. The short-term development plan is consistent with the current land use of the airport and will not affect existing land use policies regarding the airport established by the City of Page. <u>Long-Term Concept Plan</u> **Potential Impact.** In general, land use impacts discussed for the short-term concept plan are similar to those land use concerns and impacts addressed for the long-term concept plan. If land acquisition moves forward for the 4.51-acre RPZ property interest from the National Park Service in Glen Canyon National Recreation Area, it may require the City of Page to annex the land into the city limits.
Noise and Noise-Compatible Land Use	**Threshold: The action would increase noise by Day-Night Average Sound Level (DNL) 1.5 decibel (dB) or more for a noise-sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe.** Another factor to consider is that special consideration needs to be given to the evaluation of the significance of noise impacts on noise-sensitive areas within Section 4(f) properties where the land use compatibility guidelines in Title 14 Code of Federal Regulations (CFR) part 150 are not relevant to the value, significance, and enjoyment of the area in question.	<u>Short-Term Concept Plan</u> **No Impact. Exhibit 5C** depicts both the existing and anticipated noise contours for Page Municipal Airport. As shown on the exhibit for existing conditions, the DNL 65 dB noise exposure level remains entirely on airport property. <u>Long-Term Concept Plan</u> **No Impact.** In the 2038 ultimate noise contour condition (**Exhibit 5C**), the DNL 65 noise exposure contours expand around the ultimate runway location off airport property to the northeast and southeast. Northeast of the ultimate runway condition, the 65 DNL contour impacts Glen Canyon National Recreation Area, considered a noise-sensitive land use under FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. However, according to 14 Code of Federal Regulations (CFR) Part 150, recreational land uses are compatible within the 65 DNL noise contour. Southeast of the ultimate runway condition, the 65 DNL noise contour will expand beyond the airport property line, affecting undeveloped desert terrain.


2018 Noise Contours
N
0
800
1600
SCALE IN FEET
Photo Source:
Quantum Spatial 10/19/2018
Runway 15-33 (5,950' x 150')
Runway 7-25 (2,201' X 75')


2038 Noise Contours
LEGEND
Airport Property Line
Future Pavement
Pavement to be Removed
75+ Day-Night Average Sound Level (DNL)
70-75 DNL
65-70 DNL
Runway 15-33 (7,200' x 100')
Sage Ave.

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		It is important to note that operational growth, unless tied to a specific project, will not result in noise impacts under FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. Impacts to noise-sensitive land uses are only identified through NEPA documentation for specific projects or through the voluntary Part 150 process.
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks		
Socioeconomics	FAA has not established a significance threshold for Socioeconomics. However, factors to consider are if an action would have the potential to: ▪ Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area); ▪ Disrupt or divide the physical arrangement of an established community; ▪ Cause extensive relocation when sufficient replacement housing is unavailable; ▪ Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities; ▪ Disrupt local traffic patterns and substantially reduce the levels of service of roads serving the airport and its surrounding communities; or ▪ Produce a substantial change in the community tax base.	<u>Short-term Concept Plan</u> **No Impact.** The impact to the regional economic health under the short-term concept plan will be brief, as the proposed activities will provide temporary employment and not a long-term regional economic impact. <u>Long-term Concept Plan</u> **Potential Impact.** The proposed development, such as the expansion of the terminal building, could potentially encourage economic growth for the region. Results include new construction jobs, new jobs for the airport and other commercial uses, new housing, increase in daily commercial flights, and increase the local tax base. New development could change the level of service to roads leading to and within the airport, such as along Sage Avenue and South 10th Street. The long-term changes to the level of service are determined by the type of use proposed, and it may be necessary to perform a traffic study to ensure service is either not substantially impacted or mitigation measures are incorporated into the construction plan. During short-term construction projects, there could be temporary disruptions to surface traffic patterns. The recommended development concept plan does not include proposals to acquire residences or relocate businesses.
Environmental Justice	FAA has not established a significance threshold for Environmental Justice. However, factors to consider are if an action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population (i.e., a low-income or minority population), due to: ▪ Significant impacts in other environmental impact categories; or ▪ Impacts on the physical or natural environment that affect an environmental justice population in a way that FAA determines is unique to	E.O. 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations*, and the accompanying Presidential Memorandum, and Order DOT 5610.2, *Environmental Justice*, require the FAA to provide for meaningful public involvement by minority and low-income populations, as well as analysis that identifies and addresses potential impact on these populations that may be disproportionately high and adverse. If disproportionately high or adverse impacts are noted, mitigation and enhancement measures and offsetting benefits can be taken into consideration. Both low-

	the environmental justice population and significant to that population.	income and minority populations have been identified in the vicinity of the airport. <u>Short-Term Concept Plan</u> **No Impact.** Airport improvements depicted on **Exhibit 5A** are contained on airport property. Impacts to surrounding residents, regardless of income levels or racial backgrounds, will not be disproportionate. <u>Long-Term Concept Plan</u> **Potential Impact.** The closing of Runway 7-25, identified in the long-term concept plan (**Exhibit 5B**), will be a benefit to residential land uses west of the airport by eliminating flyover aircraft utilizing that runway. The long-term concept depicts locating and reconstructing of Runway 15-33. The new runway will be placed east of the existing location, which will further remove aircraft utilizing the airport from residential land uses. On airport property, the long-term concept proposes aviation uses and new hangars in location of Runway 15-33, which will provide a buffer between the runway and residential uses along Sage Avenue.
Children's Environmental Health and Safety Risks	FAA has not established a significance threshold for Children's Environmental Health and Safety Risks. However, factors to consider are if an action would have the potential to lead to a disproportionate health or safety risk to children.	**Potential Impact.** Per E.O. 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, federal agencies are directed to identify and assess environmental health and safety risks that may disproportionately affect children. These risks include those that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products to which they may be exposed. There are two schools are within 0.25 miles of Page Municipal Airport (the location of all schools within the City of Page are labeled on Exhibit 1N in Chapter One). Page Middle School is closest educational facility to the airport, located directly west of Sage Avenue. Best management practices should be implemented to decrease environmental health risks to children. During construction of the projects outlined in both the short-term and long-term concept plan of the concept plans, appropriate measures should be taken to prevent access by unauthorized persons to construction project areas.

Visual Effects		
Light Emissions	The FAA has not established a significant threshold for light emissions. However, a factor to consider is the degree to which an action would have the potential to: ▪ Create annoyance or interfere with normal activities from light emissions; and ▪ Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resource.	Short-Term Concept Plan **No Impact.** Airport improvements depicted on **Exhibit 5A** will require minimal new edge lighting for the holding bays adjacent to Taxiway A and will be similar to lighting fixtures required for existing taxiway and runway edge lighting. No additional lighting will be required for the short-term recommended concept plan. Long-Term Concept Plan **Potential Impact.** New lighting associated with the long-term recommended master plan development concept will remain on the airfield and other developed portions of the airport. Proposed lighting associated with new development include wall pack lighting on new hangars or temporary construction lighting as a result of nighttime work. It may be necessary to evaluate whether there are any factors considering context and intensity to determine if there are any significant impacts and warrant a special lighting study. The airport is responsible for such an undertaking. Section 152.059, *Outdoor Lighting*, of the City of Page's *Code of Ordinances (*updated 2020) outlines the intent and regulations regarding exterior illumination. While the code is intended to ensure adequate illumination is provided, the cumulative impact of exterior illuminations shall not create excessive light pollution, reduce glare, and to conserve energy. The City of Page is not a designated dark sky place.
Visual Resources/ Visual Character	FAA has not established a significance threshold for Visual Resources or Character. However, a factor to consider is the extent an action would have on the potential to: ▪ Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources; ▪ Contrast with the visual resources and/ or visual character in the study area; and ▪ Block or obstruct the views of the visual resources, including whether these	Short-Term Concept Plan **No Impact.** The improvements outlined on the short-term concept plan will not have an impact on the visual character of the airport and environs. Long-Term Concept Plan **Potential Impact.** Development proposed in the long-term master plan concept could change the overall visual character of the airport with additional roads and structures planned. New development could change the visual character of the area,

	resources would still be viewable from other locations.	contrasting with the visual character from the nearby mountains, mesas, and desert environs. Potential visual effects could be minimized by installing native vegetation as a landscape buffer and painting structures a deep earth-tone color to blend with the natural environment, as preferred by the City of Page for new development (City of Page, Chapter 152: *Zoning Code*, *City of Page Code of Ordinances*).
Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)		
Wetlands	**Threshold: The action would:** **1. Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers;** **2. Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected;** **3. Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public);** **4. Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands;** **5. Promote development of secondary activities or services that would cause the circumstances listed above to occur; or** **6. Be inconsistent with applicable state wetland strategies.**	**No Impact.** The biological field survey performed in December 2018 determined that wetlands are not present on airport property.
Floodplains	**Threshold: The action would cause notable adverse impacts on natural and beneficial floodplain values. Natural and beneficial floodplain values are defined in Paragraph 4.k of DOT Order 5650.2, *Floodplain Management and Protection.***	**No Impact.** Based on FEMA FIRM panel number 04005C0400G (dated September 3, 2010), the airport and surrounding environs have been identified as Zone X, an area of minimal flood hazard.

Surface Waters	**Threshold: The action would:** **1. Exceed water quality standards established by federal, state, local, and tribal regulatory agencies; or** **2. Contaminate public drinking water supply such that public health may be adversely affected.** Factors to consider are when a project would have the potential to: ▪ Adversely affect natural and beneficial water resource values to a degree that substantially diminishes or destroys such values; ▪ Adversely affect surface water such that the beneficial uses and values of such waters are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or ▪ Present difficulties based on water quality impact when obtaining a permit or authorization.	**Potential Impact.** The airport is located within the Lower Colorado River basin watershed. Most likely, runoff from the airport will flow in a westerly manner towards the Colorado River though engineered drainages and ephemeral washes. Stormwater pollutants are a source of potential adverse effects to endangered species living in the Colorado River and the Havasu National Wildlife Refuge. The City of Page manages airport stormwater discharges with an Arizona Pollutant Discharge Elimination System (AZPDES) issued and regulated by the ADEQ. Improvements to the airport depicted on both **Exhibit 5A** and **Exhibit 5B** will require a revised permit to be issued addressing operational and structural source controls, treatment best management practices (BMPs), and sediment and erosion control. An AZPDES General Construction permit will be required for all projects involving ground disturbance over one acre. FAA's AC 150/5370-10G, *Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control* should also be implemented during construction projects at the airport.
Groundwater	**Threshold: The action would:** **1. Exceed groundwater quality standards established by federal, state, local, and tribal regulatory agencies: or** **2. Contaminate an aquifer used for public water supply such that public health may be adversely affected.** Factors to consider are when a project would have the potential to: ▪ Adversely affect natural and beneficial groundwater values to a degree that substantially diminishes or destroys such values; ▪ Adversely affect groundwater quantities such that the beneficial uses and values of such groundwater are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or ▪ Present difficulties based on water quality impacts when obtaining a permit or authorization.	**No Impact.** Proposed projects will not substantially change the amount of water used by the airport. Additionally, the airport property does not serve as a significant source of groundwater recharge and is not located near a sole source aquifer.

Wild and Scenic Rivers	FAA has not established a significance threshold for Wild and Scenic Rivers. Factors to consider are when an action would have an adverse impact on the values for which a river was designated (or considered for designation) through: ▪ Destroying or altering a river's free-flowing nature; ▪ A direct and adverse effect on the values for which a river was designated (or under study for designation); ▪ Introducing a visual, audible, or other type of intrusion that is out of character with the river or would alter outstanding features of the river's setting; ▪ Causing the river's water quality to deteriorate; ▪ Allowing the transfer or sale of property interests without restrictions needed to protect the river or the river corridor; or ▪ Any of the above impacts preventing a river on the Nationwide Rivers Inventory (NRI) or a Section 5(d) river that is not included in the NRI from being included in the Wild and Scenic River System or causing a downgrade in its classification (e.g., from wild to recreational).	*Wild and Scenic Rivers:* **No Impact.** The nearest designated Wild and Scenic river, the East Fork Virgin River, is approximately 80 miles from the airport in Utah. The recommended airport projects identified in both **Exhibit 5A** and **Exhibit 5B** will not have adverse effects on the river's outstanding remarkable values (i.e., scenery, recreation, geology, fish, wildlife, and history). *Nationwide Rivers Inventory.* **Potential Impact.** The Colorado River, beginning just south of the Glen Canyon Dam, is listed on the NRI. Activities outlined on the both the short- and long-term concept plan could potentially indirectly impact the river, and any proposed action or alternative affecting an NRI listed river is subject to consultation with the appropriate land management agency. The FAA is responsible to confer with the appropriate regional office of the National Park Service as a federal government interagency consultation.
Source: Coffman Associates, Inc. analysis		

AIRPORT RECYCLING, REUSE, and WASTE REDUCTION

The *FAA Modernization and Reform Act of 2012* (FMRA), which amended Title 49, United States Code (USC), included several changes to the Airport Improvement Program (AIP). Two of these changes are related to recycling, reuse, and waste reduction at airports.

- Section 132(b) of FMRA expanded the definition of airport planning to include "developing a plan for recycling and minimizing the generation of airport solid waste, consistent with applicable state and local recycling laws, including the cost of a waste audit."

- Section 133 of FMRA added a provision requiring airports that have prepared or plan to prepare a master plan, and that receive AIP funding for an eligible project, to ensure that the new or updated master plan addresses issues relating to solid waste recycling at the airport, including:

    - the feasibility of solid waste recycling at the airport;
    - minimizing the generation of solid waste at the airport;
    - operation and maintenance requirements;

- a review of waste management contracts; and
- the potential for cost savings or the generation of revenue.

Typically, an airport sponsor controls the waste handling services in facilities they own and operate, such as the passenger terminal building, ARFF station, and maintenance facilities. The fixed-base operators and tenants that own their own facilities are typically responsible for coordinating their own waste handling services. While the focus of this plan is on airport-operated facilities, it is recommended the airport work to incorporate strategies facility-wide to create a consistent waste disposal mechanism. This would ultimately result in the reduction of materials sent to the landfill.

Understanding the waste stream for Page Municipal Airport requires an understanding of the types of waste typically generated at airports. Generally, airport waste can be divided into eight categories:[1]

- **Municipal Solid Waste** (MSW) is more commonly known as trash or garbage consisting of everyday items that are used and then discarded, like product packaging.

- **Construction and Demolition Waste** (C&D) is considered non-hazardous waste resulting from land clearing, excavation, demolition, renovation or repair of structures, roads and utilities, including concrete, wood, metals, drywall, carpet, plastic, pipe, cardboard, and salvaged building components. C&D is also generally labeled as MSW.

- **Green Waste** is yard waste consisting of tree, shrub and grass clippings, leaves, weeds, small branches, seeds, and pods.

- **Food Waste** includes unconsumed food products or waste generated and discarded during food preparation. Also considered MSW.

- **Deplaned Waste** is waste removed from passenger aircraft. Deplaned waste includes bottles, cans, newspapers, mixed paper (newspaper, napkins, paper towels), plastic cups, service ware, food waste, and food-soiled paper/packaging. Deplaned waste can represent as much as 20 percent of an airport's total MSW stream.

- **Lavatory Waste** is a special waste that is emptied through a hose and pumped into a lavatory service vehicle. The waste is then transported to a triturator[2] facility for pretreatment prior to discharge in the sanitary sewage system. Due to the chemicals in lavatory waste, it can present both environmental and human health risks if mishandled. Caution must be taken to ensure lavatory waste is not released into the public sanitary sewerage system prior to pretreatment.

- **Spill Clean and Remediation Wastes** are also special wastes and are generated during cleanup of spills and/or the remediation of contamination from several types of sites on an airport.

[1] *Recycling, Reuse and Waste Reduction at Airports*, FAA (April 24, 2013)
[2] A triturator facility turns lavatory waste into fine particulates for further processing.

- **Hazardous Wastes** are governed by the *Resource Conservation and Recovery Act* (RCRA), as well as the regulations in 40 Code of Federal Regulations (CFR) Subtitle C, Parts 260 to 270. The United States (U.S.) Environmental Protection Agency (EPA) developed less stringent regulations for certain hazardous waste, known as universal waste, described in 40 CFR Part 237, *Standards for Universal Waste Management*.

As depicted in **Exhibit 5D**, there are six potential areas of the airport contributing to the local waste stream, including the terminal/administrative offices, airfield, hangars, aircraft, airport construction projects, and galleys. To create a comprehensive waste reduction and recycling plan for Page Municipal Airport, all potential waste inputs should be considered.

EXISTING SERVICES

Currently, airport maintenance staff oversee waste management for PGA. Solid waste services are provided by Republic Services. No information is available regarding the weight of MSW hauled or the cost of service, and dumpsters are emptied on a weekly basis.

At this time, there is no formal recycling program at PGA. Airport tenants are responsible for setting up individual recycling services if they chose.

SOLID WASTE MANAGEMENT SYSTEM

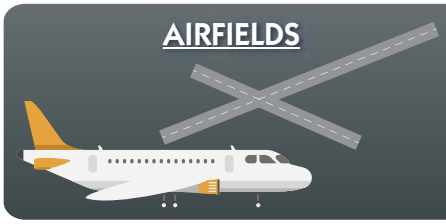
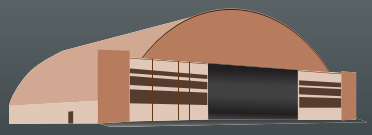
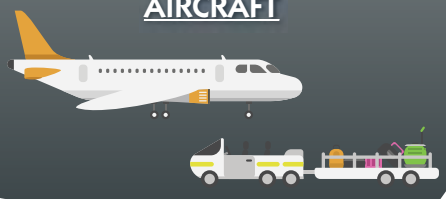
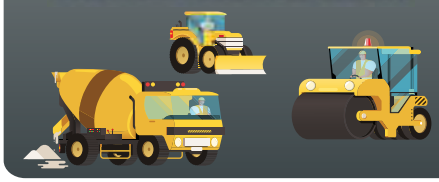
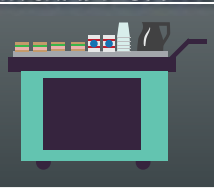
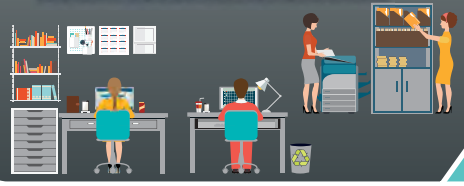
There are two different waste management practices airports can employ when overseeing solid waste and recycling efforts at their facility. Airports generally utilize either a *centralized* or a *decentralized* waste management system. The differences between these two methods are described below and summarized in **Exhibit 5E**.

- **Centralized waste management system.** A centralized waste management system happens when the airport provides receptables for the collection of waste, recyclables, or compostable materials and contracts for the removal by a single local provider for all airport tenants.[3] This waste management system allows a greater opportunity for participation from airport tenants who may not be incentivized to recycle on their own. The centralized system is advantageous in that is has less players involved in the overall management of the solid waste and recycling efforts, and allows greater control by the city over the type, placement, and maintenance of dumpsters, thereby saving space and eliminating the need for each tenant to have their own containers.

  A centralized strategy can be inefficient for some airports as it requires more effort and oversight on the part of airport management. However, this waste management system streamlines MSW

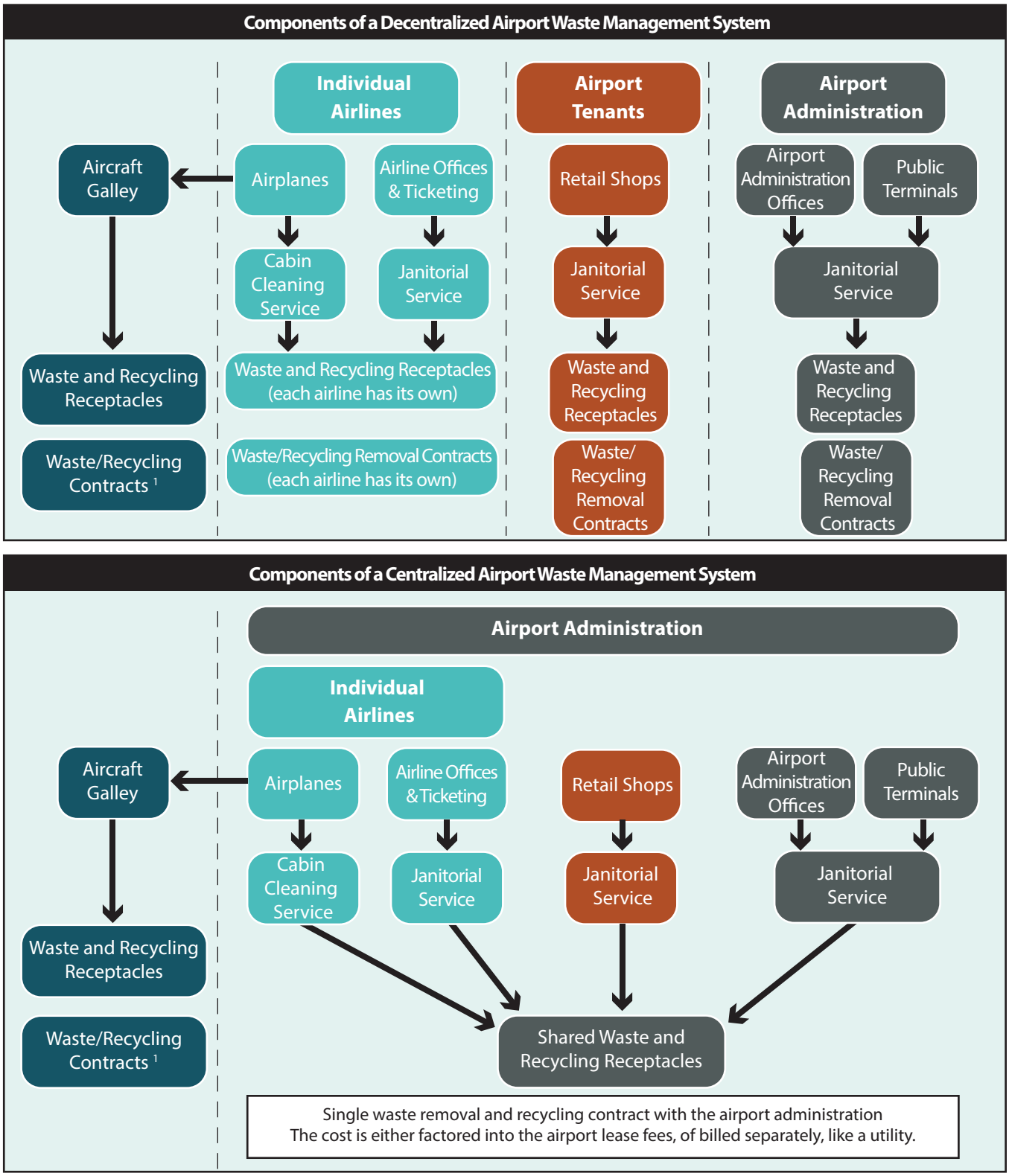
[3] *Airport Waste Management and Recycling Practices* (2018) The National Academies of Sciences, Engineering, and Medicine Airport Cooperative Research Program, Synthesis 92.

PAGE MUNICIPAL AIRPORT WASTE STREAMS

AIRPORT AREA	POTENTIAL INPUTS	POTENTIAL OUTPUTS
TERMINAL/ ADMINISTRATIVE OFFICES 	Passengers Employees	Paper, Plastic, Aluminum Cans Trash Green Waste Deplaned Waste
AIRFIELDS 	Aircraft Operations	Runway Rubber Green Waste
HANGARS 	Goods Movements	Plastic Wood Vehicle Waste (Tires & Fluids)
AIRCRAFT 	Aircraft Ground Support Equipment	Vehicle Waste Plastic Wastewater Hazmat
AIRPORT CONSTRUCTION 	Construction Re-Construction Demolition	Reused Concrete/Asphalt Vehicle Waste Soils, Building Materials Wood, General Waste
AIRCRAFT GALLEY 	Aircraft Beverage Services	Beverage Waste Waste Water Plastic Aluminum Cans
ADMINISTRATIVE OFFICES 	Employees	Food Waste Paper, Plastic Aluminum Cans Trash

Source: Recycling, Reuse, and Waste Reduction at Airports, FAA (April 24, 2013)

COMPONENTS OF AN AIRPORT WASTE MANAGEMENT SYSTEM



[1] Flight kitchens usually manage their own waste even if an airport relies on a centralized system

Source: Natural Resources Defense Council, Trash Landings: How Airlines and Airports Can Clean Up Their Recycling Programs, December 2006.

and recycling collection, maximizes the opportunity to reduce waste generation, and increases diversion of recyclables.

- **Decentralized waste management system.** A decentralized waste management system happens when an airport provides waste containers and contracts for the hauling of waste materials in airport-operated spaces only. Airport tenants, such as fixed-base operators, retail shops, and other tenants, manage the waste from their leased spaces with separate contracts, billing, and hauling schedules. A decentralized waste management system can increase both the number of receptacles on airport property and the number of trips by a waste collection service provider, should the collection schedule for the tenant differ from the airport.

Waste management services at Page Municipal Airport are currently managed independently by various tenants and entities, also known as a *decentralized* waste management system. To maximize waste management efforts, the airport should actively engage tenants by transitioning to a *centralized* system.

SOLID WASTE AND RECYCLING GOALS

Some steps can be taken to initiate a recycling program since the airport currently does not participate in one. First and foremost, it is important to get the buy-in from tenants to ensure the effort is a success. Such activities can include:

- Make recycling a part of everyday business. Airport administration can provide training, education, and support to personnel, tenants, and others who conduct business at the airport. In-person meetings with airport tenants should be held to create a mutual understanding of the airport's solid waste and recycling goals and how tenants play a vital role in the airport's overall success.

- Establish consistent internal procedures to ensure there are no unacceptable items contaminating recycling containers or recyclables thrown in the trash. Clearly marked signage of what can and cannot be accepted placed near the solid waste and recycling containers is a significant act of a consistent, effective recycling system.

A second step in initiating a recycling program is to conduct a waste audit, which is the most comprehensive and intensive way to assess the airport's waste stream composition and capture of recyclables, as well as identify further opportunities for waste reduction. This will ensure that waste and recycling containers are rightsized for the existing operation, as well as having a collection schedule that picks up only when the containers are full.

Finally, the implementation of an effective program requires accurate data of current local waste and recycling cost rates. Since waste collection is currently provided by Republic Service, the airport could track recycling cost rates and waste quantities to identify the most beneficial service available.

Quantitative data can be measured from available information provided by the airport and the Republic Services, such as:

Examination of Records

- Waste hauling and disposal records
- Supply and equipment invoices
- Other waste management costs (commodity rebates, container costs, etc.)

Facility Walk-Through

- Qualitative waste information
- Understanding waste pickup and hauling practices

Waste Audit

- Collection and analysis of the types of waste produced

While the airport may or may not expand the existing waste management system with additional landside recycle dumpsters at the airport, there are other opportunities for improvement. **Table 5C** outlines objectives that could help reduce waste generation and increase recycling efforts at PGA. To increase the effectiveness of tracking progress at the airport, a baseline state of all suggested metrics should be established to provide a comparison over time.

TABLE 5C
Waste Management and Recycling Goals
Page Municipal Airport

Goals	Objectives
Reduce the amount of solid waste generated	Switch to online bill pay to eliminate monthly paper bills
	Conduct a waste audit to identify the most common types of waste
	Eliminate the purchase of items that are not recyclable (i.e., Styrofoam, plastic bags)
	Make electronic files, not paper files, when possible
	Set copiers and printers to print on both sides of paper by default
	Reduce the amount of "junk mail" received
Reuse of materials or equipment	Offer reusable dishes to employees
	Reuse of cardboard boxes
	Reuse of construction materials
Increase the amount of material recycled	Improve waste tracking and data management
	Incorporate recycling requirements and/or recommendations into tenant lease agreements
	Expand recycling marketing and promotion efforts throughout public areas
	Require contractors to implement strategies to reduce, reuse, and recycle construction and demolition waste

Source: *Coffman Associates, Inc.*

SUMMARY

This chapter has been prepared to help the City of Page plan for the future growth and development of Page Municipal Airport by describing the master plan concept and detailing the environmental conditions that must be taken into consideration when implementing the development plan. The master plan concept represents an airfield facility that fulfills the needs of the community, while conforming to safety and design standards to the extent practicable. It also provides a landside development concept that can be developed over time as demand dictates. Further refinements can be made pending comments from the PAC, City of Page, and the general public.

Flexibility is important when planning future development at an airport, as activity may not occur as predicted. The master plan concept provides airport stakeholders with a guide to help maintain the long-term viability of the airport. The next chapter of the master plan will consider strategies for funding the recommended improvements and provide a reasonable schedule for improvement projects based upon airport safety priorities and operational demand over the course of the 20-year planning period.



page
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Chapter Six

CAPITAL PROGRAM









CAPITAL PROGRAM

The analyses completed in previous chapters evaluated development needs at Page Municipal Airport over the next 20 years, based on forecast activity, facility requirements, safety standards, and operational efficiency. Now that the recommended master plan concept has been developed and specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule for project implementation as well as the associated costs for the plan. This chapter will provide a description and overall cost for each project identified in the capital improvement program (CIP) and development schedule. The program has been evaluated from a variety of perspectives and represents a comparative analysis of basic budget factors, demand, and priority assignments.

CAPITAL IMPROVEMENT PROGRAM

Now that the recommended master plan concept has been developed and specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule for project implementation as well as the associated costs for the plan. This section will provide a description and overall cost for each project identified in the capital improvement program (CIP) and development schedule. The program has been evaluated from a variety of perspectives and represents a comparative analysis of basic budget factors, demand, and priority assignments.



The presentation of the capital program has been organized into two sections. First, the airport's CIP and associated cost estimates are presented in narrative and graphic form. The CIP has been developed following Federal Aviation Administration (FAA) guidelines for master plans and primarily identifies those projects that are likely eligible for FAA and Arizona Department of Transportation – Aeronautics Group (ADOT) grant funding. Second, capital improvement funding sources on the federal, state, and local levels are identified and discussed.

AIRPORT CAPITAL IMPROVEMENT PROGRAM AND COST SUMMARIES

Now that the specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule and the associated costs for implementing the recommended master plan concept. The capital program considers the interrelationships among the projects to determine an appropriate sequence of projects while remaining within reasonable fiscal constraints.

This section will examine the overall cost of each item in the capital program. The CIP, programmed by years, has been developed to cover the first five years of the plan. The remaining projects are grouped into intermediate (years 6-10) and long (years 11-20) term planning horizons. More detailed information is provided for the five-year horizon, with less detail provided for the longer planning periods. By utilizing planning horizons instead of specific years for intermediate and long-term development, the City of Page will have greater flexibility to adjust capital needs as demand dictates. **Table 6A** summarizes the key milestones for each of the three planning horizons.

A key aspect of this planning document is the use of demand-based planning milestones. The short-term planning horizon contains items of highest need and/or priority, many of which have been previously defined by airport management. As short-term horizon activity levels are reached, it will then be time to program for the intermediate term based upon the next activity milestones. Similarly, when the intermediate-term milestones are reached, it will be time to program for the long-term activity milestones.

Many development items included in the recommended master plan concept will need to follow these demand indicators. For example, the alternatives analysis and master plan concept include an ultimate terminal building expansion. Growth in passenger enplanements is the trigger for this project. The proposed runway extension outlined in the master plan concept also follows similar triggers related to the increased demand for commercial service and business jet aircraft that would require additional runway length. If growth slows or does not occur as forecast, some projects may be delayed. As a result, capital expenditures are planned to be made on an as-needed basis, leading to more responsible use of capital assets. Some development items do not depend on demand, such as pavement maintenance. These types of projects typically are associated with day-to-day operations and should be monitored and identified by airport management.

TABLE 6A
Planning Horizon Activity Levels
Page Municipal Airport

	Base Year	Short Term	Intermediate Term	Long Term
BASED AIRCRAFT				
Single Engine Piston	57	59	61	64
Multi Engine Piston	7	6	5	5
Turboprop	2	4	6	8
Jet	0	2	4	6
Helicopter	2	3	4	5
TOTAL BASED AIRCRAFT	**68**	**74**	**80**	**88**
ANNUAL OPERATIONS				
Itinerant				
General Aviation	12,140	13,610	15,090	17,390
Scheduled Commercial	1,600	1,620	1,760	1,700
Air Tour	15,360	16,760	18,260	21,820
Military	100	100	100	100
Total Itinerant	**29,200**	**32,090**	**35,210**	**41,010**
Local				
General Aviation	1,060	1,190	1,310	1,510
Total Local	**1,060**	**1,190**	**1,310**	**1,510**
TOTAL OPERATIONS	**30,260**	**33,280**	**36,520**	**42,520**
ENPLANEMENTS				
Scheduled Commercial	9,600	12,200	14,600	19,200
Air Tour	43,020	49,400	56,200	68,400
Total	**52,620**	**61,600**	**70,800**	**87,600**

Because of economic realities, few airports are constructing hangars on their own and instead are relying on private developers. In some cases, private developers can keep construction costs lower, which in turn lowers the monthly lease rates necessary to amortize a loan. To the greatest extent possible, private development of all hangar types should be supported and promoted by the airport sponsor. The CIP for the airport assumes that most future hangars would be constructed through public/private partnerships. This assumption does not preclude the possibility of the airport constructing new hangars. The airport sponsor's responsibility related to new hangars can be to provide public access taxiways, typically in conjunction with FAA and/or state development grants. These taxiways are then able to be utilized by hangar tenants for aircraft access to the runway/taxiway system.

Not all projects identified are necessary to meet projected demand. Other projects are necessary to enhance the safety of the airport, maintain existing infrastructure, or meet FAA design standards. These projects need to be programmed in a timely manner regardless of changes in demand indicators.

As a master plan is a conceptual document, implementation of the capital projects should only be undertaken after further refinement of their design and costs through architectural or engineering analyses. Moreover, some projects may require additional infrastructure improvements (i.e., drainage improvements, extension of utilities, etc.) that may increase the estimated cost of the project or increase the timeline for completion.

Once a list of necessary projects was identified and refined, project-specific cost estimates were prepared. These estimates include design, construction administration, and contingency costs that may arise on the project. Capital costs presented here should be viewed only as "order-of-magnitude" estimates subject to further refinement during engineering/architectural design. Nevertheless, they are considered sufficient for planning purposes. Cost estimates for each of the development projects in the CIP are based on present-day construction, design, and administration costs. Adjustments will need to be applied over time to account for inflation. Cost estimates for these projects were provided by C&S Engineering, who is providing engineering support for the master plan and is familiar with Page Municipal Airport, having been involved with the design and construction of several capital projects on the airfield. Cost estimates for each of the development projects in the CIP are in current dollars. Adjustments will need to be applied over time as construction costs or capital equipment costs change.

Exhibit 6A presents the proposed 20-year CIP for Page Municipal Airport. **Exhibit 6B** and **Exhibit 6C** graphically depicts the development staging by overlaying each project onto the aerial photograph of the airport. An estimate of FAA and ADOT funding eligibility has been included, although actual funding is not guaranteed. For those projects that would be eligible for federal funding, Airport Improvement Program (AIP) reauthorization provides for 95 percent of the total project cost at the airport. The remaining amount (5 percent) would be equally shared (2.5 percent) between ADOT and the City of Page.

As detailed in the CIP, many of the projects listed are eligible for federal and state funding. Obviously, demand and justification for these projects must be provided prior to a grant being issued by either the FAA and/or ADOT.

The FAA utilizes a national priority rating system to help objectively evaluate potential airport projects. Projects are weighted toward safety, infrastructure preservation, meeting design standards, and capacity enhancement. The FAA will participate in the highest priority projects before considering lower priority projects, even if a lower priority project is considered a more urgent need by the local sponsor. Nevertheless, the project should remain a priority for the airport and funding support should continue to be requested in subsequent years.

Some projects identified in the CIP will require environmental documentation. The level of documentation necessary for each project must be determined in consultation with the FAA and ADOT. There are three major levels of environmental review to be considered under the *National Environmental Policy Act* (NEPA) that include categorical exclusions (CatEx), Environmental Assessments (EA), and Environmental Impact Statements (EIS). Each level requires more time to complete and more detailed information. Guidance on what level of documentation is required for a specific project is provided in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. The Environmental Overview presented in Chapter Five addresses NEPA and provides an evaluation of various environmental categories for Page Municipal Airport. The level of environmental documentation that could be required for future projects in the CIP is further addressed later in this chapter.

The following sections describe in greater detail the projects identified for the airport over the next 20 years. The projects are grouped based upon a detailed evaluation of existing and projected demand, safety, rehabilitation needs, and local priority. While the CIP identifies the priority ranking of the

PROJECT DESCRIPTION	ESTIMATED TOTAL PROJECT COST	FAA SHARE	ADOT SHARE	AIRPORT/LOCAL SHARE
SHORT TERM PROGRAM (0-5 YEARS)				
2021				
1 Construct -Taxiway Safety Area (TSA) improvements and south ramp reconstruction	$1,750,000	$1,662,500	$43,750	$43,750
2 Environmental / Design - Runway Safety Area (RSA) grading project to meet RDC C-II design standards on Runway 15-33. Displace the Runway 33 threshold by 150' and amend declared distances.	$200,000	$190,000	$5,000	$5,000
2021 Total	*$1,950,000*	*$1,852,500*	*$48,750*	*$48,750*
2022				
3 Construct - Runway Safety Area (RSA) grading project to meet RDC C-II design standards on Runway 15-33. Displace the Runway 33 threshold by 150' and amend declared distances.	$4,700,000	$4,465,000	$117,500	$117,500
4 Design / Construct - relocate segmented circle	$300,000	$0	$270,000	$30,000
2022 Total	*$5,000,000*	*$4,465,000*	*$387,500*	*$147,500*
2023				
5 Design - Taxiway A rehabilitation and connector taxiway relocation for taxiway geometry improvements	$175,000	$166,250	$4,375	$4,375
2023 Total	*$175,000*	*$166,250*	*$4,375*	*$4,375*
2024				
6 Construct - Taxiway A rehabilitation and connector taxiway relocation for taxiway geometry improvements	$3,300,000	$3,135,000	$82,500	$82,500
7 Design / Construct - apron rehabilitation (approx. 82,000 SY)	$575,000	$0	$517,500	$57,500
2024 Total	*$3,875,000*	*$3,135,000*	*$600,000*	*$140,000*
2025				
8 Design - standard holding bays on Taxiway A serving Runway 15-33 (remove existing holding aprons)	$100,000	$0	$90,000	$10,000
9 Design - commercial service terminal expansion (10,100 sq. ft.) and parking area reconfiguration	$200,000	$190,000	$5,000	$5,000
2025 Total	*$300,000*	*$190,000*	*$95,000*	*$15,000*
2026				
10 Construct - standard holding bays on Taxiway A serving Runway 15-33 (remove existing holding aprons)	$1,200,000	$1,140,000	$30,000	$30,000
11 Construct - commercial service terminal expansion (10,100 sq. ft.) and parking area reconfiguration	$1,500,000	$1,425,000	$37,500	$37,500
2026 Total	*$2,700,000*	*$2,565,000*	*$67,500*	*$67,500*
SHORT TERM PROGRAM TOTAL	**$14,000,000**	**$12,373,750**	**$1,203,125**	**$423,125**
INTERMEDIATE TERM PROGRAM (6-10 YEARS)				
1 Environmental documentation for airside and landside improvements in the intermediate term program***	$50,000	$47,500	$1,250	$1,250
2 Northwest apron with vehicle access adjacent to Taxiway C (18,000 SY)	$2,641,100	$2,509,045	$66,028	$66,028
3 Close Runway 7-25 and repurpose as taxiway west of Taxiway A	$904,200	$858,990	$22,605	$22,605
4 Main apron expansion and executive box hangars (80' x 80') west of former Runway 7-25**	$2,054,650	$0	$0	$2,054,650
5 Acquire property interests for ultimate Runway Protection Zone (avigation easement or fee simple acquisition)	$175,000	$166,250	$4,375	$4,375
6 Environmental Assessment (EA) for relocation of Runway 15-33	$400,000	$380,000	$10,000	$10,000
7 Main apron expansion and linear box hangar (50' x 600')**	$1,831,600	$0	$0	$1,831,600
8 General airfield pavement maintenance***	$500,000	$475,000	$12,500	$12,500
INTERMEDIATE TERM PROGRAM TOTAL	**$8,556,550**	**$4,436,785**	**$116,758**	**$4,003,008**
LONG TERM PROGRAM (11-20 YEARS)				
1 Environmental documentation for airside and landside improvements in the intermediate term program***	$50,000	$47,500	$1,250	$1,250
2 Construct southwest apron and executive box hangar complex (60' x 60')**	$1,825,650	$0	$0	$1,825,650
3 Relocate VOR facility to accommodate critical area for runway relocation	$253,000	$240,350	$6,325	$6,325
4 Ultimate runway safety area grading (site prep)	$21,502,590	$20,427,461	$537,565	$537,565
5 Install utility infrastructure for ultimate runway site	$1,637,400	$1,555,530	$40,935	$40,935
6 Ultimate Runway 15-33, install blast pads, and Engineered Materials Arresting System (EMAS)	$46,567,000	$44,238,650	$1,164,175	$1,164,175
7 Taxiway A extensions and standard holding bays on each end of ultimate Runway 15-33	$2,665,600	$2,532,320	$66,640	$66,640
8 Northwest general aviation apron (approx 27,000 SY)	$6,331,150	$6,014,593	$158,279	$158,279
9 Relocate ARFF facility to north side of executive box hangar complex adjacent to Sage Avenue	$6,846,900	$6,504,555	$171,173	$171,173
10 General airfield pavement maintenance***	$1,000,000	$950,000	$25,000	$25,000
LONG TERM PROGRAM TOTAL	**$88,679,290**	**$82,510,958**	**$2,171,341**	**$3,996,991**
CAPITAL IMPROVEMENT PROGRAM TOTAL	**$111,235,840**	**$99,321,493**	**$3,491,224**	**$8,423,124**

Note: Totals may not equal due to rounding

KEY:

FAA	- Federal Aviation Administration	RSA	- Runway Safety Area
ADOT	- Arizona Department of Transportation	VOR	- Very High Frequency Omnidirctional Range
CatEx	- Categorical Exclusion	RDC	- Runway Design Code
EA	- Environmental Assessment	AIP	- Airport Improvement Program



*Project implementation is dependent on federal and state grant funding and availability. The CIP is based on FAA fiscal year programming.

**Hangar development is eligible for Primary Entitilement (PE) funds at a very low priority, so for the purposes of this study, it is assumed that PE funds will be utilized for other airport projects.

***Actual costs would be determined on a per project basis throughout the course of the planning period.

Note: Several projects are eligible for federal and state funding assistance; however, certain projects are designated for state/local funding only per the Airport's current CIP. These allocations are subject to change.

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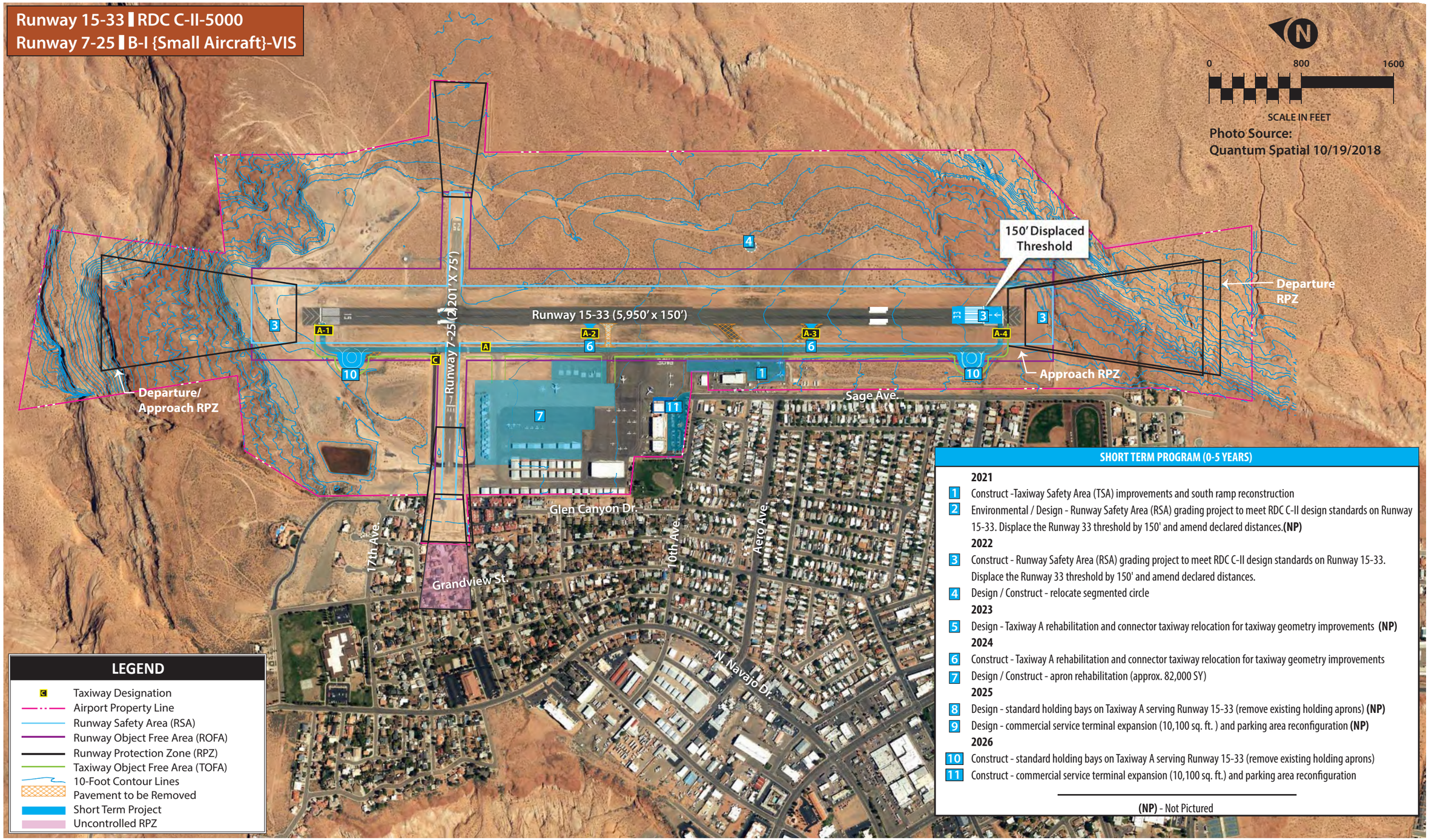
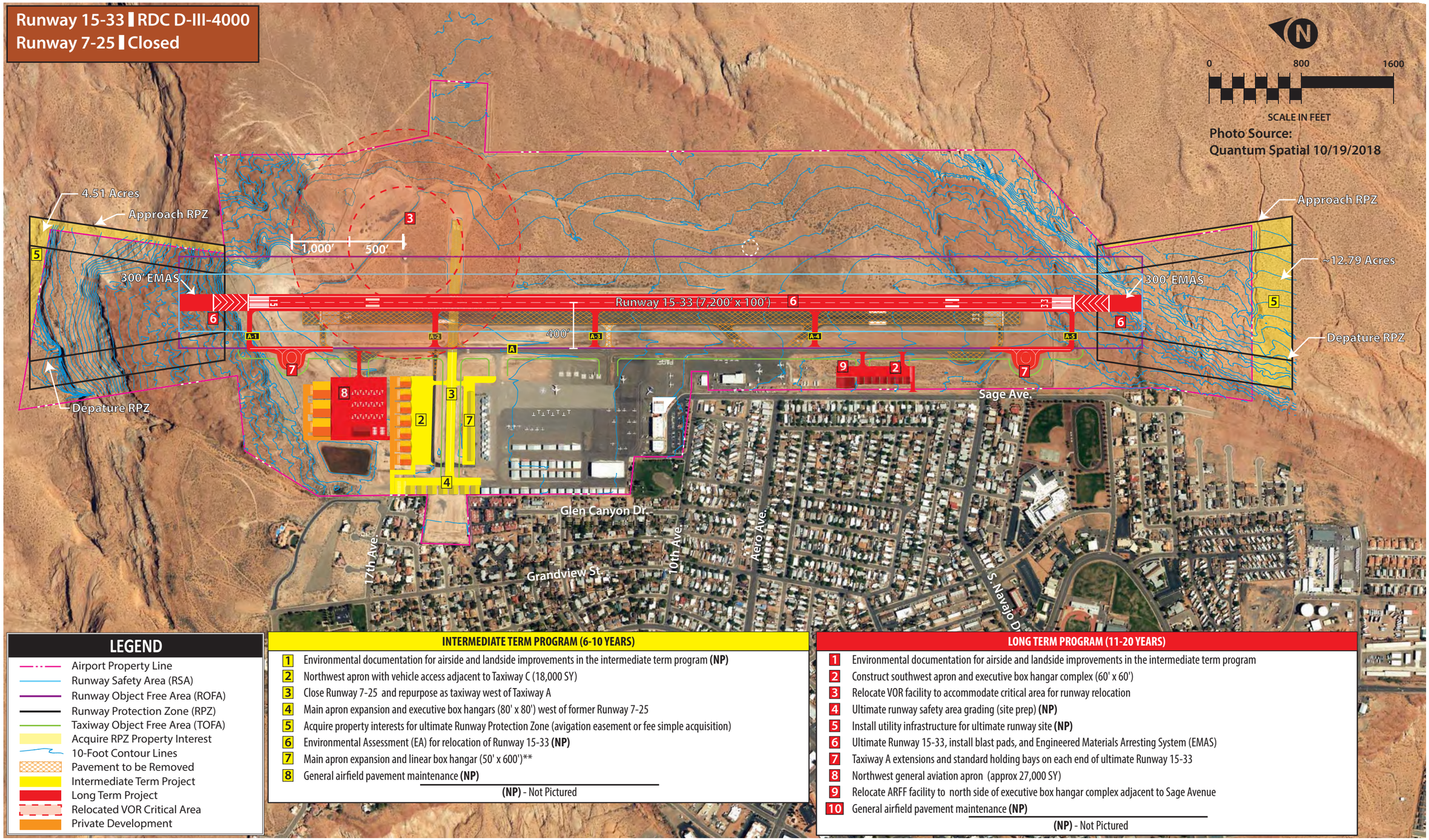

Runway 15-33 ▌RDC C-II-5000
Runway 7-25 ▌B-I {Small Aircraft}-VIS
N
0
800
1600
SCALE IN FEET
Photo Source:
Quantum Spatial 10/19/2018
150' Displaced Threshold
Runway 15-33 (5,950' x 150')
Runway 7-25 (2,201' X 75')
Departure RPZ
Approach RPZ
Departure/ Approach RPZ
Sage Ave.
Glen Canyon Dr.
17th Ave.
10th Ave.
Aero Ave.
Grandview St.
N. Navajo Dr.
A-1
A-2
A-3
A-4
A
C
LEGEND
Taxiway Designation
Airport Property Line
Runway Safety Area (RSA)
Runway Object Free Area (ROFA)
Runway Protection Zone (RPZ)
Taxiway Object Free Area (TOFA)
10-Foot Contour Lines
Pavement to be Removed
Short Term Project
Uncontrolled RPZ
SHORT TERM PROGRAM (0-5 YEARS)
2021
1 Construct -Taxiway Safety Area (TSA) improvements and south ramp reconstruction
2 Environmental / Design - Runway Safety Area (RSA) grading project to meet RDC C-II design standards on Runway 15-33. Displace the Runway 33 threshold by 150' and amend declared distances.(NP)
2022
3 Construct - Runway Safety Area (RSA) grading project to meet RDC C-II design standards on Runway 15-33. Displace the Runway 33 threshold by 150' and amend declared distances.
4 Design / Construct - relocate segmented circle
2023
5 Design - Taxiway A rehabilitation and connector taxiway relocation for taxiway geometry improvements (NP)
2024
6 Construct - Taxiway A rehabilitation and connector taxiway relocation for taxiway geometry improvements
7 Design / Construct - apron rehabilitation (approx. 82,000 SY)
2025
8 Design - standard holding bays on Taxiway A serving Runway 15-33 (remove existing holding aprons) (NP)
9 Design - commercial service terminal expansion (10,100 sq. ft.) and parking area reconfiguration (NP)
2026
10 Construct - standard holding bays on Taxiway A serving Runway 15-33 (remove existing holding aprons)
11 Construct - commercial service terminal expansion (10,100 sq. ft.) and parking area reconfiguration
(NP) - Not Pictured

Runway 15-33 | RDC D-III-4000
Runway 7-25 | Closed



LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Protection Zone (RPZ)
- Taxiway Object Free Area (TOFA)
- Acquire RPZ Property Interest
- 10-Foot Contour Lines
- Pavement to be Removed
- Intermediate Term Project
- Long Term Project
- Relocated VOR Critical Area
- Private Development

INTERMEDIATE TERM PROGRAM (6-10 YEARS)

1. Environmental documentation for airside and landside improvements in the intermediate term program **(NP)**
2. Northwest apron with vehicle access adjacent to Taxiway C (18,000 SY)
3. Close Runway 7-25 and repurpose as taxiway west of Taxiway A
4. Main apron expansion and executive box hangars (80' x 80') west of former Runway 7-25
5. Acquire property interests for ultimate Runway Protection Zone (avigation easement or fee simple acquisition)
6. Environmental Assessment (EA) for relocation of Runway 15-33 **(NP)**
7. Main apron expansion and linear box hangar (50' x 600')**
8. General airfield pavement maintenance **(NP)**

(NP) - Not Pictured

LONG TERM PROGRAM (11-20 YEARS)

1. Environmental documentation for airside and landside improvements in the intermediate term program
2. Construct southwest apron and executive box hangar complex (60' x 60')
3. Relocate VOR facility to accommodate critical area for runway relocation
4. Ultimate runway safety area grading (site prep) **(NP)**
5. Install utility infrastructure for ultimate runway site **(NP)**
6. Ultimate Runway 15-33, install blast pads, and Engineered Materials Arresting System (EMAS)
7. Taxiway A extensions and standard holding bays on each end of ultimate Runway 15-33
8. Northwest general aviation apron (approx 27,000 SY)
9. Relocate ARFF facility to north side of executive box hangar complex adjacent to Sage Avenue
10. General airfield pavement maintenance **(NP)**

(NP) - Not Pictured

projects, the list should be evaluated and revised on a regular basis. It is also important to note that certain projects, while listed separately for purposes of evaluation in this study, could be combined with other projects during time of construction/ implementation.

SHORT-TERM PROGRAM

The short-term projects are those anticipated to be needed during the first five years of the 20-year CIP. The list of projects is further divided into yearly timeframes and are prioritized based on the needs of Page Municipal Airport. Projects related to safety and maintenance generally have the highest priority. This applies to many of the projects identified in the short-term CIP that are associated with maintaining existing airfield pavements, improving airfield safety and geometry standards, and enhancing terminal facilities. The short-term program considers 11 projects for the planning period as presented on **Exhibit 6A** and depicted on **Exhibit 6B**. The following provides a detailed breakdown of each project.

Project # 1: Construct - Taxiway Safety Area Improvements and South Ramp Reconstruction Project

Description: Improve taxiway safety area by removing approximately 20 feet of apron and relocating terrain slope outside of the safety area. This project will also reconstruct and strengthen south ramp apron.
Cost Estimate: $1,750,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 2: Environmental / Design - Runway Safety Area (RSA) grading project to meet RDC C-II design standards on Runway 15-33. Displace the Runway 33 threshold by 150' and amend declared distances

Description: This project includes engineering, design, and environmental documentation associated with bringing Runway 15-33 in compliance with C-II design standards to include the displacement of the Runway 33 landing threshold and the amendment of Runway 15-33 declared distances.
Cost Estimate: $200,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 3: Construct - Runway Safety Area (RSA) grading project to meet RDC C-II design standards on Runway 15-33. Displace the Runway 33 threshold by 150' and amend declared distances

Description: This project is the physical grading of the RSA surrounding runway 15-33 to meet C-II design standards and the implementation of the displaced threshold on Runway 33.
Cost Estimate: $4,700,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 4: Design / Construct - Relocate Segmented Circle

Description: This project includes engineering, design, environmental documentation, and construction associated with the relocation of the segmented circle to an area outside of the ultimate runway object free area.
Cost Estimate: $300,000
Funding Breakdown: AIP - 0 percent / ADOT - 90 percent / Airport-Local - 10 percent

Project # 5: Design - Taxiway A Rehabilitation and Connector Taxiway Relocation

Description: This project includes engineering, design, and environmental documentation associated with the rehabilitation of Taxiway A and the relocation of associated connector taxiways for taxiway geometry improvement.
Cost Estimate: $175,000
Funding Breakdown: FAA - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 6: Construct - Taxiway A Rehabilitation and Connector Taxiway Relocation

Description: Construct the rehabilitation of Taxiway A and the relocation of associated connector taxiways for taxiway geometry improvement.
Cost Estimate: $3,300,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 7: Design / Construct - Apron Rehabilitation (approx. 82,000 SY)

Description: This project includes engineering, design, and environmental documentation associated with the apron rehabilitation project and will consist of crack seal and seal coat for eligible areas and reconstruction for areas below PCI 55.
Cost Estimate: $575,000
Funding Breakdown: AIP - 0 percent / ADOT - 90 percent / Airport-Local - 10 percent

Project # 8: Design - Standard Holding Bays on Taxiway A Serving Runway 15-33

Description: This project includes engineering, design, and environmental documentation associated with replacing existing holding aprons with redesigned holding bays per updated FAA standards.
Cost Estimate: $100,000
Funding Breakdown: AIP - 0 percent / ADOT - 90 percent / Airport-Local - 10 percent

Project # 9: Design - Commercial Service Terminal Expansion (18,200 sq. ft.) and Parking Area Reconfiguration

Description: This project includes engineering, design, and environmental documentation associated with the expansion the existing commercial service terminal to meet current and future demand.
Cost Estimate: $200,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 10: Construct - Standard Holding Bays on Taxiway A Serving Runway 15-33

Description: For airfield safety, a redesigned holding bay is programmed at each end of Taxiway A. The construction of this holding bay provides aircraft the ability to perform engine run-up procedures, while allowing aircraft to bypass each other, if necessary. This holding bay configuration adheres to FAA design for hold areas on an airfield.
Cost Estimate: $1,200,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 11: Construct - Commercial Service Terminal Expansion (18,200 sq. ft.) and Parking Area Reconfiguration

Description: Construction of the expansion the existing commercial service terminal to meet current and future demand.
Cost Estimate: $1,500,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Short-Term Program Summary

The short-term CIP includes projects that enhance the overall safety and maintenance of the airfield, while also implementing landside improvements to the existing terminal area. The total investment necessary for the short-term CIP is $14 million as detailed on **Exhibit 6A**. Of this total, approximately $13.58 million is eligible for federal and state funding assistance. The remaining $423,125 is to be provided through local funding outlets.

INTERMEDIATE-TERM PROGRAM

The intermediate-term projects are those that are anticipated to be necessary in years 6 through 10 of the master plan. These projects are not tied to specific years for implementation; instead, they have been prioritized so that airport management has the flexibility to determine when they need to be pursued based on current conditions. It is not unusual for certain projects to be delayed or advanced based on changing conditions, such as funding availability or changes in the aviation industry. This planning horizon includes seven projects for the five-year timeframe as listed on **Exhibit 6A** and depicted on **Exhibit 6C**. The following section includes a description of each project.

Project # 1: Environmental Documentation for Airside and Landside Improvements in the Intermediate-Term Program

Description: A line item in the CIP that provides the necessary environmental reviews needed for several projects outlined in the intermediate-term program. These environmental reviews, whether a CatEx or EA, would likely be programmed separately and in conjunction with a project at least one to two years in advance of actual construction and/or implementation.
Cost Estimate: $50,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 2: Northwest Apron with Vehicle Access Adjacent to Taxiway C (18,000 SY)

Description: This project includes the design and construction of an apron north of Runway 7-25 adjacent to Taxiway C. The northwest apron will provide a location for additional private landside development.
Cost Estimate: $2,641,100
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 3: Close Runway 7-25 and Repurpose as Taxiway West of Runway 15-33

Description: This project repurposes Runway 7-25 as a taxiway and provides vehicle access to the northwest apron development area for future aviation development potential.
Cost Estimate: $904,200
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 4: Main Apron Expansion and Executive Box Hangars (80'X80') West of Former Runway 7-25

Description: This project expands the apron west of the approach end of Runway 7 and serves to provide additional executive box hangar storage on the airport.
Cost Estimate: $2,054,650
Funding Breakdown: AIP - 0 percent / ADOT – 0 percent / Airport-Local – 100 percent

Project # 5: Acquire Property Interests for Ultimate Runway Protection Zone

Description: This land acquisition is programmed for approach protection and airfield safety associated with enhanced instrument approach capabilities on ultimate Runway 15-33. This project is intended to align the airport for the future by acquiring property interest through either fee simple acquisition or avigation easements to establish lower visibility minimums.
Cost Estimate: $175,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 6: Environmental Assessment (EA) for relocation of Runway 15-33

Description: An Environmental Assessment (EA) will be required for the relocation of Runway 15-33 to provide the 400 feet of runway to taxiway separation associated with RDC D-III standards.
Cost Estimate: $400,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 7: Main Apron Expansion and Linear Box Hangar (50' x 600')

Description: This project expands the main apron to the north and adds a linear box hangar to provide additional small aircraft storage on the airport.
Cost Estimate: $1,831,600
Funding Breakdown: AIP - percent / ADOT – 0 percent / Airport-Local – 100 percent

Project # 8: General Airfield Pavement Maintenance

Description: A line item in the CIP that allocates a certain amount of funding for the general maintenance of various pavements not specifically identified by project in the CIP and could include crack sealing and other routine maintenance.
Cost Estimate: $500,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Intermediate-Term Program Summary

The total costs associated with the intermediate-term program are estimated at $8.56 million as presented on **Exhibit 6A**. Of this total, approximately $4.55 million could be eligible for federal/state funding, and the local share is projected at approximately $4 million in the intermediate term.

LONG-TERM PROGRAM

The long-term planning horizon considers 10 projects for the 10-year period that are mainly demand-driven. The projects and their associated costs are listed on **Exhibit 6A** and graphically depicted on **Exhibit 6C** as appropriate. Airport management and the City of Page should assess the need and timing for these projects based on actual demand and growth at Page Municipal Airport.

Project # 1: Environmental Documentation for Airside and Landside Improvements in the Long-Term Program

Description: A line item in the CIP that provides the necessary environmental reviews needed for several projects outlined in the long-term program. These environmental reviews, whether a CatEx or EA, would likely be programmed separately and in conjunction with a particular project at least one year in advance of actual construction and/or implementation.
Cost Estimate: $50,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 2: Construct Southwest Apron and Executive Box Hangar Complex

Description: This project provides an apron, vehicle parking areas, and additional aircraft storage adjacent to Sage Avenue.
Cost Estimate: $1,825,650
Funding Breakdown: AIP - 0 percent / ADOT – 0 percent / Airport-Local – 100 percent

Project # 3: Relocate VOR Facility to Accommodate Critical Area for Runway Relocation

Description: The VOR must remain 500 feet from the ultimate runway centerline and 1,000 feet from any building to maintain the VOR critical area. Therefore, the VOR must be relocated approximately 100 feet to the east to be located outside the ROFA.
Cost Estimate: $253,000
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 4: Ultimate Runway Safety Area (RSA) Grading

Description: This project is the physical grading of the RSA surrounding ultimate Runway 15-33 to meet D-III design standards and to extend the runway to a length of 7,200 feet.
Cost Estimate: $21,502,590
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 5: Install Utility Infrastructure to Ultimate Runway Site

Description: This project provides additional utility infrastructure for the ultimate runway relocation.
Cost Estimate: $1,637,400
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 6: Ultimate Runway 15-33, Install Blast Pads, and Engineered Materials Arresting System (EMAS)

Description: Construction of the new ultimate Runway 15-33 will be 7,200 feet long by 100 feet in wide and will include 300-foot long blast pads and EMAS beds also measuring 300 feet. These improvements will allow for the full length of the extended runway to be utilized.
Cost Estimate: $46,567,000
Funding Breakdown: AIP – 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 7: Taxiway A Extensions and Standard Holding Bays on Each End of Ultimate Runway 15-33

Description: Construction of relocated holding bays is programmed at each end of Taxiway A. The construction of this holding bay provides aircraft the ability to perform engine run-up procedures while allowing aircraft to bypass each other, if necessary. This holding bay configuration adheres to FAA design standards for hold areas on an airfield.
Cost Estimate: $2,665,600
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 8: Northwest General Aviation Apron

Description: This project provides additional apron in the northwest corner of the airport to provide for additional private aviation development.
Cost Estimate: $6,331,150
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 9: Relocate ARFF Facility

Description: Relocation of the existing ARFF facility to the north side of (60' x 60') executive box hangar complex adjacent to Sage Ave.
Cost Estimate: $6,846,900
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Project # 10: General Airfield Pavement Maintenance

Description: A line item in the CIP that allocates a certain amount of funding for the general maintenance of various pavements not specifically identified by project in the CIP and could include crack sealing and other routine maintenance.
Cost Estimate: $1,000,00
Funding Breakdown: AIP - 95 percent / ADOT – 2.5 percent / Airport-Local – 2.5 percent

Long-Term Program Summary

The total investment necessary for the long-term CIP is approximately $88.68 million. Of the total long-term program projects detailed on **Exhibit 6A**, approximately $84.68 million is eligible for federal/state funding assistance. The airport's matching share is projected at $3.99 million.

Capital Improvement Program Summary

The list of projects needed to accomplish the vision for Page Municipal Airport has been prioritized and cost estimates have been developed. Projects considered for the short-term planning horizon (years 0-5) have been divided into yearly increments. Projects considered for the intermediate (years 6-10) and long term (years 11-20) have been prioritized and grouped together. The grouping of projects is necessary to provide the needed flexibility for the airport to adjust, as necessary. In addition, on an annual basis, the airport, FAA, and ADOT assemble and review a five-year CIP. Therefore, the list of projects and the prioritization of the projects can and likely will change in the future.

The total CIP proposes approximately $111.24 million in airport development needs. Of this total, approximately $99.32 million of which could be eligible for federal/state funding assistance. The local funding estimate for the proposed CIP is approximately $8.42 million. The CIP can serve as a road map of airport improvements to help guide the City of Page, the FAA, and ADOT.

CAPITAL IMPROVEMENT PROGRAM FUNDING SOURCES

There are generally four sources of funds used to finance airport development, which include:

- Airport cash flow
- Revenue and general obligation bonds
- Federal/state/local grants
- Passenger facility charges (PFCs), which are reserved for commercial service airports

Access to these sources of financing varies widely among airports, with some large airports maintaining substantial cash reserves and the smaller commercial service and general aviation airports often requiring subsidies from local governments to fund operating expenses and finance modest improvements. Financing capital improvements at Page Municipal Airport will not rely solely on the financial resources of the City of Page. Capital improvement funding is available through various grant-in-aid programs on both the federal and state levels. Historically, the airport has received federal and state grants. While more funds could be available some years, the CIP was developed with project phasing in order to remain realistic and within the range of anticipated grant assistance. The following discussion outlines key sources of funding potentially available for capital improvements at the airport.

All airports receiving federal AIP funding are required to maintain a current CIP with the FAA, which identifies projects to be undertaken at an airport over the next five-year period. The CIP further estimates the order of implementation as well as total project costs and funding sources. **Exhibit 6A** presents cost estimates based on a planning level of detail for Short Term, which is the required five-year plan, as well as Intermediate Term and Long Term. While accurate for master planning purposes, actual project costs will likely vary from these planning estimates once project design and engineering estimates are developed. The cost estimates presented in the table are in 2020 dollars and include contingencies, design costs, and construction management costs. As shown in the table, the CIP is estimated to cost approximately $111.24 million in 2020 dollars. Potential funding sources for any proposed improvements can be found at a variety of agencies, both federal and state. Many of the available funds come in the form of grants, should the project meet eligibility requirements. Additional financing options are available such as passenger facility charges (PFCs) and private investment. The following sections list available sources and detail the eligibility requirements for each. The amount of funding available from these sources will depend primarily on future levels of aviation activity at Page Municipal Airport and future federal reauthorizations.

FEDERAL FUNDING

The United States Congress has long recognized the need to develop and maintain a system of aviation facilities across the nation for the purpose of national defense and promotion of interstate commerce. Various grants-in aid programs to public airports have been established over the years for this purpose. The most recent legislation is the Airport Improvement Program (AIP) of 1982. The AIP has been reauthorized several times, with the most recent legislation (H.R. 302, the FAA Reauthorization Act of 2018) was signed into law on October 5, 2018. It extended FAA's funding and authorities through Fiscal Year 2023.

Grants administered by the FAA through the AIP represent a critical capital funding source to implement the projects recommended in this master plan. Although the future status of the AIP is currently uncertain, for the purpose of this master plan, it is assumed that the AIP will continue to be authorized and appropriated at levels consistent with H.R. 302, the FAA Reauthorization Act of 2018. There is oftentimes an adjustment to rates at some airports in Alaska, Arizona, California, Nevada, New Mexico, Oregon, Utah, and Washington due to the high percentage of Federally owned lands in these states. As such, Page Municipal Airport is entitled to 95 percent in federal funding for AIP-eligible projects. AIP funds can be used for most airport improvement needs but not operating costs. AIP funds are typically not available for revenue-generating projects, so it may be difficult, though not impossible, for the airport to use these funds for projects designated to generate revenue.

A national priority system is used to evaluate and rank each airport project. Those projects with the highest priority are given preference in funding. Under the AIP program, examples of eligible development projects include the airfield, aprons, and access roads. Passenger terminal building improvements (such as bag claim and public waiting lobbies) may also be eligible for FAA funding.

Entitlement Grants

Entitlement funds are distributed through grants by a formula currently based on the number of enplanements and the amount of landed weight of arriving cargo at individual airports. These funds are available to airports in the year they are first apportioned and remain available for the two fiscal years immediately following or three fiscal years in the case of primary airports such as Page Municipal Airport.

Primary commercial service airports receive a guaranteed minimum of federal assistance each year, based on their enplaned passenger levels and Congressional appropriation levels. A primary airport is defined as any commercial service airport enplaning at least 10,000 passengers annually. Page Municipal Airport, with enplanements at the 52,000 level, currently receives the minimum entitlement level of $1.0 million each federal fiscal year. Although, the long-range forecast anticipates enplanement levels to exceed that level; therefore, the airport could qualify for additional annual entitlement funding in the future.

In cases where entitlement funds are not used, the funds are redistributed to other airport sponsors as discretionary funds and become “protected entitlement” funding in the next federal fiscal year. Annual entitlement grant collections in certain years may not be sufficient to fund certain project costs requiring short-term funding until the project costs can be reimbursed.

Discretionary Grants

At the beginning of each federal fiscal year, the FAA sets aside the amount of discretionary grants to fund the Letter-of-Intent payment schedules. The FAA approves discretionary funds for use on specific projects after consideration of project priority and other selection criteria. As previously mentioned, this analysis does not anticipate the use of discretionary grants to fund the CIP; however, Page Municipal Airport could apply for these grants should the need arise.

Table 6B presents the approximate distribution of the AIP funds as described in FAA Order 5100.38D, Change 1, *Airport Improvement Program Handbook*, issued February 26, 2019. The Page Municipal Airport is eligible to apply for grants which may be funded through state apportionments, the small airport fund, discretionary funds, and/or set-aside categories.

TABLE 6B
Federal AIP Funding Distribution

Funding Category	Percent of Total	Funds*
Apportionment/Entitlement		
Passenger Entitlements	27.01%	$904,840,000
Cargo Entitlements	3.50%	$117,250,000
Alaska Supplemental	0.67%	$22,450,000
Nonprimary Entitlements	12.01%	$402,340,000
State Apportionment	7.99%	$267,670,000
Carryover	22.85%	$765,480,000
Small Airport Fund		
Small Hubs	2.33%	$78,060,000
Nonhubs	4.67%	$156,450,000
Nonprimary (GA and Reliever)	9.33%	$312,560,000
Discretionary		
Capacity/Safety/Security/Noise	4.36%	$146,060,000
Pure Discretionary	1.45%	$48,580,000
Set Asides		
Noise and Environmental	3.37%	$112,900,000
Military Airports Program	0.39%	$13,070,000
Reliever	0.06%	$2,010,000
Totals	**100.00%**	**$3,350,000,000**

* FAA *Modernization and Reform Act of 2018*
AIP: Airport Improvement Program
Source: FAA Order 5100.38D, Change 1, Airport Improvement Program Handbook

Passenger Facility Charges

PFCs are authorized by Title 14 of the Code of Federal Regulations, Part 158 and are administered by the FAA. PFCs collected from qualified enplaned passengers are used to fund eligible projects. An airport operator can impose a PFC of $1.00, $2.00, $3.00, $4.00, or $4.50 per eligible enplaned passenger. Once a PFC is imposed, it is included as part of the ticket price paid by passengers enplaning at the airport, collected by the airlines, and remitted to the airport operator, less an allowance for airline processing expenses. The PFC legislation stipulates that if a medium- to large-hub airport institutes a PFC of $1.00,

$2,00, or $3.00, they must forego 50 percent of their AIP entitlement funds. This increases to 75 percent if they charge a $4.00 or $4.50 PFC. Since Page Municipal Airport is classified as a non-hub airport, it does not have to forego any annual AIP entitlement funds.

Projects that are eligible for PFC funding are those that preserve or enhance the capacity, safety, or security of the air transportation system; reduce noise or mitigate noise effects; or furnish opportunities for enhanced competition between or among air carriers. PFCs cannot be used for revenue-generating facilities at airports, such as restaurants and other concession space, rental car facilities, public parking facilities, or construction of exclusively leased space or facilities. Page Municipal Airport does not currently charge a PFC; however, PFCs remain a potential funding source should the need arise.

Small Airport Fund

If a large-hub or medium-hub commercial service airport chooses to institute a PFC, which is a fee of up to $4.50 on each airline ticket for funding of capital improvement projects, then their apportionment is reduced. A portion of the reduced apportionment goes to the small airport fund. The small airport fund is reserved for small-hub primary commercial service airports, non-hub commercial service airports, reliever, and general aviation airports. As a non-hub primary commercial service airport, Page Municipal Airport is eligible for funds from this source.

FAA Facilities and Equipment (F&E) Program

The Airway Facilities Division of the FAA administers the Facilities and Equipment (F&E) Program. This program provides funding for the installation and maintenance of various navigational aids and equipment of the national airspace system. Under the F&E program, funding is provided for FAA airport traffic control towers (ATCTs), enroute navigational aids, on-airport navigational aids, and approach lighting systems. While F&E still installs and maintains some navigational aids, on-airport facilities at general aviation airports have not been a priority. Therefore, airports often request funding assistance for navigational aids through AIP and then maintain the equipment on their own[1].

STATE FUNDING

The State of Arizona also supports needed capital improvements at Arizona's public airports through its grant program. ADOT's Aeronautics Division administers the grant program through the State Aviation Fund. Funds are distributed across three major categories: Airport Development Grants Program, Airport Preventive Maintenance System, and Airport Loan Program. The Airport Development Grants Program is designed to provide 50 percent of the local share for projects receiving federal AIP funding, while the Airport Preventive Maintenance System may fund up to 90 percent of projects that maintain and protect aviation pavement surfaces. In addition, ADOT's Airport Loan Program was established to enhance the

[1] Guidance on the eligibility of a project for federal AIP grant funding can be found in FAA Order 5100.38D, *Airport Improvement Program Handbook*.

utilization of available state funds and provide a flexible funding source for eligible airport sponsors. Approximately $3.63 million of the CIP is anticipated to be funded by ADOT.

Pavement Maintenance Program

The airport system in Arizona is a multi-million-dollar investment of public and private funds that must be protected and preserved. State aviation fund dollars are limited, and the State Transportation Board recognizes the need to protect and extend the maximum useful life of the airport system's pavement. The Arizona Pavement Management System (APMS) has been established to assist in the preservation of Arizona airports' system infrastructure.

Public Law 103-305 requires that airports requesting federal AIP funding for pavement rehabilitation or reconstruction have an effective pavement maintenance program system. To this end, ADOT – Aeronautics Group maintains the APMS.

The Arizona APMS uses the Army Corps of Engineers' "Micropaver" program as a basis for generating a Five-Year Arizona Pavement Preservation Program (APPP). The APPP consists of visual inspections of all airport pavements. Evaluations are made of the types and severities observed and entered into a computer database. PCI values are determined through the visual assessment of pavement conditions in accordance with the most recent FAA Advisory Circular 150/5380-7, *Pavement Management System*, and range from 0 (failed) to 100 (excellent). Every three years, a complete database update with new visual observations is conducted. Individual airport reports from the update are shared with all participating system airports. ADOT – Aeronautics Group ensures that the APMS database is kept current, in compliance with FAA requirements.

Every year, ADOT, utilizing the APMS, will identify airport pavement maintenance projects eligible for funding for the upcoming five years. These projects will appear in the state's Five-Year Airport Development Program. Once a project has been identified and approved for funding by the State Transportation Board, the airport sponsor may elect to accept a state grant for the project and not participate in the APPP, or the sponsor may sign an Inter-Government Agreement (IGA) with ADOT-MPD – Aeronautics Group to participate in the APPP. Page Municipal Airport is eligible to participate in this program.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. A goal for any airport is to generate enough revenue to cover all operating and capital expenditures, if possible. There are several local financing options to consider when funding future development at airports, including airport revenues, issuance of a variety of bond types, leasehold financing, implementing a customer facility charge (CFC), pursuing non-aviation development potential, and collecting from special events. These strategies could be used to fund the local matching share or

complete a project if grant funding cannot be arranged. Below is a brief description of the most common local funding options.

Airport Revenues

Page Municipal Airport generates revenue through air tour operator fees, ground transportation fees, airline revenues, terminal concessions, land and facility leases, fuel flowage fees, ramp fees, and security fees. The largest of these revenue sources is generated from air tour operator tenants. An airport's daily operations are conducted through the collection of various rates and charges. These airport revenues are generated specifically by airport operations. There are restrictions on the use of revenues collected by the airport. All receipts, excluding bond proceeds or related grants and interest, are irrevocably pledged to the punctual payment of operating and maintenance expenses, payment of debt service for as long as bonds remain outstanding, or for additions and improvements to airport facilities.

All airports should establish standard basis rates for various leases. All lease rates should be set to adjust to a standard index, such as the consumer price index (CPI), to assure that fair and equitable rates continue to be charged into the future. Many factors will impact what the standard lease rate should be for a facility or ground parcel. For example, ground leases for aviation-related facilities should have a different lease rate than for non-aviation leases. When airports own hangars, a separate facility lease rate should be charged. The lease rate for any individual parcel or hangar can vary due to availability of utilities, condition, location, and other factors. Nevertheless, standard lease rates should fall within an acceptable range.

Bonding

Bonding is a common method to finance large capital projects at airports. A bond is an instrument of indebtedness of the bond issuer to the bond holders, thus a bond is a form of loan or IOU. While bond terms are negotiable, typically the bond issuer is obligated to pay the bond holder interest at regular intervals and/or repay the principal at a later date.

Leasehold Financing

Leasehold financing refers to a developer or tenant financing improvements under a long-term ground lease. The advantage of this arrangement is that it relieves the airport of the responsibility of having to raise capital funds for the improvement. As an example, an FBO might consider constructing hangars and charging fair market lease rates while paying the airport for a ground lease. A fuel farm can be undertaken in the same manner, with the developer of the facility paying the airport a fuel flowage fee.

Customer Facility Charge (CFC)

A CFC is the imposition of an additional fee charged to customers for the use of certain facilities. The most common example is when an airport constructs a consolidated rental car facility and imposes a fee

for each rental car contract. That fee is then used by the airport to pay down the debt incurred from building the facility.

Non-Aviation Development

In addition to generating revenue from traditional aviation sources, airports with excess land can permit compatible non-aviation development. Generally, an airport will extend a long-term lease for land not anticipated to be needed for aviation purposes in the future. The developer then pays the monthly lease rate and constructs and uses the compatible facility. Certain areas at Page Municipal Airport could potentially be made available for non-aviation development. Although, it should be noted that each individual proposed non-aviation development must be reviewed and approved by the FAA.

Special Events

Another common revenue-generating option is permitted use of airport property for temporary or single events. For example, some airports host an airport open house that attracts spectators from around the region. Airports can also permit portions of their facility to be utilized for non-aviation special events, such as car shows or video production of commercials. This type of revenue generation must be approved by the FAA.

Private Investment

Many airports use private investment when the planned improvements will be primarily used by a private business or other organization. Such projects are not ordinarily eligible for federal funding. Projects of this kind typically include hangars, fixed based operator facilities, fuel storage, exclusive aircraft parking aprons, industrial aviation use facilities, non-aviation office/commercial/industrial developments, and other similar projects. Private development proposals are considered on a case-by-case basis. Often, airport funds for infrastructure, preliminary site work, and site access are required to facilitate privately developed projects on airport property. The CIP does not list or provide cost estimates for any projects that could be funded through private investment; however, this remains a viable option to fund future landside development. Although, private investment is a potential revenue source when examining lease revenue generated from such options.

ENVIRONMENTAL OVERVIEW SUMMARY OF AIRPORT DEVELOPMENT SCHEDULE

As a follow-up to the Environmental Overview provided in Chapter Five, **Table 6C** lists the future development projects previously detailed and the most likely NEPA documentation that could be required by the FAA. Some of the projects are actions normally requiring an EA. However, most of the proposed improvements, unless involving extraordinary circumstances, could be evaluated in terms of NEPA compliance using one of the CatExs listed in FAA Order 1050.1F. In addition, some of the projects may not require a federal action or federal funding.

Table 6C
Anticipated Environmental Review for Future Development Projects
Page Municipal Airport

PROJECT DESCRIPTION		
SHORT TERM PROGRAM (1-5 years)		**Initial NEPA Action**
1	Construct - Taxiway Safety Area (TSA) improvements and south ramp reconstruction	CatEx
2	Environmental / Design - Runway Safety Area (RSA) grading project to meet RDC C-II design standards on Runway 15-33. Displace the Runway 33 threshold by 150' and amend declared distances.	CatEx or EA
3	Construct - Runway Safety Area (RSA) grading project to meet RDC C-II design standards on Runway 15-33. Displace the Runway 33 threshold by 150' and amend declared distances.	CatEx or EA
4	Design/Construct - relocate segmented circle	CatEx
5	Design - Taxiway A rehabilitation and connector taxiway relocation for taxiway geometry improvements	CatEx
6	Construct - Taxiway A rehabilitation and connector taxiway relocation for taxiway geometry improvements	CatEx
7	Design / Construct - apron rehabilitation (approx. 82,000 SY)	CatEx
8	Design - standard holding bays on Taxiway A serving Runway 15-33 (remove existing holding aprons)	CatEx
9	Design - commercial service terminal expansion (10,100 sq. ft.) and parking area reconfiguration	CatEx
10	Construct - standard holding bays on Taxiway A serving Runway 15-33 (remove existing holding aprons)	CatEx
11	Construct - commercial service terminal expansion (10,100 sq. ft.) and parking area reconfiguration	CatEx
INTERMEDIATE TERM PROGRAM (6-10)		**Initial NEPA Action**
1	Environmental Documentation for Airside and Landside Improvements in the Intermediate Term Program	N/A
2	Northwest apron with vehicle access adjacent to Taxiway C (18,000 SY)	CatEx
3	Close Runway 7-25 and repurpose as taxiway west of Runway 15-33	CatEx or EA
4	Main apron expansion and executive box hangars (80'X80') west of former Runway 7-25	CatEx
5	Acquire property interests for ultimate 3/4-mile RPZ (avigation easement or fee simple acquisition)	CatEx or EA
6	Environmental Assessment (EA) for relocation of Runway 15-33 (to include connected actions listed in Long-Term Program, Items 3-7)	EA
7	Main apron expansion and linear box hangar (50'x600')	CatEx
8	General airfield pavement maintenance	CatEx

LONG TERM PROGRAM (11-20)		Initial NEPA Action
1	Environmental Documentation for Airside and Landside Improvements in the Intermediate Term Program	N/A
2	Construct southwest apron and executive box hangar complex ('60'X60')	CatEx
3	Relocate VOR facility to accommodate critical area for runway relocation	EA
4	Ultimate runway safety area grading (site prep)	EA
5	Install utility infrastructure for ultimate runway site	EA
6	Ultimate Runway 15-33, install blast pads, and Engineered Materials Arresting System (EMAS)	EA
7	Taxiway A extensions and standard holding bays on each end of ultimate Runway 15-33	EA
8	Northwest general aviation apron (approx. 27,000 SY)	CatEx
9	Relocate ARFF facility to north side of (60' x 60') executive box hangar complex adjacent to Sage Ave.	CatEx or EA
10	General airfield pavement maintenance	CatEx or EA

KEY
CatEx- Categorical Exclusion
EA- Environmental Assessment

MASTER PLAN IMPLEMENTATION

To implement the master plan recommendations, it is key to recognize that planning is a continuous process and does not end with approval of this document. The airport should implement measures that allow it to track various demand indicators, such as based aircraft, hangar demand, enplanements, and operations. The issues that this master plan is based on will remain valid for a number of years. The primary goal is for Page Municipal Airport to best serve the air transportation needs of the region, while achieving economic self-sufficiency.

The CIP and the phasing program presented will change over time. An effort has been made to identify and prioritize all major capital projects that would require FAA and ADOT grant funding. Nevertheless, the airport and FAA review the five-year CIP on an annual basis.

The value of this study is keeping the issues and objectives at the forefront of the minds of managers and decision-makers. In addition to adjustments in aviation demand, decisions on when to undertake the improvements recommended in this master plan will impact how long the plan remains valid. The format of this plan reduces the need for formal and costly updates by simply adjusting the timing of project implementation. Updates can be done by airport management, thereby improving the plan's effectiveness. Nevertheless, airports are typically encouraged to update their master plans every 7 to 10 years, or sooner if significant changes occur in the interim.

In summary, the planning process requires the City of Page to consistently monitor the progress of the airport. The information obtained from continually monitoring activity will provide the data necessary to determine if the development schedule should be accelerated or decelerated.



page
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Appendix A

GLOSSARY OF TERMS









Glossary of Terms

A

ABOVE GROUND LEVEL: The elevation of a point or surface above the ground.

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): See declared distances.

ADVISORY CIRCULAR: External publications issued by the FAA consisting of nonregulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviaı on subject.

AIR CARRIER: An operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the ı mes, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a current contract with the U.S. Postal Service. Cerı fied in accordance with Federal Aviaı on Regulaı on (FAR) Parts 121 and 127.

AIRCRAFT: A transportaı on vehicle that is used or intended for use for flight.

AIRCRAFT APPROACH CATEGORY: A grouping of aircraı based on 1.3 ı mes the stall speed in their landing configuraı on at their maximum cerı ficated landing weight. The categories are as follows:

- Category A: Speed less than 91 knots.
- Category B: Speed 91 knots or more, but less than 121 knots.
- Category C: Speed 121 knots or more, but less than 141 knots.
- Category D: Speed 141 knots or more, but less than 166 knots.
- Category E: Speed greater than 166 knots.

AIRCRAFT OPERATION: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA (AOA): A restricted and secure area on the airport property designed to protect all aspects related to aircraft operaı ons.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION: A private organizaı on serving the interests and needs of general aviaı on pilots and aircraı owners.

AIRCRAFT RESCUE AND FIRE FIGHTING: A facility located at an airport that provides emergency vehicles, exı nguishing agents, and personnel responsible for minimizing the impacts of an aircraı accident or incident.

AIRFIELD: The porı on of an airport which contains the facilıı es necessary for the operaı on of aircraı .

AIRLINE HUB: An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.

AIRPLANE DESIGN GROUP (ADG): A grouping of aircraı based upon wingspan. The groups are as follows:

- Group I: Up to but not including 49 feet.
- Group II: 49 feet up to but not including 79 feet.
- Group III: 79 feet up to but not including 118 feet.
- Group IV: 118 feet up to but not including 171 feet.
- Group V: 171 feet up to but not including 214 feet.
- Group VI: 214 feet or greater.

AIRPORT AUTHORITY: A quasi-governmental public organizaı on responsible for seı ng the policies governing the management and operaı on of an airport or system of airports under its jurisdicı on.

AIRPORT BEACON: A navigaı onal aid located at an airport which displays a rotaı ng light beam to ideni fy whether an airport is lighted.

AIRPORT CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviaı on Administraı on to ideni fy, priorii ze, and distribute funds for airport development and the needs of the Naı onal Airspace System to meet specified naı onal goals and objecı ves.

AIRPORT ELEVATION: The highest point on the runway system at an airport expressed in feet above mean sea level (MSL).

AIRPORT IMPROVEMENT PROGRAM: A program authorized by the Airport and Airway Improvement Act of 1982 that provides funding for airport planning and development.

AIRPORT LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of exis. ng and proposed airport facilities.

AIRPORT LAYOUT PLAN (ALP): A scaled drawing of the existing and planned land and facilities necessary for the operation and development of the airport.

AIRPORT LAYOUT PLAN DRAWING SET: A set of technical drawings depicting the current and future airport conditions. The individual sheets comprising the set can vary with the complexities of the airport, but the FAA-required drawings include the Airport Layout Plan (sometimes referred to as the Airport Layout Drawing (ALD), the Airport Airspace Drawing, and the Inner Portion of the Approach Surface Drawing, On-Airport Land Use Drawing, and Property Map.

AIRPORT MASTER PLAN: The planner's concept of the long-term development of an airport.

AIRPORT MOVEMENT AREA SAFETY SYSTEM: A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.

AIRPORT OBSTRUCTION CHART: A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, buildings, roads and other detail in the vicinity of an airport.

AIRPORT REFERENCE CODE (ARC): A coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP): The latitude and longitude of the approximate center of the airport.

AIRPORT SPONSOR: The entity that is legally responsible for the management and operation of an airport, including the fulfillment of the requirements of laws and regulations related thereto.

AIRPORT SURFACE DETECTION EQUIPMENT: A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport.

AIRPORT SURVEILLANCE RADAR: The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling and other devices to provide safe and expeditious movement of terminal air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER: A facility which provides en route air traffic control service to aircraft operating on an IFR flight plan within controlled airspace over a large, multi-state region.

AIRSIDE: The portion of an airport that contains the facilities necessary for the operation of aircraft.

AIRSPACE: The volume of space above the surface of the ground that is provided for the operation of aircraft.

AIR TAXI: An air carrier certificated in accordance with FAR Part 121 and FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIR TRAFFIC CONTROL: A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight.

AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER: A facility operated by the FAA which is responsible for the central flow control, the central altitude reservation system, the airport reservation position system, and the air traffic service contingency command for the air traffic control system.

AIR TRAFFIC HUB: A categoriza. on of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.

AIR TRANSPORT ASSOCIATION OF AMERICA: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.

ALERT AREA: See special-use airspace.

ALTITUDE: The vertical distance measured in feet above mean sea level.

ANNUAL INSTRUMENT APPROACH (AIA): An approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS): An airport lighting facility which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

APPROACH MINIMUMS: The altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

APPROACH SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

APRON: A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION: The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS): The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS): A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

AUTOMATIC WEATHER OBSERVATION STATION (AWOS): Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dew point, etc.)

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AVIGATION EASEMENT: A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

AZIMUTH: Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

B

BASE LEG: A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See "traffic pattern."

BASED AIRCRAFT: The general aviation aircraft that use a specific airport as a home base.

BEARING: The horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE: A barrier used to divert or dissipate jet blast or propeller wash.

BLAST PAD: A prepared surface adjacent to the end of a runway for the purpose of elimina. ng the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on the airport.

C

CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute Airport Improvement Program funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

CARGO SERVICE AIRPORT: An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.

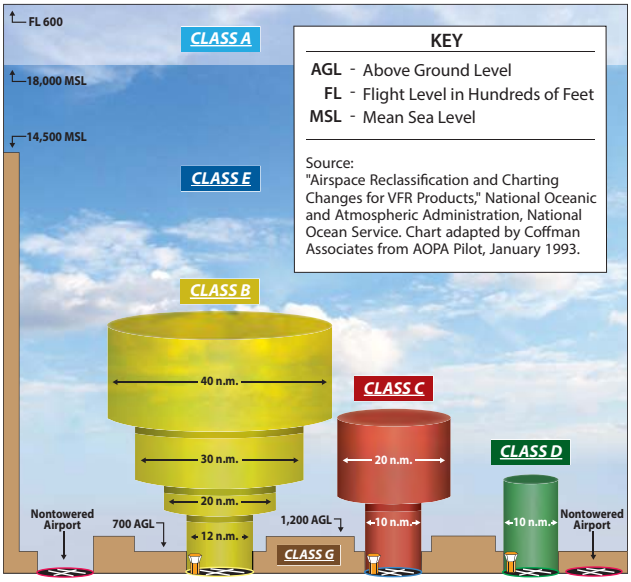
CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 200 feet above the horizontal plane containing the runway threshold.

CATEGORY II: An ILS that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 100 feet above the horizontal plane containing the runway threshold.

CATEGORY III: An ILS that provides acceptable guidance information to a pilot from the coverage limits of the ILS with no decision height specified above the horizontal plane containing the runway threshold.

CEILING: The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

CIRCLING APPROACH: A maneuver initiated by the pilot to align the aircraft with the runway for landing when flying a predetermined circling instrument approach under IFR.



CLASS A AIRSPACE: See Controlled Airspace.

CLASS B AIRSPACE: See Controlled Airspace.

CLASS C AIRSPACE: See Controlled Airspace.

CLASS D AIRSPACE: See Controlled Airspace.

CLASS E AIRSPACE: See Controlled Airspace.

CLASS G AIRSPACE: See Controlled Airspace.

CLEAR ZONE: See Runway Protection Zone.

COMMERCIAL SERVICE AIRPORT: A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.

COMMON TRAFFIC ADVISORY FREQUENCY: A radio frequency identified in the appropriate aeronautical chart which is designated for the purpose of transmitting airport advisory information and procedures while operating to or from an uncontrolled airport.

COMPASS LOCATOR (LOM): A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.

CONICAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that extends

from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONTROLLED AIRPORT: An airport that has an opera. ng airport traffic control tower.

CONTROLLED AIRSPACE: Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- **CLASS A**: Generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.

- **CLASS B**:
  Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.

- **CLASS C**: Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- **CLASS D**: Generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedure. Unless otherwise authorized, all persons must establish two-way radio communication.

- **CLASS E**: Generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

- **CLASS G**: Generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.

CONTROLLED FIRING AREA: See special-use airspace.

CROSSWIND: A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.

CROSSWIND COMPONENT: The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

CROSSWIND LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

D

DECIBEL: A unit of noise representing a level relative to a reference of a sound pressure 20 micro newtons per square meter.

DECISION HEIGHT/ DECISION ALTITUDE: The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.

DECLARED DISTANCES: The distances declared available for the airplane's takeoff runway, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

- **TAKEOFF RUNWAY AVAILABLE (TORA):** The runway length declared available and suitable for the ground run of an airplane taking off.

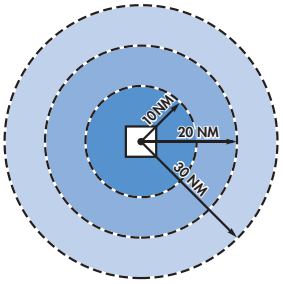
- **TAKEOFF DISTANCE AVAILABLE (TODA):** The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.
- **ACCELERATE-STOP DISTANCE AVAILABLE (ASDA):** The runway plus stopway length declared available for the accelera. on and deceleration of an aircraft aborting a takeoff.
- **LANDING DISTANCE AVAILABLE (LDA):** The runway length declared available and suitable for landing.

DEPARTMENT OF TRANSPORTATION: The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration, which was established to promote the coordination of federal transportation programs and to act as a focal point for research and development efforts in transportation.

DISCRETIONARY FUNDS: Federal grant funds that may be appropriated to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety, and security, or mitigating noise.

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.



DNL: The 24-hour average sound level, in Aweighted decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 p.m. and 7 a.m. as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG: A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see "traffic pattern."

E

EASEMENT: The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on, or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ELEVATION: The vertical distance measured in feet above mean sea level.

ENPLANED PASSENGERS: The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and nonscheduled services.

ENPLANEMENT: The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.

ENTITLEMENT: Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

ENVIRONMENTAL ASSESSMENT (EA): An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact statement.

ENVIRONMENTAL AUDIT: An assessment of the current status of a party's compliance with applicable environmental requirements of a party's environmental compliance policies, practices, and controls.

ENVIRONMENTAL IMPACT STATEMENT (EIS): A document required of federal agencies by the National Environmental Policy Act for major projects are legislative proposals affecting the environment. It is a tool for decision-making describing the positive and negative effects of a proposed action and citing alternative actions.

ESSENTIAL AIR SERVICE: A federal program which guarantees air carrier service to selected small cities by providing subsidies as needed to prevent these cities from such service.

F

FEDERAL AVIATION REGULATIONS: The general and permanent rules established by the execu. ve departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

FEDERAL INSPECTION SERVICES: The provision of customs and immigration services including passport inspection, inspection of baggage, the collection of duties on certain imported items, and the inspections for agricultural products, illegal drugs, or other restricted items.

FINAL APPROACH: A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See "traffic pattern."

FINAL APPROACH AND TAKEOFF AREA (FATO). A defined area over which the final phase of the helicopter approach to a hover, or a landing is completed and from which the takeoff is initiated.

FINAL APPROACH FIX: The designated point at which the final approach segment for an aircraft landing on a runway begins for a non-precision approach.

FINDING OF NO SIGNIFICANT IMPACT (FONSI): A public document prepared by a Federal agency that presents the rationale why a proposed action will not have a significant effect on the environment and for which an environmental impact statement will not be prepared.

FIXED BASE OPERATOR (FBO): A provider of services to users of an airport. Such services include, but are not limited to, hangaring, fueling, flight training, repair, and maintenance.

FLIGHT LEVEL: A measure of altitude used by aircraft flying above 18,000 feet. Flight levels are indicated by three digits representing the pressure altitude in hundreds of feet. An airplane flying at flight level 360 is flying at a pressure altitude of 36,000 feet. This is expressed as FL 360.

FLIGHT SERVICE STATION: An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facilities.

FRANGIBLE NAVAID: A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

G

GENERAL AVIATION: That portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GENERAL AVIATION AIRPORT: An airport that provides air service to only general aviation.

GLIDESLOPE (GS): Provides vertical guidance for aircraft during approach and landing. The glideslope consists of the following:

1. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or

2. Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM (GPS): A system of 48 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

GROUND ACCESS: The transportation system on and around the airport that provides access to and from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.

H

HELIPAD: A designated area for the takeoff, landing, and parking of helicopters.

HIGH INTENSITY RUNWAY LIGHTS: The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

HIGH-SPEED EXIT TAXIWAY: A long radius taxiway designed to expedite aircra. turning off the runway after landing (at speeds to 60 knots), thus reducing runway occupancy time.

HORIZONTAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

I

INITIAL APPROACH FIX: The designated point at which the initial approach segment begins for an instrument approach to a runway.

INSTRUMENT APPROACH PROCEDURE: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR): Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids:

1. Localizer.
2. Glide Slope.
3. Outer Marker.
4. Middle Marker.
5. Approach Lights.

INSTRUMENT METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS: Operations by aircraft that are not based at a specified airport.

K

KNOTS: A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

L

LANDSIDE: The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

LANDING DISTANCE AVAILABLE (LDA): See declared distances.

LARGE AIRPLANE: An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL AREA AUGMENTATION SYSTEM: A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy integrity, continuity, and availability.

LOCAL OPERATIONS: Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

LOCAL TRAFFIC: Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch and-go training operations.

LOCALIZER: The component of an ILS which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA): A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LONG RANGE NAVIGATION SYSTEM (LORAN): Long range navigation is an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for en route navigation.

LOW INTENSITY RUNWAY LIGHTS: The lowest classificaı on in terms of intensity or brightness for lights designated for use in delineaı ng the sides of a runway.

M

MEDIUM INTENSITY RUNWAY LIGHTS: The middle classificaı on in terms of intensity or brightness for lights designated for use in delineaı ng the sides of a runway.

MICROWAVE LANDING SYSTEM (MLS): An instrument approach and landing system that provides precision guidance in azimuth, elevaı on, and distance measurement.

MILITARY OPERATIONS: Aircraı operaı ons that are performed in military aircraı .

MILITARY OPERATIONS AREA (MOA): See special-use airspace

MILITARY TRAINING ROUTE: An air route depicted on aeronauı cal charts for the conduct of military flight training at speeds above 250 knots.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, aı er an instrument approach, a landing is not affected, and occurring normally:

1. When the aircraı has descended to the decision height and has not established visual contact; or

2. When directed by air traffic control to pull up or to go around again.

MOVEMENT AREA: The runways, taxiways, and other areas of an airport which are uı lized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraı , exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

N

NATIONAL AIRSPACE SYSTEM: The network of air traffic control facili. es, air traffic control areas, and navigational facilities through the U.S.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS: The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

NATIONAL TRANSPORTATION SAFETY BOARD: A federal government organization established to investigate and determine the probable cause of transportation accidents, to recommend equipment and procedures to enhance transportation safety, and to review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.

NAUTICAL MILE: A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

NAVAID: A term used to describe any electrical or visual air navigational aids, lights, signs, and associated supporting equipment (i.e. PAPI, VASI, ILS, etc.)

NAVIGATIONAL AID: A facility used as, available for use as, or designed for use as an aid to air navigation.

NOISE CONTOUR: A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NON-DIRECTIONAL BEACON (NDB): A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his or her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

NON-PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

NOTICE TO AIRMEN: A notice containing information concerning the establishment, condition, or change in any component of or hazard in the National Airspace System, the timely knowledge of which is considered essential to personnel concerned with flight operations.

O

OBJECT FREE AREA (OFA): An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircra. operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ): The airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

ONE-ENGINE INOPERABLE SURFACE: A surface emanating from the runway end at a slope ratio of 62.5:1. Air carrier airports are required to maintain a technical drawing of this surface depicting any object penetrations by January 1, 2010.

OPERATION: The take-off, landing, or touch-and-go procedure by an aircraft on a runway at an airport.

OUTER MARKER (OM): An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline, indicating to the pilot that he/she is passing over the facility and can begin final approach.

P

PILOT CONTROLLED LIGHTING: Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.

PRECISION APPROACH: A standard instrument approach procedure which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- **CATEGORY I (CAT I)**: A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.
- **CATEGORY II (CAT II)**: A precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.
- **CATEGORY III (CAT III)**: A precision approach which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI): A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a VASI but provides a sharper transition between the colored indicator lights.

PRECISION APPROACH RADAR: A radar facility in the terminal air traffic control system used to detect and display with a high degree of accuracy the direction, range, and elevation of an aircraft on the final approach to a runway.

PRECISION OBJECT FREE AREA (POFA): An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard which requires the POFA to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than 3/4 mile visibility.

PRIMARY AIRPORT: A commercial service airport that enplanes at least 10,000 annual passengers.

PRIMARY SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.

PROHIBITED AREA: See special-use airspace.

PVC: Poor visibility and ceiling. Used in determining Annual Service Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one mile.

R

RADIAL: A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.

REGRESSION ANALYSIS: A statistical technique that seeks to identify and quantify the relationships between factors associated with a forecast.

REMOTE COMMUNICATIONS OUTLET (RCO): An unstaffed transmitter receiver/facility remotely controlled by air traffic personnel. RCOs serve flight service stations (FSSs). RCOs were established to provide ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/ landing times.

REMOTE TRANSMITTER/RECEIVER (RTR): See remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT: An airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA: See special-use airspace.

RNAV: Area navigation - airborne equipment which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used en route and for approaches to an airport.

RUNWAY: A defined rectangular area on an airport prepared for aircraft landing and takeoff. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. For example, a runway with a magnetic heading of 180 would be designated Runway 18. The runway heading on the opposite end of the runway is 180 degrees from that runway end. For example, the opposite runway heading for Runway 18 would be Runway 36 (magnetic heading of 360). Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY ALIGNMENT INDICATOR LIGHT: A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunc. on with an approach lighting system.

RUNWAY DESIGN CODE: A code signifiying the design standards to which the runway is to be built.

RUNWAY END IDENTIFICATION LIGHTING (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT: The average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ): An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type and minima.

RUNWAY REFERENCE CODE: A code signifying the current operational capabilities of a runway and associated taxiway.

RUNWAY SAFETY AREA (RSA): A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

RUNWAY VISIBILITY ZONE (RVZ): An area on the airport to be kept clear of permanent objects so that there is an unobstructed line of- site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

RUNWAY VISUAL RANGE (RVR): An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

S

SCOPE: The document that identifies and defines the tasks, emphasis, and level of effort associated with a project or study.

SEGMENTED CIRCLE: A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER: An area adjacent to the edge of paved runways, taxiways, or aprons providing a transi. on between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE: The straight line distance between an aircraft and a point on the ground.

SMALL AIRCRAFT: An aircraft that has a maximum certified takeoff weight of up to 12,500 pounds.

SPECIAL-USE AIRSPACE: Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- **ALERT AREA**: Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.
- **CONTROLLED FIRING AREA**: Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.
- **MILITARY OPERATIONS AREA (MOA)**: Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.
- **PROHIBITED AREA**: Designated airspace within which the flight of aircraft is prohibited.
- **RESTRICTED AREA**: Airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.
- **WARNING AREA:** Airspace which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD INSTRUMENT DEPARTURE PROCEDURES: A published standard flight procedure to be utilized following takeoff to provide a transition between the airport and the terminal area or en route airspace.

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO: A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

STOPWAY: An area beyond the end of a takeoff runway that is designed to support an aircraft during an aborted takeoff without causing structural damage to the aircraft. It is not to be used for takeoff, landing, or taxiing by aircraft.

STRAIGHT-IN LANDING/APPROACH: A landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

T

TACTICAL AIR NAVIGATION (TACAN): An ultrahigh frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF RUNWAY AVAILABLE (TORA):
See declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA):
See declared distances.

TAXILANE: The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY: A defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY DESIGN GROUP: A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance.

TAXIWAY SAFETY AREA (TSA): A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TERMINAL INSTRUMENT PROCEDURES: Published flight procedures for conducting instrument approaches to runways under instrument meteorological conditions.

TERMINAL RADAR APPROACH CONTROL: An element of the air traffic control system responsible for monitoring the en-route and terminal segment of air traffic in the airspace surrounding airports with moderate to high levels of air traffic.

TETRAHEDRON: A device used as a landing direction indicator. The small end of the tetrahedron points in the direction of landing.

THRESHOLD: The beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

TOUCH-AND-GO: An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and go is recorded as two operations: one operation for the landing and one operation for the takeoff.

TOUCHDOWN: The point at which a landing aircraft makes contact with the runway surface.

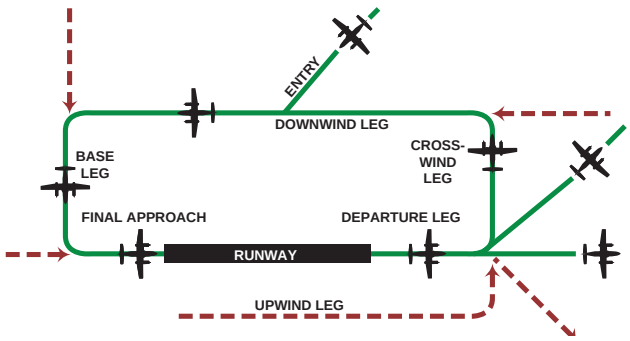
TOUCHDOWN AND LIFT-OFF AREA (TLOF): A load bearing, generally paved area, normally centered in the FATO, on which the helicopter lands or takes off.

TOUCHDOWN ZONE (TDZ): The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE): The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING: Two rows of transverse light bars located symmetrically about the runway centerline normally at 100- foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraı landing at or taking off from an airport. The components of a typical traffic paı ern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.



U

UNCONTROLLED AIRPORT: An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

UNCONTROLLED AIRSPACE: Airspace within which aircra. are not subject to air traffic control.

UNIVERSAL COMMUNICATION (UNICOM):
A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.

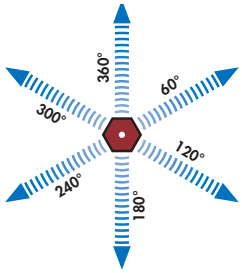
UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."

V

VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE (VOR): A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature.

VERY HIGH FREQUENCY OMNI-DIRECTIONAL RANGE/ TACTICAL AIR NAVIGATION (VORTAC): A naviga. on aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.



VICTOR AIRWAY: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/ white, above path if white/white, and below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

VISUAL METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

VOR: See "Very High Frequency Omnidirectional Range Station."

VORTAC: See "Very High Frequency Omnidirectional Range Station/Tactical Air Navigation."

W

WARNING AREA: See special-use airspace.

WIDE AREA AUGMENTATION SYSTEM: An enhancement of the Global Positioning System that includes integrity broadcasts, differential corrections, and additional ranging signals for the purpose of providing the accuracy, integrity, availability, and continuity required to support all phases of flight.

Abbreviations

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

AIR-21: Wendell H. Ford Aviation Investment and Reform Act for the 21st Century

ALS: approach lighting system

ALSF-1: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT I configuration)

ALSF-2: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT II configuration)

AOA: Aircraft Operation Area

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircra. rescue and fire fighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

AVGAS: aviation gasoline - typically 100 low lead (100LL)

AWOS: automatic weather observation station

BRL: building restriction line

CFR: Code of Federal Regulation

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity of aircraft with dual-wheel type landing gear

DTWL: runway weight bearing capacity of aircraft with dual-tandem type landing gear

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at middle marker

LOM: compass locator at outer marker

LORAN: long range navigation

MALS: medium intensity approach lighting system with indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MSL: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

NM: nautical mile (6,076.1 feet)

NPES: National Pollutant Discharge Elimination System

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rule making

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory commi. ee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

PVC: poor visibility and ceiling

RCO: remote communications outlet

RRC: Runway Reference Code

RDC: Runway Design Code

REIL: runway end identification lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: runway safety area

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with runway alignment indicator lights

STAR: standard terminal arrival route

SWL: runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN: tactical air navigational aid

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TDG: Taxiway Design Group

TLOF: Touchdown and lift-off

TDZ: touchdown zone

TDZE: touchdown zone elevation

TODA: takeoff distance available

TORA: takeoff runway available

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omni-directional range

VORTAC: VOR and TACAN collocated



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Appendix B

FAA FORECAST APPROVAL LETTER






U.S. Department
of Transportation
Federal Aviation Administration

Western-Pacific Region
Office of Airports
Phoenix Airports District Office

3800 N Central Ave
Suite 1025
Phoenix, AZ 85012

October 31, 2019

Kyle Christiansen
City of Page
Airport Director
Page Municipal Airport
P.O. Box 1180
Page, AZ 86040

Dear Mr. Christiansen:

Page Municipal Airport (PGA), Page, Arizona
Aviation Activity Forecast Approval

The Federal Aviation Administration (FAA) has reviewed the aviation forecast for the Page Municipal Airport Master Plan update dated July 19, 2019. The FAA approves this forecast and the use of C-II as the existing critical design aircraft, and D-III as the future critical design aircraft for airport planning purposes on runway 15-33, and the use of B-I as the existing and future critical design aircraft for the secondary runway; 7-25. These existing and future design aircraft are approved for airport planning purposes, including Airport Layout Plan (ALP) development.

In summary, the FAA TAF and the Page Municipal Airport forecast update regarding total operations exceeds the 10 percent and 15 percent allowance for five and 10-year planning horizons. The airport forecast update appropriately explains these tolerances due to the most current conditions at the airport and the available data when the forecasts were developed which include an estimated 2.58% compound annual growth rate in passenger enplanements due to the introduction of scheduled regional jet service by Contour Airlines. It was also justified due to the following: the increase in the actual based aircraft (68 based planes vs. TAF's estimated 54 planes), increased aircraft operations, an increase in tourism operations, and future airport development. While the 5 and 10 year forecasts do exceed benchmarks established in the FAA's Guidance on Review & Approval of Local Aviation Forecasts published in 2008, this forecast was reviewed by the Western Pacific Regional District Office of Airports (Richard Dykas - AWP 610.3), and it was determined that the forecast does not need to be sent to FAA Headquarters for review because the future growth has been adequately justified.

The forecast was developed using current data, appropriate methodologies, and therefore is approved for planning purposes at the Page Municipal Airport. It is important to note that

the approval of this forecast does not guarantee funding for large-scale capital improvements as future projects will need to be justified by current activity levels at the time the projects are proposed for implementation. If you have any questions about this forecast approval, please call me at 602-792-1072.

Sincerely,

Jared M. Raymond
Phoenix ADO,
Community Planner

Cc: FAA Grant File
Kyle Christiansen, Airport Director - City of Page
Matt Quick, Associate - Coffman Associates



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Appendix C

AIRPORT LAYOUT PLANS






AIRPORT LAYOUT PLANS

APPENDIX C

As part of this master plan, the Federal Aviation Administration (FAA) requires the development of Airport Layout Plan (ALP) drawings detailing specific parts of Page Municipal Airport and its environs. The ALP drawings are created on a computer-aided drafting (CAD) system and serve as the official depiction of the current and planned condition at the airport. The ALP drawings are delivered to the FAA and Arizona Department of Transportation – Aeronautics Group (ADOT) for their review. These entities critique the drawings from a technical perspective to be sure all applicable federal regulations are met. Ultimately, the FAA will approve the ALP drawing set. The ALP will then be used as the basis for justification for funding decisions.

It should be noted that the FAA requires any changes to the airfield (i.e., runway and taxiway system, navigational aids, etc.) to be presented on the ALP. The landside configuration developed during the master planning process is also depicted on the ALP, but the FAA recognizes that landside development is much more fluid and dependent on developer needs. Thus, an updated ALP set is typically not necessary for future landside development.

The five primary functions of the ALP that define its purpose are provided in Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, as follows:

1) An approved plan is necessary for the airport to receive financial assistance under the terms of the *Airport and Airway Improvement Act of 1982* (AIP), as amended, and to be able to receive specific Passenger Facility Charge funding. An airport must keep its ALP current and follow that plan, since those are grant assurance requirements of the AIP and previous airport development programs, including the 1970 Airport Development Aid Program (ADAP) and Federal Aid Airports Program (FAAP) of 1946, as amended. While ALPs are not required for airports other than those developed with assistance under the aforementioned federal programs, the same guidance can be applied to all airports.

2) An ALP creates a blueprint for airport development by depicting proposed facility improvements. The ALP provides a guideline by which the airport sponsor can ensure that development maintains airport design standards and safety requirements and is consistent with airport and community land use plans.

3) The ALP is a public document that serves as a record of aeronautical requirements, both present and future, and as a reference for community deliberations on land use proposals and budget resource planning.

4) The approved ALP enables the airport sponsor and the FAA to plan for facility improvements at the airport. It also allows the FAA to anticipate budgetary and procedural needs. The approved ALP will also allow the FAA to protect the airspace required for facility or approach procedure improvements.

5) The ALP can be a working tool for the airport sponsor, including its development and maintenance staff.

AIRPORT LAYOUT PLAN SET

The ALP set includes several technical drawings which depict various aspects of the current and future layout of the airport. The following is a description of the ALP drawings included with this Master Plan.

AIRPORT DATA SHEET

The Airport Data Sheet provides existing and ultimate conditions for the airport as they relate to the runways, taxiways, navigational aids, and wind data tabulations.

AIRPORT LAYOUT PLAN DRAWING

An official ALP Drawing has been developed for Page Municipal Airport. The ALP Drawing graphically presents the existing and ultimate airport layout. The ALP Drawing includes such elements as the physical airport features, location of airfield facilities (i.e., runways, taxiways, navigational aids), and existing aviation development. Also presented on the ALP Drawing are the runway safety areas, airport property boundary, and revenue support areas.

The computerized plan provides detailed information on existing and future facility layouts on multiple layers that permit the user to focus on any section of the airport at a desired scale. The plan can be used as base information for design and can be easily updated in the future to reflect new development and more detail concerning existing conditions as made available through design

surveys. The ALP Drawing is used by the FAA to determine funding eligibility for future capital projects.

TERMINAL AREA DRAWING

The Terminal Area Drawing is a larger scale plan view drawing of existing and planned aprons, buildings, hangars, parking lots, and other landside facilities.

AIRPORT AIRSPACE DRAWING

Title 14 Code of Federal Regulations (CFR) Part 77, *Objects Affecting Navigable Airspace*, was established for use by local authorities to control the height of objects near airports. The Part 77 Airspace Drawing is a graphic depiction of this regulatory criterion. The Airspace Drawing is a tool to aid local authorities in determining if proposed development could present a hazard to aircraft using the airport. It can be a critical tool for the airport sponsor's use in reviewing proposed development in the vicinity of the airport and for establishing locally enforceable height and hazard zoning regulations.

The Airspace Drawing assigns three-dimensional imaginary surfaces associated with the airport. These imaginary surfaces emanate from the runway centerline(s) and are dimensioned according to the visibility minimums associated with the approach to the runway end and size of aircraft to operate on the runway. The Part 77 imaginary surfaces include the primary surface, horizontal surface, approach surface, transitional surface, and conical surface.

Penetrations to the Part 77 surfaces are considered obstructions to the airport airspace. Further analysis by the FAA, through an aeronautical survey, is necessary to determine if any obstructions are hazards to air navigation. It should be noted that the Part 77 drawings are based on ultimate planning recommendations and not necessarily existing conditions.

APPROACH SURFACE PROFILE DRAWINGS

The Approach Surface Profile Drawings present the entirety of the Part 77 approach surface to the end of each runway. It also depicts the runway centerline profile with elevations. This drawing provides profile details that the Airspace Drawings do not.

The Approach Surface Profile Drawings include identified penetrations to the approach surface. Penetrations to the approach surface are considered obstructions. The FAA will determine if any obstructions are also hazards which require mitigation. The FAA utilizes other design criteria such as the threshold siting surface (TSS) and various surfaces defined in FAA Order 8260.3B, *Terminal Instrument Procedures* (TERPS), to determine if an obstruction is a hazard.

If an obstruction is a hazard, the FAA can take many steps to protect air navigation. The mitigation options range from the airport owner removing the hazard to installing obstruction lighting, to the FAA adjusting the instrument approach minimums.

The drawing set includes the following approach surface drawings:

- Approach profile drawings for each runway end
- Inner portion of the approach surface drawings for each runway end

LAND USE DRAWING

The objective of the Land Use Drawing is to coordinate uses of the airport property in a manner compatible with the functional design of the airport facility. Airport land use planning is important for orderly development and efficient use of available space. There are two primary considerations for airport land use planning. These are to secure those areas essential to the safe and efficient operation of the airport and to determine compatible land uses for the balance of the property which would be most advantageous to the airport and community. In essence, this drawing depicts the suggested highest and best potential uses for airport property.

The Land Use Drawing presents generalized proposed uses of property for the future. The on-airport land uses on this drawing become the official FAA acceptance of current and future land uses. The map also depicts the existing and ultimate noise exposure limits.

EXHIBIT "A" AIRPORT PROPERTY MAP

The Airport Property Map provides information on property under airport control and is, therefore, subject to FAA grant assurances. The various recorded deeds that make up the airport property are listed in tabular format. The primary purpose of the drawing is to provide information for analyzing the current and future aeronautical use of land acquired with federal funds.

DEPARTURE SURFACE DRAWING

The Departure Surface Drawing provides detailed analysis of the existing and ultimate departure surface for each corresponding runway end. A composite profile of the extended ground line is depicted. Obstructions are shown where appropriate.

DRAFT ALP DISCLAIMER

The preparation of the ALP set has been supported, in part, through financial assistance from the FAA through the Airport Improvement Program (AIP). The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of the Master Plan does not in any way constitute a commitment on the part of the FAA to participate in any development depicted on the ALP drawings, nor does it indicate that the proposed development is environmentally acceptable or would have justification in accordance with appropriate public laws.

The ALP drawing set has been developed in accordance with accepted FAA standards. The ALP set has not been approved at the time of this printing and is subject to FAA airspace reviews. Land use and other changes may result.

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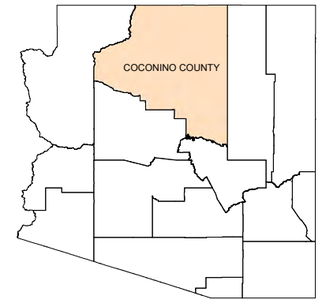
AIRPORT LAYOUT PLANS
for
PAGE MUNICIPAL AIRPORT
Prepared For
City of Page, Arizona

LOCATION/VICINITY MAP



COUNTY MAP



INDEX OF DRAWINGS

1. TITLE SHEET
2. AIRPORT DATA SHEET
3. EXISTING/SHORT-TERM AIRPORT LAYOUT PLAN DRAWING
4. ULTIMATE AIRPORT LAYOUT PLAN DRAWING
5. AIRPORT AIRSPACE DRAWING
6. EXISTING APPROACH SURFACE PROFILES
7. ULTIMATE RUNWAY 15-33 APPROACH SURFACE PROFILE
8. INNER PORTION OF RUNWAY 15-33 APPROACH SURFACE DRAWING
9. INNER PORTION OF RUNWAY 7-25 APPROACH SURFACE DRAWING
10. INNER PORTION OF ULTIMATE RUNWAY 15-33 APPROACH SURFACE DRAWING
11. EXISTING RUNWAY 15-33 DEPARTURE SURFACE DRAWING
12. ULTIMATE RUNWAY 15-33 DEPARTURE SURFACE DRAWING
13. TERMINAL AREA DRAWING
14. LAND USE DRAWING
15. EXHIBIT "A" AIRPORT PROPERTY INVENTORY MAP

FOR APPROVAL BY:

Page, Arizona

APPROVED BY: _____ ON THE DATE OF: _____

Kyle Christiansen
Public Works Director

NO.	REVISIONS	DATE	BY	APP'D.
4	ALP UPDATE	09/16/20	COFFMAN	-
3	ALP UPDATE	03/05/09	COFFMAN	FAA
2	ALP UPDATE	03/01/01	RC	AM
1	MASTER PLAN AND ALP UPDATE	05/31/00	AM	WR

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

PAGE MUNICIPAL AIRPORT

TITLE SHEET ~~DRAFT~~

Page, Arizona

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020 | SHEET 1 OF 15

Coffman Associates
Airport Consultants
www.coffmanassociates.com

Coffman Associates C:\Users\jjohnson\Coffman Associates Inc\Coffman - ap_CAD\AIP\PGA_20\ALP\01_PGA_Title.dwg Printed Date: 9-15-20 10:46:29 AM jjohnson

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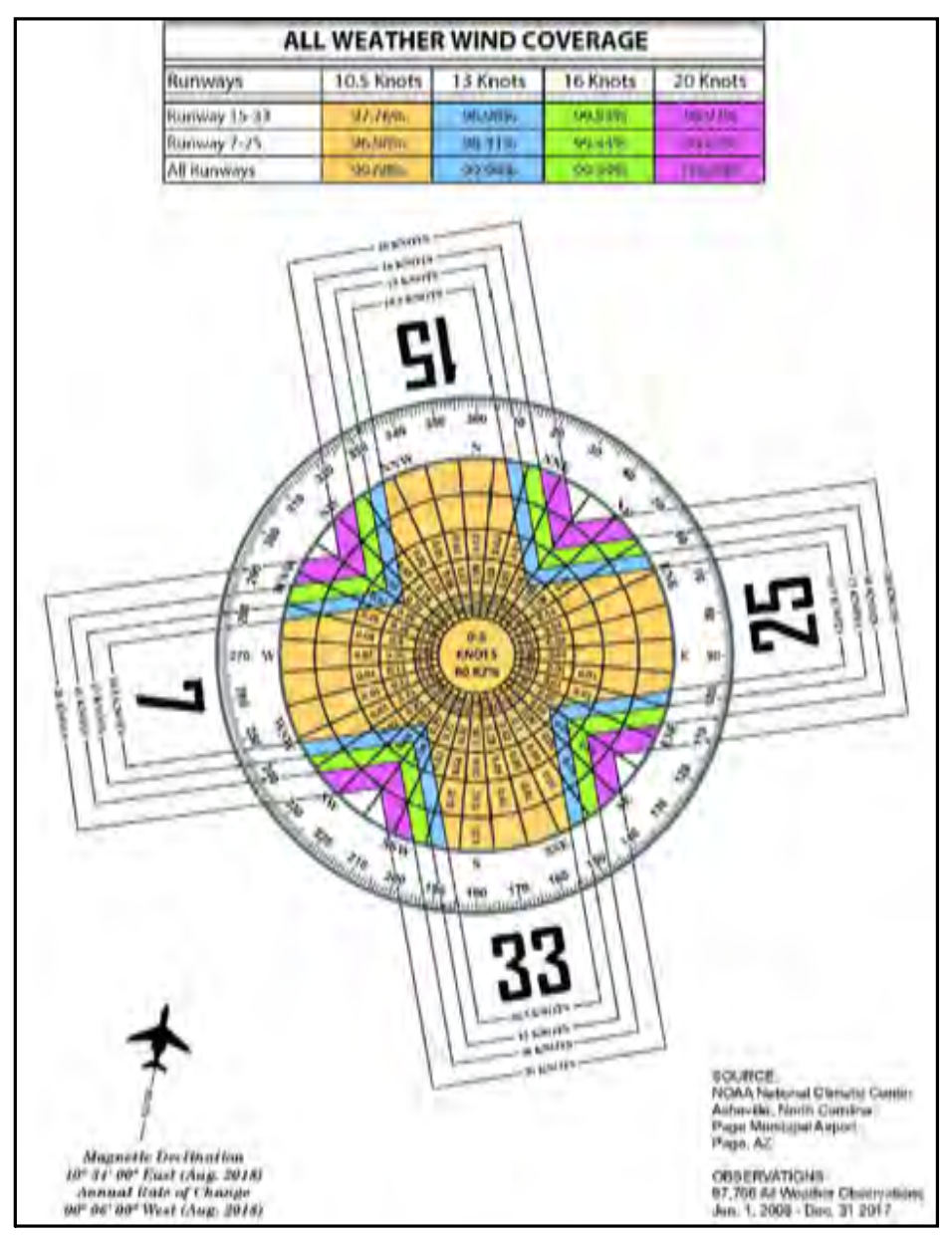
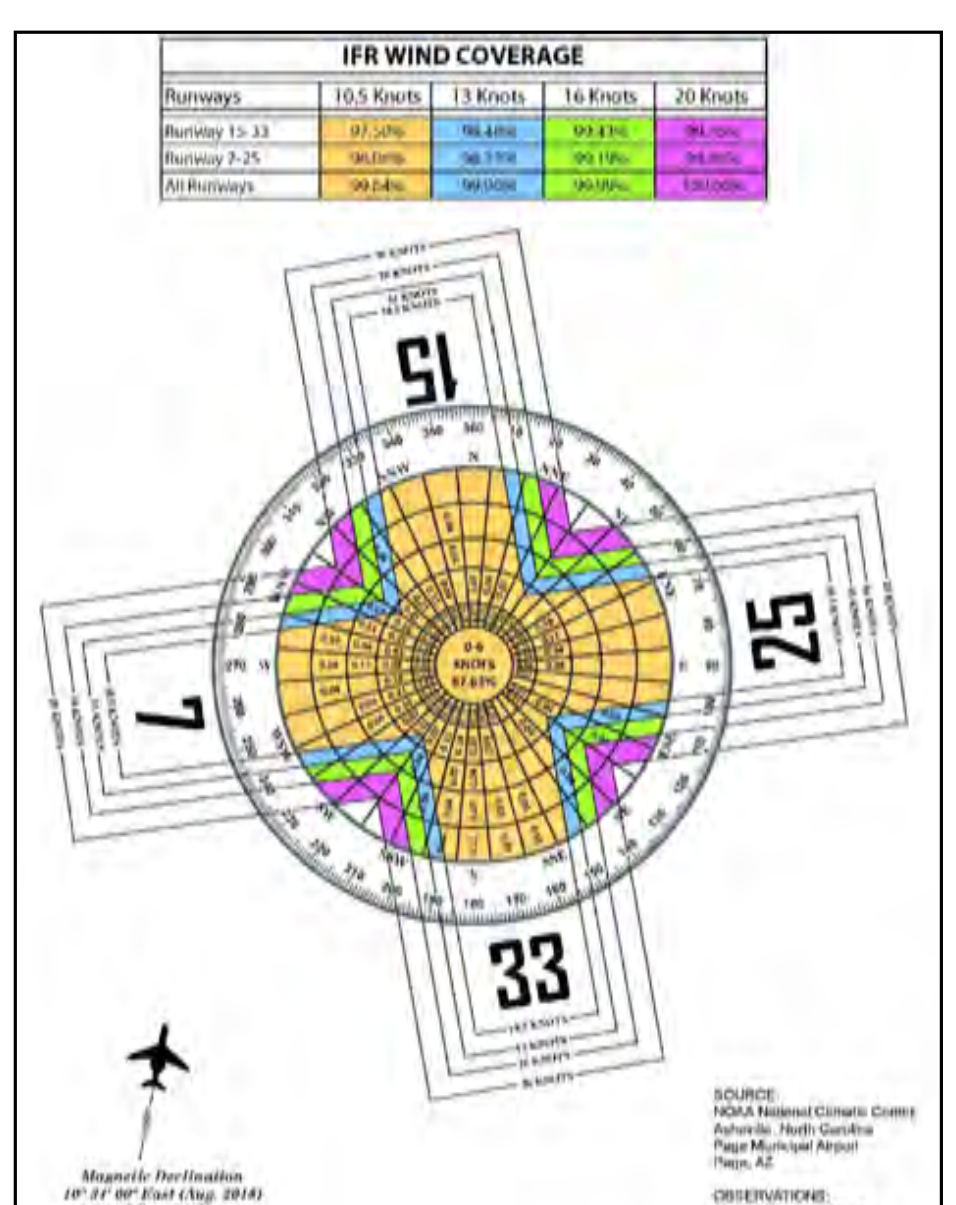
AIRPORT DATA		
OWNER: City of Page, AZ	CITY: Page, AZ	COUNTY: Coconino, AZ
PAGE MUNICIPAL AIRPORT (PGA)	EXISTING	ULTIMATE
AIRPORT REFERENCE CODE (ARC)	C-II	D-III
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH	95.7° F (July)	SAME
AIRPORT ELEVATION (NAVD 88)	4,316.7' MSL	4,317.0' MSL
AIRPORT NAVIGATIONAL AIDS	RNAV (GPS) Rwy 15-33	SAME
	VOR-B	SAME
	REILs Rwy 15-33	SAME
	VASI-4 Rwy 15-33	PAPI-4 Rwy 15-33
AIRPORT REFERENCE POINT (ARP)	Latitude 36° 55' 33.85" N	36° 55' 29.39" N
COORDINATES (NAD 83)	Longitude 111° 26' 54.06" W	111° 26' 50.90" W
MISCELLANEOUS FACILITIES	MIRL, MITL	SAME
	ASOS	SAME
	Airport Beacon	SAME
	Segmented Circle/Lighted Windcone	SAME
CRITICAL DESIGN AIRCRAFT	C-II-2	D-III-2
CRITICAL DESIGN AIRCRAFT TYPE	ERJ-135	Gulfstream G650
WINGSPAN OF DESIGN AIRCRAFT (FEET)	65.75'	99.6'
APPROACH SPEED OF DESIGN AIRCRAFT (KNOTS)	124 knots	145 knots
UNDERCARRIAGE WIDTH OF DESIGN AIRCRAFT (MGW)	15.72'	16'
MAGNETIC DECLINATION	10° 26' E, changing by 0° 6' W per year	SAME
MAGNETIC DECLINATION SOURCE	NOAA (8/11/2020)	SAME
NPIAS CODE	Nonhub Primary CS	SAME
STATE SYSTEM PLAN ROLE	Commercial Service- National	SAME

TAXIWAY DATA TABLE

Taxiway Designation	Taxiway Width	TDG	Taxiway Existing/Ultimate Safety Area Dimension	Taxiway Existing/Ultimate Object Free Area Dimension	Taxiway Existing/Ultimate CL to Fixed or Moveable Object	Taxiway Existing /Ultimate Separation	Taxiway Lighting	Notes
A	40'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	
A1	40'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	
A2	40'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	TO BE REMOVED
A3	75'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	TO BE REMOVED
A4	75'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	TO BE REMOVED
A5	40'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	
B	25'	1	49'	89'	79'	70'	REFLECTORS	
C	25'	1	49'	89'	79'	70'	REFLECTORS	
SHORT-TERM								
A2	35'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	SHORT-TERM
A3	35'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	SHORT-TERM
ULTIMATE								
A	35'	2	79'/118'	131'/186'	65.5'/93'	152'	MITL	ULTIMATE
A1	35'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	ULTIMATE
A2	35'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	ULTIMATE
A3	35'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	ULTIMATE
A4	35'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	ULTIMATE
A5	35'	2	79'/118'	131'/186'	65.5'/93'	105'/152'	MITL	ULTIMATE





RUNWAY DATA		RUNWAY 15-33						RUNWAY 7-25			
		EXISTING		SHORT TERM		ULTIMATE		EXISTING / SHORT TERM		ULTIMATE	
RUNWAY IDENTIFICATION		RUNWAY 15	RUNWAY 33	RUNWAY 15	RUNWAY 33	RUNWAY 15	RUNWAY 33	RUNWAY 7	RUNWAY 25	RUNWAY 7	RUNWAY 25
RUNWAY DESIGN CODE (RDC)		C-II-5000		C-II-5000		D-III-4000		B-I-VIS (Small Aircraft)		TO BE CLOSED	
APPROACH REFERENCE CODE (APRC)		B/III/5000, D/II/5000		SAME		D/IV/4000, D/V/4000		B/I(S)/VIS		TO BE CLOSED	
DEPARTURE REFERENCE CODE (DPRC)		B/III, D/II		SAME		D/IV, D/V		B/I(S)		TO BE CLOSED	
RUNWAY SURFACE MATERIAL		Asphalt		SAME		SAME		Asphalt		TO BE CLOSED	
RUNWAY PAVEMENT STRENGTH WHEEL (IN THOUSAND LBS. #1)		65 (S), 90 (D), 190 (2D)		SAME		SAME		12.5 (S)		TO BE CLOSED	
RUNWAY PAVEMENT STRENGTH PCN		15/F/C/W/T		SAME		SAME		2/F/D/Y/T		TO BE CLOSED	
RUNWAY PAVEMENT SURFACE TREATMENT		NONE		SAME		SAME		NONE		TO BE CLOSED	
RUNWAY EFFECTIVE GRADIENT (in percent)		1.2%		SAME		1.2%		0.35%		TO BE CLOSED	
RUNWAY WIND COVERAGE (16 KNOTS)		99.83%		SAME		SAME		98.31 (13 Knots)		TO BE CLOSED	
RUNWAY DIMENSIONS (L X W)		5,950' x 150'		SAME		7,200' x 100'		2,201' x 75'		TO BE CLOSED	
RUNWAY DISPLACED THRESHOLD (Actual Length)		NONE	NONE	NONE	150'	N/A	N/A	588.1'	NONE	TO BE CLOSED	TO BE CLOSED
RUNWAY DISPLACED THRESHOLD ELEVATION		NONE	NONE	NONE	4,315.5' MSL	N/A	N/A	4,246.3' MSL	NONE	TO BE CLOSED	TO BE CLOSED
RUNWAY DISPLACED THRESHOLD COORDINATES (NAD 83)	LAT	NONE	NONE	NONE	36° 55' 1.71" N	N/A	N/A	36° 55' 45.78" N	NONE	TO BE CLOSED	TO BE CLOSED
	LONG	NONE	NONE	NONE	111° 26' 46.15" W	N/A	N/A	111° 27' 5.51" W	NONE	TO BE CLOSED	TO BE CLOSED
RUNWAY SAFETY AREA (Standard Beyond Runway End)		1,000' x 500'	1,000' x 500'	SAME	SAME	1,000' x 500' (with EMAS)	1,000' x 500' (with EMAS)	240' x 120'	240' x 120'	TO BE CLOSED	TO BE CLOSED
RUNWAY SAFETY AREA (EMAS)		NONE	NONE	NONE	NONE	300' EMAS	300' EMAS	NONE	NONE	TO BE CLOSED	TO BE CLOSED
RUNWAY SAFETY AREA (Actual L x W)		7,950' x 500'		SAME		9,200' x 500'		2,681' x 120'		TO BE CLOSED	
RUNWAY END COORDINATES (NAD 83)	LAT	36° 55' 58.15" N	36° 55' 0.21" N	SAME	SAME	36° 56' 4.46" N	36° 54' 54.32" N	36° 55' 44.98" N	36° 55' 47.98" N	TO BE CLOSED	TO BE CLOSED
	LONG	111° 26' 58.43" W	111° 26' 45.85" W	SAME	SAME	111° 26' 58.51" W	111° 26' 43.30" W	111° 27' 12.68" W	111° 26' 45.84" W	TO BE CLOSED	TO BE CLOSED
RUNWAY END ELEVATION		4,245.3' MSL	4,316.7' MSL	SAME	SAME	4,230.0' MSL	4,316.7' MSL	4,243.1' MSL	4,250.7' MSL	TO BE CLOSED	TO BE CLOSED
RUNWAY LIGHTING		MIRL		SAME		SAME		MIRL		TO BE CLOSED	
RUNWAY PROTECTION ZONE DIMENSIONS		500' x 1,700' x 1,010'	500' x 1,700' x 1,010'	500' x 1,700' x 1,010'	500' x 1,700' x 1,010'	1,000' x 1,700' x 1,510'	1,000' x 1,700' x 1,510'	250' x 1,000' x 450'	250' x 1,000' x 450'	TO BE CLOSED	TO BE CLOSED
RUNWAY MARKING		Nonprecision	Nonprecision	Nonprecision	Nonprecision	Nonprecision	Nonprecision	BASIC / VISUAL	BASIC / VISUAL	TO BE CLOSED	TO BE CLOSED
14 CFR PART 77 APPROACH SLOPE		34:1	34:1	34:1	34:1	34:1	34:1	20:1	20:1	TO BE CLOSED	TO BE CLOSED
14 CFR PART 77 APPROACH CATEGORY/TYPE		NP-C	NP-C	NP-C	NP-C	NP-C	NP-C	VISUAL	VISUAL	TO BE CLOSED	TO BE CLOSED
VISIBILITY MINIMUMS		1 mile	1 mile	1 mile	1 mile	Greater than 3/4 mile	Greater than 3/4 mile	VISUAL	VISUAL	TO BE CLOSED	TO BE CLOSED
TYPE OF AERONAUTICAL SURVEY REQUIRED FOR APPROACH		VGS	VGS	VGS	VGS	VGS	VGS	NVGS	NVGS	TO BE CLOSED	TO BE CLOSED
DEPARTURE SURFACE (YES/NO)		YES	YES	YES	YES	YES	YES	NO	NO	TO BE CLOSED	TO BE CLOSED
RUNWAY OBJECT FREE AREA (Standard Beyond Runway End)		1,000' x 800'	1,000' x 800'	SAME	SAME	1,000' x 800' (with EMAS)	1,000' x 800' (with EMAS)	240' x 250'	240' x 250'	TO BE CLOSED	TO BE CLOSED
RUNWAY OBJECT FREE AREA (Actual L x W)		7,950' x 800'		SAME		9,200' x 800'		2,681' x 250'		TO BE CLOSED	
RUNWAY OBSTACLE FREE ZONE (Standard Beyond Runway End)		200' x 400'	200' x 400'	SAME	SAME	200' x 400'	200' x 400'	200' x 250'	200' x 250'	TO BE CLOSED	TO BE CLOSED
RUNWAY OBSTACLE FREE ZONE (Actual L x W)		6,350' x 400'		6,350' x 400'		7,600' x 400'		2,601' x 250'		TO BE CLOSED	
RUNWAY OBSTACLE CLEARANCE SURFACE (EB 99, updated 2018)		Runway Type 4	Runway Type 4	SAME	SAME	SAME	SAME	Runway Type 2	Runway Type 2	TO BE CLOSED	TO BE CLOSED
INSTRUMENT APPROACH PROCEDURES		RNAV (GPS) LPV	RNAV (GPS) LPV	SAME	SAME	SAME	SAME	NONE	NONE	TO BE CLOSED	TO BE CLOSED
		VOR-B	VOR-B	SAME	SAME	SAME	SAME	NONE	NONE	TO BE CLOSED	TO BE CLOSED
INSTRUMENT APPROACH PROCEDURES		VASI-4	VASI-4	SAME	SAME	PAPI-4	PAPI-4	NONE	NONE	TO BE CLOSED	TO BE CLOSED
		REIL	REIL	SAME	SAME	SAME	SAME	NONE	NONE	TO BE CLOSED	TO BE CLOSED
TOUCHDOWN ZONE ELEVATION (TDZE)		4,264.5' MSL	4,316.7' MSL	SAME	SAME	4,256.0' MSL	4,317.0' MSL	4,251.9' MSL	4,251.9' MSL	TO BE CLOSED	TO BE CLOSED
TAXIWAY WIDTH		40'-75' (TDG 2)		SAME		SAME		25' (TDG 1)		TO BE CLOSED	
TAXIWAY AND TAXILANE SAFETY AREA DIMENSIONS		79'		SAME		SAME		49'		TO BE CLOSED	
TAXIWAY AND TAXILANE OBJECT FREE AREA WIDTH		131' / 115'		SAME		SAME		89' / 79'		TO BE CLOSED	
TAXIWAY CENTERLINE TO FIXED OR MOVABLE OBJECT		65.5' / 39.5'		SAME		SAME		44.5' / 39.5'		TO BE CLOSED	
TAXIWAY LIGHTING		MITL		SAME		SAME		Elevated Edge Reflectors		TO BE CLOSED	
TAXIWAY HOLDING MARKING/HOLD SIGN		200' (250' Standard)		SAME		293'		125'		TO BE CLOSED	
TAXIWAY EDGE SAFETY MARGIN		7.5'		SAME		SAME		5'		TO BE CLOSED	
VERTICAL DATUM		NAVD 88		SAME		SAME		NAVD 88		TO BE CLOSED	
HORIZONTAL DATUM		NAD 83		SAME		SAME		NAD 83		TO BE CLOSED	

1 PAVEMENT STRENGTHS ARE EXPRESSED IN SINGLE (S), DUAL (D), DUAL TANDEM (2D) WHEEL LOAD CAPACITIES

DECLARED DISTANCES	EXISTING		SHORT TERM		ULTIMATE		EXISTING		SHORT TERM		ULTIMATE	
RUNWAY	15	33	15	33	15	33	7	25	7	25	7	25
TAKE OFF RUN AVAILABLE (TORA)	5,950'	5,950'	5,950'	5,950'	7,200'	7,200'	2,201'	2,201'	2,201'	2,201'	TO BE CLOSED	
TAKEOFF DISTANCE AVAILABLE (TODA)	5,950'	5,950'	5,950'	5,950'	7,200'	7,200'	2,201'	2,201'	2,201'	2,201'	TO BE CLOSED	
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	5,950'	5,950'	5,400'	5,550'	7,200'	7,200'	2,201'	2,201'	2,201'	2,201'	TO BE CLOSED	
LANDING DISTANCE AVAILABLE (LDA)	5,950'	5,950'	5,400'	5,400'	7,200'	7,200'	1,613'	2,201'	1,613'	2,201'	TO BE CLOSED	

MODIFICATIONS TO STANDARDS APPROVAL TABLE			
APPROVAL DATE	AIRSPACE CASE NUMBER	STANDARD MODIFIED	DESCRIPTION
NONE			

AIRPORT NAVAID (Owned by FAA)
VASI-4 ( ) Yes/No
TVOR ( ) Yes/No
ASOS ( ) Yes/No
REIL ( ) Yes/No
AIRPORT BEACON ( ) Yes/No

NO.	REVISIONS	DATE	BY	APP'D.
4	ALP UPDATE	09/16/20	COFFMAN	-
3	ALP UPDATE	03/05/09	COFFMAN	FAA
2	ALP UPDATE	03/01/01	RC	AM
1	MASTER PLAN AND ALP UPDATE	05/31/00	AM	WR

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PAGE MUNICIPAL AIRPORT

AIRPORT DATA SHEET

DRAFT

Page, Arizona

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020 SHEET 2 OF 15

Coffman Associates
Airport Consultants
www.coffmanassociates.com

Coffman Associates C:\Users\ljohnson\Coffman Associates Inc\Coffman - sp_CAD\MP\PGA_20\ALP\02_PGA_data.dwg Printed Date: 9-16-20 02:30:20 PM ljohnson

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LEGEND

EXISTING	ULTIMATE	DESCRIPTION
	SAME	ABANDONED PAVEMENT (To Be Removed)
	SAME	AIRPORT PROPERTY LINE/FENCE
	SAME	AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
	SAME	BUILDING
	SAME	PAVEMENT
	SAME	FENCING (up to 6')
xRVZ	SAME	RUNWAY VISIBILITY ZONE
VASI-4	SAME	NAVIGATIONAL AID INSTALLATION
REIL PAPI	SAME	RUNWAY THRESHOLD LIGHTS and REIL
	SAME	SECTION CORNER
	SAME	SEGMENTED CIRCLE/WIND INDICATOR
4100	SAME	TOPOGRAPHY (NAVD 88)
	SAME	HOLDING POSITION MARKING
TSA	SAME	TAXIWAY SAFETY AREA (79')
TOFA	SAME	TAXIWAY OBJECT FREE AREA (131')
OFZ	SAME	OBSTACLE FREE ZONE (OFZ)
RSA	SAME	RUNWAY SAFETY AREA (RSA)
OFA	SAME	RUNWAY OBJECT FREE AREA (OFA)
AS	SAME	PART 77 APPROACH SURFACE
	SAME	SURVEY MONUMENT (PACS/SACS)
	SAME	RUNWAY PROTECTION ZONE (RPZ)
BRL-20'	SAME	BUILDING RESTRICTION LINE (BRL)
	SAME	ASOS
	SAME	TIE-DOWNS
	SAME	TREES
	SAME	NAVAID CRITICAL AREA

EXISTING BUILDINGS/FACILITIES

NO.	DESCRIPTION	ELEVATION Top (MSL)	OL LIGHTED	NO.	DESCRIPTION	ELEVATION Top (MSL)	OL LIGHTED
1	Port-a-Port Hangar	4261.0'	-	38	Executive Hangar	4269.5'	-
2	Port-a-Port Hangar	4263.7'	-	39	Executive Hangar	4271.4'	-
3	Port-a-Port Hangar	4261.0'	-	40	Executive Hangar	4272.2'	-
4	Port-a-Port Hangar	4263.5'	-	41	Executive Hangar	4278.1'	-
5	Port-a-Port Hangar	4264.3'	-	42	Executive Hangar	4290.3'	-
6	Port-a-Port Hangar	4263.5'	-	43	Executive Hangar	4270.1'	-
7	Port-a-Port Hangar	4261.7'	-	44	Executive Hangar	4272.2'	-
8	Port-a-Port Hangar	4261.6'	-	45	Executive Hangar	4270.3'	-
9	Port-a-Port Hangar	4260.7'	-	46	Executive Hangar	4272.6'	-
10	Port-a-Port Hangar	4260.9'	-	47	Executive Hangar	4274.2'	-
11	Port-a-Port Hangar	4260.7'	-	48	Executive Hangar	4275.1'	-
12	Port-a-Port Hangar	4261.1'	-	49	Executive Hangar	4268.1'	-
13	Port-a-Port Hangar	4260.7'	-	50	Executive Hangar	4269.7'	-
14	Port-a-Port Hangar	4261.4'	-	51	Executive Hangar	4271.3'	-
15	Port-a-Port Hangar	4261.2'	-	52	Executive Hangar	4272.5'	-
16	Port-a-Port Hangar	4261.4'	-	53	Executive Hangar	4273.3'	-
17	Port-a-Port Hangar	4260.7'	-	54	Executive Hangar	4274.2'	-
18	Port-a-Port Hangar	4268.4'	-	55	Executive Hangar	4275.2'	-
19	Port-a-Port Hangar	4260.8'	-	56	Executive Hangar	4276.2'	-
20	Executive Hangar	4260.9'	-	57	Executive Hangar	4281.3'	-
21	Executive Hangar	4270.9'	-	58	Executive Hangar	4281.3'	-
22	Executive Hangar	4271.7'	-	59	Executive Hangar	4282.1'	-
23	Executive Hangar	4275.3'	-	60	Maintenance Facility	4274.4'	-
24	Executive Hangar	4276.2'	-	61	Aircraft Wash Rack	N/A	-
25	Executive Hangar	4277.9'	-	62	Executive Hangar	4293.2'	-
26	Executive Hangar	4276.7'	-	63	Conventional Hangar	4295.9'	-
27	Executive Hangar	4276.8'	-	64	Terminal Building	4295.4'	-
28	Executive Hangar	4274.1'	-	65	Airport Beacon	-	-
29	Executive Hangar	4277.3'	-	66	National Parks Service	4292.3'	-
30	Executive Hangar	4274.2'	-	67	ARFF/FBO/Hangar	4212.8'	-
31	Executive Hangar	4273.4'	-	68	Maintenance Building	4290.8'	-
32	Executive Hangar	4278.5'	-	69	Fuel Farm	4296.2'	-
33	Executive Hangar	4270.3'	-	70	Fuel Farm	4300.5'	-
34	Executive Hangar	4270.9'	-	71	Fuel Farm	4303.6'	-
35	Executive Hangar	4274.3'	-	72	ASOS	-	-
36	Executive Hangar	4272.1'	-	73	Utility Shack	4300.5'	-
37	Executive Hangar	4269.7'	-	74	Tower	-	-

Existing Runway 25
Part 77 Surface (AV)
250' x 5,000' x 1,250'
20:1 Visual Approach

Existing Runway 25 RPZ
250' x 1,000' x 450'
Visibility Minimums Visual
Own Fee Simple

Existing Runway 25
End-EL 4,250.7
36° 55' 47.98" N
111° 26' 45.84" W

Existing Runway 15 RPZ
500' x 1,700' x 1,010'
Visibility Minimums 1 mile
Own Fee Simple

Existing Runway 15
End-EL 4,245.3
36° 55' 58.15" N
111° 26' 58.43" W

Existing Runway 15
Part 77 Surface (NP-C)
500' x 10,000' x 3,500'
34:1 Nonprecision Approach

Existing Runway 7
588' Disp Thr-EL 4,246.3
36° 55' 45.78" N
111° 27' 5.51" W

Existing Runway 7
End-EL 4,243.1
36° 55' 44.98" N
111° 27' 12.68" W

Existing Runway 7 RPZ
250' x 1,000' x 450'
Visibility Minimums Visual
Partially Own

Existing Runway 7
Part 77 Surface (AV)
250' x 5,000' x 1,250'
20:1 Visual Approach

Existing ARP
36° 55' 33.85" N
111° 26' 54.06" W

Short-Term Runway 33
150' Displaced Thr.
EL 4,315.5 (TDZE)
36° 55' 1.71" N
111° 26' 46.15" W

Existing Runway 33
End-EL 4,316.7
High Point (TDZE)
36° 55' 0.21" N
111° 26' 45.85" W

Short-Term Runway 33
Approach RPZ
500' x 1,700' x 1,010'
Own Fee Simple

Existing Runway 33 RPZ
500' x 1,700' x 1,010'
Visibility Minimums 1 mile
Own Fee Simple

Existing Runway 33
Part 77 Surface (NP-C)
500' x 10,000' x 3,500'
34:1 Nonprecision Approach

SEE INSET A

EXISTING RUNWAY 15-33 5,950' X 150'

EXISTING RUNWAY 7-25 7,810' X 150'

40' Taxiway A

Ultimate Holding Bay

Helicopter Pad

Compass Rose

178,848.9 SQYD

Apron
16947.2 SQYD

Short-Term Runway 33
Approach RPZ
500' x 1,700' x 1,010'
Own Fee Simple

Departure RPZ
500' x 1,700' x 1,010'
Own Fee Simple

INSET A
Runway 33 End

FAA APPROVAL STAMP

FOR APPROVAL BY:

Page, Arizona

APPROVED BY: _____ ON THE DATE OF: _____

Kyle Christiansen
Public Works Director

Magnetic Declination 10° 26' East
Annual Rate of Change
0° 6' West (8/11/2020)

0 300 600 900
SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
4	ALP UPDATE	09/16/20	COFFMAN	-
3	ALP UPDATE	03/05/09	COFFMAN	FAA
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1	MASTER PLAN AND ALP UPDATE	05/31/00	AM	WR

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PAGE MUNICIPAL AIRPORT
EXISTING / SHORT-TERM AIRPORT LAYOUT PLAN DRAWING
DRAFT

Page, Arizona

PLANNED BY:	Jacob Allen
DETAILED BY:	Larry D. Johnson
APPROVED BY:	Matt Quick
September 2020	SHEET 3 OF 15

Coffman Associates
Airport Consultants
www.coffmanassociates.com

Coffman Associates C:\Users\Johnson\Coffman Associates Inc\Coffman - rp_CAD\MPP\PGA_20\ALP\03_PGA_ALP(4-300.dwg Printed Date: (4-17-20) 09:41:19 AM Johnson

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EXISTING BUILDINGS/FACILITIES

NO.	DESCRIPTION	ELEVATION Top (MSL)	OL LIGHTED	NO.	DESCRIPTION	ELEVATION Top (MSL)	OL LIGHTED
1	Port-a-Port Hangar	4261.0'	-	38	Executive Hangar	4269.5'	-
2	Port-a-Port Hangar	4263.7'	-	39	Executive Hangar	4271.4'	-
3	Port-a-Port Hangar	4261.0'	-	40	Executive Hangar	4272.2'	-
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28	Executive Hangar	4274.1'	-	65	Airport Beacon	-	-
29	Executive Hangar	4277.3'	-	66	National Parks Service	4292.3'	-
30	Executive Hangar	4274.2'	-	67	ARFF/FBO/Hangar	4212.8'	-
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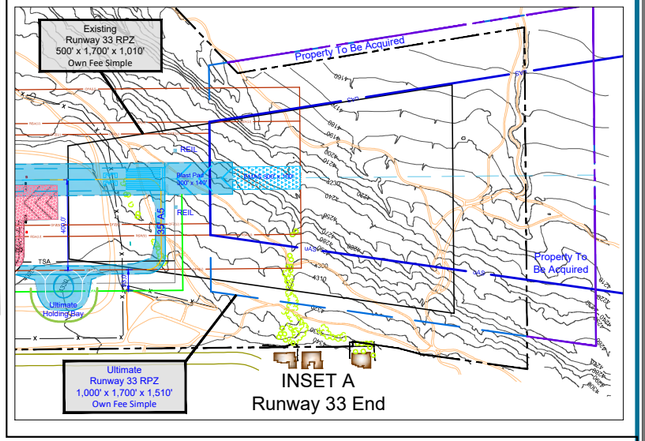
33	Executive Hangar	4270.3'	-	70	Fuel Farm	4300.5'	-
34	Executive Hangar	4270.9'	-	71	Fuel Farm	4303.6'	-
35	Executive Hangar	4274.3'	-	72	ASOS	-	-
36	Executive Hangar	4272.1'	-	73	Utility Shack	4300.5'	-
37	Executive Hangar	4269.7'	-	74	Tower	-	-

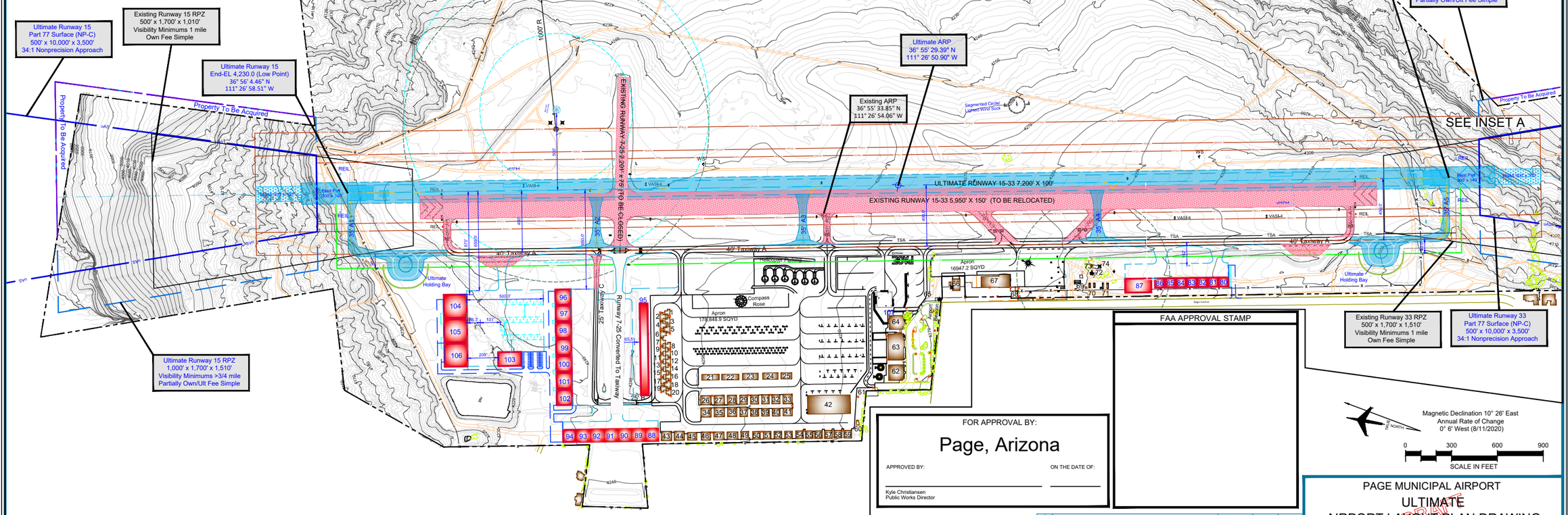
ULTIMATE BUILDINGS/FACILITIES

NO.	DESCRIPTION	ELEVATION (AGL/AMSL)	LIGHTED (OL)
80	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
81	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
82	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
83	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
84	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
85	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
86	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
87	FIRE STATION / ARFF (170' x 90')	25' AGL	
88	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
89	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
90	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
91	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
92	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
93	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
94	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
95	T-HANGAR/LINEAR BOX HANGAR (800' x 50')	25' AGL	
96	CONVENTIONAL HANGAR (100' x 100')	25' AGL	
97	CONVENTIONAL HANGAR (100' x 100')	25' AGL	
98	CONVENTIONAL HANGAR (100' x 100')	25' AGL	
99	CONVENTIONAL HANGAR (100' x 100')	25' AGL	
100	CONVENTIONAL HANGAR (100' x 100')	25' AGL	
101	CONVENTIONAL HANGAR (100' x 100')	25' AGL	
102	CONVENTIONAL HANGAR (100' x 100')	25' AGL	
103	FBO/SASO BUILDING (150' X 90')	25' AGL	
104	CONVENTIONAL HANGAR (150' X 150')	25' AGL	
105	CONVENTIONAL HANGAR (150' X 150')	25' AGL	
106	CONVENTIONAL HANGAR (150' X 150')	25' AGL	
107	COMMERCIAL SERVICE/AIR TOUR TERMINAL	25' AGL	

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
	SAME	ABANDONED PAVEMENT (To Be Removed)
		AIRPORT PROPERTY LINE/FENCE
		AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
		BUILDING
		PAVEMENT
		FENCING (up to 6')
		NAVIGATIONAL AID INSTALLATION (PAPI)
		RUNWAY THRESHOLD LIGHTS and REIL
22|15 / 04|33	SAME	SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
	SAME	TOPOGRAPHY (NAVD 88)
		HOLDING POSITION MARKING
TSA	TSA	TAXIWAY SAFETY AREA (79')
TOFA	TOFA	TAXIWAY OBJECT FREE AREA (131')
	uOFZ	RUNWAY OBSTACLE FREE ZONE (OFZ)
	uRSA	RUNWAY SAFETY AREA (RSA)
	uOFA	RUNWAY OBJECT FREE AREA (OFA)
	uAS	PART 77 APPROACH SURFACE
	SAME	SURVEY MONUMENT (PACS/SACS)
		RUNWAY PROTECTION ZONE (RPZ)
	BRL-20'	BUILDING RESTRICTION LINE (BRL)
	SAME	ASOS
		TIE-DOWNS
	SAME	TREES
		NAVAID CRITICAL AREA





FOR APPROVAL BY:

Page, Arizona

APPROVED BY: _____ ON THE DATE OF: _____

Kyle Christiansen
Public Works Director

FAA APPROVAL STAMP

Magnetic Declination 10° 26' East
Annual Rate of Change
0° 6' West (8/11/2020)

0 300 600 900
SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
1	ALP UPDATE	09/16/20	COFFMAN	-
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PAGE MUNICIPAL AIRPORT

ULTIMATE AIRPORT LAYOUT PLAN DRAWING

DRAFT

Page, Arizona

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020 | SHEET 4 OF 15

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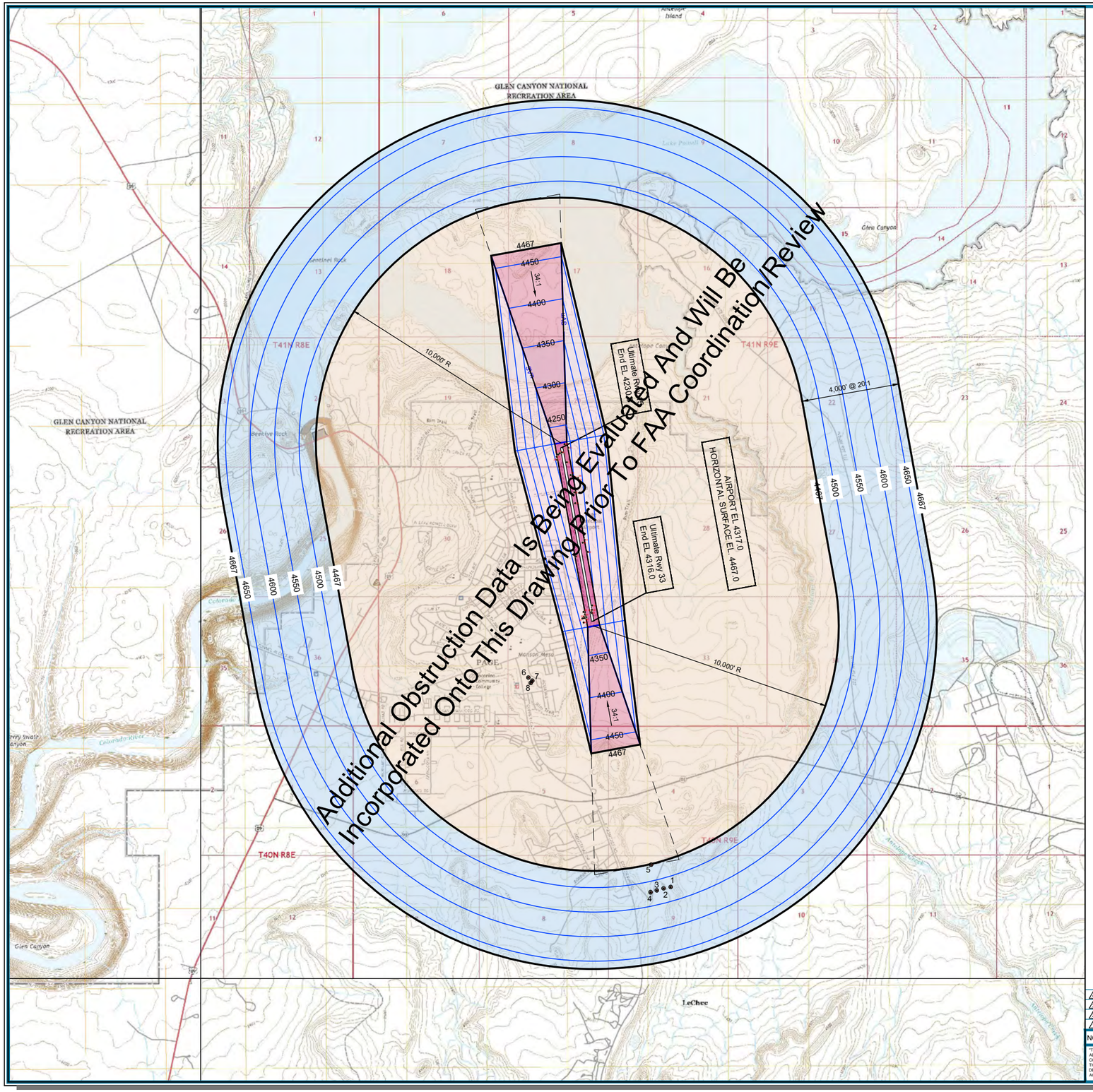
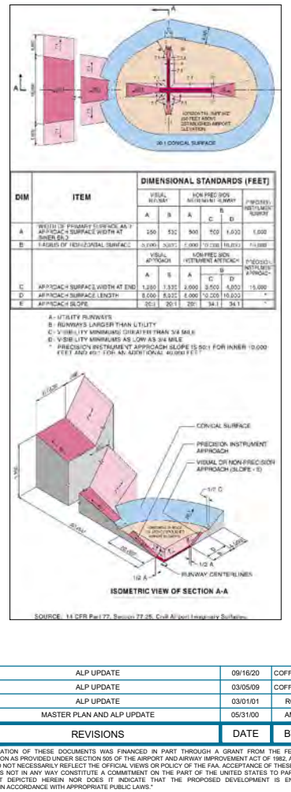


OBSTRUCTION TABLE							
No.	Description	Elevation Top MSL	Object AGL (FT)	Ground Surface EL	Part 77 Surface	Object Penetration	Proposed Remediation
1	POWER_TRANSMISSION_PYLON	4589.8	97.6	4492.2	Ult_Conical	68.2	Add obstruction Light
2	POWER_TRANSMISSION_LINE	4551.9	46.5	4505.4	Ult_Conical	31.3	Add obstruction Light
3	POWER_TRANSMISSION_LINE	4552.9	47.5	4505.4	Ult_Conical	31.9	Add obstruction Light
4	POWER_TRANSMISSION_PYLON	4611.0	114.6	4496.4	Ult_Conical	89.0	Add obstruction Light
5	Terrain	4481.5	0.0	4481.5	Ult_Conical	14.0	Add obstruction Light
6	ANTENNA	4466.6	98.2	4373.4	Ult_Horizontal	0.6	Add obstruction Light
7	WATER_TOWER	4487.1	108.5	4378.6	Ult_Horizontal	21.1	Add obstruction Light
8	CELL_TOWER	4508.3	130.1	4378.2	Ult_Horizontal	42.3	Add obstruction Light
9	BUSH	4243.7	0.0	4243.7	Ult_Primary	11.4	Remove
10	BUSH	4243.3	0.0	4243.3	Ult_Primary	10.8	Remove
11	BUSH	4242.4	0.0	4242.4	Ult_Primary	9.4	Remove
12	GROUND	4241.0	0.0	4241.0	Ult_Primary	3.6	Request Ground To Be Graded
13	GROUND	4249.3	0.0	4249.3	Ult_Primary	5.5	Request Ground To Be Graded
14	BUSH	4253.2	0.0	4253.2	Ult_Primary	0.7	Remove
15	WINDSOCK	4271.8	22.3	4249.5	Ult_Primary	14.1	Relocate
16	GROUND	4277.4	0.0	4277.4	Ult_Primary	0.2	Request Ground To Be Graded
17	BUSH	4283.5	0.0	4283.5	Ult_Primary	0.2	Remove
18	BUSH	4317.7	0.0	4317.7	Ult_Primary	9.6	Remove
19	BUSH	4318.5	0.0	4318.5	Ult_Primary	8.3	Remove
20	BUSH	4317.7	0.0	4317.7	Ult_Primary	6.5	Remove
21	BUSH	4317.2	0.0	4317.2	Ult_Primary	5.6	Remove
22	FENCE	4319.7	6.1	4313.6	Ult_Primary	6.4	Relocate
23	VERTICAL STRUCTURE	4233.0	6.3	4226.7	Ult_Primary_15	3.0	Add obstruction Light
24	V-STRC-TOWER-	4277.8	0.0	4277.8	Ult_Transitional	2.9	Add obstruction Light
25	BUSH	4241.8	0.0	4241.8	Ult_Transitional	3.0	Remove
26	BUSH	4244.0	0.0	4244.0	Ult_Transitional	2.7	Remove
27	BUSH	4244.6	0.0	4244.6	Ult_Transitional	4.4	Remove
28	ANTENNA	4277.8	28.7	4249.1	Ult_Transitional	3.2	Add obstruction Light
29	VOR	4277.6	28.4	4249.1	Ult_Transitional	8.2	Add obstruction Light
30	ANTENNA	4279.0	29.9	4249.1	Ult_Transitional	2.8	Add obstruction Light
31	BUSH	4277.5	0.0	4277.5	Ult_Transitional	0.5	Remove
32	WINDSOCK	4296.0	26.0	4270.0	Ult_Transitional	7.0	Relocate
33	GROUND	4318.0	0.0	4318.0	Ult_Transitional	1.5	Request Ground To Be Graded
34	BUSH	4319.5	0.0	4319.5	Ult_Transitional	7.0	Remove
35	BUSH	4324.6	0.0	4324.6	Ult_Transitional	4.6	Remove
36	BUSH	4324.1	0.0	4324.1	Ult_Transitional	7.0	Remove
37	FENCE	4334.7	8.1	4326.6	Ult_Transitional	2.1	Relocate
38	FENCE	4327.9	6.4	4321.5	Ult_Transitional	5.0	Relocate
39	BUSH	4323.8	0.0	4323.8	Ult_Transitional	4.3	Remove
40	TREE	4333.2	0.0	4333.2	Ult_Transitional	1.8	Remove
41	VERTICAL STRUCTURE	4240.7	6.7	4234.0	Ult_Transitional	5.3	Add obstruction Light



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL (V) MIN		NON-PRECISION INSTRUMENT (NPI) MIN			(P)RECISION INSTRUMENT (P) MIN
		A	B	A	C	D	
A	WIDTH OF PRIMARY SURFACE, A'S APPROACH SURFACE WIDTH AT INNER END	250	500	500	1,000	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	7,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			(P)RECISION INSTRUMENT APPROACH
		A	B	A	C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

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
* PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR ADDITIONAL 40,000 FEET

ISOMETRIC VIEW OF SECTION A-A

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

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, horizontal, and conical surfaces, are illustrated on the AIRPORT AIRSPACE DRAWINGS.
3. Depiction of features and objects within the outer portion of the approach surfaces, are illustrated on the APPROACH SURFACE PROFILES.
4. Depiction of features and objects within the inner portion of the approach surfaces, are illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS.

OBSTRUCTION LEGEND

1 OBSTRUCTION

GROUP of TREES

Date of Obstruction Survey: 2020

TRUE NORTH

Magnetic Declination 10° 26' East
Annual Rate of Change
0° 6' West (8/11/2020)

0 2000 4000 6000

SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
1	ALP UPDATE	09/16/20	COFFMAN	-
2	ALP UPDATE	03/05/09	COFFMAN	FAA
1	ALP UPDATE	03/01/01	RC	AM
0	MASTER PLAN and ALP UPDATE	05/31/00	AM	WR

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PAGE MUNICIPAL AIRPORT

AIRPORT AIRSPACE DRAWING

DRAFT

Page, Arizona

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020 | SHEET 5 OF 15

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Coffman Associates C:\Users\Johnson\Coffman Associates Inc\Coffman - sp_CAD\MP\PGA_2014\ALP\05_PGA_Airspace.dwg Printed Date: 9-17-20 08:09:44 AM Johnson

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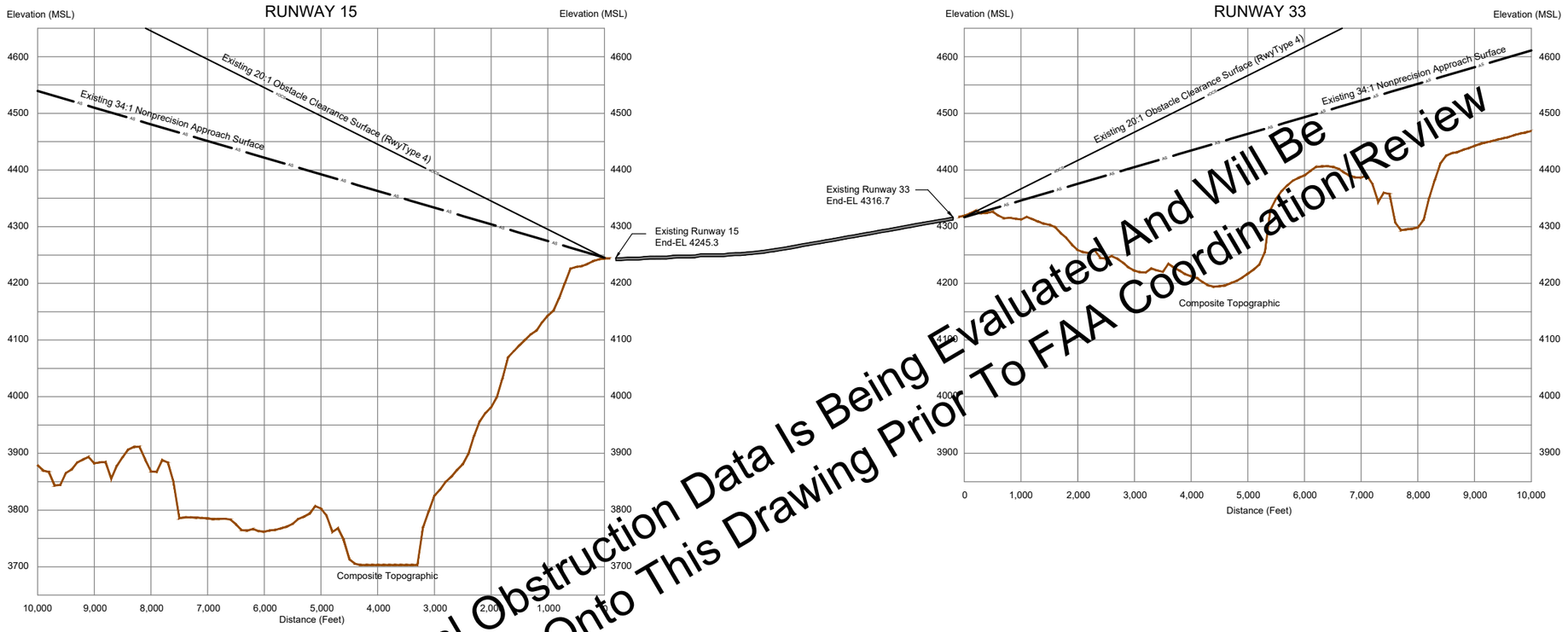
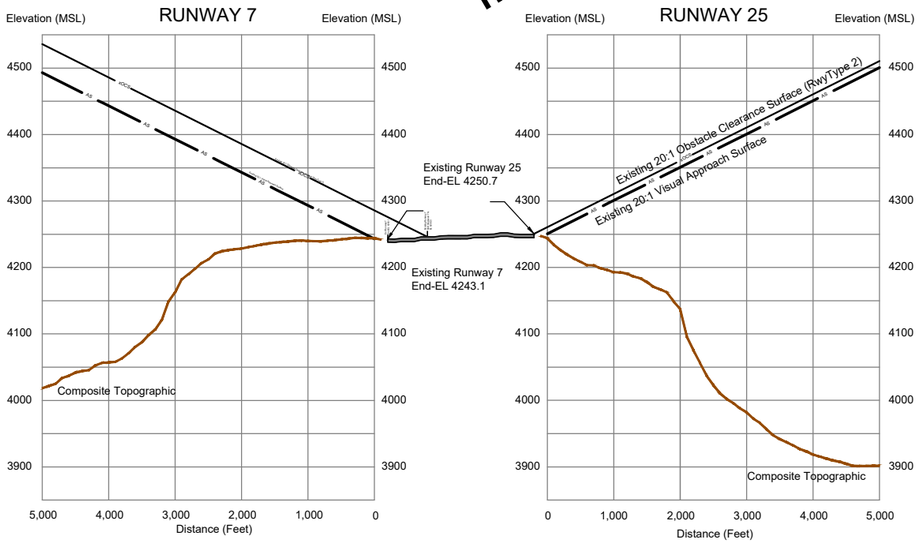


Additional Obstruction Data Is Being Evaluated And Will Be Incorporated Onto This Drawing Prior To FAA Coordination/Review



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3. Vertical Datum NAVD 88 and Horizontal Datum NAD 83.

OUTER PORTION OF RUNWAY 15 APPROACH OBSTRUCTION TABLE

No.	Description	Elevation Top MSL	Existing 34:1 Penetration	Existing 20:1 OCS Penetration	Proposed Remediation
-	NONE	-	-	-	-

OUTER PORTION OF RUNWAY 33 APPROACH OBSTRUCTION TABLE

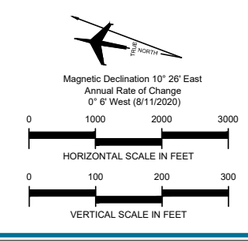
No.	Description	Elevation Top MSL	Existing 34:1 Penetration	Existing 20:1 OCS Penetration	Proposed Remediation
-	NONE	-	-	-	-

OUTER PORTION OF RUNWAY 7 APPROACH OBSTRUCTION TABLE

No.	Description	Elevation Top MSL	Existing 20:1 Penetration	Existing 20:1 OCS Penetration	Proposed Remediation
-	NONE	-	-	-	To Be Closed

OUTER PORTION OF RUNWAY 25 APPROACH OBSTRUCTION TABLE

No.	Description	Elevation Top MSL	Existing 20:1 Penetration	Existing 20:1 OCS Penetration	Proposed Remediation
-	NONE	-	-	-	To Be Closed



NO.	REVISIONS	DATE	BY	APP'D.
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1	MASTER PLAN AND ALP UPDATE	05/31/00	AM	WR

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PAGE MUNICIPAL AIRPORT

EXISTING APPROACH SURFACE PROFILES

DRAFT

Page, Arizona

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020 SHEET 6 OF 15

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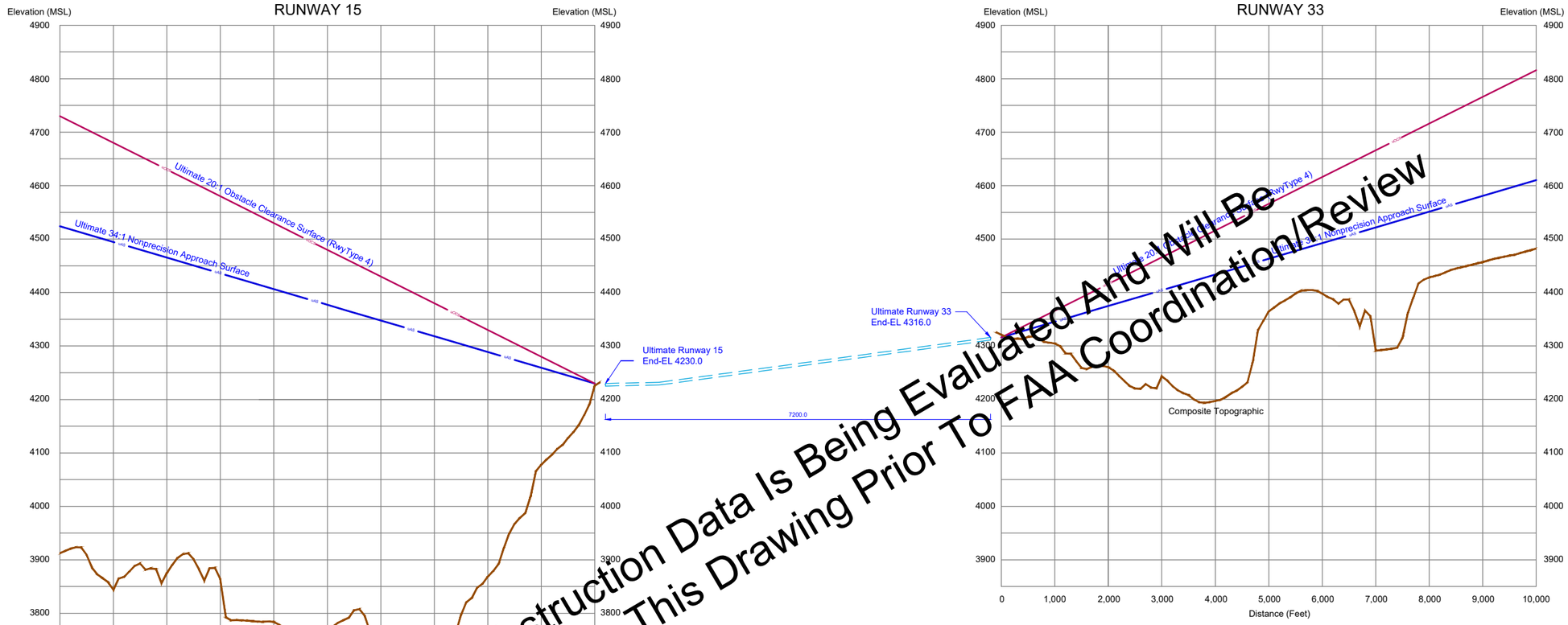

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3. Vertical Datum NAVD 88 and Horizontal Datum NAD 83.

OUTER PORTION OF RUNWAY 15 APPROACH OBSTRUCTION TABLE

No.	Description	Elevation Top MSL	Ultimate 34:1 Penetration	Ultimate 20:1 OCS Penetration	Proposed Remediation
-	NONE	-	-	-	-

OUTER PORTION OF RUNWAY 33 APPROACH OBSTRUCTION TABLE

No.	Description	Elevation Top MSL	Ultimate 34:1 Penetration	Ultimate 20:1 OCS Penetration	Proposed Remediation
-	NONE	-	-	-	-

Magnetic Declination 10° 26' East
Annual Rate of Change
0° 6' West (8/11/2020)

HORIZONTAL SCALE IN FEET
0 1000 2000 3000

VERTICAL SCALE IN FEET
0 100 200 300

NO.	REVISIONS	DATE	BY	APP'D.
1	ALP UPDATE	09/16/20	COFFMAN	-
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PAGE MUNICIPAL AIRPORT

ULTIMATE RUNWAY 15-33 APPROACH SURFACE PROFILE

Page, Arizona

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020 | SHEET 7 OF 15

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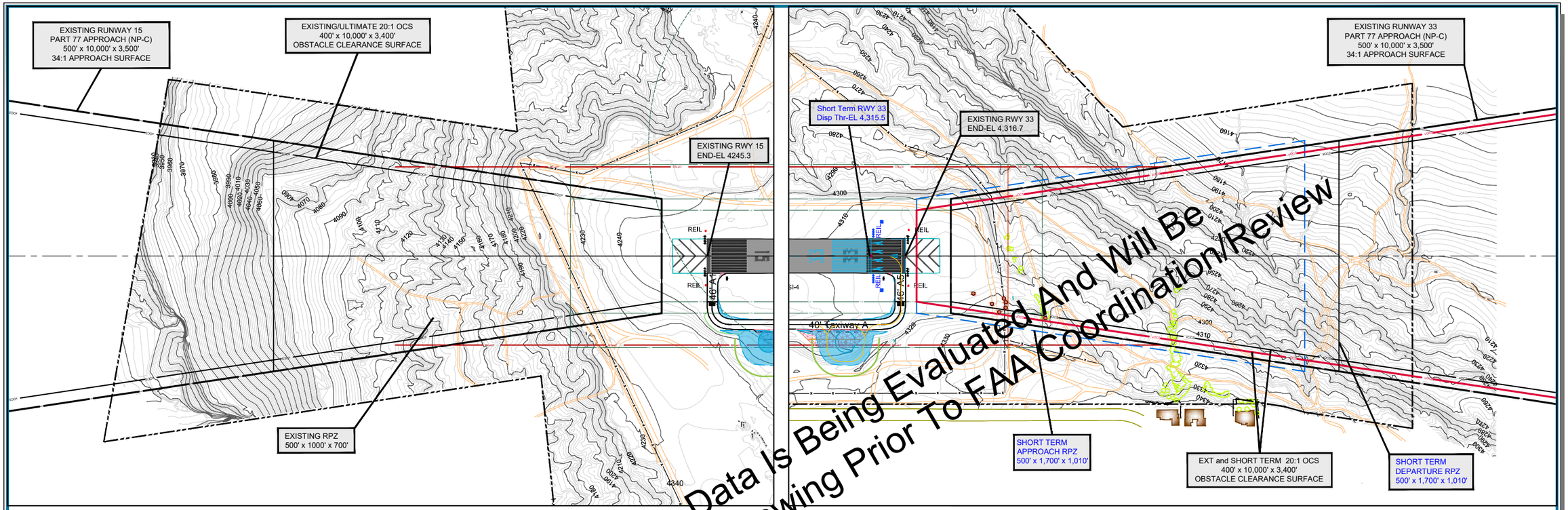

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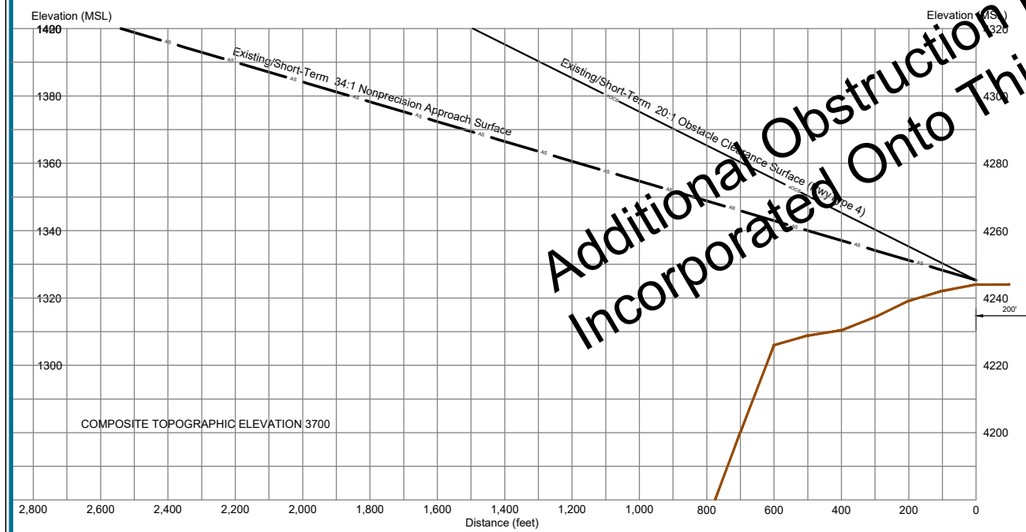

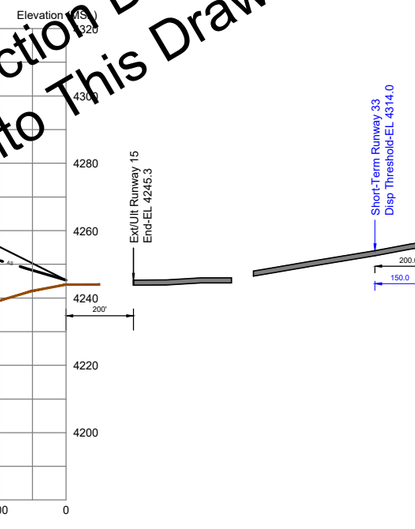

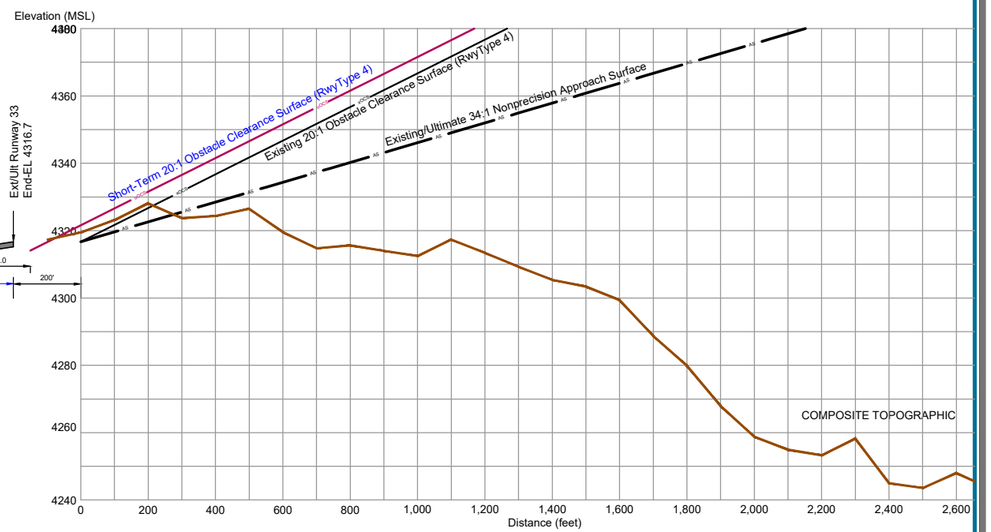

RUNWAY 15 APPROACH OBSTRUCTION TABLE

No.	Object Name	Elevation Top MSL	Existing 34:1 Penetration	Ext 20:1 OCS Penetration	Proposed Remediation
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

RUNWAY 33 APPROACH OBSTRUCTION TABLE

No.	Object Name	Elevation Top MSL	Existing 34:1 Penetration	Ext 20:1 OCS Penetration	Proposed Remediation
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

GENERAL NOTES:

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3. Vertical Datum NAVD 88 and Horizontal Datum NAD 83.

Magnetic Declination 10° 26' East
Annual Rate of Change
0° 6' West (8/11/2020)

HORIZONTAL SCALE IN FEET
VERTICAL SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
5	ALP UPDATE	08/18/20	COFFMAN	-
4	ALP UPDATE	03/05/09	COFFMAN	FAA
3	ALP UPDATE	03/01/01	RC	AM
2	MASTER PLAN AND ALP UPDATE	05/31/00	AM	WR

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PAGE MUNICIPAL AIRPORT
INNER PORTION OF RUNWAY 15-33
APPROACH SURFACE DRAWING
DRAFT
Page, Arizona

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020 SHEET 8 OF 15

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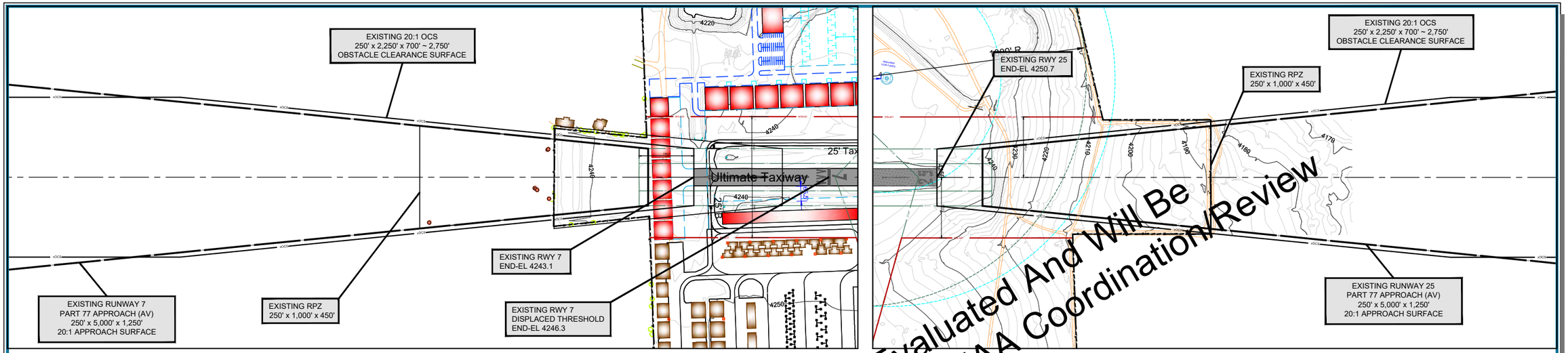
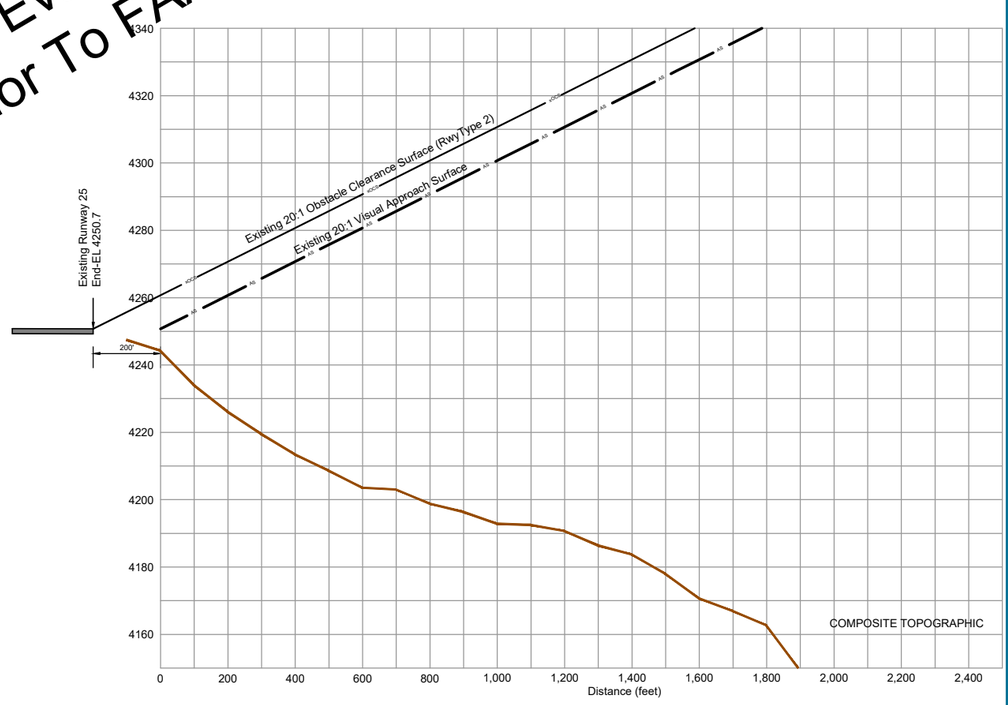




RUNWAY 7-25
(To Be Closed)



Additional Obstruction Data Is Being Evaluated And Will Be Incorporated Onto This Drawing Prior To FAA Coordination/Review

RUNWAY 7 APPROACH OBSTRUCTION TABLE

No.	Object Name	Elevation Top MSL	Existing 20:1 Penetration	Ext 20:1 OCS Penetration	Proposed Remediation
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--

RUNWAY 25 APPROACH OBSTRUCTION TABLE

No.	Object Name	Elevation Top MSL	Existing 20:1 Penetration	Ext 20:1 OCS Penetration	Proposed Remediation
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--

GENERAL NOTES:

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TRUE NORTH

Magnetic Declination
10° 26' East
Annual Rate of Change
0° 6' West (8/11/2020)

HORIZONTAL SCALE IN FEET
0 200 400 600

VERTICAL SCALE IN FEET
0 20 40 60

NO.	REVISIONS	DATE	BY	APP'D.
4	ALP UPDATE	09/18/20	COFFMAN	-
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PAGE MUNICIPAL AIRPORT

INNER PORTION OF RUNWAY 7-25 APPROACH SURFACE DRAWING

Page, Arizona

DRAFT

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020 | SHEET 9 OF 15

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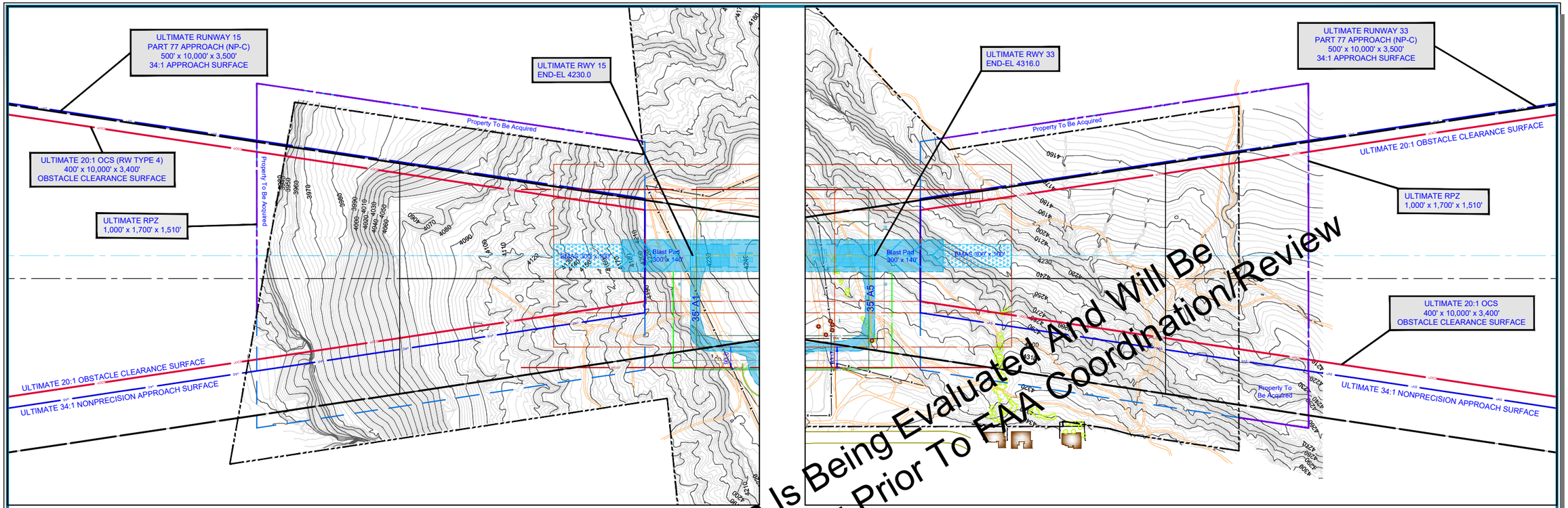

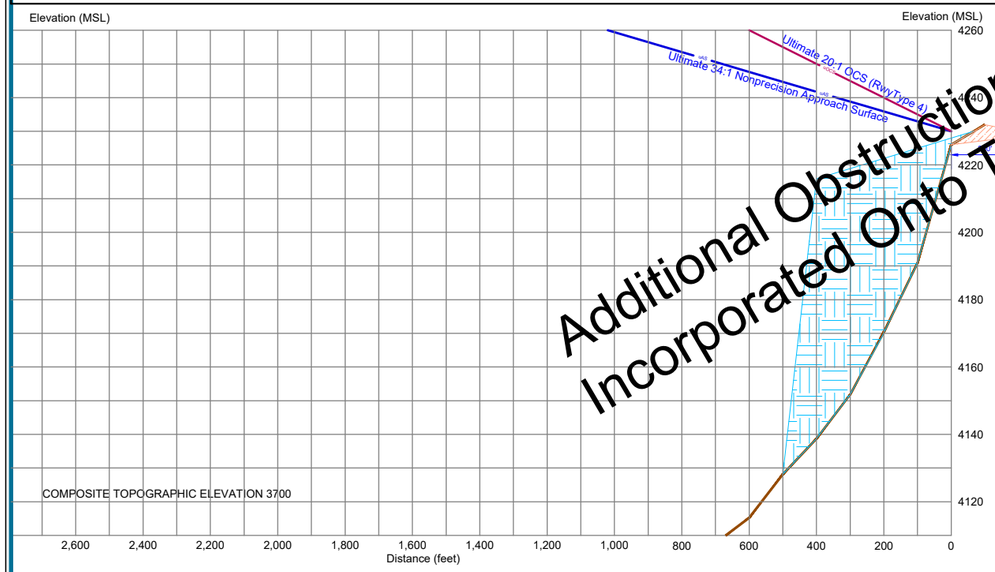

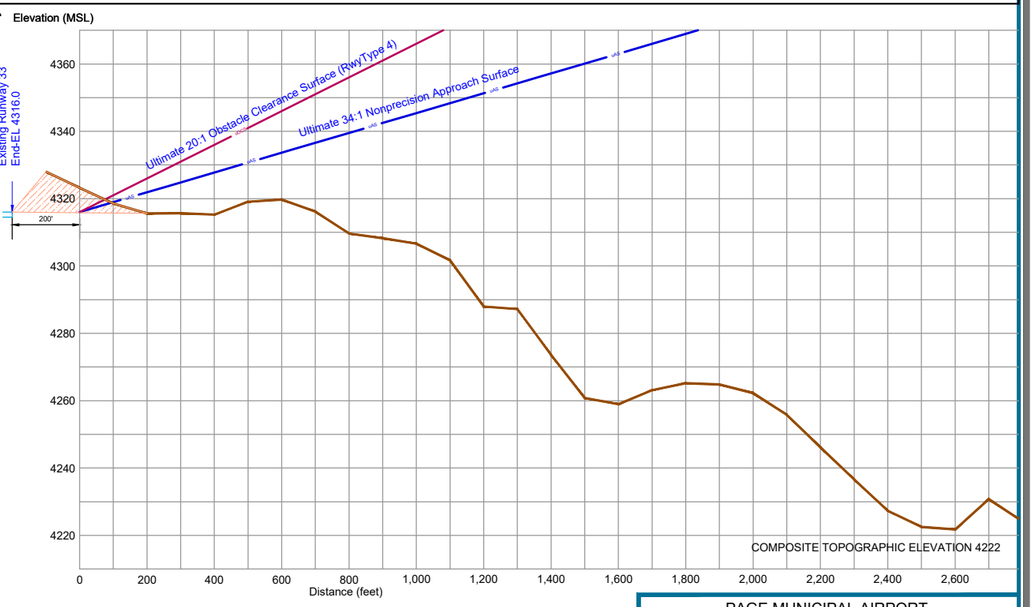

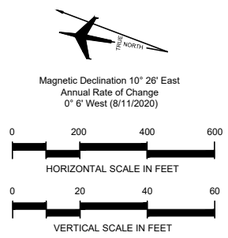

Additional Obstruction Data Is Being Evaluated And Will Be Incorporated Onto This Drawing Prior To FAA Coordination/Review

RUNWAY 15 APPROACH OBSTRUCTION TABLE

No.	Object Name	Elevation Top MSL	Ultimate 34:1 Penetration	Ult 20:1 OCS Penetration	Proposed Remediation
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

RUNWAY 33 APPROACH OBSTRUCTION TABLE

No.	Object Name	Elevation Top MSL	Ultimate 34:1 Penetration	Ult 20:1 OCS Penetration	Proposed Remediation
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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PAGE MUNICIPAL AIRPORT

INNER PORTION OF ULTIMATE RWY 15-33 APPROACH SURFACE DRAWING

Page, Arizona

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020 | SHEET 10 OF 15

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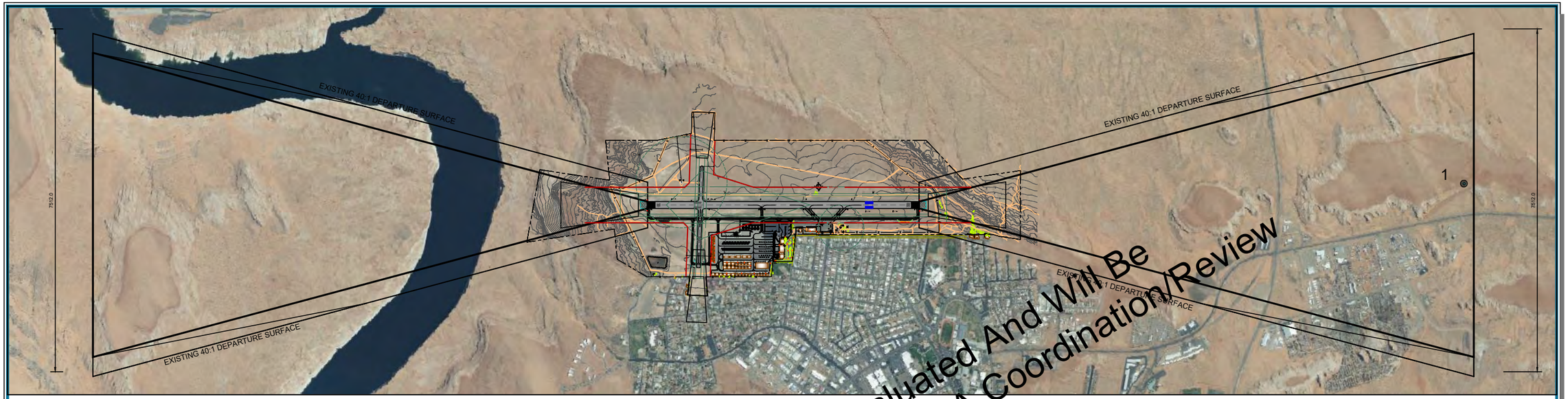
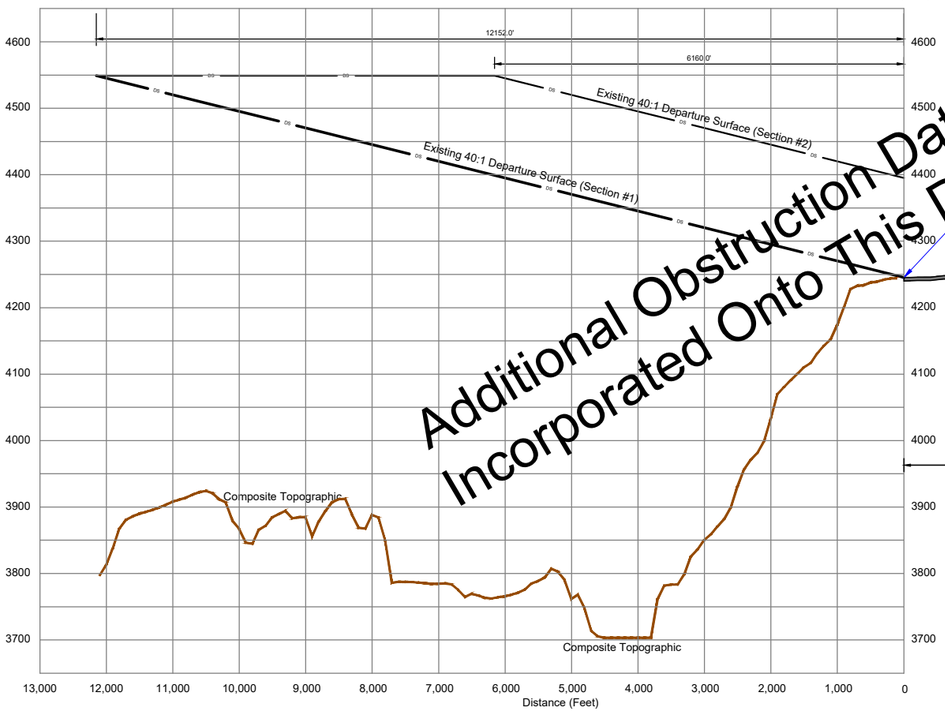
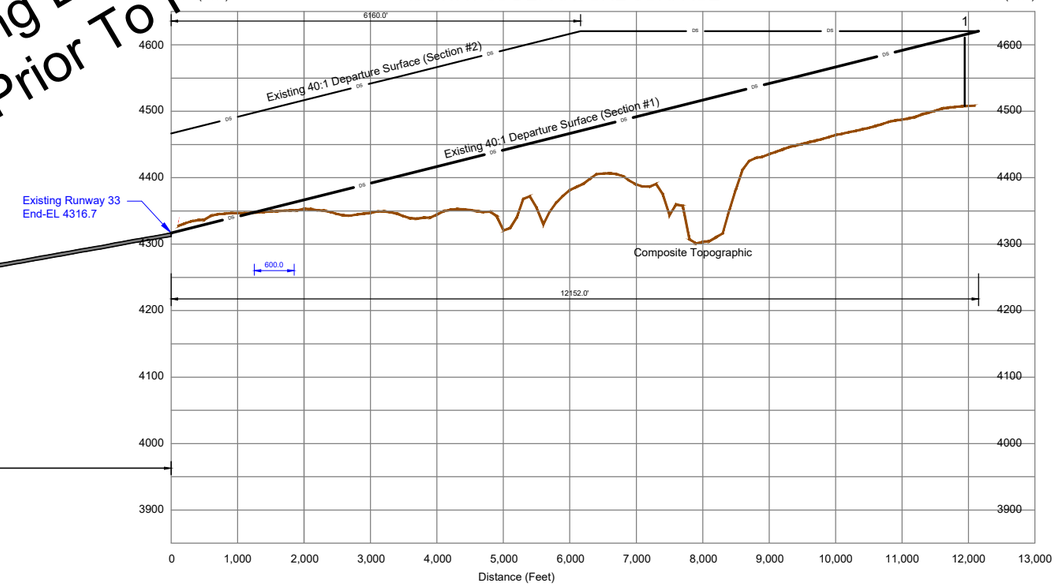


Additional Obstruction Data Is Being Evaluated And Will Be Incorporated Onto This Drawing Prior To FAA Coordination/Review

RUNWAY 15 DEPARTURE SURFACE



RUNWAY 33 DEPARTURE SURFACE

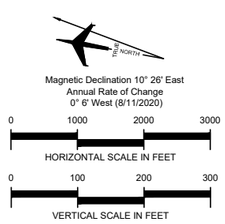


EXISTING RUNWAY 15 OBSTRUCTION TABLE

No.	Object Name	Elevation Top MSL	Departure 40:1 Surface	Penetration	AGL	Proposed Remediation
-	NONE	-	-	-	-	-

EXISTING RUNWAY 33 OBSTRUCTION TABLE

No.	Object Name	Elevation Top MSL	Departure 40:1 Surface	Penetration	AGL	Proposed Remediation
-	NONE	-	-	-	-	-



NO.	REVISIONS	DATE	BY	APP'D.
1	ALP UPDATE	09/16/20	COFFMAN	-
2	ALP UPDATE	03/05/09	COFFMAN	FAA
3	ALP UPDATE	03/01/01	RC	AM
4	MASTER PLAN AND ALP UPDATE	05/31/00	AM	WR

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PAGE MUNICIPAL AIRPORT

EXISTING RUNWAY 15-33 DEPARTURE SURFACE DRAWING

Page, Arizona

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020 | SHEET 11 OF 15

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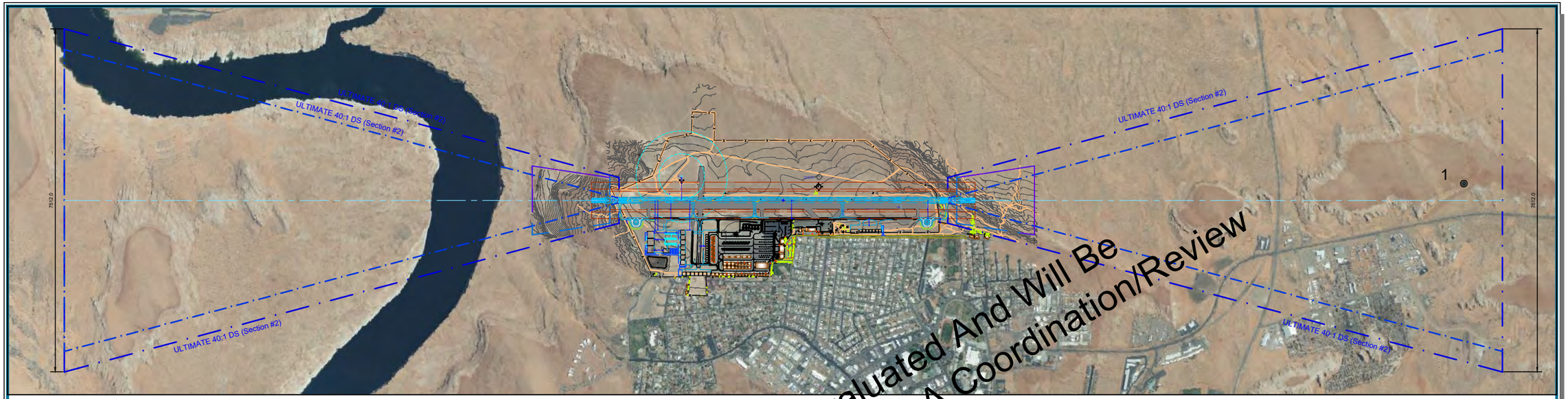

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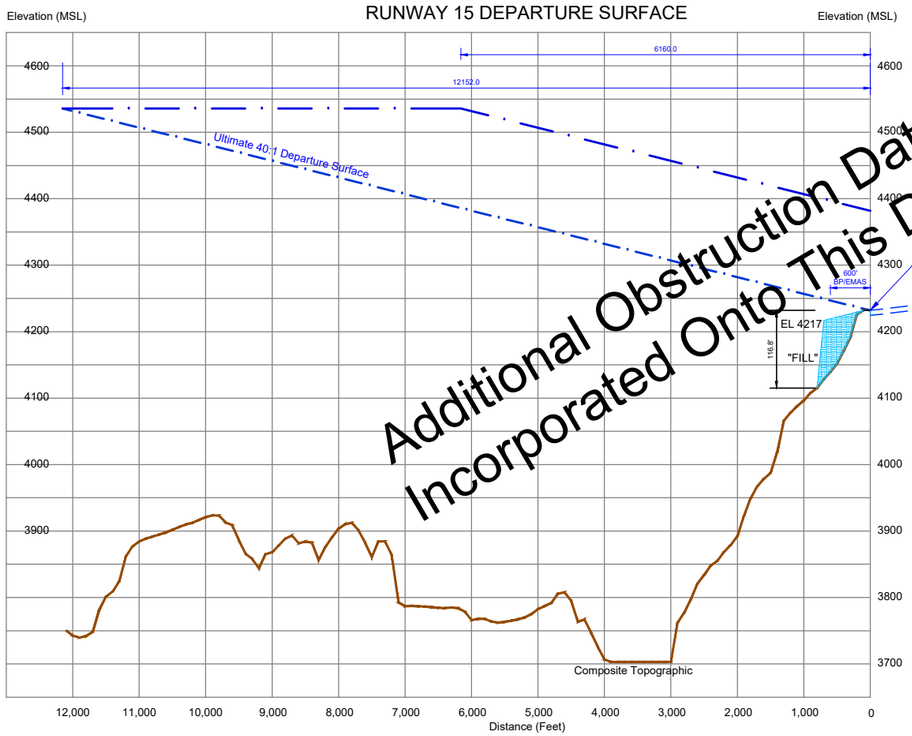
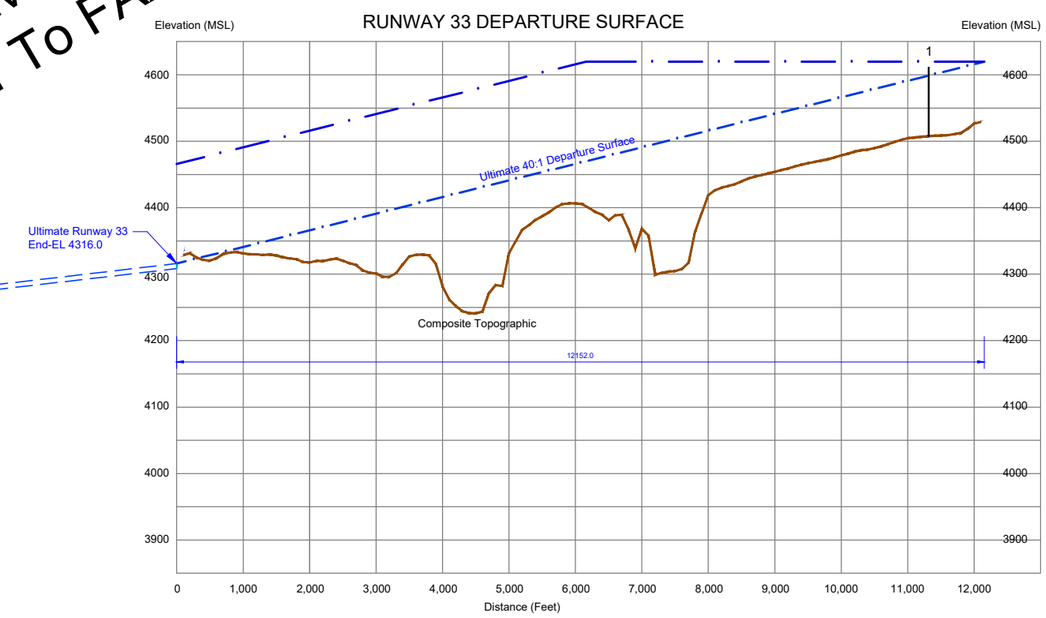
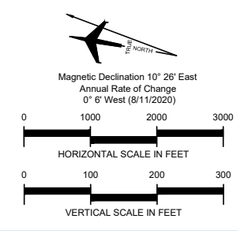




ULTIMATE RUNWAY 15 OBSTRUCTION TABLE						
No.	Object Name	Elevation Top MSL	Departure 40:1 Surface	Penetration	AGL	Proposed Remediation
-	NONE	-	-	-	-	-

ULTIMATE RUNWAY 33 OBSTRUCTION TABLE						
No.	Object Name	Elevation Top MSL	Departure 40:1 Surface	Penetration	AGL	Proposed Remediation
1	POWER_TRANSMISSION_PYLON	4611	SECTION #1	12.2'	114.6'	-



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PAGE MUNICIPAL AIRPORT

ULTIMATE RUNWAY 15-33
DEPARTURE SURFACE DRAWING

DRAFT

Page, Arizona

PLANNED BY: Jacob Allen
DETAILED BY: Larry D. Johnson
APPROVED BY: Matt Quick

September 2020

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LEGEND

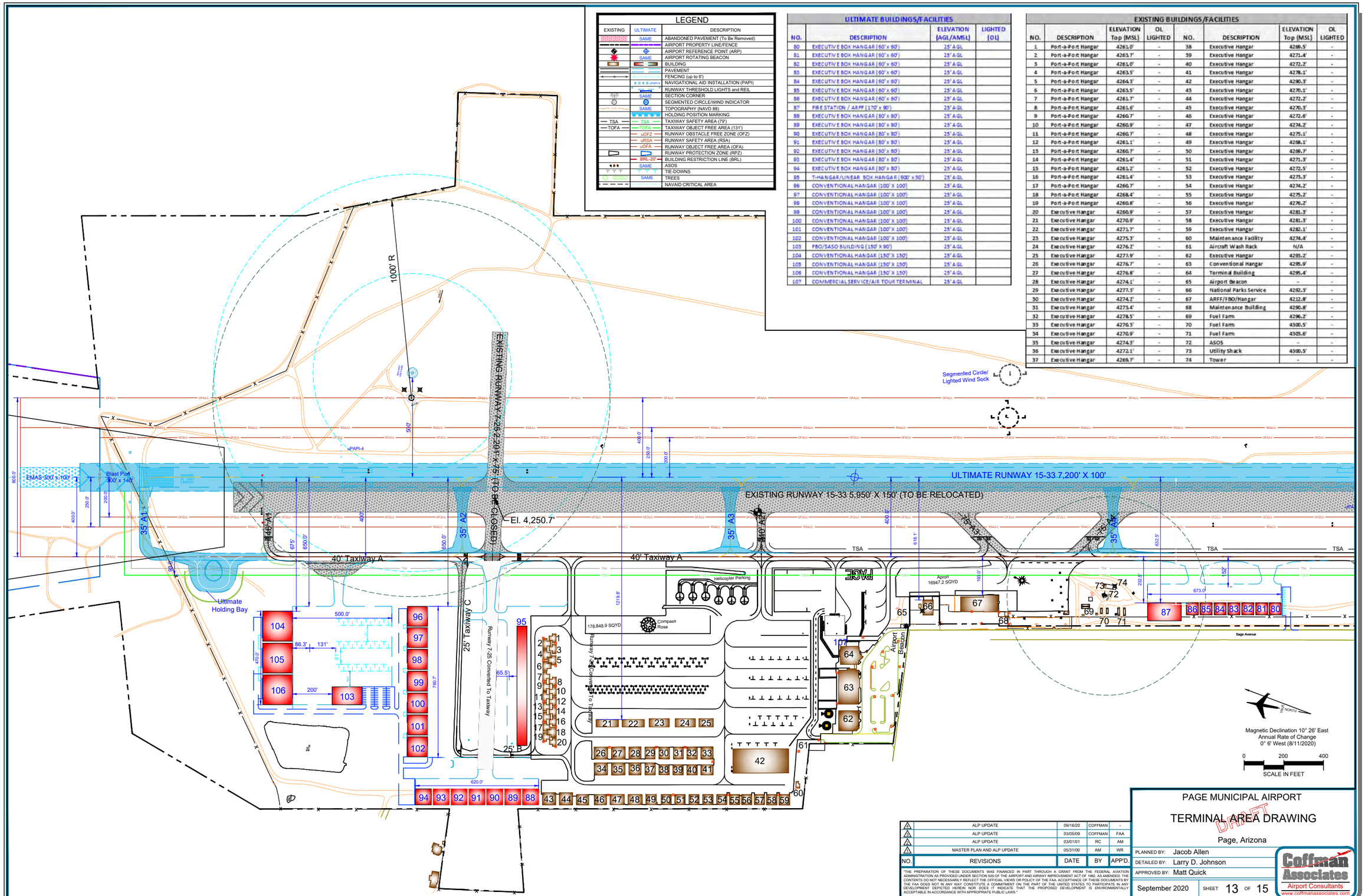
EXISTING	ULTIMATE	DESCRIPTION
	SAME	ABANDONED PAVEMENT (To Be Removed)
		AIRPORT PROPERTY LINE/FENCE
		AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
		BUILDING
		PAVEMENT
		FENCING (up to 6')
		NAVIGATIONAL AID INSTALLATION (PAPI)
		RUNWAY THRESHOLD LIGHTS and REIL
	SAME	SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
	SAME	TOPOGRAPHY (NAVD 88)
		HOLDING POSITION MARKING
TSA	TSA	TAXIWAY SAFETY AREA (79')
TOFA	TOFA	TAXIWAY OBJECT FREE AREA (131')
	uOFZ	RUNWAY OBSTACLE FREE ZONE (OFZ)
	uRSA	RUNWAY SAFETY AREA (RSA)
	uOFA	RUNWAY OBJECT FREE AREA (OFA)
		RUNWAY PROTECTION ZONE (RPZ)
	BRL-20'	BUILDING RESTRICTION LINE (BRL)
	SAME	ASOS
		TIE-DOWNS
	SAME	TREES
		NAVAID CRITICAL AREA

ULTIMATE BUILDINGS/FACILITIES

NO.	DESCRIPTION	ELEVATION (AGL/AMSL)	LIGHTED (OL)
80	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
81	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
82	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
83	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
84	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
85	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
86	EXECUTIVE BOX HANGAR (60' x 60')	25' AGL	
87	FIRE STATION / ARFF (170' x 80')	25' AGL	
88	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
89	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
90	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
91	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
92	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
93	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
94	EXECUTIVE BOX HANGAR (80' x 80')	25' AGL	
95	T-HANGAR/LINEAR BOX HANGAR (60' x 50')	25' AGL	
96	CONVENTIONAL HANGAR (100' X 100')	25' AGL	
97	CONVENTIONAL HANGAR (100' X 100')	25' AGL	
98	CONVENTIONAL HANGAR (100' X 100')	25' AGL	
99	CONVENTIONAL HANGAR (100' X 100')	25' AGL	
100	CONVENTIONAL HANGAR (100' X 100')	25' AGL	
101	CONVENTIONAL HANGAR (100' X 100')	25' AGL	
102	CONVENTIONAL HANGAR (100' X 100')	25' AGL	
103	FBO/SASO BUILDING (150' X 90')	25' AGL	
104	CONVENTIONAL HANGAR (150' X 150')	25' AGL	
105	CONVENTIONAL HANGAR (150' X 150')	25' AGL	
106	CONVENTIONAL HANGAR (150' X 150')	25' AGL	
107	COMMERCIAL SERVICE/AIR TOUR TERMINAL	25' AGL	

EXISTING BUILDINGS/FACILITIES

NO.	DESCRIPTION	ELEVATION Top (MSL)	OL LIGHTED	NO.	DESCRIPTION	ELEVATION Top (MSL)	OL LIGHTED
1	Port-a-Port Hangar	4261.0'	-	38	Executive Hangar	4269.5'	-
2	Port-a-Port Hangar	4263.7'	-	39	Executive Hangar	4271.4'	-
3	Port-a-Port Hangar	4261.0'	-	40	Executive Hangar	4272.2'	-
4	Port-a-Port Hangar	4263.5'	-	41	Executive Hangar	4278.1'	-
5	Port-a-Port Hangar	4264.3'	-	42	Executive Hangar	4290.3'	-
6	Port-a-Port Hangar	4263.5'	-	43	Executive Hangar	4270.1'	-
7	Port-a-Port Hangar	4261.7'	-	44	Executive Hangar	4272.2'	-
8	Port-a-Port Hangar	4261.6'	-	45	Executive Hangar	4270.3'	-
9	Port-a-Port Hangar	4260.7'	-	46	Executive Hangar	4272.6'	-
10	Port-a-Port Hangar	4260.9'	-	47	Executive Hangar	4274.2'	-
11	Port-a-Port Hangar	4260.7'	-	48	Executive Hangar	4275.1'	-
12	Port-a-Port Hangar	4261.1'	-	49	Executive Hangar	4268.1'	-
13	Port-a-Port Hangar	4260.7'	-	50	Executive Hangar	4269.7'	-
14	Port-a-Port Hangar	4261.4'	-	51	Executive Hangar	4271.3'	-
15	Port-a-Port Hangar	4261.2'	-	52	Executive Hangar	4272.5'	-
16	Port-a-Port Hangar	4261.4'	-	53	Executive Hangar	4273.3'	-
17	Port-a-Port Hangar	4260.7'	-	54	Executive Hangar	4274.2'	-
18	Port-a-Port Hangar	4268.4'	-	55	Executive Hangar	4275.2'	-
19	Port-a-Port Hangar	4260.8'	-	56	Executive Hangar	4276.2'	-
20	Executive Hangar	4260.9'	-	57	Executive Hangar	4281.3'	-
21	Executive Hangar	4270.9'	-	58	Executive Hangar	4281.3'	-
22	Executive Hangar	4271.7'	-	59	Executive Hangar	4282.1'	-
23	Executive Hangar	4275.3'	-	60	Maintenance Facility	4274.4'	-
24	Executive Hangar	4276.2'	-	61	Aircraft Wash Rack	N/A	-
25	Executive Hangar	4277.9'	-	62	Executive Hangar	4293.2'	-
26	Executive Hangar	4276.7'	-	63	Conventional Hangar	4295.9'	-
27	Executive Hangar	4276.8'	-	64	Terminal Building	4295.4'	-
28	Executive Hangar	4274.1'	-	65	Airport Beacon	-	-
29	Executive Hangar	4277.3'	-	66	National Parks Service	4282.3'	-
30	Executive Hangar	4274.2'	-	67	ARFF/FBO/Hangar	4212.8'	-
31	Executive Hangar	4273.4'	-	68	Maintenance Building	4290.8'	-
32	Executive Hangar	4278.5'	-	69	Fuel Farm	4296.2'	-
33	Executive Hangar	4270.3'	-	70	Fuel Farm	4300.5'	-
34	Executive Hangar	4270.9'	-	71	Fuel Farm	4303.6'	-
35	Executive Hangar	4274.3'	-	72	ASOS	-	-
36	Executive Hangar	4272.1'	-	73	Utility Shack	4300.5'	-
37	Executive Hangar	4269.7'	-	74	Tower	-	-



Magnetic Declination 10° 26' East
Annual Rate of Change
0° 6' West (8/11/2020)

0 200 400
SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
4	ALP UPDATE	09/16/20	COFFMAN	-
3	ALP UPDATE	03/05/09	COFFMAN	FAA
2	ALP UPDATE	03/01/01	RC	AM
1	MASTER PLAN AND ALP UPDATE	05/31/00	AM	WR

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PAGE MUNICIPAL AIRPORT

TERMINAL AREA DRAWING

DRAFT

Page, Arizona

PLANNED BY:	Jacob Allen
DETAILED BY:	Larry D. Johnson
APPROVED BY:	Matt Quick
September 2020	SHEET 13 OF 15

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OPEN SPACE

OPEN SPACE

Existing Property Line

Existing Property Line

Ultimate Property Line
Property To Be Acquired

Property To Be Acquired

65

65

65

65

65

65

65

65

65

65

65

EXISTING RUNWAY 7-25 2,201' x 75' (TO BE CLOSED)

ULTIMATE RUNWAY 15-33 7,200' X 100'

EXISTING RUNWAY 15-33 5,950' X 150' (TO BE RELOCATED)

Future Taxiway

Ultimate Property Line
Property To Be Acquired

Property To Be Acquired

Existing Property Line

RESIDENTIAL

Existing Property Line

RESIDENTIAL

OPEN SPACE

OPEN SPACE

RESIDENTIAL

LAND USE LEGEND

- AIRFIELD OPERATIONS
- FUTURE AIRFIELD OPERATIONS
- AIRFIELD DRAINAGE
- GENERAL AVIATION DEVELOPMENT
- FUTURE AVIATION DEVELOPMENT
- AVIATION SUPPORT
- TERMINAL AREA/COMMERCIAL SERVICE
- 2018 NOISE CONTOUR 65 DNL
- 2038 NOISE CONTOUR 65 DNL

TRUE NORTH

Magnetic Declination 10° 26' East
Annual Rate of Change
0° 6' West (8/11/2020)

0 400 800 1200

SCALE IN FEET

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PAGE MUNICIPAL AIRPORT

AIRPORT LAND USE DRAWING

DRAFT

Page, Arizona

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September 2020	SHEET 14 OF 15

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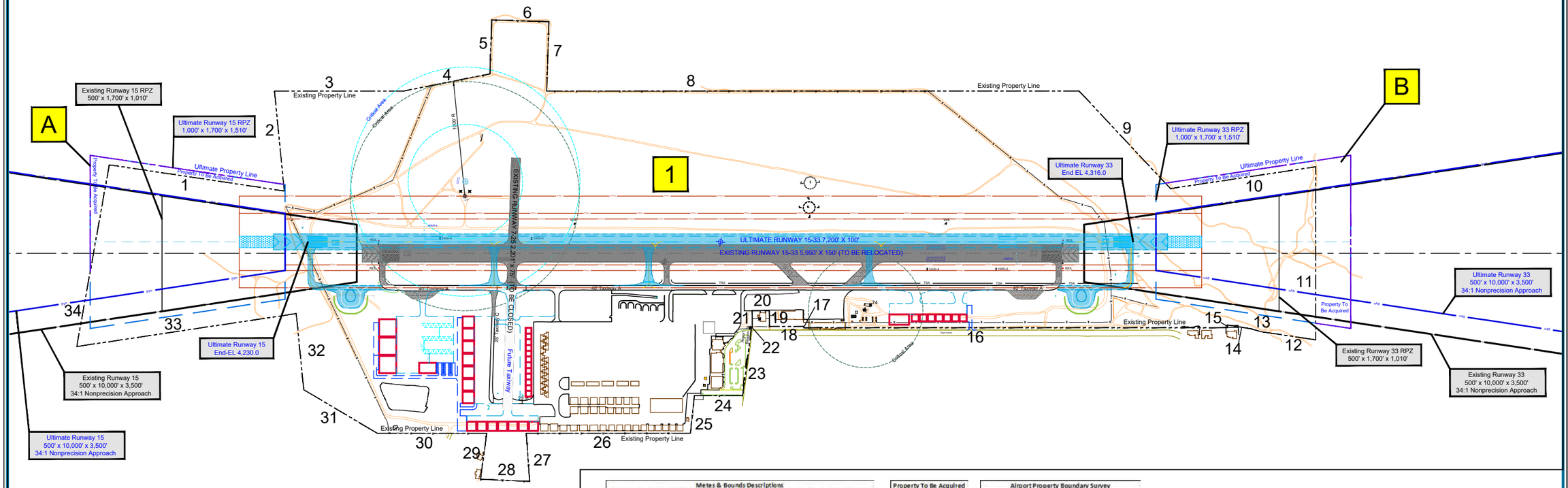

Metes & Bounds Descriptions

Label ID	Direction (DMS)	Distance (ft.)	Label ID	Direction (DMS)	Distance (ft.)
1	N 01-38-09 W	1,543.93	18	N 10-10-00 W	300.00
2	S 74-15-00 W	876.17	19	S 79-50-00 W	139.57
3	N 10-10-00 W	1,124.85	20	S 10-10-00 E	150.00
4	N 21-23-48 W	769.79	21	S 79-50-00 W	150.00
5	S 81-45-51 W	471.93	22	S 10-10-00 E	6.06
6	N 08-14-09 W	500.00	23	S 87-16-54 W	597.46
7	S 81-45-51 W	605.07	24	S 10-10-00 E	420.66
8	N 10-10-00 W	4,646.67	25	N 85-57-49 E	329.41
9	N 36-45-00 E	1,165.69	26	N 10-10-00 W	1,432.54
10	S 18-41-51 E	1,283.40	27	S 75-50-34 W	422.10
11	S 79-50-00 W	1,510.00	28	N 07-30-55 W	429.24
12	S 01-38-09 E	479.40	29	N 87-37-43 E	404.50
13	N 05-29-39 E	91.04	30	N 10-12-25 W	955.67
14	S 00-57-48 E	212.93	31	N 20-30-16 E	746.43
15	N 76-34-09 E	23.15	32	S 74-15-00 W	666.79
16	S 10-10-00 E	3,697.88	33	S 18-41-51 E	1,937.10
17	S 79-50-00 W	10.43	34	North Page City Limit	1,610.71

Property To Be Acquired

Parcel ID	Acreage
A	5.27
B	13.52

Airport Property Boundary Survey

Document #	Book/Page	Date	Acreage
3055369	Case 8 Map 23	6/30/2000	536.32

Parcel ID	Grantor	Interest Type	Instrument	Book/Page	FAA Grant #	Easement	Date	Purpose
1	Bureau Of Reclamation	Fee Simple	Quit Claim Deed	Dkt. 541/182-241	N/A	N/A	4/18/1975	BOR quitclaim of townsite of Page, AZ

TRUE NORTH

Magnetic Declination 10° 26' East
Annual Rate of Change
0° 6' West (8/11/2020)

0 400 800 1200
SCALE IN FEET

FAA APPROVAL STAMP

FOR APPROVAL BY:

Page, Arizona

APPROVED BY: _____ ON THE DATE OF: _____

Kyle Christiansen
Public Works Director

NO.	REVISIONS	DATE	BY	APP'D.
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PAGE MUNICIPAL AIRPORT

EXHIBIT "A" AIRPORT PROPERTY INVENTORY MAP

DRAFT

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September 2020 SHEET 15 OF 15

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