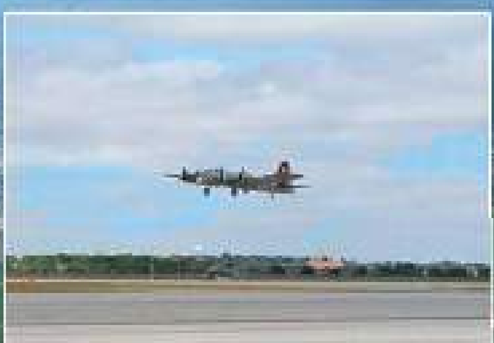
WILEY POST
AIRPORT



AIRPORT MASTER PLAN

AIRPORT MASTER PLAN

For

WILEY POST AIRPORT
Oklahoma City, Oklahoma

Coffman Associates
Airport Consultants

July 2022

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Introduction and Summary

INTRODUCTION AND SUMMARY

A Master Plan provides an evaluation of an airport's aviation demand and an overview of the systematic development that will best meet that demand. The Master Plan establishes development objectives and provides for a 20-year planning period that details the rationale for various study elements, including airfield configuration, facility development, on-airport land use recommendations, and support facilities. It also serves as a strategic tool for establishing airport improvement priorities and justifying the need for federal and state funding assistance.

The Federal Aviation Administration (FAA) recommends that airports update their Master Plan every seven to 10 years, or as necessary, to address local changes at the airport. The last Master Plan for Wiley Post Airport (PWA) was completed in 2009. The preparation of this Airport Master Plan is necessary as a timely reassessment of the development direction of PWA to meet the needs of the Oklahoma City Metropolitan Region economy and an ever-changing air transportation industry.

The Airport Master Plan has been initiated by the Oklahoma City Airport Trust (OCAT) and the City of Oklahoma City to evaluate the airport's capabilities and role, to forecast future aviation demand, and to plan for the development of new or expanded facilities that may be required to meet that demand. The goal of the Master Plan is to provide guidelines for the airport's overall maintenance, development, and operation in an environmentally and fiscally responsible manner while adhering to appropriate FAA standards.

An important outcome of the Airport Master Plan process is a recommended development plan that reserves sufficient areas for future facility needs. Such planning will protect development areas and ensure they will be readily available when required to meet future needs. 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.

With a sound and realistic Master Plan in place, PWA can take steps to achieve these goals and strategies that have been set forth. Furthermore, the airport will continue to remain an important link to the regional and national air transportation systems, as well as maintain the public and private investments in its facilities.

STUDY OVERVIEW

The OCAT is responsible for funding capital improvements at the airport, as well as obtaining FAA and development grants. In addition, the OCAT oversees facility enhancements and infrastructure development conducted by private entities at the airport. The Master Plan is intended to provide guidance for future development and justification for projects for which the Airport may receive funding through an updated capital improvement program (CIP) to demonstrate the future investment required by the OCAT, as well as the FAA.

The Airport Master Plan follows a systematic approach outlined by the FAA to identify existing and future airport needs in advance of the actual need for improvements. This is done to ensure that the OCAT and the Oklahoma City Department of Airports 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 all areas of the airport.

The OCAT has contracted with the airport planning firm of Coffman Associates, Inc. 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 Airport Master Plan is to develop and maintain a financially feasible, long-term development program which will satisfy aviation demand of the region, while also being compatible with area development, other transportation modes, and the environment. Accomplishing this objective requires an evaluation of the existing airport to decide what actions should be taken to maintain a safe, adequate, and reliable airport facility.

This Airport Master Plan is intended to provide guidance through an updated capital improvement and financial program to demonstrate the future investments required by the OCAT. The new planning study also provides justification for new priorities. The plan has been closely coordinated with other planning studies in the area and with aviation plans developed by the FAA. This study will also utilize historical planning efforts (2009 Master Plan) that have been undertaken at PWA.

While the Master Plan must be developed per FAA requirements, it can also be prepared in a manner which makes it useful in strategic planning for the airport. The FAA requires specific elements within a Master Plan. These elements, to be detailed in the following section, are guidelines which allow for a systematic and technical approach to reach the final recommended plan.

Specific goals and objectives to be considered in the Airport Master Plan include, but are not limited to, the following:

- Research factors likely to affect all air transportation demand segments in the City of Oklahoma City and greater Oklahoma City Metropolitan Region over the next twenty years. The analysis will include the development of forecasts of potential general aviation activity elements.

- Determine projected needs of airport users for the next twenty years, factoring in: recent revisions to FAA airfield geometrical design standards, global positioning system (GPS) Next Generation (NexGen) approaches or other new technology, and the impact of general aviation fleet transitions on design standards. This analysis will also include considerations of military needs and usage.

- Determine airport's current and future critical design aircraft.

- Analyze the existing airfield system in order to determine the existing and ultimate runway length required to satisfy the airport's critical aircraft now and into the future.

- Conduct a demand capacity analysis as a means to evaluate upgraded development of the parallel runway.

- Determine airfield adequacy and outline justification for federal financial investments for all three runways.

- Evaluate highest and best uses of airport property to include the potential to relocate hangar facilities as needed to present redevelopment opportunities.

- Recommend improvements which will satisfy the potential for future increased general aviation needs including fixed base operator (FBO), specialty aviation service operator (SASO), and hangar development options as well as relocation of the terminal building and/or ATCT.

- Consider opportunities for west-side development to include aviation, non-aviation, and roadway and utility infrastructure development options.

- Produce accurate base maps of existing and proposed facilities and updated Airport Layout Plan (ALP) drawings consistent with the FAA's Standard Operating Procedures (SOP) No. 2.0 and 3.0.

- Review future use and zoning of airport property, instrument approach areas, and nearby developments to ensure flight safety and land use compatibility. This will involve the development of new noise exposure contours, application of current land use compatibility guidelines, review of local land use controls and plans, and analysis of land use management techniques.

- Analyze all opportunities and develop strategies for incompatible land use encroachments.

- Establish a schedule of development priorities and a program for improvements proposed in the master plan, consistent with the FAA's capital improvement program planning.

- Consider sustainability efforts, specifically waste and recycling improvements as part of FAA's updated standards.

MASTER PLAN TASKS

The Master Plan for PWA specifically addresses the following tasks:

- Assist the OCAT and the Oklahoma City Department of Airports, through a Technical Advisory Committee (TAC) and a series of Public Information Workshops, in determining a vision for the airport.

- 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 PWA to include physical and operational features.

- Based on the realistic evaluation of the facility in terms of configuration, condition, amenities, location, competition, and forecasted aviation demand, establish goals and priorities for the airport to meet that vision.

- Identify airfield alternatives based on goals and opportunities, as well as FAA applicable design standards. The analysis will include an evaluation of the airfield geometry to address potential non-standard conditions.

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

- Assess compatible land uses near the airport.

BASELINE ASSUMPTIONS

A study such as this typically requires some baseline assumptions that will be used throughout the analysis. The baseline assumptions for this study include:

- The airport will continue to operate as a publicly owned, general aviation reliever airport through the 20-year planning period.
- PWA will continue to serve general aviation tenants, and itinerant and/or local aircraft operations by air taxi, general aviation, and military operators.
- The general aviation industries will grow through the planning period as projected by the FAA. Specifics of projected growth in the national general aviation industries are contained in Chapter Two of the Master Plan.
- A federal airport improvement program will be in place through the planning period to assist in funding capital development needs.

MASTER PLAN ELEMENTS AND PROCESS

The Airport Master Plan is being prepared in a fashion pursuant to the scope of services that has been coordinated with the OCAT and the Oklahoma City Department of Airports. The study has eight specific elements that are intended to assist in the identification of future facility needs and which provide the supporting rationale 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, schedule, and study website. A TAC is also formed, and study material will be assembled in a workbook format. General background information will be established that includes outlining the goals and objectives to be accomplished during the Master Plan.

Element 2 – Inventory is focused on collecting and assembling relevant data pertaining to the airport and the area it serves. Information is collected on existing airport facilities and operations. Local economic and demographic data is collected to define the local growth trends, and environmental information is gathered to identify potential environmental sensitivities that might affect future improvements. Planning studies which may have relevance to the Master Plan are also collected.

Element 3 – Aviation Demand Forecasts examines the potential aviation demand at the airport. The analysis utilizes local socioeconomic information, as well as national air transportation trends to quantify the levels of aviation activity which can reasonably be expected to occur at PWA over a 20-year period. The results of this effort are used to determine the types and sizes of facilities which will be required to meet the projected aviation demand at the airport through the planning period.

PROJECT WORK ELEMENTS

→ TAC #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

DEMAND/CAPACITY AND FACILITY REQUIREMENTS

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

→ WP

→ TAC #2 PIW #1

AIRPORT DEVELOPMENT ALTERNATIVES

- Evaluate development scenarios (airside, landside, support)

→ WP

→ TAC #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 MANAGEMENT AND DEVELOPMENT PROGRAM

- Airport Development schedule
- Cost estimates
- Funding sources

→ WP

→ TAC #4 PIW #3

AIRPORT LAYOUT PLANS/LAND USE COMPATIBILITY

- 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

KEY:

TAC - Technical Advisory Committee
PIW - Public Information Workshop
WP - Working Paper

Exhibit IA
PROJECT WORK FLOW

Element 4 – Demand/Capacity and Facility Requirements converts aviation demand needs into types and volumes of actual physical facilities required to meet existing and forecast demands in aviation activity. The critical design aircraft and physical planning criteria based upon AC 150/5300-13A, *Airport Design*, is also established in preparation of a needs assessment for airside and landside facilities.

Element 5 – Airport Development 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 – Recommended Master Plan Concept/Environmental Review provides both a graphic and narrative description of the recommended plan for the use, development, and operation of the airport. An environmental overview is provided to analyze potential environmental impacts of proposed airport development projects, and a waste audit and recycling plan is also conducted to identify opportunities for the airport to be more sustainable in its approach to waste management. The official ALP drawings that are produced based on the recommended development concept and used by the FAA in determining grant eligibility will also be included.

Element 7 – Financial Management and Development Program provides a proposed capital needs program which defines the schedules, costs, and funding sources for the recommended development projects.

Element 8 – Final Documentation and Deliverables 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 Airport Master Plan is of interest to many within the local community and region. This includes local citizens, local businesses, community organizations, Oklahoma City officials, airport users, airport tenants, and aviation organizations. As a component of the regional, state, and national aviation systems, the Master Plan is of importance to both state and federal agencies responsible for overseeing the air transportation system.

To assist in the development of the Airport Master Plan, the OCAT has identified a group of stakeholders to act in an advisory role in the development of the Master Plan. The TAC is comprised of airport users and stakeholders with a vested interest in the future development of PWA as well as local governmental agencies. Members of the TAC met four times at designated points during the planning process to review study materials and provide comments to help ensure that a realistic and viable plan is developed.

Draft working paper materials have been prepared at various milestones in the planning process. The working paper process allows for timely input and review during each step within the Master Plan to ensure that all issues are fully addressed as the recommended program develops.

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 persons to become informed and provide input concerning the Master Plan process. Notices of meeting times and locations were advertised through local media outlets. Draft working papers and other information related to the Master Plan were made available on a project specific website.

SWOT ANALYSIS

A SWOT analysis is a strategic business planning technique used to identify **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats associated with an action or plan. The SWOT analysis involves identifying an action, objective, or element, and then identifying the internal and external forces that are positively and negatively impacting that action, objective, or element in each environment. For this study, the SWOT analysis factors are being applied to PWA within the confines of the Master Plan. As a result, it provides a continuous vision and direction for the development of the Master Plan.

SWOT DEFINITIONS

As previously discussed, this particular SWOT analysis groups 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 as 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 PWA is based upon information gathered, including a kick-off TAC meeting that was conducted in May 2018. As previously discussed, the TAC is a diversified group of stakeholders, community leaders, and governmental agencies that represent several interests in the airport. A SWOT analysis was conducted with this group to identify key factors that might be addressed in the Master Plan. A summary of the results from the SWOT analysis exercise is shown in **Figure IA** on the next page. These results were used to frame the subjective or judgmental processing of the data presented in the Master Plan.

Figure IA – SWOT Analysis Results

SUMMARY

Planned development at PWA is focused on accommodating projected growth in activity and meeting FAA airfield design standards. The capital improvement program (CIP) that has been developed identifies both airside (runways, taxiways, navigational aids, etc.) and landside (aprons, access roads, vehicle parking, etc.) facility needs.

To properly plan for future demand that may occur, aviation demand forecasts were prepared. Because of the cyclical nature of the economy, it is virtually impossible to predict with certainty year-to-year fluctuations in activity when looking five, ten, and twenty years into the future. Recognizing this reality, the Master Plan is keyed toward potential demand "horizon" levels rather than future dates in time.

These "planning horizons" were established as levels of activity that will call for consideration of the implementation of the next step in the Airport Master Plan program. By developing the Airport to meet the aviation demand levels instead of specific points in time, the Airport will serve as a safe and efficient aviation facility which will meet the operational demands of its users while being developed in a cost-efficient manner. This program allows the OCAT to change specific development in response to unanticipated needs or demand.

The forecast approach utilized historical and forecasted general aviation and economic trends resulting in modest growth projections for PWA through the planning period of the Master Plan. The forecast planning horizons are summarized in **Table IA**. These forecasts were reviewed and approved by the FAA on January 7, 2021.

TABLE IA
Planning Horizon Activity Summary
Wiley Post Airport

	Base Year	Short Term (1-5 years)	Intermediate Term (6-10 years)	Long Term (11-20 years)
BASED AIRCRAFT – Base Year 2018				
Single-Engine Piston	166	181	191	214
Multi-Engine Piston	27	25	22	17
Turboprop	17	20	25	35
Jet	63	69	74	90
Helicopter	13	15	18	24
Total Based Aircraft	**286**	**310**	**330**	**380**
ANNUAL AIRCRAFT OPERATIONS* - Base Year 2017				
General Aviation	51,417	55,388	58,658	65,622
Air Taxi	3,405	3,712	4,106	5,023
Military	487	526	526	526
Total Operations	***55,309***	***59,626***	***63,290***	***71,171***
*Includes ATCT After-Hours Adjustment				

Source: Coffman Associates analysis

MASTER PLAN CONCEPT

The Master Plan concept includes improvements to the airfield and landside area to satisfy FAA design and safety standards and to meet current and forecast needs. Runway design standards are based upon the characteristics of each runway's critical design aircraft, which is the most physically demanding aircraft that uses each runway for at least 500 operations annually.

Airside Summary

PWA is classified in the FAA's National Plan of Integrated Airports System (NPIAS) as a general aviation reliever airport of national importance. As such, its airfield needs to be capable of accommodating the entirety of the national general aviation aircraft fleet including small single-engine aircraft up to the largest business jets. The existing airfield, which consists of three runways, is well situated to serve in its role. However, improvements are necessary to meet FAA design standards and the needs of a new generation of business jets that are heavier and faster. **Table IB** provides a summary of airside improvements, which are depicted on **Exhibit IB**. A more detailed discussion of recommendations can be found in Chapter Five of the Master Plan.

TABLE IB
Airside Summary
Wiley Post Airport

	EXISTING CONDITION	ULTIMATE CONDITION
RUNWAY 17L-35R		
Runway Design Code (RDC)	RDC C-III-2400	RDC D-III-2400
Critical Design Aircraft	Bombardier Challenger 300	Gulfstream G550/Boeing Business Jet
Runway Dimensions (l x w) (in feet)	7,199' x 150'	Extend to 7,700 feet to accommodate heavier/faster business jets
Runway Pavement Strength	35,000 lbs. SWL/50,000 lbs. DWL/ 90,000 lbs. DTWL	Strengthen up to 170,000 lbs. DWL to accommodate the Boeing Business Jet
Safety Areas	Standard RSA w/Declared Distances; Standard ROFA w/Declared Distances; Standard ROFZ	Maintain
Runway Protection Zones (RPZs)	RPZs: 20 acres uncontrolled by airport; includes buildings and structures	Mitigate RPZ incompatibilities
RUNWAY 17R-35L		
Runway Design Code (RDC)	RDC B-II-5000	RDC D-II-5000
Critical Design Aircraft	Cessna Citation Sovereign	Gulfstream G450
Runway Dimensions (l x w) (in feet)	5,002' x 75'	Extend to 6,000 feet and widen to 100 feet to better serve mid-sized business jets
Runway Pavement Strength	26,000 lbs. SWL/45,000 lbs. DWL	Strengthen up to 73,900 lbs. DWL
Safety Areas	Standard RSA; ROFA; ROFZ	600' displaced threshold on 17R and declared distances applied to meet RSA/ROFA standards
Runway Protection Zones (RPZs)	RPZs: 6 acres uncontrolled by airport – primarily diversion channel property	Acquire avigation easements for uncontrolled RPZ properties.
RUNWAY 13-31		
Runway Design Code (RDC)	RDC B-I(S)-VIS	RDC B-I(S)-VIS
Critical Design Aircraft	Beechcraft King Air 100	Beechcraft King Air 100
Runway Dimensions (l x w) (in feet)	4,214' x 100'	Maintain to a minimum of 60 feet wide; reclaim 348' aligned taxiway for runway pavement (4,562' ultimate length)
Runway Pavement Strength	35,000 lbs. SWL/50,000 lbs. DWL/ 90,000 lbs. DTWL	Maintain to a minimum of 12,500 pounds SWL
Safety Areas	Standard RSA; ROFA; ROFZ	Maintain
Runway Protection Zones (RPZs)	RPZs: 4 acres uncontrolled by airport	Acquire avigation easements for uncontrolled property
TAXIWAYS		
Taxiway Design Group (TDG)	TDG-3	TDG-3
Taxiway Width	All taxiways at least 50' wide	Maintain
Taxiway Geometry Issues	Taxiway A2 intersects with multiple runways	Eliminate A2 pavement
	Wide pavement area at the end of Runway 17R	Eliminate excessive pavement

TABLE IB (continued)
Airside Summary
Wiley Post Airport

NAVIGATIONAL AND APPROACH AIDS		
Instrument Approach Procedures	9 published approach procedures including ILS and GPS	Maintain
Weather Reporting Station	Automated Surface Observation System (ASOS)	Maintain
Airport Traffic Control Tower	ATCT repairs/upgrades needed	Identified two potential sites for a new tower
Visual Approach Aids	PAPI-4s - Runways 17L, 17R, 35L, 35R	Install PAPI-2s on Runway 13-31
	MALSR - Runways 17L, 35R	Potential MALSR for Runway 35L to support lower visibility minimums
	REILs - Runways 17R, 35L	Maintain
LIGHTING, MARKING, AND SIGNAGE		
Lighting	Rotating Beacon	Maintain
	HIRL - Runway 17L-35R	Consider gradual replacement with LED technology
	MIRL - Runways 17R-35L and 13-31	Maintain
Marking	Precision Markings - Runway 17L-35R	Maintain
	Non-Precision Markings – Runways 17R-35L and 13-31	Potential upgrade to precision markings on Runway 17R-35L to support lower visibility minimums
	Runway 17L-35R - Holding position markings 263' from runway centerline	Maintain
	Runway 17R-35L - Holding position markings 200' from runway centerline	Relocate to 250' from runway centerline
	Runway 13-31 - Holding position markings 200' from runway centerline	Maintain
Signage	Lighted airfield location, directional, and distance remaining signage	Consider gradual replacement with LED technology

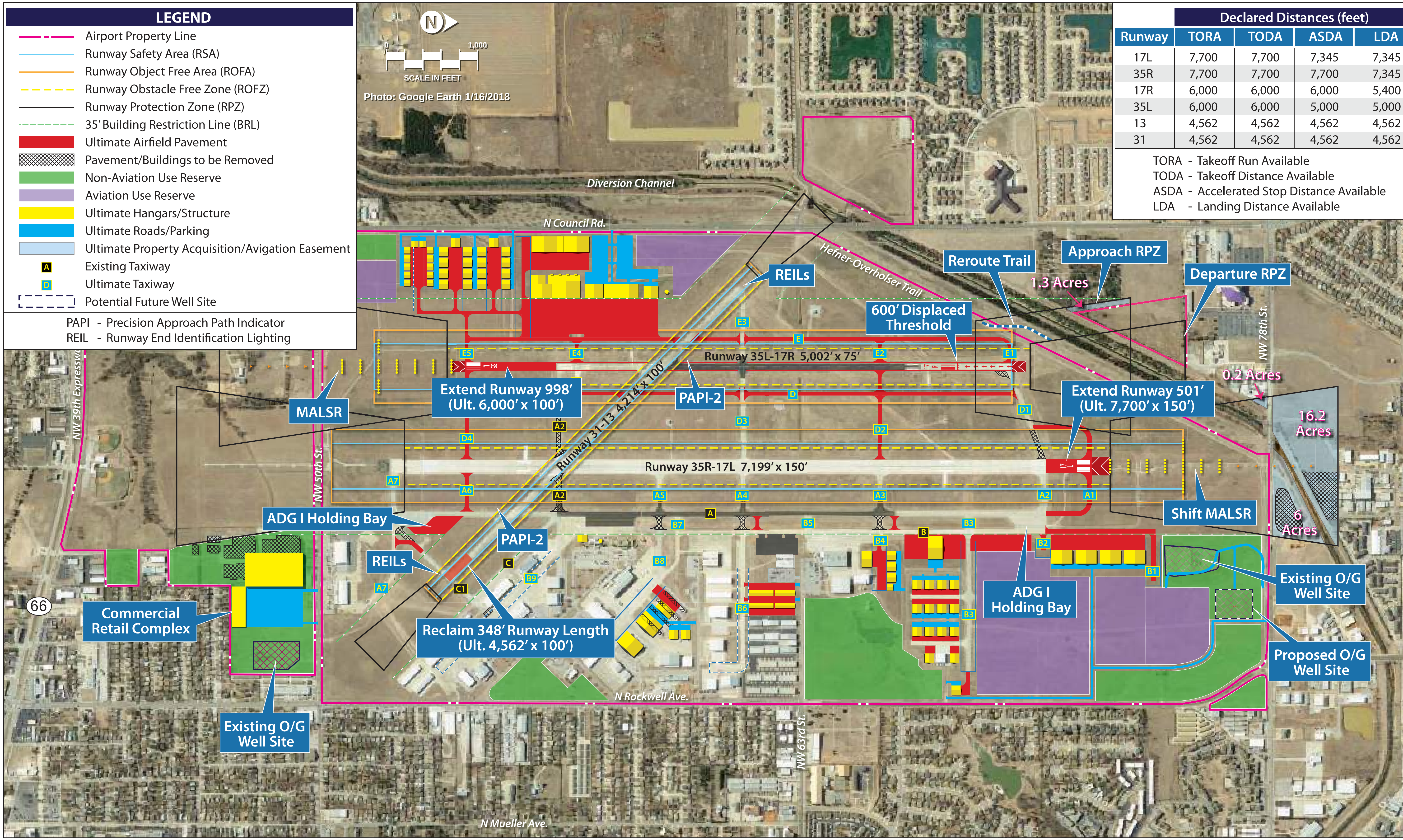
Landside Summary

Landside facilities at PWA consist of aircraft storage hangars, parking aprons, and businesses providing aviation services (fixed base operators [FBOs] and specialty aviation service operators [SASOs]). Additional landside support facilities include fuel storage tanks, maintenance facilities, and vehicle parking lots and access roads. The master plan provides recommendations on the development of new landside facilities to accommodate the needs of existing and future users.

All hangar-related development should occur only as dictated by demand. The locations and sizes of hangars proposed in the recommended concept are conceptual and may not reflect the needs of future developers and their customers. The recommended concept is intended to be used strictly as a guide for PWA staff when considering new developments.

A summary of landside recommendations is included below.

- **East Side** | Recommended facilities include a variety of new hangars including T-hangars for individual small aircraft and conventional hangars to support FBOs/SASOs that can accommodate the storage of multiple aircraft. Approximately 59 acres of PWA property that is inaccessible to the airfield is reserved for future non-aviation use development such as commercial/office park,



Declared Distances (feet)

Runway	TORA	TODA	ASDA	LDA
17L	7,700	7,700	7,345	7,345
35R	7,700	7,700	7,700	7,345
17R	6,000	6,000	6,000	5,400
35L	6,000	6,000	5,000	5,000
13	4,562	4,562	4,562	4,562
31	4,562	4,562	4,562	4,562

TORA - Takeoff Run Available
TODA - Takeoff Distance Available
ASDA - Accelerated Stop Distance Available
LDA - Landing Distance Available

Exhibit IB
RECOMMENDED DEVELOPMENT CONCEPT

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light industrial, and/or government agency uses. Additionally, the old Gulfstream Aerospace aircraft manufacturing plant hangars south of Northwest 50th Street are planned to be demolished and the site redeveloped for non-aviation uses such as a commercial retail complex.

- **West Side** | Development on the west side is dependent on the extension of utility (electric, water, sewer, etc.) infrastructure. It is anticipated that development of the west side would not begin until available property on the east side is built-out or if a large-scale operation comes to PWA. Potential development includes a large-scale maintenance, repair, overhaul (MRO) or aircraft manufacturing facility that includes several large conventional hangars and an adjoining 66,700-square yard (sy) apron. Additional facilities include 5,000 sf and 10,000 sf conventional hangars and additional property reserved for aviation-related and non-aviation related uses.

DEVELOPMENT FUNDING

The full implementation of the Airport Master Plan is likely to take two decades or more at a cost of $87.1 million in 2018 dollars. The breakdown of funding over the three planning horizons is presented in **Table IC**. Approximately 66 percent of the total is eligible for grant funding from the FAA or the Oklahoma Aeronautics Commission (OAC). The source for FAA funding is the Aviation Trust Fund, which is funded through user fees and taxes on airline tickets, aviation fuel, and aircraft parts. A more detailed discussion of the Capital Improvement Program can be found in Chapter Six of the Master Plan.

With the Airport Master Plan Update completed, the most important challenge is implementation. The cost of developing and maintaining aviation facilities is an investment which yields impressive benefits for the OCAT. This plan and associated development program provide the tools the OCAT will require to meet the challenges of the future. By providing a safe and efficient facility, PWA will continue to be a valuable asset to Oklahoma City and the surrounding region.

TABLE IC
Development Funding Summary
Wiley Post Airport

PLANNING HORIZON	Total Cost	AIP-Eligible Share	OAC Share	OCAT Share
Short-Term Program	$10,294,039	$8,943,892	$61,050	$1,289,098
Intermediate-Term Program	$27,698,688	$15,327,824	$851,546	$11,519,319
Long-Term Program	$49,118,242	$30,964,901	$1,720,272	$16,433,069
Total Program Costs	**$87,110,969**	**$55,236,616**	**$2,632,868**	**$29,241,486**

Sources: Project cost estimates prepared by the engineering firm CP&Y and project staging established by OCAT and Coffman Associates.

WILEY POST AIRPORT

Chapter One

Inventory

Chapter One

INVENTORY

To produce a realistic and adequate plan for future growth at Wiley Post Airport (PWA), it is essential to understand the framework within which the airport functions. An initial task within this Master Plan consists of gathering data to provide a clear definition of the airport's physical and operational features, including facilities, users, and activity levels. The information that follows formed the baseline for developing this report.

The initial action necessary in preparing a master plan is the collection of all pertinent data that relates to the area served by the airport, as well as the airport itself. This inventory was conducted using the following sources of information:

- *Wiley Post Airport Master Plan Update*, 2009
- *planokc*, adopted by City Council on July 21, 2015
- Wiley Post Airport website: http://www.wileypostairport.com
- Oklahoma City Department of Airports, *Minimum Standards for Aeronautical Activities and Leasing of Land and Facilities at Oklahoma City Airports*, approved October 27, 2016.

This chapter briefly describes the physical facilities at the airport. Aviation-specific information on the airspace, aviation activity, and role of the airport are described. The chapter also details the environment in which the airport operates, including socioeconomic characteristics of the region.

AIRPORT SETTING

LOCALE

Airport Entrance Signage

PWA is located within the jurisdictional boundary of Oklahoma County, approximately seven miles northwest of downtown Oklahoma City. The airport is within Oklahoma City limits but, as shown on **Exhibit 1A**, is bordered by the City of Bethany and the City of Warr Acres to the south and east. The Oklahoma City Metropolitan Statistical Area (MSA) consists of seven counties: Canadian, Cleveland, Grady, Lincoln, Logan, McClain, and Oklahoma. Shawnee, the micro urban area located in Pottawatomie County, is also included in the Oklahoma City MSA, bringing the total land area of the Oklahoma City MSA to 6,359 square miles. According to the U.S. Census Bureau, the Oklahoma City MSA's estimated population for 2017 is 1,383,737. Oklahoma City has a land area of approximately 620 square miles.

PWA is one of two publicly owned airports in Oklahoma County, the other being Will Rogers World Airport (OKC). PWA is classified in the Federal Aviation Administration's (FAA) *National Plan of Integrated Airport Systems* (NPIAS) as a National Reliever airport. Reliever airports are defined as high capacity general aviation airports in major metropolitan areas. These specialized airports provide pilots with attractive alternatives to using congested hub airports in addition to providing access to the surrounding area.

COMMUNITY PLANNING

On July 21, 2015, the City Council of Oklahoma City adopted a comprehensive plan update called *planokc*. The comprehensive plan serves the community and city leaders by guiding future growth, development, policy, and capital improvements. The plan includes seven "Big Ideas":

1. Develop a transportation system that works for everyone.
2. Increase housing choice and diversity for all lifestyles.
3. Build an urban environment that facilitates health and wellness.
4. Develop great places that attract people and catalyze development and innovation.
5. Ensure stable, safe, attractive, and vibrant neighborhoods.
6. Develop efficiently to achieve fiscal sustainability and improve our quality of life.
7. Preserve rural character and natural resources.

As a significant part of the city's transportation infrastructure and an economic driver, PWA should be planned to help achieve these overall ideas for the future growth of the community. The plan includes a map showing land use typology areas (LUTAs), which are depicted on **Exhibit 1B**. According to this map, PWA is classified as a Heavy Industrial use area, which is defined as "intended to accommodate industrial

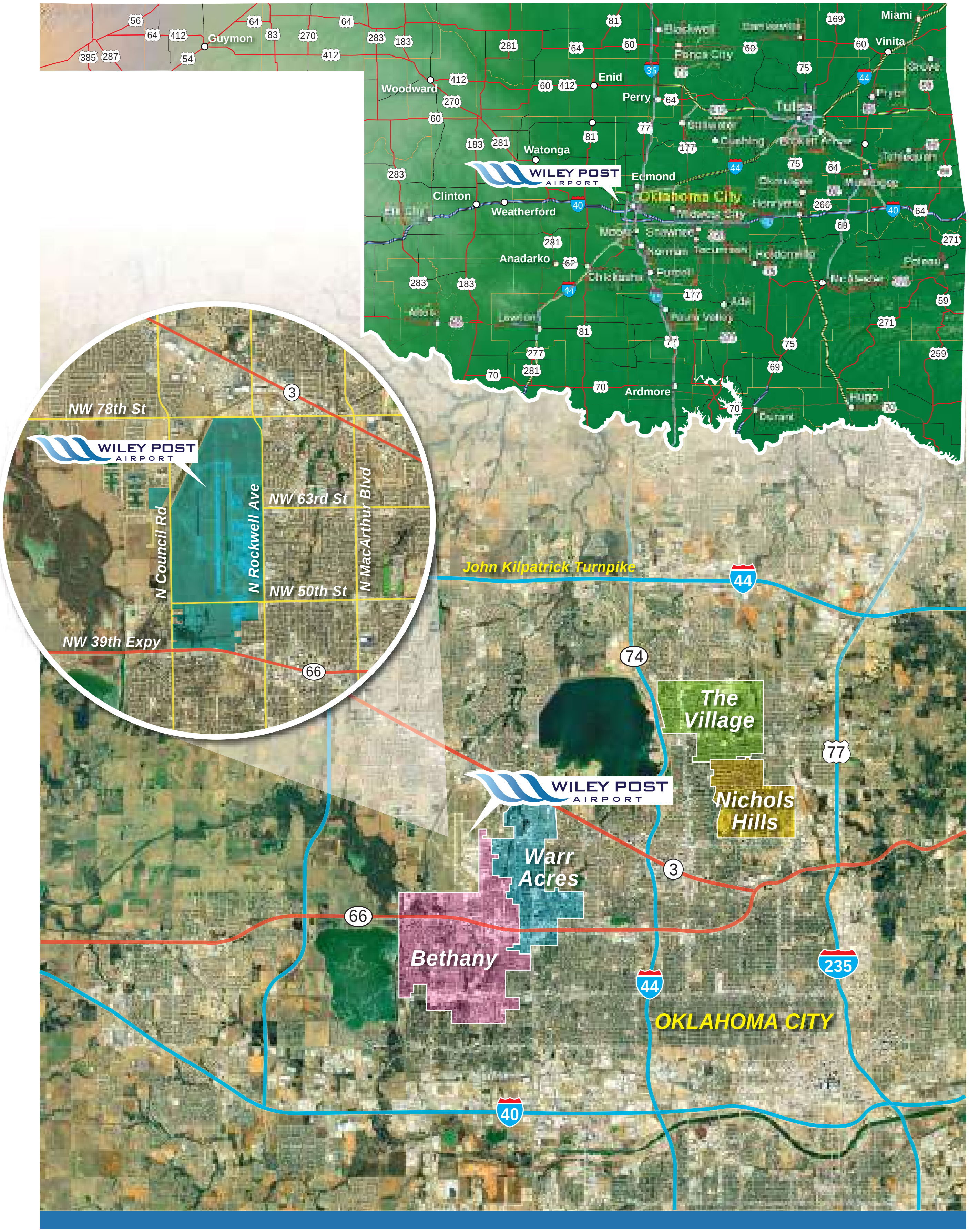


Exhibit 1A
LOCATION MAP

uses that are difficult to integrate with less intense uses due to negative impacts from heavy traffic, noise, or odors." Areas immediately surrounding the airport to the west, north, and northeast within the Oklahoma City limits are classified as Urban-low intensity, which is "applicable to the least intensely developed areas of the city that still receive urban water, sewer, police, park, and fire services." The map also shows that the City of Bethany and the City of Warr Acres border the airport to the south and east.

The City has also adopted, within its municipal code, Airport Environs Zones (Article XIII – Zoning Overlay Districts § 59-13150). These zones are applied to each of the city's airports, including PWA, and consist of Airport Environs Zone One (AE-1) and Airport Environs Zone Two (AE-2).

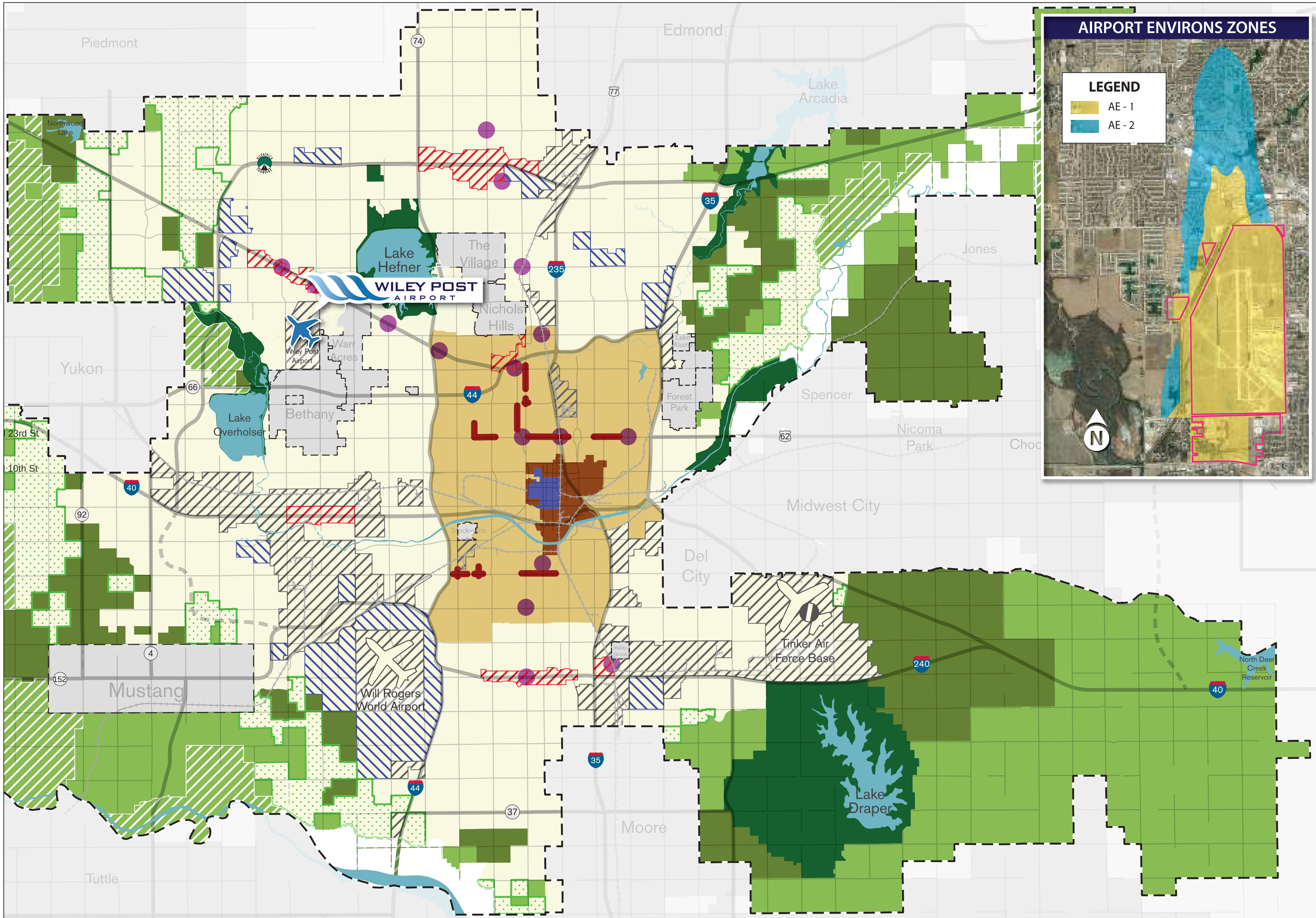
AE-1 is governed by the following regulations:

1. "Certain land uses, such as agricultural, airport property and related uses, industrial uses, wholesale and retail commercial uses, and areas zoned for open space or recreational uses, are deemed compatible, and therefore shall be exempted from the provisions of Division 4 of Article II of Chapter 12 of the Oklahoma City Municipal Code.
2. Other uses allowed within the AE-1 Zone shall meet or exceed building code requirements for a minimum noise level reduction of 30 decibels inside the structure as set forth in Division 4 of Article II of Chapter 12 of the Oklahoma City Municipal Code.
3. All uses allowed within this zone shall grant an avigation easement right as a condition of subdivision or building permit approval, except as otherwise provided herein. Said avigation easement right shall be granted to the Oklahoma City Airport Trust for uses within the AE-1 Zones for Will Rogers World Airport, Wiley Post Airport and Clarence E. Page Airport.
4. All residential uses and institutional uses such as schools, community centers, churches, etc., are prohibited in this zone."

AE-2 is governed by the following regulations:

1. "Certain land uses, such as agricultural, airport property and related uses, industrial uses, wholesale and retail commercial uses, and areas zoned for open space or recreational uses, are deemed compatible, and therefore shall be exempted from the provisions of Division 4 of Article II of Chapter 12 of the Oklahoma City Municipal Code.
2. Other uses allowed within this zone shall meet or exceed building requirements for a minimum noise level reduction of 25 decibels, inside the structure as set forth in Division 4 of Article II of Chapter 12 of the Oklahoma City Municipal Code.
3. All uses allowed within this zone shall grant an avigation easement right as a condition of subdivision or building permit approval, except as otherwise provided herein. Said avigation easement right shall be granted to the Oklahoma City Airport Trust for uses within the AE-2 Zones for Will Rogers World Airport, Wiley Post Airport and Clarence E. Page Airport."

The AE-1 and AE-2 zones applicable to PWA are depicted on **Exhibit 1B**.



LEGEND

- Regional District
- Heavy Industrial
- Employment Reserve
- Urban Reserve
- Agricultural Preserve
- Urban Commercial
- Transit-Oriented
- Downtown
- Urban – High Intensity
- Urban – Medium Intensity
- Urban – Low Intensity
- Rural – Medium Intensity
- Rural – Low Intensity
- Open Space

N

0 3
SCALE IN MILES

Source: planokc, adopted by City Council on July 21, 2015

LAND USE MAP

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CLIMATE

Knowledge of climate and typical regional weather conditions greatly enhances a pilot's flying capabilities. Likewise, the ability to prepare for these conditions enhances the use of an airport. High surface temperatures and high humidity increase runway length requirements. Runway orientation is dependent on predominant wind patterns for the area. Cloud cover percentages and frequency of other climatic conditions also determine the need for navigational aids and lighting.

Table 1A summarizes climatic data sourced from the National Oceanic and Atmospheric Administration (NOAA) PWA automated surface observation system (ASOS) weather station (station ID: GHCN: USW00003954). Data presented represents the period beginning January 1, 2008, through December 31, 2017, also sourced from the PWA ASOS. This data shows an average annual high temperature of 71.1 degrees and an average annual low temperature of 49.6 degrees. July is the hottest month of the year with average highs reaching 93.2 degrees, and January is the coolest month of the year with average lows down to 27.5 degrees. Precipitation is most plentiful during the month of June, which averages 4.71 inches of precipitation. Snowfall in the region is very rare.

TABLE 1A
Climate Summary
Wiley Post Airport

	Precipitation	Temperature (°F)		
Month	Precip. Mean (inches)	Mean Min	Mean	Mean Max
January	0.68	27.5	38.1	48.7
February	1.22	31.0	42.2	53.5
March	2.78	39.2	50.5	61.9
April	2.93	48.3	59.5	70.7
May	4.07	58.5	69.1	79.6
June	4.71	66.9	77.2	87.6
July	2.69	71.9	82.6	93.2
August	3.29	70.7	81.6	92.4
September	3.41	62.7	73.2	83.6
October	3.26	50.2	61.3	72.3
November	1.84	39.1	49.6	60.0
December	1.51	29.2	39.3	49.4
Annual Average	2.70	49.6	60.4	71.1

[1]With greater than or equal to 0.1 inch of precipitation.

Source: NOAA Monthly Normals 2008-2017; Station ID: OKLAHOMA CITY WILEY POST AIRPORT, OK US - GHCND:USW00003954.

Presented in **Table 1B**, visual meteorological conditions (VMC) at PWA occur 93.30 percent of the time. When under VMC conditions, pilots are able to operate using visual flight rules (VFR) and are responsible for maintaining proper separation from objects and other aircraft. Instrument meteorological conditions (IMC) accounts for all weather conditions less than VMC conditions that still allow for aircraft to safely operate under instrument flight rules (IFR). Under IFR, pilots rely on instruments in the aircraft to accomplish navigation. IMC conditions occur approximately 3.91 percent of the time, while less than IMC, or poor visibility conditions (PVC), are present 2.79 percent of the time. These weather conditions are lower than instrument approach minimums, making the airport inaccessible to most air traffic.

TABLE 1B
Weather Conditions
Wiley Post Airport

Condition	Cloud Ceiling	Visibility	Count	Percent of Total
VMC	> 1,000' AGL	> 3 statute miles	205,448	93.30%
IMC	≥ 500' AGL and ≤ 1,000' AGL	1-3 statute miles	146,765	3.91%
PVC	< 500' AGL	< 1 statute mile	4,908,047	2.79%

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

Source: National Oceanic and Atmospheric Administration (NOAA) - National Climatic Data Center. Airport observations from January 2008 – December 2017.

CAPITAL IMPROVEMENT HISTORY

To assist in funding capital improvements, the FAA has provided funding assistance to PWA through the Airport Improvement Program (AIP). The AIP is funded through the Aviation Trust Fund, established in 1970 to provide funding for aviation capital investments such as facilities and equipment, as well as research and development.

Table 1C summarizes the capital improvement projects undertaken at the airport since 2006. Over this period, PWA has received approximately 15.8 million in AIP grants. The grants have funded several airfield pavement rehabilitation projects, the taxiway and runway lighting upgrades, and updates to the airport master plan.

TABLE 1C
AIP Grant History
Wiley Post Airport

Fiscal Year	Project Number	Project Description	AIP Grant Amount ($)
2006	15	Install Taxiway Lighting, Rehabilitate Apron, Rehabilitate Runway 17R/35L, Rehabilitate Taxiway	$475,000
2007	16	Rehabilitate Taxiway, Update Airport Master Plan Study	$2,751,662
2008	17	Rehabilitate Taxiway	$2,011,240
2009	19	Rehabilitate Taxiway	$115,000
2009	18	Rehabilitate Runway Lighting - 17L/35R	$428,500
2010	20	Rehabilitate Taxiway	$1,200,000
2014	21	Install Runway Lighting - 17R/35L, Install Runway Vertical/Visual Guidance System - 17R/35L, Rehabilitate Runway 17R/35L, Rehabilitate Taxiway	$2,475,097
2015	22	Rehabilitate Runway 17L/35R, Rehabilitate Runway Lighting - 17L/35R	$3,560,494
2016	23	Rehabilitate Taxiway, Rehabilitate Taxiway Lighting	$2,955,690
2017	24	Update Airport Master Plan Study	$340,000
		Total	$15,837,683

Source: FAA AIP Grant History Lookup Tool

AIRPORT ADMINISTRATION

The Oklahoma City Department of Airports (OCDA) is comprised of three airports: Will Rogers World Airport, Wiley Post Airport, and Clarence E. Page Airport. The airports are owned by the City of Oklahoma City and leased to the Oklahoma City Airport Trust (OCAT), which oversees the management of the facilities. The department is led by an Airports Director, who is responsible for the operations of the airport system.

The OCAT is composed of five members who oversee the operations of the three airports that comprise the OCDA, plus buildings and grounds for the Mike Monroney Aeronautical Center, a major national Federal Aviation Administration Complex.

ECONOMIC IMPACT

In 2017, the Oklahoma Aeronautics Commission (OAC) completed a study of the economic impact of aviation and aerospace industries in Oklahoma. The study found that among the state's 109 study airports, aviation contributed $10.6 billion in economic activity. Of that amount, PWA contributes $187.7 million, or 1.8 percent of the state total. A summary of PWA's economic impact is provided in **Table 1D**.

TABLE 1D
Economic Impacts
Wiley Post Airport

Description	Impacts
Total Economic Activity	$187,742,279
Annual Payroll	$79,593,938
Employment	1,636.3
Spending	$108,148,341

Source: Oklahoma Aviation and Aerospace Economic Impact Study, Executive Summary

THE AIRPORT'S SYSTEM ROLE

Airport planning takes place at the local, regional, state, and national levels. Each level has a different emphasis and purpose. On the national level, the airport is included in the NPIAS. On the state level, the airport is included in the *Oklahoma Airport System Plan*. The local planning document is the Airport Master Plan, which was last updated in 2009.

FEDERAL AIRPORT PLANNING

The FAA maintains a database of airports that are eligible for AIP funding that are for public use called the NPIAS. The NPIAS categorizes these facilities by the type of activities that take place, including commercial service, cargo service, reliever operations, and general aviation (as seen in **Table 1E**). Furthermore, the FAA provides definitions for the various roles that general aviation facilities provide for their service areas, which **Table 1F** describes. PWA is currently classified as a National Reliever Airport in the FAA's NPIAS. Reliever airports are considered high-capacity general aviation facilities in major metropolitan areas that provide pilots with alternatives to congested hub airports, while simultaneously providing access to the surrounding area. The following represent reliever airport eligibility requirements:

- The airport must be open to the public;
- The airport must maintain 100 or more based aircraft; or,
- The airport must have at least 25,000 annual itinerant operations.

TABLE 1E
Airport Classifications

<table>
<tr><th colspan="2">Airport Classifications</th><th>Hub Type: Percentage of Annual Passenger Boardings (enplanement)</th><th>Common Name</th></tr>
<tr><td rowspan="5">Commercial Service:
Publicly owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service</td><td rowspan="4">Primary:
Have more than 10,000 passenger boardings each year</td><td>Large:
1% or more</td><td>Large Hub</td></tr>
<tr><td>Medium:
At least 0.25%, but less than 1%</td><td>Medium Hub</td></tr>
<tr><td>Small:
At least 0.05%, but less than 0.25%</td><td>Small Hub</td></tr>
<tr><td>Nonhub:
More than 10,000,
but less than 0.05%</td><td>Nonhub Primary</td></tr>
<tr><td>Nonprimary</td><td>Nonhub:
At least 2,500 and no more than 10,000</td><td>Nonprimary Commercial Service</td></tr>
<tr><td colspan="2">Nonprimary
(Except Commercial Service)</td><td>Not Applicable</td><td>Reliever
General Aviation</td></tr>
</table>

Source: https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories/

TABLE 1F
General Aviation Airport Descriptions

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

Source: https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories/

While PWA is classified in the NPIAS as a Reliever Airport, it has also been identified in the *General Aviation Airports: A National Asset* (2012) study as a "national" Airport. This study identified 84 airports within the national grouping. The FAA describes the national group as airports that support the national and state system by providing communities with access to national and international markets in multiple states throughout the U.S. These airports have high levels of activity, including jet and multi-engine aircraft operations, as well as single engine aircraft, and average 200 based aircraft, including 30 jets.
The most current plan is the NPIAS 2017-2021, which identified 3,340 public-use airports (3,332 existing and 8 proposed) that are important to national air transportation. The plan estimates that approximately $32.5 billion in AIP-eligible airport projects will require financial assistance between 2017 and 2021. **Table 1G** identifies the type of airports included in the NPIAS.

TABLE 1G
Activity and Development at NPIAS Airports

Number of Airports	Airport Category	Percentage of NPIAS Airports	Percentage of 2014 Total Enplanements[1]	Percentage of All Based Aircraft[2]	Percentage of NPIAS Cost[3]
30	Large Hub	1%	72	0.7%	20.9%
31	Medium Hub	1%	15	1.7%	9.6%
72	Small Hub	2%	8	4.7%	12.8%
249	Nonhub	7%	4	11.6%	16.2%
382	**Primary Subtotal**	**11%**	**99%**	**18.6%**	**59.4%**
89	National	3%	n/a	11.5%	5.4%
531	Regional	16%	n/a	25.6%	12.2%
1,261	Local	38%	n/a	21.2%	15.3%
813	Basic	24%	n/a	3.2%	6.6%
256	Unclassified	8%	n/a	1.0%	0.03%
2,950	**Nonprimary Subtotal**	**89%**	**n/a**	**62.6%**	**39.5%**
3,332	**Total NPIAS Airports**	**100%**	**99%**	**81.2%**	**99.0%**

[1] The remaining one percent of enplanements occurred at non-NPIAS airports
[2] Based on an active general aviation fleet of 203,880 aircraft in 2015
[3] These costs are rounded and do not include the cost for new airports (one percent)
Source: 2017 – 2021 National Plan of Integrated Airport Systems (NPIAS)

STATE AIRPORT PLANNING

The primary planning document for the State of Oklahoma's system of airports is the *Oklahoma Airport System Plan* (OASP). The OASP is updated by the Oklahoma Aeronautics Commission (OAC) on an annual basis and consists of seven primary activities:

1. Maintaining inventories of airport facilities, services, and activities;
2. Forecasting aviation activity;
3. Classifying airports with respect to their service level, role, design standard, and functional classification;
4. Conducting a public participation program;
5. Identifying the capital improvements needed at each system plan airport and the associated costs;
6. Preparing the annual capital improvement program; and,
7. Conducting special studies such as the economic impact of civil aviation activity, preparing action plans for specific system plan airports, preparing airport layout plans (ALP) and conducting an airport-pavement evaluation and management program.

The OASP identified four types of airport service levels serving varying roles for the Oklahoma airport system and are defined as follows:

Primary Commercial Service: These airports support scheduled passenger service by large and medium transport aircraft and enplane at least 10,000 passengers on an annual basis.

Non-Primary Commercial Service: Airports capable of accommodating scheduled passenger service by smaller transport aircraft and enplane fewer than 10,000 but more than 2,500 passengers annually.

Reliever: Airports designed primarily to relieve congestion at Commercial Service airports by providing alternative general aviation facilities.

General Aviation: Airports capable of providing air access for communities less than 30 minutes (drive time) from Commercial Service and Reliever airports and supports essential but low activity levels.

PWA is classified as a Reliever airport in the OASP. PWA is further classified as a Regional Business airport, which means that it serves multiple communities and is located near the center of a local sustaining economy, which is a geographical region that functions with some degree of independence from the rest of the state. The OASP also sets minimum design standards for its system of airports. PWA is planned within the OASP to meet the Transport airport design standards, which are listed in **Table 1H**.

TABLE 1H
Minimum Design Standards – Transport Category
Oklahoma Airport System Plan – Wiley Post

Airport Criteria	Minimum Objective
Design Aircraft	Heavy business jet
Airport Reference Code	C-III
Minimum Land	
Landing Area	136 acres
Approach Area	160 acres
Building Area	24 acres
Runways	
Length	5,000’
Width	100’
Strength	30,000 lbs
Lighting	MIRL
MIRL: MIRL Intensity Runway Lighting	

Source: Oklahoma Airport System Plan

LOCAL AIRPORT PLANNING

Airport Master Plan

The airport master plan is the primary local planning document. It is intended to provide a 20-year vision for airport development based on aviation demand forecasts. The most recent update to the airport planning document is the 2009 Airport Master Plan. Over time, the forecast element of an airport master plan typically becomes less reliable due to changes in aviation activity and/or the economy. As a result, the FAA recommends that airports update their master plans every five to ten years, or as necessary to address any significant changes. Therefore, this is an appropriate time to update the airport master plan and revisit the development assumptions from the previous planning study.

AVIATION ACTIVITY

Records of airport operational activity are essential for determining required facilities (types and sizes), as well as eligibility for federal funding. Airport staff and the FAA record key operational statistics including aircraft operations and based aircraft. Analysis of historical activity levels aid in projecting future trends which will enhance the airport's ability to plan for facility demands in a timely manner. The following sections detail specific operational activities.

OPERATIONS

Aircraft operational statistics at PWA are recorded by the airport traffic control tower (ATCT), which is operated daily from 7:00 a.m. to 10:00 p.m. Among other duties, the ATCT counts aircraft operations, which are defined as either a takeoff or a landing. Aircraft operations are segregated into four general categories: air carrier, air taxi, military, and general aviation. Air carrier operations are performed by commercial airline aircraft with greater than 60 seats. Air taxi operations are generally associated with commuter aircraft, but also include for-hire general aviation aircraft. Military operations are those conducted by airplanes and helicopters with a military identification. General aviation includes all other aviation activity from small ultralights to large business jets.

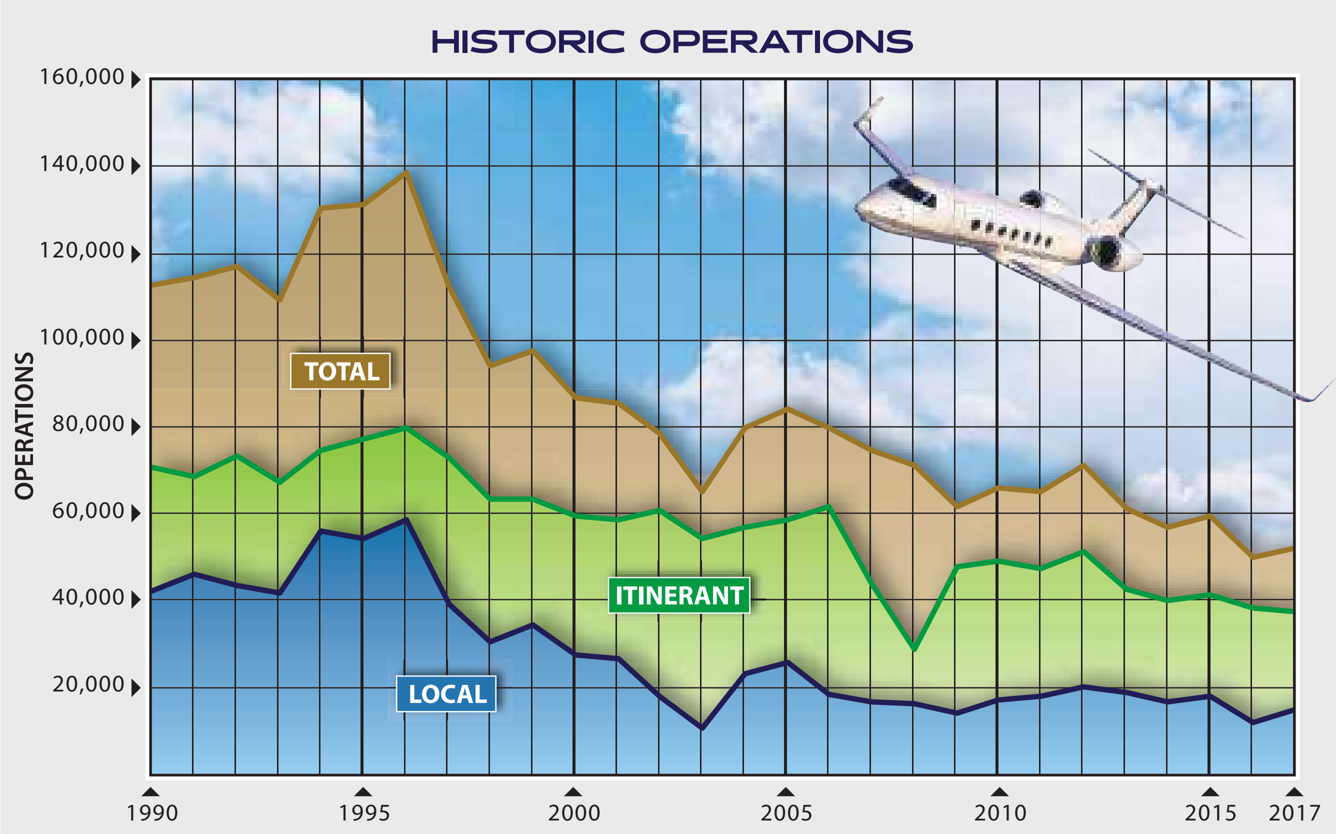
Records of airport operational activities are essential for determining required facilities (types and sizes), as well as eligibility for federal funding. A detailed account of aircraft operations (takeoffs and landings) is available dating back to 1990.

Exhibit 1C presents the annual aircraft operations at PWA since 1990, broken out by type of operation, local or itinerant, as well as the category of operations – air carrier, air taxi, military, or general aviation.

BASED AIRCRAFT

Identifying the current number of based aircraft is important to the master plan analysis as this number helps determine existing demand for a number of different facilities, including aircraft storage hangar space, parking aprons, pilot and passenger services, and various other aircraft support facilities.

The FAA's National Based Aircraft Program identifies a validated based aircraft count of 286 aircraft as of April 17, 2018. Small, single-engine piston aircraft make up approximately 58 percent (166 aircraft) of based aircraft and include representative aircraft such as the Cessna 172 and Piper 140. PWA has 44 based multi-engine aircraft such as the Beechcraft 58 Baron and Beechcraft Super King Air 300. There are also 13 civilian helicopters and 63 based jet aircraft. Examples of jet aircraft based at PWA include a variety of Cessna Citation business jets, Bombardier Challenger 600, several Learjets, and a Bombardier Global 5000. The current count and historic based aircraft data, sourced from the FAA *Terminal Area* Forecasts (TAF), is shown on **Exhibit 1C**.



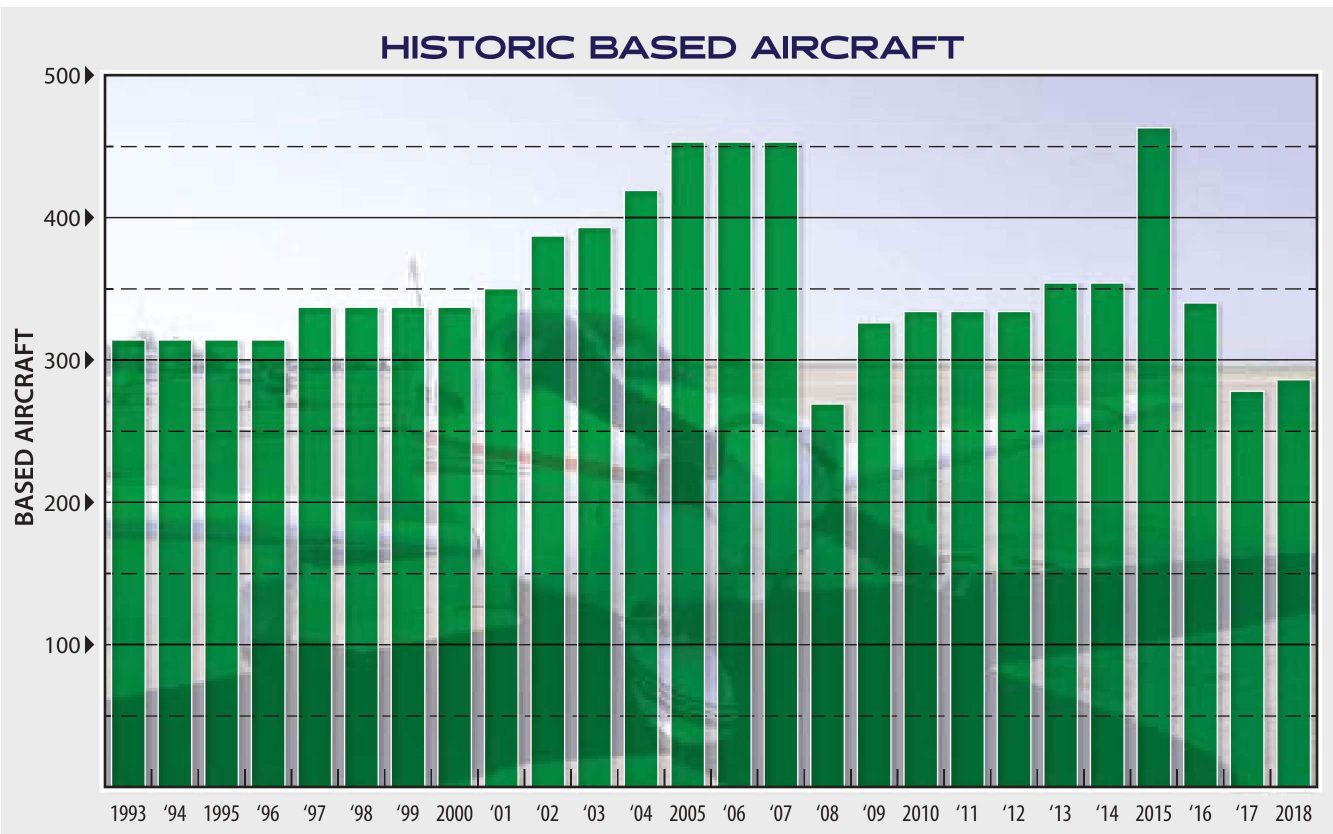


Exhibit 1C
HISTORIC OPERATIONS AND BASED AIRCRAFT

AIRPORT FACILITIES & SERVICES

There are four broad categories of facilities and services at the airport: airfield, landside, aviation, and support.

- **Airfield facilities** | facilities directly associated with aircraft operations, including runways, taxiways, lighting, markings, navigational aids, and weather reporting. **Exhibit 1D** depicts all airfield facilities at PWA.
- **Landside facilities** | facilities necessary to provide a safe transition from surface to air transportation and support aircraft parking, servicing, storage, maintenance, and operational safety, including non-aviation facilities that typically provide a revenue stream to the airport. **Exhibit 1E** depicts all landside facilities at PWA.
- **Aviation services** | organizations or facilities that provide aviation services, including aircraft fueling, aircraft parking, hangar space/leasing, flying clubs, flight instruction, air medical services, and aircraft maintenance.
- **Support facilities** | serve as a critical link to provide the necessary efficiency to aircraft ground operations, such as aircraft rescue, airport maintenance, firefighting (ARFF), and fuel storage.

AIRFIELD FACILITIES

RUNWAYS

Three runways serve PWA – Runway 17L-35R, 17R-35L, and Runway 13-31. Runway 17L-35R is the airport's primary runway, Runway 17R-35L is the secondary parallel runway, and Runway 13-31 is the crosswind runway. Information on each runway is available on **Exhibit 1D**.

Runway 17L

Runway 35R

Primary Runway 17L-35R

Runway 17L-35R is 7,199 feet long and 150 feet wide. The Runway 35R threshold is displaced by 355 feet. It is paved with concrete and at the time of this study is in good condition. It has a single wheel strength (S) of 35,000 pounds, a dual wheel strength (D) of 50,000 pounds, and a double tandem wheel strength (2D) of 90,000 pounds. Runway 17L-35R has precision pavement markings. Runway pavement edge lighting consists of high intensity runway lighting (HIRL), and each end is equipped with a medium intensity approach light system with runway alignment indicator light (MALSR). Each end of Runway 17L-35R is also equipped with instrument landing system (ILS) equipment including a glideslope antenna and localizer antenna. Additionally, each runway end has published global positioning system (GPS) approaches and very high frequency omnidirectional range (VOR) approaches. Each end is also equipped with a four-box precision approach path indicator (PAPI-4) system with standard 3.00-degree glide paths.

Parallel Runway 17R-35L

Runway 17R-35L is 5,002 feet long and 75 feet wide with no threshold displacements. It is paved with asphalt and concrete and at the time of this study is in good condition. The parallel runway has a centerline separation distance of 1,100 feet west of the primary runway. It has a single wheel strength of 26,000 pounds and a dual wheel strength of 45,000 pounds. Runway 17R-35L has non-precision pavement markings. Runway pavement edge lighting consists of medium intensity runway lighting (MIRL), and each end is equipped with runway end identifier lights (REILs). Each end of Runway 17R-35L is also equipped with GPS approaches as well as a PAPI-4 system with standard 3.00-degree glide paths.

Runway 35L

Crosswind Runway 13-31

Runway 13-31 is 4,214 feet long and 100 feet wide. It is paved with concrete and is in good condition. It has a single wheel strength of 35,000 pounds, a dual wheel strength of 50,000 pounds, and a double tandem wheel strength of 90,000 pounds. Despite these pavement strength ratings, the runway is closed to aircraft weighing over 12,500 pounds, and touch-and-go operations are not authorized on this runway. Runway 13-31 has non-precision pavement markings reported as being in poor condition. Runway lighting consists of MIRL and does not include REILs or PAPIs, and the runway does not have published instrument approaches.

Runway 13

LEGEND

- Airport Property Line
- A1 Taxiway Designation
- Supplemental Wind Cone

KEY

ASOS	Automated Surface Observing System
ATCT	Airport Traffic Control Tower
DME	Distance Measuring Equipment
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
PAPI	Precision Approach Path Indicator
VOR	Very High Frequency Omnidirectional Range

RUNWAYS	17L	35R	17R	35L	13	31
Pavement Surface Material	Concrete/Grooved		Asphalt/Concrete		Concrete	
Pavement Markings	Precision		Non-Precision		Non-Precision	
Traffic Pattern	Right	Left	Right	Left	Right	Left
Operational Restrictions	None	None	None	None	Closed 10:00 pm - 7:00 am	
Runway Pavement Loading Bearing Strength (lbs)						
Single Wheel Loading (SWL)	35,000		26,000		35,000	
Dual Wheel Loading (DWL)	50,000		45,000		50,000	
Double Tandem Wheel Loading (DTWL)	90,000		N/A		90,000	
Runway Lighting						
Runway Edge Lighting	High Intensity		Medium Intensity		Medium Intensity	
Approach Lighting System (ALS)	MALSR	MALSR	None	None	None	None
Runway End Identifier Lights (REILs)	No	No	Yes	Yes	No	No
Visual Approach Aids						
Type	PAPI-4	PAPI-4	PAPI-4	PAPI-4	None	None
Visual Glide Angle	3.00 deg	3.00 deg	3.00 deg	3.00 deg	N/A	N/A
Instrument Approach Aids						
Instrument Landing System (ILS)	Yes	Yes	No	No	No	No
GPS-Based Approach	Yes	Yes	Yes	Yes	No	No
VOR	Yes	Yes	No	No	No	No

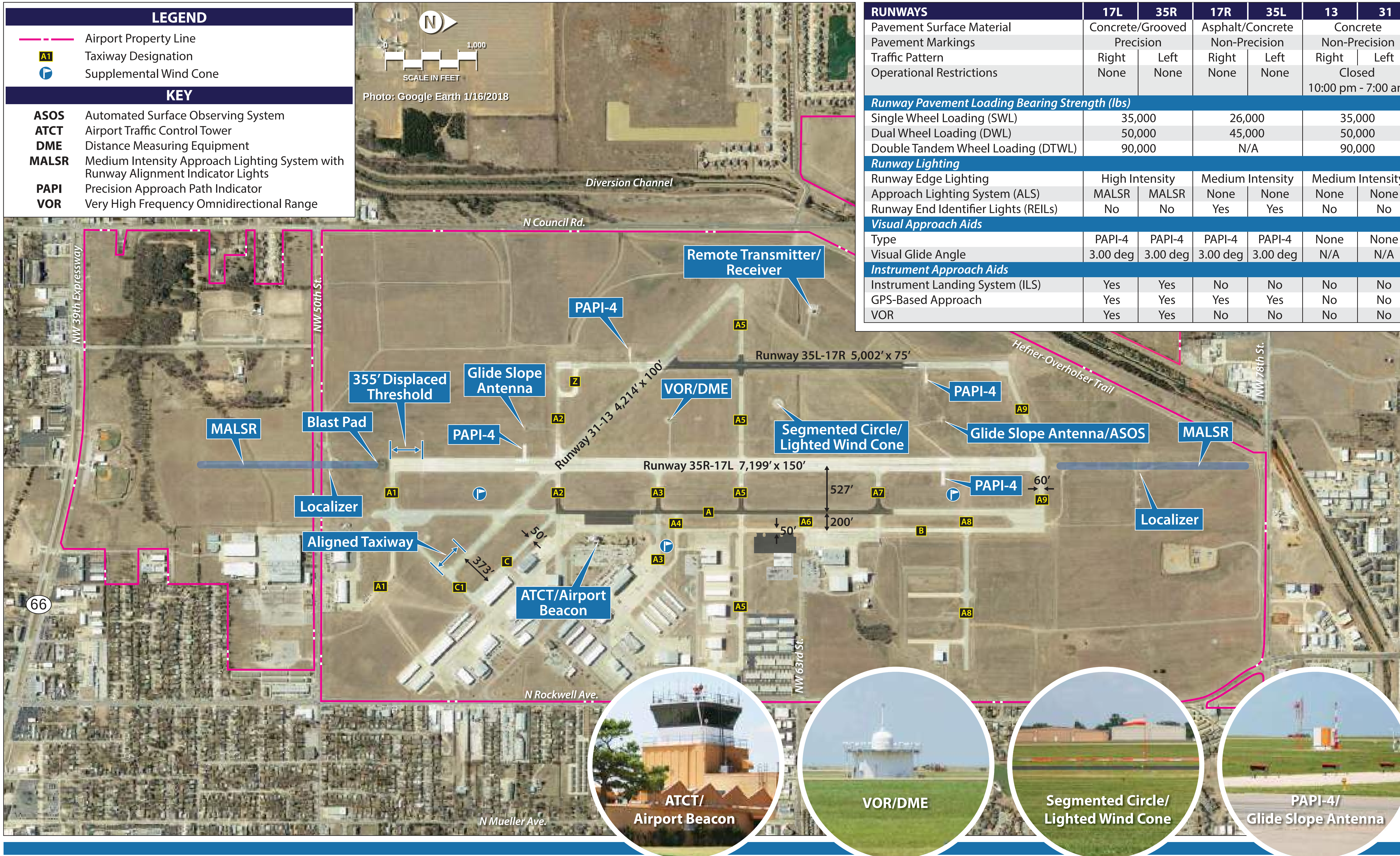


Exhibit 1D
AIRSIDE FACILITIES

ID	Hangar	Tenant/Business	Hangar Area (sf)	Bays
1	15	Air Centre/Streamline Detailing Inc.	12,600	--
2	18	Atlantic Aviation	8,000	--
3	22	Atlantic Aviation	26,400	--
4	2b	Atlantic Aviation	10,850	10
5	2c	Atlantic Aviation	10,850	10
6	2d	Atlantic Aviation	15,600	--
7	2e	Atlantic Aviation	13,750	12
8	2f	Atlantic Aviation: Airways - PWA/ Commodore Aerospace Corp./ D&B Aircraft Engines	36,000	12
9	3d	Atlantic Aviation	36,000	12
10	4b	Atlantic Aviation	9,100	8
11	4c	Atlantic Aviation	9,100	8
12	4d	Atlantic Aviation	18,900	8
13	4e	Atlantic Aviation	18,900	8
14	5b	Atlantic Aviation	12,000	10
15	5c	Atlantic Aviation	12,400	10
16	5d	Atlantic Aviation	12,200	10
17	5e	Atlantic Aviation	12,200	10
18	6b	Atlantic Aviation	15,900	10
19	6c	Atlantic Aviation	13,750	12

ID	Hangar	Tenant/Business	Hangar Area (sf)	Bays
20	14	American Jet Charter/Oklahoma Aviation/ First Global/Bill Black Aircraft Sales/ TK Aero/Xact Inc./Thomas Jets/Pilot Medical Solutions/Dr. Kenneth Rogers/ Textron-Beechcraft Aviation/Takle Management LLC/Cirrus Design	30,000	--
21	6	Avion Aero	25,500	--
22	N/A	C.E. Page Building - Quiet Birdmen		
23	3c	Calvin Taff Electronics	13,300	--
24	17	Capital Aviation	15,625	--
25	1	Capital Aviation	14,875	--
26	12	Capital Aviation	20,000	--
27	3	E.T. Mechanical/Interiors Unlimited	30,100	--
28	2	Atlantic Aviation	30,100	--
29	N/A	FAA Building		--
30	N/A	Flight Safety		--
31	N/A	Gulfstream		--
32	N/A	Meta Special Aerospace		--
33	23	Midland Financial Aviation Dept.	16,900	--
34	25	Continental Resources Aviation Dept.	19,000	--
35	24	Oklahoma Museum of Flying	10,000	--
36	29	JetSet FBO	28,500	

ID	Hangar	Tenant/Business	Hangar Area (sf)	Bays
37	M1	PWA Maintenance		--
38	24A-24J	PWA, Inc.	117,000	81
39	19	Atlantic Aviation	12,600	--
40	3b	Scott Jones Aircraft Sales	10,850	10
41	21	Turbine Aircraft Services	9,000	
42	N/A	Terminal		--
43	4	Cooper Family Management: Bank 7/700HC, LLC/Interstate Helicopters/Citation Aviation, LLC/Radio Flyer LLC	39,000	--
44	16	Atlantic Storage	8,000	--
45	8A	Meta Special Aerospace	14,450	--
46	9	Meta Special Aerospace	33,000	--
47	8	Meta Special Aerospace FBO	39,600	--
48	10	Meta Special Aerospace	35,525	--
49	11	Meta Special Aerospace	35,000	--
50	28	Southern Wings Aircraft Sales	10,000	--
51	N/A	Pumping Facility (Fire Station)		--
52	N/A	Airport Electrical Vault		--
53	27	Pronto, LLC	18,000	--

Exhibit 1E
LANDSIDE FACILITIES

TAXIWAYS

The taxiway system at PWA consists of parallel and connector taxiways. Taxiway widths are identified on **Exhibit 1D**. All taxiways are lighted with medium intensity taxiway lights (MITL).

Taxiway A2

Parallel taxiways are primarily designed to efficiently and quickly route aircraft between the runway and the origination/destination location. Taxiway A is the airport's only full-length parallel taxiway. Taxiway A is 50 feet wide and is constructed of asphalt and concrete. Taxiway A runs the length of Runway 17L-35R and includes six connecting taxiways (A1, A2, A3, A5, A7, and A9) serving the primary runway. The Taxiway A centerline is separated from the runway centerline by a distance of 527 feet to the east.

Taxiway B is 50 feet wide and is a dual-parallel taxiway to Taxiway A, extending from A9 on the north end to A2 on the south end. Taxiway B is constructed of concrete and is separated from Taxiway A by 200 feet, centerline to centerline. Taxiway C is a 50-foot wide partial-parallel taxiway serving Runway 13-31 from the 31 end to A2. Taxiways A2, A5, and A9 provide access to the parallel runway, and A5 provides access to the Runway 13 end.

AIRFIELD LIGHTING

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

Airport Identification Lighting: The location of the airport at night or during low-visibility weather is universally identified by a rotating beacon. A rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The airport beacon is located on the roof of the ATCT.

Runway Pavement and Edge Lighting: Pavement edge lighting utilizes light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility to maintain safe and efficient access to and from the runway and aircraft parking areas. Runway 17L-35R is equipped with HIRL. Runway 17R-35L and Runway 13-31 are both equipped with MIRL.

Approach Lighting System (ALS): An ALS is a configuration of lights positioned symmetrically along the extended runway centerline to supplement navigational aids, such as ILS, to provide lower visibility minimums. Examples include the ALS with flashing lights (ALSF), ALS with sequenced flashers I & II (ALSF-1/ALSF-2), medium intensity ALS with runway alignment (MALSR), and the medium intensity ALS (MALS). Airports equipped with an ILS are typically equipped with a MALSR. PWA is equipped with a MALSR in the approach to both Runway 17L and Runway 35R.

Visual Approach Lighting: Visual approach aids have been installed at the airport to assist pilots in determining the correct descent path to the runway end during an approach to the airport. A PAPI-4 is available on approach to Runways 17L, 35R, 17R, and 35L. When the system of red and white lights is interpreted by the pilot, they are given an indication of being above, below, or on the designated descent path to the runway threshold. A PAPI system has a range of five miles during the day and up to twenty miles at night. Each PAPI at PWA provides a standard 3.00-degree glidepath. Runway 13-31 is not equipped with a visual approach lighting system.

PAPI Fixtures

Runway End Identifier Lights (REILs): REILs provide a visual identification of the runway end for landing aircraft. The REILs consists of two synchronized flashing lights, located laterally on each side of the runway end, facing the approaching aircraft. These flashing lights can be seen day or night for a distance of up to 20 miles depending on visibility conditions. Each end of Runway 17R-35L is equipped with REILs.

REIL

Taxiway Lighting: All taxiways are equipped with blue MITL.

Pilot-Controlled Lighting: During nighttime hours when the ATCT is closed (10:00 p.m. to 7:00 a.m.), pilots can utilize the pilot-controlled lighting system (PCL) to activate certain airfield lights from their aircraft through a series of clicks of their radio transmitter utilizing the common traffic advisory frequency (CTAF) frequency (126.9 MHz). The HIRL and MALSRs for Runway 17L-35R can be activated utilizing this system. The lighting systems for Runways 17R-35L and 13-31 are not operable from 10:00 p.m. to 7:00 a.m.

MITL

Airport Emergency Lighting System: It should be noted that PWA is also equipped with a backup generator that is capable of supporting the airfield lighting system during power outages.

AIRFIELD SIGNAGE

Airfield identification signs assist pilots in identifying runways, taxiway routes, and critical areas. The PWA airfield is equipped with lighted and reflective signs located at each taxiway intersection. Taxiways and hold positions are identified using lighted location and directional signs.

Airfield Signage and Holding Position Markings

AIRPORT MARKINGS

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. The airport provides and maintains marking systems in accordance with Code of Federal Regulations (CFR) Part 139.311(a) and Advisory Circular (AC) 150/5340-1, *Standards for Airport Marking*.

Runway 17L-35R is equipped with precision runway markings, which identifies the runway centerline, designation, threshold markings, aiming points, edge markings, and touchdown zones. Runways 17R-35L and 13-31 are equipped with non-precision markings, which include the runway centerline, designation, and threshold markings. Runway 17R-35L also has aiming point markings since it is used by jet aircraft. Runway 13-31's markings also include pavement edge markings.

All taxiways at PWA are marked with yellow centerline and holding position markings. Centerline markings assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway edges. Aircraft holding positions are marked at each runway/taxiway intersection.

NAVIGATIONAL AIDS

Navigational aids are electronic devices that transmit radio frequencies, which pilots of properly equipped aircraft translate into point-to-point guidance and position information. Electronic navigational aids available for aircraft flying to or from PWA include the very-high frequency omni-directional range (VOR) and global positioning system (GPS).


Wiley Post 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. Frequently, distance measuring equipment (DME) is combined with a VOR facility to provide distance as well as direction information to the pilot.

Military tactical air navigation aids (TACANs) and civil VORs are commonly combined to form a VORTAC. The VORTAC provides distance and direction information to both civil and military pilots. PWA is served by the on-site Wiley Post VOR/DME, which is located between the parallel runways south of Taxiway A5 and north of Runway 13-31. In addition, the Will Rogers VORTAC, located 10.7 miles south of the airport and the Kingfisher VORTAC, located 23.8 miles southeast, serve aircraft operating to/from PWA.

GPS was initially developed by the United States Department of Defense for military navigation around the world. However, GPS is now used extensively for a wide variety of civilian uses, including civil aircraft navigation.

GPS uses satellites placed in orbit around the globe to transmit electronic signals, which pilots of properly equipped aircraft use to determine altitude, speed, and navigational information. This provides more freedom in flight planning and allows for more direct routing to the final destination. GPS provides for enroute navigation and precision instrument approaches to PWA.

INSTRUMENT LANDING SYSTEM (ILS) EQUIPMENT

Airports with ILS approaches are equipped with both a glideslope antenna and localizer antenna array. The glideslope antenna provides vertical guidance to landing aircraft and can be located on either side of the runway; however, it is best to locate the glideslope antenna on the side of the runway with the least possibility of signal reflections from buildings, power lines, vehicles, aircraft, etc. The localizer antenna array is used to establish and maintain an approaching aircraft's position relative to the runway centerline until visual contact confirms the runway alignment and location. Typically, the localizer antenna array is sited on the extended runway centerline between 1,000 feet and 2,000 feet from the end of the runway.


Glideslope Antenna

Runways 17L and 35R at PWA are equipped with ILS equipment. The glideslope antennas are located on the west side of the runway where potential signal obstructions are limited. The localizer antenna array north of the runway is located approximately 1,050 feet beyond the end of the runway, and the localizer south of the runway is located approximately 1,000 feet beyond the end of the displaced threshold.

WEATHER AND COMMUNICATION

PWA is served by an automated surface observing system (ASOS). The ASOS reports automated aviation weather observations 24 hours per day. The system updates weather observations every minute, continuously reporting significant weather changes as they occur. The ASOS system reports cloud ceiling, visibility, temperature, dew point, wind direction, wind speed, altimeter setting (barometric pressure), and density altitude (airfield elevation corrected for temperature). The ASOS equipment is located on the west side of the primary runway co-located with the Runway 17L ILS glideslope antenna equipment. Weather information can be obtained from the ASOS by utilizing the Automated Terminal Information Service (ATIS) radio frequency (128.725 MHz) or by calling 405-798-2013. ATIS broadcasts are updated hourly (at a minimum) and provide arriving and departing pilots with the current surface weather conditions, communication frequencies, and other important airport-specific information.

Segmented Circle and Lighted Wind Cone

PWA is equipped with a lighted wind cone and segmented circle located between the parallel runways and north of Taxiway A5. The wind cone indicates wind direction and speed to pilots, and the segmented circle indicates aircraft traffic pattern information. Supplemental lighted wind cones are located at the approach ends of Runways 17L-35R and between Taxiways A3 and A4.

LANDSIDE FACILITIES

TERMINAL BUILDING

The PWA terminal building and adjoining ATCT is located east of Taxiway A between Taxiways A2 and A3. With an area of approximately 13,000 square feet (sf), the terminal houses airport management offices, a restaurant, and commercial office space. A vehicle parking lot, located immediately east of the terminal building, has approximately 168 individual parking spaces, including two handicapped spaces. The terminal is accessible to ground vehicles via Philip J. Rhoads Avenue.

Terminal Building

AIRCRAFT HANGAR FACILITIES

Hangar facilities at PWA are identified on **Exhibit 1E**, along with the existing tenant/business areas. Hangar facilities, along with all other landside facilities, are concentrated on the east side of the airfield along N. Rockwell Avenue.

PWA has 44 hangar facilities totaling approximately 942,675 sf of aircraft storage capacity. There are 16 T-hangar style hangars on the airport with 160 individual hangar bays. Remaining facilities are conventional style hangars ranging in size from 8,000 sf to 39,600 sf.

AIRCRAFT PARKING APRONS

PWA has five main aircraft parking aprons serving the terminal building, Atlantic Aviation fixed base operator (FBO), Oklahoma Jet Center, and Meta Airspace North FBO. The terminal apron, located between Taxiways A2 and A3, has an area of approximately 14,000 square yards (sy). The Atlantic Aviation FBO apron, accessible via A3 and A4, has an area of approximately 19,400 sy. The Oklahoma Jet Center apron, located between Taxiways A4 and A5, has an area of approximately 9,900 sy. The Meta Airspace North FBO apron, located between Taxiways A6 and A7, has an area of approximately 16,200 sy, while the Meta Airspace South FBO apron, located south of Taxiway A1, has a total area of approximately 19,600 sy. In total, these five main aprons provide 79,100 sy of parking space for transient and local aircraft.


Terminal Apron

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 near 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 locating too close to the airport. Thirdly, business development on and around airports can generate a direct revenue stream to the airport. Some airports have done this successfully, leading to airport self-sufficiency.

A wide variety of aviation services are available at PWA including full service FBO and specialty aviation service operators (SASOs). Typical services provided by these operators include aviation fueling, line services, aircraft maintenance and modifications, avionics, hangar space/leasing, aircraft parts, flight instructions, air charter services, and other services. A partial listing of aviation service providers at PWA is included below:

- A-26 Lady Liberty Sponsorship - Air show performer
- Air Centre - Pilot supplies
- American Jet Charter - Air charter company
- Associated Aero Service - Airframe repair services
- Atlantic Aviation - Full service FBO
- Bootsedge Corporation - Aircraft maintenance and repairs
- Calvin Taff Electronics - Radio repairs and installation
- Capital Aviation - Jet aircraft maintenance and painting
- Cirrus Aircraft - Aircraft sales
- Commodore Aerospace - Aircraft restoration and sales
- E.T. Mechanical - Aircraft maintenance
- First Global Aviation LLC - Aircraft sales and rental
- Interstate Helicopters - Flight school for helicopter training
- JetSet FBO – Full service FBO
- Meta Special Airspace Aerospace - Full service FBO
- Oklahoma Aviation LLC - Aircraft Charter company that has planes for rent, sale, and flight training
- Oklahoma Aviation LLC - Aircraft charters, sales, and flight training services
- Oklahoma Jet Support Center - Aircraft maintenance
- Oklahoma Museum of Flying - Historical aircraft museum
- PWA, Inc. - Private hangar complex
- Scott Jones Aircraft Sales - Aircraft sales
- Southern Wings Aircraft Sales - Private and corporate aircraft sales
- TK Aero, Inc. - Turboprop and jet aircraft sales and acquisition
- Turbine Aircraft Service - Aircraft maintenance

Atlantic Aviation FBO

FAA Office Building – The FAA leases office space in a building immediately north of the terminal building. The FAA utilizes this space for its Oklahoma Airports District Office (ADO), the FAA Manufacturing and Inspection District Office (MIDO), and the FAA Airways Facilities Sector Office.


FAA Building

Vehicle Parking

Marked vehicle parking at PWA is provided at the terminal building and at many of the individual FBO/SASO operations throughout the hangar complex. As previously mentioned, the terminal parking lot has a total of 168 individual spaces. For the two FBOs, Atlantic Aviation has a 70-space parking lot and the Meta Airspace North FBO facility has a 188-space parking lot. Many of the other SASOs on the airport have additional vehicle parking at the individual facilities throughout the landside area.


Terminal Parking Lot

SUPPORT FACILITIES

Several support facilities serve as critical links in providing the necessary efficiency to aircraft ground operations, such as aircraft rescue and firefighting (ARFF), airport maintenance, and fuel storage.

Aircraft Rescue and Firefighting Facilities (ARFF)

Airports that have been certified under Part 139 that serve scheduled air carrier operations are required to provide ARFF services during air carrier operations. Each certificated 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, A through E, with A applicable to the smallest aircraft and E the largest (based on aircraft length). Since PWA is not certificated under Part 139, the airport is not required to maintain ARFF equipment on-site. The nearest Oklahoma City Fire Department station is Station 34, which is located approximately 3.6 miles north of the airport on N. Council Road.

Airport Maintenance Facilities

PWA has a maintenance facility located southwest of the intersection of N. Rockwell Avenue and Millionaire Drive. Equipment such as vehicles, mowers, and runway sweepers are located at this facility.

Fuel Storage

There are eight fuel storage facilities at PWA. The two FBOs, Atlantic Aviation and Meta Airspace, each have storage facilities for AvGas (100LL) and Jet A fuels. Atlantic Aviation and Meta Airspace both offer full-service fuel service, with Atlantic Aviation also offering self-service fuel. Private Jet A fuel storage facilities are located on the leaseholds of Interstate Helicopters, Pronto, and Midland Financial. PWA, Inc., which is the ownership group of a private hangar group (hangars 24A-24J) has AvGas fuel storage near its facilities.

Fuel flowage history, summarized in **Table 1J**, shows that Jet A fuel flowage in 2017 reached its highest level during the last seven years. AvGas flowage reached its seven-year peak in 2012 and has since dropped to its lowest level of the period in 2017.

TABLE 1J
Fuel Flowage History
Wiley Post Airport

Year	Jet A (gallons)`						AvGas (gallons)			
	Midland Financial	Interstate Helicopters	Pronto	Meta Airspace	Atlantic[2]	Jet A Total	Atlantic	PWA	Meta Airspace	AvGas Total
2010	68,460	68,474	0	515,570	1,508,357	**2,160,861**	90,027	78,713	40,837	**209,577**
2011	67,808	88,603	0	507,859	1,564,427	**2,228,697**	110,304	78,690	32,426	**221,420**
2012	59,610	59,182	0	477,586	1,810,824	**2,407,202**	122,088	89,487	37,566	**249,141**
2013	74,844	51,156	0	565,654	1,321,772	**2,013,426**	75,194	86,381	23,806	**185,381**
2014	83,412	67,006	0	607,909	1,312,397	**2,070,724**	103,293	83,222	24,076	**210,591**
2015	87,622	73,659	86,751	719,336	1,116,903	**2,084,271**	120,839	74,694	16,114	**211,647**
2016	147,314	82,290	157,480	676,301	1,114,998	**2,178,383**	103,617	70,199	13,045	**186,861**
2017	175,548	90,040	155,822	827,843	1,305,881	**2,555,134**	107,821	56,937	16,031	**180,789**

[1] Meta Airspace FBO's fuel service is operated as ServiCenter.
[2] Atlantic Aviation FBO's fuel service is operated as Trajen.
Source: Oklahoma City Department of Airports, Recap of Fuel Sales

Vehicle Airfield Access and Perimeter Fencing

Access Gate

Ground vehicles authorized by the airport to operate on movement and safety areas are limited to those vehicles necessary for airport operations. These include airport maintenance vehicles, fire and rescue vehicles, aircraft fuel and service vehicles, and others authorized by the airport such as FBO vehicles, construction vehicles, FAA, and airport staff. The east side of the airfield is accessible to ground vehicles via the system of taxiways/taxilanes and aprons while the west side of the airfield is accessible via a series of gravel service roads. Controlled gates are located throughout the airport's system of perimeter security fencing to restrict access to the airfield and service roads.

The entire airfield perimeter and landside areas are fenced primarily with 3-foot chain-link fencing. The terminal building is separated from the terminal apron by 3-foot wrought iron fencing.

UTILITIES

The availability and capacity of the utilities serving the airport are factors in determining the development potential of the airport property, as well as the land immediately adjacent to the facility. Of primary concern in the inventory investigation is the availability of water, gas, sewer, and power sources. Currently, the airport's electrical needs are served by OG&E Energy Corp., while natural gas is provided by Oklahoma Natural Gas (ONG). The City of Bethany or City of Oklahoma City (depending on location on the field) provides the airport's water and waste water services, and Cox and AT&T serve all telecommunications needs. **Exhibit 1F** depicts the location of existing utility infrastructure at PWA.

AREA AIRSPACE AND AIR TRAFFIC CONTROL

The *Federal Aviation Administration (FAA) Act of 1958* established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS covers the common network of U.S. airspace, including air navigation facilities; airports and landing areas; aeronautical charts; associated rules, regulations, and procedures; technical information; and personnel and material. The system also includes components shared jointly with the military.

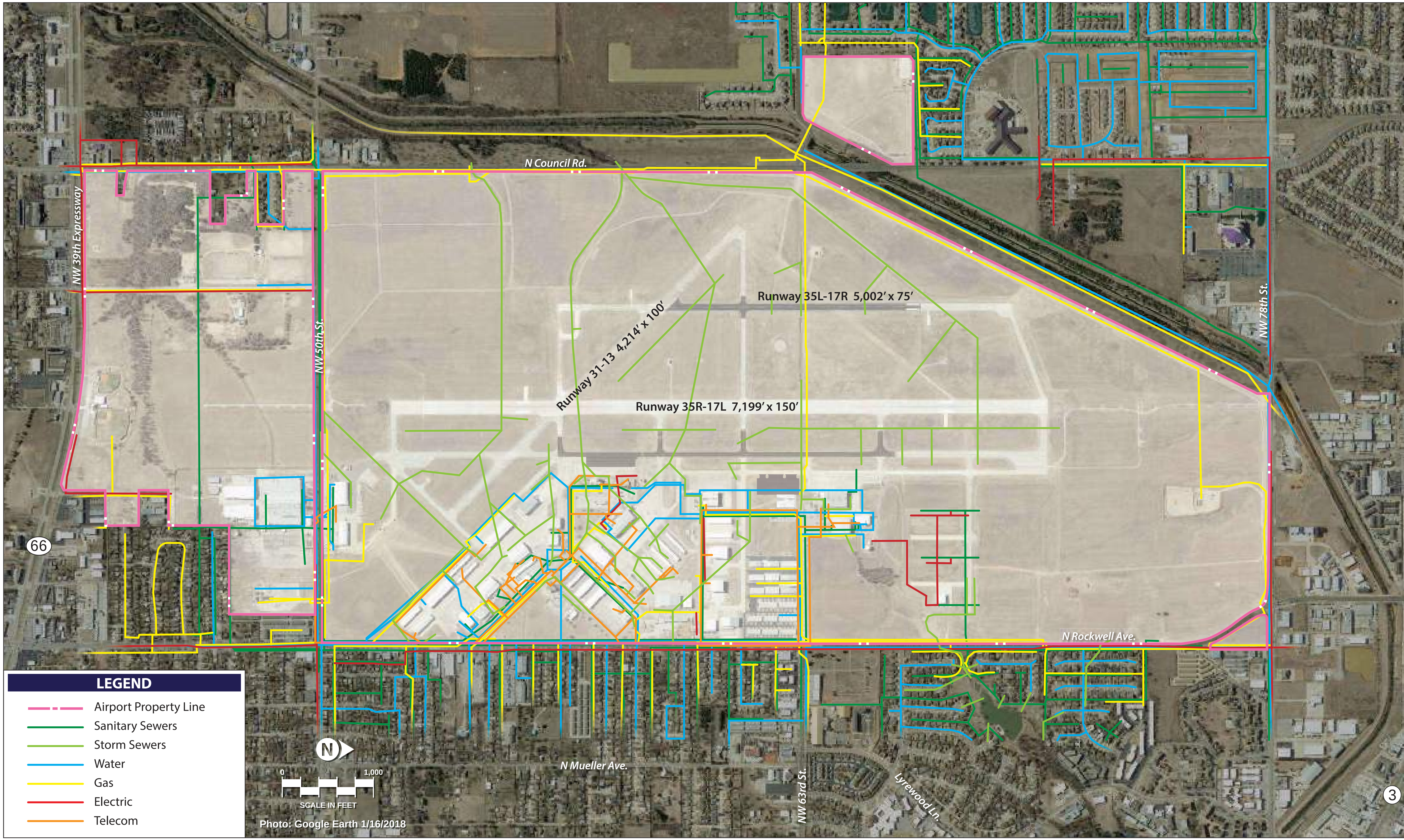


Exhibit 1F
EXISTING UTILITIES

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AIRSPACE STRUCTURE

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

Class A Airspace: Class A airspace includes all airspace from 18,000 feet mean sea level (MSL) to flight level (FL) 600 (approximately 60,000 feet MSL) over the contiguous 48 states and Alaska. This airspace is designated in Federal Aviation Regulation (F.A.R.) Part 71.33 for positive control of aircraft. All aircraft must be on an IFR clearance to operate within Class A airspace.

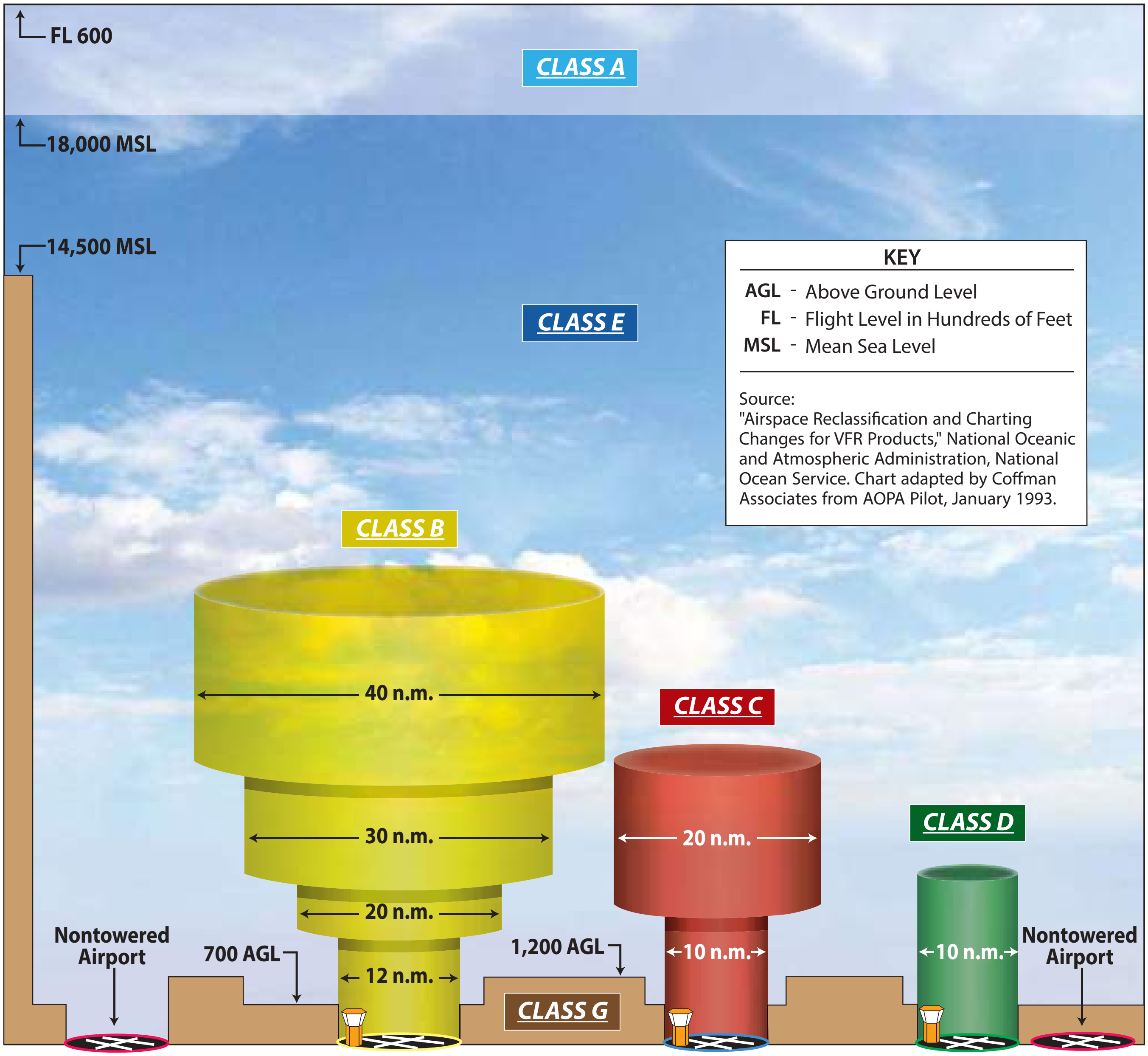
Class B Airspace: Class B airspace has been designated around some of the country's major airports, such as Dallas/Fort Worth International Airport (DFW), to separate all aircraft within a specified radius of the primary airport. Each Class B airspace is specifically tailored for its primary airport. All aircraft operating within Class B airspace must have an air traffic control (ATC) clearance. Certain minimum aircraft equipment and pilot certification requirements must also be met. This airspace is the most restrictive controlled airspace routinely encountered by pilots operating under VFR in an uncontrolled environment. The nearest Class B airspace is centered on DFW, approximately 160.8 nautical miles (nm) to the southeast.

Class C Airspace: The FAA has established Class C airspace at approximately 120 airports around the country that have significant levels of IFR traffic. 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. In order to fly inside Class C airspace, an aircraft must have a two-way radio, an encoding transponder, and have established communication with the ATC facility. Aircraft may fly below the floor of the Class C airspace or above the Class C airspace ceiling without establishing communication with ATC.

Will Rogers World Airport (OKC) is surrounded by Class C airspace consisting of an inner and outer circle both with a five nm radius. The inner circle begins at the surface extending up to 5,300 feet MSL. The outer circle begins at 2,500 feet MSL extending up to 5,300 feet MSL. PWA is located in the outer circle of Class C airspace surrounding OKC.

Class D Airspace: Class D airspace is controlled airspace surrounding airports with an ATCT. 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.

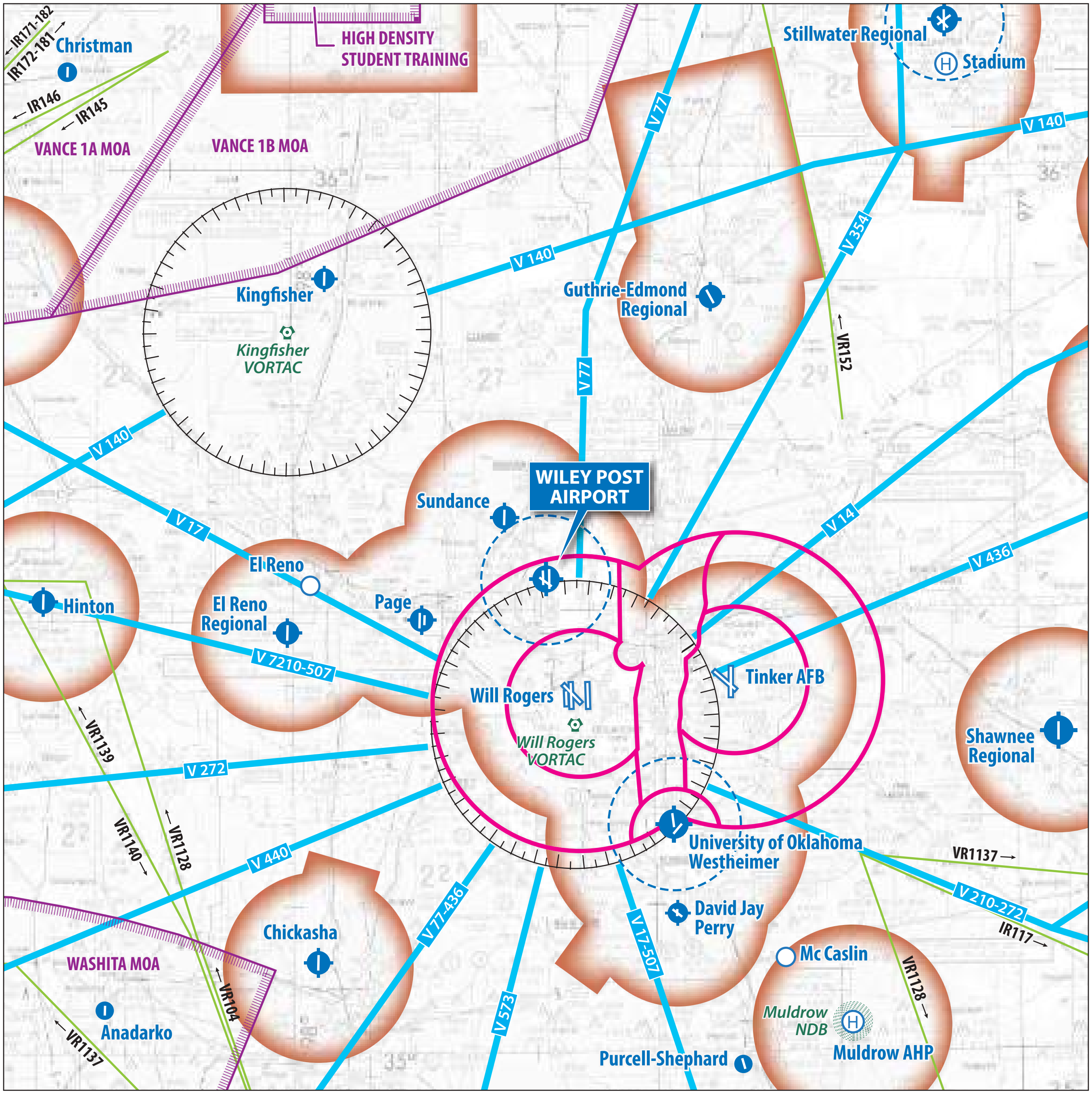
As shown on **Exhibit 1H**, PWA operates within Class D airspace beginning at the surface and extending to 3,800 feet MSL during the operational hours of the ATCT. Aircraft operators operating within Class D airspace are required to make contact with PWA air traffic control prior to entering or departing PWA airspace and must maintain contact while within the controlled airspace to land at PWA or to transverse the area. When the ATCT is inactive, PWA airspace reverts to Class E airspace.



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.

Exhibit 1G
AIRSPACE CLASSIFICATION



LEGEND

- Airports with other than hard-surfaced runways
- Heliport
- Airports with hard-surfaced runways 1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- VORTAC
- Non-Directional Radiobeacon (NDB)
- Compass Rose
- Class C Airspace
- Class D Airspace
- Class E Airspace with floor 700' above surface
- Military Training Routes
- Victor Airways
- Alert Area and MOA - Military Operations Area

Source: Dallas-Ft. Worth Sectional Chart, US Department of Commerce, National Oceanic and Atmospheric Administration, March 1, 2018

Class E Airspace: Class E airspace consists of controlled airspace designed to contain IFR operations near an airport and while aircraft are transitioning between the airport and enroute environments. Unless otherwise specified, Class E airspace terminates at the base of the overlying airspace. Only aircraft operating under IFR are required to be in contact with air traffic control when operating in Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio communications with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist.

Class G Airspace: Airspace not designated as Class A, B, C, D, or E is considered uncontrolled, or Class G, airspace. Air traffic control does not have the authority or responsibility to exercise control over air traffic within this airspace. Class G airspace lies between the surface and the overlaying Class E airspace (700 to 1,200 feet above ground level).

While aircraft may technically operate within this Class G airspace without any contact with ATC, it is unlikely that many aircraft will operate this low to the ground. Furthermore, federal regulations specify minimum altitudes for flight. F.A.R. Part 91.119*, Minimum Safe Altitudes*, generally states that except when necessary for takeoff or landing, pilots must not operate an aircraft over any congested area of a city, town, or settlement, or over any open-air assembly of persons, at an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

Over less congested areas, pilots must maintain an altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure. Helicopters may be operated at less than the minimums prescribed above if the operation is conducted without hazard to persons or property on the surface. In addition, each person operating a helicopter shall comply with any routes or altitudes specifically prescribed for helicopters by the FAA.

Special Use Airspace

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

Victor Airways: For aircraft arriving or departing the regional area using VOR facilities, a 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 1,200 feet above ground level (AGL) to 18,000 feet MSL and extend between VOR navigational facilities. Victor Airways are shown with blue lines on **Exhibit 1H**.

For aircraft enroute or departing PWA, there are several Victor Airways available converging at the Will Rogers VORTAC at OKC.

Military Operations Area (MOA): MOAs are depicted on aeronautical charts to inform nonparticipating pilots of areas that may contain a high volume of military operations/activities. Pilots should exercise caution near and within these areas. All activity within these areas, if granted by the controlling agency, should be conducted in accordance with regulations, without waiver, and pilots of participating aircraft, as well as pilots transitioning the area, are equally responsible for collision avoidance. The Vance 1A and 1B MOA, beginning approximately 26 nm northwest of PWA, is controlled by the United States Air Force and is utilized for general flight training activities. The Vance 1B MOA's operational altitudes range from 7,000 feet up to but not including 18,000 feet MSL, and Vance 1A's operational altitudes range from 8,000 feet up to but not including 18,000 feet MSL.

AIRSPACE CONTROL

The FAA has established 21 Air Route Traffic Control Centers (ARTCCs) throughout the continental United States to control aircraft operating under IFR within controlled airspace and while enroute. An ARTCC assigns specific routes and altitudes along Federal Airways to maintain separation and orderly traffic flow. The Fort Worth Center ARTCC controls IFR airspace enroute to and from PWA.

Flight service stations (FSS) are air traffic facilities which provide pilot briefings, flight plan processing, in-flight radio communications, search and rescue (SAR) services, and assistance to lost aircraft and aircraft in emergency situations. FSSs also relay air traffic control clearances, process NOTAMs, and broadcast aviation meteorological and aeronautical information. The McAlester FSS is the nearest FSS Facility to PWA.

Airport Traffic Control Tower (ATCT)

The PWA ATCT operates daily from 7:00 a.m. to 10:00 p.m. The tower is operated as part of the Federal Contract Tower (FCT) program. The FCT program is a federally funded initiative to provide contract air traffic control services at designated airports across the country.

The ATCT is located on the east side of the airfield and is a part of the terminal building complex. The primary responsibilities for tower controllers are to sequence and separate local arriving and departing traffic and to provide ground control direction to aircraft taxiing on the ground. Tower radio frequencies are 126.900 MHz for Tower and 121.700 MHz for Ground. When the tower is not operational, 124.125 MHz reverts to the CTAF and serves as the primary communication frequency.

FLIGHT PROCEDURES

Flight procedures are a set of predetermined maneuvers established by the FAA, using electronic or visual navigational aids, that assist pilots in locating and landing or departing from an airport.

Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers established by the FAA, using electronic navigational aids that assist pilots in locating and landing at an airport, especially during instrument flight conditions. There are currently nine published instrument approach procedures, including ILS instrument approaches to Runways 17L and 35R. Precision instrument approaches provide vertical descent information and course guidance information to the pilot. Non-precision approaches only provide course guidance to the pilot; however, the relatively new GPS localizer performance with vertical guidance (LPV) approaches are categorized by the FAA as an approach with vertical guidance (APV) which is not considered a precision approach.

The capability of an instrument approach procedure is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance the pilot must be able to see in order to complete the approach. Cloud ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for the pilot to complete the approach. If the observed visibility or cloud ceilings are below the minimums prescribed for the approach, the pilot cannot complete the instrument approach. **Table 1K** includes the eight published instrument approach procedures at PWA.

Local Operating Procedures

The traffic pattern at PWA is maintained to provide the safest and most efficient use of the airspace. A standard left-hand traffic pattern is published for Runways 35L, 35R, and 31, and right-hand traffic patterns are published for Runways 17R, 17L, and 13. The published traffic pattern altitude (TPA) for Runway 17R-35L is 600 feet AGL, while the TPA for the other runways is 1,000 feet AGL.

PWA has published optional noise abatement procedures for aircraft weighing more than 12,500 pounds departing on Runway 17L-35R. These aircraft are requested to climb at a maximum rate consistent with safe operations to an altitude of 1,500 feet AGL, then reduce power setting and climb rate up to 3,000 feet AGL or until 2.0 nm from the airport, depending on ATC and safety conditions.

PWA does not have aircraft restrictions, curfews, or a mandatory noise abatement program, as these programs would violate the federal *Airport Noise and Capacity Act* (ANCA) of 1990. Federal law requires the airport to remain open 24 hours a day, 7 days a week, and to accept all civilian and military aircraft that can be safely accommodated.

TABLE 1K
Instrument Approach Procedures
Wiley Post Airport

	WEATHER MINIMUMS BY AIRCRAFT TYPE			
	Category A	**Category B**	**Category C**	**Category D**
ILS or LOC Runway 17L				
S-ILS	200'/0.5	200'/0.5	200'/0.5	200'/0.5
S-LOC	400'/0.5	400'/0.5	400'/0.5	400'/0.75
Circling	500'/1.0	500'/1.0	600'/1.5	500'/2.0
ILS or LOC Runway 35R				
S-ILS	200'/0.5	200'/0.5	200'/0.5	200'/0.5
S-LOC	500'/0.5	500'/0.5	500'/0.75	500'/1.0
Circling	500'/1.0	500'/1.0	600'/1.5	600'/2.0
RNAV (GPS) Runway 17L				
LPV DA	200'/0.5	200'/0.5	200'/0.5	200'/0.5
LNAV/VNAV DA	300'/0.5	300'/0.5	300'/0.5	300'/0.5
LNAV MDA	400'/0.5	400'/0.5	400'/0.625	400'/0.625
Circling	500'/1.0	500'/1.0	600'/1.5	600'/2.0
RNAV (GPS) Runway 35L				
LP DA	400'/0.5	400'/0.5	400'/1.125	200'/0.5
LNAV MDA	400'/0.5	400'/0.5	400'/0.625	400'/0.625
Circling	500'/1.0	500'/1.0	600'/1.5	600'/2.0
RNAV (GPS) Runway 35R				
LPV DA	200'/0.5	200'/0.5	200'/0.5	200'/0.5
LNAV/VNAV DA	500'/1.25	500'/1.25	500'/1.25	500'/1.25
LNAV MDA	500'/0.5	500'/0.5	500'/0.75	500'/1.0
Circling	500'/1.0	500'/1.0	600'/1.5	600'/2.0
VOR Runway 17L				
S-17L	400'/0.5	400'/0.5	400'/0.625	400'/0.625
VOR Runway 35R				
S-35R	500'/1.0	500'/1.0	500'/1.25	500'/1.5
Circling	500'/1.0	500'/1.0	600'/1.5	600'/2.0
VOR-A				
Circling	500'/1.0	500'/1.0	600'/1.5	600'/2.0

Aircraft categories are based on the approach speed of aircraft, which is determined as 1.3 times the stall speed in landing configuration as follows:
Category A: 0-90 knots (e.g., Cessna 172)
Category B: 91-120 knots (e.g., Beechcraft King Air)
Category C: 121-140 knots (e.g., Canadair Challenger, Boeing 737)
Category D: 141-166 knots (e.g., Gulfstream IV, Boeing MD-88)
Category E: Greater than 166 knots (e.g., Certain large military or cargo aircraft)

Abbreviations:
GPS - Global Positioning System
LNAV/RNAV - A technical variant of GPS (Lateral, Area Navigation)
MDA - Minimum Decision Altitude
NDB – Non-Directional Beacon
VOR – Very High Frequency Omnidirectional Range

Note: (xxx'/ x-mile) = Cloud ceiling height/Visibility minimum

Source: U.S. Terminal Procedures (Effective January 2021)

AREA AIRPORTS

A review of other public-use airports with at least one paved runway within a 30-nm radius of PWA was conducted to identify and distinguish the types of air service provided in the region. It is important to consider the capabilities and limitations of these airports when planning for future changes or improvements at PWA. **Exhibit 1J** provides information on public-use airports within the vicinity of PWA. Information pertaining to each airport was obtained from FAA Form 5010-1, Airport Master Record.

SOCIOECONOMIC CHARACTERISTICS

Socioeconomic characteristics are collected and examined to derive an understanding of the dynamics of growth within the vicinity of PWA. This information is essential in determining aviation demand level requirements, as most general aviation demand can be directly related to the socioeconomic condition of the area. Statistical analysis of population, employment, and income trends can define the economic strength of the region and the ability of the region to sustain a strong economic base over an extended period of time.

For this study, socioeconomic data was gathered from Woods and Poole Economics, *The Complete Economic and Demographic Data Source*, 2018. It should be noted that only historical figures are presented in this section. Future socioeconomic projections will be outlined in Chapter Two.

POPULATION

Historic population trends for Oklahoma County, the Oklahoma City MSA, which includes Canadian, Cleveland, Grady, Lincoln, Logan, McClain, and Oklahoma counties, and the State of Oklahoma is detailed in **Table 1L**. According to this data, the state has grown over the past 18-year period at a compound annual growth rate (CAGR) of 0.8 percent compared to 1.0 and 1.4 percent for Oklahoma County and the Oklahoma City MSA, respectively.

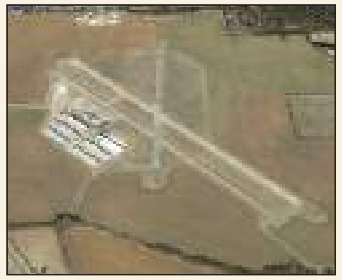
TABLE 1L
Historical Population Statistics

	2000	2005	2010	2015	2018	CAGR 2000-2018
Oklahoma County	661,769	683,299	721,096	775,949	794,318	1.0%
Oklahoma City MSA	1,098,132	1,161,308	1,257,950	1,356,965	1,401,012	1.4%
State of Oklahoma	3,454,365	3,548,597	3,759,603	3,907,414	3,980,452	0.8%
CAGR – Compound Annual Growth Rate						

Source: Woods & Poole Complete Economic Demographic Data (2018)

DAVID J. PERRY AIRPORT (1K4)

Airport NPIAS Classification .... GA
FAA Asset Study Classification .... Local
Location from PWA.......... 24.3 nm SSE
Elevation .... 1,168.8′
Weather Reporting.......... None
ATCT .... None
Annual Operations.......... 15,000
Based Aircraft.......... 51



RUNWAY	13-31	17-35
Length	3,004′	1,801′
Width	60′	60′
Pavement Strength (lbs.)		
SWL	30,000	4,000
DWL	NA	NA
DTWL	NA	NA
Lighting	MIRL	NA
Marking	Basic (13) Non-Precision (31)	Basic
Approach Aids	None	None
Instrument Approaches	RNAV/VOR (31)	None

Services Provided

Aircraft tiedowns, 100LL and 24 hour automated fuel servicing system.

EL RENO REGIONAL AIRPORT (RQO)

Airport NPIAS Classification .... GA
FAA Asset Study Classification .... Local
Location from PWA.......... 17.9 nm W
Elevation .... 1,420.4′
Weather Reporting.......... AWOS
ATCT .... None
Annual Operations.......... 24,825
Based Aircraft.......... 24

RUNWAY	17-35	18-36
Length	5,600′	4,017′
Width	75′	190′
Pavement Strength (lbs.)		
SWL	30,000	NA
DWL	NA	NA
DTWL	NA	NA
Lighting	MIRL	NA
Marking	Non-Precision	None
Approach Aids	PAPI-4 (both), REILs	None
Instrument Approaches	RNAV (both)	None

Services Provided

Aircraft hangars and tiedowns, 100LL and Jet A fuel, major airframe and powerplant maintenance.

WILL ROGERS WORLD AIRPORT (OKC)

Airport NPIAS Classification .... Primary
FAA Asset Study Classification .... NA
Location from PWA.......... 8.8 nm S
Elevation .... 1,295.8′
Weather Reporting.......... AWOS
ATCT .... Yes
Annual Operations.......... 115,024
Based Aircraft.......... 64

RUNWAY	17R-35L	17L-35R	13-31	18-36
Length	9,803′	9,801′	7,800′	3,078
Width	150′	150′	150′	75′
Pavement Strength (lbs.)				
SWL	50,000	50,000	50,000	50,000
DWL	200,000	200,000	200,000	150,000
DTWL	400,000	400,000	400,000	240,000
Lighting	HIRL	HIRL	MIRL	None
Marking	Precision	Precision	Non-Precision	Basic
Approach Aid	MALSR (17R) ALSF-2 (35L)	PAPI-4 (17L) MALSR (both)	PAPI-4 (both)	None
Instrument Approaches	ILS/RNAV (both)	ILS/RNAV (both)	RNAV (both)	None

Services Provided: Aircraft hangars and tiedowns, 100LL and Jet A fuel, major airframe service and powerplant service, high/low bottled oxygen, and high/low bulk oxygen.

CLARENCE PAGE MUNICIPAL AIRPORT (RCE)

Airport NPIAS Classification .... GA
FAA Asset Study Classification .... Local
Location from PWA.......... 9.1 nm W
Elevation .... 1,353.8′
Weather Reporting.......... AWOS
ATCT .... None
Annual Operations.......... 42,554
Based Aircraft.......... 62

RUNWAY	17R-35L	17L-35R
Length	6,014′	3,502′
Width	100′	75′
Pavement Strength (lbs.)		
SWL	40,000	17,000
DWL	60,000	NA
DTWL	NA	NA
Lighting	HIRL	MIRL
Marking	Non-Precision	Basic
Approach Aid	PAPI-4 (both)	None
Instrument Approaches	RNAV (both)	None

Services Provided

Aircraft tiedowns, 100LL and Jet A fuel, major airframe service and major powerplant service, high bottled oxygen.

UNIVERSITY OF OKLAHOMA WESTHEIMER AIRPORT (OUN)

Airport NPIAS Classification .... Reliever
FAA Asset Study Classification .... Regional
Location from PWA.......... 19.3 nm SSE
Elevation .... 1,181.7′
Weather Reporting.......... AWOS
ATCT .... Yes
Annual Operations.......... 48,700
Based Aircraft.......... 110

RUNWAY	18-36	3-21
Length	5,199	4,748′
Width	100′	100′
Pavement Strength (lbs.)		
SWL	30,000	30,000
DWL	50,000	50,000
DTWL	100,000	100,000
Lighting	MIRL	MIRL
Marking	Precision (18), Non-Precision (36)	Non-Precision
Approach Aids	PAPI-4 (both)	PAPI-4 (both)
Instrument Approaches	ILS (18)/RNAV (both)	RNAV (3)

Services Provided

Aircraft hangars and tiedowns, 100LL and Jet A fuel, major airframe and powerplant maintenance.

ABBREVIATIONS

ASOS - Automated Surface Observation System
ATCT - Airport Traffic Control Tower
AWOS - Automated Weather Observation System
DME - Distance Measuring Equipment
DWL - Dual Wheel Loading
DTWL - Dual Tandem Wheel Loading
GPS - Global Positioning System
ILS - Instrument Landing System
LOC - Localizer
MIRL - Medium Intensity Runway Lighting
NPIAS - National Plan of Integrated Airport Systems
PAPI - Precision Approach Path Indicator
RNAV - Area Navigation (GPS variant)
RNP - Required Navigation Performance
SWL - Single Wheel Loading
VASI - Visual Approach Slope Indicator
VOR - VHF Omnidirectional Range

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SUNDANCE AIRPORT (HSD)

Airport NPIAS Classification ...... NA
FAA Asset Study Classification .... NA
Location from PWA......... 5 nm NW
Elevation .... 1,192.9′
Weather Reporting............ AWOS
ATCT .... None
Annual Operations........... 39,492
Based Aircraft................... 210

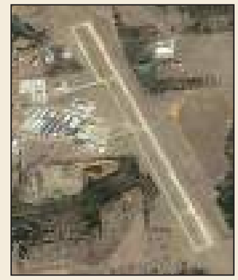
RUNWAY	18-36
Length	5,001′
Width	100′
Pavement Strength (lbs.)	
SWL	NA
DWL	NA
DTWL	NA
Lighting	MIRL
Marking	Non-Precision
Approach Aids	VASI-2 (both)
Instrument Approaches	Localizer

Services Provided

Aircraft hangars and tiedowns, 100LL and Jet A fuel, minor airframe service and powerplant service.

GUTHRIE-EDMOND REGIONAL AIRPORT (GOK)

Airport NPIAS Classification ...... GA
FAA Asset Study Class ...... Regional
Location from PWA..... 22.1 nm NNE
Elevation .... 1,069.2′
Weather Reporting............ AWOS
ATCT .... None
Annual Operations........... 73,200
Based Aircraft..................... 81



RUNWAY	16-34
Length	5,001′
Width	75′
Pavement Strength (lbs.)	
SWL	30,000
DWL	48,000
DTWL	78,000
Lighting	MIRL
Marking	Non-Precision
Approach Aids	ODALS (16), PAPI-4 (both)
Instrument Approaches	RNAV (both)

Services Provided

Aircraft hangars and tiedowns, 100LL, major airframe service and major powerplant maintenance.

KINGFISHER AIRPORT (F92)

Airport NPIAS Classification ...... NA
FAA Asset Study Classification .... NA
Location from PWA...... 25.4 nm NW
Elevation .... 1,072′
Weather Reporting............. None
ATCT .... None
Annual Operations............. 4,010
Based Aircraft..................... 11

RUNWAY	18-36
Length	2,800′
Width	60′
Pavement Strength (lbs.)	
SWL	NA
DWL	NA
DTWL	NA
Lighting	MIRL
Marking	Basic
Approach Aids	None
Instrument Approaches	None

Services Provided

100 LL and automated credit card fuel system.

EL RENO AIRPORT (99F)

Airport NPIAS Classification ...... NA
FAA Asset Study Classification .... NA
Location from PWA........ 16.3 nm W
Elevation .... 1,395′
Weather Reporting............. None
ATCT .... None
Annual Operations................ 75
Based Aircraft...................... 0

RUNWAY	17-35
Length	2,600′
Width	100′
Pavement Strength (lbs.)	
SWL	NA
DWL	NA
DTWL	NA
Lighting	None
Marking	None
Approach Aids	None
Instrument Approaches	None

Services Provided

None.

EMPLOYMENT

Analysis of a region's employment base can be valuable in determining the overall well-being of the general area. In most cases, the area's makeup and health is significantly impacted by the availability of jobs, variety of employment opportunities, and types of wages provided by local employers. **Table 1M** provides historical employment characteristics from 2000 to 2018 in three analysis categories, including Oklahoma County, the Oklahoma City MSA, and the State of Oklahoma. Similar to population, growth in employment within the Oklahoma MSA has outpaced growth in the state.

TABLE 1M
Historical Employment Statistics

	2000	2005	2010	2015	2018	CAGR 2000-2018
Oklahoma County	516,809	535,163	556,205	615,796	642,831	1.2%
Oklahoma City MSA	698,069	733,935	772,018	857,939	898,953	1.4%
State of Oklahoma	1,994,411	2,045,118	2,131,425	2,287,453	2,388,811	1.0%
CAGR – Compound Annual Growth Rate						

Source: Woods & Poole Complete Economic Demographic Data (2018)

Locally, the greater Oklahoma City MSA is the center of commerce for the entire state. Major employers within the MSA are presented in **Table 1N**. Understanding the types of employment opportunities will aid in identifying demand for aviation services in the immediate area.

TABLE 1N
Top 10 Employers
Oklahoma City MSA Major Employers

#	Employer	Employees (#)
1	State of Oklahoma	47,300
2	Tinker Air Force Base	24,000
3	University of Oklahoma- Norman	12,700
4	FAA Mike Monroney Aeronautical Center	7,000
5	INTEGRIS Health	6,000
6	Hobby Lobby Stores Inc.	5,100
7	University of Oklahoma Health Sciences Center	5,000
8	City of Oklahoma City	4,700
9	Mercy Hospital	4,500
10	OGE Energy Corp	3,400

Source: Economic Development Division of the Greater Oklahoma City Chamber, March 2018

PER CAPITA PERSONAL INCOME

Table 1P presents the per capita personal income (PCPI) for Oklahoma County, the Oklahoma City MSA, and the State of Oklahoma since 2000. PCPI is determined by dividing the total income by population. For PCPI to grow, income growth must outpace population growth significantly. As shown in the table, PCPI growth within each jurisdiction has grown at just under two percent since 2000. Oklahoma County has the highest PCPI, which is about 20 percent higher than PCPI rates on the state level.

TABLE 1P
Historical Per Capita Personal Income (Adjusted to 2009 Dollars)

	2000	2005	2010	2015	2018	CAGR 2000-2018
Oklahoma County	33,647	39,919	41,091	43,835	47,009	1.9%
Oklahoma City MSA	31,778	36,423	38,119	41,208	42,799	1.7%
State of Oklahoma	28,850	33,667	35,327	40,157	39,860	1.8%
CAGR – Compound Annual Growth Rate						

Source: Woods & Poole Complete Economic Demographic Data (2018)

ENVIRONMENTAL INVENTORY

The Environmental Inventory addresses existing conditions at PWA and its environs. This inventory is intended to help identify relevant environmental issues that should be considered during preparation of the Airport Master Plan. The inventory is organized using the resource categories contained in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (2015). Available information regarding the environmental conditions at the airport and within the surrounding area has been derived from internet resources, agency maps, and existing literature. A comprehensive list of resources is included below.

AIR QUALITY

The *Clean Air Act*, which was last amended in 1990, requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to the public health and environment. The Clean Air Act identifies two types of national ambient air quality standards. *Primary standards* provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. *Secondary standards* provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The EPA has set NAAQS for six principal pollutants, which are called "criteria" air pollutants. Periodically, the standards are reviewed and may be revised. The current standards are listed in **Table 1Q**.

An area with ambient air concentrations exceeding the NAAQS for a criteria pollutant is said to be a nonattainment area for the pollutant's NAAQS, while an area where ambient concentrations are below the NAAQS is considered an attainment area. The U.S. EPA requires that areas designated as nonattainment demonstrate how they will attain the NAAQS by an established deadline. To accomplish this, states are required to prepare State Implementation Plans (SIPs). SIPs are typically a comprehensive set of reduction strategies and emissions budgets designed to bring the area into attainment.

PWA is in Oklahoma County, Oklahoma. According to the U.S. EPA's *Green Book – National Area and County-Level Multi-Pollutant Information*, Oklahoma County is in attainment for all federal criteria pollutants.

TABLE 1Q
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)	Primary	8 hours	9 ppm	Not to be exceeded more than once per year
		1 hour	35 ppm	
Lead (Pb)	Primary & Secondary	Rolling 3-month average	0.15 µg/m^3	Not to be exceeded
Nitrogen Dioxide (NO_2)	Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary & Secondary	1 year	53 ppb	Annual mean
Ozone (O_3)	Primary & Secondary	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	**$PM_{2.5}$** Primary	1 year	12.0 µg/m^3	Annual mean, averaged over 3 years
	$PM_{2.5}$ Secondary	1 year	15.0 µg/m^3	Annual mean, averaged over 3 years
	$PM_{2.5}$ Primary & Secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10} Primary & Secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)	Primary	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: EPA, data accessed 08.01.18

BIOLOGICAL RESOURCES

The purpose of the *Endangered Species Act* (ESA) is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the U.S. Fish and Wildlife Service (USFWS) and the Commerce Department's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife.

Section 7 of the ESA sets forth requirements for consultation to determine if a proposed action "may affect" a federally endangered or threatened species. If an agency determines that an action "may affect" a federally protected species, then Section 7(a)(2) requires the agency to consult with USFWS to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species, or result in the destruction or adverse modification of critical habitat. If a species has been listed as a candidate species, Section 7(a)(4) states that each agency must confer with USFWS.

Additional federal laws protecting fish, wildlife, and plants include the *Migratory Bird Treaty Act* (MBTA), which prohibits activities that would harm migratory birds, their eggs, or nests, and the *Bald and Golden Eagle Protection Act* (BaGEPA), which prohibits the take (defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb") of bald and golden eagles, including their parts, nests, or eggs, without a permit. Executive Order (E.O.) 13312, *Invasive Species* aims to prevent the introduction of invasive species because of a proposed action. (E.O. 11990, *Protection of Wetlands* is discussed under the *Water Resources* section of this report.)

A USFWS Information for Planning and Consultation (IPaC) report indicates that there are five federally protected species within Oklahoma County. However, there are no critical habitats reported at PWA. The Oklahoma Department of Wildlife Conservation (ODWC) also maintains a list of state and candidate-listed species in Oklahoma. **Table 1R** lists current federally listed and state-listed species.

Table 1S lists bird species protected under the MBTA and *Bald and Golden Eagle Protection Act* that may be affected by activities at PWA; it is not an exhaustive list of every bird species potentially found at this location.

TABLE 1R
Federally and State Listed Species

Species Name	Scientific Name	Federal Status	State Status
Whooping Crane	*Grus americana*	Endangered	N/A
Piping Plover	*Charadrius melodus*	Threatened	N/A
Black-capped Vireo	*Vireo atricapilla*	Endangered	N/A
Lesser Prairie-chicken	*Tympanuchus pallidicinctus*	Threatened	N/A
Red-cockaded Woodpecker	*Picoides boreals*	Endangered	N/A
Interior Least Tern	*Sterna antillarum*	Endangered	N/A
Rufa Red Knot	*Calidris canutus rufa*	Threatened	N/A
American Burying Beetle	*Nicrophorus americanus*	Endangered	N/A
Neosho Mucket	*Lampsilis rafinesqueana*	Endangered	N/A
Rabbitsfoot	*Quadrula cylindrica*	Threatened	N/A
Scaleshell Mussel	*Leptodea leptodon*	Endangered	N/A
Winged Mapleleaf	*Quadrula fragosa*	Endangered	N/A
Quachita Rock Pocketbook	*Arkansia wheeleri*	Endangered	N/A
Arkansas River Shiner	*Notropis girardi*	Threatened	N/A
Neosho Madtom	*Noturus placidus*	Threatened	N/A
Ozark Cavefish	*Amblyopsis rosae*	Threatened	N/A
Leopard Darter	*Percina pantherina*	Threatened	N/A
Indiana Bat	*Myotis sodalis*	Endangered	N/A
Ozark Big-eared Bat	*Corynorhinus townsendii ingens*	Endangered	N/A
Gray Bat	*Myotis grisescens*	Endangered	N/A
Northern Long-Eared Bat	*Myotis septentrionalis*	Threatened	N/A
Eastern Prairie-fringed Orchid	*Platanthera leucophaea*	Threatened	N/A
Western Prairie-fringed Orchid	*Platanthera praeclara*	Threatened	N/A
Harperella	*Ptillium nodosum*	Endangered	N/A
Longnose Darter	*Percina nasuta*	N/A	Endangered
Blackside Darter	*Percina maculata*	N/A	Threatened
Oklahoma Cave Crayfish	*Cambarus tartarus*	N/A	Endangered

Source: ODWC & IPaC data, accessed 08.01.18

TABLE 1S
Birds Protected Under the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

Protected Species	Scientific Name	Breeding Season
American Golden-plover	*Pluvialis dominica*	Breeds elsewhere
Bald Eagle	*Haliaeetus leucocephalus*	Breeds October 15 to July 31
Buff-breasted Sandpiper	*Calidris subruficollis*	Breeds elsewhere
Chestnut-collared Longspur	*Calcarius ornatus*	Breeds elsewhere
Harris's Sparrow	*Zonotrichia querula*	Breeds elsewhere
Hudsonian Godwit	*Limosa haemastica*	Breeds elsewhere
Lesser Yellowlegs	*Tringa flavipes*	Breeds elsewhere
Long-billed Curlew	*Numenius americanus*	Breeds April 1 to July 31
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Breeds May 10 to September 10
Semipalmated Sandpiper	*Calidris pusilla*	Breeds elsewhere
Smith's Longspur	*Calcarius pictus*	Breeds elsewhere
Whimbrel	*Numenius phaeopus*	Breeds elsewhere
Willet	*Tringa semipalmata*	Breeds April 20 to August 5

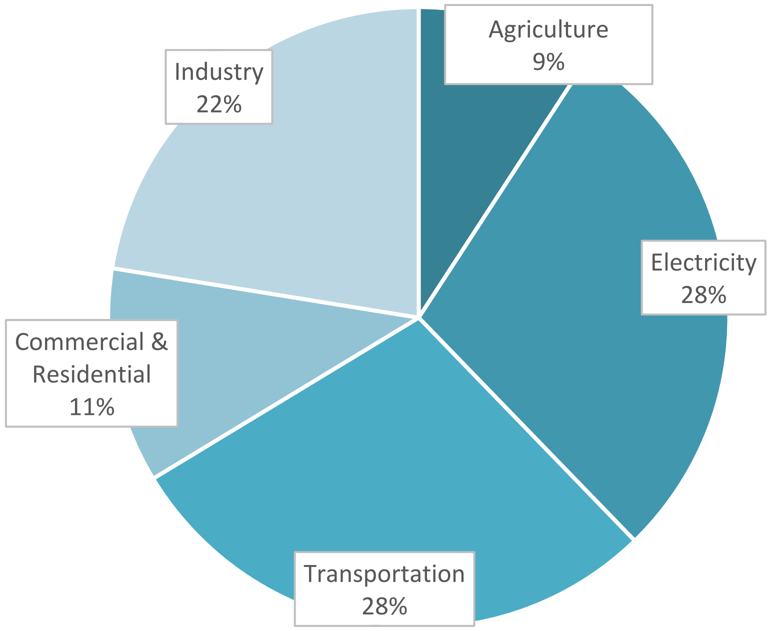
Source: IPaC data, accessed 08.01.18

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 percent of U.S. greenhouse gas (GHG) emissions in 2016. Of this, aviation contributed nearly nine percent of all transportation emissions. 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 small 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, the above figure shows all GHG emissions sources in the U.S. in 2016 (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. 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).



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

Research has also shown 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.

COASTAL RESOURCES

Federal activities involving or affecting coastal resources are governed by the *Coastal Barriers Resource Act*, the *Coastal Zone Management Act*, and E.O. 13089, *Coral Reef Protection*. PWA is approximately 460 miles northwest of the nearest ocean, thus causing no potential impacts to coastal resources.

DEPARTMENT OF TRANSPORTATION (DOT) ACT: SECTION 4(f)

Section 4(f) of the DOT Act, which was recodified and renumbered as Section 303(c) of Title 49 United States Code (USC), states that the Secretary of Transportation shall not approve any program or project that requires the use of any publicly owned land from a historic site, public park, recreation area, or waterfowl or wildlife refuge 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 term "use" includes not only the physical taking of such lands, but "constructive use" of such lands. "Constructive use" of lands occurs when "a project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired" (Title 23 Code of Federal Regulations [CFR] Section 771.135).

Table 1T lists all nationally registered historic places, public parks, and wildlife refuges that are within five miles of PWA.

TABLE 1T
Section 4(f) Protected Resources

NAME	ADDRESS	DISTANCE FROM WILEY POST AIRPORT
National Register of Historic Places		
Lake Overholser Bridge	N Overholser Drive, 0.5 mi W of N Council Rd. Oklahoma City, OK	1.5 miles southeast
Lake Overholser Dam	NW 16th St. and E. Lake Overholser Dr. Oklahoma City, OK	3.4 miles southwest
Will Rogers Park Gardens and Arboretum	3400-3500 NW 36th St., Oklahoma City, OK	4.0 miles southeast
Public Parks		
Dolese Youth Park	4701 NW 50th St., Oklahoma City, OK	2.0 miles east
North Rotary Park	5708 N Tulsa Ave., Oklahoma City, OK	3.0 miles east
Jack W Cornett Park	3001 N Grove Ave., Oklahoma City, OK	3.0 miles southeast
J.B. Black Park	2121 N Council Rd., Oklahoma City, OK	3.07 southwest
Overholser	2402 E Overholser Dr., Oklahoma City, OK	3.12 miles southwest
Geraldine Park	3203 N Geraldine Ave., Oklahoma City, OK	3.5 miles southeast
Lela Park	1801 Lela Ave., Oklahoma City, OK	3.5 miles southeast
Stars and Stripes Park	3701 S Lake Hefner Dr., Oklahoma City, OK	3.65 miles northeast
Route 66 Park	9901 NW 23rd St., Oklahoma City, OK	3.75 miles southwest
Will Rogers Park	3400 NW 36th St., Oklahoma, City OK	4.0 miles southeast
Harlow Park	4800 NW 19th St., Oklahoma City, OK	4.0 miles southeast
Tinsley Park	3243 NW 65th St., Oklahoma City, OK	4.0 miles northeast
Lytle Park	801 Greenvale Rd., Oklahoma City, OK	4.07 miles south
Hefner Park	3301 NW Grand Blvd., Oklahoma City, OK	4.10 miles northeast
Bluff Creek Park	11301 N Meridian Ave., Oklahoma City, OK	4.13 miles northeast
E.B. Jeffery Park	4432 NW 16th St., Oklahoma City, OK	4.20 miles southeast
Mayview Park	3135 NW 73rd St., Oklahoma City, OK	4.25 miles northeast
Rockwell Park	618 N Rockwell Ave., Oklahoma City, OK	4.30 miles south
Melrose Park	7800 Melrose Ln., Oklahoma City, OK	4.5 miles south
Luther Dulaney Park	2931 NW 41st St., Oklahoma City, OK	4.6 miles southeast
Grant Corbin Park	4032 NW 13th St., Oklahoma City, OK	4.7 miles southeast
Belle Isle Park	2701 NW 62nd St., Oklahoma City, OK	4.8 miles east
Wildlife Refuge		
Stinchcomb Wildlife Refuge	5101 N Stinchcomb Ave., Oklahoma, City, OK	1.5 miles west

Source: National Park Service & U.S. Geological Survey, accessed 08.03.18

FARMLANDS

The *Farmland Protection Policy Act* (FPPA) is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. For FPPA, farmland includes prime farmland, unique farmland, prime farmland if drained, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can also be forest land, pastureland, or other land, but not water or urban built-up land.

The U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Web Soil Survey is a common source of information for soil types within mapped areas. According to the tool, approximately 145.9 acres of PWA (13.8 percent of the total airport property) is classified as prime farmlands. The remaining parts of the airport property are listed as not prime farmland.

HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

Federal, state, and local laws, including the *Resource Conservation Recovery Act* (RCRA) and the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), as amended (also known as the Superfund), regulate hazardous materials use, storage, transport, and disposal. These laws may extend to past and future landowners of properties containing these materials. Disturbing areas that contain hazardous materials or contaminants can 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 sites or hazardous waste facilities near PWA.

The closest landfill, Oklahoma City landfill, is approximately six miles south of the airport.

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*, among others. Impacts can occur when a 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.

There are three sites listed on the NRHP within five miles of PWA. These include: Lake Overholser Bridge, Lake Overholser Dam, and Will Rogers Park Gardens and Arboretum.

LAND USE

The Wiley Post Airport sits at an elevation of 1,281 feet above MSL on approximately 1,365.4 acres of land. The property is located in a developed area characterized by various commercial and residential properties. The entire airport is zoned Airport Environs Zone 1, I-2.

PWA is bound by W. Wilshire Boulevard (NW 78th Street) to the north, NW 50th Street to the south, N. Rockwell Avenue to the east, and N. Council Road to the west. The surrounding area beyond W. Wilshire Boulevard (NW 78th Street) primarily consists of commercial properties with scattered multi-family and single-family residential properties and Northwest Expressway, located further to the north. Beyond NW 50th Street, the area consists of commercial properties, single-family residences, vacant land, and a baseball field followed by Northwest 39th Expressway. The area to the east of N. Rockwell Avenue primarily consists of single-family residences with scattered multi-family residences and commercial properties, followed by N. MacArthur Boulevard located further to the east. The area west of North Council Road primarily consists of single-family residences and vacant land. Bluff Creek Canal is located adjacent to the western perimeter of the airport followed by the North Canadian River and the Stinchcomb Wildlife Refuge farther to the west.

NATURAL RESOURCES AND ENERGY SUPPLY

Energy usage at the airport includes the consumption of aviation fuel (Jet A and 100LL), gasoline and diesel fuel for vehicles and maintenance equipment, natural gas, and electricity.

NOISE AND COMPATIBLE LAND USE

Federal land use compatibility guidelines are established under 14 CFR Part 150, *Airport Noise Compatibility Planning*. Per 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).

There are single- and multi-family residential uses in the surrounding areas of PWA. In addition to residential uses, there are medical facilities, places of worship, and schools near the airport. These are identified in the **Table 1U**.

TABLE 1U
Noise-sensitive Uses

Name	Distance from Airport	Direction from Airport
Medical Facilities		
Birth Choice of Bethany	0.5 miles	East
PRC Vocational Testing Center	0.6 miles	Southeast
Places of Worship		
Mar Toma Church of Oklahoma	0.7 miles	Southeast
Williams Memorial Church	0.9 miles	Southeast
Cherokee Hills Church of Christ	1.0 miles	Northeast
Schools/Daycares		
Bethany Public Schools	1.5 miles	Southeast
Tulakes Elementary	1.6 miles	Northeast
Southern Nazarene University	1.9 miles	Southeast
Snowbarger	1.7 miles	Southeast
Residential		
Single- and multi-family uses	0.0 miles	North, South, East & West

SOCIOECONOMIC IMPACTS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Within a one-mile radius of PWA, there is an estimated population of 25,095 people (2011-2015 American Community Survey [ACS] Estimates). Minority populations comprise approximately 40 percent of this area. **Table 1V** provides the race makeup within one mile of PWA.

TABLE 1V
Population by Race, 1-Mile Radius

Race	Total
White	15,031
Black	4,148
American Indian	436
Asian	1,054
Pacific Islander	83
Some other Race	16
Two or More Races	1,682
Hispanic	2,645
Total Population	25,095

Source: ACA data accessed 08.03.18

The 2011-2015 ACS five-year estimates report that 69 percent of those residing around PWA are employed (of those ages 16 years and over). The per capita income in this section of the population is approximately $23,596 annually. Approximately 15 percent of the population within the one-mile radius reports a total household income of less than $15,000.

As previously discussed, there are residential land uses, elementary schools, and public parks located within one mile of the airport. The closest landfill is approximately six miles south of the airport.

VISUAL RESOURCES

The City of Oklahoma City has a municipal code related to visual resources which requires a permit for certain activities affecting visual resources such as murals. However, these permits are organized by districts around the city. PWA is not within one of the referenced districts.

WATER RESOURCES

Wetlands: Certain drainages (both natural and human-made) that are considered "waters of the U.S." come under the purview of the U.S. Army Corps of Engineers (USACE) under Sections 401 and 404 of the *Clean Water Act*; wetlands are also protected. In addition, E.O. 11990, *Protection of Wetlands* provides definitions and calls for safeguarding wetlands. Wetlands typically exhibit three characteristics: hydrology, hydrophytes (plants able to tolerate various degrees of flooding or frequent saturation), and poorly drained or "hydric" soils.

The following wetland areas are present on PWA property: Freshwater Emergent Wetland, Riverine, Freshwater Forested/Shrub Wetland, and Freshwater Pond. Water resources on and near airport property are depicted on **Exhibit 1K**.

Floodplains: E.O. 11988, *Floodplain Management* directs federal agencies to act to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by the floodplains. The limits of base floodplains are determined by Flood Insurance Rate Maps (FIRMs) prepared by Federal Emergency Management Agency (FEMA). Based on FIRM panel 40109C0145H from 2009, PWA is located within Zone X, an area of minimal flood hazard. There are two special hazard flood areas, Regulatory Floodway Zone AE to the east and west of the airport surrounding the Spring Creek of Bluff Creek and the North Canadian River.

Surface Waters: Surface waters include rivers, streams, creeks, lakes, and reservoirs. The primary uses of surface water are for drinking water and other public uses, irrigation, and for industrial purposes (i.e., cooling electricity-generating equipment at a power plant).

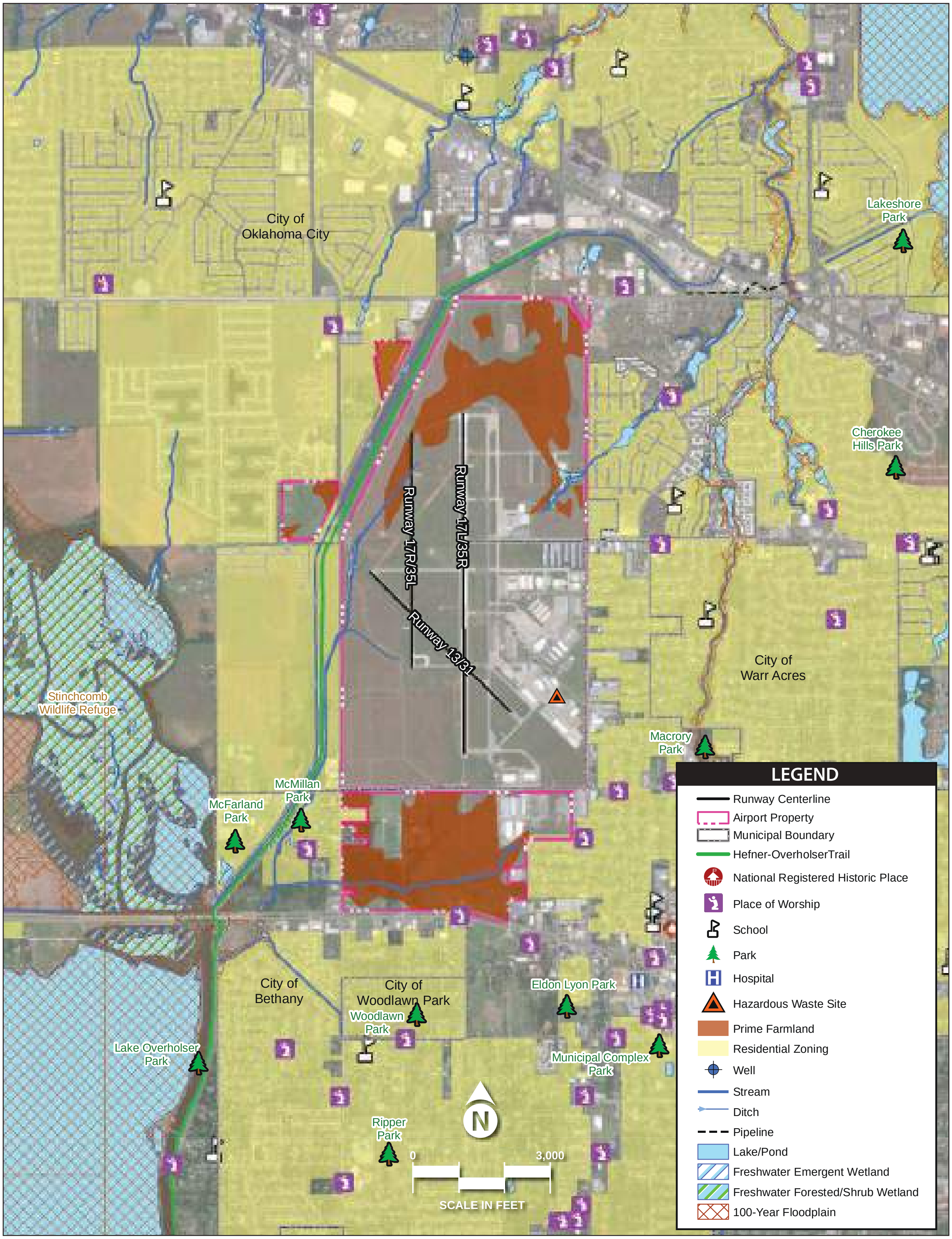
Storm water runoff is conveyed throughout the facility via sheet flow and divided into two major drainage areas. Surface runoff for the southern ¾ of the airport flows to the south-southwest, and storm water discharges may be received by Bluff Creek Canal located immediately adjacent to the west of PWA. This drainage area is located within the Lake Overholser-North Canadian River Watershed. The Lake Overholser-North Canadian River Watershed is not classified as a sensitive area; however, portions of this watershed are listed as impaired. Surface runoff for the remaining northern ¼ of the airport flows to the north-northeast, and storm water discharges may be received by Lake Hefner located approximately 2.5 miles to the northeast of PWA. This drainage area is located within the Cottonwood Creek Watershed. The Cottonwood Creek Watershed is not listed as a sensitive area, but portions of this watershed are listed as impaired.

Groundwater: The nearest sole source aquifer, which is an aquifer that has been designated by the EPA as the primary source of drinking water for an area, is the Garber-Wellington Aquifer. Generally, a sole source aquifer provides a minimum of 50 percent of the drinking water that is consumed in the area overlying the aquifer. However, PWA is supplied with drinking water from the City of Oklahoma City.

Wild and Scenic Rivers: Wild and scenic rivers refer to designations within the National Park Services' Nationwide Rivers Inventory. Public Law 90-542 states that such rivers are free-flowing and possess "outstanding remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values." There are no designated wild and scenic rivers that will be affected by activities at PWA.

SUMMARY

The information contained in this chapter is intended to establish a baseline of understanding about the current capabilities of the airport and the environment in which it operates. The chapter began with a discussion of the history, regional setting, administration, and operational characteristics of the airport. The airport is a general aviation reliever facility for OKC providing a direct aviation link to the national network of airports and a full range of services for operators from small piston-powered aircraft to large business jets.



Source: ESRI Basemap Imagery, FEMA, USDA, City of Oklahoma City, City of Bethany, City of Warr Acres

Exhibit 1K
ENVIRONMENTAL SENSITIVITIES

The Airport Master Plan is intended to provide the Oklahoma City Airport Trust and the Oklahoma City Department of Airports a long-term (20-year) visioning document to aid decision making, particularly as related to capital improvements, in the coming years. Development of the Airport Master Plan follows an FAA-prescribed process. While the FAA will not provide approval of the overall Airport Master Plan, they will review and approve two specific elements: the aviation demand forecasts and the airport layout plan (ALP).

In the next chapter, the baseline information presented here will be used in the development of aviation demand forecasts.

Chapter Two

Aviation Demand Forecasts

Chapter Two

AVIATION DEMAND FORECASTS

The definition of demand that may reasonably be expected to occur during the useful life of an airport's key components (e.g., runways, taxiways, landside facilities, etc.) is an important factor in facility planning. In airport master planning, this involves projecting potential aviation activity for at least a 20-year timeframe. Aviation demand forecasting for Wiley Post Airport (PWA) will focus on demand indicators, such as based aircraft, based aircraft fleet mix, annual aircraft operations, and peaking operational periods.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. In addition, aviation activity forecasts may be an important input to future benefit-cost analyses associated with airport development, and the FAA reviews these analyses when federal funding requests are submitted.

The FAA will review individual airport forecasts with the objective of comparing them to its *Terminal Area Forecast* (TAF) and the *National Plan of Integrated Airport Systems* (NPIAS). Even though the TAF is updated annually, in the past there was almost always a disparity between the TAF and master planning forecasts. This was primarily because the TAF forecasts did not consider local conditions or recent trends. In recent years, however, the FAA has improved its forecast model to be a demand-driven forecast for aviation services based upon local and national economic conditions, as well as conditions within the aviation industry.

The FAA approves only two components of a Master Plan: the aviation demand forecasts and the Airport Layout Plan (ALP). The ALP will be updated later in this study. As stated, in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, forecasts should be:

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

The forecast process for an Airport Master Plan consists of a series of basic steps that vary in complexity depending upon the issues to be addressed and the level of effort required. The steps include a review of previous forecasts, determination of data needs, identification of data sources, collection of data, selection of forecast methods, preparation of the forecasts, and evaluation and documentation of the results. FAA Advisory Circular (AC) 150/5070-6C, *Airport Master Plans*, outlines seven standard steps involved in the forecast process, including:

1) **Identify Aviation Activity Measures**: The level and type of 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. In this case, the forecasts produced in the 2009 *Airport Master Plan Update* will be used for comparison.

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

4) **Select Forecast Methods**: 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 judgment.

5) **Apply Forecast 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 Forecast 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 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 FAA has provided additional guidance indicating forecasts are consistent with the TAF when they differ by less than 10 percent in the first five years, and less than 15 percent in the 10-year period.)

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 certainty. Therefore, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The following forecast analysis for PWA 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 PWA 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 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, mostly 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 gross domestic product (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 2A** 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 2008-2009 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 2008-2009 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.

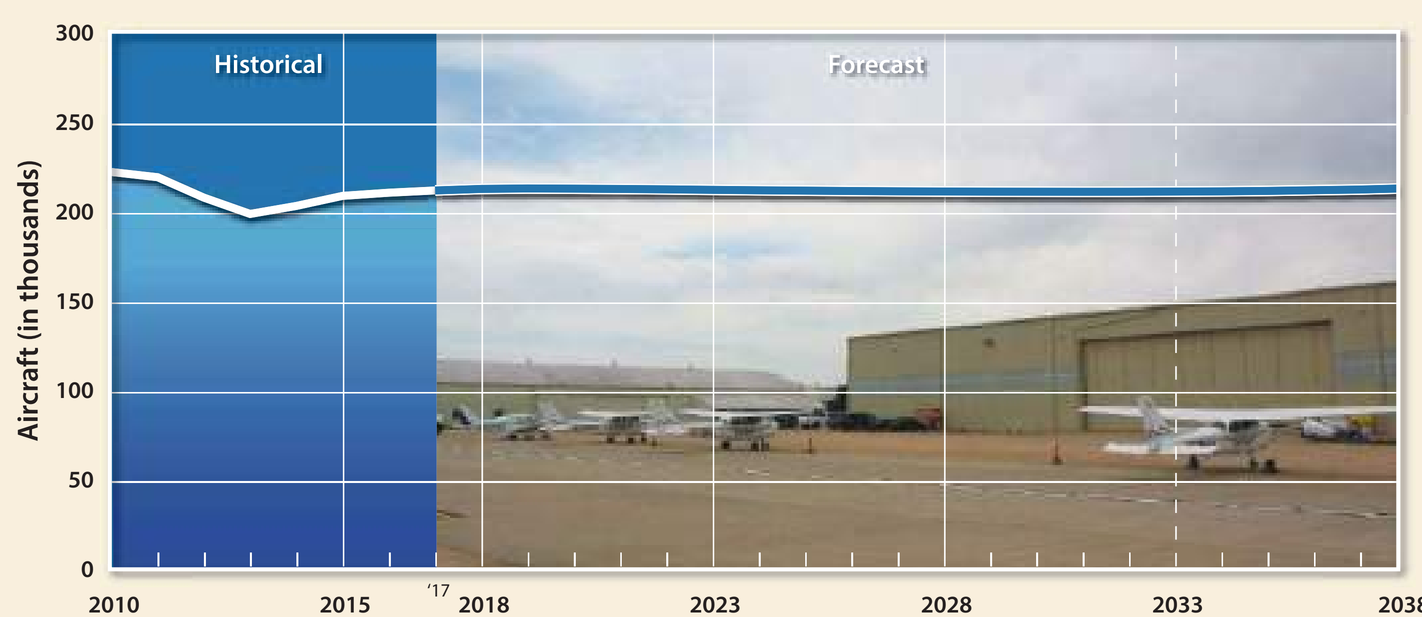
Business Jets: General aviation manufacturers' business jet deliveries grew from 667 units in 2016 to 676 units in 2017. The North American market accounted for 63.8 percent of business jet deliveries, which is a 1.8 percent increase in market share compared to 2016.

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.

U.S. ACTIVE GENERAL AVIATION AIRCRAFT

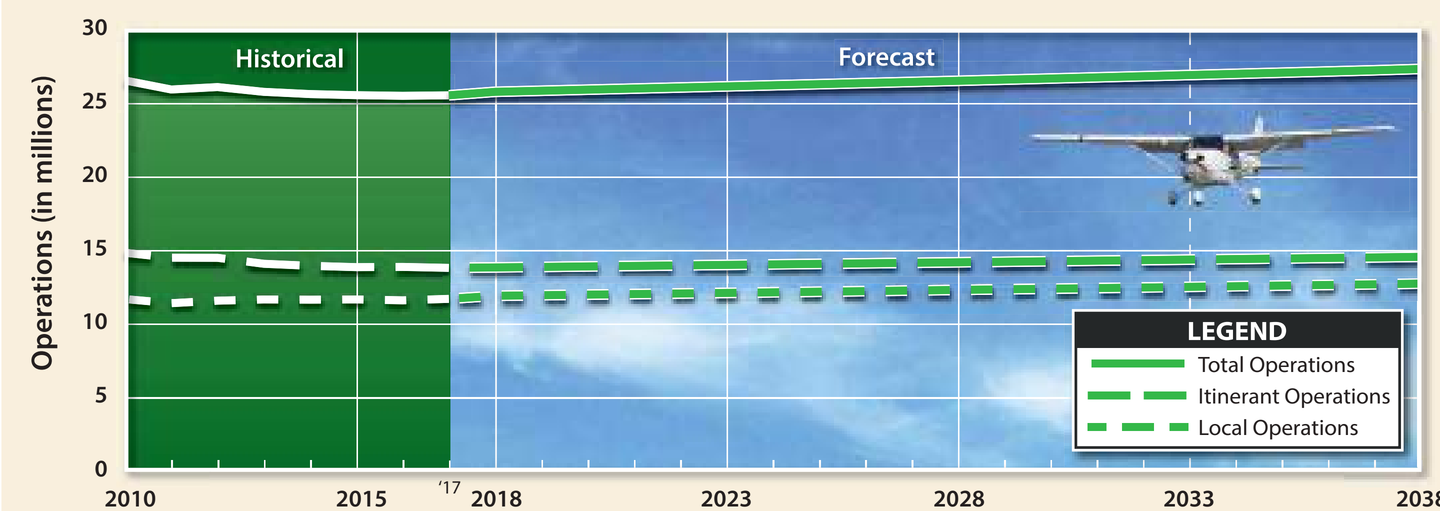
	2017E	2023	2028	2038	AAGR 2018-2038
Fixed Wing					
Piston					
Single Engine	130,330	125,330	118,740	107,800	-1.0%
Multi-Engine	12,935	12,720	12,465	11,845	-0.4%
Turbine					
Turboprop	9,430	9,025	9,870	12,855	1.7%
Turbojet	14,075	16,220	18,120	22,195	2.2%
Rotorcraft					
Piston	3,405	3,750	4,035	4,675	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%**



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*

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. GENERAL AVIATION 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%

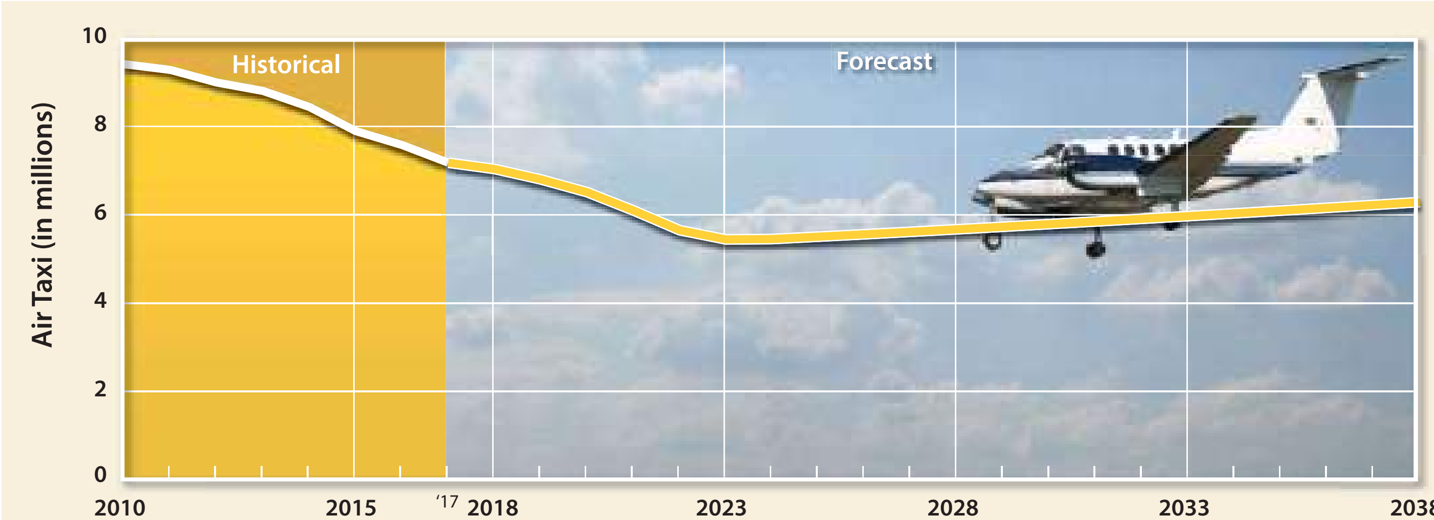


Exhibit 2A
NATIONAL GENERAL AVIATION/AIR TAXI FORECASTS

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

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 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 PWA, the primary role is to accommodate general aviation demand in the region. PWA is classified as a reliever airport within the NPIAS, meaning that one of its main purposes is to relieve general and corporate aviation activity at Will Rogers World Airport (OKC).

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 an airport. 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.

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 an airport from more distant locales.

As a general rule, a general aviation airport's service area extends for approximately 30 miles. There are nine public-use airports within 30 nautical miles of PWA; however, several of these facilities provide limited aviation services to primarily small general aviation aircraft. Seven airports are included in the NPIAS, including OKC which has a primary role to serve commercial cargo and passenger airlines operations, although OKC does cater to corporate general aviation activity also. The six other NPIAS airports provide various levels of general aviation services. Of these six, the University of Oklahoma Westheimer Airport (OUN) is also classified as a general aviation reliever airport. **Table 2B** presents information related to PWA and the nine public-use airports in proximity.

TABLE 2B
Regional Airports

Airport	Distance from PWA (nm)	NPIAS Service Level	Based Aircraft	Annual Operations	Longest Runway (feet)	Lowest Visibility Minimums
Wiley Post Airport (PWA)	0	GA-R	313	52,088	7,199	½-mile
Sundance Airport (HSD)	5.0 NW	N/A	210	39,492	5,001	1-mile
Will Rogers World Airport (OKC)	8.8 SSE	CS	64	117,518	9,803	½-mile
Clarence E. Page Municipal (RCE)	9.1 WSW	GA	56	42,554	6,014	¾-mile
El Reno Airport (99F)	16.3 W	N/A	0	75	2,600	N/A
El Reno Regional (RQO)	17.9 WSW	GA	24	24,825	5,600	1-mile
U. of Oklahoma Westheimer (OUN)	19.3 SSE	GA-R	120	48,707	5,199	½-mile
Guthrie-Edmond Regional (GOK)	22.1 NNE	GA	66	23,000	5,001	1-mile
David Jay Perry Airport (1K4)	24.3 SSE	GA	45	15,000	3,004	1¼-mile
Kingfisher Airport (F92)	25.4 NW	GA	11	4,010	2,800	N/A
GA-R: General Aviation Reliever; GA: General Aviation; CS: Commercial Service; nm: nautical mile						

Sources: FAA Form 5010-1, Airport Master Record; www.airnav.com; FAA National Based Aircraft Inventory Program; FAA Operations Network (OPSNET); Wiley Post ATCT Records.

The previously mentioned airports' available levels of service and facilities will play a role in limiting PWA's service area, especially in areas west of the airport with HSD and RCE to the northwest and southwest, respectively. However, PWA has the most convenient access to the central Oklahoma City (OKC) business district, while OUN is the more convenient airport for users in Norman and south side OKC metropolitan area.

As a general aviation reliever airport, PWA's service area is also driven by aircraft owners or operators and where they choose to base their aircraft. The primary consideration of aircraft owners or operators when choosing where to base their aircraft is convenience (i.e., easy access and proximity to the airport). Under this circumstance, the most effective method of defining an airport's service area is by examining the based aircraft by their registered address. **Exhibit 2B** presents the number of PWA based aircraft located within the region by their associated zip code. This map also depicts a 30-minute drivetime from PWA, which covers western Oklahoma County, eastern Canadian County, and extends to a small degree into Grady, McClain, Cleveland, and Logan counties. According to this analysis, 75 percent of aircraft based at PWA are within the 30-minute drivetime range. Most based aircraft are registered to addresses within Oklahoma County; however, several aircraft are registered to addresses outside the regional area, including out-of-state. It is not uncommon for an aircraft based in one location to be registered in another, especially for corporate aircraft, which typically are registered by the controlling ownership entity, such as a bank. While the most concentrated areas of based aircraft ownership are located within Oklahoma County, based aircraft are also spread throughout several communities in the greater OKC metropolitan area. Considering these factors, the primary service area for PWA can be defined as being Oklahoma County and, more broadly defined, as the entirety of the OKC metropolitan area as the secondary service area.

SOCIOECONOMIC TRENDS

Socioeconomic conditions also provide an important baseline for preparing aviation demand forecasts. Local socioeconomic variables, such as population and employment, are indicators for understanding the dynamics of the community and can relate to local trends in aviation activity. Analysis of the demographics of the airport service area will give a more comprehensive understanding of the socioeconomic situations influencing the region which support PWA. The following is a summary of the demographic and socioeconomic data presented in Chapter One, as well as forecasts of those socioeconomic characteristics.

Table 2C summarizes historical and forecast population, employment, and income estimates for Oklahoma County and the Oklahoma City Metropolitan Statistical Area (MSA), which includes Canadian, Cleveland, Grady, Lincoln, Logan, McClain, and Oklahoma counties. Also depicted in the table are historical and forecast figures for the State of Oklahoma. By 2038, the population of Oklahoma County is projected to reach over 900,000 people. The OKC MSA is projected to reach almost 1.7 million residents by 2038, which will make up approximately 37 percent of the state's population. Employment growth is projected to outpace population growth in each jurisdiction forecast at 1.1 percent CAGR for both the county and MSA and 1.0 percent CAGR for the state. Per capita personal income is projected to grow most quickly in Oklahoma County at 1.0 percent CAGR, compared to 0.8 and 0.9 percent CAGR for the MSA and state, respectively. Gross regional product (GRP) for the MSA is projected to grow by $28.6 billion in the next 20 years, which accounts for approximately half the total GRP growth in the state.

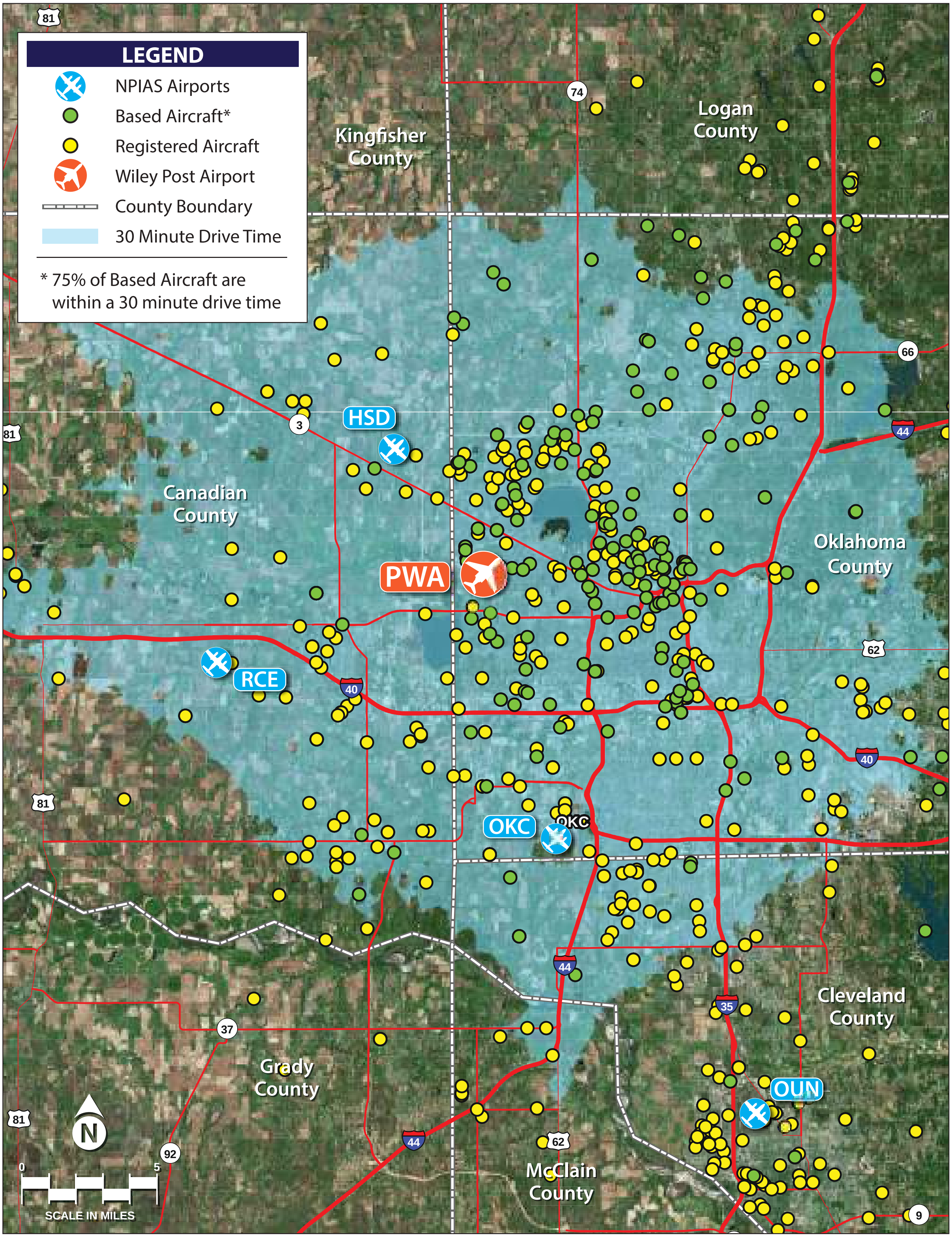


Exhibit 2B
REGISTERED AND BASED AIRCRAFT LOCATIONS

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 judgment 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 or a combination of several projections based on 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.

TABLE 2C
Socioeconomic History and Projections

	HISTORICAL				PROJECTIONS			
	2000	2010	2018	CAGR (2000-2018)	2023	2028	2038	CAGR (2018-2038)
Oklahoma County								
Population	661,769	721,096	794,318	1.0%	824,429	854,379	906,785	0.7%
Employment	516,809	556,205	642,831	1.2%	686,349	728,251	795,803	1.1%
Income (PCPI)	$33,647	$41,091	$47,009	1.9%	$50,034	$52,957	$57,406	1.0%
GRP (millions)	$32,646	$39,085	$46,720	2.0%	$51,567	$56,687	$66,811	1.8%
Oklahoma City Metropolitan Statistical Area (MSA)								
Population	1,098,132	1,257,950	1,401,012	1.4%	1,475,176	1,551,444	1,697,637	1.0%
Employment	698,069	772,018	898,953	1.4%	962,979	1,024,766	1,129,697	1.1%
Income (PCPI)	$31,778	$38,119	$42,799	1.7%	$45,169	$47,348	$50,376	0.8%
GRP (millions)	$42,129	$54,585	$64,163	2.4%	$70,908	$78,080	$92,805	1.9%
State of Oklahoma								
Population	3,454,365	3,759,603	3,980,452	0.8%	4,132,949	4,287,042	4,565,712	0.7%
Employment	1,994,411	2,131,425	2,388,811	1.0%	2,540,520	2,680,651	2,918,953	1.0%
Income (PCPI)	$28,850	$35,327	$39,860	1.8%	$42,312	$44,546	$47,750	0.9%
GRP (millions)	$109,972	$147,475	$170,134	2.5%	$184,295	$199,081	$229,920	1.5%

CAGR - Compound Annual Growth Rate
GRP – Gross Regional Product (adjusted to 2009 dollars)
PCPI - Per Capita Personal Income (adjusted to 2009 dollars)
Oklahoma City MSA includes Canadian, Cleveland, Grady, Lincoln, Logan, McClain, and Oklahoma counties
Source: U.S. Census Bureau; Woods & Poole Complete Economic and Demographic Data Source (CEDDS) 2018

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 manner 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 used to measure the relationship between variables. This technique yields an r-squared (r^2) value which shows the level of correlation between the 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 update the forecasts, reassess the assumptions originally made, and revise the forecasts based on the current airport and industry conditions. Facility and financial planning usually requires at least a 10-year purview 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 PWA have been developed 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 PWA 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.

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

- Registered Aircraft
- Based Aircraft
- Based Aircraft Fleet Mix
- Annual Aircraft Operations
- Peaking Characteristics
- Annual Instrument Approaches

For a general aviation reliever airport such as PWA, based aircraft, annual aircraft operations, and peak activity levels are the most important indicators of aviation demand that need to be forecast. Future facility requirements, such as hangars, apron area, and airfield enhancements are derived from these projections.

FAA *TERMINAL AREA FORECAST*

As previously discussed, on an annual basis the FAA publishes the TAF for each airport included in the NPIAS. The TAF is a generalized forecast of airport activity used by FAA for internal planning purposes. It is available to airports and consultants to use as a point of comparison for development of local forecasts. **Table 2D** presents the *Terminal Area Forecast* for PWA.

Given that there is currently no commercial service activity at PWA, the TAF does not reflect any existing and/or forecast commercial airline passenger enplanements or aircraft operations. Aircraft operations are forecast to continue to be dominated by general aviation operations, which account for over 90 percent of operations. The TAF also accounts for military activity; however, it provides a flat-line forecast for military segments after 2018. Because of the potential for a rapidly changing missions, it is common to implement a flat-line forecast for military activity. Air taxi operations are projected to be the fastest growing segment at a 2.0 percent CAGR and ultimately accounting for approximately eight percent of total operations. Based aircraft are forecast to increase by 116 additional aircraft over the next 20 years. As noted previously, the FAA will examine the new forecasts developed for this Master Plan in light of the TAF. A comparison between the Master Plan forecasts and TAF is detailed later in this chapter.

In 2017, the airport experienced 52,088 operations, as counted by the PWA airport traffic control tower (ATCT), which is slightly above the base year TAF operations count. The TAF also presents a total of 350 based aircraft for 2018; however, the FAA's national based aircraft inventory program reports a validated count of 313 based aircraft as of 2018. The FAA's national based aircraft inventory program is the most reliable source of data, so the TAF should be updated. Once the forecasts presented here are approved by the FAA, the TAF could be updated to reflect the selected forecasts.

TABLE 2D
2018 FAA *Terminal Area Forecast*
Wiley Post Airport

	2018	2023	2028	2038	CAGR (2018 - 2038)
ENPLANEMENTS					
Air Carrier	0	0	0	0	0.0%
Commuter	0	0	0	0	0.0%
Total	***0***	***0***	***0***	***0***	***0.0%***
ANNUAL OPERATIONS					
Itinerant					
Air Carrier	0	0	0	0	0.0%
Air Taxi	2,889	3,199	3,538	4,327	2.0%
General Aviation	33,191	33,691	34,199	35,238	0.3%
Military	257	257	257	257	0.0%
Total Itinerant	***36,337***	***37,147***	***37,994***	***39,822***	***0.5%***
Local					
General Aviation	13,562	14,327	15,135	16,885	1.1%
Military	158	158	158	158	0.0%
Total Local	***13,720***	***14,485***	***15,293***	***17,043***	***1.1%***
Total Operations	***50,057***	***51,632***	***53,287***	***56,865***	0.6%
Based Aircraft	***350***	***376***	***402***	***466***	1.4%

Source: FAA Terminal Area Forecast (January 2018)

REGISTERED AIRCRAFT

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 activity 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. As previously discussed, most based aircraft at PWA reside in Oklahoma County with small numbers spread throughout the other MSA counties.

Table 2E presents historical data regarding aircraft registered in Oklahoma County since 1998. These figures are derived from the FAA aircraft registration database that categorized registered aircraft by county based on the zip code of the registered aircraft. Although this information generally provides a correlation to based aircraft, it is common for some aircraft to be registered in the county but based at an airport outside the county or vice versa.

TABLE 2E
Historical Aircraft Registration by Type
Oklahoma County

Year	SEP	MEP	Turboprop	Jet	Helicopter	Other[1]	Total
1998	4,699	863	130	283	496	166	6,637
1999	4,675	838	142	294	489	173	6,611
2000	4,697	856	129	333	493	197	6,705
2001	4,727	812	211	464	500	201	6,915
2002	4,724	812	209	475	505	202	6,927
2003	4,749	799	306	547	522	199	7,122
2004	3,760	638	285	573	461	183	5,900
2005	3,647	622	285	621	431	182	5,788
2006	3,801	765	107	556	426	186	5,841
2007	3,897	791	111	606	423	237	6,065
2008	3,884	673	194	689	422	242	6,104
2009	3,994	672	205	725	442	251	6,289
2010	3,974	669	199	708	447	257	6,254
2011	3,714	598	196	670	410	235	5,823
2012	1,055	181	129	616	97	75	2,153
2013	692	116	98	581	32	52	1,571
2014	660	108	90	598	33	47	1,536
2015	674	100	85	614	37	52	1,562
2016	684	105	106	643	46	68	1,652
2017	722	92	112	664	45	77	1,712
2018[2]	--	--	--	--	--	--	1,513

[1]"Other" category consists of gliders, ultralight, unmanned aerial vehicles (UAVs), and electric aircraft.
[2] Fleet mix data not available for 2018.
SEP - Single Engine Piston
MEP - Multi-Engine Piston

Source: FAA Aircraft Registration Database

Between 2010 and 2012, a significant decrease in the total number of registered aircraft is reported. This is likely due to the fact that during this period, the FAA required all aircraft to be re-registered, which removed nearly 30 percent of previously registered active general aviation aircraft nationwide. As presented in the table, Oklahoma County experienced a 63 percent decrease in registered aircraft from 2011 to 2012. An additional 27 percent decline occurred the following year in 2013. The clear majority of the decreases were within the single- and multi-engine piston categories. Since 2014, registered aircraft had begun to increase again, reaching 1,712 in 2017. As of July 2018, registered aircraft in Oklahoma County has taken another 12 percent drop to a current level of 1,513.

The table also includes the type of aircraft registered in Oklahoma County. As is typical for nearly all areas in the United States, single engine piston aircraft dominate the total aircraft numbers. In 2017, for example, there were 1,712 aircraft registered in the county, of which 722 were single engine piston aircraft; however, jet aircraft accounted for nearly as many with 664. Aircraft registrations in 2017 also included 92 multi-engine piston aircraft, 112 turboprop aircraft, and 45 helicopters. There were also 77 aircraft included in the "other" category, which can include gliders, ultralights, electric aircraft, and unmanned aerial vehicles (UAVs).

Table 2F presents four different projections of registered aircraft for Oklahoma County, two market share forecasts and two ratio projections. Regression and time-series analyses were also considered; however, due to the significant drop in registrations from 2010 to 2013, the regression and time-series analyses did not result in reliable forecasts. As a result, these analytical methods were not considered further.

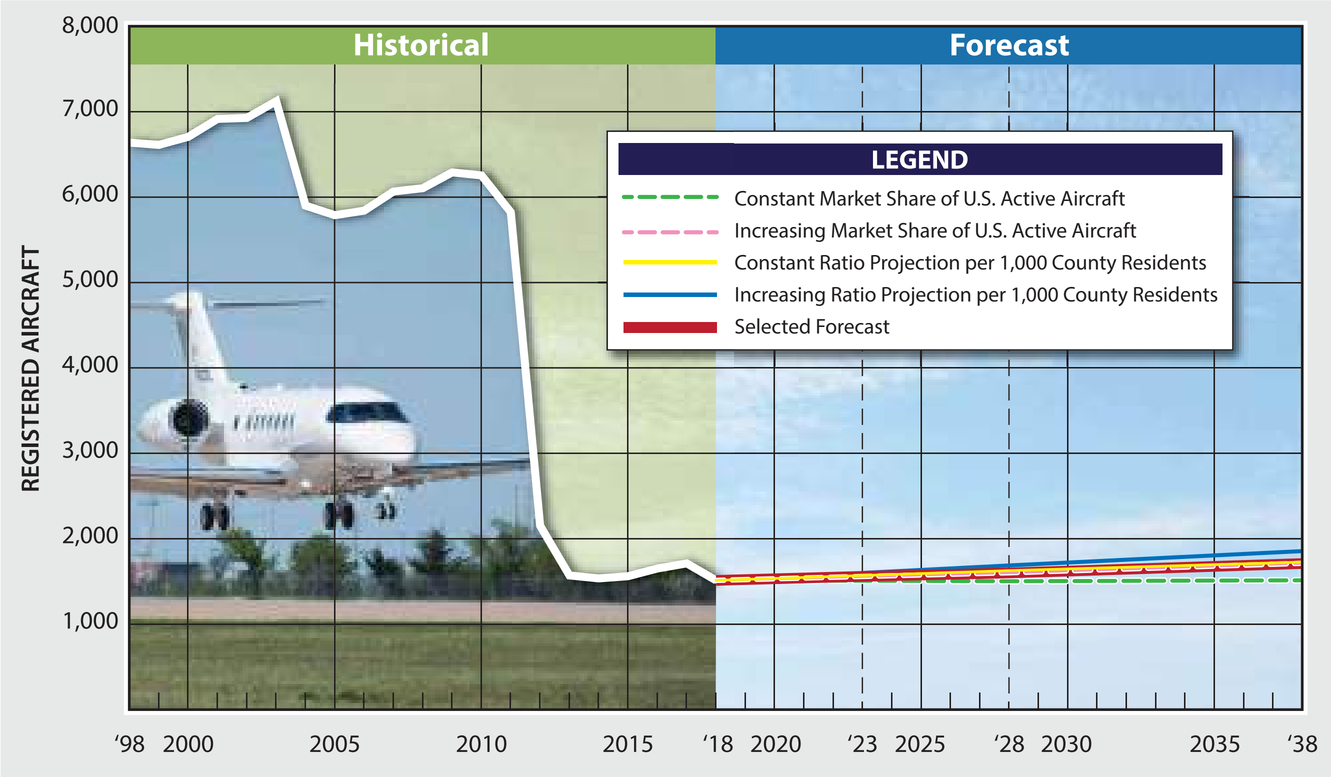
The first market share forecast considers the relationship between registered aircraft located within Oklahoma County and active aircraft within the United States. In 2018, Oklahoma County held 0.7073 percent of the U.S. active aircraft. By keeping this market share constant, a forecast emerges that shows essentially zero growth since very little growth is projected in the U.S. active fleet.

The second forecast considers an increasing market share percentage of local registered aircraft to the number of national active aircraft. As evidenced in the table, since 2015 the county gained market share of the U.S. active fleet, increasing from 0.7437 percent to 0.8036 percent in 2017. Market share has dropped again in 2018; however, this period does indicate the county has the capacity to grow market share. An increasing forecast model having the county market share of U.S. active aircraft rising to 0.8003 percent in 2038 generates 1,713 registered aircraft at a CAGR of 0.62 percent.

In addition to the market share forecasts, two ratio projection forecasts were generated. In 2018, the county had 1.90 registered aircraft per 1,000 Oklahoma County residents. The first ratio projection holds this ratio constant while it is applied to the population forecast of Oklahoma County. This forecast results in 1,570 registered aircraft and a CAGR of 0.66 percent. A second ratio projection considers increasing the ratio to the average level experienced in the county since 2013, when registrations normalized after a period of significant decreases. During this period, the county averaged 2.05 registered aircraft per 1,000 residents. Growing to this level by 2038 results in 1,856 registered aircraft and a CAGR of 1.03 percent.

Exhibit 2C summarizes the registered aircraft forecasts for Oklahoma County. The registered aircraft forecasts produced a high range of 1,856 and a low range of 1,514 registered aircraft. Ultimately, the selected forecast aligns closely with the increasing market share of U.S. active aircraft projection reaching 1,710 by 2038 or an increase of 197 registered aircraft. Prior to 2018, the county's market share had been steadily increasing and, based upon the potential for continued population and economic growth in the county, it's reasonable to anticipate moderate growth in aircraft registrations over the next 20 years.

COUNTY REGISTERED AIRCRAFT FORECASTS



BASED AIRCRAFT FORECASTS

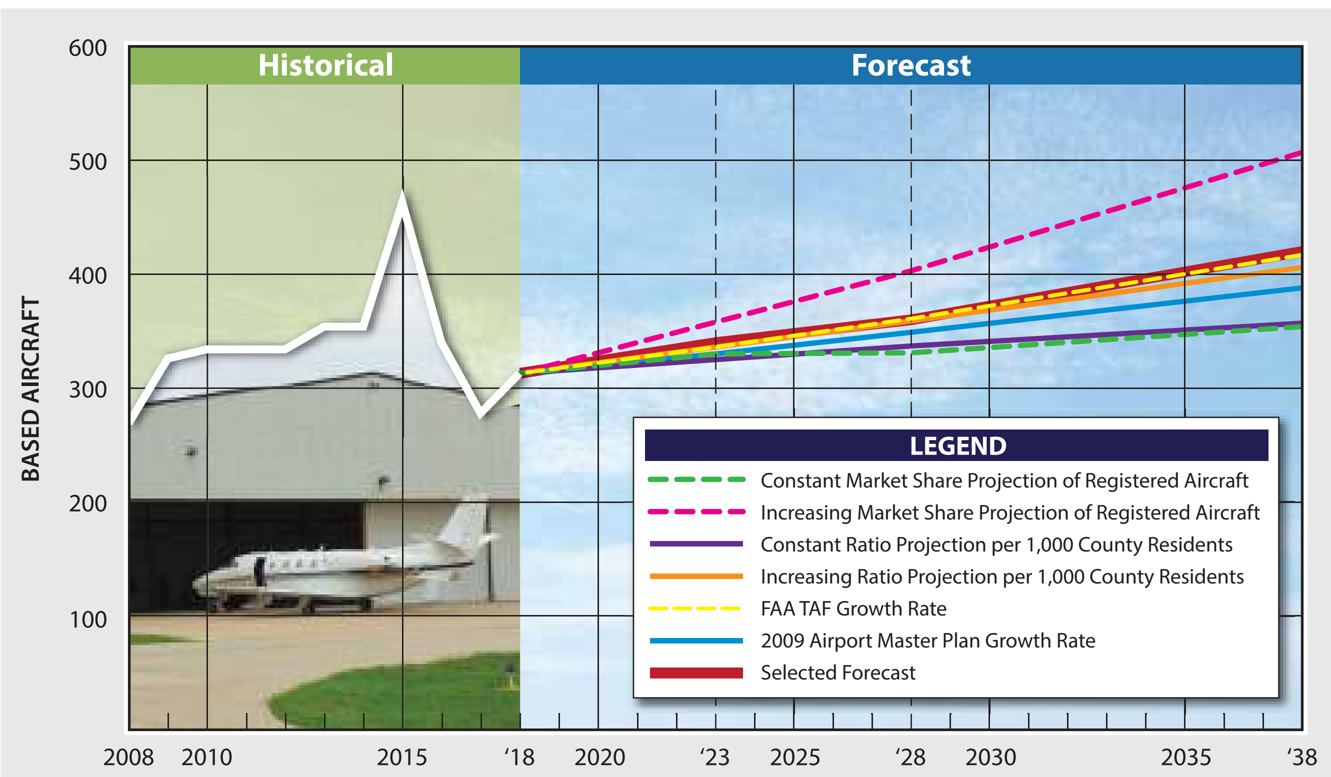


Exhibit 2C
REGISTERED AND BASED AIRCRAFT FORECASTS

TABLE 2F
Registered Aircraft Projections
Oklahoma County

Year	County Registrations[1]	U.S. Active Aircraft[2]	Market Share of U.S. Aircraft	Oklahoma County Population[3]	Aircraft per 1,000 Residents
1998	6,637	N/A	--	650,289	10.21
1999	6,611	N/A	--	657,182	10.06
2000	6,705	217,533	3.0823%	661,769	10.13
2001	6,915	211,446	3.2703%	664,836	10.40
2002	6,927	211,244	3.2791%	671,120	10.32
2003	7,122	209,606	3.3978%	674,571	10.56
2004	5,900	219,319	2.6901%	677,742	8.71
2005	5,788	224,257	2.5810%	683,299	8.47
2006	5,841	221,942	2.6318%	690,153	8.46
2007	6,065	231,606	2.6187%	695,706	8.72
2008	6,104	228,664	2.6694%	701,484	8.70
2009	6,289	223,876	2.8091%	711,595	8.84
2010	6,254	223,370	2.7998%	721,096	8.67
2011	5,823	220,453	2.6414%	729,915	7.98
2012	2,153	209,034	1.0300%	742,541	2.90
2013	1,571	199,927	0.7858%	755,639	2.08
2014	1,536	204,408	0.7514%	766,389	2.00
2015	1,562	210,031	0.7437%	775,949	2.01
2016	1,652	211,794	0.7800%	782,970	2.11
2017	1,712	213,050	0.8036%	788,349	2.17
2018	1,513	213,905	0.7073%	794,318	1.90
Constant Market Share of U.S. Active Aircraft (CAGR = 0.00%)					
2023	1,509	213,390	0.7073%	824,429	1.83
2028	1,503	212,465	0.7073%	854,379	1.76
2038	1,514	214,090	0.7073%	906,785	1.67
Increasing Market Share of U.S. Active Aircraft (CAGR = 0.62%)					
2023	1,559	213,390	0.7306%	824,429	1.89
2028	1,602	212,465	0.7538%	854,379	1.87
2038	1,713	214,090	0.8003%	906,785	1.89
Constant Ratio Projection per 1,000 County Residents (CAGR = 0.66%)					
2023	1,570	213,390	0.7359%	824,429	1.90
2028	1,627	212,465	0.7660%	854,379	1.90
2038	1,727	214,090	0.8068%	906,785	1.90
Increasing Ratio Projection per 1,000 County Residents (CAGR = 1.03%)					
2023	1,600	213,390	0.7497%	824,429	1.94
2028	1,688	212,465	0.7946%	854,379	1.98
2038	1,856	214,090	0.8671%	906,785	2.05
Selected Registered Aircraft Forecast (CAGR = 0.61%)					
2023	1,560	213,390	0.7311%	824,429	1.89
2028	1,600	212,465	0.7531%	854,379	1.87
2038	1,710	214,090	0.7987%	906,785	1.89

Sources:
[1]FAA Aircraft Registration Database
[2]FAA Aerospace Forecasts - Fiscal Years 2018-2038
[3]Woods & Poole Complete Economic and Demographic Data Source (CEDDS) 2018

The registered aircraft projection is one data point to be used in the development of a based aircraft forecast. The following section will present several potential based aircraft forecasts, as well as the selected based aircraft forecast, to be utilized in this study.

BASED AIRCRAFT

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 non-existent.

The current based aircraft count at PWA was compiled using the FAA National Based Aircraft Inventory Program as reported by airport management. Based on airport records and FAA's verified database, including specified aircraft registration numbers in 2018, there were 313 based aircraft at PWA. Historic based aircraft figures were sourced from the FAA TAF for 1998 to 2017. The TAF figures are not independently verified, which is why for certain periods, such as from 2010 to 2012, the based aircraft figure is static at 334. Like aircraft registrations, it is likely that based aircraft figures at many airports have historically been incomplete or inaccurate, which is why the FAA initiated the National Based Aircraft Inventory Program. While these historic figures are unverified, they likely reflect what airport staff at the times estimated for based aircraft.

Table 2G presents several based aircraft forecasts for PWA. The first method used to project based aircraft examined the airport's share of registered aircraft in Oklahoma County. As shown, the airport captured 20.7 percent of aircraft registered in the county in 2018. The first forecast assumes a constant market share of 20.7 percent yielding 354 based aircraft by 2038, equating to a 0.61 percent CAGR. The second projection assumes the airport's market share will increase throughout the planning period to a level like the airport's 2015 share of 29.6 percent. This projection yields 507 based aircraft by 2038, resulting in a CAGR of 2.44 percent.

Trends comparing the number of based aircraft with the Oklahoma County population were also analyzed. A constant ratio of based aircraft per 1,000 people results in based aircraft growing at the same rate as the county population. This yields 357 based aircraft by 2038, which is a CAGR of 0.66 percent. In comparison, an increasing ratio projection, which assumes reaching a ratio similar to the average experienced since 2008, generates a forecast of 406 based aircraft and CAGR of 1.30 percent.

As a point of comparison, the FAA TAF projects a total of 466 based aircraft by 2038; however, its 2018 count of 350 is higher than the current validated count of 313. Therefore, the TAF's projected growth rate of 1.44 percent was applied to the validated count to produce a modified TAF forecast of 417 based aircraft.

TABLE 2G
Based Aircraft Forecasts
Wiley Post Airport

Year	Wiley Post Airport Based Aircraft[1]	Oklahoma County Registered Aircraft[2]	Market Share of Registered Aircraft	Oklahoma County Population[3]	Based Aircraft per 1,000 Residents
2008	269	6,104	4.4%	701,484	0.38
2009	326	6,289	5.2%	711,595	0.46
2010	334	6,254	5.3%	721,096	0.46
2011	334	5,823	5.7%	729,915	0.46
2012	334	2,153	15.5%	742,541	0.45
2013	354	1,571	22.5%	755,639	0.47
2014	354	1,536	23.0%	766,389	0.46
2015	463	1,562	29.6%	775,949	0.60
2016	340	1,652	20.6%	782,970	0.43
2017	278	1,712	16.2%	788,349	0.35
2018	313	1,513	20.7%	794,318	0.39
Constant Market Share Projection of Registered Aircraft (CAGR = 0.61%)					
2023	323	1,560	20.7%	824,429	0.39
2028	331	1,600	20.7%	854,379	0.39
2038	354	1,710	20.7%	906,785	0.39
Increasing Market Share Projection of Registered Aircraft (CAGR = 2.44%)					
2023	358	1,560	22.9%	824,429	0.43
2028	403	1,600	25.2%	854,379	0.47
2038	507	1,710	29.6%	906,785	0.56
Constant Ratio Projection per 1,000 County Residents (CAGR = 0.66%)					
2023	325	1,560	20.8%	824,429	0.39
2028	337	1,600	21.0%	854,379	0.39
2038	357	1,710	20.9%	906,785	0.39
Increasing Ratio Projection per 1,000 County Residents (CAGR = 1.30%)					
2023	336	1,560	21.5%	824,429	0.41
2028	359	1,600	22.5%	854,379	0.42
2038	406	1,710	23.7%	906,785	0.45
FAA Terminal Area Forecast Growth Rate (CAGR = 1.44%)					
2023	336	1,560	21.6%	824,429	0.41
2028	361	1,600	22.6%	854,379	0.42
2038	417	1,710	24.4%	906,785	0.46
2009 Airport Master Plan Growth Rate (CAGR = 1.08%)					
2023	330	1,560	19.3%	824,429	0.40
2028	349	1,600	19.9%	854,379	0.41
2038	388	1,710	20.7%	906,785	0.43
Selected Based Aircraft Forecast (CAGR = 1.48%)					
2023	340	1,560	21.8%	824,429	0.41
2028	360	1,600	22.5%	854,379	0.42
2038	420	1,710	24.6%	906,785	0.46

Sources:
[1]FAA TAF (2008-2017); FAA National Based Aircraft Inventory Program (2018).
[2]FAA Aircraft Registration Database
[3]Woods & Poole Complete Economic and Demographic Data Source (CEDDS) 2018

Finally, the based aircraft forecast from the *Wiley Post Airport Master Plan Update* (2009) study was also examined. It should be noted that this study utilized a base year of 2006. As such, the forecast growth rate of 1.08 percent was adapted and carried forward to the year 2038. Ultimately, this extended forecast yields a based aircraft count of 388 by year 2038.

Similar to the registered aircraft projections, based aircraft forecasts considered regression and time-series analyses techniques. Due to the lack of verified based aircraft data, as well as contradicting trends in based aircraft and other variables, these techniques did not result in reliable forecasts.

The forecasts previously discussed in **Table 2G** and further depicted on **Exhibit 2C** represent a reasonable planning envelope. The selected forecast aligns closely with the FAA TAF growth rate. As such, it considers the airport experiencing a slight increase in market share and in the ratio of based aircraft to 1,000 residents through the planning period. In the next five years, 340 aircraft are projected. In 10 years, 360 aircraft are projected and by 2038, 420 based aircraft are projected. This forecast results in a 1.48 percent CAGR through the long-term planning period.

Future aircraft basing at the airport will depend on several factors, including the state of the economy, fuel costs, available facilities, competing airports, and adjacent development potential. Forecasts assume a reasonably stable and growing economy, as well as reasonable development of airport facilities necessary to accommodate aviation demand. Competing airports will play a role in deciding demand; however, PWA should fare well in this competition as it is served by a runway capable of handling most general aviation aircraft and the airport's capability of being expanded to meet future demand.

Consideration must also be given to the current and future aviation conditions at the airport. PWA provides an array of aviation services and it has a runway that offers instrument approach capabilities which makes the facility accessible during poor weather conditions. In short, PWA will continue to be favored by aviation operators due to its location and available facilities. Furthermore, Oklahoma City has given every indication that it plans to continue strong support of PWA. Significant investments have already been made in the facility and the airport should continue to meet the needs of aircraft in the regional aviation system.

BASED AIRCRAFT FLEET MIX

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

Knowing the aircraft fleet mix expected to utilize PWA is necessary to properly plan for facilities that will best serve the level of activity and the type of activities occurring at the airport. The existing fleet mix of aircraft based at the airport is comprised of 172 single engine piston aircraft, 34 multi-engine piston aircraft, 27 turboprops, 67 jets, and 13 helicopters.

The based aircraft fleet mix, as presented on **Table 2H**, was compared to the existing and forecast U.S. general aviation fleet mix trends as presented in FAA *Aerospace Forecasts – Fiscal Years 2018-2038*, as well as to trends occurring at the airport. The national trend in general aviation continues to be toward a greater percentage of larger, more sophisticated aircraft as part of the national fleet. While single engine piston-powered aircraft will continue to account for the largest share of based aircraft at the airport, these aircraft are forecast to drop as a percentage of the fleet mix. Multi-engine piston-powered aircraft are expected to decrease in number and decrease as a percentage of the fleet mix during the planning period of the Master Plan.

Consistent with national aviation trends, real growth is anticipated to occur within the more sophisticated categories, including turboprop and jet categories. The turboprop category is projected to increase by 23 based aircraft over the next 20 years, while the jet category is projected to grow by 28 based aircraft. Helicopters are also considered a significant growth category, growing by 17 through 2038.

TABLE 2H
Based Aircraft Fleet Mix
Wiley Post Airport

	Existing		Forecast					
Aircraft Type	**2018**	**Percent**	**2023**	**Percent**	**2028**	**Percent**	**2038**	**Percent**
Single-Engine Piston	172	55.0%	187	55.0%	197	54.7%	225	53.6%
Multi-Engine Piston	34	10.9%	31	9.1%	26	7.2%	20	4.8%
Turboprop	27	8.6%	33	9.7%	37	10.3%	50	11.9%
Jet	67	21.4%	74	21.8%	81	22.5%	95	22.6%
Helicopter	13	4.2%	15	4.4%	19	5.3%	30	7.1%
Totals	313	100.0%	340	100.0%	360	100.0%	420	100.0%

Source: Airport Records: FAA National Based Aircraft Inventory Program; Coffman Associates analysis

ANNUAL AIRCRAFT OPERATIONS

Aircraft operations can be separated into distinct groups. For facilities such as PWA, operations typically include general aviation, air taxi, and military. General aviation operations are those conducted by private individuals or companies that are not associated with scheduled passenger services or non-scheduled transport services for hire. Air taxi refers to those operators who are certified in accordance with Title 14 Code of Federal Regulations (CFR) Part 135 and are authorized to provide on-demand public transportation of persons and property by aircraft. Military operations are those conducted by military personnel and aircraft. Air carrier operations are those conducted by commercial aircraft having a seating capacity of 60 or more and/or a maximum payload capacity of 18,000 pounds. Aside from 2007 and 2008, PWA has experienced no air carrier operations.

Aircraft operations are further classified by the ATCT 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. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations. Typically, itinerant operations increase with business use.

Table 2J depicts the history of all aircraft operations at PWA since 1998. In general, the airport has experienced operational declines within each category. In 2017, the airport experienced 37,190 itinerant operations, which was the lowest level since 2008. Local operations have also declined but were up slightly in 2017 compared to 2016.

TABLE 2J
Historical Aircraft Operations
Wiley Post Airport

	Itinerant Operations					Local Operations			
Year	Air Carrier	Air Taxi	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
1998	0	171	62,906	167	63,244	28,969	1,682	30,651	93,895
1999	0	191	62,860	144	63,195	32,655	1,789	34,444	97,639
2000	0	423	58,733	142	59,298	26,482	1,030	27,512	86,810
2001	0	1,493	56,786	224	58,503	25,928	802	26,730	85,233
2002	0	3,117	57,218	476	60,811	16,750	1,110	17,860	78,671
2003	0	3,223	50,708	370	54,301	9,760	930	10,690	64,991
2004	0	3,395	53,159	265	56,819	22,126	914	23,040	79,859
2005	0	4,749	53,230	446	58,425	24,250	1,300	25,550	83,975
2006	0	4,163	56,167	1,142	61,472	17,993	538	18,531	80,003
2007	30	3,813	38,404	1,815	44,062	16,174	539	16,713	74,519
2008	265	3,246	24,602	555	28,668	15,342	708	16,050	71,036
2009	0	2,792	43,615	1,279	47,686	13,230	806	14,036	61,722
2010	0	3,224	43,975	2,002	49,201	15,514	1,422	16,936	66,137
2011	0	3,362	41,078	2,834	47,274	16,491	1,319	17,810	65,084
2012	0	3,548	44,337	3,417	51,302	18,539	1,391	19,930	71,232
2013	0	2,696	38,043	1,806	42,545	17,657	1,040	18,697	61,242
2014	0	2,593	35,906	1,506	40,005	15,566	1,142	16,708	56,713
2015	0	3,029	37,139	1,331	41,499	16,991	914	17,905	59,404
2016	0	2,780	35,202	353	38,335	11,546	198	11,744	50,079
2017	0	2,935	34,009	246	37,190	14,728	170	14,898	52,088

Source: FAA Air Traffic Activity Data System; PWA ATCT Counts

Military operations have dropped significantly from over 3,100 on average from 2008 to 2015 to almost 400 annually in 2017. Air taxi operations have been somewhat consistent, averaging near 3,200 since 2001.

Overall, 1999 marked the highest number of total aircraft operations when the airport experienced 97,639 operations. Conversely, the airport experienced its lowest operational activity in 2016, when 50,079 aircraft operations were logged. General aviation operations (both itinerant and local) accounted for a clear majority of overall operations at over 90 percent during the timeframe.

These operational statistics are based on actual ATCT counts conducted when the tower is open and do not reflect operations that occur while the tower is closed. An adjustment will be added to the final operations forecast later in this chapter to account for operations that occur when the tower is closed.

The operational mix at PWA has been approximately 73 percent itinerant and 27 percent local since 1998. The split is typical of general aviation airports that are destinations for business and personal/recreational activities.

Itinerant General Aviation Operations

Five forecasts of itinerant general aviation operations have been developed and are presented in **Table 2K**. The forecasts presented examine and/or manipulate variables, such as the PWA market share of itinerant operations, operations per based aircraft, the FAA TAF, and the 2009 Airport Master Plan. The first projection considers the airport maintaining its market share of total U.S. itinerant general aviation operations at a constant level. In 2017 (the latest full year of operational data), PWA accounted for 0.2458 percent of U.S. itinerant operations. By carrying this percentage forward to the plan years of this study, a forecast emerges generating a CAGR of 0.26 percent and 35,900 itinerant general aviation operations by year 2038. The second forecast considers an increasing PWA market share of national itinerant general aviation operations to the historic high level of 0.3053 percent producing a CAGR of 1.29 percent and 44,500 operations by 2038.

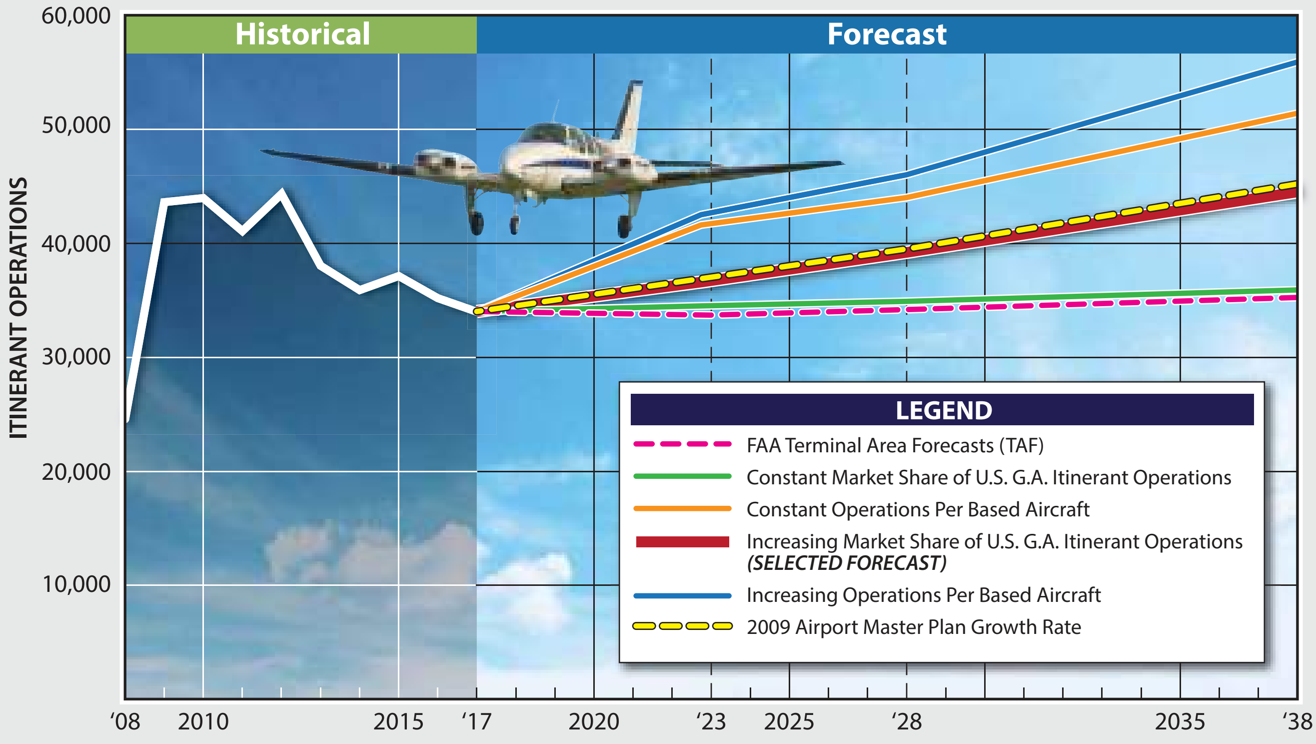
Additional forecasts were prepared by examining the airport's operations per based aircraft. By maintaining the current ratio of operations per based aircraft constant at 122 through the planning period, a forecast of 51,400 itinerant general aviation operations by 2038 results. Alternatively, increasing this ratio to the historical average operations per based aircraft (133) was considered yielding a CAGR of 2.39 percent and 55,900 itinerant general aviation operations by the year 2038.

For comparison, the FAA TAF projections are presented in the table. It is important to note that the FAA TAF's current count of itinerant general aviation operations is lower than what has been reported by the PWA ATCT; thus, the TAF actually would project a decrease in itinerant general aviation operations in the short-term period. Ultimately, the TAF reaches 35,238 annual general aviation itinerant operations by 2038. resulting in a CAGR of 0.17 percent.

The 2009 Airport Master Plan forecasts have also been used for comparison. The previous plan projected itinerant operations growing at a CAGR of 1.36 percent over a 20-year period. Applying that growth rate results in 45,200 annual general aviation itinerant operations by 2038.

Except for 2015, which had a questionable based aircraft count, the airport has consistently maintained an operation per based aircraft between 100 and 110. Since based aircraft are projected to increase to 420 with the fleet mix anticipated to consist of more sophisticated aircraft with higher utilization rates, the airport should continue to maintain an operation per based aircraft level in this range with modest growth in market share. Therefore, the increasing market share projection is carried forward as the selected forecast. **Exhibit 2D** further presents the general aviation itinerant operations forecasts.

GENERAL AVIATION ITINERANT OPERATIONS FORECASTS



GENERAL AVIATION LOCAL OPERATIONS FORECASTS

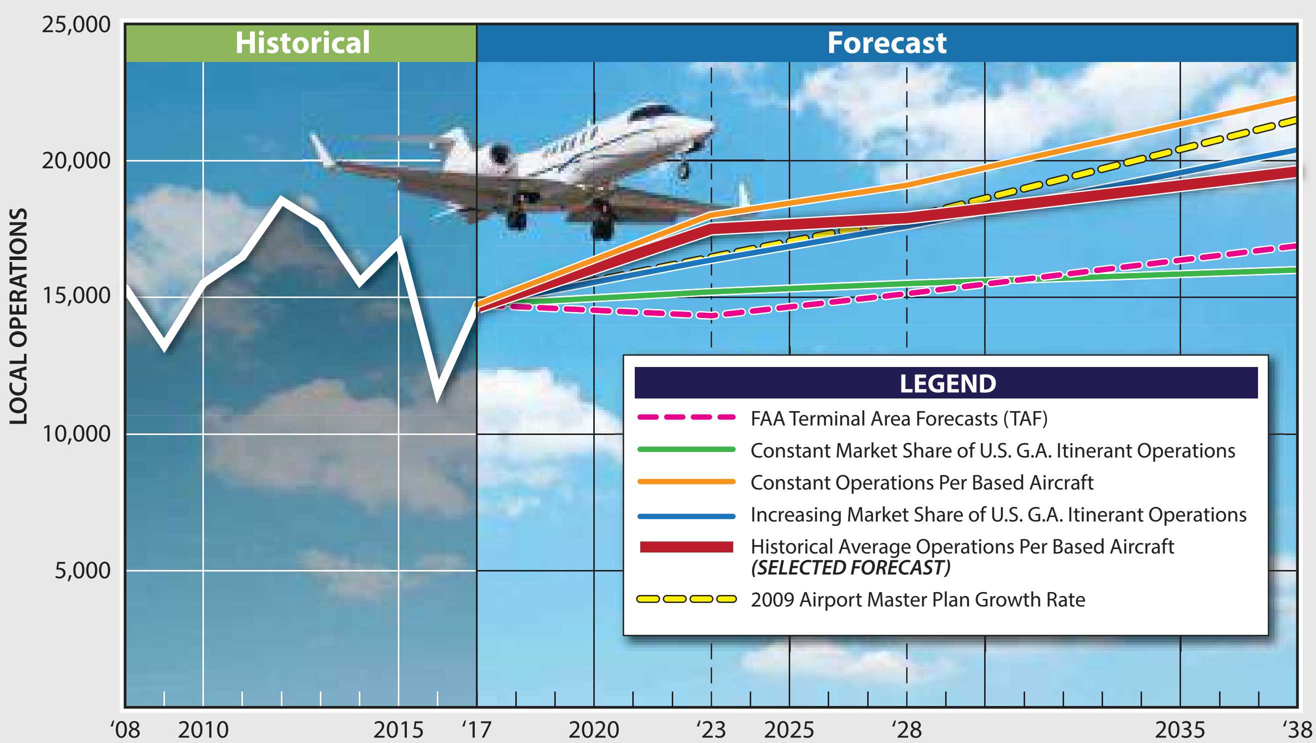


Exhibit 2D
GENERAL AVIATION OPERATIONS FORECASTS

TABLE 2K
Itinerant General Aviation Operations Forecasts
Wiley Post Airport

Year	PWA Itinerant GA Operations[1]	U.S. ATCT Itinerant GA Operations[2] (millions)	Market Share of Itinerant Operations	PWA Based Aircraft[3]	Itinerant Operations per Based Aircraft
2008	24,602	17.49	0.1406%	269	91
2009	43,615	15.57	0.2801%	326	134
2010	43,975	14.86	0.2958%	334	132
2011	41,078	14.53	0.2828%	334	123
2012	44,337	14.52	0.3053%	334	133
2013	38,043	14.12	0.2695%	354	107
2014	35,906	13.98	0.2569%	354	101
2015	37,139	13.89	0.2674%	463	80
2016	35,202	13.90	0.2532%	340	104
2017	34,009	13.84	0.2458%	278	122
Constant Market Share Projection (CAGR = 0.26%)					
2023	34,500	14.04	0.2458%	340	101
2028	34,900	14.22	0.2458%	360	97
2038	35,900	14.59	0.2458%	420	85
Increasing Market Share Projection (CAGR = 1.29%) – *Selected Forecast*					
2023	**36,600**	14.04	0.2607%	340	108
2028	**39,200**	14.22	0.2755%	360	109
2038	**44,500**	14.59	0.3053%	420	106
Constant Operations per Based Aircraft (CAGR = 1.99%)					
2023	41,600	14.04	0.2963%	340	122
2028	44,000	14.22	0.3095%	360	122
2038	51,400	14.59	0.3524%	420	122
Increasing Operations per Based Aircraft (CAGR = 2.39%)					
2023	42,500	14.04	0.3027%	340	125
2028	46,000	14.22	0.3236%	360	128
2038	55,900	14.59	0.3832%	420	133
FAA Terminal Area Forecast (CAGR = 0.17%)					
2023	33,691	14.04	0.2400%	340	99
2028	34,199	14.22	0.2405%	360	95
2038	35,238	14.59	0.2416%	420	84
2009 Airport Master Plan Growth Rate Forecast (CAGR = 1.36%)					
2023	36,900	14.04	0.2628%	340	109
2028	39,500	14.22	0.2778%	360	110
2038	45,200	14.59	0.3099%	420	108

Sources:
[1]Historical data from ATCT
[2]FAA Aerospace Forecasts - Fiscal Years 2018-2038
[3]FAA TAF

Local General Aviation Operations

A similar methodology was utilized to generate a planning forecast for local general aviation operations at PWA. Five forecasts have been developed and are presented in **Table 2L**. Local general aviation operations at PWA have not fluctuated significantly in the past 10 years, averaging 15,560 annually. PWA's 2017 market share of total general aviation local operations at towered airports was 0.1255 percent in 2017. Also depicted in the table are the local operations per based aircraft ratios. These numbers have also not fluctuated significantly, experiencing a high of 57, a low of 34, and an average of 47 since 2008.

The first forecast considers maintaining a constant 0.1255 percent market share of national local operations, yielding a local annual operations projection of approximately 16,000 by 2038. The second forecast applies an increasing market share of local operations growing to a recent historic high of 0.1597 percent and yielding 20,400 operations by 2038.

Constant and historical average operations per based aircraft forecasts were also prepared. These forecasts generated CAGRs of 2.00 percent and 1.37 percent, respectively.

The FAA TAF projections are also presented in the table. Like itinerant operations, the TAF shows a decrease in operations in the short-term period due to lower base year counts in the TAF. The TAF ultimately increases local general aviation operations to 16,885 by 2038 at a CAGR of 0.65 percent.

The 2009 Airport Master Plan forecasted local operations growing at a CAGR of 1.82 percent. Applying the growth rate results to this forecast period results in 21,500 local general aviation operations by 2038.

Each projection of local general aviation operations is depicted on **Exhibit 2D**. Ultimately, the airport has maintained a consistent operation per based aircraft count, averaging 47 each year since 2008. The 2017 operations per based aircraft count of 53 is slightly above this level and, as more based aircraft are added, it is anticipated that this ratio will gradually return to that average level. For this reason, the historical average operations per based aircraft projection is carried forward as the selected forecast.

Air Taxi Operations

Air taxi operations are those with authority to provide "on-demand" transportation of persons or property via aircraft with fewer than 60 passenger seats. Air taxi includes a broad range of operations, including some smaller commercial service aircraft, some charter aircraft, air cargo aircraft, many fractional ownership aircraft, and air ambulance services.

The history of air taxi operations is included in **Table 2M**. As presented, air taxi operations at the airport have not fluctuated significantly since 2010 ranging from a high of 3,548 in 2012 to a low of 2,593 in 2014. PWA's current market share of national air taxi operations is 0.0409 percent.

TABLE 2L
Local General Aviation Operations Forecasts
Wiley Post Airport

Year	PWA Local GA Operations[1]	U.S. ATCT Local GA Operations[2]	Market Share of Local Operations	PWA Based Aircraft[3]	Local Operations per Based Aircraft
2008	15,342	14.08	0.1090%	269	57
2009	13,230	12.45	0.1063%	326	41
2010	15,514	11.18	0.1388%	334	46
2011	16,491	11.44	0.1442%	334	49
2012	18,539	11.61	0.1597%	334	56
2013	17,657	11.69	0.1511%	354	50
2014	15,566	11.68	0.1333%	354	44
2015	16,991	11.69	0.1453%	463	37
2016	11,546	11.63	0.0993%	340	34
2017	14,728	11.73	0.1255%	278	53
Constant Market Share Projection (CAGR = 0.40%)					
2023	15,200	12.14	0.1255%	340	45
2028	15,500	12.34	0.1255%	360	43
2038	16,000	12.76	0.1255%	420	38
Increasing Market Share Projection (CAGR = 1.56%)					
2023	16,300	12.14	0.1341%	340	48
2028	17,600	12.34	0.1426%	360	49
2038	20,400	12.76	0.1597%	420	49
Constant Operations per Based Aircraft (CAGR = 2.00%)					
2023	18,000	12.14	0.1483%	340	53
2028	19,100	12.34	0.1548%	360	53
2038	22,300	12.76	0.1747%	420	53
Historical Average Operations per Based Aircraft (CAGR = 1.37%) – *Selected Forecast*					
2023	**17,500**	12.14	0.1442%	340	51
2028	**17,900**	12.34	0.1451%	360	50
2038	**19,600**	12.76	0.1536%	420	47
FAA Terminal Area Forecast (CAGR = 0.65%)					
2023	14,327	12.14	0.1181%	340	42
2028	15,135	12.34	0.1227%	360	42
2038	16,885	12.76	0.1323%	420	40
2009 Airport Master Plan Growth Rate Forecast (CAGR = 1.82%)					
2023	16,400	12.14	0.1351%	340	48
2028	17,900	12.34	0.1451%	360	50
2038	21,500	12.76	0.1684%	420	51

Sources:
[1] Historical data from PWA ATCT
[2] FAA Aerospace Forecasts - Fiscal Years 2018-2038
[3] FAA TAF

TABLE 2M
Air Taxi Operations Forecasts
Wiley Post Airport

Year	PWA Air Taxi Operations[1]	U.S. Air Taxi Operations[2] (thousands)	Market Share of Air Taxi Operations
2010	3,224	9,410.4	0.0343%
2011	3,362	9,278.5	0.0362%
2012	3,548	8,994.4	0.0394%
2013	2,696	8,803.4	0.0306%
2014	2,593	8,439.7	0.0307%
2015	3,029	7,894.9	0.0384%
2016	2,780	7,579.6	0.0367%
2017	2,935	7,179.3	0.0409%
Constant Market Share Projection (CAGR = -0.63%)			
2023	2,220	5,442.4	0.0409%
2028	2,320	5,671.7	0.0409%
2038	2,570	6,287.7	0.0409%
Increasing Market Share Projection (CAGR = 2.27%			
2023	2,690	5,442.4	0.0493%
2028	3,280	5,671.7	0.0578%
2038	4,700	6,287.7	0.0747%
FAA Terminal Area Forecast (CAGR = 1.87%)			
2023	3,199	5,442.4	0.0588%
2028	3,538	5,671.7	0.0624%
2038	4,327	6,287.7	0.0688%
Selected Air Taxi Operations Forecast (CAGR = 1.87%)			
2023	**3,200**	5,442.4	0.0588%
2028	**3,540**	5,671.7	0.0624%
2038	**4,330**	6,287.7	0.0689%

Sources:
[1]Historical data from PWA ATCT
[2]FAA Aerospace Forecasts - Fiscal Years 2018-2038

The FAA national air taxi forecast projects a 2.13 percent decrease in air taxi operations through 2028, followed by modest increases thereafter. The primary reason for this decrease is the transition by commuter airlines to larger aircraft with more than 60 passenger seats, which are then counted as air carrier operations. While air taxi operations that are represented by commuter airlines using aircraft with fewer than 60 seats are decreasing, the business jet segment of the air taxi category is expected to continue to grow nationally. The facilities and services available at PWA are especially accommodating to operators of business jets. Therefore, it is reasonable to expect the business jet component of air taxi activity to increase moderately over time at PWA.

Table 2M presents three forecasts for air taxi operations at PWA. The first simply considers the airport capturing a constant market share of national air taxi operations, which results in a decreasing number of air taxi operations. This forecast is not thought to reflect the local condition at PWA, considering the air taxi operators at the airport and the number of based jets and turboprop aircraft. The second forecast considers an increasing market share of air taxi operations, increasing at the same CAGR that based jets and turboprops are anticipated to grow (2.3 percent). This projection produces a total of 4,700 air taxi operations by 2038.

The remaining forecast analyzes air taxi operations presented in the FAA TAF. The TAF projects air taxi operations to grow at a CAGR of 1.87 percent, reaching 4,327 operations by 2038. Ultimately, the rounded FAA TAF projection will be carried forward as the selected forecast. The TAF results in modest air taxi operations growth that accounts for growth potential in based jets and turboprop aircraft, which are more likely to conduct those types of operations. As a reliever airport, PWA can be expected to handle an increasing number of air taxi operations as more operators utilize less congested and restrictive airports compared with the larger commercial service airports.

Military Operations

Historically, PWA has not experienced high levels of military operations. At its peak in 2012, military operations accounted for 4,808 operations. Since then, military operations have dropped to 416 in 2017.

Forecasting for military activity is particularly challenging when there are no based military aircraft. The FAA has taken the position that it is inherently difficult to forecast military operations because of the variable nature of the military mission. Due to this unpredictability, military activity is forecast as a constant of 250 itinerant and 200 local operations annually for the duration of the planning period.

ATCT Count Adjustment and Total Operations

As previously mentioned, the PWA ATCT is not a 24-hour tower and, as such, its air traffic counts are not all-inclusive of aircraft operations at the Airport. Some aspects of the Master Plan require that all airport activity be considered. For these evaluations, it is necessary to estimate and adjust for operations that occur when the tower is closed. The PWA ATCT operates from 7:00 a.m. to 10:00 p.m. daily.

Utilizing data from the FAA's Traffic Flow Management System Counts (TFMSC) Distributed OPSNET, which provides hourly operations data, including after-hours estimates, approximately six percent of general aviation operations occur during the hours that the tower is closed. The air taxi and military categories have higher levels of operations during after-hours at 16 and 17 percent, respectively.

Table 2N presents a summary of the ATCT operations, as well as the adjusted operations, when considering the increases for after-hours activity. Factoring for the adjustment, total annual operations are estimated at 55,309 for 2017. Through the 20-year planning period, annual operations, including nighttime operations, are forecast to be 73,175. The operational projections equate to a 1.34 percent CAGR.

TABLE 2N
Forecast Adjustment for ATCT After-Hours Operations
Wiley Post Airport

	2017	2023	2028	2038
ATCT OPERATIONS				
General Aviation				
Itinerant	34,009	36,600	39,200	44,500
Local	14,728	17,500	17,900	19,600
Total General Aviation Operations	*48,737*	*54,100*	*57,100*	*64,100*
Air Taxi	2,935	3,200	3,540	4,330
Military	416	450	450	450
Total ATCT Operations	***52,088***	***57,750***	***61,090***	***68,880***
ADJUSTED OPERATIONS				
General Aviation				
Itinerant	35,879	38,613	41,356	46,948
Local	15,538	18,463	18,885	20,678
Total General Aviation Operations	*51,417*	*57,076*	*60,241*	*67,626*
Air Taxi	3,405	3,712	4,106	5,023
Military	487	526	526	526
Total Adjusted Operations	***55,309***	***61,314***	***64,873***	***73,175***

Adjustment accounts for the hours (10:00 p.m. - 7:00 a.m.) when the ATCT is closed.

PEAKING CHARACTERISTICS

Many airport facility needs are related to the levels of activity during peak periods (busy times). The periods used in developing 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 the month.
- **Busy Day** – The busy day of a typical week in the peak month.
- **Design Hour** – The peak hour within the design day.

It is important to realize that only the peak month is an absolute peak within the year. Each of the other periods will be exceeded at various times during the year. However, each provides reasonable planning standards that can be applied without overbuilding or being too restrictive.

A review of ATCT reports shows that the peak month for operations has averaged 9.7 percent of total annual operations over the past five years. This factor is carried to the plan years. The design day is simply the peak month divided by the number of days in that month (30).

Daily operational counts from the ATCT were utilized to determine a busy day peaking factor for general aviation activity. The peak day of each week has historically averaged 22 percent of weekly operations. Thus, to determine the typical busy day, the design day is multiplied by 1.54, which represents 22 percent of the days in a week (7 x 0.22). Design hour operations were determined to be approximately 14 percent of the design day operations. The peaking characteristics are summarized in **Table 2P** for each planning year period.

TABLE 2P
Peak Operations Forecast
Wiley Post Airport

	2018	2023	2028	2038
Annual Operations	55,309	61,314	64,873	73,175
Peak Month	4,856	5,974	6,320	7,129
Design Day	162	199	211	238
Busy Day	250	307	326	367
Design Hour	22	27	29	33

Source: ATCT records; Coffman Associates analysis

ANNUAL INSTRUMENT APPROACHES

An instrument approach, as defined by the FAA, is "an approach to an airport with the intent to land by an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude." To qualify as an instrument approach, aircraft must land at the Airport after following one of the published instrument approach procedures in less than visual conditions. Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities, such as an instrument landing system. It should be noted that practice or training approaches do not count as annual AIAs, nor do instrument approaches conducted in visual conditions.

During poor weather conditions, pilots are less likely to fly and rarely would perform training operations. As a result, an estimate of the total number of AIAs can be made based on a percentage of itinerant operations regardless of the frequency of poor weather conditions. An estimate of three percent of total itinerant (general aviation, air taxi, and military) operations is utilized to forecast AIAs at PWA, as presented in **Table 2Q**.

TABLE 2Q
Annual Instrument Approaches (AIAs)
Wiley Post Airport

Year	Annual Instrument Approaches	Itinerant Operations	Ratio
2017	1,190	39,572	3.00%
2023	1,280	42,617	3.00%
2028	1,370	45,754	3.00%
2038	1,570	52,263	3.00%

Source: Coffman Associates analysis

FORECAST COMPARISON TO THE FAA TAF

The FAA will review the forecasts presented in this Master Plan for consistency with the *Terminal Area Forecast*. Typically, the local FAA Airports District Office (ADO) or Regional Airports Division (RO) are responsible for forecast approvals. When reviewing a sponsor's forecast, FAA must ensure 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 considered 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 used for FAA decision-making. The reason the FAA allows this differential is because the TAF forecasts are not meant to replace forecasts developed locally (i.e., in this Master Plan). While the TAF can provide a point of reference or comparison, their purpose is much broader in defining FAA national workload measures.

Table 2R presents the direct comparison of the master planning forecasts with the TAF published in January 2018. Regarding based aircraft, the FAA TAF count is 10.6 percent higher than the actual count validated by the FAA's National Based Aircraft Inventory Program. However, the selected Master Plan forecast aligns closely with the FAA TAF CAGR at 1.5 percent. Due to the base year count discrepancy, the Master Plan is near FAA's tolerance in the 5-year period but well within the 10-year tolerance level. It is recommended that the FAA update its TAF to reflect the current count.

TABLE 2R
Master Plan Forecast Comparison to the *Terminal Area Forecast*
Wiley Post Airport

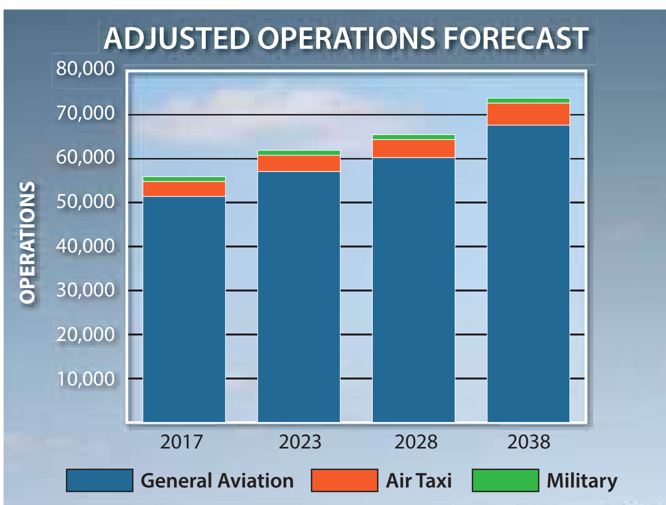
Year	Master Plan Forecast	FAA TAF	Percent Difference
BASED AIRCRAFT			
2018	313	350	-10.6%
2023	340	376	-9.6%
2028	360	402	-10.4%
2038	420	466	-9.9%
CAGR	1.5%	1.4%	
ANNUAL AIRCRAFT OPERATIONS			
2017	55,309	50,918	8.6%
2023	61,314	51,632	18.8%
2028	64,873	53,287	21.7%
2038	73,175	56,865	28.7%
CAGR	1.3%	0.5%	

Source: FAA TAF (2018); FAA National Based Aircraft Inventory Program; Coffman Associates analysis

The total annual operations forecast in the Master Plan is 18.8 percent higher than the TAF in the five-year timeframe. The 10-year forecast is 21.7 percent higher than the TAF. The primary reason for this is that the TAF has a lower operations number than what was counted by the ATCT in 2017, in addition to the adjustment increase for after-hours activity when the ATCT is closed. Furthermore, the TAF is calling for a minimal increase in annual aircraft activity through the planning period, and the Master Plan accounts for modest growth in aircraft operations through 2038. Overall, the Master Plan considers a 1.3 percent CAGR in annual aircraft operations through the 20-year planning period.

Exhibit 2E presents a summary of the Master Plan forecasts previously detailed in this chapter.

	BASE YEAR	FORECAST 2023	FORECAST 2028	FORECAST 2038
ATCT OPERATIONS				
General Aviation				
Itinerant	34,009	36,600	39,200	44,500
Local	14,728	17,500	17,900	19,600
Total General Aviation Operations	***48,737***	***54,100***	***57,100***	***64,100***
Air Taxi	2,935	3,200	3,540	4,330
Military	416	450	450	450
Total ATCT Operations	***52,088***	***57,750***	***61,190***	***68,880***
ADJUSTED OPERATIONS				
General Aviation				
Itinerant	35,879	38,613	41,356	46,948
Local	15,538	18,463	18,885	20,678
Total General Aviation Operations	***51,417***	***57,076***	***60,241***	***67,626***
Air Taxi	3,405	3,712	4,106	5,023
Military	487	526	526	526
Total Adjusted Operations	***55,309***	***61,314***	***64,873***	***73,175***
ANNUAL INSTRUMENT APPROACHES				
	1,190	1,280	1,370	1,570
PEAK OPERATIONS FORECAST				
Annual	55,309	61,314	64,873	73,175
Peak Month	4,856	5,974	6,320	7,129
Design Day	162	199	211	238
Busy Day	250	307	326	367
Design Hour	22	27	29	33
BASED AIRCRAFT FORECAST				
Single-Engine Piston	172	187	197	225
Multi-Engine Piston	34	31	26	20
Turboprop	27	33	37	50
Jet	67	74	81	95
Helicopter	13	15	19	30
Total Based Aircraft	***313***	***340***	***360***	***420***



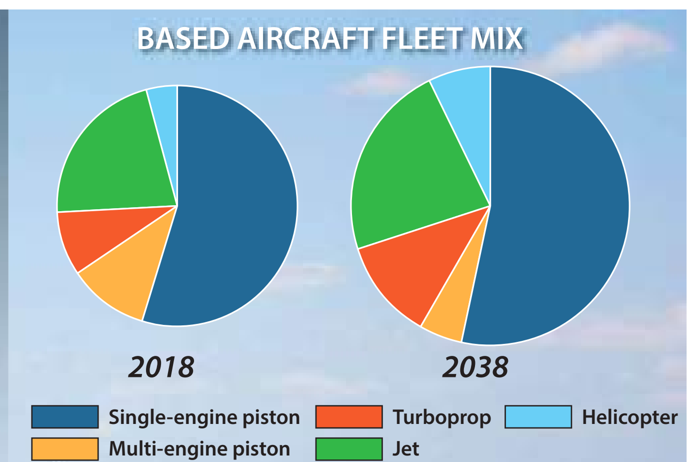


Exhibit 2E
FORECAST SUMMARY

AIRCRAFT/AIRPORT/RUNWAY CLASSIFICATION

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

AIRCRAFT CLASSIFICATION

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using, or are expected to 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, more commonly, is a composite aircraft representing a collection of aircraft with similar characteristics. The critical design aircraft is defined by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). FAA AC 150/5300-13A, *Airport Design*, describes the following airplane classification systems, the parameters of which are presented on **Exhibit 2F**.

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

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

Airplane Design Group (ADG): The ADG, depicted 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 in different groups, the higher group is used. The ADG influences design standards for taxiway safety area (TSA), taxiway object free area (TOFA), apron wingtip clearance, and various separation distances.

Taxiway Design Group (TDG): A classification of airplanes based on outer-to-outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance. The TDG relates to the undercarriage dimensions of the design aircraft. The taxiway design elements determined by the application of the TDG include the taxiway width, taxiway edge safety margin, taxiway shoulder width, taxiway fillet dimensions, and, in some cases, the separation distance between parallel taxiways/taxilanes. Other taxiway elements, such as the TSA, TOFA, taxiway/taxilane separation to parallel taxiway/taxilanes or fixed or movable objects,

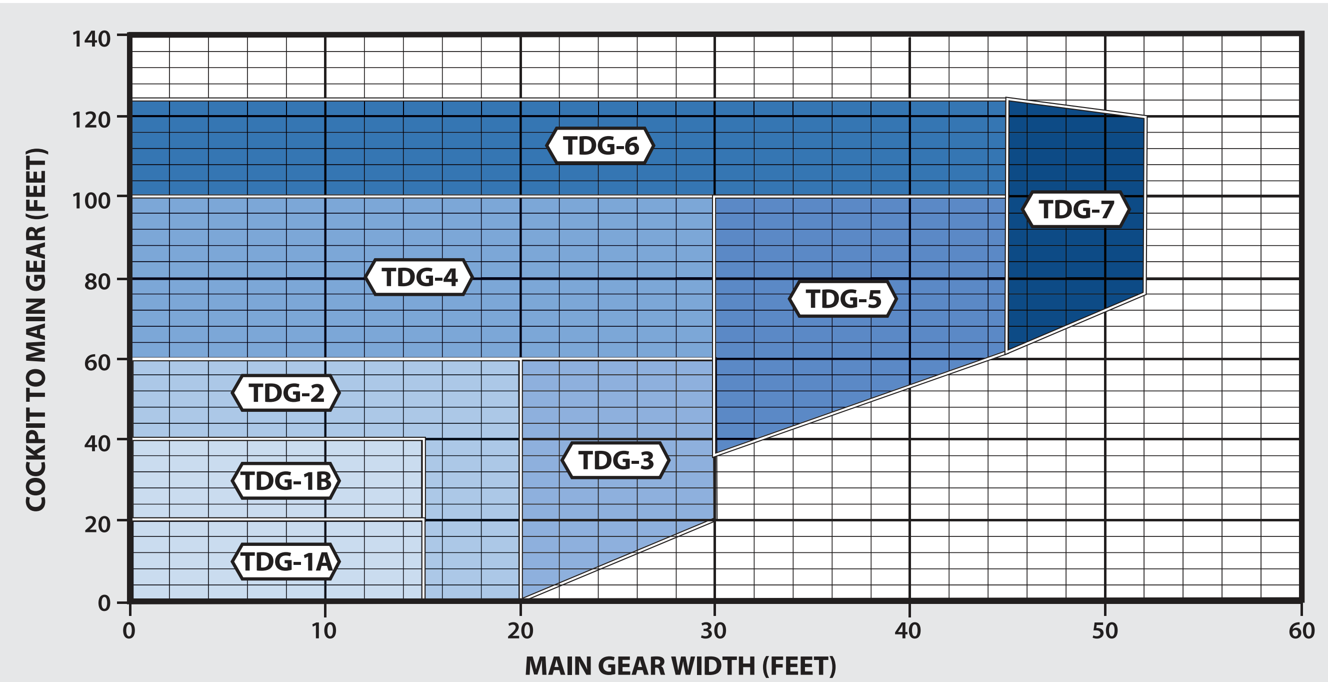
AIRCRAFT APPROACH CATEGORY (AAC)	
Category	**Approach Speed**
A	less than 91 knots
B	91 knots or more but less than 121 knots
C	121 knots or more but less than 141 knots
D	141 knots or more but less than 166 knots
E	166 knots or more

AIRPLANE DESIGN GROUP (ADG)		
Group #	**Tail Height (ft)**	**Wingspan (ft)**
I	<20	<49
II	20-<30	49-<79
III	30-<45	70-<118
IV	45-<60	118-<171
V	60-<66	171-<214
VI	66-<80	214-<262

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

***RVR**: Runway Visual Range

TAXIWAY DESIGN GROUP (TDG)



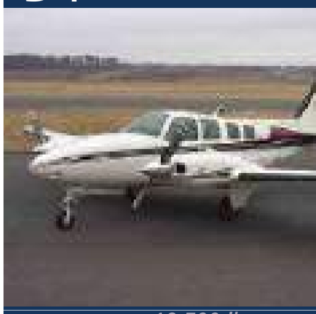
Source: FAA AC 150/5300-13A, Airport Design

Exhibit 2F: AIRCRAFT CLASSIFICATION PARAMETERS

A-I

Aircraft	TDG
Beech Baron 55	1A
Beech Bonanza	1A
Cessna 150, 172	1A
Eclipse 500	1A
Piper Archer, Seneca	1A

B-I



Aircraft	TDG
Beech Baron 58	1A
Beech King Air 90	1A
Cessna 421	1A
Cessna Citation CJ1 (525)	1A
Cessna Citation 1(500)	2
Embraer Phenom 100	1B

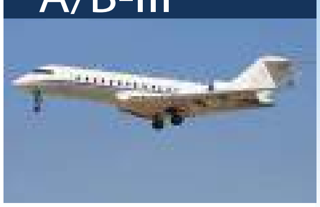
A/B-II 12,500 lbs. or less

Aircraft	TDG
Beech Super King Air 200	2
Cessna 441 Conquest	1A
Cessna Citation CJ2 (525A)	2
Pilatus PC-12	1A

B-II over 12,500 lbs.

Aircraft	TDG
Beech Super King Air 350	2
Cessna Citation CJ3(525B), Bravo (550), V (560)	2
Cessna Citation CJ4 (525C)	1B
Cessna Citation Latitude/Longitude	1B
Embraer Phenom 300	1B
Falcon 10, 20, 50	1B
Falcon 900, 2000	2
Hawker 800, 800XP, 850XP, 4000	1B
Pilatus PC-24	1B

A/B-III

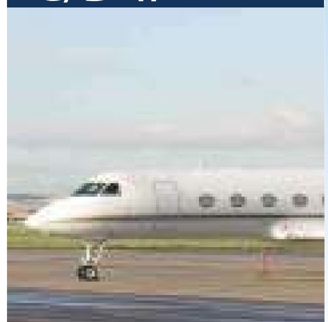


Aircraft	TDG
Bombardier Dash 8	3
Bombardier Global 5000, 6000, 7000, 8000	2
Falcon 6X, 7X, 8X	2

C/D-I

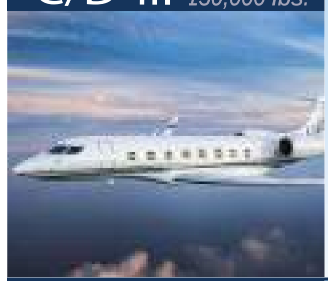
Aircraft	TDG
Lear 25, 31, 45, 55, 60	1B
Learjet 35, 36 (D-I)	1B

C/D-II



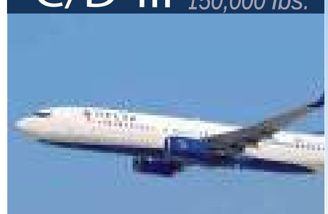
Aircraft	TDG
Challenger 600/604/ 800/850	1B
Cessna Citation VII, X+	1B
CRJ-700	2
Embraer Legacy 450/500	1B
ERJ-135, 140, 145	2
Gulfstream IV, 350, 450 (D-II)	2
Gulfstream G200/G280	1B
Lear 70, 75	1B

C/D-III less than 150,000 lbs.



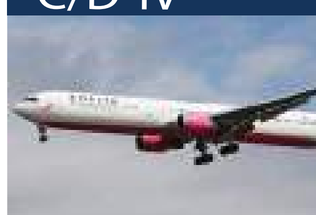
Aircraft	TDG
Boeing 737-700, BBJ	3
CRJ-900, 1000	2
ERJ-170, 175, 190, 195	3
Gulfstream V	2
Gulfstream G500, 550, 600, 650 (D-III)	2

C/D-III over 150,000 lbs.



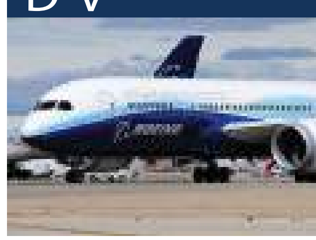
Aircraft	TDG
Airbus A319-100, 200	3
Boeing 737 -800, 900, BBJ2 (D-III)	3
MD-83, 88 (D-III)	4

C/D-IV



Aircraft	TDG
Airbus A300-100, 200, 600	5
Boeing 757-200	4
Boeing 767-300, 400	5
MD-11	6

D-V



Aircraft	TDG
Airbus A330-200, 300	5
Airbus A340-500, 600	6
Boeing 747-100 - 400	5
Boeing 777-300	6
Boeing 787-8, 9	5

Note: Aircraft pictured is identified in bold type.

Exhibit 2F
AIRPORT REFERENCE CODES

and taxiway/taxilane wingtip clearances are determined solely based on the wingspan (ADG) of the design aircraft utilizing those surfaces. It is appropriate for taxiways to be planned and built to different TDG standards based on expected use.

Exhibit 2F presents the aircraft classification of the most common aircraft in operation today.

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 airfield facilities are to be designed and built.

***Airport Reference Code (ARC)*:** An airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport.

The current ALP for PWA, which will be updated as part of this master planning effort, identifies an existing ARC of C-II and a future ARC of D-II.

Runway Design Code (RDC): A code signifying the design standards to which the runway is to be 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.

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 AAC, ADG, and RVR. The APRC describes the current operational capabilities of a runway under particular 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 the 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 takeoff 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 composed of two components: ACC and ADG. A runway may have more than one DPRC depending on 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 using, or are expected to 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 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 an 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 the airport design on an aircraft that uses the airport infrequently.

The design aircraft is defined as the most demanding aircraft type, in a grouping of aircraft with similar characteristics, that makes regular use of the airport. Regular use is 500 annual operations, excluding touch-and-go operations. Planning for future aircraft use is of particular importance since the design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure that short term development does not preclude the reasonable long range potential needs of the airport. Thus, if the critical design aircraft is anticipated to change within the near future, that aircraft (or family of aircraft), should be used as the current critical design aircraft.

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

PWA is served by an ATCT; however, the ATCT only logs aircraft operations by operational type (air taxi, general aviation, and military), but not by specific aircraft make and model. The FAA maintains the TFMSC database which documents certain aircraft operations at airports. Information is added to the TFMSC database when pilots file flight plans and/or when flights are detected by the National Airspace System, usually via radar. It includes documentation of commercial traffic (air 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 that there are more operations at the airport than are captured by this methodology. TFMSC data is available for activity at PWA and was utilized in this analysis.

Current Critical Design Aircraft

Exhibit 2G presents the TFMSC operational mix at the airport for turbine (jet and turboprop) aircraft operations for the last nine years. As can be seen, the airport experiences activity by a full range of business jets, including occasional operations by the largest in the national fleet.

Over the last nine years, the airport has averaged 9,462 annual turbine operations in AAC B, 2,696 in AAC C, and 187 in AAC D. PWA has 80 based turbine aircraft, including several Beechcraft King Air turbo-props, Cessna Citation business jets, and a Bombardier Global 5000, which are within AAC B, and several Learjet aircraft and Challenger 300/600 aircraft, which fall in AAC C. There are no AAC D aircraft based at PWA. **AAC C has well over 500 annual operations; thus, the Master Plan will consider AAC C as the current critical design AAC.**

Since 2008, the airport has averaged 8,000 annual operations by jets in ADG II and 64 in ADG III. The airport does not meet the 500 annual operations threshold for ADG III aircraft operations despite having a based aircraft within that group (Global 5000). **Therefore, the Master Plan will consider ADG II as the current critical design ADG.**

This Master Plan will utilize the current ARC of C-II for Runway 17L-35R.

The airport's current ALP designates parallel Runway 17R-35L as an ARC B-II runway and crosswind Runway 13-31 as an ARC B-I (small airplanes exclusively) runway. These classifications are sufficient to accommodate most aircraft operating at PWA now. This Master Plan maintains these classifications for Runways 17R-35L and 13-31 for the current condition.

Future Design Aircraft

The aviation demand forecasts indicate the potential for growth in business jet aircraft at the airport. This includes a forecast of 90 based business jets by the long-term planning period. The types and sizes of business jets using an airport regularly can impact the design standards to be applied to the airport system. Therefore, it is important to understand what type of aircraft may use the airport in the future.

PWA is located within the largest population center in Oklahoma and is well-suited to accommodate businesses that operate larger corporate aircraft. The airport already has one based Bombardier Global 5000, several Challenger 300/600s, and a Gulfstream G100, and with the projected growth in based jets, it is reasonable to consider aircraft, such as the Gulfstream G550/G650 or the Boeing Business Jet, as potentially basing at the airport in the future as well. Thus, the Master Plan will consider aircraft, such as the Gulfstream G550 (ARC D-III), as the future critical design aircraft. **As such, the future critical design aircraft for the airport is best described as ARC D-III.**

ARC Code	Table Name	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
A-I	Eclipse 400/500	56	34	35	20	34	25	17	31	29	28
A-I	Kodiak Quest	0	0	2	2	0	0	2	1	3	1
A-I	Lancair 4	2	0	0	0	0	0	0	0	0	0
A-I	Lancair Evolution/Legacy	1	0	0	0	0	0	0	14	5	0
A-I	Mitsubishi MU-2	28	14	18	15	12	6	8	4	6	2
A-I	Piper Lance	3	0	0	0	0	0	0	0	0	0
A-I	Piper Malibu/Meridian	350	285	346	337	329	263	208	208	195	116
A-I	Socata TBM 7/850/900	36	44	44	71	129	146	168	157	177	172
TOTAL		**476**	**377**	**445**	**445**	**504**	**440**	**403**	**415**	**415**	**319**
A-II	Cessna 425 Corsair	27	28	34	40	60	58	63	89	105	115
A-II	Cessna Caravan	60	45	26	41	33	80	38	29	40	8
A-II	De Havilland Twin Otter	9	2	2	5	2	2	1	8	0	2
A-II	Pilatus PC-12	547	579	620	1,020	1,177	1,163	1,199	1,276	1,340	1,134
TOTAL		**643**	**654**	**682**	**1,106**	**1,272**	**1,303**	**1,301**	**1,402**	**1,485**	**1,259**
B-I	Aero Commander 690	142	228	181	158	132	169	88	106	61	26
B-I	Beech 99 Airliner	4	4	2	0	0	1	0	0	0	0
B-I	Beechjet 400	659	450	525	475	388	443	469	503	475	475
B-I	Cessna 526 Jet Trainer	0	0	2	0	0	0	0	0	0	0
B-I	Citation CJ1/CJ2	538	543	612	391	342	406	545	651	501	418
B-I	Citation I/SP	184	239	165	153	158	84	117	198	233	154
B-I	Citation M2	0	0	0	0	0	0	0	0	0	117
B-I	Citation Mustang	18	25	80	194	205	253	304	187	98	160
B-I	Falcon 10	74	33	64	64	37	12	6	6	2	17
B-I	Hawker 1000	8	4	6	2	2	2	2	1	0	0
B-I	Honda Jet	0	0	0	0	0	2	0	0	4	5
B-I	King Air 90/100	1,271	1,069	1,248	1,311	1,281	1,150	1,038	1,021	870	811
B-I	L-29 Delfin	0	2	1	0	0	0	0	0	0	0
B-I	L-39 Albatross	3	3	2	0	0	0	0	0	0	0
B-I	Phenom 100	0	32	57	111	132	142	232	259	322	306
B-I	Piaggio Avanti	150	124	149	214	205	49	4	17	12	5
B-I	Piper Cheyenne	269	180	141	87	85	107	98	102	113	74
B-I	Premier 1	62	46	50	42	44	28	16	19	21	14
B-I	Rockwell Sabre 40/60	259	132	159	82	86	23	28	7	0	3
B-I	Swearingen Merlin	14	16	18	19	10	12	23	23	18	12
B-I	T-6 Texan	557	483	865	896	1,084	750	780	758	125	60
TOTAL		**4,212**	**3,613**	**4,327**	**4,199**	**4,191**	**3,633**	**3,750**	**3,858**	**2,855**	**2,657**
B-II	BAe Jetstream	0	0	2	0	0	2	0	6	0	0
B-II	Beech 1900	60	18	23	17	27	8	11	10	17	11
B-II	Cessna Conquest	109	58	58	58	43	80	115	101	84	80
B-II	Citation CJ3/CJ4	686	568	615	576	544	545	492	500	319	436
B-II	Citation II/SP/Latitude	1,528	1,264	1,369	1,218	958	679	727	621	701	587
B-II	Citation V/VII/Sovereign	1,002	729	868	1,366	2,067	1,557	1,585	1,708	1,744	1,640
B-II	Citation X	202	180	207	202	324	135	170	170	107	205
B-II	Citation XLS	751	643	645	745	1,041	1,203	1,296	1,182	1,199	1,227
B-II	Dornier 328	18	2	8	6	4	8	2	3	7	2
B-II	Embraer 500/450 Legacy	0	0	0	0	0	0	0	0	4	12
B-II	Embraer EMB-110/120	0	0	0	2	0	1	0	0	2	0
B-II	Falcon 20/50	401	255	110	160	147	169	163	180	175	160
B-II	Falcon 2000	85	79	64	88	83	87	61	75	39	88
B-II	Falcon 900	85	37	70	68	155	164	45	13	27	29
B-II	King Air 200/300/350	1,501	1,089	1,145	1,115	1,059	927	891	813	767	839
B-II	King Air F90	42	49	94	51	74	61	33	39	8	26
B-II	Phenom 300	0	0	12	14	61	104	118	183	223	204
B-II	Saab 340	0	0	4	0	0	0	0	0	0	0
B-II	Shorts 330/360	4	0	2	2	2	0	0	0	0	0
TOTAL		**6,474**	**4,971**	**5,296**	**5,688**	**6,589**	**5,730**	**5,709**	**5,604**	**5,423**	**5,546**
B-III	Aerospatiale ATR 42/72	0	2	0	0	0	0	0	0	0	0
B-III	Bombardier Global 5000	2	2	1	2	2	4	6	0	64	57
B-III	Bombardier Global Express	5	3	3	2	9	15	2	0	0	6
B-III	CASA 235	0	0	0	0	0	0	0	7	2	0
B-III	De Havilland Dash 8 Series	0	0	1	0	0	0	0	0	0	0
B-III	Falcon 7X/8X	0	0	2	2	23	4	12	30	16	4
B-III	Saab 2000	0	0	0	2	0	0	1	0	0	0
TOTAL		**7**	**7**	**7**	**8**	**34**	**23**	**21**	**37**	**82**	**67**
C-I	AV-8B Harrier	0	0	0	0	1	0	0	0	0	0
C-I	BAe HS 125 Series	16	6	4	6	9	2	16	23	4	8
C-I	BAe Systems Hawk	2	0	0	10	35	28	24	33	1	12
C-I	Fuji T-1	8	3	3	1	0	0	0	0	0	0
C-I	Learjet 20 Series	76	14	14	2	14	11	4	5	0	2
C-I	Learjet 31	243	144	79	82	142	103	240	238	164	187
C-I	Learjet 40 Series	302	307	573	554	698	803	813	534	496	713
C-I	Learjet 50 Series	39	13	18	24	73	19	67	60	56	46
C-I	Learjet 60 Series	511	524	411	307	247	207	161	126	82	112
C-I	Rockwell Sabre 75	1	3	2	0	0	0	0	0	0	0
C-I	T-45 Goshawk	0	0	0	0	0	0	1	0	0	0
C-I	Westwind II	676	566	539	565	543	445	480	326	260	240
TOTAL		**1,874**	**1,580**	**1,643**	**1,551**	**1,762**	**1,618**	**1,806**	**1,345**	**1,063**	**1,320**
C-II	Beech Starship	19	1	12	21	9	0	0	0	0	0
C-II	Bombardier CRJ 100/200/700	2	2	0	0	0	0	2	4	0	2
C-II	Challenger 300/600/604	348	407	503	535	530	565	611	563	493	807
C-II	Embraer ERJ-135/140/145	12	4	8	14	16	12	14	26	89	94
C-II	Fairchild A-10	0	0	0	1	1	0	1	0	0	0
C-II	Gulfstream 100/150	6	10	4	20	20	8	10	8	4	1
C-II	Gulfstream 200/280	112	133	76	78	89	54	77	60	14	71
C-II	Gulfstream G100	35	22	19	44	23	50	88	152	170	137
C-II	Gulfstream G-III	49	61	49	31	8	8	0	10	0	2
C-II	Hawker 4000	0	0	6	0	3	3	6	5	34	15
C-II	Hawker 800	335	225	344	346	397	440	367	551	292	362
C-II	Learjet 70 Series	0	0	0	0	0	0	0	6	35	44
C-II	Lockheed Jetstar	1	0	0	0	0	0	0	0	0	0
TOTAL		**919**	**865**	**1,021**	**1,090**	**1,096**	**1,140**	**1,176**	**1,385**	**1,131**	**1,535**
C-III	Boeing 737 (200 thru 700 series)	0	1	0	0	1	0	4	0	0	0
C-III	De Havilland Dash 8 Q-400	0	0	4	0	1	0	4	0	0	0
C-III	P-3 Orion	1	0	0	0	0	0	0	0	0	0
TOTAL		**1**	**1**	**4**	**0**	**2**	**0**	**8**	**0**	**0**	**0**
C-IV	Boeing 757-200	0	0	0	1	0	0	0	0	0	0
C-IV	Boeing 767-200/300	0	0	0	0	1	0	0	0	0	0
C-IV	Boeing C-17	1	0	0	0	0	0	0	0	0	0
C-IV	C-130 Hercules	0	1	2	1	1	0	0	0	0	0
TOTAL		**1**	**1**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**0**
C-V	Airbus A350/360	4	5	1	0	0	0	0	0	0	0
TOTAL		**4**	**5**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
C-VI	C-5 Galaxy	0	0	0	0	0	0	0	1	0	0
TOTAL		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
D-I	F/A-18 Hornet	1	1	1	2	2	0	0	0	0	0
D-I	F-15 Eagle	0	3	2	0	1	0	0	0	0	0
D-I	Learjet 35/36	149	189	106	144	94	63	64	99	43	71
D-I	T-38 Talon	0	0	0	1	0	0	0	0	1	0
TOTAL		**150**	**193**	**109**	**147**	**97**	**63**	**64**	**99**	**44**	**71**
D-II	Gulfstream 450	89	86	64	61	32	20	58	34	34	29
TOTAL		**89**	**86**	**64**	**61**	**32**	**20**	**58**	**34**	**34**	**29**
D-III	Boeing 737 800/900	0	0	0	0	0	0	0	0	0	2
D-III	Gulfstream 500/600	31	28	30	60	60	29	24	24	12	29
TOTAL		**31**	**28**	**30**	**60**	**60**	**29**	**24**	**24**	**12**	**31**
E-I	F-16 Falcon/Viper	0	2	0	0	0	0	0	1	0	0
TOTAL		**0**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**

ARC CODE SUMMARY

ARC Code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
A-I	476	377	445	445	504	440	403	415	415	319
A-II	643	654	682	1,106	1,272	1,303	1,301	1,402	1,485	1,259
B-I	4,212	3,613	4,327	4,199	4,191	3,633	3,750	3,858	2,855	2,657
B-II	6,474	4,971	5,296	5,688	6,589	5,730	5,709	5,604	5,423	5,546
B-III	7	7	7	8	34	23	21	37	82	67
C-I	1,874	1,580	1,643	1,551	1,762	1,618	1,806	1,345	1,063	1,320
C-II	919	865	1,021	1,090	1,096	1,140	1,176	1,385	1,131	1,535
C-III	1	1	4	0	2	0	8	0	0	0
C-IV	1	1	2	2	2	0	0	0	0	0
C-V	4	5	1	0	0	0	0	0	0	0
C-VI	0	0	0	0	0	0	0	1	0	0
D-I	150	193	109	147	97	63	64	99	44	71
D-II	89	86	64	61	32	20	58	34	34	29
D-III	31	28	30	60	60	29	24	24	12	31
E-I	0	2	0	0	0	0	0	1	0	0
Total	**14,881**	**12,383**	**13,631**	**14,357**	**15,641**	**13,999**	**14,320**	**14,205**	**12,544**	**12,834**

APPROACH CATEGORY

AC	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
A	1,119	1,031	1,127	1,551	1,776	1,743	1,704	1,817	1,900	1,578
B	10,693	8,591	9,630	9,895	10,814	9,386	9,480	9,499	8,360	8,270
C	2,799	2,452	2,671	2,643	2,862	2,758	2,990	2,731	2,194	2,855
D	270	307	203	268	189	112	146	157	90	131
E	0	2	0	0	0	0	0	1	0	0
Total	**14,881**	**12,383**	**13,631**	**14,357**	**15,641**	**13,999**	**14,320**	**14,205**	**12,544**	**12,834**

DESIGN GROUP

DG	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
I	6,712	5,765	6,524	6,342	6,554	5,754	6,023	5,718	4,377	4,367
II	8,125	6,576	7,063	7,945	8,989	8,193	8,244	8,425	8,073	8,369
III	39	36	41	68	96	52	53	61	94	98
IV	1	1	2	2	2	0	0	0	0	0
V	4	5	1	0	0	0	0	0	0	0
VI	0	0	0	0	0	0	0	1	0	0
Total	**14,881**	**12,383**	**13,631**	**14,357**	**15,641**	**13,999**	**14,320**	**14,205**	**12,544**	**12,834**

Parallel Runway 17R-35L, should be planned to be accommodate most aircraft operating at PWA in the future. This is especially true since the primary runway at some point will go through periods of maintenance that require it to be closed for months at a time. To ensure the airport remains capable of accommodating the bulk of the business jet fleet during these maintenance periods, parallel Runway 17R-35L should be planned to at least ARC D-II standards. Therefore, the ultimate critical design aircraft is the Gulfstream G450 (ARC D-II).

Runway 13-31 will continue to serve a secondary runway role accommodating primarily small aircraft. As such, the current ARC B-I (small aircraft exclusively) design should be carried forward for the future. The Runway 13-31 critical design aircraft is identified as the Beechcraft King Air 100 (ARC B-I).

AIRPORT DESIGN SUMMARY

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 or not the airport currently meets the appropriate design standards (to be discussed in Chapter Three).

Table 2S summarizes the design aircraft components to be applied at the three runways at PWA. Besides the RDC, the APRC and DPRC are also noted for the runway system.

TABLE 2S
Design Aircraft Parameters
Wiley Post Airport

Runway Design Parameters	Runway Design Code (RDC)	Approach Reference Code (APRC)	Departure Reference Code (DPRC)
EXISTING			
Runway 17L-35R (527' runway/taxiway separation)	C-II-2400	D/VI/2400	D/VI
Runway 17R-35L (>550' runway/taxiway separation)	B-II-5000	D/VI/5000	D/VI
Runway 13-31 (375' runway/taxiway separation)	B-I(S)-VIS	B/III/VIS	B/III D/II
ULTIMATE			
Runway 17L-35R (527' runway/taxiway separation)	D-III-2400	D/VI/2400	D/VI
Runway 17R-35L (>550' runway/taxiway separation)	D-II-4000	D/VI/4000	D/VI
Runway 13-31 (375' runway/taxiway separation)	B-I(S)-VIS	B/III/VIS	B/III D/II

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

SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the next 20 years at PWA. **Exhibit 2E** presents a summary of the aviation demand forecasts. The baseline year for forecast data is 2018 for based aircraft and 2017 for operations. The forecasting effort extends to 2038.

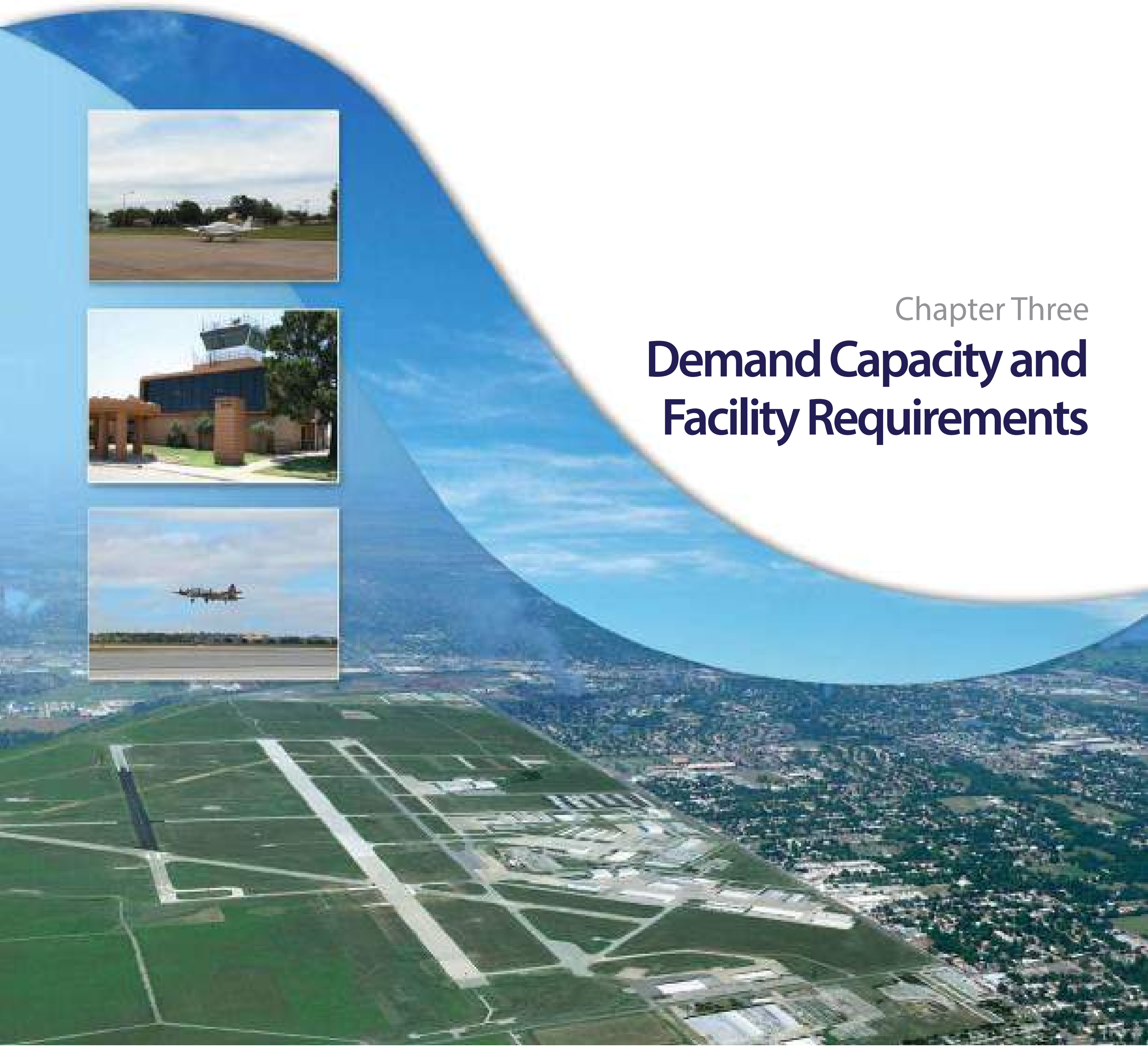
Forecasts of aviation activity, including based aircraft and annual aircraft operations, is key to determining future facility requirements. There are currently 313 aircraft based at the airport, and this is forecast to grow to 420 aircraft by 2038. When considering an adjustment to aircraft operations when the ATCT is closed, the airport experienced approximately 55,309 operations in 2017. This is forecast to grow to approximately 73,175 operations annually by 2038.

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 represent the majority of based aircraft, the long-term forecast considers increasing the number of turboprop and jet aircraft, as well as helicopters, in the fleet mix.

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 hangars, aircraft aprons, and support services. As a general observation, PWA is well-positioned for growth into the future. The remaining portions of the Master Plan will lay out how that growth can be accommodated in an orderly, efficient, and cost-effective manner.

Chapter Three

Demand Capacity and Facility Requirements



Chapter Three

DEMAND/CAPACITY AND 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 Wiley Post Airport (PWA) facilities. The existing capacities will then be compared to the forecast activity levels prepared in Chapter Two to determine where facility deficiencies currently exist or may be expected to materialize in the future. This chapter will present the following elements:

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

As indicated previously in Chapter One, PWA's facilities include both airfield and landside components. Airfield facilities include those that are related to the arrival, departure, and ground movement of aircraft. The 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. The general aviation elements analyzed 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 the existing airport facilities and outline what new facilities may be needed and when they may be needed to accommodate forecast demands. Having established these facility requirements, alternatives for providing the facilities will be evaluated to determine the most cost-effective and efficient means for implementation.

The facility requirements at PWA 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)*

PLANNING HORIZONS

An updated set of aviation demand forecasts for PWA has been established. These activity forecasts include annual operations, based aircraft, based aircraft and operational fleet mix, and operational 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. To develop a Master Plan that is demand-based rather than time-based, a series of planning horizon milestones have been established for PWA that takes into consideration the reasonable range of aviation demand projections. The planning horizons for the Master Plan are the short term (~years 1-5), intermediate term (~years 6-10), and long term (~years 11-20).

It is important to consider that the actual activity at the airport will not follow a straight line as tends to be presented in forecast projections. More commonly, aviation activity will 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 according to need generated by actual demand levels, not based solely on dates in time. 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 management 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
Planning Horizon Activity Summary
Wiley Post Airport

	Base Year	Short Term (1-5 years)	Intermediate Term (6-10 years)	Long Term (11-20 years)
BASED AIRCRAFT – Base Year 2018				
Single-Engine Piston	166	181	191	214
Multi-Engine Piston	27	25	22	17
Turboprop	17	20	25	35
Jet	63	69	74	90
Helicopter	13	15	18	24
Total Based Aircraft	**286**	**310**	**330**	**380**
ANNUAL AIRCRAFT OPERATIONS* - Base Year 2017				
General Aviation	51,417	55,388	58,658	65,622
Air Taxi	3,405	3,712	4,106	5,023
Military	487	526	526	526
Total Operations	***55,309***	***59,626***	***63,290***	***71,171***
PEAKING CHARACTERISTICS				
Peak Month	4,856	5,809	6,166	6,934
Design Day	162	194	206	231
Busy Day	250	299	318	356
Design Hour	22	27	28	32

*Includes ATCT After-Hours Adjustment
Source: Coffman Associates analysis

AIRFIELD CAPACITY AND DELAY

Airfield capacity is measured in a variety of different ways. The **hourly capacity** of a runway measures the maximum number of aircraft operations that can take place in an hour. The **annual service volume** (ASV) is an annual level of service that may be used to define airfield capacity needs and is a reasonable estimate of the maximum level of aircraft operations that can be accommodated in a year without incurring significant delay factors. **Aircraft delay** is the total delay incurred by aircraft using the airfield during a given timeframe. The FAA AC 150/5060-5, *Airport Capacity and Delay*, provides a methodology for examining the operational capacity of an airfield for planning purposes.

FACTORS AFFECTING ANNUAL SERVICE VOLUME

This analysis considers specific factors about the airfield, such as airfield layout, weather conditions, aircraft mix, and operations to calculate the airport's ASV. These factors are depicted in **Exhibit 3A**. The following describes the input factors as they relate to PWA.

- **Runway Configuration –** The existing runway configuration consists of three runways. Runway 17L-35R is 7,199 feet long and 150 feet wide; Runway 17R-35L is 5,002 feet long and 75 feet wide; and Runway 13-31 is 4,214 feet long and 100 feet wide.

- **Runway Use –** Runway use in capacity conditions will be controlled by wind and/or airspace conditions. The direction of takeoffs and landings are generally determined by the direction of the wind. It is generally safest for aircraft to take off and land into the wind to avoid crosswind (wind that is blowing perpendicular to the travel of the aircraft) or tailwind components. Based upon information from the airport's automated surface observation system (ASOS), winds generally tend to be out of the south, which favors the use of Runway 17. This is true for both visual flight rule (VFR) and instrument flight rule (IFR) 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. Only exit taxiways located between 2,000 and 4,000 feet from the landing threshold count in the capacity determination. The exits must be at least 750 feet apart to count as separate exits. Under these criteria, Runways 35R, 35L, and 13 each have two exits credited to them, and Runways 17L, 17R, and 31 have one.

- **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.

  According to historic meteorological data collected from the ASOS for the period January 1, 2008 to December 31, 2017, the airport reported VFR conditions a large majority of the time at 93.3 percent. VFR conditions exist whenever the cloud ceiling is greater than or equal to 1,000 feet above ground level (AGL) and visibility is greater than three statute miles. IFR conditions 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, IFR conditions accounted for 3.9 percent of the time. Poor visibility conditions (PVC) apply for cloud ceilings below 500 feet and visibility minimums below one mile. PVC constituted 2.8 percent of the time.

AIRFIELD LAYOUT

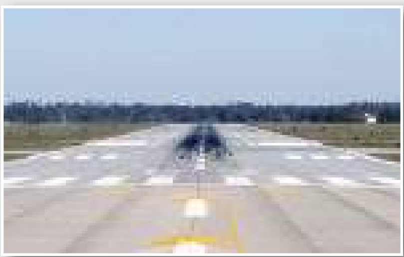
Runway Configuration

Runway Use

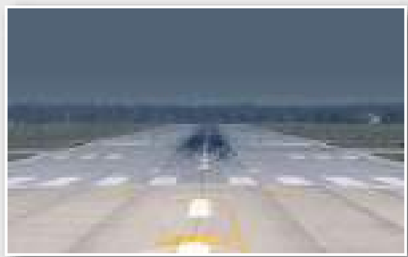
Number of Exits

WEATHER CONDITIONS

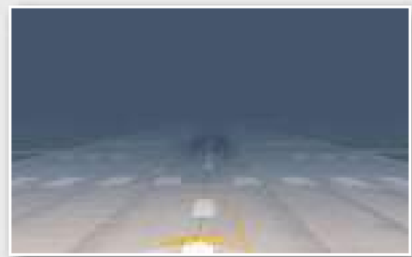
VMC
Visual Meteorological Conditions



IMC
Instrument Meteorological Conditions



PVC
Poor Visibility Conditions



AIRCRAFT MIX

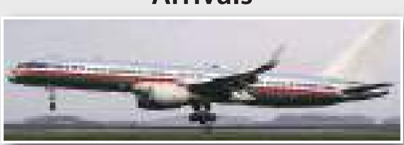
Category A & B Aircraft

Category C Aircraft

Category D Aircraft

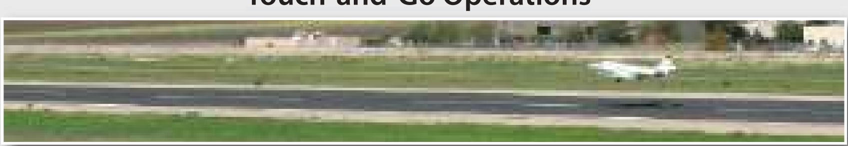
OPERATIONS

Arrivals

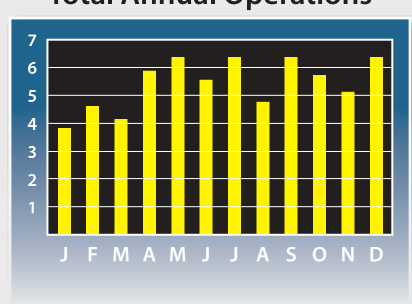


Departures

Touch-and-Go Operations



Total Annual Operations



- **Aircraft Mix –** The aircraft mix for the capacity analysis is defined in terms of four aircraft classes. Classes A and B consist of small- and medium-sized propeller-driven aircraft and some smaller business jets, 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. Class C consists of aircraft weighing between 12,500 pounds and 300,000 pounds. These aircraft include most business jets and some turboprop aircraft. Class D consists of large aircraft weighing more than 300,000 pounds. These aircraft are associated with major airline and air cargo activities and include the Boeing 747 and 777, among others. The airport does not currently, nor is it expected to, experience operations by Class D aircraft. A description of the classifications and the percentage mix for each planning horizon is presented in **Table 3B**.

  For the capacity analysis, the percentage of Class C aircraft operating at PWA is critical in determining the ASV as this class includes the larger and faster aircraft in the operational mix. The percentage of Class C aircraft operations at the airport is expected to increase through the planning period as business and corporate use of jets increases.

TABLE 3B
Aircraft Operational Mix - Capacity Analysis
Wiley Post Airport

Aircraft Classification	Base Year (2017)	Short Term (1-5 Years)	Intermediate Term (6-10 Years)	Long Term (11-20 Years)
Visual Flight Rule (VFR) Conditions				
Classes A & B	84.5%	84.3%	84.1%	83.7%
Class C	15.5%	15.7%	15.9%	16.3%
Class D	0.0%	0.0%	0.0%	0.0%
Instrument Flight Rule (IFR) Conditions				
Classes A & B	50.0%	50.0%	50.0%	50.0%
Class C	50.0%	50.0%	50.0%	50.0%
Class D	0%	0%	0%	0%

Class A - Small single engine aircraft with gross weights of 12,500 pounds or less
Class B - Small multi-engine aircraft with gross weights of 12,500 pounds or less
Class C - Large aircraft with gross weights over 12,500 pounds up to 300,000 pounds
Class D - Large aircraft with gross weights over 300,000 pounds

Source: Coffman Associates analysis

- **Percent Arrivals vs. Departures –** The aircraft arrival/departure split is typically 50/50 in the design hour. At PWA, traffic information indicated no major deviation from this pattern.

- **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 one takeoff occurs within a shorter time period than individual operations. Touch-and-go operations at PWA account for approximately 29 percent of total annual operations currently and is projected to drop to 27 percent by the long-range horizon.

- **Peak Period Operations –** Typical 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. For the airfield capacity analysis, average daily operations and average peak hour operations during the peak month, as calculated in the previous chapter and detailed earlier in this chapter, are utilized.

CAPACITY ANALYSIS CONCLUSION

Given the factors outlined above, the airfield's ASV exceeds 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 aircraft operation will increase exponentially.

PWA has averaged approximately 56,000 annual operations over the past five years, which represents 28 percent of the airfield's ASV, if the ASV is considered at the low end of the typical range of 200,000 annual operations. By the end of the long-term planning period, total annual operations are expected to represent 36 percent of the airfield's ASV.

FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS), indicates that improvements for airfield capacity purposes should begin to be considered once operations reach 60 to 75 percent of the annual service volume. This is an approximate level to begin the detailed planning of 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 in the master plan.

AIRFIELD FACILITY REQUIREMENTS

Airfield facilities include those facilities related to the arrival, departure, and ground movement of aircraft. The adequacy of existing airfield facilities at PWA has been analyzed from a number of perspectives, including:

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

Airfield 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-III-2400 for Runway 17L-35R; RDC B-II-5000 for Runway 17R-35L; and RDC B-I(S)-VIS for Runway 13-31. Ultimately, the RDC for Runway 17L-35R is anticipated to be D-III-2400; however, most design standards going from C-III-2400 to D-III-2400 are the same; therefore, for the remainder of this chapter Runway 17L-35R standards will be expressed as C/D-

III-2400. Runway 17R-35L should be considered for RDC D-II-5000 standards or possibly D-II-4000 standards if lower instrument approach visibility minimums are desired. Runway 13-31 will remain as a B-I(S)-VIS runway for the duration of the planning period.

RUNWAYS

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

Runway Orientation

For the operational safety and efficiency of an airport, it is desirable for the primary runway to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off. The parallel runways at PWA are orientated in a north-south manner and the crosswind runway is oriented in a northwest-southeast manner.

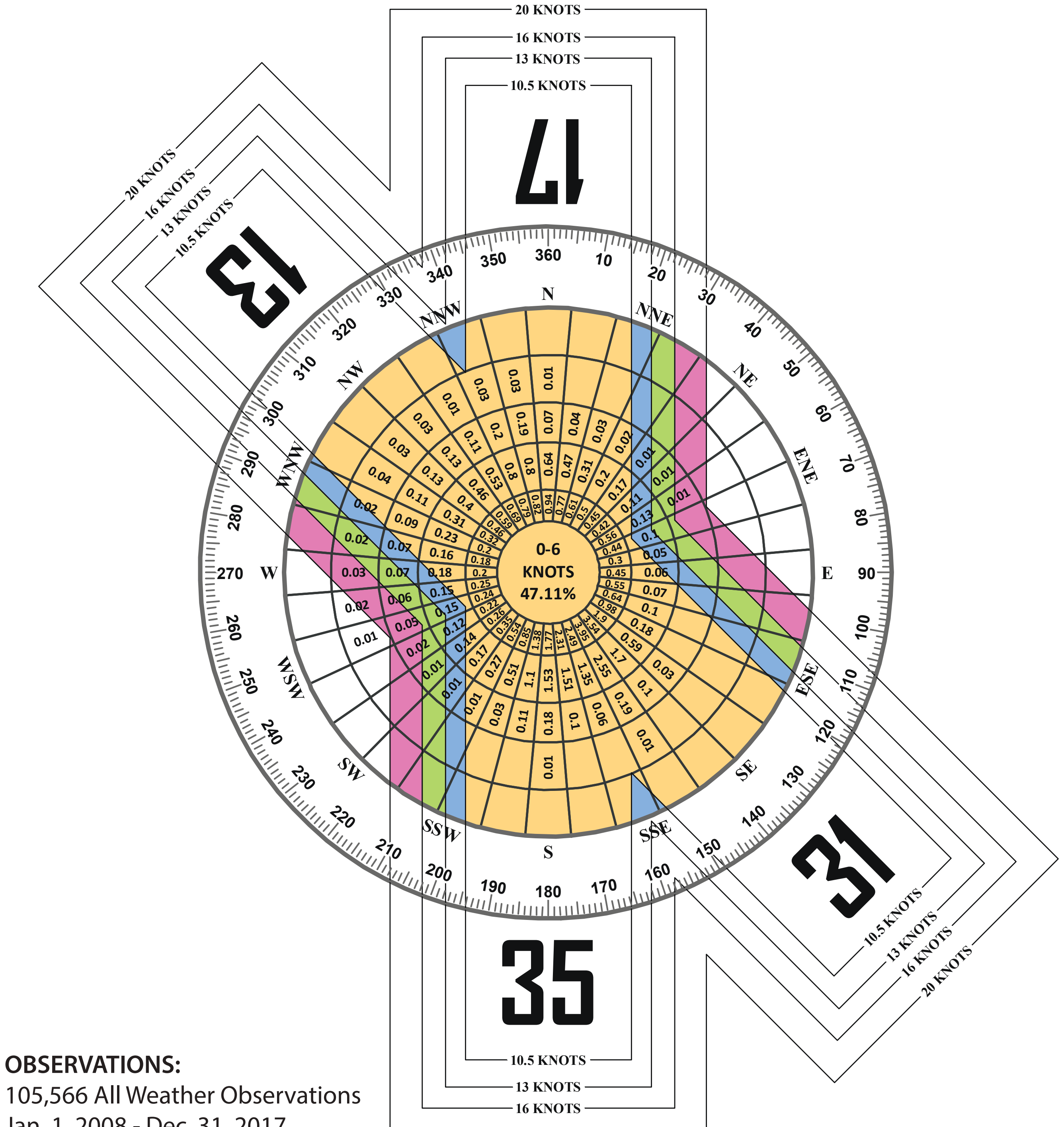
FAA AC 150/5300-13A, *Airport Design,* recommends that a crosswind runway be made available when the primary runway orientation provides for less than 95 percent wind coverage for specific crosswind components. The 95 percent wind coverage is based on the crosswind component not exceeding 10.5 knots (12 mph) for Runway Design Code (RDC) A-I and B-I; 13 knots (15 mph) for RDC A-II and B-II; and 16 knots (18 mph) for RDC A-III, B-III, C-I through C-III, and D-I through D-III.

Weather data specific to the airport was obtained from the National Oceanic Atmospheric Administration (NOAA) National Climatic Data Center. This data was collected from the on-field ASOS over a continuous period from 2008 to 2017. A total of 105,566 observations of wind direction and other data points were made. Of the total number of observations, 13,969 were made in IFR conditions. As previously detailed, IFR conditions exist when the visibility is below three miles or the cloud ceilings are below 1,000 feet.

Exhibit 3B presents both the all-weather and IFR wind rose for the airport. A wind rose is a graphic tool that gives a succinct view of how wind speed and direction are historically distributed at a particular location. The table at the top of each wind rose indicates the percent of wind coverage for the runway and specific wind intensity. In all-weather conditions, the parallel runway (Runway 17-35) provides 94.90 percent wind coverage for 10.5 knot crosswinds, 97.68 percent coverage at 13 knots, 99.32 percent at 16 knots, and 99.82 percent at 20 knots. The crosswind runway (Runway 13-31) provides 77.70 percent at 10.5 knots, 87.61 percent at 13 knots, 95.36 percent coverage at 16 knots, and 98.87 percent at 20 knots. This shows that no single runway orientation meets the 95 percent crosswind component, which justifies maintaining a crosswind runway at PWA. Combined, the orientation of all runways provides for 97.79 percent or greater coverage for 10.5 knots and greater crosswinds in all-weather conditions and 97.21 percent or greater coverage for 10.5 knots and greater crosswinds in IFR conditions.

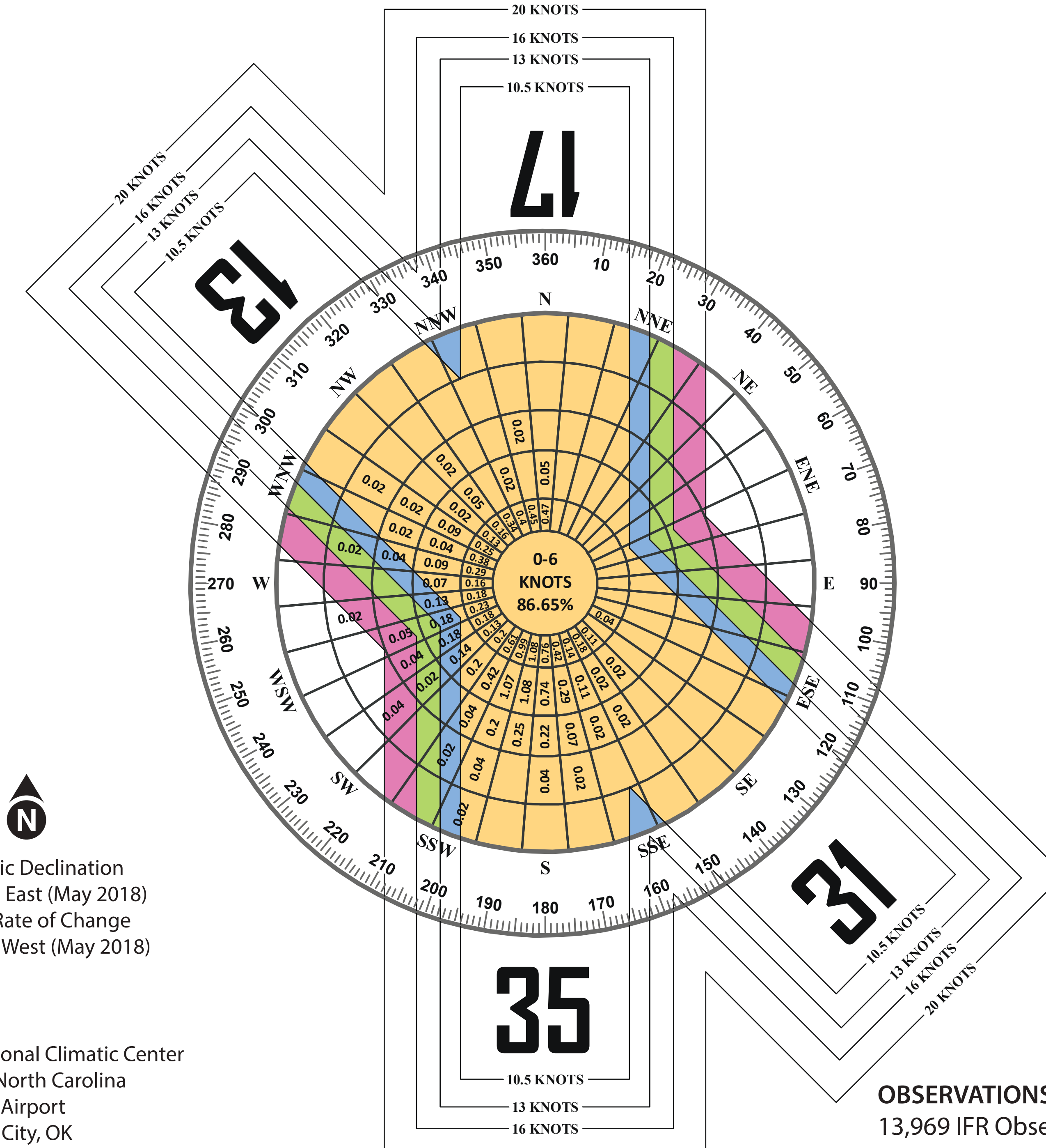
ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 17-35	94.90%	97.68%	99.32%	99.82%
Runway 13-31	77.70%	87.61%	95.36%	98.87%
All Runways	97.79%	99.19%	99.77%	99.94%



IFR WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 17-35	93.97%	96.87%	98.75%	99.52%
Runway 13-31	81.34%	90.15%	96.29%	98.79%
All Runways	97.21%	98.80%	99.54%	99.79%



Magnetic Declination
03° 45' 00" East (May 2018)
Annual Rate of Change
00° 06' 00" West (May 2018)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Wiley Post Airport
Oklahoma City, OK

OBSERVATIONS:
105,566 All Weather Observations
Jan. 1, 2008 - Dec. 31, 2017

OBSERVATIONS:
13,969 IFR Observations
Jan. 1, 2008 - Dec. 31, 2017

Runway Length

FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length needs. A draft revision to 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 PWA is based on five primary factors:

- Mean maximum temperature of the 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)

Aircraft performance declines as elevations, temperature, and runway gradient factors increase. For PWA, the mean maximum daily temperature of the hottest month is 93.2 degrees Fahrenheit (F), which occurs in July. The airport's elevation is 1,299.6 feet above mean sea level (MSL). The runway elevation difference is approximately 9.1 feet for Runway 17L-35R, which equates to a 0.13 percent gradient change. The gradient of the runway conforms to FAA design standards.

Airplanes operate on a wide variety of available runway lengths. Many factors will govern the suitability of those 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 can maximize the suitability of the runway length. Policies, such as area zoning and height and hazard restrictions, can protect an airport's runway length. Airport ownership (fee simple or easement) of land leading to the runway ends can reduce the possibility of natural growth or man-made obstructions. Planning of runways should include an evaluation of aircraft types expected to use the airport or a particular runway now and in the future. Future plans should be realistic and supported by the FAA-approved forecasts and should be based on the critical design aircraft (or family of aircraft).

Small General Aviation Aircraft

Most operations at PWA are conducted using smaller single engine piston-powered aircraft weighing less than 12,500 pounds. **Table 3C** summarizes the FAA's generalized recommended runway lengths for small aircraft determined for PWA. FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, recommends that airports be designed to at least serve 95 percent of small airplanes. The advisory circular further defines the fleet categories as follows:

- **95 Percent of Small Airplane Fleet:** Applies to airports that are primarily intended to serve medium-sized population communities with a diversity of usage and a greater potential for increased aviation activities. This category also includes airports that are primarily intended to serve low-activity locations, small population communities, and remote recreational areas.

- **100 Percent of Small Airplane Fleet:** This type of airport is primarily intended to serve communities located on the fringe of a metropolitan area or a relatively large population community remote from a metropolitan area.

TABLE 3C
Small Airplane Runway Length Requirements
Wiley Post Airport

AIRPORT AND RUNWAY DATA	
Airport elevation	1,299.6 feet
Mean daily maximum temperature of the hottest month	93.2° F
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats	
95 percent of these small airplanes	3,600 feet
100 percent of these small airplanes	4,200 feet
Small airplanes with 10 or more passenger seats	4,600 feet

Source: FAA AC 150/5325-4B, Runway Length Requirements for Airport Design.

Following guidance from AC 150/5325-4B, to accommodate 100 percent of these small aircraft, a runway length of 4,200 feet is recommended. For small aircraft with 10 or more passenger seats, 4,600 feet of runway length is recommended.

Turbine Aircraft

The airport is also utilized by aircraft weighing more than 12,500 pounds, including turboprop aircraft, such as the Beechcraft King Air family and all types of business jets, up to and including the Bombardier Global 5000, the Gulfstream G550, and potential more future operations by the Boeing Business Jet (BBJ). A turbine aircraft runway takeoff and landing length analysis was prepared and is detailed in **Tables 3D** and **3E**.

The analysis data was obtained from Ultranav software, which computes operational parameters for specific aircraft based on flight manual data. The takeoff length analysis includes the maximum takeoff weight (MTOW) allowable and the percent useful load from 60 percent to 100 percent, and the landing length analysis considers the aircraft's maximum landing weight (MLW). The figures are shaded from green to red based upon their proximity to the current length of Runway 17L-35R (7,199 feet), with darker red figures exceeding the current runway length available at PWA.

This takeoff length analysis, shown in **Table 3D**, shows that all turbine aircraft examined, including the BBJ, are capable of taking off on Runway 17L-35R during the summer at useful loads up to 70 percent. At 80 percent useful loads, only the Lear 35A needs additional length. At 100 percent useful loads, 13 turbine aircraft need additional length, including the BBJ, which requires 7,700 feet and the Gulfstream G550, which needs 7,899 feet.

Table 3E 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 operating their own transport category 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. Part 91k and Part 135 rules regarding landing operations require operators to land at the destination airport within 60 percent of the effective runway length. An additional rule allows for operators to land within 80 percent of the effective runway length if the operator has an approved destination airport analysis in the airport's program operating manual. The landing length analysis conducted accounts for both scenarios.

The landing length analysis shows that aircraft operating at MLW under Part 135 rules needing to land within 60 percent of the effective runway length during wet conditions is the most restrictive with some aircraft, such as the Cessna Citation III, needing over 10,400 feet. The BBJ needs 9,500 feet of landing length and the Gulfstream G550 needs 8,578 feet. The average length needed for this category is 7,500 feet. The BBJ is the only aircraft that needs additional landing length when operating on a dry runway under Part 135 with the 60 percent rule. Per FAA guidance on determining runway length needs, wet runway conditions do not apply to turboprop aircraft so figures for the King Air aircraft are only included under the dry runway conditions. Each of the King Airs are capable of landing in approximately 4,800 feet.

Runway Length Summary

Most operations taking place at PWA are conducted by smaller, single-engine, fixed-wing aircraft weighing less than 12,500 pounds. Following guidance from AC 150/5325-4B, to accommodate 100 percent of these small aircraft, including those with 10 or more passenger seats, a runway length of at least 4,600 feet is recommended. The lengths of Runways 17L-35R and 17R-35L both exceed this need and Runway 13-31 meets the need of 100 percent of small airplanes with fewer than 10 passenger seats.

TABLE 3D
Business Aircraft Takeoff Length Requirements
Wiley Post Airport

Aircraft Name	MTOW lbs.	Takeoff Length Requirements (feet) Useful Load				
		60%	70%	80%	90%	100%
King Air C90B	10,100	2,847	3,058	3,278	3,512	3,760
Citation I/SP	11,850	2,953	3,207	3,478	3,764	4,068
Citation CJ3	13,870	3,053	3,280	3,528	3,785	4,076
King Air 200 GT	12,500	3,563	3,691	3,826	3,967	4,093
Citation (525A) CJ2	12,375	3,353	3,608	3,906	4,181	4,482
King Air 350	15,000	3,666	3,828	3,991	4,264	4,601
Citation Mustang	8,645	3,034	3,362	3,729	4,185	4,650
Citation Encore	16,630	3,272	3,593	3,935	4,323	4,748
Citation Encore Plus	16,830	3,279	3,604	3,973	4,366	4,805
Citation 560 XL	20,000	3,621	3,908	4,225	4,544	4,920
Citation Bravo	14,800	3,627	3,905	4,217	4,578	4,970
Citation (525) CJ1	10,600	3,645	4,115	4,582	5,049	5,527
Beechjet 400A	16,300	4,188	4,511	4,848	5,210	5,586
Premier 1A	12,500	4,091	4,529	5,048	5,559	6,093
Hawker 900 XP	28,000	4,466	4,723	5,147	5,616	6,124
Gulfstream 350	70,900	4,390	4,779	5,217	5,681	6,177
Lear 31A	17,000	4,010	4,353	4,724	5,122	6,190
Hawker 4000	39,500	4,424	4,800	5,201	5,657	6,204
Global 5000	92,500	4,537	5,043	5,574	6,130	6,708
Gulfstream IV/SP	74,600	4,729	5,210	5,725	6,270	6,860
Citation X	35,700	4,776	5,201	5,705	6,273	6,868
Gulfstream 450	74,600	4,710	5,197	5,718	6,283	6,878
Falcon 7X	70,000	4,619	5,136	5,679	6,287	6,989
Gulfstream 100	24,650	5,157	5,717	6,314	6,906	7,493
Boeing Business Jet	171,000	5,100	5,400	6,100	6,500	7,700
Lear 60	23,500	5,378	5,956	6,477	7,078	7,838
Gulfstream 550	91,000	4,871	5,544	6,280	7,066	7,889
Canadair Challenger 601	45,100	5,340	5,960	6,640	7,400	8,260
Citation III	21,500	4,619	5,083	5,587	O/L	O/L
Gulfstream 200	35,450	5,691	6,381	7,139	7,958	O/L
Gulfstream 150	26,100	5,130	5,409	5,661	6,178	O/L
Gulfstream IIB	69,700	4,593	5,085	5,594	6,119	O/L
Global XRS	98,000	4,954	5,547	6,171	6,825	O/L
Hawker 800 (Non-T/R)	27,400	5,590	6,240	6,963	7,809	O/L
Lear 35A	19,600	5,802	6,510	7,420	O/L	O/L
Westwind II	23,500	5,261	5,803	6,365	O/L	O/L
Average Takeoff Length		4,300	4,800	5,200	5,600	5,900

SHORTER 7,199' LONGER

Runway length calculation assumptions: 1,299.6' MSL field elevation; 93.2° F ambient temperature; 0.1% runway grade.
O/L – Condition is Outside Climb Limits of the Aircraft
MTOW – Maximum takeoff weight

Source: Ultranav software

TABLE 3E
Business Aircraft Landing Length Requirements
Wiley Post Airport

Aircraft Name	MLW lbs.	Landing Length Requirements (feet)					
		Dry Runway Condition			Wet Runway Condition		
		Part 25	80% Rule	60% Rule	Part 25	80% Rule	60% Rule
King Air 200 GT	12,500	1,955	2,444	3,258	N/A	N/A	N/A
King Air C90B	9,600	1,400	1,750	2,333	N/A	N/A	N/A
King Air 350	15,000	2,887	3,609	4,812	N/A	N/A	N/A
Citation I/SP	11,350	2,454	3,068	4,090	2,823	3,529	4,705
Westwind II	19,000	2,470	3,088	4,117	2,840	3,550	4,733
Global 5000	78,600	2,732	3,415	4,553	3,142	3,928	5,237
Global XRS	78,600	2,732	3,415	4,553	3,142	3,928	5,237
Falcon 7X	62,400	3,003	3,754	5,005	3,454	4,318	5,757
Citation Mustang	8,000	2,602	3,253	4,337	3,652	4,565	6,087
Gulfstream IV/SP	66,000	3,248	4,060	5,413	3,735	4,669	6,225
Hawker 4000	33,500	3,289	4,111	5,482	3,782	4,728	6,303
Gulfstream 350	66,000	3,348	4,185	5,580	3,850	4,813	6,417
Hawker 800	23,350	3,040	3,800	5,067	3,920	4,900	6,533
Citation (525) CJ1	9,800	2,969	3,711	4,948	4,011	5,014	6,685
Hawker 900 XP	23,350	2,729	3,411	4,548	4,054	5,068	6,757
Challenger 601	36,000	3,431	4,289	5,718	4,117	5,146	6,862
Gulfstream 200	30,000	3,622	4,528	6,037	4,166	5,208	6,943
Citation CJ3	12,750	3,089	3,861	5,148	4,205	5,256	7,008
Lear 31A	16,000	3,094	3,868	5,157	4,332	5,415	7,220
Premier 1A	11,600	3,470	4,338	5,783	4,467	5,584	7,445
Gulfstream 150	21,700	3,178	3,973	5,297	4,612	5,765	7,687
Lear 35A	15,300	3,330	4,163	5,550	4,662	5,828	7,770
Citation Encore	15,200	3,114	3,893	5,190	4,672	5,840	7,787
Citation (525A) CJ2	11,500	3,267	4,084	5,445	4,735	5,919	7,892
Citation Encore Plus	15,200	3,115	3,894	5,192	4,743	5,929	7,905
Lear 60	19,500	3,718	4,648	6,197	5,000	6,250	8,333
Gulfstream 550	75,300	2,847	3,559	4,745	5,147	6,434	8,578
Citation 560 XL	18,700	3,511	4,389	5,852	5,594	6,993	9,323
Citation X	31,800	3,920	4,900	6,533	5,595	6,994	9,325
Beechjet 400A	15,700	3,819	4,774	6,365	5,657	7,071	9,428
Boeing Business Jet	134,000	5,100	6,375	8,500	5,700	7,125	9,500
Gulfstream 450	66,000	3,348	4,185	5,580	5,764	7,205	9,607
Citation Bravo	13,500	3,716	4,645	6,193	5,838	7,298	9,730
Gulfstream 100	20,700	3,201	4,001	5,335	6,081	7,601	10,135
Gulfstream IIB	58,500	3,236	4,045	5,393	6,204	7,755	10,340
Citation III	19,000	4,266	5,333	7,110	6,266	7,833	10,443
Average Landing Length		3,300	4,100	5,400	4,500	5,600	7,500

Runway length calculation assumptions: 1,299.6' MSL field elevation; 93.2° F ambient temperature; 0.1% runway grade.
MLW – Maximum Landing Weight
N/A – Not Applicable

Source: Ultranav software

Previous planning included extending Runway 17R-35L to 6,000 feet and maintaining Runway 17L-35R at its current length. This analysis has shown that certain business jets need additional runway length for takeoff and landing. The BBJ needs up to 7,700 feet of takeoff length and 9,500 feet of landing length. The Gulfstream G550, which is also an ultimate critical design aircraft, needs up to 7,900 feet for takeoff and 8,600 feet for landing. Since the ultimate condition considers improving Runway 17R-35L to accommodate a greater number of business jets, the alternatives analysis to follow in the next chapter will consider extensions to both runways.

Crosswind Runway 13-31 has a length of 4,214 feet and is used exclusively by small aircraft weighing less than 12,500 pounds. The current length of the crosswind runway is adequate for these types of aircraft so no additional runway length is recommended.

A runway extension will not be considered justified unless and/or until support is obtained from users detailing 500 annual operations by the critical aircraft requiring the additional runway length. Detailed justification for constructing the runway extension will be required with the environmental assessment (EA) and benefit-cost analysis.

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 17L-35R, RDC C/D-III design criteria stipulate a runway width of 100 feet unless the critical aircraft has a MTOW greater than 150,000 pounds. For ADG III aircraft with MTOWs greater than 150,000 pounds, the standard runway width is 150 feet. For Runway 17R-35L, RDC B-II standards stipulate a runway width of 75 feet going to 100 feet in the ultimate condition to meet RDC D-II standards. For Runway 13-31, RDC B-I(S) standards stipulate a runway width of 60 feet.

The current runway widths are 150 feet for Runway 17L-35R; 75 feet for Runway 17R-35L; and 100 feet for Runway 13-31. As detailed earlier in this study, the ultimate critical design aircraft could include larger jets up to and including the BBJ, which can have a MTOW over 170,000 pounds. Furthermore, the existing width provides added safety enhancements for existing operations by larger business jet aircraft that utilize the airport. As such, it is recommended that the current width on Runway 17L-35R be maintained in the future.

Parallel Runway 17R-35L currently meets the B-II standard but ultimately consideration should be given to widening it to 100 feet to meet D-II standards. Having parallel runways capable of accommodating the full range of business jet aircraft operating at PWA will ensure the airport can continue to operate uninterrupted during periods that the primary runway is closed for extended maintenance (pavement reconstruction) or emergency situations. For a more detailed explanation on the purpose and need for widening Runway 17R-35L to 100 feet, see **Appendix D**.

Runway 13-31, at 100 feet wide, exceeds the current and ultimate design standard. The airport can choose to maintain the runway at this width, which can serve to improve operational safety of the runway; however, it is unlikely that FAA will assist in funding the maintenance of this runway at its current width. 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 the Oklahoma City Airport Trust.

Runway Pavement Strength

An important feature of airfield pavement is its ability to withstand repeated use by aircraft. The FAA reports the pavement strength for Runways 17L-35R and 13-31 at 35,000 pounds single wheel loading (SWL), 50,000 pounds dual wheel loading (DWL), and 90,000 pounds double tandem wheel loading (DTWL). Runway 17R-35L is rated at 26,000 pounds SWL and 45,000 pounds DWL. These strength ratings refer to the configuration of the aircraft landing gear. For example, SWL indicates an aircraft with a single wheel on each landing gear.

The strength rating of a runway does not preclude aircraft weighing more than the published strength rating from using the runway. The strength is based on design parameters which support a high volume of aircraft at or below the published weight, allowing the pavement to survive its intended useful life. Aircraft weighing more than the published weight could damage the runway in severe conditions, but more likely will simply reduce the life cycle of the pavement.

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, an 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, *Airport/Facility Directory*, "Runway strength rating is not intended as a maximum allowable weight or as an operating limitation. Many airport pavements are capable of supporting limited operations with gross weights in excess of the published figures." The directory goes on to say that those aircraft exceeding the pavement 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 or other maintenance methods can increase the strength rating. The current runway strength is adequate to accommodate most aircraft that currently operate at the airport and that are forecast to utilize the airport in the future; however, more frequent operations by aircraft such as the BBJ, which can have a MTOW over 170,000 on dual-wheel main landing gear, will more quickly deteriorate the runway pavement. Therefore, it is recommended that Runway 17L-35R be strengthened to 170,000 pounds DWL. Runway 17R-35L is planned to accommodate mid-sized business jet aircraft such as the Gulfstream G450, which can weigh up to 73,900 pounds. Therefore, Runway 17R-35L should be strengthened to at least 73,900 pounds DWL. Runway 13-31, which is currently restricted to use by aircraft weighing 12,500 pounds or less, has adequate strength to accommodate these airplanes. Therefore, the current strength rating of this runway should be maintained through the planning period.

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 3C**.

Table 3F presents the FAA design standards as they apply to each runway at PWA both now and in the future.

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 Advisory Circular 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.

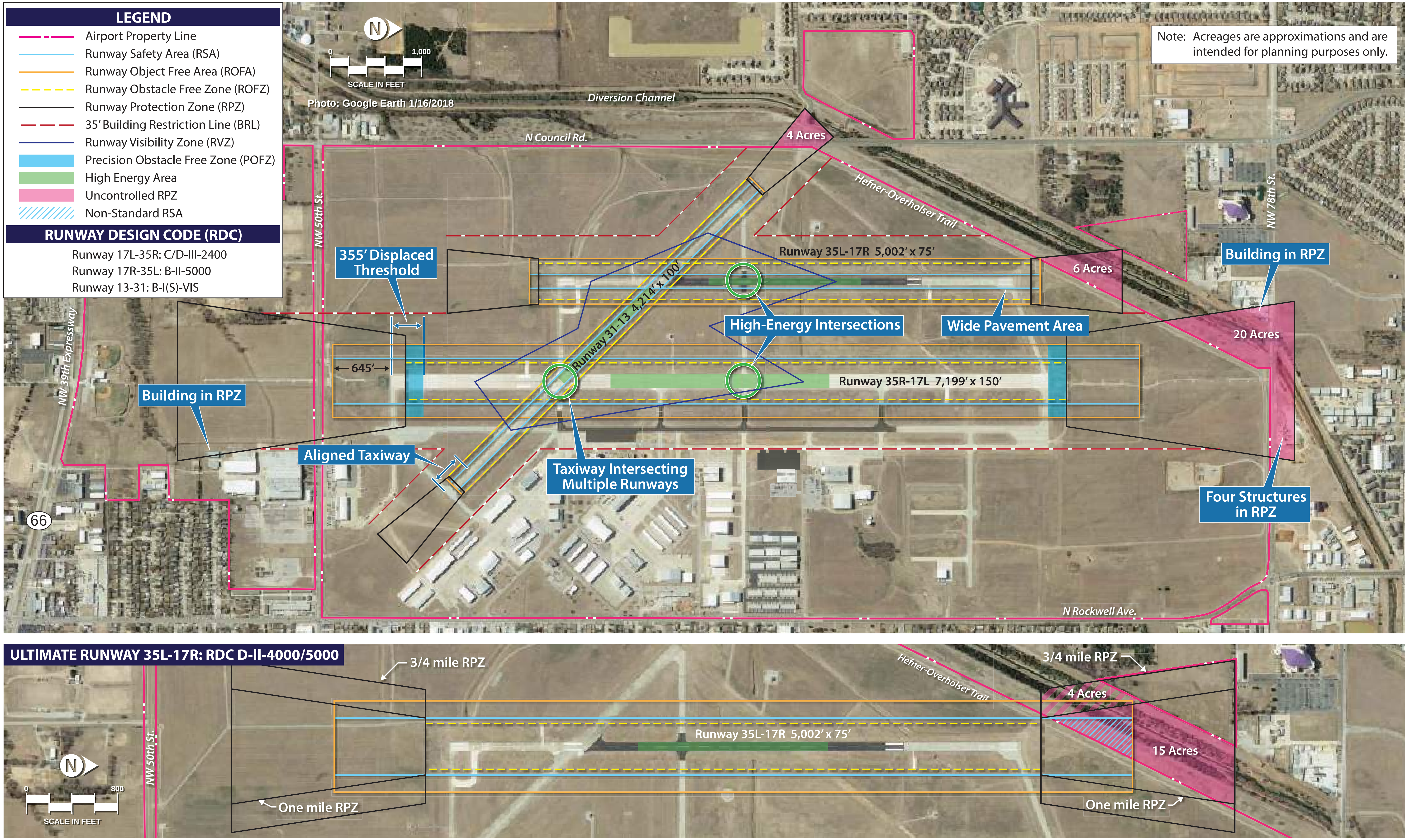

LEGEND
Airport Property Line
Runway Safety Area (RSA)
Runway Object Free Area (ROFA)
Runway Obstacle Free Zone (ROFZ)
Runway Protection Zone (RPZ)
35' Building Restriction Line (BRL)
Runway Visibility Zone (RVZ)
Precision Obstacle Free Zone (POFZ)
High Energy Area
Uncontrolled RPZ
Non-Standard RSA
RUNWAY DESIGN CODE (RDC)
Runway 17L-35R: C/D-III-2400
Runway 17R-35L: B-II-5000
Runway 13-31: B-I(S)-VIS
N
0 1,000
SCALE IN FEET
Photo: Google Earth 1/16/2018
Diversion Channel
N Council Rd.
Note: Acreages are approximations and are intended for planning purposes only.
4 Acres
Hefner-Overholser Trail
NW 78th St.
NW 50th St.
NW 39th Expressway
355' Displaced Threshold
Runway 35L-17R 5,002' x 75'
Runway 31-13 4,214' x 100'
6 Acres
Building in RPZ
High-Energy Intersections
Wide Pavement Area
20 Acres
645'
Runway 35R-17L 7,199' x 150'
Building in RPZ
Aligned Taxiway
Taxiway Intersecting Multiple Runways
Four Structures in RPZ
66
N Rockwell Ave.
ULTIMATE RUNWAY 35L-17R: RDC D-II-4000/5000
3/4 mile RPZ
Hefner-Overholser Trail
3/4 mile RPZ
4 Acres
Runway 35L-17R 5,002' x 75'
15 Acres
NW 50th St.
N
0 800
SCALE IN FEET
One mile RPZ
One mile RPZ

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TABLE 3F
Runway Design Standards
Wiley Post Airport

	Runway 17L-35R (Existing/Ult.)	Runway 17R-35L (Ult.)	Runway 17R-35L (Existing)	Runway 13-31 (Existing/Ult.)
RUNWAY CLASSIFICATION				
Runway Design Code	C/D-III	D-II	B-II	B-I(S)
Visibility Minimums	½-mile (Both Ends)	¾-mile (Both Ends)	Not lower than 1-mile (Both Ends)	Visual (Both Ends)
RUNWAY DESIGN				
Runway Width	150[1]	100	75	60
RUNWAY PROTECTION				
Runway Safety Area (RSA)				
Width	500	500	150	120
Length Beyond Departure End	1,000	1,000	300	240
Length Prior to Threshold	600	600	300	240
Runway Object Free Area (ROFA)				
Width	800	800	500	400
Length Beyond Departure End	1,000	1,000	300	240
Length Prior to Threshold	600	600	300	240
Runway Obstacle Free Zone (ROFZ)				
Width	400	400	400	250
Length Beyond End	200	200	200	200
Precision Obstacle Free Zone (POFZ)				
Width	800	N/A	N/A	N/A
Length	200	N/A	N/A	N/A
Approach Runway Protection Zone (RPZ)				
Length	2,500	1,700	1,000	1,000
Inner Width	1,000	1,000	500	250
Outer Width	1,750	1,510	700	450
Departure Runway Protection Zone (RPZ)				
Length	1,700	1,700	1,000	1,000
Inner Width	500	500	500	250
Outer Width	1,010	1,010	700	450
RUNWAY SEPARATION				
Runway Centerline to:				
Holding Position	263[2]	250	200	125
Parallel Taxiway	400	300	240	150
Aircraft Parking Area	500	400	250	125

[1] For airplanes with maximum certificated takeoff weight of 150,000 pounds or less, the standard runway width is 100 feet.
[2] This distance is increased one foot for each 100 feet above sea level.
Note: All dimensions in feet

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

For RDC C/D-III design, the FAA calls for the RSA to be 500 feet wide and extend 1,000 feet beyond the runway ends. Applying these dimensions to Runway 17L-35R would result in a non-standard condition with the RSA extending over NW 50th Street, a public roadway, the localizer antenna array, and perimeter fencing along the airfield's southern boundary. To remedy this, the airport has implemented declared distances. Declared distances are used by the FAA to define the effective runway length for landing and takeoff. The declared distance pertaining to the RSA in this case is the accelerated stop distance available (ASDA) and the landing distance available (LDA). ASDA takes into consideration RSA standards, thereby improving safety margins for users. ASDA is equal to the balance field length calculated by pilots prior to takeoff. The ASDA, or balanced field length, considers the runway length required by an aircraft to accelerate to rotation speed and then decelerate safely on the remaining runway available. This is the controlling takeoff distance and is used for evaluating if sufficient takeoff distance is provided. LDA considers the runway length necessary for an aircraft to touch down and decelerate to a safe speed prior to exiting the runway, while allowing for appropriate safety areas at each end of the runway to safely accommodate an aircraft that may undershoot or overrun the runway. For Runway 17L, the published ASDA and LDA are 6,844 feet. For Runway 35R, the published LDA is 6,844 feet, while the ASDA is the full pavement length. The result is that the RSA extends only 645 feet south from the end of the runway, keeping it clear of NW 50th Street, the localizer antenna array, and perimeter fencing. The RSAs associated with the other two runways meet current standards without incorporating declared distances.

In the ultimate condition, applying RDC D-II standards to Runway 17R-35L increases the RSA dimensions to extend north beyond airport property encompassing the Hefner-Overholser Trail and a portion of the water diversion channel, which has steep banks on either side that would not meet RSA grading standards. The alternatives evaluation in the following chapter will consider this impact and how it could be mitigated, if necessary, in the future.

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 with the critical design aircraft utilizing the runway.

Like the RSA, the declared distances applied to Runway 17L-35R reduce the length of the ROFA beyond the south end of the runway to 645 feet eliminating NW 50th Street, the localizer antenna array, and perimeter fencing from penetrating the surface. The ROFAs for each runway currently meet all standards.

In the ultimate condition, the ROFA increases in size when applying RDC D-II standards to Runway 17R-35L. This results in the ROFA extending north beyond airport property encompassing the Hefner-Overholser Trail and the water diversion channel. The channel itself may not be an obstruction as it is below the elevation of the RSA; however, the trail is an obstruction that would need to be mitigated if the runway were to transition to RDC D-II design.

Obstacle Free Zone

The ROFZ is an imaginary volume of airspace 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, an airport's approaches could be removed or approach minimums could be increased.

The FAA's criterion for runways utilized by aircraft weighing more than 12,500 pounds (Runways 17L-35R / 17R-35L) requires a clear ROFZ to extend 200 feet beyond the runway ends and be 400 feet wide (200 feet on either side of the runway centerline). For runways utilized by aircraft weighing less than 12,500 pounds (Runway 13-31), the ROFZ is 250 feet wide extending 200 feet beyond the runway ends. The ROFZ standards are met on each runway in the existing and ultimate conditions.

A precision obstacle free zone (POFZ) is further defined for runway ends with a precision approach, such as the ILS approach to Runways 17L and 35R. The POFZ is 800 feet wide, centered on the runway, and extends from the runway threshold to a distance of 200 feet. The POFZ is in effect when the following conditions are met:

a) The runway supports a vertically guided approach.
b) Reported ceiling is below 250 feet or visibility is less than ¾-mile.
c) An aircraft is on final approach within two miles of the runway threshold.

When the POFZ is in effect, a wing of an aircraft holding on a taxiway may penetrate the POFZ; however, neither the fuselage nor the tail may infringe on the POFZ. POFZ standards currently apply to each end of Runway 17L-35R as outlined above since both runway ends allow for a vertically guided approach with instrument approach minimums below 250 feet or visibility minimums below ¾-mile.

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* (9.27.2012), 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
    - 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.

Currently, portions of Runways 17L, 17R, 13, and 35R RPZs extend beyond airport property and/or contain incompatible structures. Approximately 20 acres of the Runway 17L RPZ extend beyond airport property, with most of this property part of the diversion channel; however, NW 78th Street, a public roadway, extends through the RPZ. In addition, a concrete plant located on the south side of NW 78th Street is partially within the RPZ, including a portion of a building and four structures located on the north side of NW 78th Street. These structures are identified on **Exhibit 3C**.

Approximately six acres of the Runway 17R RPZ and four acres of the Runway 13 RPZ extend beyond airport property encompassing the diversion channel. The Runway 13 RPZ also includes N Council Road, a public roadway. The Runway 35R RPZ also includes a public roadway, NW 50th Street, and a building on the Gulfstream leasehold south of NW 50th Street.

Applying RDC D-II standards to Runway 17R-35L would increase the overall size of the RPZ from 13.770 acres to 29.465 acres if the runway were to maintain one-mile instrument approach visibility minimums. This would result in increasing the uncontrolled property in the RPZ from six to 15 acres. This area consists primarily of the diversion channel. There would be no public roadways or buildings within the enlarged, ultimate RPZ. Considering visibility minimums down to ¾-mile would further increase the overall size of the RPZ to 48.978 acres. The airport already owns property north of the diversion channel that the Runway 17R RPZ would encompass so going to ¾-mile would add only an additional four acres of uncontrolled property. The Runway 35L RPZ in either the one-mile or ¾-mile condition remains entirely on airport property with no incompatible structures or developments.

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. Since extensions to the parallel runways will be considered and Runway 17R-35L is considered for upgraded design standards, mitigation measures may need to be considered for removing the public roadways from these RPZs.

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/D-III with lower than ¾-mile visibility minimums is 400 feet from the runway centerline to the parallel taxiway centerline. Parallel Taxiway A is 527 feet from the runway; therefore, the current location of the taxiway exceeds the separation standard.

Taxiway C, which is a partial-parallel taxiway to Runway 13-31, is at a separation distance of 373 feet, which exceeds the RDC B-I(S) standard of 150 feet. Runway 17R-35L does not have a parallel taxiway; however, if one is planned in the future it should be to a minimum separation distance of 300 feet.

Holding Position Separation

Holding position markings are placed on taxiways leading to runways. When instructed, pilots are to stop short of the holding position marking line. For Runway 17L-35R, holding position marking lines are situated at least 263 feet from the runway centerline. Runway 17R-35L and Runway 13-31 both have holding position markings 200 feet from the runway centerline.

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 C/D-III, the holding position marking line should be increased one foot for every 100 feet above sea level. With PWA's elevation at 1,299.6 feet MSL, the holding position markings for Runway 17L-35R should be at least 263 feet from the runway centerline. The existing condition meets this design standard. Holding position markings for the other two runways meet or exceed current design standards.

In the ultimate condition, holding position markings for Runway 17R-35L would need to be placed 250 feet from the runway centerline to meet RDC D-II standards.

Aircraft Parking Area Separation

Aircraft parking areas should be at least 500 feet from the Runway 17L-35R centerline and 125 feet from the Runway 13-31 centerline. Currently, all aircraft parking areas exceed these standards as approximately 593 feet of separation exists between the Runway 17L-35R centerline and designated aircraft parking aprons on the east side of the airfield. The nearest aircraft parking area from the Runway 13-31 centerline is 475 feet away. Any potential future aircraft parking areas on the west side of the airfield should be at least 400 feet from the Runway 17R-35L centerline.

Parallel Runway Separation

FAA criteria requires a parallel runway be separated from an existing runway by at least 700 feet in order for aircraft to conduct simultaneous takeoffs and landings under VFR conditions. Runways 17L-35R and 17R-35L are separated by approximately 1,100 feet.

TAXIWAYS

The design standards associated with taxiways are determined by the Taxiway Design Group (TDG) or the Airplane Design Group (ADG) of the critical design aircraft. The applicable ADG for Taxiway A and Taxiway B and associated connectors east of Runway 17L-35R is ADG III. Taxiways A2, A5, A9, Z, and C, which serve the parallel and crosswind runways, should meet ADG II standards. **Table 3G** presents the various taxiway design standards.

TABLE 3G
Taxiway Dimensions and Standards
Wiley Post Airport

STANDARDS BASED ON WINGSPAN	***ADG II***	***ADG III***
Taxiway Protection		
Taxiway Safety Area width (feet)	79	118
Taxiway Object Free Area width (feet)	131	186
Taxilane Object Free Area width (feet)	115	162
Taxiway Separation		
Taxiway Centerline to:		
Fixed or Movable Object (feet)	65.5	93
Parallel Taxiway/Taxilane (feet)	105	152
Taxilane Centerline to:		
Fixed or Movable Object (feet)	57.5	81
Parallel Taxilane (feet)	97	140
Wingtip Clearance		
Taxiway Wingtip Clearance (feet)	26	34
Taxilane Wingtip Clearance (feet)	18	27
STANDARDS BASED ON TDG	***TDG 2***	***TDG 3***
Taxiway Width Standard (feet)	35	50
Taxiway Edge Safety Margin (feet)	7.5	10
Taxiway Shoulder Width (feet)	10	20
ADG: Airplane Design Group TDG: Taxiway Design Group		

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

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 of the airfield meets TDG 3 standards with all taxiways at 50 feet wide or greater. **Exhibit 3D** depicts the taxiway and taxilane object free areas (TOFAs) throughout the taxiway system. Similar to the ROFA, TOFAs should be cleared of objects and parked aircraft except for objects needed for air navigation or aircraft ground maneuvering purposes.

The taxiway OFAs associated with the airfield taxiways remain clear of obstructions. The taxilanes that extend into the hangar areas on the east side of the airfield have also been examined with both the ADG III and ADG II taxilane OFAs. The ADG III taxilane OFA extending from A2 southeast towards N Rockwell Avenue is obstructed by a T-hangar, whereas the ADG II taxilane OFA is unobstructed. Taxilane A5 extending from Taxiway B east towards N Rockwell Avenue is also clear when applying ADG II taxilane standards; however, ADG III standards result in two fuel storage facilities penetrating the TOFA. If aircraft within ADG III are planned to utilize these taxilanes, the obstructions should be removed and relocated.

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."

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.

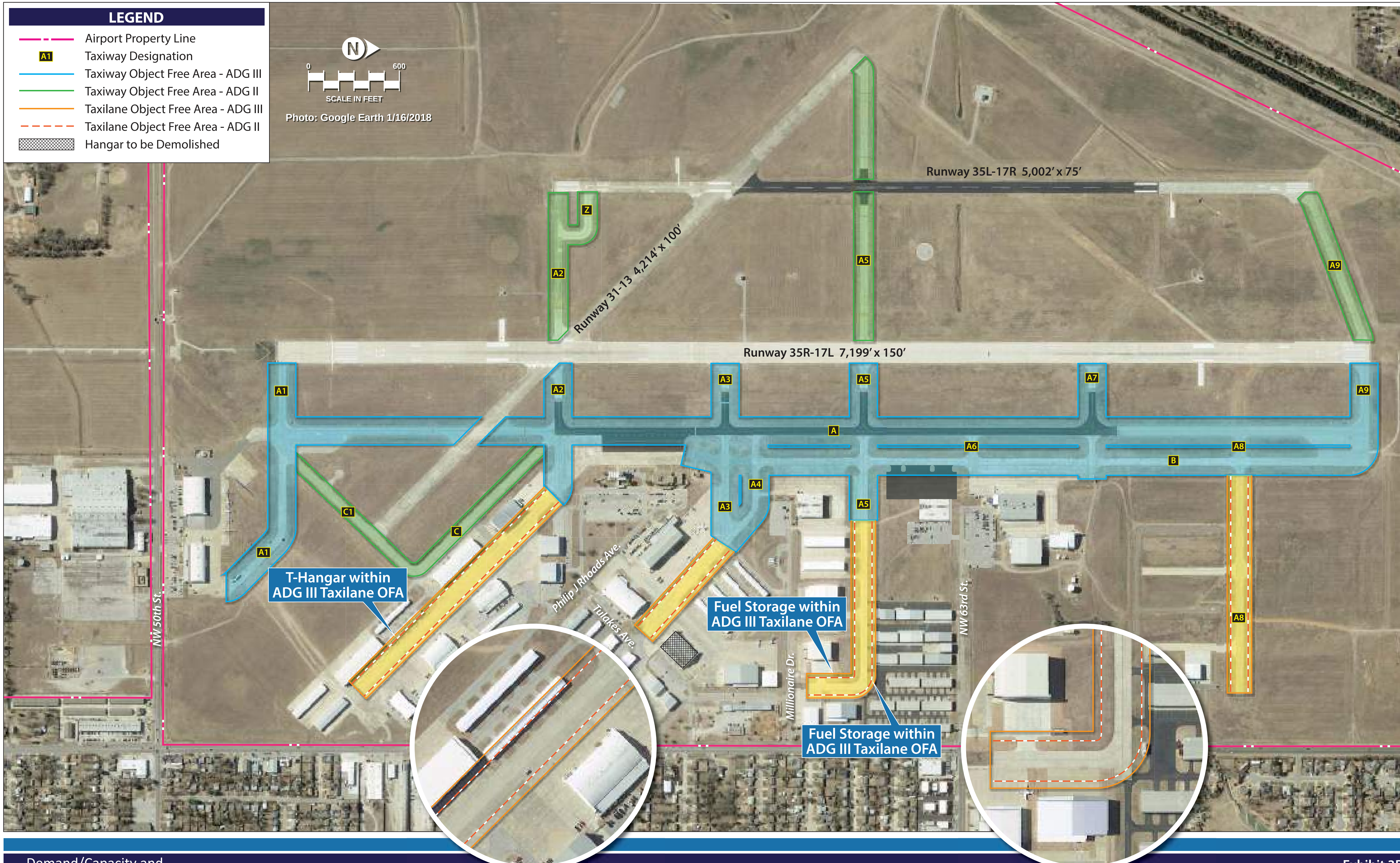


Exhibit 3D
TAXIWAY SAFETY AREAS

- *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. PWA does not have any identified hot spots.

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

- Pavement at the southeast end of Runway 13-31 is marked as a taxiway, creating an aligned taxiway, which is no longer allowed by the FAA.
- Taxiway A2 intersects with Runway 17L-35R and Runway 13-31, which creates wide pavement areas and can lead to pilot confusion.
- Taxiway A5 intersects with Runways 17L-35R and 17R-35L in the high-energy areas.
- The end of Runway 17R includes a wide pavement area.

Exhibit 3C identifies these areas of interest. 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 with the proposed parallel runway will also take into consideration the taxiway design standards previously discussed.

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. PWA employs the following navigational and approach aids.

Instrument Approach Aids

Instrument approaches are categorized as precision, approach with vertical guidance (APV), or non-precision. Precision instrument approach aids provide an exact course alignment and vertical descent path for an aircraft on final approach to a runway with a height above threshold (HATh) lower than 250 feet and visibility lower than ¾-mile. APVs also provide course alignment and vertical descent path guidance but have HATHs of 250 feet or more and visibility minimums of ¾-mile or greater. Non-precision instrument approach aids provide only course alignment information.

PWA currently has straight-in instrument approach capabilities to each end of Runway 17L-35R and Runway 17R-35L. Runway 13-31 does not have published instrument approaches so it is considered a visual runway. Each end of Runway 17L-35R is equipped with a Category I ILS approach, GPS-based precision approaches, and VOR-based approaches providing visibility minimums down to ½-mile. Each end of Runway 17R-35L is equipped with GPS-based non-precision instrument approaches with visibility minimums down to one mile. Consideration should be given to implementing a GPS RNAV approach providing visibility minimums down to ¾-mile, which would improve the airport's accessibility and redundancy during periods that the primary runway is closed for maintenance. A ¾-mile RNAV approach does not require the installation of an approach lighting system or other on-site equipment, so it is a relatively low-cost improvement.

Runways 17L and 35R are served by a medium intensity approach lighting system with runway alignment indicator lights (MALSR). This approach lighting system enhances safety at the airport, especially during inclement weather or nighttime activity.

These existing instrument approach aids adequately serve users of the airport and should be maintained in the future.

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, each end of Runway 17L-35R and 17R-35L is served by a four-box precision approach path indicator (PAPI-4). These approach aids should be maintained through the planning period. Consideration should be given to installing two-box PAPIs (PAPI-2s) on Runway 13-31. PAPI-2s are used on runways that serve primarily small aircraft.

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 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 a more sophisticated approach lighting system. Currently, REILs are available at the ends of Runway 17R-35L. Runway 13-31 is closed at night so REILs are not necessary; however, if there is a desire to make the runway usable at night, consideration should be given to installing REILs on Runway 13-31.

Weather Reporting Aids

PWA has a lighted windcone and segmented circle, as well as additional supplemental windcones in various locations on the airfield. The windcones provide information to pilots regarding wind speed and direction. The segmented circle consists of a system of visual indicators designed to provide traffic pattern information to pilots. These should be maintained throughout the planning period.

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. This information is then transmitted at regular intervals (usually once per hour). This system should be maintained through the planning period.

Airport Traffic Control Tower

PWA has an operational airport traffic control tower (ATCT) located on the east side of the airfield. The ATCT is staffed from 7:00 a.m. to 10:00 p.m. daily. Tower staff reports that the facility is approximately 58 years old and is in good condition. It has been indicated that the existing ATCT and its equipment do not adequately meet the needs of the controllers. Consideration will be given to the development of a new ATCT facility in the alternatives evaluation.

AIRFIELD LIGHTING, MARKING, AND SIGNAGE

There are several lighting and pavement marking aids serving pilots using PWA. These aids assist pilots in locating the airport and runway at night or in poor visibility conditions. They also assist in the ground movement of aircraft.

Airport Identification Lighting

The location of the airport at night is universally indicated by a rotating beacon. For civil airports, a rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The existing beacon located atop the ATCT should be maintained through the planning period.

Runway and Taxiway Lighting

Runway lighting provides the pilot with positive identification of the runway and its alignment. Runway 17L-35R is served by high intensity runway lighting (HIRL). Runways 17R-35L and 13-31 are served by medium intensity runway lighting (MIRL). These systems should be maintained through the planning period.

Medium intensity taxiway lighting (MITL) is provided on all taxiways at PWA. This system is vital for safe and efficient ground movements and should be maintained in the future. Planning should also consider MITL on future taxiways that directly support the runway system at the airport.

Over time, the airport should consider removing the incandescent airfield signage and runway and taxiway edge lighting systems and replacing them with light emitting diode (LED) technology. LEDs have many advantages, including lower energy consumption, longer lifetime, tougher construction, reduced size, greater reliability, and faster switching. While a substantial initial investment is required upfront, the energy savings and reduced maintenance costs will outweigh any additional costs in the long run.

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 17L-35R is served by precision markings. This aids in accommodating the ILS approaches. Runways 17R-35L and 13-31 have non-precision markings. The Runway 13-31 markings are reported to be in poor condition. All runway markings should be periodically restored, typically during routine pavement maintenance projects, through the long-term planning period.

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, ILS critical areas, and runway exits. All these signs should be maintained throughout the planning period.

A summary of the airfield facilities previously discussed at PWA is 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 PWA, this includes components for general aviation needs such as:

- General Aviation Terminal Facilities
- Aircraft Hangars
- Aircraft Parking Aprons
- Airport Support Facilities

GENERAL AVIATION TERMINAL FACILITIES

The general aviation terminal facilities at the 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, pilots' lounge, pilot flight planning, concessions, management, storage, and various other 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 PWA, general aviation terminal services are provided by the two FBOs, Atlantic Aviation and Meta Aerospace. The terminal building at PWA is not included in this count since it is occupied by a restaurant and airport management offices as well as the ATCT facilities.

The methodology used in estimating general aviation terminal facility needs was based upon 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 2.5 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 business and recreational operations through the long term. These operations often support larger turboprop and jet aircraft, which provide greater seating capacities.

Table 3H outlines the space requirements for general aviation terminal services at PWA through the long-term planning period. As shown in the table, the long-term general aviation services need is up to 8,800 square feet (sf). The amount of space currently offered by the FBOs is approximately 12,600 sf.

Other specialty aviation operators on the airfield also provide space for pilots and passengers. It can be assumed that adequate services and space is provided to accommodate their customers.

TABLE 3H
General Aviation Terminal Area Facilities
Wiley Post Airport

	Currently Available	Short Term Need	Intermediate Term	Long Term Need
General Aviation Services Facility Area (sf)	12,600[1]	6,000	7,100	8,800
Design Hour Passengers		19	21	23
Passenger Multiplier		2.5	2.8	3.0
Vehicle Parking Spaces	426	332	360	418

[1] Includes approximate space offered by the FBOs.
[2] Approximate number of total marked vehicle parking spaces at the FBOs and the terminal building.
Source: Coffman Associates analysis

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

	AVAILABLE	SHORT TERM	LONG TERM

RUNWAYS

Runway 17L-35R		
RDC C-III-2400	RDC C-III-2400	RDC D-III-2400
7,199' x 150'	Maintain	Examine potential extention alternatives
35,000 lbs. SWL/50,000 lbs. DWL/90,000 lbs. DTWL	Maintain	Strengthen up to 170,000 lbs. DWL
Standard RSA w/Declared Distances; Standard ROFA w/Declared Distances; Standard ROFZ	Maintain	Maintain
RPZs: 20 acres uncontrolled by airport; includes buildings and structures	Mitigate RPZ incompatibilities	Maintain
Runway 17R-35L		
RDC B-II-5000	RDC B-II-5000	RDC D-II-4000/5000
5,002' x 75'	Maintain	Examine potential extension alternatives and widen to 100'
26,000 lbs. SWL/45,000 lbs. DWL	Maintain	Strengthen up to 73,900 lbs. DWL
Standard RSA; ROFA; ROFZ	Maintain	Maintain
RPZs: 6 acres uncontrolled by airport - primarily diversion channel property	Consider avigation easements for uncontrolled property	Establish control of enlarged RPZ
Runway 13-31		
RDC B-I(S)-VIS	RDC B-I(S)-VIS	RDC B-I(S)-VIS
4,214' x 100'	Maintain	Consider width reduction to 60'
35,000 lbs. SWL/50,000 lbs. DWL/90,000 lbs. DTWL	Maintain	Maintain to at least 12,500 lbs. SWL
Standard RSA; ROFA; ROFZ	Maintain	Maintain
RPZs: 4 acres uncontrolled by airport	Consider avigation easements for uncontrolled property	Maintain

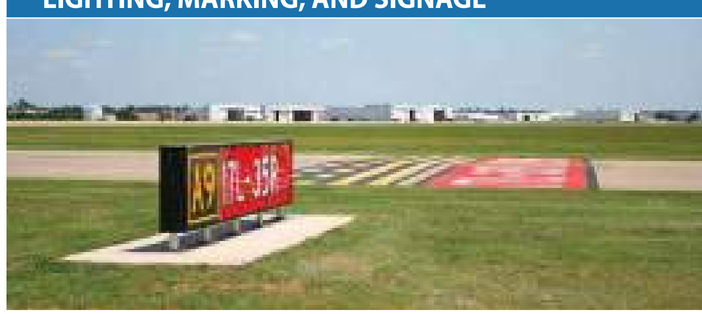
TAXIWAYS

AVAILABLE	SHORT TERM	LONG TERM
TDG-3	TDG-3	TDG-3
All taxiways at least 50' wide	Maintain	Maintain
Aligned taxiway on southeast end of Runway 13-31	Reclaim pavement for runway use	Maintain corrected condition
Taxiway A2 intersects with multiple runways	Consider corrective measures	Maintain corrected condition
Taxiway A5 intersects with the parallel runways high-energy areas	Consider corrective measures	Maintain corrected condition
Wide pavement area at the end of Runway 17R	Consider corrective measures	Maintain corrected condition

NAVIGATIONAL AND APPROACH AIDS

AVAILABLE	SHORT TERM	LONG TERM
ILS or LOC - Runways 17L, 35R	Maintain	Maintain
RNAV (GPS) - Runways 17L, 17R, 35L, 35R	Maintain	3/4 mile RNAV - Runway 17R, 35L
VOR - Runways 17L, 35R	Maintain	Maintain
ASOS	Maintain	Maintain
ATCT	Maintain	Consider relocation
Lighted Windcones	Maintain	Maintain
PAPI-4s - Runways 17L, 17R, 35L, 35R	Consider PAPI-2s for Runway 13-31	Maintain
MALSR - Runways 17L, 35R	Maintain	Maintain
REILs - Runways 17R, 35L	Maintain	REILs - Runway 13, 31

LIGHTING, MARKING, AND SIGNAGE



AVAILABLE	SHORT TERM	LONG TERM
Rotating Beacon	Maintain	Maintain
Precision Markings - Runway 17L-35R	Maintain	Maintain
Non-Precision Markings - Runways 17R-35L and 13-31	Maintain	Maintain
HIRL - Runway 17L-35R	Consider gradual replacement with LED technology	Maintain
MIRL - Runways 17R-35L and 13-31	Maintain	Maintain
Runway 17L-35R - Holding position markings 263' from runway centerline	Maintain	Maintain
Runway 17R-35L - Holding position markings 200' from runway centerline	Maintain	Relocate to 250' from runway centerline
Runway 13-31 - Holding position markings 200' from runway centerline	Maintain	Maintain
Lighted airfield location, directional, and distance remaining signage	Consider gradual replacement with LED technology	Maintain and expand as necessary

ABBREVIATIONS

ASOS - Automated Surface Observing System
ATCT - Airport Traffic Control Tower
DWL - Dual Wheel Loading
DTWL - Dual Tandem Wheel Lo
GPS - Global Positioning System
HIRL - High Intensity Runway Lighting
ILS - Instrument Landing System
LED - Light Emitting Diode
LOC - Localizer
PAPI - Precision Approach Path Indicator
MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
RDC - Runway Design Code
REIL - Runway End Identification Light
RNAV - Area Navigation
RSA - Runway Safety Area
ROFA - Runway Object Free Area
ROFZ - Runway Obstacle Free Zone
SWL - Single Wheel Loading
VOR - Very High Frequency Omnidirectional Range

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The parking requirements of based aircraft owners 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 332 spaces in the short term, increasing to approximately 418 spaces in the long-term planning horizon. The spaces available at the FBOs and at the terminal building alone account for approximately 426 spaces, which exceed the long-term need. Additionally, several SASOs and corporate hangars have their own parking spaces. As new facilities are developed, consideration will be given to providing additional vehicle parking.

AIRCRAFT HANGARS

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is toward more sophisticated aircraft (and, consequently, more expensive aircraft); therefore, many aircraft owners prefer enclosed hangar space 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, actual hangar construction should be based upon actual demand trends and financial investment conditions.

There are a variety of aircraft storage options typically available at an airport, including shade hangars, T-hangars, linear box hangars, executive/box hangars, and bulk storage conventional hangars. Shade hangars are the most basic form of aircraft protection and are common in warmer climates. These structures provide a roof covering, but no walls or doors. There are no shade hangars at PWA, and for purposes of planning, any future shade hangars would be included in the T-hangar need forecast.

T-hangars are intended to accommodate one small single engine piston aircraft or, in some cases, one multi-engine piston aircraft. T-hangars are so named because they are in the shape of a “T,” providing a space for the aircraft nose and wings, but no space for turning the aircraft within the hangar. Basically, the aircraft can be parked in only one position. T-hangars are commonly “nested” with several individual storage units to maximize hangar space. In these cases, taxiway access is needed on both sides of the nested T-hangar facility. T-hangars are popular with aircraft owners with tighter budgets as they tend to be the least expensive enclosed hangar space to build and lease. There are currently 241 T-hangar positions at PWA totaling 369,750 sf of aircraft storage capacity.

Similar to the T-hangar style is the linear box hangar. Linear box hangars typically provide storage for a single aircraft and can be nested with multiple individual linear box hangars. Unlike the T-hangar, linear box hangars enable users to store aircraft in more ways than one. Ultimately, this will allow the user to maximize aircraft storage space.

The next type of aircraft hangar common for storage of general aviation aircraft is the executive/box hangar. Executive/box hangars typically provide a larger space, generally with an area between 2,500 and 10,000 sf. This type of hangar can provide for maneuverability within the hangar, can accommodate more than one aircraft, and may have a small office and utilities. Executive/box hangars may be connected in a row of units with doors facing a taxilane. Executive box hangars may also be stand-alone hangars. These hangars are typically utilized by a corporate/business entity or to support an on-airport business.

Conventional hangars are the large, clear span hangars typically located facing the main aircraft apron at airports. These hangars provide for bulk aircraft storage and are often utilized by airport businesses, such as an FBO and/or aircraft maintenance business. Conventional hangars are generally larger than executive/box hangars and can range in size from 10,000 sf to more than 20,000 sf. Often, a portion of a conventional hangar is utilized for non-aircraft storage needs, such as maintenance or office space.

Remaining hangars at PWA that do not fall into the T-hangar category can be classified within the box hangar/executive hangar/conventional hangar categories. This grouping accounts for 572,925 sf of aircraft storage capacity. In total, the airport has 942,675 sf of aircraft storage capacity.

Planning for future aircraft storage needs is based on typical owner preferences and standard sizes for hangar space. For determining future aircraft storage needs, a planning standard of 1,200 sf per based aircraft is utilized for T-hangars. For conventional hangars, a planning standard of 3,000 sf is utilized for turboprop aircraft, 5,000 sf is utilized for business jet aircraft, and 1,500 sf is utilized for helicopter storage needs.

PWA has a total of 286 based aircraft that is projected to grow to 380 in the long-term. With the trend toward aircraft owners preferring enclosed aircraft storage space, it is assumed that all new based aircraft will require additional hangar capacity. Providing a mix of aircraft storage options is preferred when planning storage needs, in order to meet the varied needs of aircraft owners. **Table 3J** provides a summary of the aircraft storage needs through the long-term planning horizon.

The analysis shows that future hangar requirements indicate that there is a potential need for 1,282,900 sf of hangar storage space to be offered through the long-term planning period. This includes a mixture of hangar and maintenance areas. 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. The largest need could involve the construction of conventional-style hangars that are better suited to accommodate larger turboprop and jet aircraft.

TABLE 3J
Aircraft Hangar Requirements
Wiley Post Airport

	Currently Available	Short-Term Need	Intermediate-Term Need	Long-Term Need
Total Based Aircraft	286	310	330	380
Hangar Area Requirements				
T-Hangar Hangar Area (s.f.)	369,750	383,900	390,800	409,500
Conventional Hangar Area (s.f.)	572,925	614,900	659,400	778,400
Maintenance Area (s.f.)	--	77,500	82,500	95,000
Total	942,675*	1,076,300	1,132,700	1,282,900
Note: * Includes total hangar and maintenance area currently at the airport				

Source: Coffman Associates analysis

It should be noted that hangar requirements are general in nature and based on the aviation demand forecasts. The actual need for hangar space will further depend on the actual usage within 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

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. At PWA, the number of itinerant spaces required was determined to be approximately 20 percent of the busy-day itinerant operations for general aviation operations. A planning criterion of 800 square yards (sy) per aircraft was applied to determine future transient apron requirements for single and multi-engine aircraft. For business jets (which can be much larger), a planning criterion of 1,600 sy per aircraft position was used. In addition, PWA has based aircraft that utilize outside aircraft tiedowns for storage. It is assumed that these aircraft require less space than transient aircraft; therefore, a planning criterion of 650 sy per aircraft was applied. For local tiedown needs, an additional 31 spaces are identified for maintenance activities in the long term. Apron parking requirements are presented in **Table 3K**. Transient apron parking needs are divided into business jet needs and smaller single and multi-engine aircraft needs.

TABLE 3K
Aircraft Parking Apron Requirements
Wiley Post Airport

	Available	Short Term	Intermediate Term	Long Term
Transient Single and Multi-Engine Aircraft Positions	[redacted]	43	46	52
Apron Area (sy)		34,400	36,800	41,600
Transient Turboprop and Jet Positions		11	12	13
Apron Area (sy)		17,200	18,400	20,800
Locally Based Aircraft Positions		24	26	31
Apron Area (sy)		15,275	16,575	20,150
Total Marked Positions		**77**	**83**	**96**
Total Apron Area (sy)	**79,100**	**66,875**	**71,775**	**82,550**

Source: Coffman Associates analysis

Currently, the existing aircraft parking aprons at PWA, which consist of the terminal apron and aprons at the FBOs and SASOs encompass approximately 79,100 sy. As shown in the table, future planning should account for an additional 3,450 sy of parking apron space 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 at PWA. Helicopter operations should be segregated to the extent practicable to increase safety and efficiency of aircraft parking aprons. Long-term facility planning will consider dedicated helicopter activity areas at the airport.

AIRPORT SUPPORT FACILITIES

Various facilities that do not logically fall within classifications of airfield or landside facilities have also been identified. These other areas provide certain functions related to the overall operation of the airport.

Fuel Storage

The airport has 12 individual aviation fuel storage tanks providing a combined storage capacity for 56,000 gallons of Jet A fuel, which is used by turbine aircraft and 40,250 gallons of 100LL (AvGas), which is used by piston aircraft. Based upon historic fuel flowage records provided by airport management, in 2017, the airport pumped approximately 2,555,134 gallons of Jet A and 180,789 gallons of AvGas. Based upon the Traffic Flow Management System Count database, the reported number of turbine operations in 2017 totaled 12,834 and the total number of piston operations totaled 42,475. Dividing the total fuel flowage by the total number of operations provides a ratio of fuel flowage per operation. In 2017, the airport pumped approximately 199.09 gallons of Jet A per turbine operation and 4.26 gallons of AvGas per piston operation. Applying these ratios over the course of the planning period produces a forecast of fuel storage needs.

Maintaining a 14-day fuel supply would allow the airport to limit the impact of a disruption of fuel delivery. Currently, the airport has enough static fuel storage to meet the 14-day supply criteria for AvGas fuel but additional storage is needed for Jet A. The forecasted fuel storage requirements are summarized in **Table 3L**.

In the future, based on these usage assumptions, additional Jet A fuel storage capacity will be needed to meet demand. Available AvGas storage capacity exceeds the long-term demand.

TABLE 3L
Fuel Storage Requirements
Wiley Post Airport

			Planning Horizon		
	Available	**Current Need**	**Short-Term**	**Intermediate-Term**	**Long-Term**
Jet A					
Daily Usage (gal.)		7,000	7,841	9,017	11,309
14-Day Supply (gal.)	56,000	98,000	109,800	126,200	158,300
Annual Usage (gal.)		2,555,134	2,862,000	3,291,100	4,127,900
AvGas					
Daily Usage (gal.)		495	528	546	589
14-Day Supply (gal.)	40,250	6,900	7,400	7,600	8,300
Annual Usage (gal.)		180,789	192,900	199,300	215,100

Sources: Historic fuel flowage data provided by airport management; Fuel supply projections prepared by Coffman Associates.

Maintenance Facilities

Airport maintenance activities are staged from a maintenance lot located in the southwest corner of the intersection of N Rockwell Avenue and Millionaire Drive. A new facility is currently under construction in the northeast corner of this lot. This maintenance lot adequately serves the airport and should be maintained.

Perimeter Fencing

The airport's perimeter is currently equipped primarily with three-foot chain-link fencing. Standard airport security fencing is typically six feet tall with three-strand barbed-wire at the top. Game fencing, which has a height of eight feet, can also be considered for airports with wildlife incursion issues. PWA should consider upgrading its perimeter fencing to at least six-foot security fencing with three-strand barbed-wire or eight-foot game fencing.

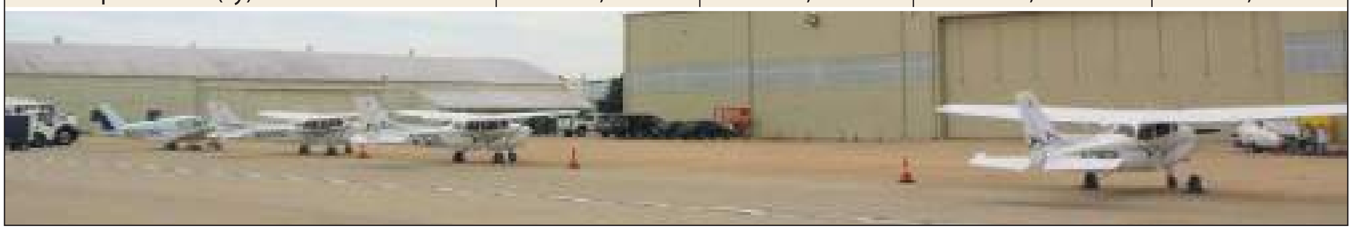
A summary of the general aviation landside facilities previously discussed at PWA is presented on **Exhibit 3F**.

SUMMARY

This chapter has outlined the safety design standards and facilities required to meet potential aviation demand projected at PWA 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 five-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.

	AVAILABLE	SHORT-TERM NEED	INTERMEDIATE TERM NEED	LONG-TERM NEED
AIRCRAFT STORAGE HANGARS				
T-Hangar Area (sf)	369,750	383,900	390,800	409,500
Conventional Hangar Area (sf)	572,925	614,900	659,400	778,400
Service/Maintenance Area (sf)		77,500	82,500	95,000
Total Hangar Storage Area (sf)	942,675	1,076,300	1,132,700	1,282,900

	AVAILABLE	SHORT-TERM NEED	INTERMEDIATE TERM NEED	LONG-TERM NEED
AIRCRAFT PARKING APRON				
Transient Single/Multi-Engine Aircraft (sy)	---	34,400	36,800	41,600
Transient Business Jet (sy)	---	17,200	18,400	20,800
Local Based (sy)	---	15,275	16,575	20,150
Total Apron Area (sy)	79,100	66,875	71,775	82,550



	AVAILABLE	SHORT-TERM NEED	INTERMEDIATE TERM NEED	LONG-TERM NEED
GENERAL AVIATION TERMINAL FACILITY AND AUTOMOBILE PARKING				
Building Space (sf)	12,600	6,000	7,100	8,800
Total GA Parking Spaces	426	332	360	418

	AVAILABLE	SHORT-TERM NEED	INTERMEDIATE TERM NEED	LONG-TERM NEED
SUPPORT FACILITIES				
14-Day Fuel Storage - 100LL	40,250	7,400	7,600	8,300
14-Day Fuel Storage - Jet A	56,000	109,800	126,200	158,300
	3' Perimeter Fencing/Gates	Consider Upgrading to 6' Security Fencing or 8' Game Fencing		
	Airport Maintenance Facility	Maintain		

Exhibit 3F
LANDSIDE FACILITY REQUIREMENTS

In Chapter Four, potential improvements to the airfield 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 development plan that presents a vision beyond the 20-year scope of this master plan will be developed for PWA.

Chapter Four

Airport Development Alternatives

Chapter Four

AIRPORT DEVELOPMENT 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 Oklahoma City Airport Trust (OCAT), which has a vested interest in the development and operation of Wiley Post Airport (PWA).

The development alternatives for the airport can be categorized into two functional areas: the **airside** (runways, navigational aids, taxiways, etc.) and **landside** (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 PWA will meet the needs of the OCAT and the Oklahoma City metropolitan area, 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 airport concept can evolve into a realistic development plan.

NON-DEVELOPMENT ALTERNATIVES

Prior to the presentation of development alternatives for PWA, there are several non-development options that should be considered. Non-development alternatives include a “no-build” or “do-nothing” alternative, development of a new 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. 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 (FAA) funds.

The airport has received more than $15.8 million in development grants since 2006. These grants represent a direct economic stimulus that has lasting positive economic impacts. The no-build alternative means that the OCAT would forgo future grants for airport development, which would have a negative economic impact which, over time, would become more noticeable.

The OCAT has a vested interest in maintaining and improving airport facilities for general aviation 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 as a general aviation reliever airport to Will Rogers World Airport (OKC) 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 necessary 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, producing undesirable results. This scenario would result in an overall unpleasant experience for regular users and visitors.

RELOCATE AIRPORT ALTERNATIVE

This option considers constructing a new airport to replace the existing PWA. The new airport would have to be completed prior to closure of the existing airport. Additional studies beyond the scope of this master plan would be required. These would include a feasibility study, a site selection study, a master plan for the replacement site, and appropriate environmental documentation of the new site (typically an environmental assessment [EA] or environmental impact statement [EIS]).

An important consideration is the potential cost associated with both constructing a new airport and closing the existing airport. A broad estimate for constructing a replacement airport is over $500 million to construct a new airport with similar capabilities as the existing airport.

A more detailed analysis would need to be undertaken to identify an acceptable site and to refine the project cost estimates. A large portion of the development costs would be eligible for FAA grant funding. Typically, non-revenue producing facilities to be located within the airport property line are eligible for funding. Elements outside the property line, such as utility extension and surface roads, are not eligible for funding.

Often the trigger for pursuing a replacement airport is encroachment upon the existing airport to the point where it can no longer fulfill its role in the national aviation system. PWA is constrained to a certain degree; however, it can serve its existing aviation fleet mix of general aviation aircraft.

If a replacement airport feasibility study were to be undertaken, a detailed analysis should identify a site capable of developing equivalent airside and general aviation facilities that exist at PWA today while providing convenient access to the local and regional service area.

TRANSFER SERVICE TO ANOTHER AIRPORT ALTERNATIVE

The feasibility of transferring services to an alternate airport relies on answering two primary questions: first, is a capable alternative airport reasonably located to accommodate PWA's primary air service area (Oklahoma County) and, second, can a nearby airport accommodate PWA's existing and projected aviation demand factors? An analysis of regional airports has been completed to determine if transferring aviation demand is reasonable.

There are nine public-use airports within 30 miles of PWA. Will Rogers World Airport (OKC) is the primary commercial service airport serving the region, while the others are general aviation airports. Each of the other general aviation airports are located farther from the Oklahoma City center, making them less convenient than PWA to the primary service area. The University of Oklahoma Westheimer (OUN), which is located three miles northwest of Norman, would be the most likely candidate for a service transfer from PWA. Like PWA, OUN is classified as general aviation reliever airport and it is closer in proximity to the primary service area of PWA than any of the other general aviation airports in the region. However, OUN's primary runway is 2,000 feet shorter than the primary runway at PWA, making it less capable to accommodate the full range of business and corporate jets.

Other factors should also be considered prior to suggesting a transfer of service to another airport. The OCAT has accepted federal development grant funding through the Airport Improvement Program (AIP) for projects at PWA. Development grants come with certain grant assurances with which the airport sponsor must comply. One of the grant assurances is for the sponsor to maintain the improvement for its useful life, typically 20 years. Acceptance of development grants also obligates the airport sponsor to maintain the airport as an airport. Closing the existing airport and transferring services to another existing airport would be considered a violation of these grant assurances, requiring repayment of grants not yet fully depreciated. Since 2006, the FAA has invested approximately $15.8 million dollars in projects at PWA. The investments made, as well as the economic benefits received from the airport, both public and private, could not readily be shifted or regenerated to another airport without significant costs/losses. As such, this alternative is not considered practical, reasonable, and/or financially feasible.

NON-DEVELOPMENT ALTERNATIVES SUMMARY

The purpose of this master plan is to examine aviation needs at PWA 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 needed 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, relocate/replacement alternatives, and transfer of services. 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 THE PREVIOUS AIRPORT PLAN

The last master plan was completed in 2009. The following is a summary of major facility recommendations from the previous master plan. Projects that have been completed are noted.

Runway 17L/35R

1. Install glide slope and localizer antenna facilities to support Runway 35R ILS approach – *project completed in 2014*
2. Install medium intensity approach lighting system with runway alignment indicator lights (MALSR) to support Runway 35R ILS approach – *project completed in 2014*
3. Publish Runway 35R ILS approach – *project completed*
4. Extend Taxiway B as demand dictates to serve expanded general aviation development areas
5. Implement ongoing runway, taxiway, and apron pavement maintenance projects – *Runway 17L-35R rehabilitated in 2015*

Runway 17R/35L

1. Widen runway to 100 feet and extend 998 feet to the south (i.e., 100' x 6,000')
2. Strengthen runway pavement to 30,000 pounds single wheel rating
3. Construct east side partial parallel taxiway to serve Runway 35L extension
4. Prepare obstruction survey, design and publish Runway 35L localizer performance with vertical guidance (LPV) approach – *Project completed*
5. Install MALSR to support Runway 35L LPV approach
6. Displace Runway 17R landing threshold 350 feet and modify medium intensity runway lighting (MIRLs) and signage to support Runway 35L LPV approach
7. Relocate precision approach path indicator (PAPI) at each runway end
8. Prepare obstruction survey, design and publish Runway 17R LPV approach – *Runway 17R has a published RNAV (GPS) LNAV MDA approach*
9. Implement ongoing runway and taxiway pavement maintenance projects – *Runway 17R-35L rehabilitated in 2014*
10. Construct west side parallel taxiway system

Runway 13/31

1. Maintain existing runway dimensions and design standards
2. Implement ongoing runway pavement maintenance projects
3. Implement ongoing parallel and connector taxiway pavement maintenance projects

Property/Easement Acquisition

1. Acquire approximately 1.3 acres of property to control the balance of the future enlarged Runway 17R RPZ

The current airport layout plan (ALP), which was last updated in 2010, is depicted on **Exhibit 4A**. This ALP reflects the projects proposed in the previous master plan as outlined above.

AIRSIDE PLANNING CONSIDERATIONS

Generally, 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. 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 for PWA was analyzed in the previous chapters. This chapter will examine airside improvement opportunities to meet design standards and/or capacity constraints. A summary of the primary airside planning issues to be considered in this alternatives analysis is listed below.

Airside Planning Considerations
• Meet runway design code (RDC) D-III-2400 standards on Runway 17L-35R
• Meet RDC D-II-4000 standards on Runway 17R-35L
• Widen Runway 17R-35L to 100 feet
• Consider extensions to Runway 17L-35R and 17R-35L
• Mitigate runway protection zone (RPZ) incompatibilities and protect future RPZs
• Consider corrective measures for non-standard taxiway design

AIRFIELD DESIGN STANDARD UPGRADE

As a national reliever airport in the FAA's National Plan of Integrated Airport Systems (NPIAS), PWA should be capable of accommodating the entirety of the general aviation fleet including the largest business jets, up to and including the Gulfstream series and Boeing Business Jet (BBJ), which has maximum takeoff weights (MTOWs) of over 150,000 pounds. These aircraft fall within airport reference code (ARC) C/D-III[1]. Primary Runway 17L-35R is currently classified as an RDC C-II-2400 runway; however, upgrading to RDC C/D-III-2400 standards would not require significant changes. The runway safety area (RSA), runway object free area (ROFA), and RPZ dimensions remain the same and the airfield is already designed to accommodate the higher separation distance requirements of RDC C/D-III-2400. In effect, Runway 17L-35R currently meets both C-II-2400 and D-III-2400 design standards.

A deficiency of the airfield is its inability to accommodate all general aviation business jets uninterrupted as a result of a lack of redundancy. Parallel Runway 17R-35L can only accommodate up to small business jet aircraft within ARC B-II and lower on a routine basis. Larger and faster business jets within ARC C-II and D-II require a runway width of 100 feet and expanded RSA, ROFA, and RPZs.

During periods that the primary runway is shut down for maintenance or an emergency incident, larger jets may not be capable of operating on the parallel or crosswind runways. In these cases, the larger jets may be forced to utilize OKC, which has limited capacity for general aviation activity and would result in

[1] ARC, RDC and other aircraft classifications are discussed in more detail in the Aircraft/Airport/Runway Classification section of Chapter Two.

RUNWAY COORDINATES & ELEVATIONS

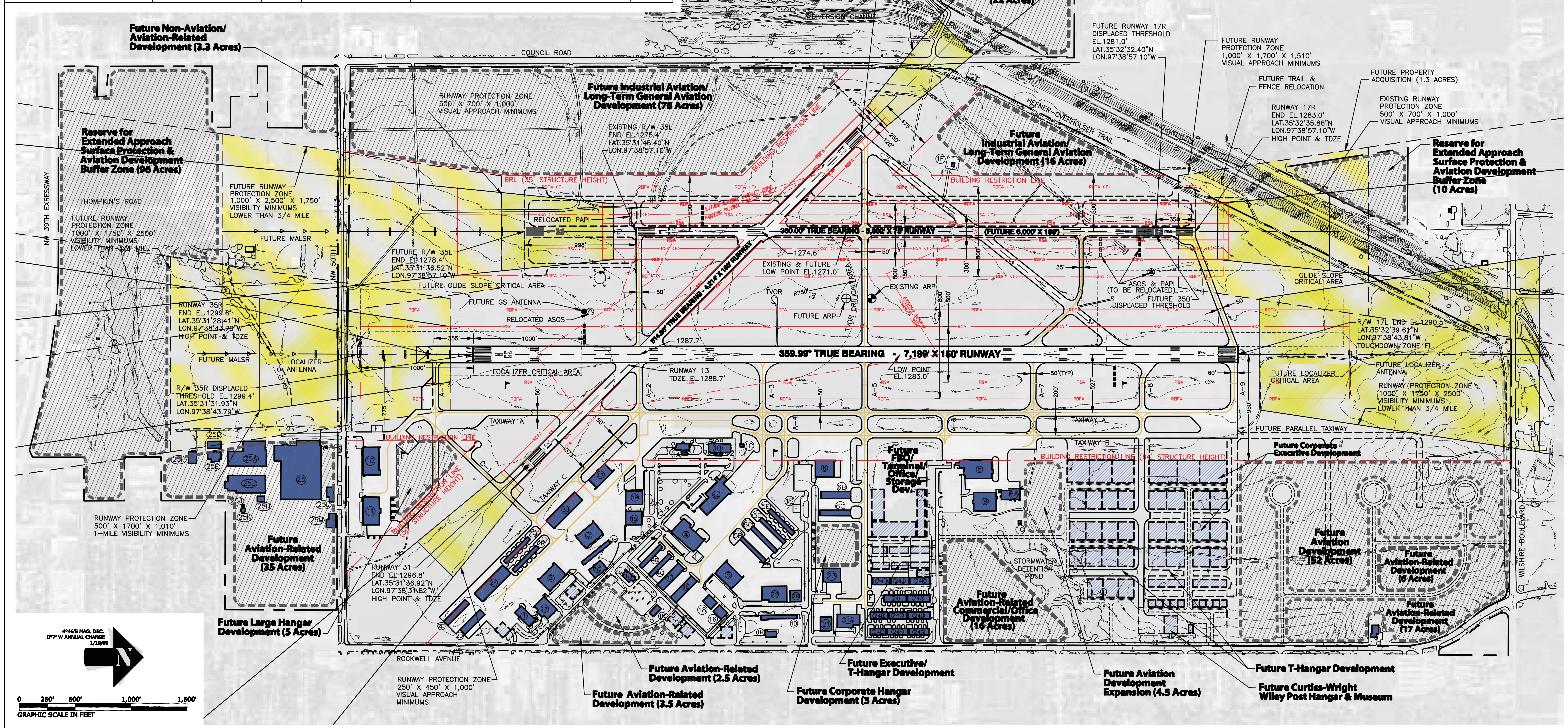
ITEM	RUNWAY 17L/35R EXISTING	RUNWAY 17L/35R FUTURE	RUNWAY 17R/35L EXISTING	RUNWAY 17R/35L FUTURE	RUNWAY 13/31 EXISTING	RUNWAY 13/31 FUTURE
RUNWAY END COORDINATES	LAT.35°32'39.61"N / LAT.35°31'28.41"N LON.97°38'43.81"W / LON.97°38'43.79"W	SAME	LAT.35°32'35.86"N / LAT.35°31'46.40"N LON.97°38'57.10"W / LON.97°38'57.10"W	LAT.35°32'35.86"N / LAT.35°31'36.52"N LON.97°38'57.10"W / LON.97°38'57.10"W	LAT.35°32'06.36"N / LAT.35°31'36.92"N LON.97°39'07.90"W / LON.97°38'31.82"W	SAME
RUNWAY END ELEVATION	1290.5'/1299.6'	SAME	1283.0'/1275.4'	SAME/1278.4'	1270.2'/1296.8'	SAME
DISPLACED THRESHOLD COORDINATE	NONE / LAT.35°31'31.93"N LON.97°38'43.79"W	SAME	NONE / NONE	LAT.35°32'32.40"N LON.97°38'57.10"W / NONE	NONE / NONE	SAME
DISPLACED THRESHOLD ELEVATION	NONE /1299.4'	SAME	NONE / NONE	1281.0' / NONE	NONE / NONE	SAME
DISPLACED THRESHOLD DISTANCE FROM RWY END	NONE /355'	SAME	NONE / NONE	350' / NONE	NONE / NONE	SAME
RUNWAY HIGH/LOW POINT ELEVATION	1299.6'/1283.0'	SAME	1283.1'/1271.0'	SAME/1275.0'	1296.8'/1270.2'	SAME
TOUCHDOWN ZONE ELEVATION (TDZE)	1290.5'/1299.4'	SAME	1283.1'/1276.5'	SAME/1275.0'	1289.1'/1296.8'	SAME

DECLARED DISTANCES

	RUNWAY 17L/35R EXISTING	RUNWAY 17L/35R FUTURE	RUNWAY 17R/35L EXISTING	RUNWAY 17R/35L FUTURE	RUNWAY 13/31 EXISTING	RUNWAY 13/31 FUTURE
TAKE OFF RUN AVAILABLE (TORA)	7,199'/SAME	NO CHANGE	5,002'/5,002'	6,000'/6,000'	4,214'/SAME	NO CHANGE
TAKE OFF DISTANCE AVAILABLE (TODA)	7,199'/SAME	NO CHANGE	5,002'/5,002'	6,000'/6,000'	4,214'/SAME	NO CHANGE
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	6,843'/7,199'	NO CHANGE	5,002'/5,002'	6,000'/5,650'	4,214'/SAME	NO CHANGE
LANDING DISTANCE AVAILABLE (LDA)	6,843'/6,843'	NO CHANGE	5,002'/5,002'	5,650'/5,650'	4,214'/SAME	NO CHANGE

REVISIONS

	DATE



BUILDING LEGEND

NO.	DESCRIPTION	TOP ELEV.
1	AERONAUTICAL SERVICE HANGAR	1323.5'
1A	TERMINAL BUILDING & ATCT	1346.5'
1B	FAA OFFICE BUILDING	1322.6'
1C	AIRPORT ELECTRICAL VAULT	1303.8'
1D	AIRPORT MAINTENANCE BUILDING	1313.5'
1E	FUEL STORAGE	1303.8'
1F	REMOTE TRANS. & ENG. GEN.	1287.3'
1G	PUMPING FACILITY (FIRE STATION)	1302.0'
1H	AIRPORT MAINTENANCE BUILDING	1313.4'
1J	SHAMROCK TRAINING FACILITY	1325.5'
1K	C.E. PAGE AVIATION BUILDING	1313.8'
2	FBO SERVICE HANGAR	1334.9'
2B	T-HANGAR	1315.6'
2C	T-HANGAR	1316.2'
2D	T-HANGAR	1319.4'
2E	T-HANGAR	1318.2'
2F	T-HANGAR	1328.9'
3	AERONAUTICAL SERVICE HANGAR	1331.3'
3B	T-HANGAR	1312.6'
3C	AERONAUTICAL SERVICE HANGAR	1320.3'
3D	T-HANGAR	1324.4'
4	AERONAUTICAL SERVICE HANGAR	1329.6'
4B	T-HANGAR	1311.7'
4C	T-HANGAR	1311.4'
4D	T-HANGAR	1317.1'
4E	T-HANGAR	1318.1'
5	AERONAUTICAL SERVICE HANGAR	1323.2'
5B	T-HANGAR	1312.0'
5C	T-HANGAR	1311.9'
5D	T-HANGAR	1311.6'
5E	T-HANGAR	1310.5'
6	AERONAUTICAL SERVICE HANGAR	1331.9'
6B	T-HANGAR	1311.5'
6C	T-HANGAR	1308.5'
8	FBO SERVICE HANGAR	1323.3'
8A	PAINT HANGAR	1325.2'
9	FBO SERVICE HANGAR	1323.7'
10	AERONAUTICAL SERVICE HANGAR	1336.4'
11	AERONAUTICAL SERVICE HANGAR	1341.5'
12	AERONAUTICAL SERVICE HANGAR	1331.3'
14	FBO SERVICE HANGAR	1332.1
15	AERONAUTICAL SERVICE BUILDING	1333.4'
16	STORAGE HANGAR	1321.7'
17	AERONAUTICAL SERVICE HANGAR	1337.4'
18	STORAGE HANGAR	1323.3'
19	AERONAUTICAL SERVICE BUILDING	1329.1'
20	AERONAUTICAL SERVICE HANGAR	1321.5'
21	AERONAUTICAL SERVICE HANGAR	1323.1'
21A	AERONAUTICAL SERVICE HANGAR	1340.9'
22	AERONAUTICAL SERVICE HANGAR	1336.5'
23	AERONAUTICAL SERVICE HANGAR	1336.2'
24	PWA HANGAR	1316.7'
24A	PWA HANGAR	1315.7'
24B	PWA HANGAR	1318.0'
24C	PWA HANGAR	1317.7'
24D	PWA HANGAR	1315.6'
24E	PWA HANGAR	1314.8'
24F	PWA HANGAR	1315.3'
24G	PWA HANGAR	1314.9'
24H	PWA HANGAR	1314.9'
24J	PWA HANGAR	1314.1'
24K	PWA HANGAR	1318.7'
25	AERONAUTICAL SERVICE HANGAR	1346.8'
25A	AERONAUTICAL SERVICE BUILDING	1332.8'
25B	PAINT HANGAR	1327.3'
25D	AERONAUTICAL SERVICE BUILDING	1316.1'
25E	AERONAUTICAL SERVICE BUILDING	1312.9'
25F	AERONAUTICAL SERVICE BUILDING	1310.1'
25H	AERONAUTICAL SERVICE BUILDING	1316.0'
25J	AERONAUTICAL SERVICE BUILDING	1307.4'
25K	WATER TANK	1325.3'
25L	AERONAUTICAL SERVICE BUILDING	1322.5'
25M	AERONAUTICAL SERVICE BUILDING	1324.5'

RUNWAY DATA

	RUNWAY 17L/35R EXISTING	RUNWAY 17L/35R FUTURE	RUNWAY 17R/35L EXISTING	RUNWAY 17R/35L FUTURE	RUNWAY 13/31 EXISTING	RUNWAY 13/31 FUTURE
APPROACH VISIBILITY MINIMUMS	<3/4-MILE/<3/4-MILE	SAME	VISUAL / VISUAL	3/4-MILE / <3/4-MILE	VISUAL / VISUAL	SAME
FAR PART 77 APPROACH SLOPE	50:1/50:1	SAME	20:1/20:1	34:1/50:1	20:1/20:1	SAME
RUNWAY WIDTH X LENGTH	150' X 7,199'	SAME	75' x 5,002'	100' x 6,000'	100' X 4,214'	SAME
RUNWAY PAVEMENT TYPE	CONCRETE	SAME	CONCRETE & ASPHALT	CONCRETE	CONCRETE	SAME
TAXIWAY PAVEMENT TYPE	CONCRETE	SAME			CONCRETE	SAME
PAVEMENT STRENGTH (IN 1000 LBS.)	25s,40d,90dt	SAME	30s,40d,55dt	SAME	25s,40d,90dt	SAME
RUNWAY LIGHTING	HIRL	SAME	MIRL	SAME	MIRL	SAME
RUNWAY MARKING	PRECISION	SAME	NON-PRECISION	PRECISION	BASIC	SAME
EFFECTIVE RUNWAY GRADIENT %	0.1	SAME	0.2	SAME	0.6	SAME
MAXIMUM GRADE WITHIN RUNWAY LENGTH %	0.79	SAME	0.46	SAME	1.0	SAME
RUNWAY LINE-OF-SIGHT	CRITERIA MET	SAME	CRITERIA MET	SAME	CRITERIA MET	SAME
VISUAL APPROACH AIDS	PAPI,MALSR	SAME	PAPI	PAPI,MALSR	NONE	SAME
INSTRUMENT APPROACH AIDS	ILS,TVOR,GPS,ASR	TVOR,GPS,ASR,ILS	NONE	GPS	NONE	SAME
AIRPORT REFERENCE CODE	D-II	SAME	B-II	SAME	B-I (SMALL A/C)	SAME
DESIGN AIRCRAFT	CESSNA 650	GULFSTREAM IV	CESSNA 650	SAME	BEECH BARON	SAME
APPROACH SPEED	131-KNOTS	145-KNOTS	108-KNOTS	SAME	90-KNOTS	SAME
WINGSPAN	53'-6"	77'-10"	51'-8"	SAME	37'-10"	SAME
MAXIMUM TAKE-OFF WEIGHT	22,000 LBS.	73,200 LBS.	13,500 LBS.	SAME	5,100 LBS.	SAME
RUNWAY SAFETY AREA (RSA) WIDTH	500'	SAME	150'	300'	120'	SAME
RSA LENGTH BEYOND STOP END	1,000'/1,000'	SAME	300'/300'	600'/600'	240'/240'	SAME
RUNWAY OBJECT FREE AREA (OFA) WIDTH	800'	SAME	500'	800'	250'	SAME
OFA LENGTH BEYOND STOP END	1,000'/1,000'	SAME	300'/300'	600'/600'	240'/240'	SAME
OBSTACLE FREE ZONE (OFZ) WIDTH *	400'	SAME	400'	SAME	250'	SAME
OFZ LENGTH BEYOND STOP END *	200'/200'	SAME	200'/200'	SAME	200'/200'	SAME
RUNWAY CENTERLINE TO HOLD LINE	200'	SAME	200'	SAME	125'	SAME
OFZ OBJECT PENETRATIONS	NONE	SAME	NONE	SAME	NONE	SAME
THRESHOLD SITING SURFACE OBJECT PENETRATIONS	200'	SAME	YES / NONE	NONE / NONE	125'	SAME

SPONSOR APPROVAL

SIGNATURE TITLE DATE

COMMENTS:

AIRPORT DATA

	EXISTING	FUTURE
LOCATION - COUNTY	OKLAHOMA	SAME
- TOWNSHIP/RANGE		SAME
AIRPORT ELEVATION (AMSL) NAVD 88	1299.6'	SAME
AIRPORT REFERENCE POINT (ARP) NAD 83	LAT.35°32'02.99"N LON.97°38'49.39"W	LAT.35°32'05.24"N LON.97°38'49.39"W
AIRPORT REFERENCE CODE	C-II	D-II
NPIAS SERVICE LEVEL/ROLE	RELIEVER	SAME
MEAN MAX. TEMPERATURE (HOTTEST MONTH)	94°F	SAME
AIRPORT & TERMINAL NAVAIDS	TVOR	SAME
TAXIWAY LIGHTING	MITL	SAME
TAXIWAY MARKING	C/L, HOLDLINES	SAME

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE	X	X
BUILDINGS		
AIRFIELD PAVEMENT		
PAVED ROADS		
SIDEWALK		
RPZ EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY SAFETY AREA	RSA	RSA (F)
RUNWAY OBJECT FREE AREA	ROFA	ROFA (F)
FUEL STORAGE AREA	F	
AIRPORT BEACON		
LIGHTED WIND CONE		
HOLDLINES		
PRECISION APPROACH PATH INDICATOR (PAPI)		
AIRPORT REFERENCE POINT (ARP)		
ASOS		
DEVELOPMENT AREA		
RUNWAY VISIBILITY ZONE		

NOTES

1. THIS DRAWING REFLECTS PLANNING STANDARDS SPECIFIC TO THIS AIRPORT, AND IS NOT A PRODUCT OF DETAILED ENGINEERING DESIGN ANALYSIS. IT IS NOT INTENDED TO BE USED FOR CONSTRUCTION DOCUMENTATION OR NAVIGATION.
2. AERIAL PHOTO BY AERIAL DATA SERVICES, INC., AUGUST 2, 2007.
3. EXISTING COORDINATES AND ELEVATIONS TAKEN FROM http://avnwww.jccbi.gov/pls/datasheet_prd/pkg_airport.PRO_AIRPORT_RUNWAY?v_cntl_num=2588. AUGUST 2007. ALL HORIZONTAL DATUM IS NAD 83; ALL VERTICAL DATUM IS NAVD 88.

Wiley Post Airport
Oklahoma City, Oklahoma

Airport Layout Plan

DATE JAN 2010

SCALE 1" = 500'

SHEET NO. 1 of 19

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negative financial impacts on PWA with lost fuel and service revenues. Upgrading the parallel runway to meet RDC D-II-4000 design standards will improve the airport's ability to serve as a reliever to OKC by accommodating most business jet traffic and help the airport be financially sustainable by maintaining large business jet revenues.

Additionally, air traffic controllers have indicated that aircraft flying missed approach procedures on Runway 35L at OKC impact aircraft operating at PWA. The missed approach route causes aircraft at PWA trying to depart on Runway 17L-35R to hold on the ground. Ground holds can lead to significant operational delays and increase flight costs with additional fuel burn while waiting for the airspace to be cleared. If Runway 17R-35L, which is 1,100 feet west of Runway 17L-35R, were upgraded to RDC D-II-4000 standards, it may be less likely to be impacted by ground holds for aircraft on missed approach procedures. Being farther west potentially removes the runway from the missed approach airspace, allowing aircraft to operate simultaneously on Runway 17R-35L while an aircraft flies the missed approach procedure for Runway 35L at OKC.

These factors combined are the reason consideration is being given to upgrading Runway 17R-35L to RDC D-II-4000 standards. For a more detailed explanation of the conditions affecting Runway 17R-35L and the need for widening the runway to 100 feet, see **Appendix D**. The alternatives to follow will examine the impacts of meeting the higher standard on the parallel runway.

RUNWAY LENGTH

The runway length analysis in the previous chapter concluded that the existing Runway 17L-35R length of 7,199 feet is adequate for most aircraft operating at the airport currently, especially during temperate weather and when aircraft operate at useful loads less than 90 percent. However, during hot days, heavier aircraft can be restricted down to 80 percent useful loads, which impacts the range capability of the aircraft. As has been stated, as a general aviation reliever for OKC, PWA should be capable of accommodating the entire business jet fleet including the largest business jets at maximum takeoff and landing weights.

To allow for heavier aircraft to operate on hot days at heavier useful loads, additional runway length is needed. The future critical design aircraft, the BBJ, needs up to 7,700 feet to operate at 100 percent useful load, and the Gulfstream G550 needs up to 7,900 feet to operate at 100 percent useful load. Additional length is also needed for business jets landing under Part 135 or 91(k) rules.

The airfield alternatives to follow will examine options to extend both the primary and parallel runways. The potential alternatives have been screened to exclude any that would impact the vicinity roadway network, primarily NW 50th Street and NW 78th Street. Any alternative that would consider rerouting or closing either of these roads has not been carried forward for consideration.

The crosswind Runway 13-31, which is planned to accommodate primarily small general aviation aircraft, has a length of 4,214 feet, which was determined to be adequate. The crosswind runway has an aligned taxiway at the southeast end, which is a non-standard condition. The alternatives consider reclaiming that pavement (approximately 348 feet) for runway use for an ultimate full length of 4,562 feet. This is not considered a capacity improvement project but a safety project, as it would eliminate a non-standard condition.

RUNWAY PROTECTION ZONES

The Safety Area Design Standards section in the previous chapter outlined incompatible developments within the RPZs or areas where the airport does not have control of the RPZs through either ownership of the property or through avigation easements. This includes portions of the RPZs associated with runways 17L, 17R, 13, and 35R, which either extend beyond airport property and/or contain incompatible structures. With potential changes to the airfield including improving to RDC D-II-4000 design standards on the parallel runway and extensions to the primary and parallel runways, the airfield alternatives consider methods to protect the RPZs from incompatible development.

TAXIWAY CONFIGURATION

There are several existing non-standard taxiway geometry conditions that need to be addressed. These non-standard conditions include:

1. Pavement at the southeast end of Runway 13-31 is marked as a taxiway, creating an aligned taxiway, which is no longer allowed by the FAA.
2. Taxiway A2 intersects with Runway 17L-35R and Runway 13-31, which creates wide pavement areas and can lead to pilot confusion.
3. Taxiway A5 intersects with Runways 17L-35R and 17R-35L in the high-energy area.
4. The end of Runway 17R includes a wide pavement area.

Each of these conditions can lead to pilots inadvertently taxiing onto the runway and causing a runway incursion and other potentially dangerous airfield safety concerns. Condition 1 was previously addressed with plans to reclaim the aligned taxiway pavement for runway use. Condition 4 is addressed by removing the excess pavement. Conditions 2 and 3 are addressed in the airside alternatives to follow.

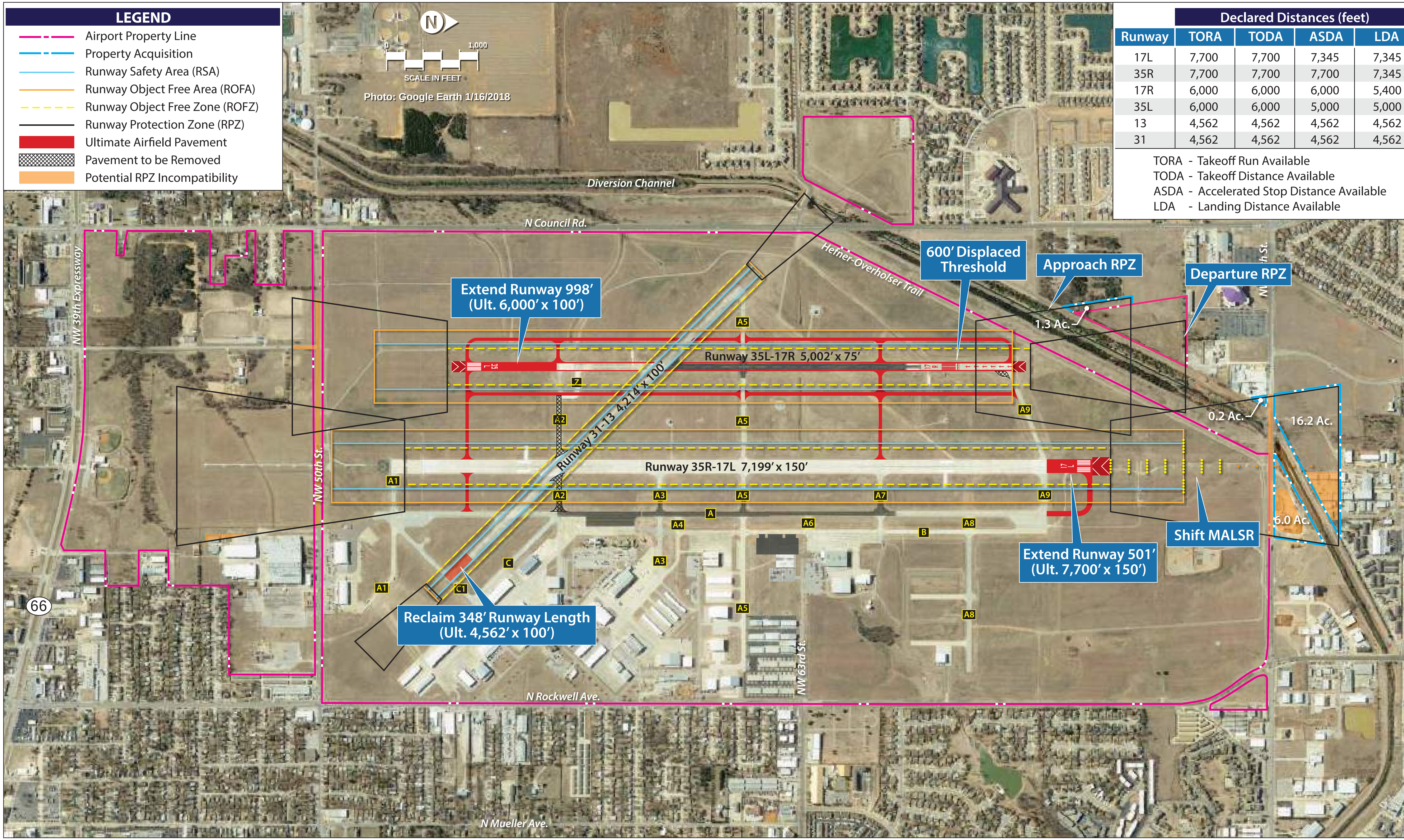
AIRSIDE ALTERNATIVES

Two airfield alternatives have been prepared to address the issues outlined above. The details of each alternative are described below along with the alternative's associated advantages and disadvantages.

AIRSIDE ALTERNATIVE 1

Depicted on **Exhibit 4B**, Airside Alternative 1 focuses on upgrading the parallel runway design standards to RDC D-II-4000 and achieving modest extensions to the primary and parallel runways. Previous planning included an extension of the parallel runway of 998 feet for a full length of 6,000 feet, which is reflected on this alternative. The primary runway in this alternative is extended by 501 feet to the north for a full length of 7,700 feet. This is the target takeoff length to accommodate the BBJ at 100 percent useful load.

Exhibit 4B: AIRSIDE ALTERNATIVE 1



Declared Distances (feet)				
Runway	TORA	TODA	ASDA	LDA
17L	7,700	7,700	7,345	7,345
35R	7,700	7,700	7,700	7,345
17R	6,000	6,000	6,000	5,400
35L	6,000	6,000	5,000	5,000
13	4,562	4,562	4,562	4,562
31	4,562	4,562	4,562	4,562

TORA - Takeoff Run Available
TODA - Takeoff Distance Available
ASDA - Accelerated Stop Distance Available
LDA - Landing Distance Available

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A result of extending the primary runway to the north is the need to shift the MALSR to the north and to acquire additional property to protect the RPZ. Excluding the diversion channel property and the NW 78th Street right-of-way, the airport would need to acquire approximately 22.4 acres to protect and clear the Runway 17L RPZ.

Runway 17R-35L is widened to 100 feet and its RPZs increase in size from 13.770 acres to 29.465 acres. The RSA dimensions increase to 500 feet wide extending 1,000 feet beyond the end of the runway, and the ROFA dimensions increase to 800 feet wide extending 1,000 feet beyond the end of the runway. Due to the Hefner-Overholser Trail and diversion channel, which would be obstructions to the RSA, this alternative implements a 600-foot displaced Runway 17R threshold and declared distances.

Declared distances are used to define the effective runway length for landing and takeoff when a standard RSA cannot be achieved. The declared distance pertaining to the RSA is the accelerated stop distance available (ASDA) and the landing distance available (LDA). ASDA and LDA consider RSA standards, thereby improving safety margins for users. ASDA is equal to the balance field length calculated by pilots prior to takeoff. The ASDA, or balanced field length, considers the runway length required by an aircraft to accelerate to rotation speed and then decelerate safely on the remaining runway available. This is the controlling takeoff distance and is used for evaluating if sufficient takeoff distance is provided. LDA considers the runway length necessary for an aircraft to touch down and decelerate to a safe speed prior to exiting the runway, while allowing for appropriate safety areas at each end of the runway to safely accommodate an aircraft that may undershoot or overrun the runway.

The ASDA and LDA for Runway 35L in this alternative is 5,000 feet (full-pavement length of 6,000 feet minus 1,000 feet of RSA beyond the end of the runway), which keeps the RSA and ROFA from extending beyond airport property to the north over the trail and diversion channel. Additionally, the Runway 17R LDA is 5,400 feet (full pavement length of 6,000 feet minus 600 feet of displaced threshold), which accounts for the 600 feet of RSA needed prior to the landing threshold. With a displaced threshold, the approach and departure RPZs are both controlling RPZs. The approach RPZ encompasses 48.978 acres and is positioned 200 feet beyond the end of the displaced threshold, and the departure RPZ encompasses 29.465 acres and is positioned 200 feet beyond the end of the runway pavement. Both are depicted on **Exhibit 4B**. Aside from the diversion channel, the ultimate approach RPZ would encompass 1.3 acres of property that is not currently controlled by the airport. This alternative considers acquiring the 1.3 acres.

The RPZs associated with Runway 35R and 35L also include incompatibilities. NW 50th Street passes through both RPZs, and a building associated with the old Gulfstream Aerospace aircraft manufacturing plant is with in the boundary of the 35R RPZ. The building should be removed and the FAA will review and determine whether the road can remain within the RPZs. The Runway 13 RPZ also includes N Council Road and NW 63rd Street; however, since the runway is not being upgraded, the roads can be grandfathered by the FAA.

Taxiway improvements presented in this alternative include constructing parallel taxiways on both sides of Runway 17R-35L to improve airfield circulation and accessibility, particularly to the west side of the airfield to support future landside developments. Taxiway A2, which intersects the primary and crosswind runways, is closed in this alternative, eliminating a non-standard condition. Taxiway A7 is extended from the primary runway to the parallel, and a new connecting taxiway between A1 and A2 is planned to provide access to the new Runway 35L threshold. While Taxiway A5 intersects with both the primary and parallel runways in the high-energy area, it provides the most direct and efficient route to the Runway 13 end. Therefore, this alternative maintains A5 under the condition that the FAA approves its continued maintenance.

Connected actions associated with this alternative include:

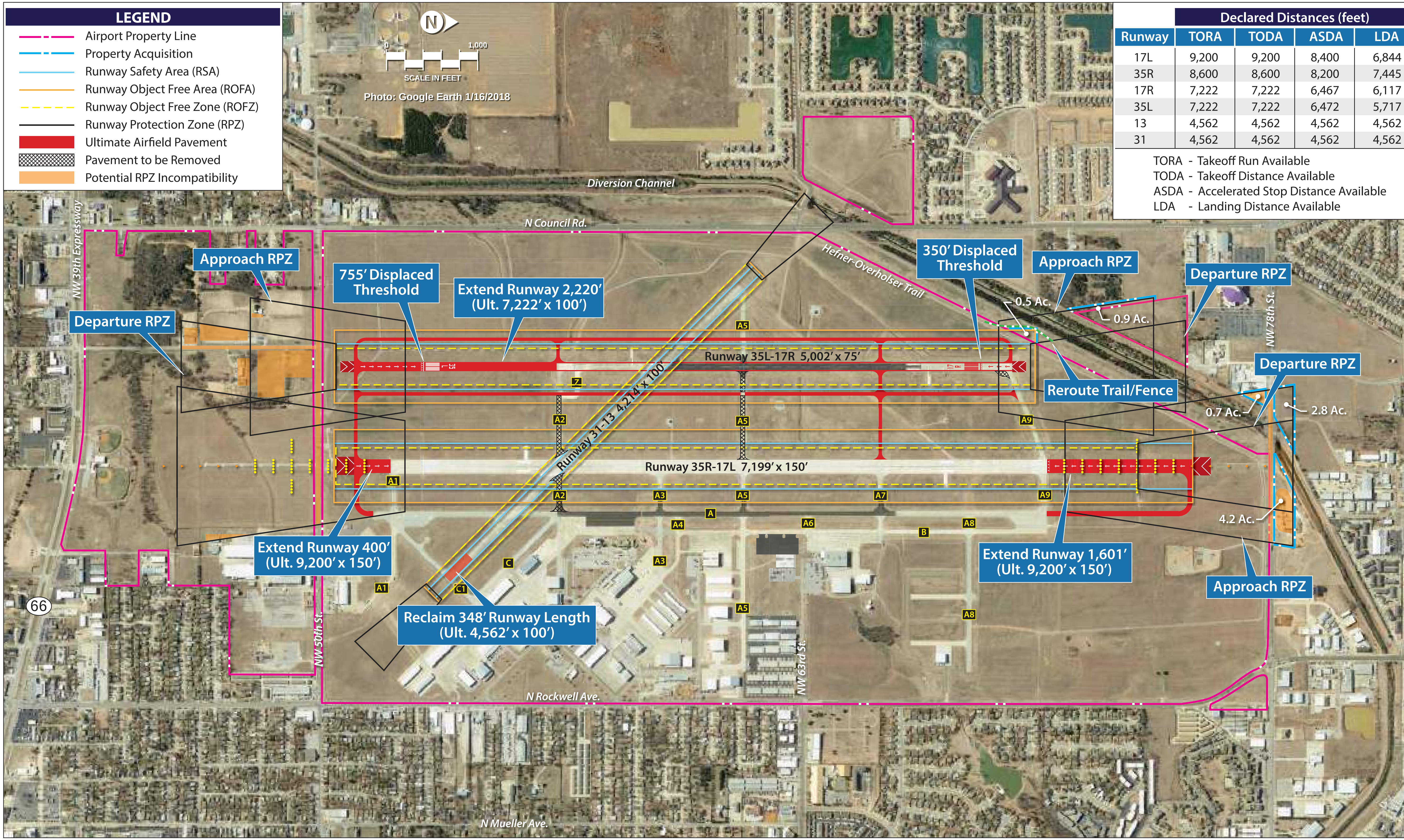
- To protect and clear incompatibilities from the RPZs, this alternative proposes the acquisition of approximately 23.7 acres of property.
- The extension of the Runway 17L end would require the relocation of the instrument landing system (ILS) glide slope antenna and localizer.
- Extend Taxiway A to the ultimate Runway 17L threshold.
- Extension of medium intensity taxiway lighting (MITL) to all new taxiway pavement.
- Expansion of airfield signage systems to all new pavement areas.
- Elimination of the excess pavement at the end of Runway 17R.
- Blast pads are planned for the ends of both the primary and parallel runways.
- The aligned taxiway at the end of Runway 31 is reclaimed for runway use.

AIRSIDE ALTERNATIVE 2

Depicted on **Exhibit 4C**, Airside Alternative 2 considers the maximum potential of runway extensions on both the primary and parallel runways. In both cases, runway pavement is extended near the boundary of airport property to the north and south and employs declared distances to meet RDC D-III-2400 standards on the primary runway and RDC D-II-4000 standards on the parallel runway.

Primary Runway 17L-35R is extended 1,601 feet north and 400 feet south for a full length of 9,200 feet. The declared distances for the primary runway reduce the ASDA of Runway 17L to 8,400 feet and the LDA to 6,844 feet. A notable difference between Alternatives 1 and 2 is this alternative displaces the entire north extension of the runway for the purpose of maintaining the approach RPZ in its current location, thereby reducing the amount of impacted property. The Runway 17L RPZ includes 7.7 acres of proposed property acquisition in this alternative, compared to 22.4 in Alternative 1. The 400-foot extension to the south would also be displaced, keeping the Runway 35R threshold in its current location and resulting in a 755-foot displaced threshold. The resulting Runway 35R ASDA is 8,200 feet and the LDA is 7,445 feet. The Runway 35R Takeoff Run Available (TORA) and Takeoff Distance Available (TODA), which do not account for the RSA but determine the location of the departure RPZ, are reduced to 7,222 feet to keep the departure RPZ from extending north beyond the end of the approach RPZ.

Parallel Runway 17R-35L is widened to 100 feet and extended by 2,220 feet to the south with a 755-foot displaced Runway 35L threshold and a 350-foot displaced Runway 17R threshold. These dimensions result in a full length of 7,222 feet. The Runway 17R ASDA is 6,467 feet and the LDA is 6,117 feet. The 35L ASDA is 6,472 feet and the LDA is 5,717 feet. This alternative would take the ROFA slightly beyond airport property on the north side and require rerouting the perimeter fence and the Hefner-Overholser trail.



Declared Distances (feet)

Runway	TORA	TODA	ASDA	LDA
17L	9,200	9,200	8,400	6,844
35R	8,600	8,600	8,200	7,445
17R	7,222	7,222	6,467	6,117
35L	7,222	7,222	6,472	5,717
13	4,562	4,562	4,562	4,562
31	4,562	4,562	4,562	4,562

TORA - Takeoff Run Available
TODA - Takeoff Distance Available
ASDA - Accelerated Stop Distance Available
LDA - Landing Distance Available

Property acquisition proposed in this alternative includes 7.7 acres within the Runway 17L RPZ and 1.4 acres to protect the parallel runway ROFA and approach RPZ. As was the case in Alternative 1, Alternative 2 does not propose acquisition of those portions of the RPZ over the diversion channel. Properties within the Runway 35R and 35L RPZs, including a building associated with the old Gulfstream Aerospace aircraft manufacturing plant in the 35R RPZ and several buildings and an outdoor sports complex (including baseball and soccer fields) within the 35L RPZs, could be required by the FAA to be removed. In addition, NW 50th Street passes through both sets of RPZs, a condition that would require FAA approval.

Taxiway improvements presented in this alternative include constructing parallel taxiways on both sides of Runway 17R-35L and closing Taxiway A2, like Alternative 1. Taxiway A5 from the primary runway west to the parallel runway would be closed to eliminate a taxiway intersection.

Connected actions associated with this alternative include:

- To protect and clear incompatibilities from the RPZs and ROFA, this alternative proposes the acquisition of approximately 9.1 acres of property.
- The extension of the Runway 17L end would require the relocation of the ILS localizer.
- Extend Taxiway A to the ultimate Runway 17L and 35R thresholds.
- Extension of MITL to all new taxiway pavement.
- Expansion of airfield signage systems to all new pavement areas.
- Elimination of the excess pavement at the end of Runway 17R.
- As a result of the displaced thresholds on the primary runway, a portion of the MALSRs off both ends would need to be converted to in-pavement fixtures.
- Blast pads are planned for the ends of both the primary and parallel runways.
- The aligned taxiway at the end of Runway 31 is reclaimed for runway use.

LANDSIDE PLANNING CONSIDERATIONS

Landside development alternatives include consideration of the general aviation services and support areas, as well as potential revenue enhancement opportunities. Landside considerations for PWA are listed below:

Landside Planning Considerations
• Identify locations for hangar and apron development • Development potential for fixed base operator (FBO) or specialized aviation service operators (SASO)-related facilities • Development potential for large-scale maintenance/repair/overhaul (MRO)/aircraft manufacturer • Airport traffic control tower (ATCT) relocation • General aviation terminal development • Non-aviation use development for revenue enhancement

The airport has large areas of undeveloped property available to meet the long-term 20-year demand for landside facilities identified in Chapter Three. On the east side, there is approximately 187 acres of developable property with an additional approximately 113 acres for development. As such, the alternatives to follow focus on maximizing the development potential of existing airport property. Each alternative meets FAA design standards and more than satisfies long-term horizon facility demand identified in the previous chapter. The landside element of the recommended master plan concept, to be presented in the next chapter, may be one of these alternatives or, more likely, is a combination of elements from each of them.

GENERAL AVIATION FACILITIES

The existing general aviation (GA) facilities are located on the east side of the airfield and consist of a variety of aircraft storage hangar types and sizes and aviation service providers. GA needs identified in the previous chapter focus on additional aircraft storage hangar capacity and apron areas. 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, 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 SASOs. The facilities associated with businesses such as these include large conventional type hangars that hold several aircraft. High activity levels 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 the airport. Limited utility services are needed for these areas.

Other types of hangar development can include executive hangars for accommodating either one larger aircraft or multiple smaller aircraft. Typically, these types of hangars are 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.

Currently, there is approximately 942,675 square feet of hangar space (including maintenance area) provided on the airport, made up of a combination of the hangar types previously discussed. The landside alternatives to follow will be split between the east and west sides to consider development potential of each area. Development on the west side will likely not occur until space becomes constrained on the east side, as new utility infrastructure will be needed on the west side adding considerable cost to development. However, if a large-scale MRO or aircraft manufacturer were to consider establishing an operation at PWA, the west side could be ideal as the airfield would provide a separation of uses between the existing general aviation activities on the east side.

AIRPORT TRAFFIC CONTROL TOWER (ATCT)

The PWA ATCT is co-located with the airport's terminal building. The facility is centrally located with good line-of-site to all areas of the airfield; however, the facility is aged and will eventually need upgrades. Also, ATCTs should be oriented so the primary operational view is to the north, if possible, to minimize the impacts of direct sun glare. The PWA ATCT operational view is primarily to the west, which is acceptable when a north view is not possible; however, an east view is preferred to west view. A south operational view is the least favorable orientation. Consideration will be given in the alternatives analysis to a potential new ATCT site if a new facility were developed in the future.

REVENUE SUPPORT DEVELOPMENT

PWA has a significant amount of undeveloped property that could be marketed for aviation-related and non-aviation-related business development. Land located along the flightline with direct access to the airfield should be reserved for aviation-related activities. Land segregated from the airfield by interior access roads can be considered for other non-aviation-related development such as business parks or industrial centers. With the amount of available land, the airport should continue to market itself as an economic center to attract new businesses and revenue streams. The alternatives analysis examines locations for both aviation and non-aviation uses.

The FAA typically requires airports to receive approval through a land-use release to lease airport owned land for non-aviation related purposes. The FAA stipulates that all land with reasonable airside access should be used or reserved for aviation purposes. Those areas on the airport not readily linked to the airfield can be considered favorably in a land-use release. In some cases, the FAA will be hesitant to release land-use if the airport has limited development areas near the airfield system. In PWA's case, there is a surplus of land for aviation uses well beyond the scope of this master plan planning period (20 years).

LANDSIDE ALTERNATIVES

EAST LANDSIDE ALTERNATIVE 1

Depicted on **Exhibit 4D**, East Landside Alternative 1 follows closely with the development of the east side as proposed on the current ALP, with some modifications. Primary developments include:

- Large-scale conventional hangars (28,000 to 40,000 square feet) along the primary runway flight line with accessibility from Taxiway A and Taxiway B. These facilities are intended for high activity uses such as FBOs or SASOs. Hangar door orientation varies from west facing, single-side access hangars to north-south facing doors allowing for pull-through access, which provides flexibility and more use options to potential operators.

- Development of the conventional/executive hangar area along Taxiway A8 as has been previously planned. New vehicle access roads are shown extending from an existing access point from N Rockwell Avenue for the purpose of minimizing new access points.
- Four new T-hangars are planned providing for up to 36 individual aircraft storage units between NW 63rd Street and Taxiway A5. These hangars are intended for a low-activity type of user (non-FBO/SASO), which coincides with the type of hangars developed in the same area.
- An extension of Taxiway A7 to the east providing access to a small hangar development area including several conventional hangars of various sizes.
- Expansion of Taxiway B and additional taxilanes to the north and east to support a future aviation-use reserve parcel. This parcel could continue to be developed with mid-size conventional/executive hangars or reserved for a large-scale operation such as an aircraft manufacturer.
- Several non-aviation use reserve parcels are located along N Rockwell Avenue in locations where direct access to the airfield is cut off by interior roads or where terrain would make aviation-use development difficult. These parcels have visibility from a major roadway, making them ideal locations for commercial development which can also serve as a buffer between airport activities and the residential areas to the east.

In total, East Landside Alternative 1 includes the development of 568,300 square feet of new aircraft storage hangars with the potential for more. This alternative also considers maintaining the ATCT and terminal buildings in their current location as has been planned previously. These facilities are centrally located on the airfield, giving them good visibility to the airfield and easy access via Taxiways A, B, and C.

Each taxilane has been applied a TOFA size based upon the type of aircraft anticipated to routinely utilize the area served. Most taxilanes, including A3/A4, A7, A8, and the new taxilanes proposed in the northeast area, have been planned to accommodate airplane design group (ADG) III standards, which calls for a 162-foot wide TOFA. The extended A2 and A5 taxilanes are planned for ADG II standards, which calls for a 115-foot wide TOFA. The narrower TOFAs on these two taxilanes eliminate obstructions that would penetrate the TOFA if ADG III standards were applied[2].

EAST LANDSIDE ALTERNATIVE 2

Depicted on **Exhibit 4E**, East Landside Alternative 2 considers redevelopment of some areas as well as new greenfield development potential. Primary developments include:

- Removing three existing T-hangars to allow for the development of new large-scale conventional hangars (10,000 to 40,000 square feet) along the extended A3/A4 taxilanes. Proposed hangars are oriented for northwest/southeast facing doors; however, a southwest orientation could also be considered to mirror Atlantic Aviation’s facility depending on the potential operator’s preference.
- Additional large-scale conventional hangars (40,000 square feet) along Taxiway B to the north and to the east along Taxiway A8. Proposed orientations include west and east facing options.

[2] Obstructions to the ADG III TOFA on these taxilanes are discussed in more detail in the Taxiways section of Chapter Three.

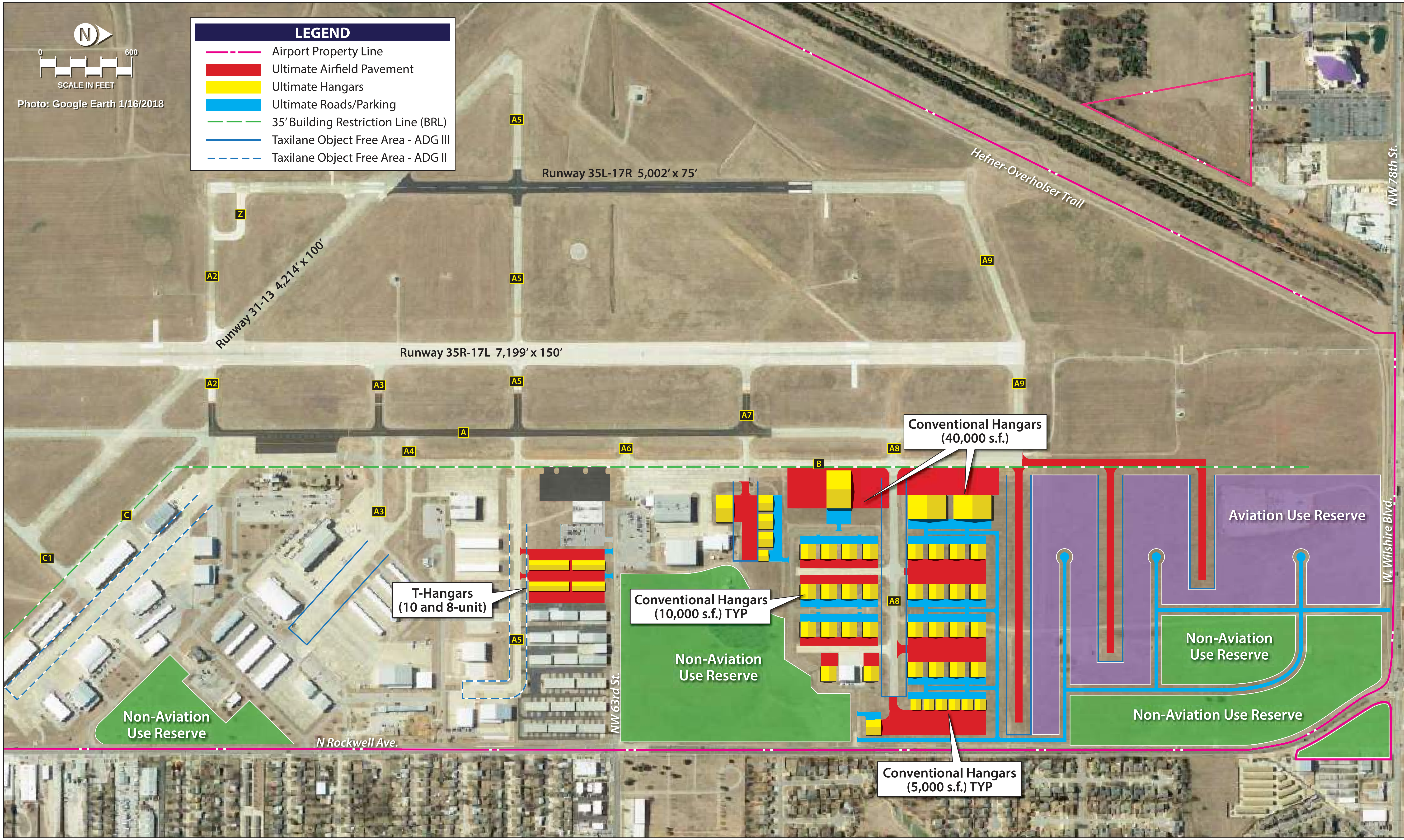


Exhibit 4D
EAST LANDSIDE ALTERNATIVE 1

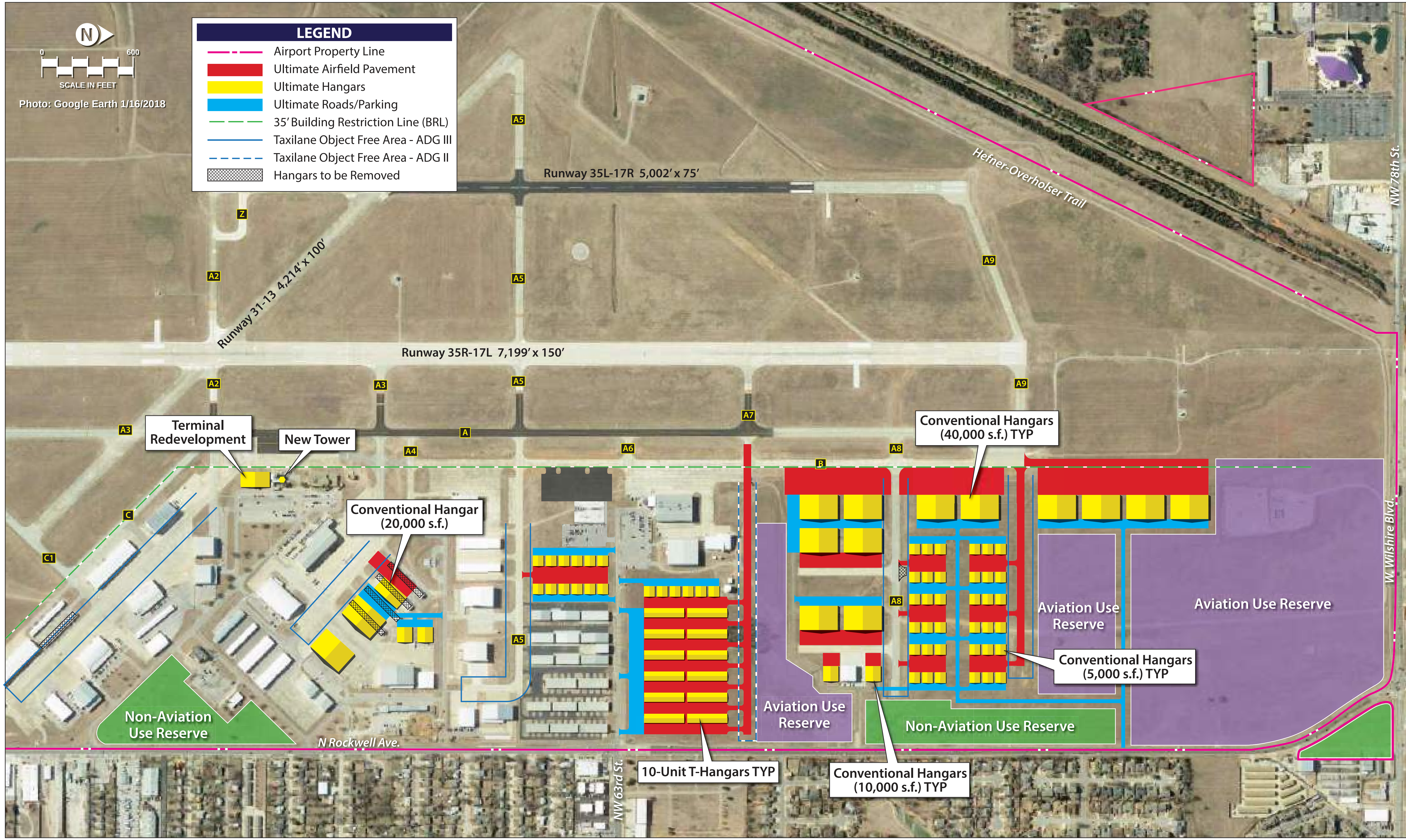


Exhibit 4E
EAST LANDSIDE ALTERNATIVE 2

- Slightly modified conventional/executive hangar development north of Taxiway A8 to include smaller 5,000 square foot facilities along with a modified vehicle access roadway network stemming from N Rockwell Avenue.
- Twelve new T-hangar facilities and small conventional hangars (5,000 square foot) planned between the extended A7 taxilane and NW 63rd Street. Combined, the T-hangars would provide up to 120 individual aircraft storage units. A dedicated vehicle parking lot is planned along the southern portion of the T-hangar area.
- Reservation of the northeast portion for future aviation-related development with accessibility from Taxiway B and A9. Another aviation-use reserve parcel is shown north of the A7 taxilane extension.
- Redevelopment of the existing terminal building and the construction of a new ATCT on or near the current facilities. New or renovated facilities would provide modern amenities and technologies for both the terminal and ATCT, creating the potential for expanded services offered, particularly at the terminal, and for increased revenue generation.
- Non-aviation use reserve parcels are again located along N Rockwell Avenue but are more limited compared to what was proposed in East Landside Alternative 1. These parcels would still allow for commercial or industrial-related developments but to a much smaller scale and with a more limited capability to provide a buffer between airport activities and the residential areas to the east.

In total, East Landside Alternative 2 includes the development of 1,108,280 square feet of new aircraft storage hangars with the potential for more, including possibly a large-scale aircraft manufacturer in the northeast corner. All taxilanes besides the extended A7 are planned to meet ADG III TOFA standards. Taxilane A7, which would serve smaller aircraft, is planned to meet ADG II TOFA standards. Obstructions to the ADG III TOFA along Taxilanes A2 (T-hangar) and A5 (fuel storage tanks) would need to be relocated.

WEST LANDSIDE ALTERNATIVE 1

Depicted on **Exhibit 4F**, West Landside Alternative 1 considers development on the west side of the airport along N Council Road. Development is proposed within the constraints of the building restriction line (BRL) and the RPZ associated with an extended Runway 17R-35L as proposed in airside alternative 2. A new parallel taxiway along the west side of Runway 17R-35L is planned to provide for convenient and safe accessibility to the airfield. Primary developments include:

- Establishing a flight line apron for large conventional hangars (40,000 square feet). Each of the hangars would have east facing doors. Taxilanes leading to the apron meet ADG III TOFA standards and the apron provides adequate parking space for multiple business jets and turboprops. Vehicle access to this area stems from N Council Road and includes a large vehicle parking lot along the west edge of the hangars.
- Development of 14 new T-hangar facilities providing up to 140 individual aircraft storage units.
- Reservation of a large parcel north of the proposed conventional hangars for future development that could include an MRO/aircraft manufacturer or additional aviation-related business.

- Development of a new ATCT, which would provide for a new and modern facility and equipment for controllers as well as provide an east operational view, which is preferable to the existing west view.
- Reservation of property along N Council Road for non-aviation uses such as a commercial park to enhance revenue-generating potential. These parcels could serve as buffers between airport activities and future development to the west.

In total, West Landside Alternative 1 includes the development of 421,760 square feet of new aircraft storage hangars with the potential for more including possibly a large-scale aircraft manufacturer or MRO. Taxilanes associated with the conventional hangars meet ADG III TOFA standards, and the taxilanes serving the T-hangars meet ADG II TOFA standards.

WEST LANDSIDE ALTERNATIVE 2

Depicted on **Exhibit 4G**, West Landside Alternative 2 considers additional layouts for new development on the west side of the airfield. Most notably, this alternative depicts the layout of a large-scale MRO facility and considers the airfield layout proposed in Airside Alternative 1. Similar constraints apply to this alternative, which include the BRL and the proposed Runway 35L RPZ. Primary developments include:

- Development of a large-scale MRO that would include several large conventional hangars for various purposes. The facility would be supported by a large apron along the Runway 17R-35L flight line and vehicle access road and parking lot stemming from N Council Road.
- Development of new conventional/executive hangar facilities ranging in size from 5,000 to 10,000 square feet. Taxilane access to the larger hangars meet ADG III TOFA standards with ADG II TOFA standards applied to the smaller hangar area.
- Reservation of a small parcel north of the MRO facility for future expansion of the MRO or for other aviation-related uses.
- Reservation of two large parcels along N Council Road for non-aviation use such as a commercial park for the purpose of enhancing revenue generation and serving as a buffer between airport activities and future development to the west.

In total, West Landside Alternative 2 includes the development of 190,000 square feet of new aircraft storage hangars, not including the MRO facilities. This alternative also does not consider a relocated ATCT on the west side; however, the aviation-use parcel could be considered as a potential ATCT development site.

ALTERNATIVES SUMMARY

The process utilized in assessing airside and landside development alternatives involved a detailed analysis of short- and long-term requirements, as well as future growth potential. Current airport design standards were considered at each stage of development.

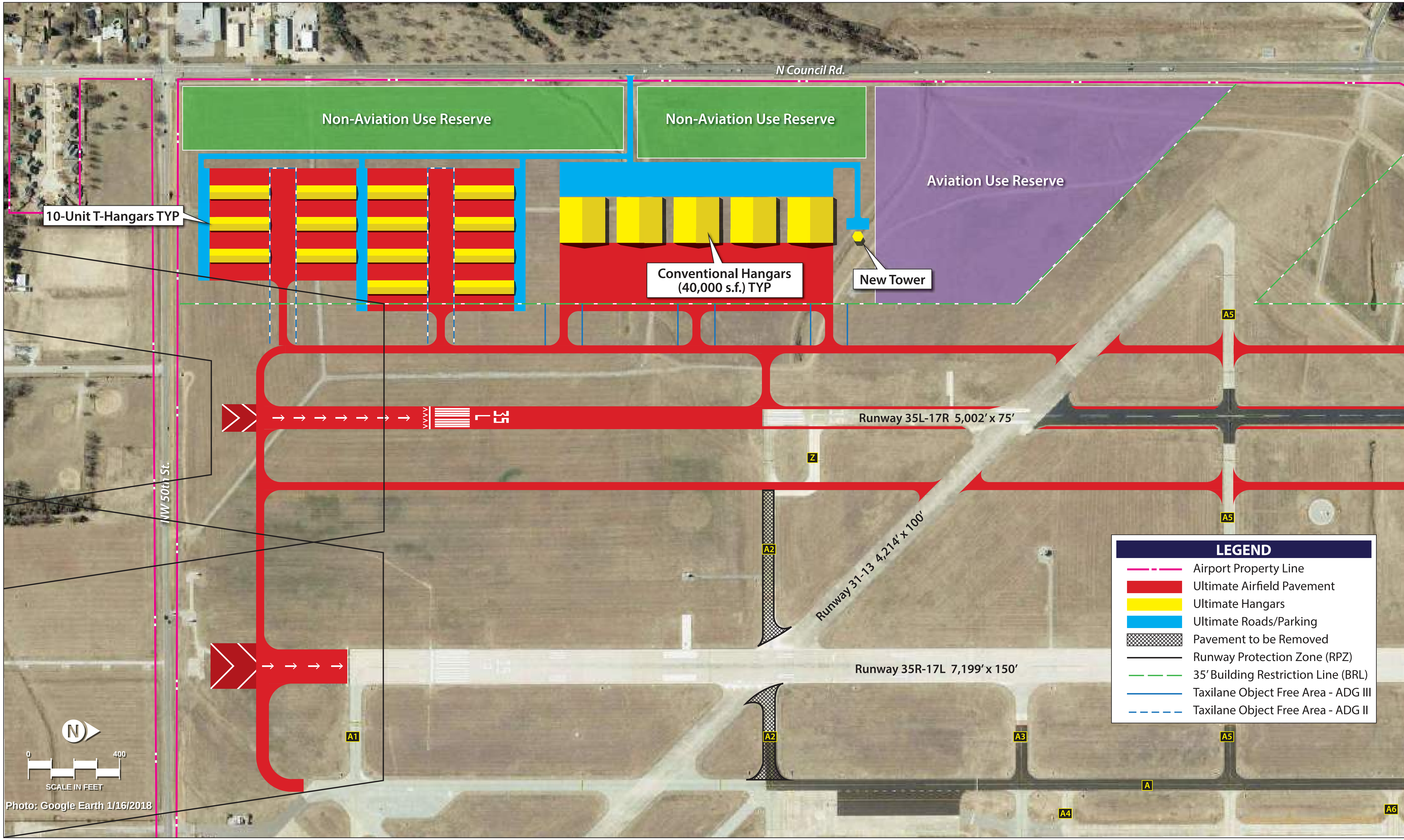


Exhibit 4F
WEST LANDSIDE ALTERNATIVE 1

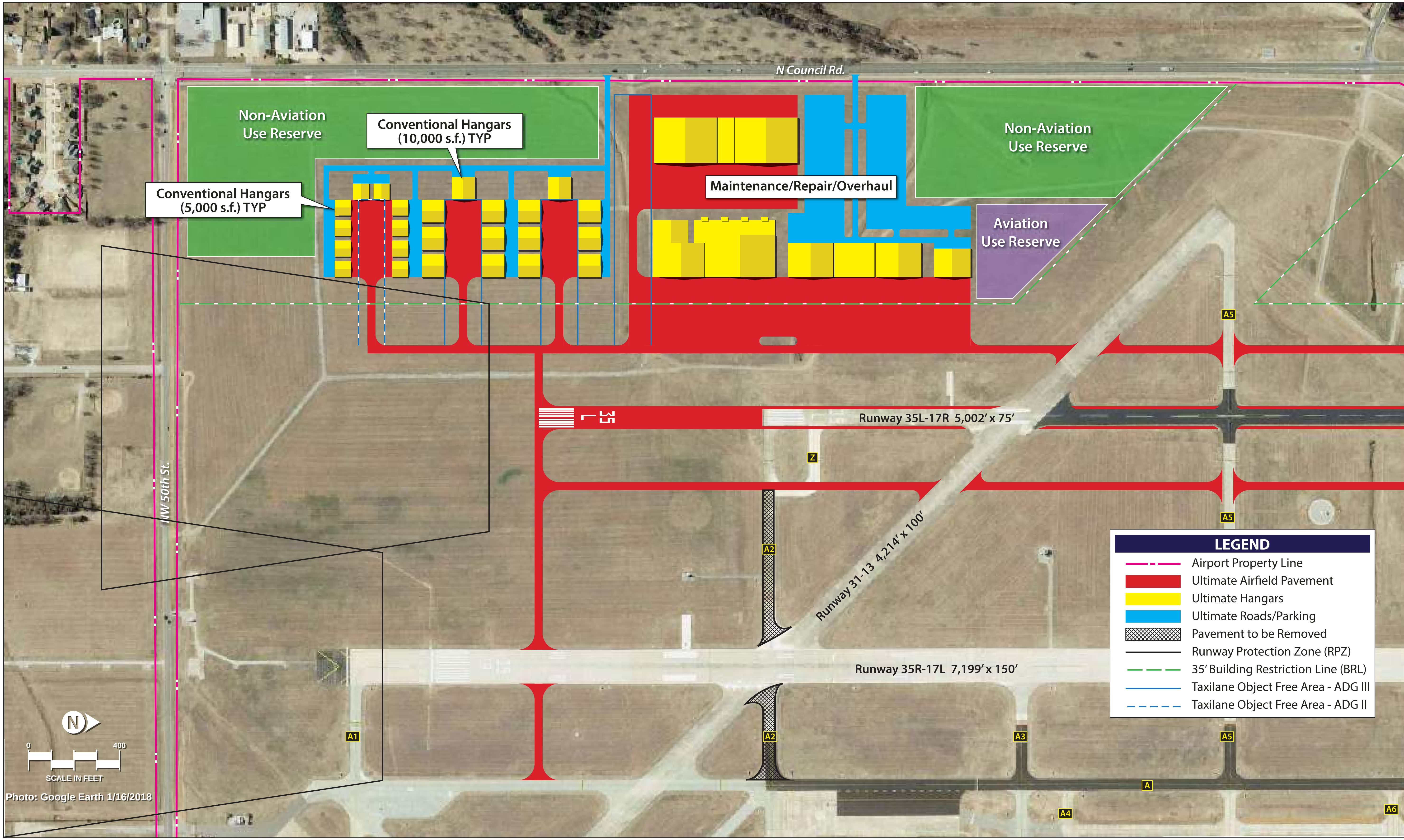


Exhibit 4G
WEST LANDSIDE ALTERNATIVE 2

Several development alternatives related to both the airside and landside have been presented. On the airside, the major considerations involve meeting higher design standards on the parallel runway and extending both the primary and parallel runways while ensuring the airfield meets FAA design standards. Numerous constraints to airfield growth have been outlined and impacts of the various alternatives weighed. On the landside, alternatives were presented to consider development potential of both the east and west sides of the airfield.

After review by the Technical Advisory Committee (TAC) and public, a recommended concept will be presented in the next chapter. The resulting plan will represent an airside facility that fulfills safety and design standards and a landside complex that can be developed as demand dictates.

Chapter Five

Recommended Master Plan Concept

Chapter Five

RECOMMENDED MASTER PLAN CONCEPT

The airport master plan for Wiley Post Airport (PWA) has progressed through a systematic and logical process with a goal of formulating a recommended 20-year development plan. The process began with an evaluation of existing and future operational demand which aided in creating an assessment of future facility needs. Those needs were then used to develop alternative facility plans to meet projected needs. Each of those steps in the planning process has included the development of draft working papers which were presented and discussed at previous Technical Advisory Committee (TAC) meetings.

In the previous chapter, several development alternatives were analyzed to explore options for the future growth and development of PWA. The development alternatives have been refined into a single recommended concept for the master plan. This chapter describes, in narrative and graphic form, the recommended direction for the future use and development of PWA.

The recommended concept provides the ability to meet the disparate needs of the array of airport operators. The goal of this plan is to ensure the airport can continue, and even improve, in the primary role of serving as the general aviation reliever to Will Rogers World Airport (OKC). The plan has been specifically tailored to support existing and future growth of all forms of potential aviation activity as the demand materializes.

The recommended master plan concept, as shown on **Exhibit 5A**, presents a long-term configuration for the airport, which preserves and enhances the role of the airport while meeting Federal Aviation Administration (FAA) design standards. The phased implementation of the recommended development concept will be presented in Chapter Six. The following subsections describe the key details of the recommended master plan concept.

AIRSIDE CONCEPT

The airside plan generally considers those improvements related to the runway and taxiway system. PWA is currently a three-runway airfield system, which positions the airport to attract and support a variety of general aviation operations.

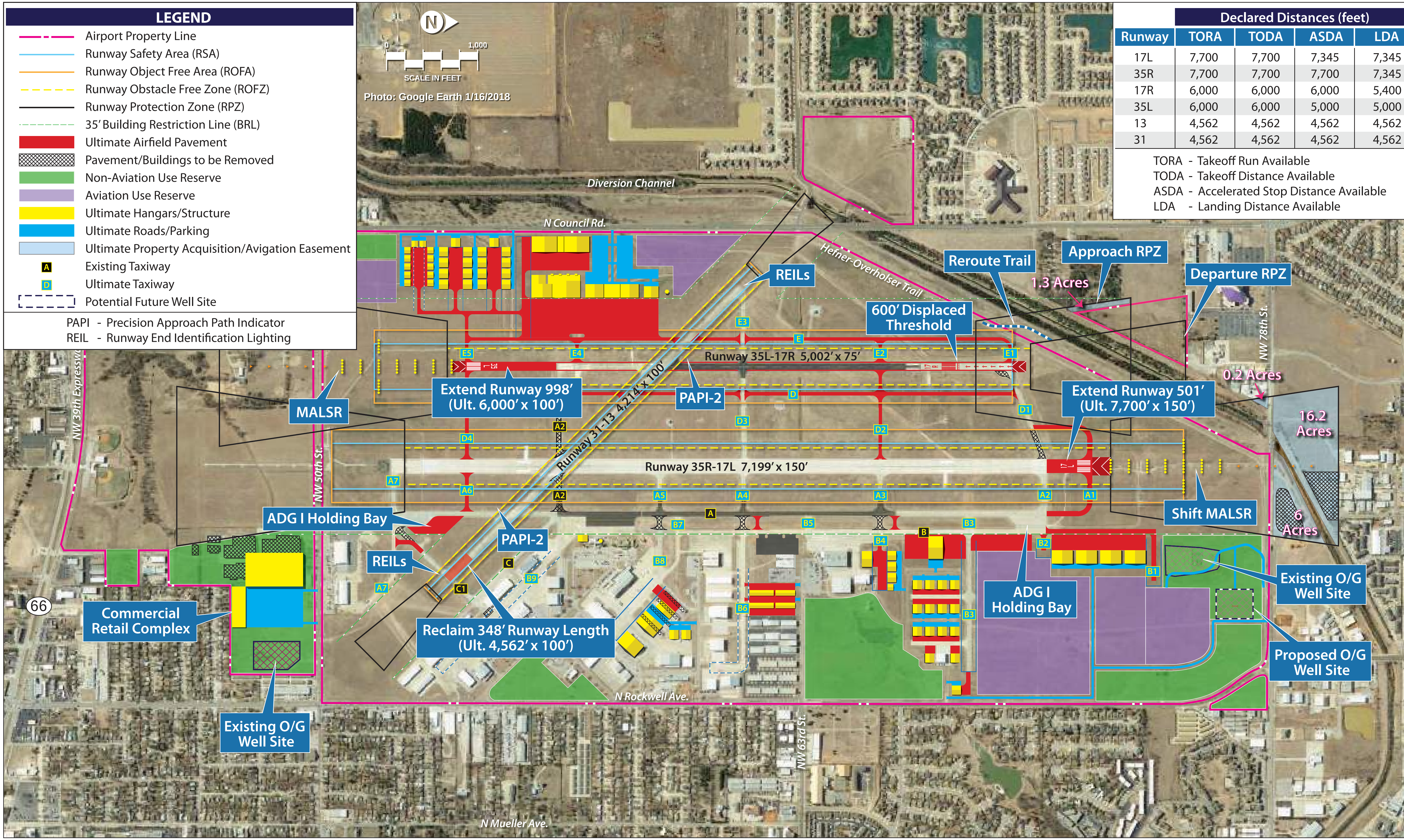
DESIGN STANDARDS

The FAA has established design criteria to define the physical dimensions of runways and taxiways, as well as the imaginary surfaces surrounding them, to enhance the safe operation of aircraft at airports. These design standards also define the separation criteria for the placement of landside facilities.

As discussed previously, the design criteria primarily center on the airport's critical design aircraft. The critical aircraft is the most demanding aircraft, or family of aircraft, which currently, or are projected to, conduct 500 or more operations (takeoffs and landings) per year at the airport. Factors included in airport design are an aircraft's wingspan, approach speed, tail height and, in some cases, the instrument approach visibility minimums for each runway. The FAA has established the Runway Design Code (RDC) to relate these design aircraft factors to airfield design standards. The most restrictive RDC is also considered the overall Airport Reference Code (ARC).

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, an airside taxiway must meet taxiway object free area (TOFA) for all aircraft types using the taxiway, while the taxilane to a T-hangar area only needs to meet width standards for smaller single and multi-engine piston aircraft expected to utilize the taxilane.

The applicable RDC and critical design aircraft for each runway at PWA in the existing and ultimate conditions, as established in Chapter Two, are summarized in **Table 5A**.



Declared Distances (feet)

Runway	TORA	TODA	ASDA	LDA
17L	7,700	7,700	7,345	7,345
35R	7,700	7,700	7,700	7,345
17R	6,000	6,000	6,000	5,400
35L	6,000	6,000	5,000	5,000
13	4,562	4,562	4,562	4,562
31	4,562	4,562	4,562	4,562

TORA - Takeoff Run Available
TODA - Takeoff Distance Available
ASDA - Accelerated Stop Distance Available
LDA - Landing Distance Available

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TABLE 5A
Airfield Design Parameters
Wiley Post Airport

Runway	Critical Design Aircraft	RDC	APRC	DPRC
Existing				
17L-35R	Bombardier Challenger 600	C-II-2400	D/VI/2400	D/VI
17R-35L	Cessna Citation Sovereign	B-II-5000	D/VI/5000	D/VI
13-31	King Air 100	B-I(S)-VIS	B/III/VIS	B/III; D/II
Ultimate				
17L-35R	Gulfstream G550	D-III-2400	D/VI/2400	D/VI
17R-35L	Gulfstream G450	D-II-2400	D/VI/2400	D/VI
13-31	King Air 100	B-I(S)-VIS	B/III/VIS	B/III; D/II

RDC – Runway Design Code
APRC – Approach Reference Code
DPRC – Departure Reference Code

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

PRIMARY RUNWAY 17L-35R

- **Runway Dimensions** - The primary runway is currently 7,199 feet long and 150 feet wide and meets RDC C-II-2400 design standards. The primary runway at a reliever airport should be planned to accommodate all aircraft in the national general aviation fleet, including the largest business jets, so that PWA can properly function in its role as a reliever to OKC. The recommended development concept for PWA includes a 501-foot extension of the primary runway to the north, resulting in a full length of 7,700 feet. At this length, some of the heaviest business jets in the fleet, such as the Boeing Business Jet (BBJ), will be capable of operating with higher useful loads (fuel, passengers, cargo) especially during the hot summer months. The planned extension keeps the runway safety area (RSA), runway object free area (ROFA), and runway obstacle free zone (ROFZ) on existing airport property and does not impact the vicinity roadway network. The Runway 17L runway protection zone (RPZ) is shifted to the north, encompassing incompatible industrial/commercial properties, which are planned for removal. NW 78th Street would also remain within the RPZ, which as a non-standard RPZ land use would require FAA review and approval. The Runway 35R threshold is planned to remain displaced at 355 feet to ensure the RSA/ROFA are not impacted by NW 50th Street. The resulting declared distances[1] for Runway 17L-35R are detailed on **Exhibit 5A**.

  The primary runway width of 150 feet exceeds the C-II-2400 design standard of 100 feet. The ultimate D-III-2400 design standard calls for a 150-foot-wide runway when the runway accommodates aircraft weighing 150,000 pounds or more. The Boeing Business Jet (BBJ1 and BBJ2), which have maximum takeoff weights (MTOW) of up to 170,000 pounds, are planned to be accommodated on the primary runway. Therefore, the 150-foot width of the primary runway should be maintained.

[1] Declared distances are described in detail in Chapter Four, Airside Alternatives section.

- **Pavement Strength** – Runway 17L-35R is currently strength rated for up to 35,000 pounds for single wheel loading aircraft (SWL), 50,000 pounds for dual wheel loading aircraft (DWL), and 90,000 pounds for dual tandem wheel loading aircraft (DTWL). These strength ratings are adequate for most aircraft currently operating at PWA; however, it is anticipated that heavier aircraft will operate more frequently in the future. For example, the Gulfstream G550/G600/G650 have MTOWs around 100,000 pounds and the Boeing BBJ1 and BBJ2 weigh upwards of 170,000 pounds on dual wheel gear configurations. It is recommended that the runway be strengthened up to 170,000 pounds DWL in the future to accommodate more frequent operations by heavier jet aircraft.

- **Instrument Approach Procedures** – Runways 17L and 35R are both equipped with Category I (CAT I) instrument landing system (ILS) approaches with minimums down to 200-foot cloud ceilings and visibility down to ½-mile. Precision RNAV (GPS) CAT I approaches are also published for both ends of the runway. These approaches are adequate, and no new approaches are planned. If the runway is extended as planned to the north, the Runway 17L medium intensity approach lighting system with runway alignment indicator lights (MALSR) would also need to be shifted north along with the ILS glide slope antenna.

- **Runway Protection Zones (RPZs)** – The Runway 17L RPZ currently encompasses several incompatible land uses including NW 78th Street and industrial properties. Impacted developed properties include a portion of the Metro Ready Mix concrete facility located at 7700 W Wilshire Boulevard (NW 78th Street) and an industrial property located at approximately 7300 W Wilshire Boulevard on the north side of the road. If the runway is extended to the north as planned, the RPZ will also shift north and encompass additional commercial/industrial properties north of the Diversion Channel between Glade Avenue and Rockback Court. The plan includes acquiring approximately 22.4 acres of property to ensure control over the entire RPZ except for the NW 78th Street right-of-way (ROW). As mentioned previously, public roads are an incompatible land use within an RPZ and require FAA approval to remain in place. If the FAA does not approve of NW 78th Street within the shifted RPZ, the 17L threshold could be displaced by approximately 800 feet or the road rerouted outside the RPZ. If none of these options are jointly favorable to the FAA or the airport sponsor, the runway extension may be abandoned.

  The Runway 35R RPZ also encompasses incompatible land uses including NW 50th Street and buildings associated with the abandoned Gulfstream complex. No changes are planned for the Runway 35R RPZ so NW 50th Street should be allowed to remain in place under the FAA's current guidance, which grandfathers existing public roads within RPZs. The entire abandoned Gulfstream complex of buildings are planned to be demolished to make way for new developments. No new buildings are planned to be located within the RPZ.

- **Visual Approach Aids** – Runway 32 is equipped with a visual approach slope indicator (VASI-2) system. The VASI-2 system is antiquated and should be replaced with a precision approach path indicator (PAPI-4). Runway 14 does not have a visual approach aid and is planned for a PAPI-4. The extension of the runway includes the expansion of the high intensity runway lighting (HIRL) system currently serving the runway.

- **Blast Pads** – Paved blast pads are planned at each end of the runway to prevent soil erosion from jet blast. The blast pad dimensions are 200 feet wide and 200 feet long.

PARALLEL RUNWAY 17R-35L

- **Runway Dimensions** – The parallel runway is currently 5,002 feet long and 75 feet wide and meets RDC B-II-5000 design standards. It is recommended that the parallel runway be improved to RDC D-II-2400 standards, extended to 6,000 feet, and widened to 100 feet to provide airfield redundancy. Improving the parallel runway ensures PWA can continue to accommodate most of the largest/fastest business jets in the national general aviation fleet should the primary runway be unavailable. For additional explanation on the purpose and need to widen Runway 17R-35L, see **Appendix D**. A result of these improvements is that the RSA and ROFA will ultimately extend 1,000 feet beyond the end of the runway and 600 feet prior to the landing threshold. The Hofner-Overholser Trail and Diversion Channel obstruct the standard RSA/ROFA north of the runway; therefore, the Runway 17R threshold is planned to be displaced 600 feet and declared distances implemented to meet the RSA/ROFA standards. The resulting declared distances for Runway 17R-35L are detailed on **Exhibit 5A**. As a result of implementing declared distances, the RSA/ROFA remain on airport property; however, the Hefner-Overholser Trail will still pass through the ROFA. It is recommended that the trail be rerouted slightly north outside the ROFA.

- **Pavement Strength** – The parallel runway is currently strength rated for up to 26,000 pounds for SWL aircraft and 45,000 pounds for DWL aircraft. These ratings allow for regular use by small and mid-size business jets including such aircraft as the Cessna Citation X, the Gulfstream G280, and Bombardier Challenger 600 series jets. However, the plan is to improve the parallel runway to accommodate heavier jets in the future; therefore, the runway should be strengthened up to 73,900 pounds DWL.

- **Instrument Approach Procedures** – Runways 17R and 35L are both equipped with non-precision RNAV (GPS) approaches with visibility minimums down to one mile. It is recommended that RNAV approaches with vertical guidance (APV) such as a localizer performance with vertical guidance (LPV) be established for both ends of the runway. Visibility minimums down to ½-mile can be achieved with an LPV approach with the installation of approach lighting system such as a MALSR. MALSR installation on the approach to Runway 17R is less feasible due to the diversion channel, so a MALSR, and thus ½-mile visibility minimums, is planned only for the Runway 35L end. Without a MALSR, the Runway 17R end is planned for ¾-mile visibility minimums.

- **Runway Protection Zones (RPZs)** – Improving to ARC D-II design standards and incorporating ½-mile visibility minimums on the Runway 35L end and ¾-mile visibility minimums on the 17R end increase the size of the RPZs from 13.770 acres to 78.914 acres (½-mile) 48.978 acres (¾-mile). Additionally, with a 600-foot displaced Runway 17R threshold ultimately, the Runway 35L departure RPZ is offset from the 17R approach RPZ[2]. The 35L departure RPZ encompasses 29.465 acres.

[2] The Runway 17R approach RPZ begins 200 feet beyond the displaced threshold and the Runway 35L departure RPZ begins 200 feet beyond the end of the runway.

The RPZs on the north end of the runway encompass primarily airport property and the diversion channel. Approximately 1.3 acres of the approach RPZ extends beyond airport property encompassing undeveloped property. The plan includes acquiring this property to ensure incompatible developments are avoided. On the south end of the runway, the Runway 35L approach RPZ is shifted over NW 50th Street and N Thompkins Avenue. As public roadways, the FAA will ultimately need to approve this future condition with public roads in an RPZ. If the FAA does not approve of the RPZ over the road, the airport could consider a 1,200-foot displacement of the Runway 35L threshold and a reduction of the Runway 17R TORA distance to shift the departure RPZ off the road.

- **Visual Approach Aids** – Both ends of the runway are equipped with PAPI-4s and REILs. These systems are adequate and should remain in place in the interim and then relocated to accommodate the runway extension and the displacement of the Runway 17R threshold. If a MALSR system is installed on the Runway 35L end, REILs would no longer be necessary and could be removed.

- **Blast Pads** – Paved blast pads are planned at each end of the runway to prevent soil erosion from jet blast. The blast pad dimensions are 120 feet wide and 150 feet long.

CROSSWIND RUNWAY 13-31

- **Runway Dimensions** – The crosswind runway is currently 4,214 feet long and 100 feet wide and meets RDC B-I(S)-VIS design standards. Based on the runway orientation analysis in Chapter Three, a crosswind runway is justified for small aircraft within the A/B-I category. Therefore, Runway 13-31 is planned to accommodate small aircraft including its critical design aircraft, the Beechcraft King Air 100. No significant extensions are planned for this runway. Approximately 348 feet of the southeast end of the runway is currently marked as an aligned taxiway. Aligned taxiways are a non-standard design and this area is planned to be removed by reclaiming the pavement for runway use. As a result, the ultimate length of Runway 13-31 is 4,562 feet. The runway's width of 100 feet exceeds the design standard of 60 feet. When the runway undergoes a routine pavement maintenance project, the FAA is likely to fund only maintaining the design standard width. If PWA chooses to maintain the additional 40 feet of width, the airport will need to provide funding.

- **Pavement Strength** – The crosswind runway is currently strength rated for up to 35,000 pounds for SWL aircraft, 50,000 pounds for DWL aircraft, and 90,000 pounds for DTWL aircraft; however, the runway is currently restricted to aircraft weighing over 12,500 pounds. The runway is planned to continue to serve only small aircraft weighing 12,500 pounds or less.

- **Instrument Approach Procedures** – The crosswind runway is a visual-approach only runway and is planned to remain so.

- **Runway Protection Zones (RPZs)** – The Runway 31 RPZ will be shifted 348 feet southeast with the aligned taxiway pavement reclamation. After the shift, the RPZ will remain entirely on airport property and be clear of incompatible developments. The Runway 13 RPZ extends off airport property over N Council Road, NW 63rd Street, and the diversion channel. Public roads are an incompatible land use within the RSA; however, the runway is not planned for significant modifications that would alter the RPZ dimensions or the critical design aircraft. Therefore, the public roads are eligible to be grandfathered by the FAA and remain within the RPZ.

- **Visual Approach Aids** – The crosswind runway is not currently equipped with visual approach aids. The plan includes adding PAPI-2 systems and REILs at both ends of the runway to improve pilot situational awareness.

TAXIWAY IMPROVEMENTS

The existing PWA taxiway system meets Taxiway Design Group (TDG) 3 width standards of 50 feet. Taxiways A and B and their associated connectors on the east side of Runway 17L-35R meet Airplane Design Group (ADG) III design standards. Taxiways associated with the parallel runway are planned to meet ADG II design standards, and taxiways associated with the crosswind runway are planned to meet ADG I design standards. All new taxiway pavement is also planned to be equipped with medium intensity taxiway edge lighting (MITL) and associated airfield signage where appropriate.

Another consideration involves reconfiguring the taxiway nomenclature. Current taxiway designations do not meet FAA Engineering Brief (EB) 89, *Taxiway Nomenclature Convention* standards. According to the EB, stub taxiways associated with a parallel taxiway should be designated with a letter and number such as A1, A2, A3, etc. beginning with the northernmost stub. Ultimate taxiway designations that meet the EB standards are identified on **Exhibit 5A**.

Recommended taxiway improvements are as follows:

- **Taxiway A** | Extension to the north to accommodate the runway extension and includes new medium intensity taxiway edge lighting and lighted signage (MITL).

- **Existing Taxiway A2** | Elimination of A2 where it intersects with the primary and crosswind runways to remove a confusing intersection and wide pavement areas. New connecting taxiways are planned approximately 825 feet north of the Runway 35R threshold from the runway to Taxiway A on the east and from the runway to the extended parallel runway. The connector east of the primary runway is to be designated as A6, and the connector west of the primary runway is to be designated D4.

- **Taxiway B** | Extension to the north to provide access to new hangar development areas and includes new MITL.

- **New Taxiway D** | To support increased usage of the parallel runway in the future and improve taxiing efficiency, a 35-foot-wide parallel taxiway meeting ADG II design standards is planned between the parallel runways at a separation distance of 300 feet from the Runway 17R-35L centerline. The north D1 connector to the Runway 17L threshold is planned to be rerouted along with the extension of the runway to provide an appropriate right-angled connection.

- **New Taxiway E** | A parallel taxiway is planned on the west side of the parallel runway to accommodate future hangar development on the west side of the airfield. Taxiway E is planned to be 35 feet wide and meet ADG II design standards.

Additional taxiway projects include:

- Removing a non-standard wide pavement area at the intersection of ultimate Taxiway D1 and the Runway 17R threshold.
- Removing taxiway pavement and providing for appropriate offset connecting taxiways between Taxiways A and B at B4, B6, B8, and C1. These connecting points do not provide direct access from an aircraft parking apron to the runway (aircraft parked on the east landside areas must make a turn from a parking apron onto each of these connecting taxilanes prior to entering a runway). However, the FAA requested the Airport Layout Plan (ALP) depict offset connections at these points in the event that they would be needed in the future.

LANDSIDE CONCEPT

The primary goal of landside facility planning is to provide adequate space to meet reasonably anticipated general aviation needs, while also optimizing operational efficiency and land use. Achieving these goals yields a development scheme which segregates functional uses while maximizing the airport's revenue potential. **Exhibit 5B** presents the planned landside developments on the east side of the airport; **Exhibit 5C** presents planned developments on the west side.

As a reminder, all hangar-related development should occur only as dictated by demand. The locations and sizes of hangars proposed in the recommended concept are conceptual and may not reflect the needs of future developers and their customers. The recommended concept is intended to be used strictly as a guide for PWA staff when considering new developments.

EAST LANDSIDE DEVELOPMENT

The recommended development concept for the east side provides a conceptual layout for new hangar, apron, and vehicle access road construction. The bulk of the proposed hangars are conventional-style hangars ranging in size from 5,000 square feet (sf), up to 40,000 sf. The larger conventional hangars situated along Taxiway B are intended for future fixed base operator (FBO) or specialty aviation service operator (SASO) uses. These hangars also include larger aprons adjacent to the hangars as well as larger vehicle parking lots.

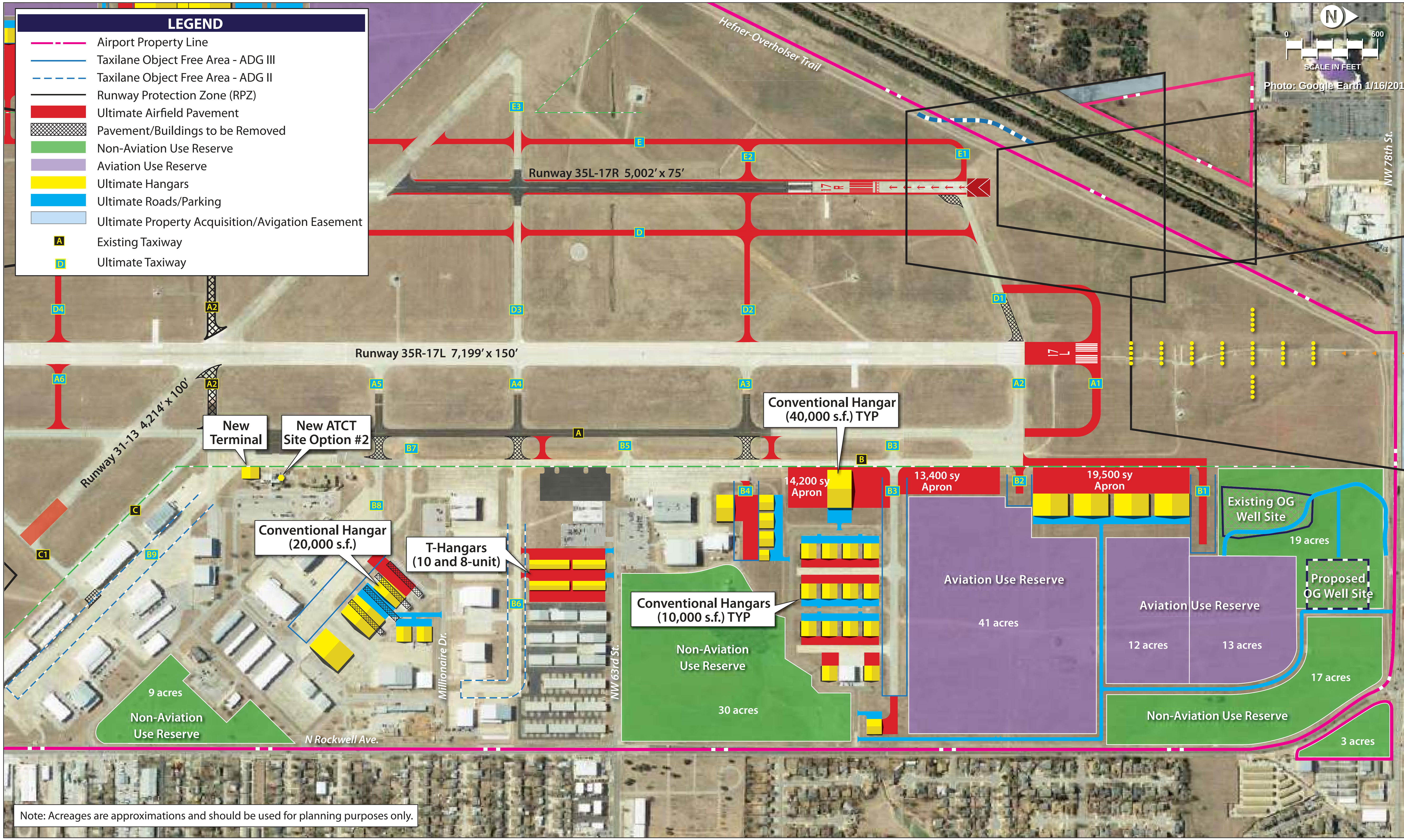
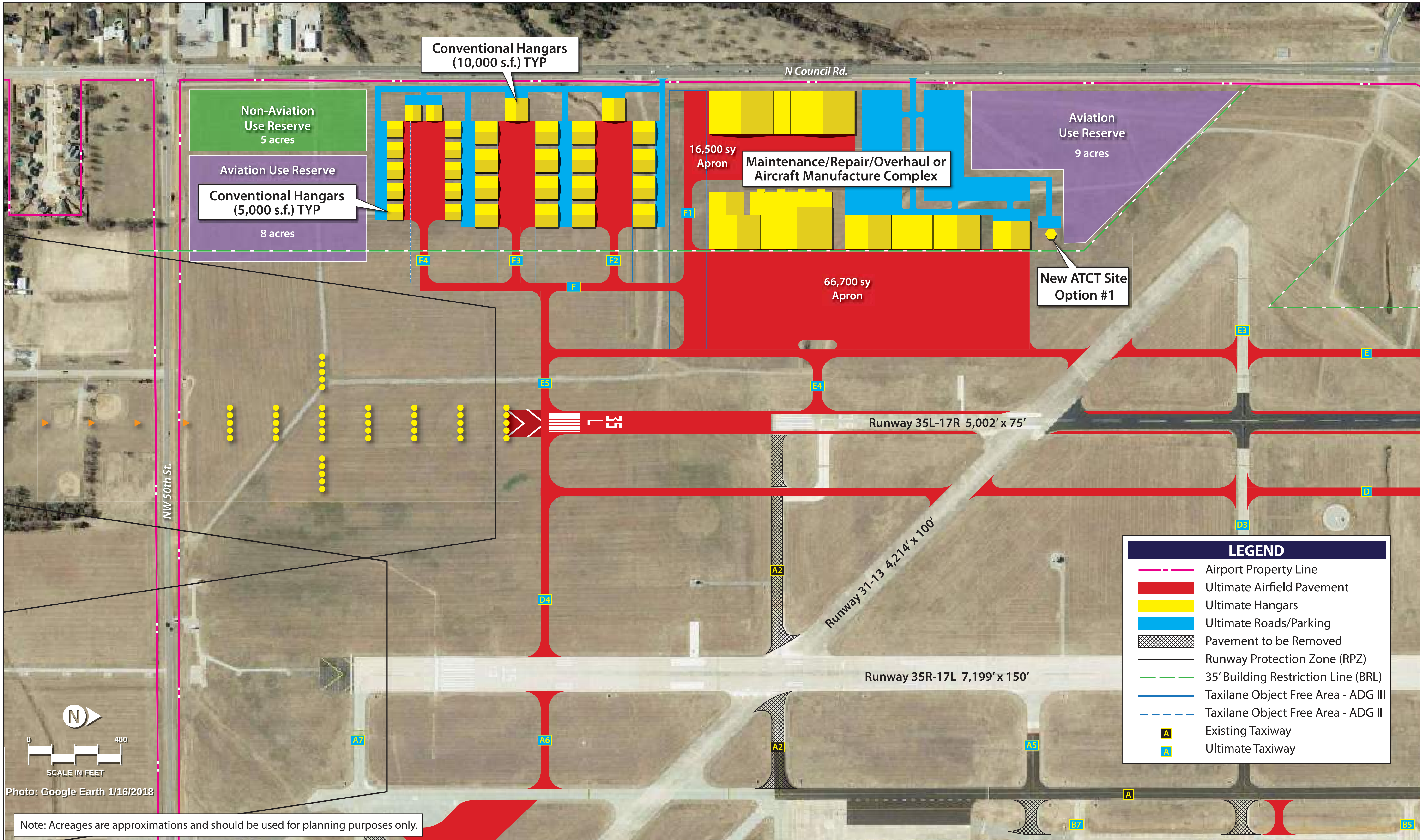


Exhibit 5B
EAST LANDSIDE DEVELOPMENTAL CONCEPT



Note: Acreages are approximations and should be used for planning purposes only.

Exhibit 5C
WEST LANDSIDE DEVELOPMENT CONCEPT

Four existing T-hangars located immediately northeast of the Atlantic Aviation FBO facilities on ultimate Taxilanes B7/B8 are planned for removal/relocation to allow for new FBO/SASO hangar development. This area is prime property for high-activity types of users such as an FBO/SASO and T-hangars are a low-activity use. Clearing the T-hangars creates space to develop up to four new conventional-style hangars with new taxilane/apron pavement and vehicle parking accessible from Millionaire Drive.

Much of the property accessible from ultimate Taxilane B3 has already been laid out for hangar development as proposed, and an existing vehicle access road and utilities are already in place. Approximately 41 acres of additional property north is reserved for aviation-related development that would be accessible by ultimate Taxilanes B1 and B2. A new vehicle access road intersecting with N. Rockwell Avenue on the east side and NW 78th Street on the north side of the development area would provide access to the aviation-use reserve parcel.

The taxilane object free areas (TOFAs) for each taxilane extending east from Taxiway B are depicted on the exhibit. Taxilanes B1, B2, B3, B4, and B7/B8 are planned to meet Airplane Design Group (ADG) III standards, which calls for a 162-foot wide TOFA. Due to limitations associated with existing facilities, Taxilanes B6 and B9 are planned to meet ADG II standards, which has a 115-foot wide TOFA.

Approximately 59 acres of PWA property on the east side is also being reserved for future non-aviation use development. These parcels, depicted in green on **Exhibit 5B**, are inaccessible to the airfield and are highly visible sites with immediate access to N Rockwell Avenue. These areas are better suited for commercial/office park, light industrial, and/or government agency types of uses that will also serve to diversify PWA revenues. Additionally, the old Gulfstream Aerospace aircraft manufacturing plant hangars south of Northwest 50th Street are planned to be demolished and the site redeveloped for non-aviation uses such as a commercial retail complex.

WEST LANDSIDE DEVELOPMENT

Development on the west side of the airfield is included in the concept and is dependent first on the extension of utility infrastructure. It is anticipated that development of the west side would not begin until available property on the east side is built-out or if a large-scale operation, such as a maintenance/repair/overhaul (MRO) or aircraft manufacturing operation, decided to move to PWA.

West side development includes a large-scale MRO/aircraft manufacturing facility that includes several large conventional hangars and an adjoining 66,700-square yard (sy) apron. A large vehicle parking lot is included with the site with accessibility from N Council Road. New taxilanes (F, F2, F3, and F4) are planned to provide access to conventional hangar development sites. Taxilanes F, F1, F2, and F3 are each planned to meet the ADG III TOFA standard (162-foot wide), and F4 is planned to meet the ADG II TOFA standard (115-foot wide). All future west side development is planned to be accessible to the airfield via a new full-length parallel Taxiway E on the west side of Runway 17R-35L.

An additional 17 acres is reserved for future aviation-related development. Approximately five acres at the southwest corner of PWA property (the northeast corner of N Council Road and NW 50th Street) is reserved for future non-aviation (commercial/business, light industrial, government) related development.

AIRPORT TRAFFIC CONTROL TOWER (ATCT)

The current ATCT structure, located on the east side of the airfield and co-located with the terminal building, is in need of repairs and upgrades. The plan includes two potential sites for the construction of a new ATCT facility. The first option for a new ATCT is located on the west side of the airfield, which would provide for an east view of the airfield for controllers, which is preferred over a west view. The challenge with the development of a new ATCT on the west side is extending utility infrastructure to the site. A second option for a new ATCT is on the east side in approximately the same location as the existing ATCT. This second site option has existing utility infrastructure in-place and would potentially eliminate the existing employee parking lot at the terminal building. The second site option would provide for a west view of the airfield for controllers, which is a less preferred option due to the higher potential for sun glare. Both site options are identified on **Exhibits 5B** and **5C**.

LAND USE COMPATIBILITY

Land use planning in the area surrounding PWA occurs through regulatory and non-regulatory means. The primary regulatory tool for directing land use is the zoning ordinance, which limits the types, size, and density of land uses in various locations. Examples of land use types include residential, commercial, industrial, and agricultural. Non-regulatory means of land use controls includes the comprehensive or strategic land use plan. These can be adopted for the greater municipality or for specific areas.

It is important to note the distinction between primary land use concepts used in evaluating development with the airport environs and existing land use, comprehensive plan, and zoning land use. Existing land use refers to property improvements as they *exist today* according to county records.

The comprehensive plan land use map identifies the *projected or future* land use according to the locally adopted comprehensive plan. This document guides future development within the community planning area and provides the basis for zoning designations.

Zoning identifies the type of land use *permitted* on a given piece of property according to the county and city zoning ordinances and maps. Local governments are required to regulate the subdivision of all lands within their corporate limits. Zoning ordinances should be consistent with the general plan, where one has been prepared. In some cases, the land use prescribed in the zoning ordinance or depicted in the general plan may differ from the existing land use.

The following sections describe the applicable land use policies for the areas within the vicinity of Wiley Post Airport. Specifically, these sections pertain to the lands within the 65 day-night average sound level (DNL) noise contours and the Part 77 Approach Surface out to one mile from the end of the runways. These geographic extents are discussed in more detail below.

EXISTING LAND USE

PWA is bordered by two cities: Oklahoma City to the east, north, and west; and the City of Bethany along the southern boundary and to the east. Most of the land surrounding the airport is developed with single-family and multi-family residential uses in both jurisdictions. Other uses around the airport within Oklahoma City include industrial and public/quasi-public uses, along with undeveloped open space, around NW 78th Street/W Wilshire Boulevard and Urban - Low Intensity use comprised primarily of low-density residential to the west along N Council Road. Within the City of Bethany, non-residential uses include commercial/mixed-use, industrial, parks/open space, and other underutilized land along NW 50th Street; and commercial/mixed-use, light industrial and Planned Unit Development along N Rockwell Avenue.

A summary of existing land uses and the associated land use map for the area surrounding PWA can be found in Chapter One under the section titled "Community Planning." These land uses are depicted on Exhibit 1B.

FUTURE LAND USE

The comprehensive plan is a general policy document used by government agencies to identify and describe communities' characteristics, articulate goals and policies, and explore alternative plans for future growth, which in turn forms zoning ordinances and subdivision regulations to carry out the plan's goals. Often, municipalities will include goals and policies for their airports, which is typically a separate policy document from an airport master plan. Comprehensive plans aid local decisionmakers regarding complicated issues during the development process or a maintenance issue.

As previously mentioned, PWA is bordered by two municipalities, the City of Oklahoma City and the City of Bethany. A discussion regarding the comprehensive plans for both jurisdictions is found below.

planokc,[3] originally adopted in 2015, is the City of Oklahoma City's comprehensive plan. The plan is divided into eight areas of interest, called "Elements," each with in-depth reviews of goals, challenges, initiatives, and implementation measures. These elements outlined in the plan are: future land use, transportation, environmental and natural resources, communities, preservation/appearance/culture, parks and recreation, economic development, and public services. Goals of *planokc* are to be achieved through the seven "Big Ideas" identified in Chapter One.

planokc identifies seven "base" Land Use Typology Areas (LUTAs) and seven "layer" LUTAs, rather than traditional land use designations. A base LUTA is oriented around a spectrum of development intensities, while a layer LUTA is a content-specific designation that adjusts the purpose and function of the base LUTA. Descriptions of the LUTAs present around the airport are described below.

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[3] City of Oklahoma City Planning Department – *planokc* (https://www.okc.gov/departments/planning/comprehensive-plan) – accessed May 2019.

- **Urban Low Density** – A base LUTA which is applicable to the least intensely developed areas of the city that still receive water, sewer, police, park, and fire services. Development in these areas should provide horizontal integration of land uses, connectivity within and between individual developments, and design that facilitates pedestrian and bicycle transportation.

- **Heavy Industrial** – This layer LUTA is intended to accommodate industrial uses that are difficult to integrate with less intense uses due to negative impacts from heavy traffic, noise, and odors.

The City of Bethany's *Comprehensive Plan 2030*,[4] adopted in 2016, was drafted to establish a new vision for the city regarding land use, transportation, economic development, housing and health, special districts, natural and historic resources, and utilities and services.

Future land uses in the Part 77 approach surface area include parks/city services/shared facilities, residential neighborhoods, hospitals/universities/schools/churches[5], industrial mixed-use, and commercial. These land uses are as follows:

- *Parks/City Services/Shared Facilities/Churches* – The City of Bethany places great importance on these public and quasi-public places. The Comprehensive Plan identifies the need to maintain deteriorating park facilities, the creation of new park land, continuing to offer strong police and fire protection, and the need to share facilities with schools and universities to curb maintenance costs.

- *Residential* – The goal for the city is to create an attractive community, with family-friendly, safe, healthy, diverse, and unique neighborhoods. Objectives to attain this goal include housing and block-level rehabilitation, encourage market driven mix of new housing, and create a volunteer corps. The Comprehensive Plan divides the current housing stock into three groups based on age and condition. The East Neighborhood includes those homes constructed prior to 1960, typically less than 1,500 sf, and generally with two bedrooms and one bathroom. The Southwest Neighborhood includes homes built between 1960 and 1979, typically less than 2,000 sf in size, but have three bedrooms and two and a half bathrooms. Finally, Central Neighborhoods represent the newer housing stock, are typically greater than 2,000 sf, with more bedrooms and bathrooms.

- *Industrial Mixed-Use* – The Rockwell Industrial Mixed-Use district is primarily located adjacent to Rockwell Avenue and was originally intended for residential use along a major arterial street in the city. However, over time, industrial and commercial uses developed adjacent to PWA, creating an unplanned mix of uses along Rockwell Avenue. The objectives for this land use are:

    1. Promote light industrial uses north of 50th Street to support Wiley Post Airport and to create a critical mass of compatible and supporting uses for a true light industrial district.

[4] City of Bethany Community Development – *Comprehensive Plan 2030* (http://cityofbethany.org/232/Comprehensive-Plan) – accessed May 2019.
[5] The City of Bethany *Comprehensive Plan 2030* does not provide a land use description for "Hospitals/Universities/Schools/Churches.

2. Re-imagine the cemetery as a gateway at the northernmost end of Rockwell Avenue with improvements to aesthetics and security to create a sense of arrival and to increase visitor safety.
3. Improve safety and walkability along Rockwell Avenue with sidewalks, lighting, shade trees, and infill mixed-use development.

The Comprehensive Plan states that the long-term vision for the Rockwell Industrial Mixed-Use district is to be a mixed-use district of industrial, commercial, and residential uses with two- to three-story development in the form of vertical and horizontal mixed-use, offering support services to PWA.

- *Commercial* – The goal for the City of Bethany is to generate additional retail sales tax to support city services. The following objectives are outlined in the Comprehensive Plan to meet this goal:

    1. Increase capacity for additional retail in different format and varying scales;
    2. Incorporate a mixed-use approach to development that incorporates residential with commercial use.
    3. Identify specific districts to concentrate future mixed-use development.

ZONING

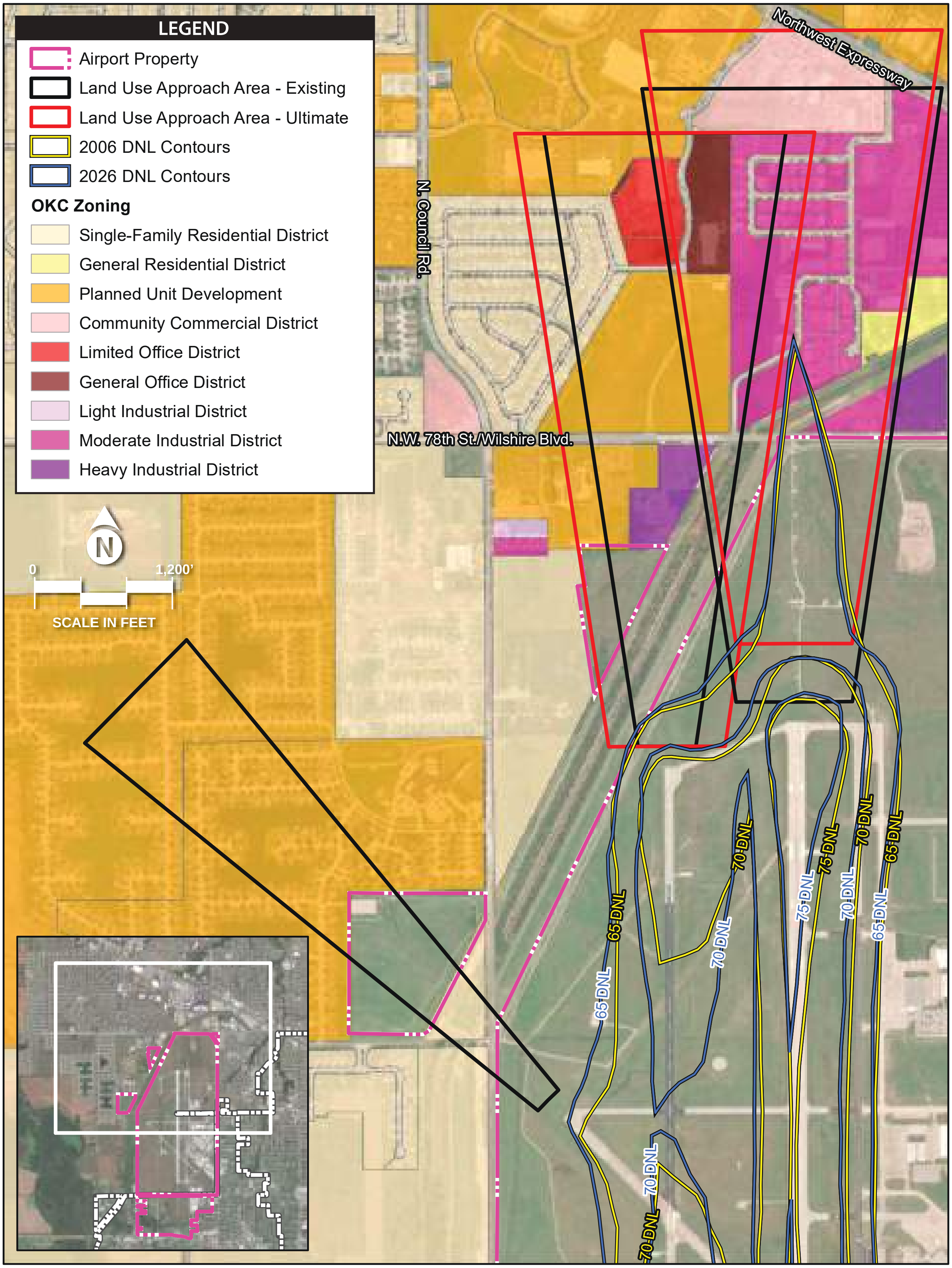
Used in conjunction with subdivision regulations and an essential tool to achieve goals and policies outlined in the Comprehensive Plan, zoning regulations are used to divide land into districts, or zones, and regulate land use activities in those districts, specify permitted uses, intensity and density of each use, and the bulk sizes of each building. Traditional zoning ordinances separate land into four basic uses: residential, commercial (includes office), industrial, and agricultural.

City of Oklahoma City Chapter 59: Zoning and Planning Code

Chapter 59 of the City of Oklahoma *Municipal Code 2010*[6] outlines the zoning classifications used to regulate the general growth of the city. The following zoning districts are found in the Part 77 approach surface area and the DNL 65 decibel (dB) of PWA as depicted on **Exhibit 5D**.

Single-family Residential District (R-1): The R-1 district is the most restrictive residential district. The principal use in R-1 is single-family residential with provisions for related recreational, religious, and educational facilities normally required to provide basic elements of a balanced and attractive residential area. Internal stability, attractiveness, order, and efficiency are encouraged by providing adequate light, air, and open space for dwellings and related facilities, and through consideration of the property functional relationships of each element.

[6] City of Oklahoma City *Municipal Code 2010*; (https://library.municode.com/ok/oklahoma_city/codes/code_of_ordinances?nodeId=OK-MUCO2010_CH59ZOPLCO) – accessed May 2019



Source: ESRI Basemap Imagery (2017), City of Oklahoma City

Exhibit 5D
OKLAHOMA CITY EXISTING ZONING

General Residential District (R-4): The R-4 district is a higher density residential district which encourages multiple-family and group residential developments, representing a broad variety of housing types and densities. The regulations are designed to facilitate infill residential development and development close to non-residential uses. Provisions are made for conditional approval of those uses that support and service the development in a manner that will not have a harmful effect on the character of existing neighborhoods by reducing dependence upon automobile transportation and encouraging population densities that will support mass transportation.

Light Industrial District (I-1): This district is intended to accommodate low-impact industrial development and supporting commercial or public uses in areas where little or no nuisance impacts are generated. These industrial uses may require good accessibility to air, rail, or street transportation routes, but the size and volume of the raw materials and finished products should not be as great as that produced by uses in the moderate and heavy industrial districts. No manufacturing, assembly, repair, work activity or storage, other than outside sales and display as permitted by this chapter, shall take place outside the confines of an enclosed building.

Moderate Industrial District (I-2): The I-2 district is intended primarily for light manufacturing, assembly and fabrication, and for warehousing, wholesale and service uses, which may generate relatively low levels of noise, odor, smoke, dust or intense light. Permitted industrial uses may require good accessibility to air, rail, or street transportation routes, but do not depend heavily on frequent personal visits of customers or clients. Provisions are also made for outdoor operation and storage.

Heavy Industrial District (I-3): The I-3 district is intended to provide locations for those industrial uses that may generate relatively high levels of noise, vibrations, smoke, dust, odor or light. These industrial uses are incompatible with residential uses, and for this reason it is desirable that they be located downwind and as far away as possible from residential and most commercial uses.

Planned Unit Development (PUD): The PUD is a special zoning district category that provides an alternative approach to conventional land use controls. The PUD may be used for specific tracts or parcels of land under common ownership and are to be developed as one unit according to a Design Statement and a Master Development Plan Map. The PUD has no limitations on minimum or maximum size; however, the PUD typically includes multiple tracts that can be regulated under different base zoning districts and include significant modifications to conventional zoning and land use regulations. The PUD requires a complex analysis and is subject to special review procedures and, once approved by the City Council, becomes a special zoning classification for the property it represents.[7]

Density and height restrictions for these zoning designations, with exception of the PUD, are outlined in **Table 5B** below.

[7] Refer to Chapter 59, Article II, Section 59-2150 for definition. Further information on the PUD zoning classification is found in Chapter 59, Article XIV of the *Municipal Code 2010*.

TABLE 5B
City of Oklahoma City Zoning Ordinance Summary
Zoning District Bulk Standards

Zoning District	Minimum Lot Area	Maximum Density (DU/ sq.ft. or acre[1])	Maximum Height (feet)
Residential Districts			
Single-Family Residential District (R1)	6,000 sq.ft.	1 DU/6,000 sq.ft.	35 ft.
General Residential District (R4)	Single-Family: 5,000 sq.ft. Two-Family: 5,000 sq.ft. or 1 DU/2,500 sq.ft. Other: 7,500 sq.ft.	Single-Family: 1 DU/5,000 sq.ft. Two-Family: 1 DU/2,500 sq.ft. Other: 1 DU/1,250 sq.ft.	Where abutting AA, R-A, R-1, R-1ZL, R-2, R-MH-1, R-MH-2, HL or HP District or within 60 ft.: 20 ft. and one story Between 60 ft. and 75 ft. of said Districts: shall not exceed a 45° bulk plane, measured from a point 35 ft. above grade at the 75 ft. mark Other: None
Industrial Districts			
Light Industrial District (I-1)	12,000 sq.ft.	Not Applicable	*
Moderate Industrial District (I-2)	24,000 sq.ft.	Not Applicable	**
Heavy Industrial District (I-3)	40,000 sq.ft.	Not Applicable	**

[1] Dwelling Units per Acre

* Where abutting or within 35 ft. of an AA, RA, R-1, R-1ZL, R-2, R-3, R-3M, R-MH-1, R-MH-2, HL or HP district: 20 ft. and 1 story. Between 35 and 75 ft. of said district: 35 ft. and two stories. Between 75 ft. and 150 ft. of said district: six stories within a diagonal line representing 2 ft. of additional building setback for every 1 ft. of additional height. For the remainder of the parcel: building height may be increased above 6 stories within a diagonal line representing 1 ft. of additional building setback for every 2 ft. of additional height. Where abutting or within 75 ft. of a R-4M or R-4 District: 35 ft. and two stories, thereafter no height limit. Other: None.

** Where abutting or within 75 ft. of an AA, RA, R- 1, R-2, R-3, R-3M, R-4M, R-MH-1, R-MH-2, HL or HP district: 35 ft. and two stories. Between 75 ft. and 150 ft. of said district: six stories within a diagonal line representing 2 ft. of additional building setback for every 1 ft. of additional height. For the remainder of the parcel: building height may be increased above six stories within a diagonal line representing 1 ft. of additional building setback for every 2 ft. of additional height. Where abutting or within 75 ft. of a R-4M or R-4 district: 35 ft. and two stories, thereafter no height limit. Other: None.

Source: City of Oklahoma City, OK Development Services Oklahoma City Municipal Code 2010 – (https://www.okc.gov/departments/development-services/subdivision-zoning) – Accessed May 2019

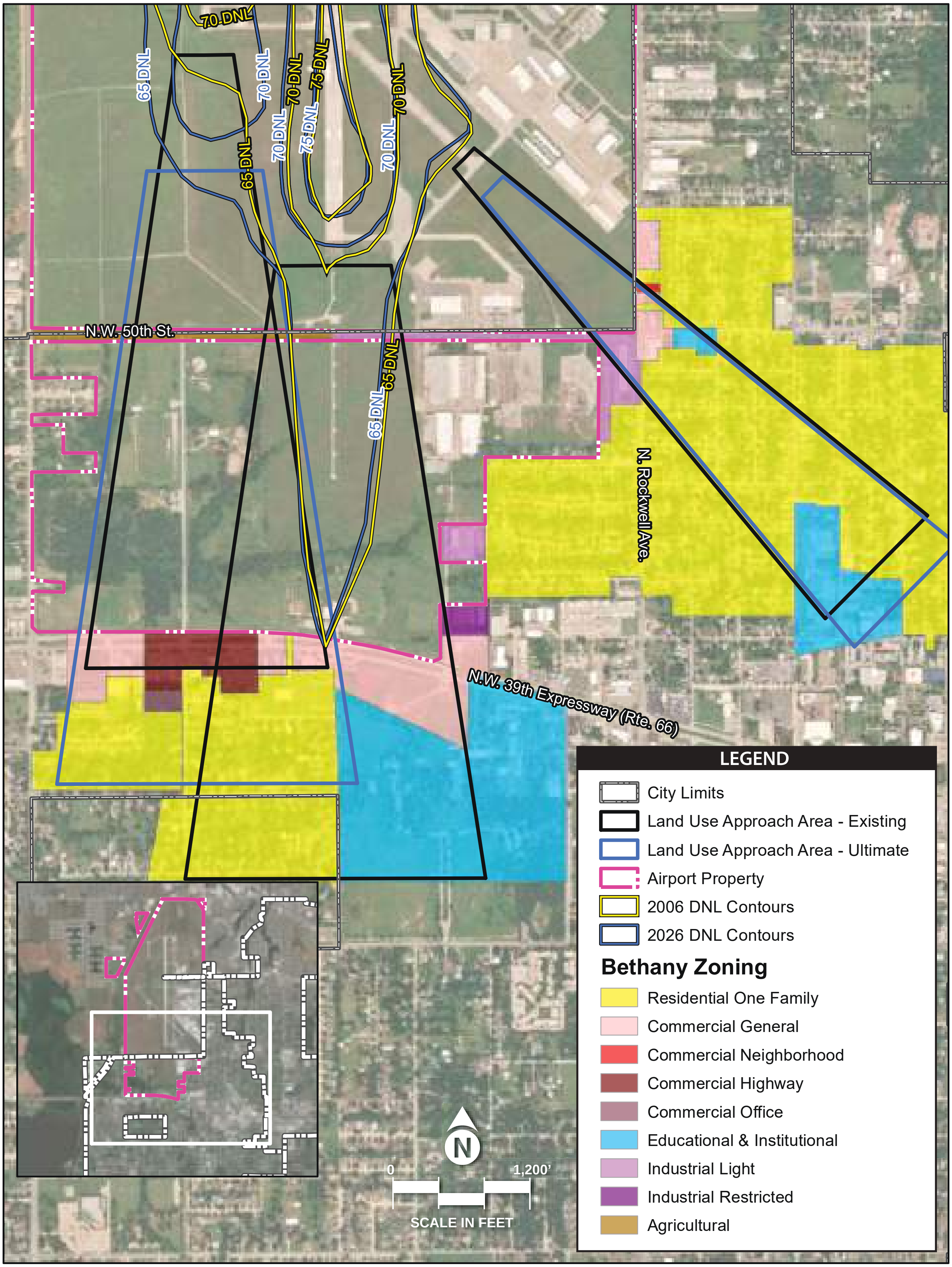
Airport Overlay District (Section 59-13150)

The City of Oklahoma City established Airport Environs Zones promoting the public health, safety, and general welfare, to prevent the creation of airport hazards, and to reduce adverse impacts to surrounding properties. Details about the airport overlay district were discussed in-depth in Chapter One.

City of Bethany Zoning Title XV: Land Usage

Title XV, Chapter 159 of the City of Bethany Code of Ordinances[8] outlines the zoning classifications used to regulate the general growth of the city. The districts listed below are within the Part 77 approach surface area of PWA and are represented on **Exhibit 5E**. The purpose and allowable uses for each zoning classification, as outlined in Chapter 159, Land Usage, is discussed below.

[8] City of Bethany *Code of Ordinances* (http://www.amlegal.com/codes/client/bethany_ok/) – Accessed May 2019



Source: ESRI Basemap Imagery (2017), City of Bethany.

Exhibit 5E
CITY OF BETHANY EXISTING ZONING

Agricultural (A): This district is designed to protect specific areas within clear zones of PWA where development should remain non-existent and other peripheral areas in which development should be controlled or limited and to allow the safe and efficient extraction of subsurface oil and gas after issuance of a special use permit.

Residential one-family (R-1): As the most restrictive residential district, the primary land use in this district is intended for single-family dwellings and related recreational, religious and educational facilities normally required to provide orderly and attractive residential areas. These residential areas are intended to be defined and protected from the encroachment of uses which are not appropriate to residential environment. Internal stability, attractiveness, order, and efficiency are encouraged by providing for adequate light, air and open space for dwellings and related facilities and through consideration of the functional relationship of different uses.

Commercial general (C-G): Intended for conducting general trade and personal services, this district meets certain regular needs and is for the convenience of residents of the community. Persons living in the community require direct and frequent access to this district. This district should not be in areas which affect the internal stability of residential areas. Traffic generated by permitted uses in this district will primarily be passenger vehicles and only those trucks and commercial vehicles required for stocking and delivery of retail goods.

Commercial highway (C-H): This unrestricted commercial district is intended to provide suitable locations for those commercial activities appropriate to location and dependent on NW 39th Expressway/Route 66. These activities typically require direct auto traffic access and visibility from the road, and therefore shall be located only in the vicinity of NW 39th Expressway or the service drives thereof.

Industrial light (I-L): This district is intended primarily for manufacturing and assembly plants that are conducted so the noise, odor, dust, and glare of each operation is completely confined within the enclosed building. These industries may require direct access to rail, air, or street transportation facilities.

Educational and institutional (E-I): This district was established to provide locations for institutional uses of public or quasi-public educational, medical, religious, charitable nature, requires a complex of buildings for a campus, and where maximum flexibility of density and use of building and facilities is desirable.

Although land use classifications for Commercial Neighborhood (C-N) and Industrial Restricted (I-R) are identified for some parcels, these designations are no longer utilized. The City of Bethany is currently undergoing a Title XV rewrite to update land use descriptions and the city's zoning map.[9]

Density and height restrictions for these zoning designations, with exception of the C-N and I-R, are outlined in **Table 5C** below.

[9] McCellon, Amanda, City of Bethany, OK Director of Planning and Community Development. Phone interview by Michelle Kriks of Coffman Associates, Inc. July 11, 2019.

TABLE 5C
City of Bethany Zoning Ordinance Summary
Zoning Districts Bulk Standards

Zoning District	Minimum Lot Area	Maximum Density (DU/sq.ft. or acre,[1] or Maximum Lot Coverage)	Maximum Height (feet)
Residential Districts			
Agriculture District (A)	5 acres	1 DU/5 acres	35 ft.
Residential One-Family (R-1)	6,000 sq.ft.	1 DU/6,000 sq.ft.	35 ft.
Commercial and Office Districts			
Commercial General (C-G)	None	35%	90 ft.
Commercial Highway (C-H)	15,000 sq.ft.	30%	90 ft.
Industrial Districts			
Industrial Light (I-L)	None	None	35 ft.
Special District			
Educational and Institutional (E-I)	None	None	None
[1] DU/sq.ft. or acre – dwelling unit per square foot or acre			

Source: City of Bethany, OK Department of Community Development Code of Ordinances, Title XV: Land Usage (http://cityofbethany.org/166/Community-Development) – Accessed May 2019

Included as part of the city's *Code of Ordinance*, the *City Charter* expresses the city's power under home rule to incorporate. Article VIII, Section 1 of the *City Charter* addresses Planning and Zoning, giving the city "full power to promote the general welfare by regulating the use of property and by controlling the development of the City through the exercise of the complete powers of planning and zoning within the City limits." In March 1988, the city amended Article VIII of the *City Charter* by limiting the number of dwelling units to 12 DU/acre, with exceptions granted for student housing owned by an accredited public or private educational institution and for dwelling units located within the Central Business District (CBD).[10]

Airport Height Regulations (Section 157)

The City of Bethany establishes certain protected zones around the airport, which limit the height and land uses to ensure both aircraft safety and the safety of those on the ground. The following information was derived using an airport zoning map last revised in 1960.[11]

- **Height Limitations:** Unless otherwise stated, no structure or tree shall be erected, altered, allowed to grow or be maintained in any zone created by the ordinance in excess of the height limit established below:[12]

[10] City of Bethany, Oklahoma *Code of Ordinance City Charter* (http://cityofbethany.org/DocumentCenter/View/1531/City-Charter-PDF-) – Accessed July 2019
[11] Wiley Post Airport zoning map prepared by Hudgins, Thompson & Ball Associates, dated November 13, 1959, revised May 26, 1960 and November 1, 1960.
[12] These zones were created and established by the city which include all land lying within the aforementioned zones for Wiley Post Airport. These zones are provided on the Wiley Post Airport zoning map, incorporated into the *Code of Ordinance* by reference, and is to be on file with the City of Bethany City Clerk. (Chapter 157: Airport Height Regulations, http://library.amlegal.com/nxt/gateway.dll/Oklahoma/bethany/cityofbethanyoklahomacodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:bethany_ok) – accessed May 2019

- *Instrument approach zone:* 1 foot in height for each 50 feet in horizontal distance beginning at a point 200 feet from the south end of the instrument runway and extending a distance of 10,200 feet from the end of the runway, thence 1 foot in height for each 40 feet in horizontal distance, extending to the south edge of the city.
- *Non-instrument approach zone:* 1 foot in height for each 40 feet in horizontal distance beginning at a point 200 feet from the end of non-instrument runway and extending to a point of 10,200 feet from the end of non-instrument runway or the east edge of the city, whichever is least.
- *Transition zone:* 1 foot in height for each 7 feet in horizontal distance, beginning at a point 250 feet from the centerline of non-instrument runways and 500 feet from the centerline of instrument runways, measured at right angles to the longitudinal centerline of the runway, extending upward to a maximum height of 150 feet above the established airport elevation. In addition to the foregoing, there are established height limits in addition to the height limit imposed by the instrument and non-instrument approach zones of 1 foot of vertical height for each 7 feet horizontal distance, measured from the surface of all approach zones for the entire length of the approach zone.
- *Horizontal zone:* 150 feet above the established airport elevation or a maximum height of 1,452 feet above the mean sea level elevation.
- *Conical zone:* In addition to the height limit on the circumference of the horizontal zone, 1 foot in height for each 20 feet of horizontal distance from the circumference of the horizontal zone, measured in an inclined plane passing through the airport reference point.

- **Prohibited uses:** No use may be made of land or water within any zone in a manner as to create electrical interference with radio communication between the airport and aircraft, make it difficult for aircraft to distinguish between airport lights and other, impair visibility in the vicinity of the airport, or otherwise endanger landing, take off, or maneuvering of aircraft.

SUBDIVISION REGULATIONS

Subdivision regulations are legal devices employed to administer the division of land into two or more lots, parcels, or sites for the building and location, design, and installation of supporting infrastructure. The subdivision regulations are one of two instruments commonly employed to carry out the goals and policies outlined in the Comprehensive Plan.

Subdivision regulations can be used to specify requirements for airport-compatible land development by requiring developers to plat and develop land to minimize noise impacts or reduce the noise exposure to new development. Subdivision regulations can also be used to protect the airport proprietor from litigation for noise impacts at a later date. The most common requirement is the dedication of a noise or avigation easement to the airport sponsor by the land developer as a condition of the development approval. Easements typically authorize overflights of property, with noise levels attendant to such operations.

The *Oklahoma City Subdivision Regulations* was adopted by the Planning Commission in January 2015, whereas the City of Bethany's subdivision regulations are included in the city's municipal code, Title XV: Land Usage. According to the regulations for both cities, there are no specific procedures related to airport land use compatibility in the subdivision process. Airport land use compatibility is addressed in the zoning code.

BUILDING CODE

Building codes were established to provide minimum standards to safeguard life, limb, health, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures. Building codes may be required to provide sound insulation in new residential, office, and institutional buildings when warranted by existing or potential high aircraft noise levels.

For the City of Oklahoma City, a building permit is required anytime there is construction to repair, enlarge, move or demolish any primary or accessory structure. Currently, the City of Oklahoma City has adopted the International Building Code (IBC), 2009,[13] and the City of Bethany has adopted the IBC 2006 Edition.[14] Aircraft sound attenuation is currently not enforced in the City of Oklahoma City[15] or in the City of Bethany.[16]

NOISE EXPOSURE CONTOURS

The standard methodology for analyzing noise conditions at airports involves the use of a computer simulation model. The purpose of the noise model is to produce noise exposure contours that are overlain on a map of the airport and vicinity to graphically represent aircraft noise conditions. When compared to land use, zoning, and general plan maps, the noise exposure contours may be used to identify areas that are currently or have the potential to be exposed to aircraft noise.

To achieve an accurate representation of an airport's noise conditions, the noise model uses a combination of industry standard information and use-supplied inputs specific to the airport. The software provides noise characteristics, standard flight profiles, and manufacturer-supplied flight procedures for aircraft which commonly operate at PWA. As each aircraft has different design and operating characteristics (number and type of engines, weight, and thrust levels), each aircraft emits different noise levels. The most common way to spatially represent the noise levels emitted by an aircraft is a noise exposure contour.

[13] City of Oklahoma City Development Services (https://www.okc.gov/departments/development-services/development-center) – Accessed May 2019)
[14] City of Bethany Community Development (http://cityofbethany.org/166/Community-Development) – Accessed July 2019
[15] Plans Examiner with Oklahoma City Building Department. Phone call interview by Michelle Kriks of Coffman Associates, Inc. May 9, 2019.
[16] City of Bethany Code of Ordinances (http://library.amlegal.com/nxt/gateway.dll/Oklahoma/bethany/cityofbethanyoklahomacodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:bethany_ok) – Accessed July 2019

Airport specific information, including runway configuration, flight paths, aircraft fleet mix, runway use distribution, local terrain and elevation, average temperature, and numbers of daytime and nighttime operations, are also used in modeling inputs.

Based on assumptions provided by the user, the noise model calculates average 24-hour aircraft sound exposure within a grid covering the airport and surrounding areas. The grid values, represented with the day-night noise level metric or DNL, at each intersection point on the grid represent a noise level for that geographic location. To create the noise contours, an isoline, similar to those on a topographic map, is drawn connecting points of the same DNL noise value. In the same way that a topographic contour represents the same elevation, the noise contour identifies areas of equal noise exposure.

DNL is the metric currently accepted by the FAA, Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three agencies have each identified the 65 DNL noise contour as the threshold of incompatibility.

The guidelines summarized in **Exhibit 5F** indicate that all land uses are acceptable in areas below 65 DNL. At or above the 65 DNL threshold, residential land uses without acoustic treatment, mobile homes, and transient lodging are all incompatible. The exhibit notes that homes of standard construction and transient lodging may be considered compatible where local communities have determined these uses are permissible; however, acoustic treatment of these structures is recommended to meet noise level reduction thresholds when comparing the outdoor noise level to the indoor noise level. Schools and other public-use facilities are also generally considered to be incompatible with noise exposure above 65 DNL. As with residential development, communities can make a policy decision that these uses are acceptable with appropriate sound attenuation measures. Hospitals and nursing homes, places of worship, auditoriums, and concert halls are structures which are generally compatible if measures to achieve noise level reduction are incorporated into design and construction of structures. Outdoor music shells and amphitheaters are not compatible and should be prohibited within the 65 DNL noise contour. Additionally, agricultural uses and livestock farming are generally considered compatible with the exception of related residential components of these uses, which should incorporate sound attenuation measures.

Noise exposure contours were prepared for the Wiley Post Airport Master Plan Update in 2009 (study) and are not being updated with this plan update. The base condition was modeled using estimates of number of operations, types of aircraft, and the airport configuration in 2006, with future contours prepared considering a 2026 forecast. The resulting contours are shown on **Exhibits 5D, 5E**, and **5G** and are discussed in the following section.[17]

[17] The contours depicted on Exhibits 5D, 5E, and 5G were prepare for the 2009 Wiley Post Airport Master Plan update. Digitized files of those contours are not available, therefore the contours on the exhibits are derived from the 2009 master plan update exhibits and may not represent exact locations of DNL noise level contours.

LAND USE	Yearly Day-Night Average Sound Level (DNL) in Decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N[1]	N[1]	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N[1]	N[1]	N[1]	N	N
Public Use						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware and farm equipment	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail trade-general	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y[2]	Y[3]	Y[4]	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]
Livestock farming and breeding	Y	Y[6]	Y[7]	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y[5]	Y[5]	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally-determined land uses for those determined to be appropriate by local authorities in response to locally-determined needs and values in achieving noise compatible land uses.

See other side for notes and key to table.

KEY

Y (Yes)	Land Use and related structures compatible without restrictions.
N (No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor-to-indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, 35	Land Use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

NOTES

1. Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB, respectively, should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

2. Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

3. Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

4. Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

5. Land use compatible provided special sound reinforcement systems are installed.

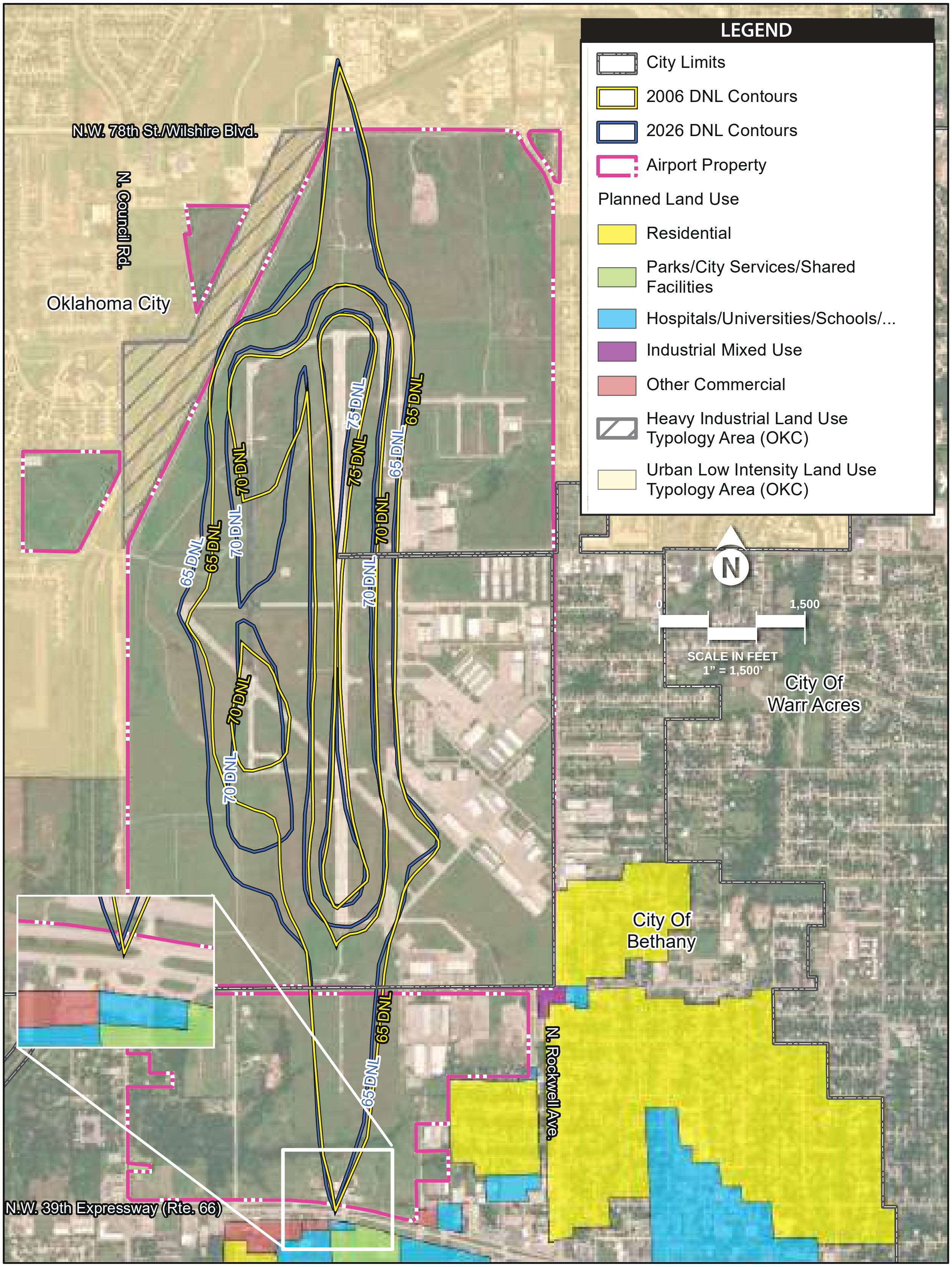
6. Residential buildings require an NLR of 25.

7. Residential buildings require an NLR of 30.

8. Residential buildings not permitted.

Source: ***14 CFR Part 150***, Appendix A, Table 1.

Exhibit 5F (continued)
PART 150 NOISE COMPATIBILITY GUIDELINES



Source: ESRI Basemap Imagery (2017),
City of Oklahoma City planokc (2015),
City of Bethany Comprehensive Plan (2016).

Exhibit 5G : OKLAHOMA CITY & CITY OF BETHANY FUTURE LAND USE

NON-COMPATIBLE DEVELOPMENT ANALYSIS

Areas with the potential for non-compatible development, when compared to the noise exposure contours and height restrictions within the Part 77 approach surfaces out to one mile, have been evaluated. Further discussion of these areas can be found in Chapter One. This was accomplished by evaluating locally adopted future land use plans and zoning designations for those parcels encompassed by the noise contours to determine if noise-sensitive land uses could be developed on those areas. Both the noise contours and height restrictions within the Part 77 approach surface area are addressed below.

Noise Contours

As previously discussed, the 65 DNL noise contour is the threshold of incompatibility for noise-sensitive land uses, such as residential land uses without acoustic treatment, mobile homes, transient lodging, schools, and public facilities.

Where the airport borders the City of Oklahoma City north of Runways 17L and 17R, the 2006 65 DNL noise contours extends beyond the airport boundary across NW 78th Street/Wilshire Boulevard. On **Exhibit 5D**, the zoning map identifies these parcels zoned as Moderate Industrial District (I-2), and based on a review of aerial photography, the current land use appears to be light to moderate industrial uses, a small industrial business park, and undeveloped land not used for agricultural purposes. The I-2 zoning district does not permit traditional residential uses, such as single-family residential or multi-family residential. However, other noise-sensitive uses, such as certain group homes, shelters, and dwelling units above ground floor, can be considered for approval. The 2026 forecast in **Exhibit 5D** shows minimal changes in the location of the 65 DNL contours.

Chapter 59 of the *Oklahoma City Municipal Code 2010* regulates land uses with the 65 DNL, which is referred to Airport Environs Zone One (AE-1) discussed in detail in Chapter One. However, the graphic used to identify the AE-1 zone in the *Municipal Code* appears to be outdated and does not reflect the most recent 65 DNL contour line provided in the 2009 study.

In **Exhibit 5E**, the study for the City of Bethany indicates the 2006 65 DNL noise contour mostly remains on airport property. A small portion of the 65 DNL contour crosses over NW 39th Expressway off airport property, impacting commercially zoned property, which appears to be a heavy commercial use. The 2026 DNL forecast is depicted on **Exhibit 5E** and, similar to the Oklahoma City 65 DNL 2026 forecast, the contours appear to not significantly change and most of the 65 DNL contour remains on airport property. There is no current review procedure in the City of Bethany's *Code of Ordinances* referencing the 65 DNL noise contour.

Both the 2006 and 2026 65 DNL noise contours on Oklahoma City's future land use map affect areas identified as an Urban Low-Density LUTA. According to *planokc*, acceptable land uses vary from low-density residential, neighborhood and regional commercial, and larger scale projects. Both the 2006 and 2026 noise contours for future land use are highlighted on **Exhibit 5G**.

On the City of Bethany's future land use map, both the 2006 and 2026 65 DNL noise contours remain mostly on airport property. However, there is a small parcel south of NW 39th Expressway designated as "hospitals/universities/schools/churches" which could be potentially impacted should the 65 DNL contour be expanded with airport growth. Both the 2006 and 2026 noise contours for future land use are highlighted on **Exhibit 5G**.

Height Restrictions

Using a similar process to the non-compatible development analysis for noise contours, the zoning and future land uses within the Part 77 approach surface area out to one mile from the end of the runways were evaluated. Future land use designations were not included in this analysis as neither Oklahoma City's *planokc* or the City of Bethany's *Comprehensive Plan 2030* specify height limitations for future land uses.

North of the airport, within Oklahoma City, multiple zoning designations are present. Height restrictions for parcels in the Part 77 approach surface area out to one mile are identified previously in **Table 5B**. These parcels within the existing and ultimate Part 77 approach surface areas are identified in **Exhibit 5D**. In general, the maximum height allowed for all districts (with exception to R-1) is 75 feet. However, since some parcels are zoned PUD, it should be noted that there is no height restriction associated with this zoning classification. All uses and other land use criteria are project-specific in the PUD. Additionally, as noted previously in **Table 5B**, the maximum height limit for the I-2 district in the City of Oklahoma City, which is contingent on adjacent property zoning designation, is as follows:

- When the lot is abutting or within 75 ft. of an AA, RA, R- 1, R-2, R-3, R-3M, R-4M, R-MH-1, R-MH-2, HL or HP district, maximum height is 35 ft. and two stories.
- When the lot is abutting or within between 75 ft. and 150 ft. of an AA, RA, R- 1, R-2, R-3, R-3M, R-4M, R-MH-1, R-MH-2, HL or HP district, maximum height is six stories within a diagonal line representing 2 ft. of additional building setback for every 1 ft. of additional height.
- For the remainder of the parcel, building height may be increased above six stories within a diagonal line representing 1 ft. of additional building setback for every 2 ft. of additional height.
- Where abutting or within 75 ft. of a R-4M or R-4 district, the maximum height is 35 ft. and two stories.
- If the setback is greater than 75 ft., there is no height limit.

Parcels south of the airport within the existing and ultimate Part 77 approach surface areas within the City of Bethany, as depicted in **Exhibit 5E**, as mentioned in a previous discussion are zoned for various uses. The height limitation for residential uses and industrial uses is 35 feet. However, the maximum height for commercial uses is 90 feet, and there is no restriction on the height limit for the E-I district, as codified on the *Code of Ordinances*.

RECOMMENDATIONS

Based on the information presented above and the non-compatible development analysis, the following recommendations are provided to maintain airport land use compatibility in the vicinity of PWA.

Incorporate Airport Land Use Compatibility Goals and Policies into Comprehensive Plans. A comprehensive plan is the starting point guiding a city's development and is the document which recommends policy for development. It is recommended each city include, with input from the City of Oklahoma City Department of Airports, goals, policies, and objectives for PWA when the comprehensive plans are scheduled for updates.

Consider Using 2026 65 DNL Contour as an Overlay Zone in the City of Bethany *Code of Ordinances*. Currently, the long range 65 DNL contour is contained on airport property south of the runways. While the 2026 forecast contour does not show significant change from the 2006, projected land use and zoning designations can change based on the political climate and evolving goals of the city. Establishing an overlay and codifying the requirements will ensure incompatible uses will stay outside the 65 DNL and provide a guide for both the city and developers of areas to avoid for certain development.

Consider Updating Section 59-13150 of the City of Oklahoma City *Municipal Code 2010* – Airport Overlay District with 2026 65 DNL Noise Contours. Incorporating the noise contours from the 2009 study will reflect the most accurate forecast considering the based aircraft and operations forecast for the airport. Updating the maps associated with the Airport Environs will aid both city staff and developers in planning for uses compatible with the airport.

Incorporate Specific Incompatible Land Uses into Title XV, Chapter 157 of the City of Bethany *Code of Ordinances* as Prohibited Uses in the Overlay Zones. Currently, the City of Bethany *Code of Ordinances* restricts height in the Airport Height Regulations of the Code, as outlined in a previous section. While it is important to restrict the height of structures in protected zones identified in Section 157 of the *Code of Ordinances*, it is also necessary to restrict noise-sensitive land uses incompatible with airports, outlined in FAA Part 150 *Noise Compatibility Guidelines*. To ensure limiting noise-sensitive land uses, it is recommended the City of Bethany update the *Code of Ordinances* to include incompatible uses in protected zones and the recommended overlay zone with FAA Part 150 *Noise Compatibility Guidelines*.

Incorporate Updated Part 77 Maps into Local Zoning Ordinances. Currently, the City of Bethany *Code of Ordinances* references various airport zones based on an airport study drafted in 1959 and revised in 1960. To ensure the city's codes are most up to date with the needs of the airport, it is recommended the city incorporate the most current Part 77 map to ensure uses incompatible with the airport or structures which could conflict with the airport are prohibited. It is also recommended the City of Oklahoma City also incorporate the same Part 77 map to ensure consistency around the airport in both jurisdictions.

Encourage the City of Bethany to Revise Permitted Uses with the Agriculture (A) District (Chapter 159, Appendix D – Permitted Uses). Currently, the City of Bethany limits the number of permitted uses in the A district to plant nursery; golf course; home occupations; agriculture, not including commercial feed lots; single-family residential; open space recreations; and group homes. As previously mentioned, the intent of the A district to is protect specific areas within clear zones of the airport; however, not all permitted uses outlined in the code are compatible with airports. Concerns such as noise compatibility and wildlife attractants should be considered.

14 CFR Part 150, addressing airport noise, states that residential and other transient lodging (such as group homes) are compatible adjacent to land uses below the 65 DNL. Land uses at 65 DNL or greater are considered incompatible.

FAA AC 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*, cautions siting golf courses near airports, as they tend to attract hazardous wildlife which post a threat to the safety of aircraft. The FAA recommends a separation distance of at least 10,000 feet from the boundary of airports selling Jet-A fuel when siting a new golf course.

Therefore, it is recommended that single-family residential, group homes, and golf courses be removed as permitted uses when sited near the airport.

Adopt Fair Disclosure Requirements for Real Estate Transactions within the Vicinity of the Airport. Fair disclosure regulations in real estate transactions are intended to ensure that prospective buyers of property are informed that the property is or will be exposed to potentially disruptive aircraft noise or overflights. It is not uncommon, around even the busiest airports, for newcomers to report having bought property without having been informed about airport noise levels. At the most formal level, fair disclosure can be implemented through a City or County ordinance requiring a deed notice for property within the vicinity based on an existing boundary such as the Part 77 Horizontal Surface. The following is an example of deed notice language that would notify the property owner of the proximity of an airport and expectations for living in the vicinity of the airport:

The subject property is within the vicinity of Wiley Post Airport, located at 5915 Phillip J. Rhoads Ave #104, Oklahoma City, OK 73008. Properties within this area are routinely subject to overflights by aircraft using this public-use airport and, as a result, residents may experience inconvenience, annoyance, or discomfort arising from the noise of such operations. Residents also should be aware that the current volume of aircraft activity may increase in response to Oklahoma City and Oklahoma County population and economic growth. Any subsequent deed conveying this parcel or subdivisions thereof shall contain a statement in substantially this form.

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 the 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 the FMRA added a provision requiring airports that have 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, airport sponsors have purview over waste handling services in facilities they own and operate such as the passenger terminal building, aircraft rescue and firefighting (ARFF) station, and maintenance facilities. Tenants of airport-owned buildings/hangars or 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, the airport should work to incorporate facility-wide strategies that create consistency in waste disposal mechanisms. This would ultimately result in the reduction of materials sent to the landfill.

Understanding the airport's waste stream requires an understanding of the types of waste typically generated at airports. Generally, waste from airports can be divided into eight categories, with additional types of municipal solid waste (MSW).[18]

- **Municipal Solid Waste** – more commonly known as trash or garbage – consists of everyday items that are used and then discarded, like product packaging. The following subcategories are either combined with MSW or sorted separately depending on an airport's solid waste practices.
  - **Construction and Demolition Waste** (C&D) is considered non-hazardous trash 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.
  - **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.
- **Deplaned Waste** is waste removed from passenger aircrafts. Deplaned waste includes bottles, cans, newspaper, mixed paper (newspaper, napkins, paper towels), plastic cups, service ware, food waste, and food soiled paper/packaging.
- **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[19] facility for pretreatment prior to discharge in the sanitary sewage system. Due to the chemical in lavatory waste, it can present

[18] Recycling, Reuse and Waste Reduction at Airports, FAA (April 24, 2013)
[19] A triturator facility turns lavatory waste into fine particulates for further processing.

environmental and human health risks if mishandled. Caution must be taken to ensure lavatory waste is not released to 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.
- **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 Environmental Protection Agency (EPA) developed less stringent regulations for certain hazardous waste, known as universal waste, described in 40 CFR Part 237 – The Universal Waste Rule.

The FAA's Airport Cooperative Research Program (ACRP) identified five key best practices in its report, *Recycling Best Practices – A Guidebook for Advancing Recycling from Aircraft Cabins* (2014), that are most effective at advancing aviation recycling.

1. Secure top-down and bottom-up commitment within the airport for recycling efforts
2. Develop consistent recycling procedures and infrastructure
3. Increase the efficiency of existing systems
4. Track, evaluate, and share data on program performance
5. Make recycling a part of everyday business

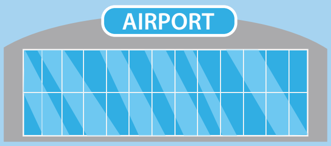
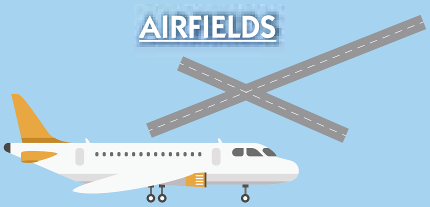
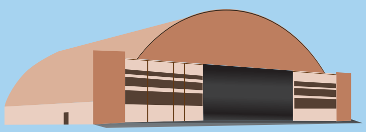
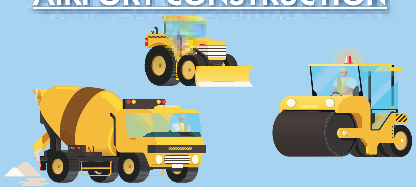
As seen on **Exhibit 5H**, there are seven potential areas of an airport contributing to the waste stream, including terminals, airfields, aircraft maintenance hangars, cargo hangars, flight kitchens, offices, and airport construction projects. To create a comprehensive waste reduction and recycling plan for PWA, all potential inputs must be considered.

There are often few key staff members that are directly involved in the waste management system, making their support and participation critical. It is also crucial to gain the participation of tenants to ensure buy-in of the airport's recycling efforts. PWA must 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 is and is not accepted placed near the solid waste and recycling containers is another significant part of a consistent, effective recycling system.

PWA should ensure that the waste and recycling containers are right-sized to the existing operation, as well as on a collection schedule that picks up only when the containers are full. If recycling services are offered, PWA could track recycling rates and waste quantities to identify cost-saving measures that are currently unidentified simply based on the lack of quantitative data. Lastly, PWA should 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 mutual understanding of the airport's solid waste and recycling goals and how tenants play a vital role in the airport's overall success.

The implementation of an effective program requires accurate data of current waste and recycling rates. There are several ways an airport can gain insight into their waste stream. The waste audit is the most comprehensive and intensive way to assess waste stream composition, opportunities for waste reduction, and capture of recyclables.

AIRPORT WASTE STREAMS

AIRPORT AREA	POTENTIAL INPUTS	POTENTIAL OUTPUTS
TERMINALS 	Restaurants Shops Passengers Employees	Food Waste, Paper Plastic, Aluminum Cans Trash, Grease & Oil Green Waste Deplaned Waste
AIRFIELDS 	Aircraft Operations	Runway Rubber Green Waste
CARGO HANGARS 	Goods Movements	Plastic Wood Vehicle Waste (Tires & Fluids)
AIRCRAFT 	Aircraft Ground Support Equipment (GSE)	Vehicle Waste Plastic Wastewater Hazmat
AIRPORT CONSTRUCTION 	Construction Re-Construction Demolition	Reused Concrete Reused Asphalt Vehicle Waste Soils, Building Materials Wood, General Waste
FLIGHT KITCHENS 	Aircraft Food Services	Food Waste Waste Water Plastic Wood
ADMINISTRATIVE OFFICES 	Employees	Food Waste Paper, Plastic Aluminum Cans Trash

Source: Recycling, Reuse, and Waste Reduction at Airports, FAA (April 24, 2013)

Examination of Records

- Waste hauling and disposal records and contracts
- 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

EXISTING SERVICES

Solid waste services at the airport are provided by the City of Oklahoma City. The airport has two solid waste dumpsters, located adjacent to the terminal building and maintenance building. No recycling receptacles are located on airport property. No information was available regarding the weight of MSW or recycling materials hauled or the cost of service. MSW bins at the airport are emptied on a weekly basis.

SOLID WASTE MANAGEMENT SYSTEM

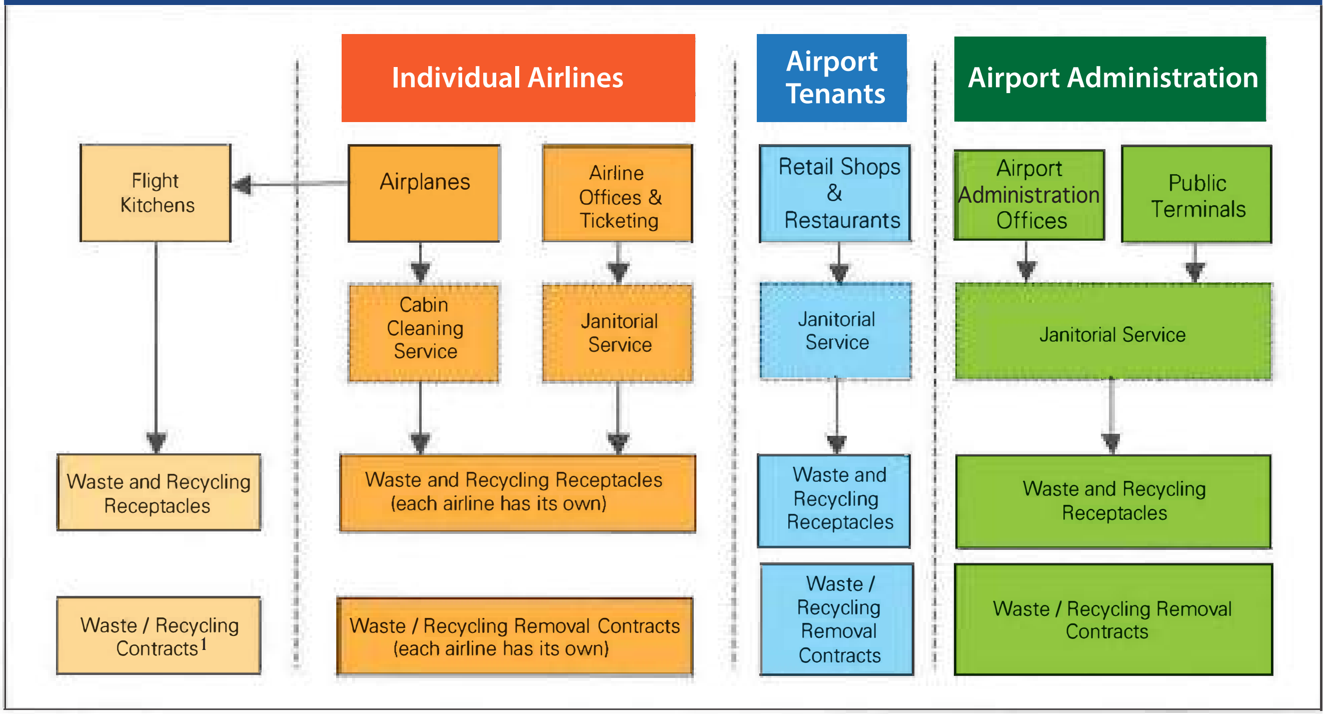
Waste management services at PWA are currently managed independently by various tenants and entities in what is known as a *decentralized* waste management system. To maximize recycling efforts, the airport should actively engage tenants by transitioning to a *centralized* waste management system. **Exhibit 5J** summarizes the differences between these two styles.

Centralized waste management systems provide 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. This management style allows greater control by the airport over the type, placement, and maintenance of compactors and dumpsters, saving space and eliminating the need for each tenant to have their own containers. However, a centralized strategy can be inefficient for some airports as it requires more effort and oversight on the part of airport management. Ultimately, a centralized waste management system will streamline waste and recycling collection, maximizing the opportunity to reduce waste generation and increase diversion of recyclables.

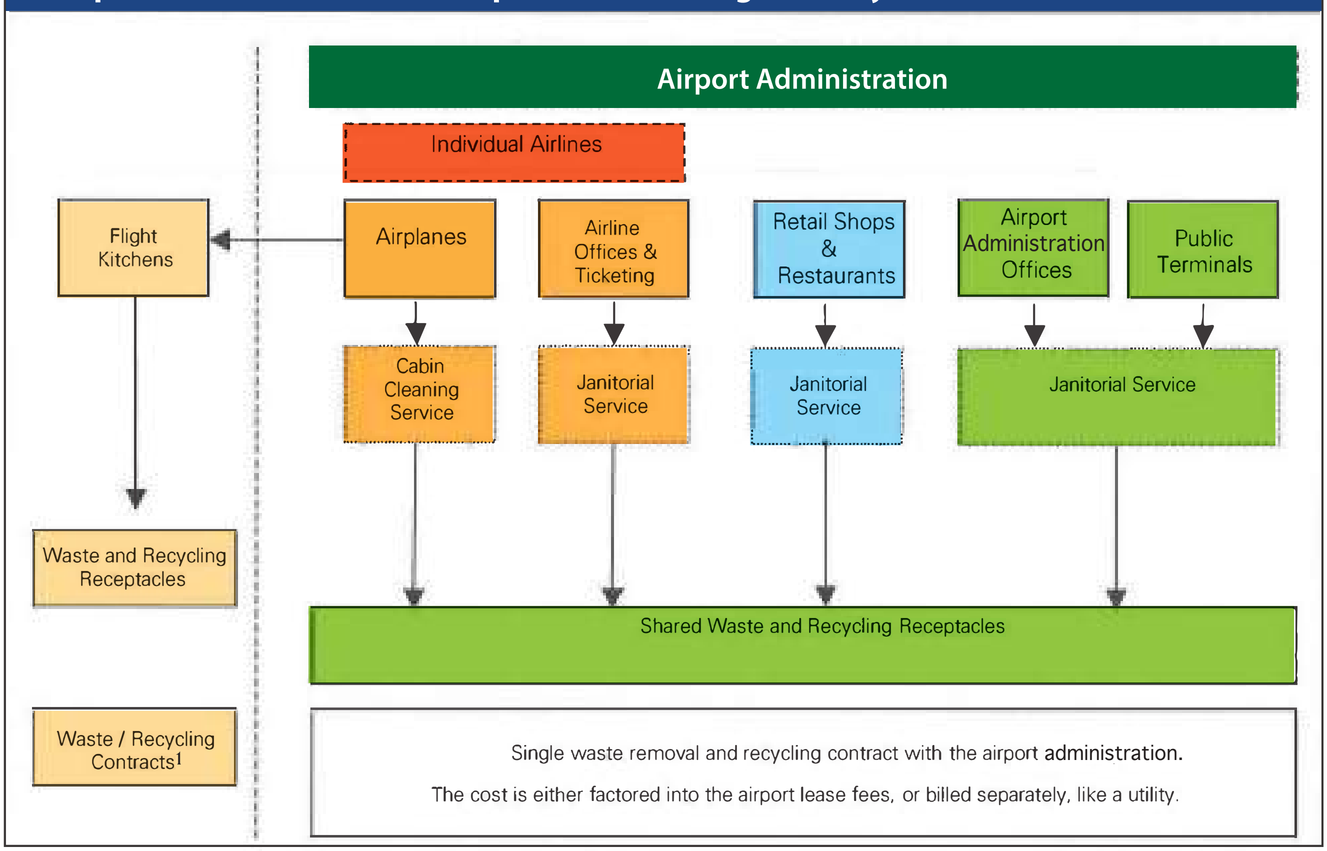
SOLID WASTE AND RECYCLING GOALS

While the airport may or may not expand the existing waste management system by adding recycling receptacles in the terminal building and other hangars at the airport, there are other opportunities for improvement. **Table 5D** outlines objectives that could help reduce waste generation and introduce recycling efforts at PWA. 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.

Components of a Decentralized Airport Waste Management System



Components of a Centralized 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.

Exhibit 5J
WASTE MANAGEMENT SYSTEMS

TABLE 5D
Waste Management and Recycling Goals
Wiley Post Airport

Goals	Objectives
Reduce amount of solid waste generated	Switch to online bill pay to eliminate monthly paper bills
	Conduct a waste audit to identify most common types of waste
	Eliminate purchase of items that are not recyclable (i.e. Styrofoam, plastic bags)
Increase amount of material recycled	Promote recycling services to all areas of the airport
	Improve waste and recycling tracking and data management
	Incorporate recycling requirements and/or recommendations into tenant lease agreements
	Incorporate recycling marketing & promotion efforts throughout public areas
	Require contractors to implement strategies to reduce, reuse & recycle construction & demolition waste

Source: Coffman Associates, Inc.

Exhibit 5K outlines items the City of Oklahoma City accepts for recycling. It is recommended the airport occasionally refer to the city's website to confirm allowable recyclables.[20]

ENVIRONMENTAL OVERVIEW

An analysis of potential environmental impacts associated with proposed airport projects is an essential consideration in the airport master plan process. The primary purpose of this discussion is to review the proposed PWA development concept to determine whether the 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 Airport Layout Plan (ALP) will require compliance with the *National Environmental Policy Act* (NEPA) *of 1969*, as amended. This includes privately funded projects, such as hangars, 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 Federal Aviation Administration (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 included in Chapter One provides baseline information about the airport environs. This section provides an overview of the potential impacts to the existing resources that could result from implementation of the planned improvements outlined in this chapter. While this portion of

[20] Source: City of Oklahoma City, OK – Utilities Department: https://www.okc.gov/departments/utilities/trash-recyling-bulk-waste/what-to-recycle (January 2019)

Recycle Right KC

talogs direct mail coupons STATIONERY notebooks
redded paper phone books paperback books
COLA BOTTLES detergent bottles yogurt containers
VIALS picnic cups milk jugs GLASS wine bottles

DO

- Place your cart at the curbside no later than 6 a.m.
- Place all materials loose in your bin or cart. (Shredded paper can go in paper sacks).
- Rinse cans, jars and bottles with water before placing in cart (a quick rinse should do for most items. Items such as peanut butter or other sticky substances may need a more thorough cleaning).
- Leave labels on.
- Break down and flatten cardboard boxes (for green cart beginning in July).

DO NOT

- Use your recycle bins (or carts) for regular trash, yard waste or construction trash.
- Put recyclable goods in plastic bags and put plastic bags in bin or cart. Plastic bags can clog machines and slow down the separation process.
- Recycle cardboard or other items that are wet or greasy (i.e. greasy pizza boxes).

PAPER

DO:

Regular household or office paper.
Staples and paper clips are okay. Please remove binder clips.

magazines, newspaper, direct mail, office paper, stationery, spiral notebooks, notepads, phone books, shredded paper (put inside paper sacks), paperback books

DO NOT:

Paper towels, toilet paper, disposable diapers, paper napkins, paper coffee cups, or any paper that is wet or has been contaminated with food, household toxins, human waste, oil or grease.

PLASTICS

DO:

Food and bathroom bottles and containers. Cleaning spray bottles.
Empty, rinse and drain as possible. Replace lids before putting in cart.

Milk, juice, pops and water bottles (emptied and drained), picnic cups and plates (rinse off food), yogurt, dairy and margarine, tubs (rinse out), shampoo and conditioner bottles, detergent, fabric softener bottles, prescription vials - emptied, Clean garden pots or flats, packaging materials such as clam shells, or semi-rigid plastics, spray bottles with regular household cleaners (not hazardous waste)

DO NOT:

Plastic grocery bags, bread or newspaper bags, kitchen wrap or shipping/packaging wrap, chip, cereal, pet food or other flexible bags, bubble wrap, plastic drinking straws, Styrofoam, household storage containers, hoses or lawn furniture, bottles that contain household poisons or automotive fluids, CDs, CD or cassette cases or hard plastics.

GLASS BOTTLES AND JARS

DO:

Rinse and drain bottles. All colors of glass accepted. Do not need to remove labels.

Glass water, wine, beer and spirit bottles, food and mason jars

DO NOT:

Window glass, mirrors, automotive glass or heat-resistant kitchen glass, ceramic dish wear, terra cotta or light bulbs.

ALUMINUM AND STEEL

DO:

Cans and kitchen products
Remove food residue. Empty and rinse. Throw lids in separately.

Aluminum cans: soda, beer and other beverage cans, Aluminum foil and bakeware soup, fruit and vegetable, coffee and pet food cans.

DO NOT:

Automotive parts, scrap metal, garage door panels, propane tanks, hangers, pots and pans

Cardboard - BIG GREEN ONLY

DO:

Clean cardboard, flattened and free from food residue and grease.
Remove liners from cardboard boxes and put in Big Blue.

Cereal, cracker and other food boxes (throw away liners), shipping and delivery boxes (break down and flatten), Pizza boxes - no food or greasy residue. Recycle top only if there is grease on bottom.

DO NOT:

Cardboard that is wet, contains melted-on food debris or automotive grease.

Paperboard Cartons - BIG GREEN ONLY

DO:

Empty, rinse and drain

Dairy milk, nut milk and juice cartons, coated and non-coated frozen food boxes the study is not designed to satisfy NEPA requirements for a Documented Categorical Exclusion (CatEx), EA, or EIS, it is intended to supply a preliminary review of environmental issues that might affect implementation of this master plan.

POTENTIAL ENVIRONMENTAL CONCERNS

Table 5E summarizes potential environmental concerns associated with implementation of the recommended Master Plan development concept at PWA. Analysis under NEPA includes direct, indirect, and cumulative impacts.

TABLE 5E
Summary of Potential Environmental Concerns
Wiley Post 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.**	**Potential Impact.** Although the projected increase in operations over the 20-year planning horizon of the Master Plan would result in additional emissions, Oklahoma 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 would 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 Master Plan. An air quality permit may be required depending on whether the airport is determined to be a major source, minor source, *de minimis* facility, or exempt. The Oklahoma Department of Environmental Quality (ODEQ) can provide a formal determination with a request for an Applicability Determination if there is uncertainty to the status of the airport. Air quality permits are required for fuel dispensing facilities.
Biological Resources	**Threshold: The U.S. Fish and Wildlife Service (FWS) 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.**	*For federally listed species:* **Potential Impact.** It has been determined there are five endangered or threatened species with the potential to occur within the vicinity of the airport: • Whooping crane (bird, endangered) • Piping plover (bird, threatened) • Rufa red knot (bird, threatened) • Interior least tern (bird, endangered)

TABLE 5E
Summary of Potential Environmental Concerns
Wiley Post Airport

Environmental Impact Category	FAA Order 1050.1F Significance Threshold / Factors to Consider	Potential Concern
	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; • 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.	• Arkansas River shiner (fish, threatened) One of these species, the whooping crane, has critical habitat identified within the vicinity of the airport. *For designated critical habitat:* **No Impact.** There are no areas of critical habitat within the areas proposed for development in the Master Plan. *For non-listed species:* **Potential Impact.** Non-listed species of concern include those protected by the *Migratory Bird Treaty Act*. There are presently 13 non-listed species of concern that could be impacted by activities at the airport. Habitat to support breeding for these species may be near the site; therefore, the potential for impacts to migratory birds should be evaluated on a project-specific basis. Pre-construction nesting surveys may be required prior to implementation of projects outlined in the Master Plan. PWA is within migratory bird flyways between Texas and Canada. Impacts to bird migratory patterns should be assessed prior to construction.
Climate	FAA has not established a significance threshold for Climate; refer to FAA Order 1050.1F *Desk Reference* for the most up-to-date methodology for examining impacts associated with climate change.	**Potential Impact.** An increase in greenhouse gas (GHG) emissions could occur over the 20-year planning horizon of the Master Plan. Project-specific analysis may be required per the FAA Order 1050.1F *Desk Reference*, based on the parameters of the individual projects.
Coastal Resources	FAA has not established a significance threshold for coastal resources in FAA Order 1050.1F; however, the FAA has identified factors to consider when evaluating the context and intensity of potential environmental impacts on coastal resources.	**No Impact.** PWA is not located within the vicinity of an ocean; therefore, no impacts to coastal resources are anticipated with airport activities.
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**	**Potential Impact.** The Hefner-Overholser trail is located along the western boundary of the airport. Airport development proposed along the trail, such as new airfield pavement, new hangars, parking, and potential non-aviation uses could potentially impact the trail. Coordination with the City of Oklahoma City may be needed to determine any necessary closures to the trail or avoidance measures as needed. Initial assessments should be made to determine whether physical (temporary or permanent) or constructive use of this Section 4(f) resource applies.

TABLE 5E
Summary of Potential Environmental Concerns
Wiley Post Airport

Environmental Impact Category	FAA Order 1050.1F Significance Threshold / Factors to Consider	Potential Concern
	the resource that contribute to its significance or enjoyment are substantially diminished.	Within proximity to the airport is the Lake Overholser Bridge, which is listed on the National Register of Historic Places list and is a protected resource under Section 4(f). If necessary, the FAA will consider several types of impacts to historical properties. The Section 4(f) compliance process involves the preparation of a Section 4(f) statement by the airport, which evaluates other feasible alternatives. Planned airport projects present potential constructive use of other Section 4(f) properties identified in Chapter One on Table 1S. Proposed expansion to Runways 17L and 17R outlined in the concept plan can affect Section 4(f) resources as protected runway areas and altered air traffic patterns may result from runway improvements. The Hefner-Overholser trail could potentially be impacted by runway improvements. The responsible FAA official will be required to consult with all appropriate Federal, state, and local officials having jurisdiction over the affected Section 4(f) properties to determine whether project-related impacts would substantially impair the resource. Consultation would occur as part of the NEPA process as specific projects are initiated.
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].) Factors to consider are if an action would have the potential to convert important farmlands to non-agricultural uses. Important farmlands include pastureland, cropland, and forest considered to be prime, unique, or statewide or locally important land.	**No Impact.** Approximately 145.9 acres (13.8 percent of airport property is classified as "prime farmland." The remaining is classified as "not prime farmland." Although some of the proposed projects in the Master Plan are on land identified as prime farmland if irrigated, that land is not currently used for agricultural purposes. Per the Master Plan, land acquisition and future avigation easements could potentially include prime farmland, but it does not appear existing airport property or future acquirements are on land currently used for agricultural uses. Because current or future land is not currently used for agricultural purposes, projects would likely be exempt from FPPA requirements.
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;	**Potential Impact.** The airport has several fuel storage facilities (100LL and Jet A fuels) and provides opportunity for aircraft maintenance activities that could involve fossil fuels or other types of hazardous materials or wastes. These operations are

TABLE 5E
Summary of Potential Environmental Concerns
Wiley Post Airport

Environmental Impact Category	FAA Order 1050.1F Significance Threshold / Factors to Consider	Potential Concern
	• 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.	regulated and monitored by the appropriate regulatory agencies, such as the U.S. EPA and the ODEQ - Land Protection Division. Since land release is proposed on the concept plan to develop non-aviation uses, an Environmental Due Diligence Audit (EDDA) may be required as part of the land release process, pursuant to FAA Order 1050.19B – *Environmental Due Diligence Audits in the Conduct of FAA Real Property Transactions*.
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).	**Potential Impact.** Three properties on the National Register of Historic Places (NRHP) are as follows: • Lake Overholser Bridge • Lake Overholser Dam • Will Rogers Park Gardens and Arboretum A Section 106 review under the *National Historical Preservation Act* (NHPA) may be required to determine if the proposed improvements will have a potential to cause effect on historic properties. Coordination with the State Historic Preservation Office (SHPO) to determine potential impacts to archeological resources on airport property may be required. If the undertaking is determined to have an adverse effect on cultural resources under Section 106 of NHPA and may have a significant effect on such resources, additional study and coordination may be required. The FAA is responsible for fulfilling the requirements of Section 106. If the undertaking is a type of activity that does not have the potential to cause effect on historic properties, the FAA has no further obligations under Section 106.
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.	**Potential Impact.** The proposed development concept plan includes possible acquisition of land or avigation easements over the airport runway protection zones to prevent land use incompatibility with the airport. Currently, an oil extraction operation is present at the northeast corner of the property, accessible from NW 78th St. Continued use of the oil extraction equipment will necessitate compliance with both state and local regulations and permitting requirements.

TABLE 5E
Summary of Potential Environmental Concerns
Wiley Post Airport

Environmental Impact Category	FAA Order 1050.1F Significance Threshold / Factors to Consider	Potential Concern
Natural Resources and Energy Supply	FAA has not established a significance threshold for Natural Resources and Energy Supply. Considerations should include the potential increased demands on energy utilities, water supplies and treatment, and natural resources that the proposed action or alternative(s) may cause.	**No Impact.** Planned development projects at the airport would result in additional demand for natural resources and energy consumption. No federal permits or certifications are required for natural resources and energy supply; however, Executive Order (E.O.) 13514 requires agencies to consult with state and local entities, as necessary, to determine if any permits may need to be obtained at that level.
Noise and Noise-Compatible Land Use	**Threshold: The action would increase noise by DNL 1.5 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 should 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.	**No Impact.** No noise-sensitive land uses such as residences, schools, and religious facilities exist within this boundary. Noise contours prepared for the Wiley Post Airport Master Plan Update in 2009 were utilized for this analysis. The existing (2006) and ultimate (2026) DNL contours from that study are depicted on **Exhibit 5G**. Local land use actions are within the purview of local governments. The FAA encourages local governments to take actions to reduce and prevent incompatible land uses around the airport. Airports receiving grant funding have compatible land use obligations, as outlined in Section 11.5.3, FAA Order 1050.1F. The NEPA document should address actions by local governments regarding compatible land use within their jurisdiction. 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. 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	**Potential Impact.** The proposed development on airport property could potentially encourage economic growth for the Cities of Oklahoma City and Bethany. New construction jobs, new jobs for the airport and other commercial uses, and new housing could result in an increase in the local tax base. The master plan does not include any recommendations to acquire residences. However, the expansion of Runway 17L-35R at the north end could potentially result in expanding the RPZ and result in the relocation of existing commercial or light industrial uses just north of the airport. If acquisition of real property or displacement of persons is involved, 49 CFR Part 24 (implementing the *Uniform Relocation Assistance of Real Property Acquisition*

TABLE 5E
Summary of Potential Environmental Concerns
Wiley Post Airport

Environmental Impact Category	FAA Order 1050.1F Significance Threshold / Factors to Consider	Potential Concern
	serving the airport and its surrounding communities; or • Produce a substantial change in the community tax base.	*Policies Act* of 1970) must be met for federal projects and projects involving federal funding. The long-term changes to the roadway level of service are determined by the type of use proposed, and a traffic study may be warranted to ensure service is either not substantially impacted or mitigation measures are addressed. In the short-term during construction, temporary disruptions to surface traffic patterns are possible along N Rockwell Avenue, NW 50th Street, N Council Road, and NW 78th Street. Impacts to the public right-of-way should be addressed with both Cities' Public Works departments.
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 the environmental justice population and significant to that population.	**Potential Impact.** Both low-income and minority populations have been identified in the vicinity of the airport. 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. Environmental justice impacts may be avoided or minimized through early and consistent communication with the public and allowing ample time for public consideration. If disproportionately high or adverse impacts are noted, mitigation and enhancement measures and offsetting benefits can be taken into consideration.
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. Two schools have been identified within a close vicinity of the airport. Best management practices should be implemented to decrease environmental health risks to children.

TABLE 5E
Summary of Potential Environmental Concerns
Wiley Post Airport

Environmental Impact Category	FAA Order 1050.1F Significance Threshold / Factors to Consider	Potential Concern
		During construction of the projects outlined in the Master Plan, appropriate measures should be taken to prevent access by unauthorized persons to construction project areas.
Visual		
Visual Effects	FAA has not established a significance threshold for Visual Effects. 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 resources would still be viewable from other locations.	**No Impact.** PWA is not located within a district referenced by municipal code requiring a permit for activities impacting visual resources for either Oklahoma City or the City of Bethany.
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.**	**Potential Impact.** Freshwater emergent wetlands, riverines, freshwater forested/shrub wetlands, and ponds have been identified on airport property, although this information is based on aerial photography interpretation from 1981. Field surveys and wetland delineations may be required to determine the presence or absence of wetlands in project areas. Project areas which could be impacted include final locations of roads/parking, non-aviation uses, and new hangars. Removal or relocation of wetlands may require a Section 404 permit under the *Clean Water Act*, which regulates the discharge of dredged or fill material into waters of the United States, including wetlands.
Floodplain	**Threshold: The action would cause notable adverse impacts on natural and beneficial floodplain values. Natural and beneficial floodplain**	**No Impact.** There are no 100-year floodplains located on the airport. However, floodplains have been identified beyond airport boundaries. The

TABLE 5E
Summary of Potential Environmental Concerns
Wiley Post Airport

Environmental Impact Category	FAA Order 1050.1F Significance Threshold / Factors to Consider	Potential Concern
	values are defined in Paragraph 4.k of DOT Order 5650.2, *Floodplain Management and Protection.*	100-year floodplain will not be impacted by development or needed avigation easements.
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.**	**Potential Impact.** The airport is divided between two watersheds: the Lake Overholser-North Canadian River Watershed and the Cottonwood Creek Watershed. Most likely, stormwater runoff will flow either to the west into drainages flowing to Lake Overholser, or to the northeast towards Lake Hefner. Stormwater pollutants are a source of potential adverse effect to downstream wetlands and streams. Depending on the location of the stormwater inlet, either Oklahoma City Public Works Department or City of Bethany Public Works manages airport stormwater discharges with an Oklahoma Pollution Discharge Elimination System (OPDES) Permit issued and regulated by the Oklahoma Department of Environmental Quality (ODEQ). The City of Bethany controls the introduction of pollutants into the municipal system through a municipal separate storm sewer system (MS4). The ODEQ requires an OPDES before construction activity. Improvements to the airport will require a revised permit to be issued addressing operational and structural source controls, treatment best management practices, and sediment and erosion control. FAA's Advisory Circular (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	**No Impact.** Proposed projects would not substantially change the amount of water used by the airport. Additionally, airport property does not serve as a significant source of groundwater recharge and is not located near a sole source aquifer.

TABLE 5E
Summary of Potential Environmental Concerns
Wiley Post Airport

Environmental Impact Category	FAA Order 1050.1F Significance Threshold / Factors to Consider	Potential Concern
	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.	
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).	**No Impact.** There are no designated Wild and Scenic Rivers which will be affected by development activities at PWA. No adverse effects on a river's outstanding remarkable values (i.e., scenery, recreation, geology, fish, wildlife, and history) are anticipated.

Source: Coffman Associates, Inc. analysis

SUMMARY

The best means to begin implementation of the recommendations in the Master Plan is to first recognize that planning is a continuous process that does not end with completion and approval of this document. Rather, the ability to continuously monitor the existing and forecast status of airport activity must be provided and maintained. The issues upon which the master plan is based will remain valid for many years. The primary goal is for PWA to best serve the general aviation air transportation needs of the region, while continuing to be economically self-sufficient.

The actual need for facilities is most appropriately established by PWA activity levels rather than a specified date. For example, projections have been made as to when additional hangars may be needed. However, the timeframe in which the development is needed may be substantially different. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need to accelerate the development. Although every effort has been made in this master planning process to conservatively estimate when facility development may be needed, actual aviation demand will dictate when facility improvements need to be delayed or accelerated.

The real value of a usable master plan is in keeping the issues and objectives in the minds of the managers and decision makers so they are better able to recognize change and its effect. In addition to adjustments in aviation demand, decisions made as to when to undertake the improvements recommended in the master plan will impact the period that the plan remains valid. The format used in this plan is intended to reduce the need for formal and costly updates by simply adjusting the timing. Updating can be done by PWA staff, thereby improving the plan’s effectiveness.

In summary, the planning process requires PWA management to consistently monitor progress in terms of aircraft operations and based aircraft. Analysis of aircraft demand is critical to the timing and need for certain airport facilities. The information obtained from continually monitoring activity will provide the data necessary to determine if the development schedule should be accelerated or decelerated.

Chapter Six

Financial Management and Development Program

Chapter Six

FINANCIAL MANAGEMENT AND DEVELOPMENT PROGRAM

This chapter presents financial projections for Wiley Post Airport (PWA) based on the Capital Improvement Program (CIP) presented later in this chapter and the aviation activity forecasts presented in Chapter Two. The Airport's Fiscal Year (FY) ends September 30. Financial projections were developed for three planning periods: short term (years 1-5 or FY 2021 through FY 2025), intermediate term (years 6-10 or FY 2026 through FY 2030), and long term (years 11-20 or FY 2031 through FY 2040). Financial projections are based on historical FY 2018 data and budgeted FY 2019 provided by the Oklahoma City Airport Trust (OCAT).

AIRPORT'S FINANCIAL STRUCTURE

OCAT is a public trust established in 1956 pursuant to Title 60 of the Oklahoma Statutes section 176 et seq., as amended. The beneficiary of OCAT is The City of Oklahoma City (the City). The primary purpose of OCAT is to plan, provide financing, develop, and operate airports and air navigation facilities for the use and benefit of the City. OCAT has entered into a Lease Agreement with the City whereby the City properties, which are used or useful for airport purposes, are leased to OCAT.

OCAT is a separate and distinct legal entity from the City but does not have employees. All the necessary staffing and operational needs of OCAT to operate and maintain Will Rogers World Airport, PWA, and Clarence E. Page Airport are provided by the City's Department of Airports under the direction of the Director of Airports who also serves as OCAT's General Manager.

OCAT and the Airports Fund are both major funds of the reporting entity and are combined and reported as the Department. The measurement focus is on the flow of economic resources and the accrual basis of accounting whereby, revenues are recognized when earned and expenses are recorded when incurred, regardless of the timing of related cash flows.

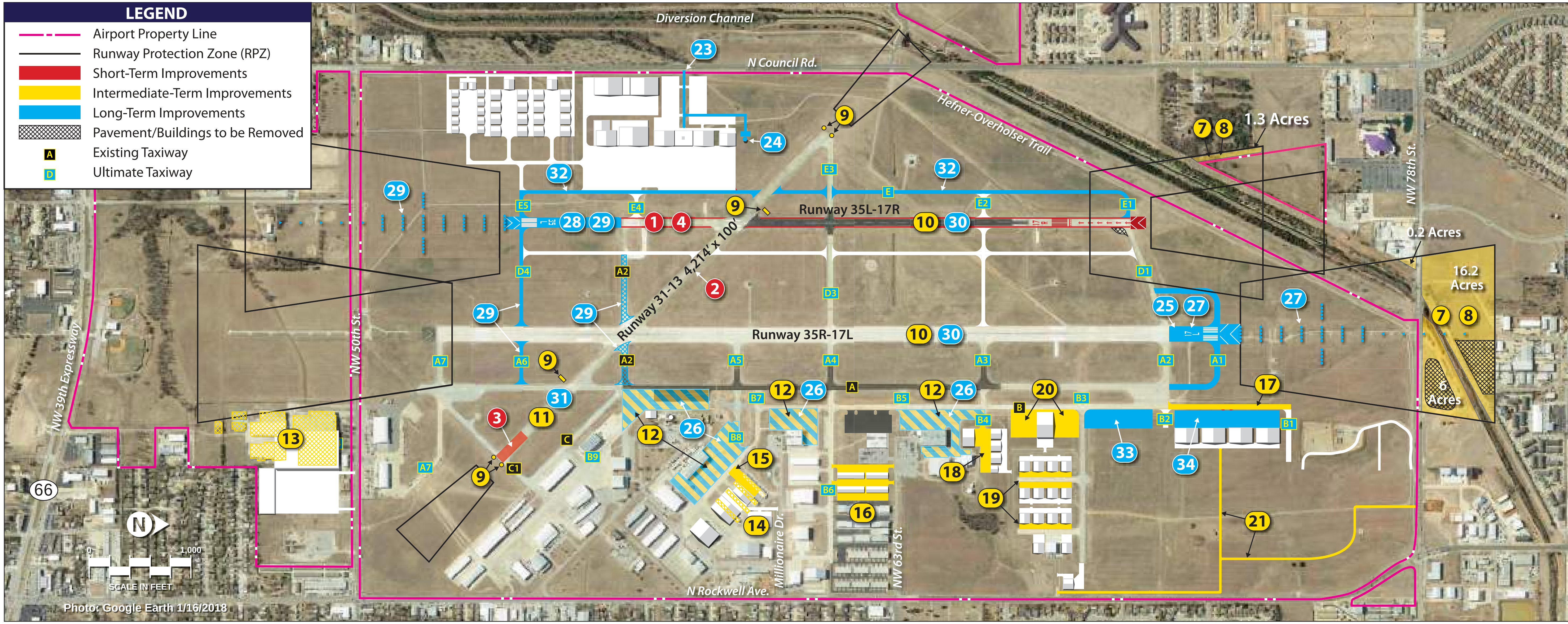
Operating income includes revenues and expenses related to the primary continuing operations of the Department. Principal operating revenues include charges to customers for services and rentals of Department-owned facilities. Principal operating expenses are the costs of providing services, or facilities, and include administrative expenses and depreciation of capital assets. Other revenues and expenses are classified as nonoperating in the financial statements.

CAPITAL IMPROVEMENT PROGRAM

All airports receiving federal Airport Improvement Program (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. **Table 6A** presents cost estimates based on a planning level of detail for the short-term planning period, which is the required five-year plan, as well as the intermediate-term and long-term planning periods.

While accurate for 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 2019 dollars and also include contingencies, design costs, and construction management costs. Beginning with the intermediate-term, project costs are inflated at 3 percent annually, which reflects the most recent five-year average of Engineering News Record's Construction Cost Index. As shown in **Table 6A**, the CIP is estimated to cost approximately $87.1 million in 2019 dollars and approximately $124.2 million in inflated dollars.

Exhibit 6A graphically presents the master plan projects color-coded by planning period. Short-term projects are shown in yellow, intermediate-term projects in blue, long-term projects in green, and beyond long-term projects in orange. A brief discussion of key projects in each period follows.



SHORT-TERM PROJECTS (2020-2024)		
2020	1	Environmental Assessment for the Widening of Runway 17R-35L
2021	2	Design & Construct Rehabilitation of Runway 13-31 - Pavement, Lights and Signs
2022	3	Reclaim Runway 13-31 (348'x100')
2023	4	Design & Construct Widening of Runway 17R-35L
2024	5	New Perimeter Fence *(NP)*
2024	6	Relocate Runway 17R-35L Holding Position Markings to 250' *(NP)*

NP - Not Pictured

INTERMEDIATE-TERM PROJECTS (FY 2025-2029)	
7	Environmental Assessment for Acquisition of 17L and 17R RPZ Properties
8	Acquire Property (17L and 17R RPZ) - 23.7 Acres
9	Install Runway 13-31 PAPI-2's and REILs
10	Rehabilitate Runway 17R-35L and 17L-35R
11	Rehabilitate Runway 13L-31R
12	Apron Rehabilitation - Seal Coat
13	Remove Vacant Gulfstream Structures
14	Remove 4 Existing T-Hangars
15	Expand Apron for Conventional Hangar Development
16	Construct T-Hangar Taxilanes/Aprons and Access Road
17	Extend Taxiway B
18	Construct Taxilane A7
19	Construct Conventional Hangar Taxilanes/Aprons - Phase I
20	Construct FBO/SASO Apron - Phase I
21	Construct New Access Road to Northeast Development Area

LONG-TERM PROJECTS (FY 2030-2038)	
22	Extend Utilities to West Side *(NP)*
23	Construct New Access Road to West Development Area
24	Construct New Airport Traffic Control Tower - Option 1
25	Environmental Assessment for 501' Extension of Runway 17L-35R
26	Apron Pavement Maintenance - Mill/Overlay
27	Extend Runway 17L-35R (501'x150')
28	Environmental Assessment for 998' Extension of Runway 17R-35L and Construction of Taxiway E
29	Extend Runway 17R-35L (998'x100') and MALSR
30	Rehabilitate Runway 17R-35L and 17L-35R
31	Rehabilitate Runway 13L-31R
32	Construct Taxiway E
33	Construct Conventional Hangar Taxilanes/Apron - Phase II
34	Construct FBO/SASO Apron - Phase II

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TABLE 6A
20-Year CIP and Funding Sources
(in 000s)

Project #	Project	Fiscal Year	Project Costs: 2019 Dollars	Project Costs: Inflated [1]	Funding Sources: Non-Primary Entitlement	Funding Sources: OAC State Apportionment	Funding Sources: OAC Local Match	Funding Sources: Third Party	Funding Sources: PWA	Funding Sources: Total
	Short Term (2021 - 2025)									
1	Environmental assessment for the widening of Runway 17R-35L	2021	$350.0	$350.0	$0.0	$315.0	$17.5	$0.0	$17.5	$350.0
2	Design and construct rehabilitation of Runway 13-31	2022	1,523.0	1,523.0	1,370.7	0.0	76.2	0.0	76.2	1,523.0
3	Reclaim Runway 13-31 (348'x100')	2023	90.6	90.6	81.5	0.0	4.5	0.0	4.5	90.6
4	Design and construct widening of Runway 17R-35L	2024	6,200.0	6,200.0	0.0	5,580.0	310.0	0.0	310.0	6,200.0
5	New perimeter fence	2025	2,000.0	2,000.0	1,800.0	0.0	100.0	0.0	100.0	2,000.0
6	Relocate Runway 17R-35L holding position markings to 250'	2025	130.4	130.4	117.4	0.0	6.5	0.0	6.5	130.4
	Total Short Term (2021 - 2025)		$10,294.0	$10,294.0	$3,369.6	$5,895.0	$514.7	$0.0	$514.7	$10,294.0
	Intermediate Term (2026-2030)									
7	Environmental assessment for acquisition of 17L and 17R RPZ properties	2026-2030	$300.0	$380.0	$342.0	$0.0	$19.0	$0.0	$19.0	$380.0
8	Acquire property (17L and 17R RPZ) - 23.7 acres	2026-2030	8,184.6	10,367.9	9,331.2	0.0	518.4	0.0	518.4	10,367.9
9	Install Runway 13-31 PAPI-2's and REILs	2026-2030	177.4	224.7	202.2	0.0	11.2	0.0	11.2	224.7
10	Rehabilitate Runway 17R-35L and 17L-35R	2026-2030	5,494.7	6,960.5	6,264.4	0.0	348.0	0.0	348.0	6,960.5
11	Rehabilitate Runway 13L-31R	2026-2030	307.3	389.3	350.4	0.0	19.5	0.0	19.5	389.3
12	Apron rehabilitation - seal coat	2026-2030	403.2	510.8	459.7	0.0	25.5	0.0	25.5	510.8
13	Remove vacant gulfstream structures	2026-2030	1,879.2	2,380.5	0.0	0.0	0.0	0.0	2,380.5	2,380.5
14	Remove 4 existing t-hangars	2026-2030	378.0	478.8	0.0	0.0	0.0	0.0	478.8	478.8
15	Expand apron for conventional hangar development	2026-2030	383.8	486.2	0.0	0.0	0.0	486.2	0.0	486.2
16	Construct t-hangar taxilanes/aprons and access road	2026-2030	1,094.5	1,386.4	1,247.8	0.0	69.3	138.6	(69.3)	1,386.4
17	Extend Taxiway B	2026-2030	763.5	967.2	870.5	0.0	48.4	0.0	48.4	967.2
18	Construct Taxilane A7	2026-2030	305.8	387.4	348.6	0.0	19.4	0.0	19.4	387.4
19	Construct conventional hangar taxilanes/aprons - Phase I	2026-2030	1,427.3	1,808.1	0.0	0.0	0.0	1,808.1	0.0	1,808.1
20	Construct FBO/SASO apron - Phase I	2026-2030	4,699.4	5,953.0	0.0	0.0	0.0	5,953.0	0.0	5,953.0
21	Construct new access road to northeast development area	2026-2030	1,900.1	2,407.0	0.0	0.0	0.0	2,407.0	0.0	2,407.0
	Total Intermediate Term (2026-2030)		$27,698.7	$35,087.9	$19,416.8	$0.0	$1,078.7	$10,792.9	$3,799.4	$35,087.9
	Long Term (2031-2039)									
22	Extend utilities to west side	2031-2039	$8,250.0	$13,238.8	$0.0	$0.0	$0.0	$0.0	$13,238.8	$13,238.8
23	Construct new access road to west development area	2031-2039	349.9	561.5	0.0	0.0	0.0	0.0	561.5	561.5
24	Construct new airport traffic control tower - Option 1	2031-2039	5,302.4	8,508.8	7,658.0	0.0	425.4	0.0	425.4	8,508.8
25	Environmental assessment for 501' extension of Runway 17L-35R	2031-2039	500.0	802.4	722.1	0.0	40.1	0.0	40.1	802.4
26	Apron pavement maintenance - mill/overlay	2031-2039	3,400.3	5,456.4	4,910.8	0.0	272.8	0.0	272.8	5,456.4
27	Extend Runwway 17L-35R (501'x150')	2031-2039	9,370.5	15,036.9	13,533.2	0.0	751.8	0.0	751.8	15,036.9
28	Environmental assessment for extension of Rwy 17R-35L & construction of Txy E	2031-2039	500.0	802.4	722.1	0.0	40.1	0.0	40.1	802.4
29	Extend Runway 17R-35L (998'x100')	2031-2039	6,880.8	11,041.7	9,937.6	0.0	552.1	0.0	552.1	11,041.7
30	Rehabilitate Runway 17R-35L and 17L-35R	2031-2039	5,494.7	8,817.3	7,935.6	0.0	440.9	0.0	440.9	8,817.3
31	Rehabilitate Runway 13L-31R	2031-2039	307.3	493.2	443.9	0.0	24.7	0.0	24.7	493.2
32	Construct Taxiway E	2031-2039	2,649.4	4,251.5	3,826.3	0.0	212.6	0.0	212.6	4,251.5
33	Construct conventional hangar taxilanes/aprons - Phase II	2031-2039	1,726.8	2,771.0	0.0	0.0	0.0	2,771.0	0.0	2,771.0
34	Construct FBO/SASO apron - Phase II	2031-2039	4,386.1	7,038.4	0.0	0.0	0.0	7,038.4	0.0	7,038.4
	Total Long Term (2031-2039)		$49,118.2	$78,820.4	$49,689.6	$0.0	$2,760.5	$9,809.4	$16,560.8	$78,820.4
	Total CIP		$87,111.0	$124,202.3	$72,476.0	$5,895.0	$4,353.9	$20,602.3	$20,875.0	$124,202.3

[1] Beginning in FY 2026, project costs were inflated at 3%, which reflects the most recent five-year average of *Engineering News-Record's* Construction Cost Index.
Sources: Coffman Associates and DKMG Consulting, LLC

SHORT-TERM IMPROVEMENTS (FY 2021-2025)

The short-term planning period is the only planning horizon separated into single years. This is to allow the CIP to be coordinated with the planning cycle of the FAA. If any of these projects cannot be funded in the timeframe indicated, PWA should consider the project for the following year.

Project #1: Environmental Assessment (EA) for the widening of Runway 17R-35L
Description: NEPA examination for the widening of the runway to meet runway design code (RDC) D-II standards.
Cost Estimate: $350,000
Funding Eligibility: AIP – 90% / OCAT – 10%
Triggering Event: Upgrading the runway to meet higher design standards to provide airfield redundancy.

Project #2: Design and construct rehabilitation of Runway 13-31 – Pavement, lights, and signs
Description: Routine maintenance to extend the useful life of the runway pavement, lighting systems, and signage.
Cost Estimate: $1,523,048
Funding Eligibility: AIP – 90% / Oklahoma Aeronautics Commission (OAC) – 5% / OCAT – 5%
Triggering Event: This is a routine airport facility maintenance project triggered by wear and tear on pavement and equipment.

Project #3: Reclaim Runway 13-31 (348' x 100')
Description: This pavement is a non-standard aligned taxiway with Runway 13-31 that would be re-claimed for the runway resulting in a full length of 4,562 feet.
Cost Estimate: $90,582
Funding Eligibility: AIP – 90% / Oklahoma Aeronautics Commission (OAC) – 5% / OCAT – 5%
Triggering Event: Reclaiming the pavement for runway use eliminates a non-standard aligned taxiway, which improves airfield safety.

Project #4: Design and construct widening of Runway 17R-35L
Description: Adding 12.5 feet of runway pavement on both sides of the existing Runway 17R-35L for a total width of 100 feet.
Cost Estimate: $6,200,000
Funding Eligibility: AIP – 90% / OCAT – 10%
Triggering Event: Project will improve operational safety of the runway for business jet aircraft.

Project #5: New perimeter fence
Description: This project replaces existing fence line along the airport's perimeter.
Cost Estimate: $2,000,000
Funding Eligibility: AIP – 90% / OCAT – 10%
Triggering Event: This is a routine airport facility maintenance/improvement project.

Project #6: Relocate Runway 17R-35L Holding Position Markings to 250 feet
Description: The holding position markings for the parallel runway need to be relocated to a separation distance of 250 feet from the runway centerline to meet ARC B-II-2400 design standards.
Cost Estimate: $130,409
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: Implementing ½-mile visibility minimums for the Runway 35L approach.

INTERMEDIATE-TERM IMPROVEMENTS (FY 2026-2030)

Project #7: EA for Acquisition of 17L and 17R RPZ Properties
Description: NEPA examination for acquiring property within the RPZs planned for acquisition.
Cost Estimate: $300,000
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: The airport should establish control over properties within the RPZs not currently owned or managed by an avigation easement. The NEPA environmental review process is the first step in property acquisition.

Project #8: Acquire Property (17L and 17R RPZ) - 23.7 Acres
Description: Purchasing property within the RPZs.
Cost Estimate: $8,184,553
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: Finding of No Significant Impact (FONSI) during the EA process (see Project #7).

Project #9: Install Runway 13-31 PAPI-2s and REILs
Description: Installation of precision approach path indicators (PAPI) and runway end identifier lights (REILs) at both ends of Runway 13-31.
Cost Estimate: $177,355
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: This project is triggered by a need to improve the operational safety of the crosswind runway for smaller aircraft. PAPIs and REILs improve situational awareness for pilots.

Project #10: Rehabilitate Runway 17R-35L and 17L-35R
Description: Routine maintenance to extend the useful life of the runway pavement.
Cost Estimate: $5,494,660
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: This is a routine airport facility maintenance project triggered by wear and tear on pavement.

Project #11: Rehabilitate Runway 13L-31R
Description: Routine maintenance to extend the useful life of the runway pavement.
Cost Estimate: $307,332
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: This is a routine airport facility maintenance project triggered by wear and tear on pavement.

Project #12: Apron Rehabilitation - Seal Coat
Description: Project includes seal coating the main apron areas on the airport.
Cost Estimate: $403,248
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: This is a routine airport facility maintenance project triggered by wear and tear on pavement.

Project #13: Remove Vacant Gulfstream Structures
Description: The buildings located south of NW 50th Street, formerly associated with the Gulfstream aircraft manufacturing plant, are to be demolished and the site cleared for future non-aviation related development.
Cost Estimate: $1,879,200
Funding Eligibility: OCAT – 100%
Triggering Event: The existing structures are in poor condition, and several are located within the Runway 35R RPZ. The buildings need to be removed from the RPZ for safety purposes.

Project #14: Remove Four Existing T-Hangars
Description: Four existing T-hangars north of the Atlantic Aviation facility are to be removed to allow for new fixed base operator (FBO)/specialty aviation service operator (SASO) conventional hangar development.
Cost Estimate: $378,000
Funding Eligibility: OCAT – 100%
Triggering Event: Hangar development, including site preparation, is dictated by demand.

Project #15: Expand Apron for Conventional Hangar Development
Description: New apron pavement to be constructed in support of new conventional hangar development.
Cost Estimate: $383,785
Funding Eligibility: OCAT/Private Developer – 100%
Triggering Event: Hangar development, including associated apron pavement, is dictated by demand.

Project #16: Construct T-Hangar Taxilanes/Aprons and Access Road
Description: New taxilane pavement to be added in support of new T-hangar facility construction.
Cost Estimate: $1,094,461
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: Hangar development, including associated taxilane pavement, is dictated by demand.

Project #17: Extend Taxiway B
Description: Taxiway B is to be extended to the north in support of future FBO/SASO-related facilities in the area.
Cost Estimate: $763,503
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: This project should be undertaken when viable demand for new aviation-related facilities in this area is shown.

Project #18: Construct Taxilane A7
Description: Extension of the taxilane east to provide access to future hangar development sites.
Cost Estimate: $305,803
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: This project should be undertaken when viable demand for new aviation-related facilities in this area is shown.

Project #19: Construct Conventional Hangar Taxilanes/Aprons - Phase I
Description: New taxilane/apron pavement associated with future hangar development sites.
Cost Estimate: $1,427,329
Funding Eligibility: OCAT/Private – 100%
Triggering Event: This project should be undertaken when viable demand for new aviation-related facilities in this area is shown.

Project #20: Construct FBO/SASO Apron - Phase I
Description: New apron pavement associated with future FBO/SASO hangar development site.
Cost Estimate: $4,699,388
Funding Eligibility: OCAT/Private – 100%
Triggering Event: This project should be undertaken when viable demand for new aviation-related facilities in this area is shown.

Project #21: Construct New Access Road to Northeast Development Area
Description: Development of a vehicle access road in the northeast area providing access to aviation and non-aviation related development parcels.
Cost Estimate: $1,900,071
Funding Eligibility: OCAT/Private – 100%
Triggering Event: This project should be undertaken when viable demand for new developments in the northeast area is shown.

LONG-TERM IMPROVEMENTS (FY 2031-2040 and beyond)

Project #22: Extend Utilities to West Side
Description: Installation of water, electricity, gas, sanitary sewer, storm sewer, telecommunications utilities serving future developments on the west side of the airfield.
Cost Estimate: $8,250,000
Funding Eligibility: OCAT – 100%
Triggering Event: This project should be undertaken when viable demand for new developments on the west side of the airfield is shown.

Project #23: Construct New Access Road to West Development Area
Description: Development of a vehicle access road accessing the west side of the airfield providing access to aviation-related development parcels, as well as the future new airport traffic control tower (ATCT).
Cost Estimate: $349,889
Funding Eligibility: OCAT – 100%
Triggering Event: This project should be undertaken when viable demand for new developments on the west side of the airfield is shown and when a new ATCT is constructed.

Project #24: Construct New Airport Traffic Control Tower - Option 1
Description: Construction of a new ATCT on the west side of the airfield. A new ATCT on the west side of the airfield will provide east views for controllers, which is preferable over the existing site, which provides a west view.
Cost Estimate: $5,302,429
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: The existing ATCT is outdated and will eventually need to be replaced.

Project #25: EA for 501-foot Extension of Runway 17L-35R
Description: NEPA examination for the extension of Runway 17L-35R.
Cost Estimate: $500,000
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: Documentation of 500 annual operations by aircraft requiring the additional runway length.

Project #26: Apron Pavement Maintenance - Mill/Overlay
Description: Project includes the mill/overlay of the main apron areas on the airport.
Cost Estimate: $3,400,258
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: This is a routine airport facility maintenance project triggered by wear and tear on pavement.

Project #27: Extend Runway 17L-35R (501' x 150')
Description: A 501-foot extension would result in a full length of 7,700 feet, which would better serve larger/heavier aircraft. The extension would occur entirely to the north and would include the relocation of the medium intensity approach lighting system with runway alignment indicator lights (MALSR), glide slope antenna, localizer antenna, PAPI-4, and extension of Taxiway A to the new threshold.
Cost Estimate: $9,370,524
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: FONSI during the EA process (see Project #25).

Project #28: EA for 998-Foot Extension of Runway 17R-35L and Construction of Taxiway E
Description: NEPA examination for the extension of Runway 17R-35L and associated taxiway improvements.
Cost Estimate: $500,000
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: Documentation of 500 annual operations by aircraft requiring the additional runway length.

Project #29: Extend Runway 17R-35L (998' x 100')
Description: A 998-foot extension would result in a full length of 6,000 feet, which better serves larger/faster business jet aircraft. The project includes the relocation of the PAPI-4 the installation of a MALSR, and the construction of new connecting Taxiways A2 and D2 and the removal of existing Taxiway A2.
Cost Estimate: $6,880,848
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: FONSI during the EA process (see Project #28).

Project #30: Rehabilitate Runway 17R-35L and 17L-35R
Description: Routine maintenance to extend the useful life of the runway pavement.
Cost Estimate: $5,494,660
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: This is a routine airport facility maintenance project triggered by wear and tear on pavement.

Project #31: Rehabilitate Runway 13L-31R
Description: Routine maintenance to extend the useful life of the runway pavement.
Cost Estimate: $307,332
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: This is a routine airport facility maintenance project triggered by wear and tear on pavement.

Project #32: Construct Taxiway E
Description: Construction of a full-length parallel taxiway on the west side of the parallel runway. This taxiway will support future landside developments on the west side of the airfield.
Cost Estimate: $2,649,394
Funding Eligibility: AIP – 90% / OAC – 5% / OCAT – 5%
Triggering Event: FONSI during the EA process (see Project #28) and when viable demand for new aviation-related facilities on the west side is shown.

Project #33: Construct Conventional Hangar Taxilanes/Aprons - Phase II
Description: New taxilane/apron pavement associated with future hangar development sites.
Cost Estimate: $1,726,810
Funding Eligibility: OCAT/Private – 100%
Triggering Event: This project should be undertaken when viable demand for new aviation-related facilities in this area is shown.

Project #34: Construct FBO/SASO Apron - Phase II
Description: New apron pavement associated with future FBO/SASO hangar development site.
Cost Estimate: $4,386,098
Funding Eligibility: OCAT/Private – 100%
Triggering Event: This project should be undertaken when viable demand for new aviation-related facilities in this area is shown.

CAPITAL PROGRAM FUNDING SOURCES

Potential funding sources for any proposed improvements at PWA are derived from federal and state agencies. Many of the available funds come in the form of grants, should the project meet the eligibility requirements. The following sections list available sources and detail the eligibility requirements for each. The amount of funding available from these sources will depend on future federal reauthorizations. Due to the uncertainty of the timing of the intermediate- and long-term projects in the CIP, this analysis does not contemplate their financial feasibility.

Table 6B presents the CIP's possible funding sources for the planning period. While certain projects may be eligible for certain funding, PWA may not receive the full eligibility amount due to funding constraints, which are discussed in greater detail in the **Financial Feasibility** section of this chapter.

TABLE 6B
CIP Funding Sources by Year
(in 000s)

Fiscal Year	Project Costs		Funding Sources					
				OAC				
	2019 Dollars [1]	Inflated [2]	Non-Primary Entitlement	State Apportionment	Local Match	Third Party	PWA	Total
2021	$350.0	$350.0	$0.0	$315.0	$17.5	$0.0	$17.5	$350.0
2022	1,523.0	1,523.0	1,370.7	0.0	76.2	0.0	76.2	1,523.0
2023	90.6	90.6	81.5	0.0	4.5	0.0	4.5	90.6
2024	6,200.0	6,200.0	0.0	5,580.0	310.0	0.0	310.0	6,200.0
2025	2,130.4	2,130.4	1,917.4	0.0	106.5	0.0	106.5	2,130.4
Total Short Term (2021 - 2025)	$10,294.0	$10,294.0	$3,369.6	$5,895.0	$514.7	$0.0	$514.7	$10,294.0
Total Intermediate Term (2026-2030)	$27,698.7	$35,087.9	$19,416.8	$0.0	$1,078.7	$10,792.9	$3,799.4	$35,087.9
Total Long Term (2031-2039)	$49,118.2	$78,820.4	$49,689.6	$0.0	$2,760.5	$9,809.4	$16,560.8	$78,820.4
Total	$87,111.0	$124,202.3	$72,476.0	$5,895.0	$4,353.9	$20,602.3	$20,875.0	$124,202.3

[1] Represents CIP as presented in Exhibit 6A.

[2] Beginning in FY 2026, project costs were inflated at 3%, which reflects the most recent five-year average of *Engineering News-Record's* Construction Cost Index.

FEDERAL GRANTS

Entitlement funds are generally 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. However, general aviation airports such as PWA receive non-primary entitlements, which are specifically for general aviation airports listed in the latest published National Plan of Integrated Airports (NPIAS). General aviation airports with needed airfield development are eligible to receive annually the lesser value of 20 percent of the five-year cost of their current NPIAS value or $150,000. Non-primary entitlement funds are available to general aviation airports in the year they are first apportioned and remain available for three fiscal years in the case of non-hub primary airports such as PWA. After four years, any unused funds expire unless the airport sponsor obligates the funds under a grant or transfers the funds to another NPIAS airport. In addition, non-primary entitlement funds can be used on most airfield capital improvements, airfield pavement maintenance, and limited revenue-generating areas such as terminals, hangars, and fuel farms.

As shown on **Table 6A**, approximately $3.4 of the short-term CIP is eligible to be funded with non-primary entitlement grants. Currently, PWA is estimated to receive approximately $250,000 annually in non-primary entitlement funds from FY 2020 through FY 2025, which totals approximately $1.5 million. As a result, a $1.9 million cash flow deficiency occurs in federally eligible projects in the short-term CIP requiring additional funding from either OCAT, a third party, or through short-term financing if PWA decides to undertake the projects.

OKLAHOMA AERONAUTICS COMMISSION

The State of Oklahoma also supports needed capital improvements at Oklahoma's public airports through its grant program, which is administered through the Oklahoma Aeronautics Commission (OAC). OAC assists with the development of a statewide system of airports, encourages aeronautical safety and development, and coordinates activities with the FAA to develop a national system of civil aviation. Justification is required for projects in the CIP and must be consistent with FAA and OAC Regulations, Policies and Procedures. While OAC does not award entitlement funds; it does fund 5 percent of the 10 percent local match required for AIP funded projects. Additionally, OAC may also decide to assign State Apportionment funds at its discretion. OAC prepares a three-year CIP annually indicating the projects needed statewide. The last CIP OAC published was for 2017 through 2019 time period. As a result, OAC has not yet determined the funding of the FY 2020 projects in PWA's CIP. However, OAC has tentatively agreed to fund the widening of Runway 17R-35L. Therefore, this analysis assumes the projects related to the widening of Runway 17R-35L will be funded in part with discretionary funds.

As shown on **Table 6A**, approximately $5.9 million of the short-term CIP is anticipated to be funded by OAC through state apportionment and local match funding.

LOCAL FUNDS

PWA primarily generates revenue through ground space rentals, hangar rentals, and fuel sales. Typically, such revenues are used to cover maintenance and operating expenses. However, any surplus revenues can be applied directly to the CIP. As shown on **Table 6A**, approximately $514,700 of the short-term CIP is assumed to be funded with PWA revenues.

FINANCIAL FEASIBILITY

This section of the financial analysis presents the forecasted expenditures and revenues resulting from the daily operation of PWA. The FAA requires airports to be as self-sustaining as possible under the specific circumstances at that airport. As a result, the goal of any airport should be the capability to support its own operation and development through airport revenues. This section also presents the ability of PWA to fund the local share of the short-term CIP.

OPERATING EXPENSES

Operating expenses at PWA include personnel, maintenance, operations, contractual services, materials and supplies, equipment, and administrative. FY 2018 operating expenses reflect actual expenses provided by OCAT.

Table 6C presents operating expenses for FY 2018 through FY 2025. As shown in the table, operating expenses were approximately $1.3 million in FY 2018. Operating expenses are forecast to be approximately $1.5 million in FY 2025, reflecting a compound annual growth rate of 1.5 percent from FY 2018 through FY 2025. Operating expenses are projected based on the anticipated effects of inflation assumed at 1.5 percent annually, reflecting the 10-year average of the Consumer Price Index (CPI) for the South region, which includes the City.

REVENUES

PWA primarily generates revenue through fuel sales, hangar rentals, parking, and OAC RAMP grants. The largest of the revenue sources is generated from ground space rentals. **Table 6C** presents revenues for FY 2018 through FY 2025. As shown in the table, revenues were approximately $1.5 million in FY 2018 and are forecast to be approximately $1.7 million in FY 2025, reflecting a compound annual growth rate of 1.5 percent.

PRO FORMA CASH FLOW

Table 6C presents PWA's pro forma cash flow for the short-term planning period based on the projection of revenues and operating expenses previously discussed.

The bottom of **Table 6C** reflects the cash flow of the funding sources of the short-term CIP. As shown, PWA funds are not sufficient to fund the short-term CIP, however, the expenses include the general office allocation. These represent the allocation to PWA for the Trust's administrative expenses. If that allocation is not reflected in the cash flow, PWA is forecast to have sufficient funds.

As previously mentioned, this analysis does not include the feasibility of the intermediate- and long-term planning horizon due to funding shortfalls. There are several actions PWA could pursue to meet the financial requirements of the intermediate and long-term CIP, some of which are presented as follows:

- Re-phase certain projects in the CIP, moving them to years when PWA can afford the local share component.
- Identify another funding source for the projects in the CIP currently assigned to local share.
- Obtain additional general aviation services.

TABLE 6C
Pro Forma Cash Flow
(in 000s)

	Actual	Forecast							2020-2025
	2018	2019	2020	2021	2022	2023	2024	2025	Total
Revenues									
Ground space rental	$643.6	$653.3	$663.1	$673.0	$683.1	$693.4	$703.8	$714.3	$4,130.7
Hangar rental	333.8	338.8	343.9	349.1	354.3	359.6	365.0	370.5	2,142.5
Non-scheduled aviation fuel	217.8	221.1	224.4	227.8	231.2	234.7	238.2	241.8	1,398.1
Maintenance reimbursements	158.7	161.1	163.5	166.0	168.5	171.0	173.5	176.1	1,018.6
Apron maintenance	103.7	105.2	106.8	108.4	110.0	111.7	113.4	115.1	665.4
Terminal space rental	54.0	54.8	55.6	56.4	57.3	58.1	59.0	59.9	346.4
Insurance reimbursements	26.5	26.8	27.2	27.7	28.1	28.5	28.9	29.4	169.8
Agriculture and hay leases	4.4	4.5	4.6	4.6	4.7	4.8	4.8	4.9	28.4
Total revenue	$1,542.6	$1,565.7	$1,589.2	$1,613.0	$1,637.2	$1,661.8	$1,686.7	$1,712.0	$9,899.9
Percent change		1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Less: expenses									
Personnel expenses	($650.9)	($660.7)	($670.6)	($680.7)	($690.9)	($701.2)	($711.7)	($722.4)	($4,177.5)
Maint, operations, & contractual svcs	(312.8)	(317.4)	(322.2)	(327.0)	(331.9)	(336.9)	(342.0)	(347.1)	(2,007.2)
Materials and supplies	(61.9)	(62.9)	(63.8)	(64.8)	(65.7)	(66.7)	(67.7)	(68.7)	(397.4)
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indirect									
General office allocation	(270.1)	(274.2)	(278.3)	(282.5)	(286.7)	(291.0)	(295.4)	(299.8)	(1,733.7)
Other	(20.4)	(20.7)	(21.0)	(21.3)	(21.7)	(22.0)	(22.3)	(22.6)	(130.9)
Total expenses	($1,316.1)	($1,335.9)	($1,355.9)	($1,376.3)	($1,396.9)	($1,417.9)	($1,439.1)	($1,460.7)	($8,446.8)
Percent change		1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Profit/(Loss)	$226.4	$229.8	$233.3	$236.8	$240.3	$243.9	$247.6	$251.3	$1,453.1
Sources:									
Non-primary entitlement funds			$250.0	$250.0	$250.0	$250.0	$250.0	$250.0	$1,500.0
OAC									
Environmental assessment for the widening of Runway 17R-35L			$315.0	$0.0	$0.0	$0.0	$0.0	$0.0	$315.0
Design and construct widening of Runway 17R-35L			$0.0	$0.0	$0.0	$5,580.0	$0.0	$0.0	$5,580.0
Other			$0.0	$17.5	$76.2	$4.5	$310.0	$106.5	$514.7
PWA Funds (profit from above)			$233.3	$236.8	$240.3	$243.9	$247.6	$251.3	$1,453.1
Uses:									
CIP [1]			$0.0	($350.0)	($1,523.0)	($90.6)	($6,200.0)	($2,130.4)	($10,294.0)
Ending Balance			$798.3	$154.3	($956.6)	$5,987.9	($5,392.4)	($1,522.6)	($931.2)
Cumulative				$952.5	($4.1)	$5,983.8	$591.4	($931.2)	
General office allocation			$278.3	$282.5	$286.7	$291.0	$295.4	$299.8	
Ending Balance without funding the general office allocation			1,076.6	436.7	(669.9)	6,278.9	(5,097.0)	(1,222.8)	
Cumulative			$1,076.6	$1,513.3	$843.4	$7,122.3	$2,025.3	$802.5	

[1] See Table 6B.

Sources:
OCAT records, FY 2018
DKMG, FY 2019 through FY 2025

SUMMARY

The financial feasibility of future projects will be determined by existing and future leases, federal and state funding levels, other funding sources, and the ability to generate internal cash flow from operations at PWA. Due to the uncertainty of the timing of the intermediate- and long-term projects in the CIP, this analysis does not contemplate their financial feasibility.

The financial projections were prepared on the basis of available information and assumptions set forth in this chapter. It is believed that such information and assumptions provide a reasonable basis for the projections to the level of detail appropriate for an airport master plan. Some of the assumptions used to develop the projections may not be realized, and unanticipated events or circumstances may occur. Therefore, the actual results will vary from those projected, and such variations could be material.

The best means to begin implementation of the recommendations in the master plan is to first recognize that planning is a continuous process that does not end with completion and approval of this document. Rather, the ability to continuously monitor the existing and forecast status of airport activity must be provided and maintained. The issues upon which the master plan is based will remain valid for a number of years. The primary goal is for PWA to best serve the general aviation needs of the region, while continuing to be economically self-sufficient.

The actual need for facilities is most appropriately established by airport activity levels rather than a specified date. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need to accelerate the development. Although every effort has been made in this master planning process to conservatively estimate when facility development may be needed, aviation demand will dictate when facility improvements need to be delayed or accelerated.

In summary, the planning process requires PWA management to consistently monitor the progress of PWA in terms of aircraft operations and based aircraft. Analysis of aircraft demand is critical to the timing and need for certain airport facilities. The information obtained from continually monitoring airport activity will provide the data necessary to determine if the development schedule should be accelerated or decelerated.

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 non-regulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviation 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 times, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

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 enroute phase of flight.

Air Taxi: An air carrier certificated in accordance with FAR Part 121 and FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

Air Traffic Control: A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of air traffic.

Air Traffic Control System Command Center: A facility operated by the FAA which is responsible for the central flow control, the central altitude reservation system, the airport reservation position system, and the air traffic service contingency command for the air traffic control system.

Air Traffic Hub: A categorization of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.

Air Transport Association Of America: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.

Aircraft: A transportation vehicle that is used or intended for use for flight.

Aircraft Approach Category: A grouping of aircraft based on 1.3 times the stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:

- **Category A:** Speed less than 91 knots.
- **Category B:** Speed 91 knots or more, but less than 121 knots.
- **Category C:** Speed 121 knots or more, but less than 141 knots.

- **Category D:** Speed 141 knots or more, but less than 166 knots.
- **Category E:** Speed greater than 166 knots

Aircraft Operation: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

Aircraft Operations Area (AOA): A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.

Aircraft Owners And Pilots Association: A private organization serving the interests and needs of general aviation pilots and aircraft owners.

Aircraft Rescue And Fire Fighting: A facility located at an airport that provides emergency vehicles, extinguishing agents, and personnel responsible for minimizing the impacts of an aircraft accident or incident.

Airfield: The portion of an airport which contains the facilities necessary for the operation of aircraft.

Airline Hub: An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.

Airplane Design Group (ADG): A grouping of aircraft 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 organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.

Airport Beacon: A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.


Airport Beacon

Airport Capital Improvement Plan: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

Airport Elevation: The highest point on 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 existing 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: A local planning document that serves as a guide for 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.

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.

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 final approach and landing.


Approach Lighting System

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 System (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 eliminating 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.

Blast Fence

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.

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 (CTAF): 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.

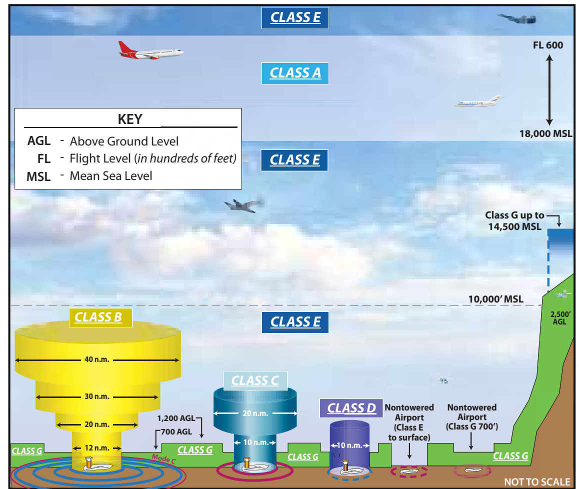
Compass Locator (LOM): A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.

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 operating airport traffic control tower.

Controlled Airspace: Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

CLASS A: Generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.



Airspace Classifications

CLASS B: Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.

CLASS C: Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

CLASS D: Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedure. Unless otherwise authorized, all persons must establish two-way radio communication.

CLASS E: Generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

CLASS G: Generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.

Controlled Firing Area: See special-use airspace.

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:

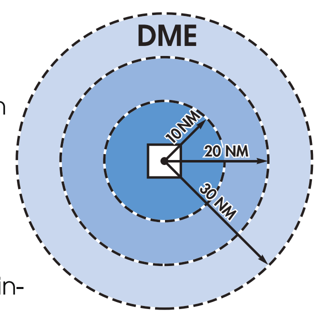
- **Takeoff Run Available (TORA):** The runway length declared available and suitable for the ground run of an airplane taking off.
- **Takeoff Distance Available (TODA):** The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.
- **Accelerate-stop Distance Available (ASDA):** The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.
- **Landing Distance Available (LDA):** The runway length declared available and suitable for landing.

Department Of Transportation: The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration, 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 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 or 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 executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

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 (FSS): 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 preflight 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:

- Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or
- Visual ground aids, such as PAPI, 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 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.

Ground Based Augmentation System (GBAS): A program that augments the existing GPS system by providing corrections to aircraft in the vicinity of an airport in order to improve the accuracy of these aircrafts' GPS navigational position

H

Helipad: A designated area for the takeoff, landing, and parking of helicopters.

High Intensity Runway Lights (HIRL): 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: An acute-angled exit taxiway forming a 30 degree angle with the runway centerline, designed to allow an aircraft to exit a runway without having to decelerate to typical taxi speed.

Horizontal Surface: An imaginary obstruction-limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

Hot Spot: A location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.

I

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	3. Outer Marker	5. Approach Lights
2. Glide Slope	4. Middle Marker	

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 arriving from outside the traffic pattern or departing the airport traffic pattern.

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 Operations: Aircraft operations performed by aircraft 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. 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.

Localizer

Low Intensity Runway Lights: The lowest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

M

Medium Intensity Runway Lights: The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

Military Operations: Aircraft operations that are performed in military aircraft.

Military Operations Area (MOA): See special-use airspace

Military Training Route: An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

Missed Approach Course (MAC): The flight route to be followed if, after an instrument approach, a landing is not affected, and occurring normally:

- When the aircraft has descended to the decision height and has not established visual contact; or
- When directed by air traffic control to pull up or to go around again.

Movement Area: The runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, 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 (NAS): The network of air traffic control facilities, air traffic control areas, and navigational facilities through the U.S.

National Plan Of Integrated Airport Systems (NPIAS): 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 their 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.


NDB

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 Air Missions (NOTAM): 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 aircraft 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.

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 minimal less than Category II.

Precision Approach Path Indicator (PAPI): A lighting system providing visual approach slope guidance to aircraft during a landing approach. A PAPI normally consists of four light units but an abbreviated system of two lights is acceptable for some categories of aircraft.


Precision Approach Path Indicator

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 Zone (POFZ): 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 POFZ is a clearing standard which requires the POFZ to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA is only in effect when the approach includes vertical guidance, the reported ceiling is below 250 feet, and an aircraft is on final approach within two miles of the runway threshold.

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 enroute 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 enroute 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 (RAIL): A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

Runway Design Code: A code signifying the FAA 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.

REIL

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 minimal.

Runway Reference Code: A code signifying the current operational capabilities of a runway and 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 sight 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, often co-located with a wind cone.

Shoulder: An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition 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 enroute 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: A taxiway designed for low speed and precise taxiing. Taxilanes are usually, but not always, located outside the movement area and provide access to from taxiways to aircraft parking positions and other terminal areas.

Taxiway: A defined path established for the taxiing of aircraft from one part of an airport to another.

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 enroute 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.

Tetrahedron

Threshold: The beginning of that portion of the runway available for landing. In some instances, the 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.

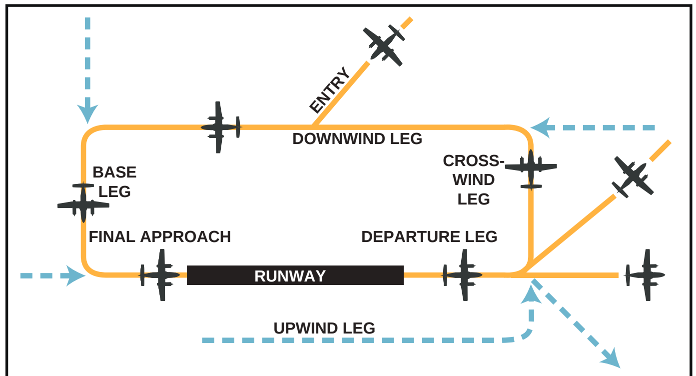
Touchdown and Lift-off Area (TLOF): A load bearing, generally paved area, normally centered in the FATO, on which a helicopter lands or takes off.

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 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 aircraft landing at or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.



Traffic Pattern

U

Uncontrolled Airport: An airport without an airport traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

Uncontrolled Airspace: Airspace within which aircraft 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 UNICOMs 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 Omnidirectional Range/ Tactical Air Navigation (VORTAC): A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

Victor Airway: A system of established routes that run along specified VOR radials, from one VOR station to another.

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. The VASI is now obsolete and is being replaced with the PAPI.

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.

Visual Runway: A runway without an existing or planned instrument approach.

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.

Windsock/Windcone: A visual aid that indicates the prevailing wind direction and intensity at a particular location.


Windsock/Windcone

Abbreviations

AC: advisory circular

ACIP: airport capital improvement program

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

APRC: approach reference code

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft 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

ATC: airport traffic control

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

DPRC: departure reference code

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

GA: general aviation

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

LNAV: lateral navigation

LOC: localizer

LOM: compass locator at outer marker

LP: localizer performance

LPV: localizer performance with vertical guidance

MALS: medium intensity approach lighting system

MALSR: MALS with runway alignment indicator lights

MALSF: MALS with sequenced flashers

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

MTOW: maximum takeoff weight

NAVAID: navigational aid

NDB: nondirectional radio beacon

NEPA: National Environmental Policy Act

NM: nautical mile (6,076.1 feet)

NPDES: 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

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCI: pavement condition index

PCL: pilot-controlled lighting

PIW: public information workshop

POFZ: precision object free zone

PVC: poor visibility and ceiling

RCO: remote communications outlet

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

WAAS: wide area augmentation system

WILEY POST
AIRPORT

Appendix B

PCN Calculation Report for Airfield Pavement

PCN Calculation Report for Airfield Pavement

at Wiley Post Airport
Oklahoma City

APRIL 26, 2019

Prepared by:

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Table of Contents

1. Introduction

This report presents the results of the Pavement Classification Number (PCN) analysis for various pavements including runways, taxiways, and aprons at Wiley Post Airport in Oklahoma City. Governed by the Federal Aviation Administration (FAA) and developed by the International Civil Aviation Organization (ICAO), the PCN is a numerical expression of the load-carrying capacity under unrestricted weight operations[1]. It is used in combination with the Aircraft Classification Number (ACN). The ACN is a numerical expression of the relative effect of an aircraft on the pavement for a specified standard subgrade category[2]. Together, the two classification numbers give Wiley Post Airport operators the ability to evaluate acceptable operations of aircraft. This is known as the ACN-PCN Method.

The PCN values reported herein not only allow operators to appropriately guide aircraft, but also serve as a strategic tool the airport can use to assess existing pavement. The PCN values should not be used as an indication of the condition of the pavement but only as a structural rating for the associated pavement section as defined by the ACN-PCN method.

2. Methodology

In accordance with the ACN-PCN methodology, only the PCN values are calculated and presented in this report. Official computed ACN values are determined by the aircraft manufacturer. Computation of the ACN requires detailed information on the operational characteristics of the aircraft, such as maximum aft center of gravity, maximum ramp weight, wheel spacing, tire pressure, and other factors[3].

Computation of the PCN value has been established by the ICAO and can be based on two procedures. These two procedures are the Technical Evaluation Method (TEM) and

[1] FAA, AC 150/5335-5C "Standardized Method of Reporting Airport Pavement Strength -PCN", 1.2.2
[2] Ibid. 1.2.1
[3] Ibid. 2.1

the Aircraft “Using” Method. The “Using” method does not consider the pavement structure and does not require a subgrade input[4]. Furthermore, it is not as widely accepted as the TEM Method, due to its higher potential for inaccuracies[5]. Therefore, this report utilizes the TEM to determine the PCN values.

The TEM utilizes certain site-specific variables to develop the PCN values that are unique to each airport. To determine the PCN values, a software developed by the FAA called COMFAA Version 3.0 was used. The inputted variables are discussed in further detail in the section titled “Variables Used in Analysis” herein.

3. Airport Description

Wiley Post Airport (PWA) is a general aviation reliever facility for OKC providing a direct aviation link to the national network of airports and a full range of services for operators from small piston-powered aircraft to large business jets[6].

Three runways serve PWA: Runway 17L-35R, 17R-35L and Runway 13-31. The primary Runway 17L-35R has been evaluated to be in good condition and is 7,199 feet long and 150 feet wide. The pavement of this runway is concrete. The secondary parallel Runway 17R-35L has been evaluated to be in good condition and is 5,002 feet long and 75 feet wide. The pavement is partially concrete and partially asphalt. The crosswind Runway 13-31 has been evaluated to be in good condition and is 4,214 feet long and 100 feet wide. The pavement of this runway is concrete.

The airport houses multiple hangers and is a base for 286 aircraft[7]. In many cases, pavement sections vary non-uniformly within the same apron, taxiway, or runway[8].

[4] AC No: 150/5335-5C, Chapter 4, Section 4.3
[5] Ibid, Section 4.3.2
[6] PWA Master Plan, Section 1, Pg. 57
[7] Ibid. Section 1, Page 15, Based Aircraft
[8] Ibid. Section 2, Table 2R

4. Variables Used in Analysis

The following sections will discuss the variables necessary to develop the PCN values inside the COMFAA software, and the derivation of each.

4.1 Air Traffic Design Mix

An air traffic report has been provided by Wiley Post Airport. The traffic report is crucial in the determination of the PCN value as it gives historical values of operation for each aircraft arriving to and departing from the airport in recent years. In Appendix D, a table extracted from the PWA Master Plan shows the air traffic mix received. The traffic mix does not include future projected values as the PCN method requires a mix of current operating aircraft[9].

Each of the reported aircraft are evaluated for its potential entry into the air traffic mix. An air traffic mix is a list of aircraft that regularly operate at the airport. For this report, it was decided that an aircraft must have at least three reported operations within the last year to be included into the air traffic mix. This requirement gives an accurate representation of what the pavement is currently experiencing on a regular basis. Additionally, only aircraft recorded in the 2017 year (last year) were considered to give the most recent and accurate representation of current operations. In Appendix B, the table titled “Aircraft Mix Groups” shows each of the mixes with their respective aircraft and number of operations.

Four different air traffic mixes were created to accurately represent the operations the evaluated pavements experience. The following is a description of each mix:

Air Traffic Mix 1 consists of 40% of aircraft listed in groups A-I thru B-I. Mix 1 was applied to Runways 17R-35L and 13-31, and all taxiways west of Runway 17L-35R. Three primary assumptions were made to develop Mix 1:

[9] AC No: 150/5335-5C, Chapter 4, Section 4.6.5

1. The applied pavements do not experience aircraft larger than those rated within a B-I classification. This is based on the dimensions of the runways, the PWA Master Plan, and discussion with airport representatives.
2. We assumed Runway 17L-35R receives 60% of the A-I thru B-I aircraft departures and the remaining 40% of the A-I thru B-I aircraft departures are distributed on the other two runways and taxiways west of Runway 17L-35R.
3. The 2017 reported operational values are used for the PCN calculations.

Air Traffic Mix 2 consists of 60% of the reported 2017 operations for all approved aircraft listed in groups A-I thru B-I and 100% of the operations for the remaining larger aircraft listed in the report. Mix 2 was applied to Runway 17L-35R. This mix was designed to reflect the heaviest operational usage atop a pavement section at PWA. Two primary assumptions were made to develop Mix 2:

1. The runway that Mix 2 is applied to experience the bulk of operational usage and all aircraft above the B-I category.
2. The 2017 reported operational values are used for the PCN calculations.

Air Traffic Mix 3 comprises all approved aircraft and uses 30% of the reported 2017 operations for each aircraft. This mix reduced each plane's operational usage as it was designed to reflect the more sporadically used Taxiways and Aprons. Mix 3 was applied to a variety of locations east of Runway 17L-35R whose pavement experiences the larger aircraft operating at PWA. Two primary assumptions were made to develop Mix 3:

1. The pavement that Mix 3 is applied to experiences only a fraction of the total annual operations of each aircraft.
2. The 2017 reported operational values are used for the PCN calculations.

Air Traffic Mix 4 comprises all approved aircraft, except for the five most critical aircraft as listed below, and uses 30% of the reported 2017 operations for each aircraft. This mix reduced the total annual operational usage of each plane and removed the five most critical aircraft to reflect pavement that do not experience every operation of an aircraft and does not experience the largest aircraft loadings that operate at PWA. Mix 4 was applied to a variety of locations east of Runway 17L–35 R with the following assumptions:

1. The pavement that Mix 4 is applied to experiences only a fraction of the total annual operations of each aircraft and does not experience the five most critical aircraft.
2. The five most critical aircraft at PWA are the:
    a. Gulfstream G-V
    b. Gulfstream G-IV
    c. Gulfstream G-III
    d. Bombardier Global Express
    e. Bombardier 5000

    Critical aircraft can be defined as the most demanding aircraft type due to its gross weight, number of operations, and gear configuration.
3. The 2017 reported operational values are used for the PCN calculations.

Reference Exhibit 2 in Appendix A for a map showing where each aircraft mix was applied.

4.2 Modulus of Subgrade Reaction (k)

The modulus of subgrade reaction (k) is a primary input for pavement assessment and classification for rigid pavement. The value estimates the support strength of the layers below a rigid placement slab and is a measure of resistance against an applied pressure at an induced deflection. For this report, the k-values were determined through geotechnical Falling Weight Deflectometer (FWD) testing conducted by Terracon Consultants Inc. (Terracon) in September of 2018. In all, 54 locations were tested, 27 atop Portland cement concrete and 27 atop hot mix asphalt (HMA). The findings and measured k-values can be found within the Geotechnical Report in Appendix C.

For PCN determination, the COMFAA Excel tables were used to adjust the measured k-value to account for improved layers (subbases) between the subgrade and the concrete layer. Specific correction factors are assigned the different subbases to compute the converted k-value and to create a composite k-value for the entire section. This adjustment was applied to each of the measured pavement sections before being inputted into the software for the PCN calculation.

The adjusted k-value is the value used to determine each of the second letters in the PCN report, not the tested k-value. This is because the PCN value is determined based on the COMFAA adjusted k-value. One assumption was made for the subgrade reaction values: the area between the measured points from the geotechnical testing are homogenous. Therefore, it is assumed that the test findings for a pavement section is the same throughout that section.

4.3 California Bearing Ratio (CBR)

The CBR value is representative of the mechanical strength of the of the natural ground, subgrade, and base courses beneath the pavement. The value used in this report is a measure of mechanical strength of the subgrade below flexible pavement (HMA). The value is determined through the resilient modulus of subgrade ($M_{R\text{-}SG}$). Higher CBR values indicate a more substantive subgrade support.

Two FWD tests were chosen to be representative of the Runway 17R-35L asphalt section. These two values were selected based on their low $M_{R\text{-}SG}$ result and/or thickness of the pavement section. Only the lowest values are selected because they are the limiting factor for the total performance of the pavement. The two values were converted to CBR values using the following correlation equation:

$$M_{R\text{-}SG} = 2555(\text{psi}) \times CBR^{0.64}$$ (AASHTO 2002 Design Guide)

Where:

- $M_{R\text{-}SG}$ is in units of: (psi)
- CBR is in units of: (psi / psi)

The two converted CBR values were input into the COMFAA software along with their associated pavement thicknesses. Once the values were computed, the lowest of the two PCN's was reported. This value (Location 11) can be found in Table 1. The measured $M_{R\text{-}SG}$ values can be found within the Geotechnical Report in Appendix C.

4.4 Pavement Sections

All pavement section information was obtained from as-recorded plans provided by PWA or on file with MacArthur Associated Consultants. The pavement material and thickness are factors in the PCN value. The airport is mostly paved with concrete but has some asphalt sections. Since some pavements were constructed in different time periods, the pavement thickness may vary across the same runway, taxiway or apron. The determination of the PCN value, via TEM, requires a different approach for flexible pavement than it does for rigid pavement. Therefore, two different data sets were input into the COMFAA software for the representation of the two pavement types.

Out of the locations identified in the geotechnical report, only Runway 17R – 35L contained a portion of asphalt (Taxiway A also contains asphalt and was evaluated but was not included in the geotechnical report). Within this section of the runway, 27 HMA tests were conducted. Appendix A displays a map of Wiley Post Airport's various pavement sections in Exhibit 3.

Four pavement sections were additionally included and required k-value and CBR assumptions as they were not included in the geotechnical report. These three locations were added because of their significance to operation at PWA. The first, Taxiway A, contains a portion of asphalt. Since a FWD test was not performed on top of the asphalt portion, a CBR of 14 was assumed. This assumption is based on the rigidity and compressive strength nature of the existing cement modified subgrade underneath. The second, Taxiway C, is a concrete pavement section. The k-value (354.0 pci) was assumed to be the same as Taxiway C1 since both taxiways were constructed using the same pavement sections and subgrade treatment. The third, Taxiway Z, is a concrete pavement section. The k-value (248 pci) was assumed to be the same as Taxiway A8 because of its similar subgrade. The fourth, Taxiway A7, only included the concrete portion between Runway 17L-35R and Taxiway A. This section was assumed to be the same as Location 14 on Taxiway A since both taxiways were constructed using the same pavement sections and subgrade treatment. This yields a k-value of (417 pci). However, the evaluated PCN for the concrete section came to 38.0 which was more than the asphalt portion within Taxiway A7 (24.0), therefore, 24.0 was recorded for Taxiway A7.

5. Evaluated Locations

In total, 32 locations where evaluated. Of those 32 locations, 28 where the same as those tested and evaluated within the geotechnical report. Only 4 locations were added for the purpose of evaluating the remaining taxiway pavement sections that were not tested (Txwy C, Txwy Z, the Concrete portion of Txwy A7, and the asphalt portion of Txwy A). The assumptions made to develop PCN values for those 4 locations are described in Section 4.4. Results are recorded in Tables 1 and 2, and can be seen in Appendix A.

6. PCN Results

The following tables summarize the results of the calculated PCN values and their associated locations. Reference Appendix B for the detailed reports of each location's COMFAA output.

Wiley Post Airport PCN Report Summary			
Test Locations[1]		Aircraft Mix	PCN
1	Runway 17L-35R	2	21.6/R/B/X/T
2	Runway 17L-35R	2	11.4/R/B/X/T
3	Runway 17L-35R	2	11.6/R/B/X/T
4	Runway 13-31	1	10.8/R/B/X/T
5	Runway 13-31	1	13.8/R/C/X/T
6	Runway 13-31	1	13.4/R/C/X/T
7	Taxiway A5	1	14.5/R/B/X/T
8	Taxiway A5	1	14.5/R/B/X/T
9	Taxiway A2	1	10.7/R/D/X/T
10	Runway 17R-35L	1	12.6/R/C/X/T

Continued next page →

11	Runway 17R-35L	1	19.5/F/A/X/T
12	Runway 17R-35L	1	14.2/R/B/X/T
13	Taxiway A9	3	13.5/R/C/X/T
14	Taxiway A	3	38.0/R/C/X/T
15	Taxiway B	4	44.4/R/B/X/T
16	Taxiway A8	4	17.3/R/B/X/T
17	Hanger 8 Apron	4	9.2/R/C/X/T
18	Taxiway B	3	11.7/R/C/X/T
19	Taxiway A5	3	11.1/R/C/X/T
20	Taxiway A3	3	56.4/R/B/X/T
21	Hanger 14 Apron	3	10.5/R/C/X/T
21a	Taxiway A4	3	11.3/R/C/X/T
22	Hanger 14 Apron	3	10.5/R/C/X/T
23	Taxiway A	3	56.5/R/B/X/T
24	Taxiway A1	3	12.2/R/B/X/T
25	Taxiway C1	4	47.9/R/B/X/T
26	Taxiway A2	4	8.5/R/D/X/T
27	Taxiway A2	4	9.9/R/C/X/T
28	Hanger 1 Apron	4	9.3/R/C/X/T
NOTES:			
1. All locations within this table correspond with the tested locations and corresponding data in the geotechnical report. Reference Exhibit 4 to see locations called out on a map.			

Table 1 – PCN Report Summary, values calculated via COMFAA

Wiley Post Airport PCN Report Summary			
Additional Locations[1]		Aircraft Mix	PCN
29	Taxiway A - Asphalt	3	24.0/F/A/X/T
30	Taxiway C	3	47.9/R/B/X/T
31	Taxiway Z	1	30.1/R/B/X/T
32	Taxiway A7	3	24.0/F/C/X/T
NOTES:			
1. Locations within this table were not part of the geotechnical report. See PCN report for details of these locations and associated assumptions. Reference exhibit 4 to see locations called out on a map.			

Table 2 – PCN Report Summary, values calculated via COMFAA

7. Discussion of Results

As-per the PCN results table (Table 1), the values vary throughout the airport, and may vary within the same runway, taxiway, or apron depending on the pavement section. Therefore, this report recommends using the lowest PCN value per runway, taxiway, or apron to classify the area. A map has been prepared in Exhibit 1 of Appendix A to report PCN values as per Runways, taxiways, and several aprons. Additionally, Exhibit 4 of Appendix A has been prepared to report all PCN values evaluated in this report as per various pavement sections.

The benefit of knowing PCN values of the various pavement sections is to identify whether the pavement section will be overloaded by anticipated aircraft. The pavement section is considered overloaded when it is subjected to an ACN value that supersedes the rated PCN value for that section. Except for extreme overloading, pavements in their structural behavior are not subject to a limiting load above which they suddenly or catastrophically fail. Behavior is such that a pavement can sustain a definable load for an expected number of repetitions during its design life. As a result, occasional minor over-loading is acceptable, when expedient, and will only yield minimal loss in pavement life expectancy and relatively small acceleration of pavement deterioration.

However, such overloaded movements should not be regularly permitted on pavements, especially on those exhibiting signs of distress or failure. Consistent overloading will result in accelerated pavement distress. Furthermore, overloading should be avoided when the strength of the pavement section could be weakened by saturated subgrade.

Where overload operations are conducted, inspection should be conducted regularly by the appropriate authority to determine pavement condition. Airport authorities should periodically review the criteria for overload operations since overloads cause reduced pavement life. If the aircraft's ACN value is significantly overloading a given pavement's PCN value on a regular basis, it is recommended that pavement strengthening, or further restriction of superseding aircraft be considered.

APPENDIX A

PCN REPORT EXHIBITS

AND TABLES

Wiley Post Airport
Pavement Ratings

Pavement Section [1]	Aircraft Mix	PCN
Runway 17L-35R	2	11.4/R/B/X/T
Runway 17R-35L	1	12.6/R/C/X/T
Runway 13-31	1	10.8/R/B/X/T
Taxiway A	3	24.0/F/C/X/T
Taxiway A1	3	12.2/R/B/X/T
Taxiway A2	4	8.5/R/D/X/T
Taxiway A3	3	24.0/F/C/X/T
Taxiway A4	3	11.3/R/C/X/T
Taxiway A5	3	11.1/R/C/X/T
Taxiway A7	3	24.0/F/C/X/T
Taxiway A8	4	17.3/R/B/X/T
Taxiway A9	3	13.5/R/C/X/T
Taxiway B	4	11.7/R/C/X/T
Taxiway C	3	47.9/R/B/X/T
Taxiway C1	4	47.9/R/B/X/T
Taxiway Z	1	30.1/R/B/X/T
Hanger 1 Apron	4	9.3/R/C/X/T
Hanger 8 Apron	4	9.2/R/C/X/T
Hanger 14 Apron	3	10.5/R/C/X/T

NOTES:

1. EACH PAVEMENT SECTION MAY HAVE MULTIPLE CORRESPONDING PCN VALUES BUT ONLY THE LOWEST PCN VALUE WAS RECORDED FOR THE RATING OF THAT PAVEMENT SECTION.

T:\1719\Drawings\WPA PCN Map-EXHIBIT 1.dgn

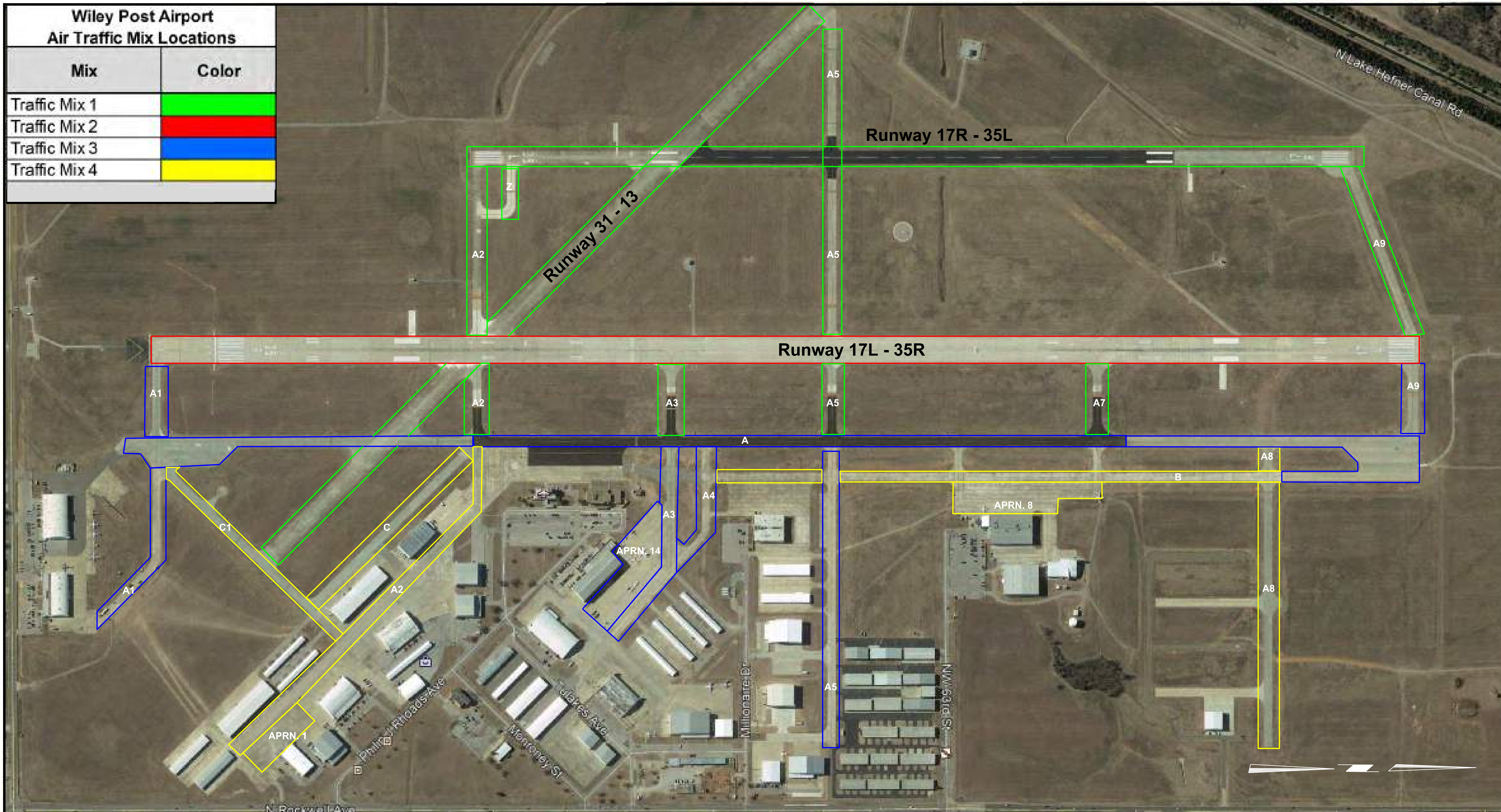
PLOTTED ON: 4/26/2019

WILEY POST AIRPORT

Coffman Associates
Airport Consultants

MacArthur Associated Consultants
25 N.W. 146th Street ~ Edmond, OK 73013 ~ 405.848.2471
C.O.A. No. 699 Renewal Date: 06-30-19

Project Title:	PCN CALCULATION REPORT FOR AIRFIELD PAVEMENT
Exhibit Title:	PCN REPORT MAP - AS PER RUNWAY / TAXIWAY / APRON
Date Title:	APRIL, 2019
Exhibit Number:	EXHIBIT 1



WILEY POST AIRPORT

Coffman Associates Airport Consultants

MacArthur Associated Consultants
25 N.W. 146th Street ~ Edmond, OK 73013 ~ 405.848.2471
C.O.A. No. 699 Renewal Date: 06-30-19

Project Title: PCN CALCULATION REPORT FOR AIRFIELD PAVEMENT

Exhibit Title: AIR TRAFFIC MIX LOCATIONS

Exhibit Number: EXHIBIT 2

Date Title: APRIL, 2019

PLOTTED ON: 4/26/2019 T:\1719\Drawings\WPA Traffic Mix Loc 2D - EXHIBIT 2.dgn

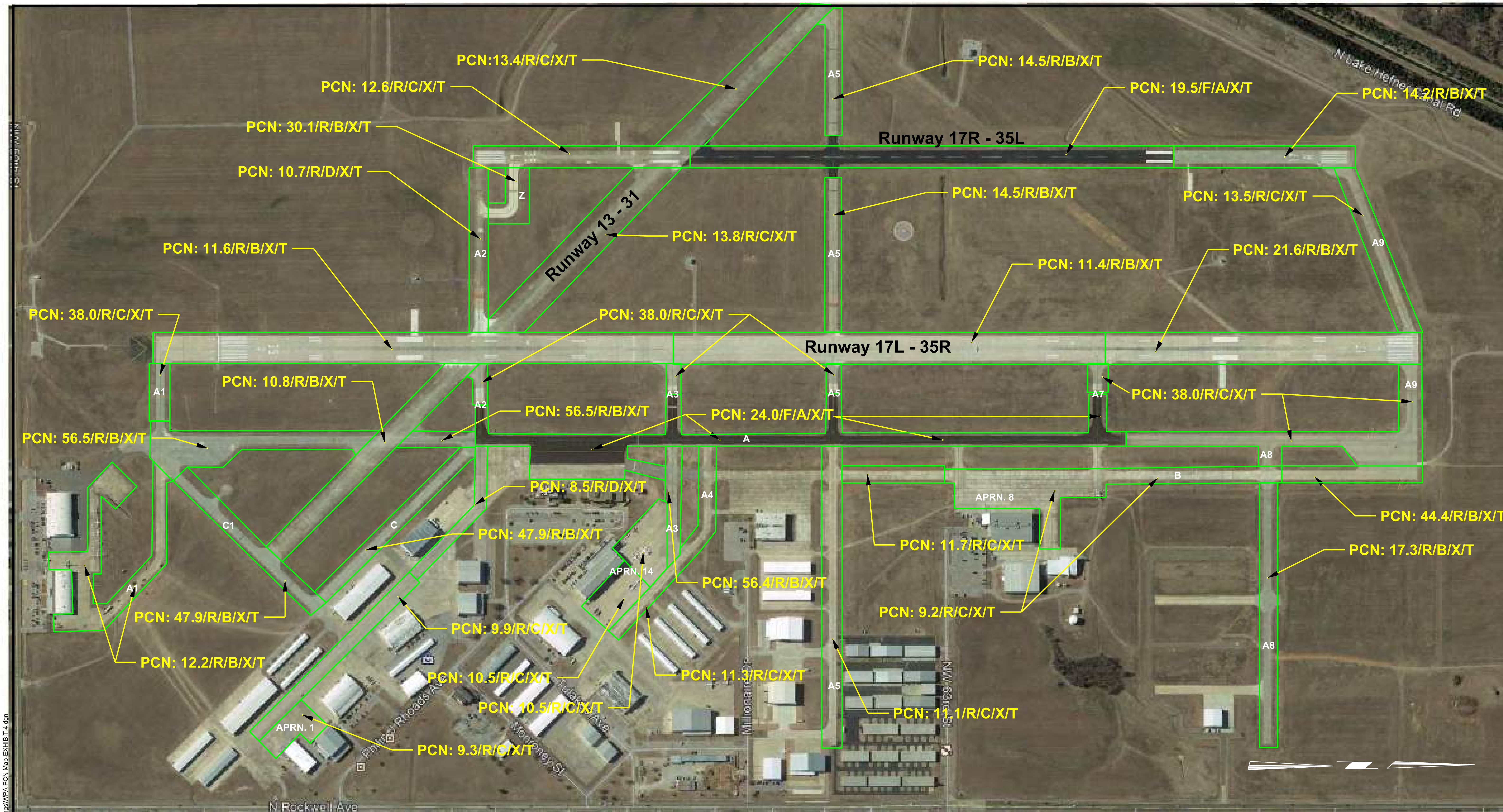
WILEY POST AIRPORT

Coffman Associates Airport Consultants

MacArthur Associated Consultants
25 N.W. 146th Street ~ Edmond, OK 73013 ~ 405.848.2471
C.O.A. No. 699 Renewal Date: 06-30-19

Project Title:	PCN CALCULATION REPORT FOR AIRFIELD PAVEMENT
Exhibit Title:	PAVEMENT SECTIONS MAP
Date Title:	APRIL, 2019
Exhibit Number:	EXHIBIT 3

PLOTTED ON: 4/26/2019 T:\1719\Drawings\WPostpaving 2018 - EXHIBIT 3.dgn



T:\1719\Drawings\WPA PCN Map-EXHIBIT 4.dgn

PLOTTED ON: 4/26/2019

WILEY POST AIRPORT

Coffman Associates Airport Consultants

MacArthur Associated Consultants
25 N.W. 146th Street ~ Edmond, OK 73013 ~ 405.848.2471
C.O.A. No. 699 Renewal Date: 06-30-19

Project Title: PCN CALCULATION REPORT FOR AIRFIELD PAVEMENT	
Exhibit Title: PCN REPORT MAP - AS PER PAVEMENT SECTIONS	Exhibit Number: EXHIBIT 4
Date Title: APRIL, 2019	

APPENDIX B

PCN Calculations

PCN CALCULATION REPORT FOR AIRFIELD PAVEMENT

WILEY POST AIRPORT, OKLAHOMA

AIRCRAFT MIX GROUPS

ARC Code	Table Name	Mix 1 DEPARTURES	Mix 2 DEPARTURES	Mix 3 DEPARTURES	Mix 4 DEPARTURES	NOTES
A-I	Eclipse 400/500	12	17	8	8	MIX 1 ASSUMES 40% OF 2017 DEPARTURES FROM THE A-I AND B-I CATEGORIES
A-I	Mitsubishi MU-2	1	2	1	1	
A-I	Piper Malibu/Meridian	47	70	35	35	
A-I	Socata TBM 7/850/900	69	104	52	52	
A-II	Cessna 425 Corsair	46	69	35	35	MIX 2 ASSUMES 60% OF 2017 DEPARTURES FROM A-I THROUGH B-I and 100% OF ALL LARGER AIRCRAFT
A-II	Cessna Caravan	4	5	2	2	
A-II	Pilatus PC-12	454	681	340	340	
B-I	Aero Commander 690	11	16	8	8	
B-I	Beechjet 400	190	285	143	143	MIX 3 ASSUMES 30% OF 2017 DEPARTURES
B-I	Citation CJ1/CJ2	168	251	125	125	
B-I	Citation I/SP	62	93	46	46	
B-I	Citation M2	47	71	35	35	
B-I	Citation Mustang	64	96	48	48	MIX 4 ASSUMES 30% OF 2017 DEPARTURES AND REMOVES THE 5 MOST CRITICAL AIRCRAFT INCLUDING: GULFSTREAM G-V, BOMBARDIER 5000
B-I	Falcon 10	7	11	5	5	
B-I	King Air 90/100	325	487	243	243	
B-I	Phenom 100	123	184	92	92	
B-I	Piaggio Avanti	2	3	2	2	
B-I	Piper Cheyenne	30	45	22	22	
B-I	Premier 1	6	9	4	4	
B-I	Rockwell Sabre 40/60	2	2	1	1	
B-I	Swearingen Merlin	5	8	4	4	
B-I	T-6 Texan	24	36	18	18	
B-II	Beech 1900		11	3	3	
B-II	Cessna Conquest		80	24	24	
B-II	Citation CJ3/CJ4		436	131	131	
B-II	Citation II/SP/Latitude		587	176	176	
B-II	Citation V/VII/Sovereign		1640	492	492	
B-II	Citation X		205	62	62	
B-II	Citation XLS		1227	368	368	
B-II	Embraer 500/450 Legacy		12	4	4	
B-II	Falcon 20/50		160	48	48	
B-II	Falcon 2000		88	26	26	
B-II	Falcon 900		29	9	9	
B-II	King Air 200/300/350		839	252	252	
B-II	King Air F90		26	8	8	
B-II	Phenom 300		204	61	61	
B-III	Bombardier Global 5000		57	17		
B-III	Bombardier Global Express		6	2		
B-III	Falcon 7X/8X		4	1	1	
C-I	BAe HS 125 Series		8	2	2	
C-I	BAe Systems Hawk		12	4	4	
C-I	Learjet 20 Series		2	1	1	
C-I	Learjet 31		187	56	56	
C-I	Learjet 40 Series		713	214	214	
C-I	Learjet 50 Series		46	14	14	
C-I	Learjet 60 Series		112	34	34	
C-I	Westwind II		240	72	72	
C-II	Challenger 300/600/604		807	242	242	
C-II	Embraer ERJ-135/140/145		94	28	28	
C-II	Gulfstream 100/150		1			
C-II	Gulfstream 200/280		71	21	21	
C-II	Gulfstream G100		137	41	41	
C-II	Gulfstream G-III		2	1		
C-II	Hawker 4000		15	5	5	
C-II	Hawker 800		362	109	109	
C-II	Learjet 70 Series		44	13	13	
D-I	Learjet 35/36		71	21	21	
D-II	Gulfstream 450		29	9		
D-III	Gulfstream 500/599		29	9		

This file name = PCN Results Rigid 11-21-2018 09;30;21.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix2.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 338.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 8.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Gulfstream-G-V	90,900	95.00	188.0	29	138	9.25
2	Gulfstream-G-IV	75,000	95.00	185.0	29	128	8.53
3	Learjet-35A/65A	18,000	95.00	171.0	71	163	4.23
4	Learjet 70 Series	21,500	95.00	65.0	44	178	3.94
5	Hawker-800	27,520	95.00	135.0	362	1,148	5.35
6	Hawker 4000	39,500	95.00	90.0	15	69	5.37
7	Gulfstream-G-III	70,200	95.00	175.0	2	9	7.43
8	Gulfstream G100	24,650	95.00	75.0	137	548	4.34
9	Gulfstream 280	39,600	95.00	90.0	71	328	5.67
10	Gulfstream 150	26,100	95.00	100.0	1	3	4.47
11	Embraer ERJ 145	48,501	95.00	90.0	94	480	6.38
12	Challenger-CL-604	48,200	95.00	145.0	807	3,211	7.18
13	Westwind II	23,500	95.00	75.0	240	937	4.31
14	Learjet 60	23,500	95.00	100.0	112	276	5.07
15	Learjet-50	21,500	95.00	201.0	46	106	4.66
16	Learjet 40	21,000	95.00	65.0	713	2,857	4.26
17	Learjet 31	15,500	95.00	55.0	187	702	3.42
18	Learjet 200	13,500	95.00	55.0	2	7	2.70
19	BAe Systems Hawk	20,001	95.00	75.0	12	31	4.09
20	BAe HS 125 Series	25,001	95.00	75.0	8	32	3.97
21	Falcon 8X	73,000	95.00	105.0	4	22	6.77
22	Bombardier Global Express	95,000	95.00	90.0	6	43	8.24
23	Bombardier 5000	92,500	95.00	90.0	57	401	8.78
24	Phenom 300	17,698	95.00	50.0	204	615	3.82
25	KingAir-F-90	10,950	95.00	58.0	26	57	3.01
26	SuperKingAir-350	15,100	95.00	92.0	839	2,403	3.84
27	Falcon-900	45,500	95.00	145.0	29	114	6.44
28	Falcon-2000	41,000	95.00	197.0	88	281	6.58
29	Falcon-50	38,800	95.00	208.0	160	484	6.56
30	Embraer 500 Legacy	37,570	95.00	90.0	12	54	5.19
31	Citation XLS	20,200	95.00	75.0	1,227	3,231	4.80
32	Citation-X	36,000	95.00	189.0	205	631	6.39
33	Citation Sovereign	30,775	95.00	85.0	1,640	6,880	5.47

34	Citation Latitude	30,800	95.00	85.0	587	2,463	5.24
35	Cessna CJ4	17,110	95.00	65.0	436	1,578	3.76
36	Cessna Conquest	9,925	95.00	95.0	80	132	3.33
37	Beech 1900	17,120	95.00	65.0	11	40	3.32
38	T-6 Texan	5,617	100.00	50.0	36	89	3.02
39	Swearingen Merlin	13,230	95.00	55.0	8	28	2.81
40	Sabreliner-60	18,340	95.00	214.0	2	3	4.41
41	Premier 1	12,501	95.00	50.0	9	23	2.95
42	Piper Cheyenne	12,050	95.00	50.0	45	112	3.07
43	Piaggio Avanti	12,100	95.00	50.0	3	7	2.79
44	Phenom 100	10,582	100.00	50.0	184	441	3.11
45	KingAir-B-100	11,800	95.00	52.0	487	1,639	2.98
46	Falcon 10	18,740	95.00	50.0	11	34	3.54
47	Citation Mustang	8,645	95.00	50.0	96	203	2.73
48	Citation M2	10,700	95.00	50.0	71	167	2.96
49	Citation SP	11,850	95.00	50.0	93	230	3.13
50	Citation CJ2	12,501	95.00	50.0	251	637	3.31
51	BeechJet-400	15,500	95.00	90.0	285	601	4.22
52	Aero Commander 690 UF	10,325	95.00	50.0	16	37	2.77
53	Pilatus PC-12	10,450	95.00	50.0	681	1,581	3.16
54	Cessna 425 Corsair	8,600	95.00	50.0	69	145	2.69
55	Cessna Caravan	8,000	95.00	50.0	5	10	2.37
56	Scota TBM 900 UF	7,394	95.00	50.0	104	203	2.55
57	Piper Malibu/Meridian UF	6,000	95.00	50.0	70	123	2.29
58	Eclipse 400/500-UF	6,000	95.00	50.0	17	30	2.18
59	Mitsubishi MU-2 UF	11,575	95.00	50.0	2	5	2.69

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
1	Gulfstream-G-V	201	9.37	66,894	8.43	51.0569	21.6

Total CDF = 51.0569

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.0,29,9.25,1.38276E+002,2.70827E+000,9.37,66893.596,21.6,8.0,B,338.00,1.00,R

This file name = PCN Results Rigid 11-21-2018 09;31;09.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix2.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 373.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Deps	6D Coverages	Thick
1	Gulfstream-G-V	90,900	95.00	188.0	29		138	9.15
2	Gulfstream-G-IV	75,000	95.00	185.0	29		128	8.45
3	Learjet-35A/65A	18,000	95.00	171.0	71		163	4.18
4	Learjet 70 Series	21,500	95.00	65.0	44		178	3.88
5	Hawker-800	27,520	95.00	135.0	362		1,148	5.29
6	Hawker 4000	39,500	95.00	90.0	15		69	5.29
7	Gulfstream-G-III	70,200	95.00	175.0	2		9	7.35
8	Gulfstream G100	24,650	95.00	75.0	137		548	4.27
9	Gulfstream 280	39,600	95.00	90.0	71		328	5.59
10	Gulfstream 150	26,100	95.00	100.0	1		3	4.43
11	Embraer ERJ 145	48,501	95.00	90.0	94		480	6.28
12	Challenger-CL-604	48,200	95.00	145.0	807		3,211	7.08
13	Westwind II	23,500	95.00	75.0	240		937	4.24
14	Learjet 60	23,500	95.00	100.0	112		276	5.01
15	Learjet-50	21,500	95.00	201.0	46		106	4.62
16	Learjet 40	21,000	95.00	65.0	713		2,857	4.20
17	Learjet 31	15,500	95.00	55.0	187		702	3.36
18	Learjet 200	13,500	95.00	55.0	2		7	2.66
19	BAe Systems Hawk	20,001	95.00	75.0	12		31	4.04
20	BAe HS 125 Series	25,001	95.00	75.0	8		32	3.90
21	Falcon 8X	73,000	95.00	105.0	4		22	6.66
22	Bombardier Global Express	95,000	95.00	90.0	6		43	8.13
23	Bombardier 5000	92,500	95.00	90.0	57		401	8.66
24	Phenom 300	17,698	95.00	50.0	204		615	3.76
25	KingAir-F-90	10,950	95.00	58.0	26		57	2.97
26	SuperKingAir-350	15,100	95.00	92.0	839		2,403	3.79
27	Falcon-900	45,500	95.00	145.0	29		114	6.36
28	Falcon-2000	41,000	95.00	197.0	88		281	6.51
29	Falcon-50	38,800	95.00	208.0	160		484	6.49
30	Embraer 500 Legacy	37,570	95.00	90.0	12		54	5.11
31	Citation XLS	20,200	95.00	75.0	1,227		3,231	4.74
32	Citation-X	36,000	95.00	189.0	205		631	6.33
33	Citation Sovereign	30,775	95.00	85.0	1,640		6,880	5.39

34	Citation Latitude	30,800	95.00	85.0	587	2,463	5.17
35	Cessna CJ4	17,110	95.00	65.0	436	1,578	3.70
36	Cessna Conquest	9,925	95.00	95.0	80	132	3.29
37	Beech 1900	17,120	95.00	65.0	11	40	3.27
38	T-6 Texan	5,617	100.00	50.0	36	89	2.98
39	Swearingen Merlin	13,230	95.00	55.0	8	28	2.77
40	Sabreliner-60	18,340	95.00	214.0	2	3	4.38
41	Premier 1	12,501	95.00	50.0	9	23	2.90
42	Piper Cheyenne	12,050	95.00	50.0	45	112	3.02
43	Piaggio Avanti	12,100	95.00	50.0	3	7	2.75
44	Phenom 100	10,582	100.00	50.0	184	441	3.07
45	KingAir-B-100	11,800	95.00	52.0	487	1,639	2.93
46	Falcon 10	18,740	95.00	50.0	11	34	3.49
47	Citation Mustang	8,645	95.00	50.0	96	203	2.69
48	Citation M2	10,700	95.00	50.0	71	167	2.92
49	Citation SP	11,850	95.00	50.0	93	230	3.08
50	Citation CJ2	12,501	95.00	50.0	251	637	3.26
51	BeechJet-400	15,500	95.00	90.0	285	601	4.18
52	Aero Commander 690 UF	10,325	95.00	50.0	16	37	2.73
53	Pilatus PC-12	10,450	95.00	50.0	681	1,581	3.11
54	Cessna 425 Corsair	8,600	95.00	50.0	69	145	2.65
55	Cessna Caravan	8,000	95.00	50.0	5	10	2.33
56	Scota TBM 900 UF	7,394	95.00	50.0	104	203	2.51
57	Piper Malibu/Meridian UF	6,000	95.00	50.0	70	123	2.26
58	Eclipse 400/500-UF	6,000	95.00	50.0	17	30	2.15
59	Mitsubishi MU-2 UF	11,575	95.00	50.0	2	5	2.65

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
1	Gulfstream-G-V	244	9.33	38,952	6.27	21762.0627	11.4

Total CDF =21762.0627

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.0,29,9.15,1.38276E+002,6.35398E-003,9.33,38951.958,11.4,6.0,B,373.00,1.00,R

This file name = PCN Results Rigid 11-21-2018 09;31;50.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix2.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 391.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Gulfstream-G-V	90,900	95.00	188.0	29	138	9.10
2	Gulfstream-G-IV	75,000	95.00	185.0	29	128	8.41
3	Learjet-35A/65A	18,000	95.00	171.0	71	163	4.16
4	Learjet 70 Series	21,500	95.00	65.0	44	178	3.85
5	Hawker-800	27,520	95.00	135.0	362	1,148	5.27
6	Hawker 4000	39,500	95.00	90.0	15	69	5.25
7	Gulfstream-G-III	70,200	95.00	175.0	2	9	7.31
8	Gulfstream G100	24,650	95.00	75.0	137	548	4.24
9	Gulfstream 280	39,600	95.00	90.0	71	328	5.54
10	Gulfstream 150	26,100	95.00	100.0	1	3	4.41
11	Embraer ERJ 145	48,501	95.00	90.0	94	480	6.24
12	Challenger-CL-604	48,200	95.00	145.0	807	3,211	7.03
13	Westwind II	23,500	95.00	75.0	240	937	4.21
14	Learjet 60	23,500	95.00	100.0	112	276	4.99
15	Learjet-50	21,500	95.00	201.0	46	106	4.60
16	Learjet 40	21,000	95.00	65.0	713	2,857	4.17
17	Learjet 31	15,500	95.00	55.0	187	702	3.33
18	Learjet 200	13,500	95.00	55.0	2	7	2.64
19	BAe Systems Hawk	20,001	95.00	75.0	12	31	4.01
20	BAe HS 125 Series	25,001	95.00	75.0	8	32	3.87
21	Falcon 8X	73,000	95.00	105.0	4	22	6.61
22	Bombardier Global Express	95,000	95.00	90.0	6	43	8.08
23	Bombardier 5000	92,500	95.00	90.0	57	401	8.61
24	Phenom 300	17,698	95.00	50.0	204	615	3.73
25	KingAir-F-90	10,950	95.00	58.0	26	57	2.95
26	SuperKingAir-350	15,100	95.00	92.0	839	2,403	3.77
27	Falcon-900	45,500	95.00	145.0	29	114	6.32
28	Falcon-2000	41,000	95.00	197.0	88	281	6.48
29	Falcon-50	38,800	95.00	208.0	160	484	6.46
30	Embraer 500 Legacy	37,570	95.00	90.0	12	54	5.07
31	Citation XLS	20,200	95.00	75.0	1,227	3,231	4.71
32	Citation-X	36,000	95.00	189.0	205	631	6.31
33	Citation Sovereign	30,775	95.00	85.0	1,640	6,880	5.35

34	Citation Latitude	30,800	95.00	85.0	587	2,463	5.13
35	Cessna CJ4	17,110	95.00	65.0	436	1,578	3.67
36	Cessna Conquest	9,925	95.00	95.0	80	132	3.28
37	Beech 1900	17,120	95.00	65.0	11	40	3.24
38	T-6 Texan	5,617	100.00	50.0	36	89	2.95
39	Swearingen Merlin	13,230	95.00	55.0	8	28	2.75
40	Sabreliner-60	18,340	95.00	214.0	2	3	4.36
41	Premier 1	12,501	95.00	50.0	9	23	2.88
42	Piper Cheyenne	12,050	95.00	50.0	45	112	3.00
43	Piaggio Avanti	12,100	95.00	50.0	3	7	2.72
44	Phenom 100	10,582	100.00	50.0	184	441	3.04
45	KingAir-B-100	11,800	95.00	52.0	487	1,639	2.90
46	Falcon 10	18,740	95.00	50.0	11	34	3.46
47	Citation Mustang	8,645	95.00	50.0	96	203	2.67
48	Citation M2	10,700	95.00	50.0	71	167	2.90
49	Citation SP	11,850	95.00	50.0	93	230	3.05
50	Citation CJ2	12,501	95.00	50.0	251	637	3.23
51	BeechJet-400	15,500	95.00	90.0	285	601	4.15
52	Aero Commander 690 UF	10,325	95.00	50.0	16	37	2.71
53	Pilatus PC-12	10,450	95.00	50.0	681	1,581	3.09
54	Cessna 425 Corsair	8,600	95.00	50.0	69	145	2.63
55	Cessna Caravan	8,000	95.00	50.0	5	10	2.32
56	Scota TBM 900 UF	7,394	95.00	50.0	104	203	2.50
57	Piper Malibu/Meridian UF	6,000	95.00	50.0	70	123	2.25
58	Eclipse 400/500-UF	6,000	95.00	50.0	17	30	2.14
59	Mitsubishi MU-2 UF	11,575	95.00	50.0	2	5	2.63

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
1	Gulfstream-G-V	242	9.27	39,367	6.31	19671.5532	11.6

Total CDF =19671.5532

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,Flex OrRig
1,Gulfstream-G-V,90900.000,31.0,29,9.10,1.38276E+002,7.02922E-003,9.27,39366.604,11.6,6.0,B,391.00,1.00,R

This file name = PCN Results Rigid 11-21-2018 09;32;33.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix2.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 302.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Deps	6D Coverages Thick
1	Gulfstream-G-V	90,900	95.00	188.0	29	138	9.38
2	Gulfstream-G-IV	75,000	95.00	185.0	29	128	8.62
3	Learjet-35A/65A	18,000	95.00	171.0	71	163	4.27
4	Learjet 70 Series	21,500	95.00	65.0	44	178	4.01
5	Hawker-800	27,520	95.00	135.0	362	1,148	5.41
6	Hawker 4000	39,500	95.00	90.0	15	69	5.46
7	Gulfstream-G-III	70,200	95.00	175.0	2	9	7.51
8	Gulfstream G100	24,650	95.00	75.0	137	548	4.42
9	Gulfstream 280	39,600	95.00	90.0	71	328	5.77
10	Gulfstream 150	26,100	95.00	100.0	1	3	4.53
11	Embraer ERJ 145	48,501	95.00	90.0	94	480	6.47
12	Challenger-CL-604	48,200	95.00	145.0	807	3,211	7.27
13	Westwind II	23,500	95.00	75.0	240	937	4.39
14	Learjet 60	23,500	95.00	100.0	112	276	5.13
15	Learjet-50	21,500	95.00	201.0	46	106	4.71
16	Learjet 40	21,000	95.00	65.0	713	2,857	4.34
17	Learjet 31	15,500	95.00	55.0	187	702	3.48
18	Learjet 200	13,500	95.00	55.0	2	7	2.75
19	BAe Systems Hawk	20,001	95.00	75.0	12	31	4.15
20	BAe HS 125 Series	25,001	95.00	75.0	8	32	4.03
21	Falcon 8X	73,000	95.00	105.0	4	22	6.88
22	Bombardier Global Express	95,000	95.00	90.0	6	43	8.38
23	Bombardier 5000	92,500	95.00	90.0	57	401	8.93
24	Phenom 300	17,698	95.00	50.0	204	615	3.89
25	KingAir-F-90	10,950	95.00	58.0	26	57	3.05
26	SuperKingAir-350	15,100	95.00	92.0	839	2,403	3.91
27	Falcon-900	45,500	95.00	145.0	29	114	6.53
28	Falcon-2000	41,000	95.00	197.0	88	281	6.65
29	Falcon-50	38,800	95.00	208.0	160	484	6.62
30	Embraer 500 Legacy	37,570	95.00	90.0	12	54	5.27
31	Citation XLS	20,200	95.00	75.0	1,227	3,231	4.87
32	Citation-X	36,000	95.00	189.0	205	631	6.45
33	Citation Sovereign	30,775	95.00	85.0	1,640	6,880	5.57

34	Citation Latitude	30,800	95.00	85.0	587	2,463	5.33
35	Cessna CJ4	17,110	95.00	65.0	436	1,578	3.83
36	Cessna Conquest	9,925	95.00	95.0	80	132	3.37
37	Beech 1900	17,120	95.00	65.0	11	40	3.38
38	T-6 Texan	5,617	100.00	50.0	36	89	3.08
39	Swearingen Merlin	13,230	95.00	55.0	8	28	2.86
40	Sabreliner-60	18,340	95.00	214.0	2	3	4.45
41	Premier 1	12,501	95.00	50.0	9	23	3.00
42	Piper Cheyenne	12,050	95.00	50.0	45	112	3.13
43	Piaggio Avanti	12,100	95.00	50.0	3	7	2.84
44	Phenom 100	10,582	100.00	50.0	184	441	3.17
45	KingAir-B-100	11,800	95.00	52.0	487	1,639	3.03
46	Falcon 10	18,740	95.00	50.0	11	34	3.61
47	Citation Mustang	8,645	95.00	50.0	96	203	2.77
48	Citation M2	10,700	95.00	50.0	71	167	3.02
49	Citation SP	11,850	95.00	50.0	93	230	3.18
50	Citation CJ2	12,501	95.00	50.0	251	637	3.37
51	BeechJet-400	15,500	95.00	90.0	285	601	4.27
52	Aero Commander 690 UF	10,325	95.00	50.0	16	37	2.82
53	Pilatus PC-12	10,450	95.00	50.0	681	1,581	3.22
54	Cessna 425 Corsair	8,600	95.00	50.0	69	145	2.73
55	Cessna Caravan	8,000	95.00	50.0	5	10	2.40
56	Scota TBM 900 UF	7,394	95.00	50.0	104	203	2.59
57	Piper Malibu/Meridian UF	6,000	95.00	50.0	70	123	2.32
58	Eclipse 400/500-UF	6,000	95.00	50.0	17	30	2.21
59	Mitsubishi MU-2 UF	11,575	95.00	50.0	2	5	2.74

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
1	Gulfstream-G-V	255	9.57	37,045	6.10	34809.7683	10.8

Total CDF =34809.7683

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.0,29,9.38,1.38276E+002,3.97233E-003,9.57,37044.510,10.8,6.0,B,302.00,1.00,R

This file name = PCN Results Rigid 11-21-2018 09;33;19.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix1.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 266.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Deps / 6D Coverages	Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	3.09
2	Swearingen Merlin	13,230	95.00	55.0	5	17	2.87
3	Sabreliner-60	18,340	95.00	214.0	2	3	4.49
4	Premier 1	12,501	95.00	50.0	6	15	3.01
5	Piper Cheyenne	12,050	95.00	50.0	30	75	3.14
6	Piaggio Avanti	12,100	95.00	50.0	2	5	2.85
7	Phenom 100	10,582	100.00	50.0	123	295	3.18
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	3.05
9	Falcon 10	18,740	95.00	50.0	7	22	3.63
10	Citation Mustang	8,645	95.00	50.0	64	135	2.78
11	Citation M2	10,700	95.00	50.0	47	110	3.02
12	Citation SP	11,850	95.00	50.0	62	153	3.20
13	Citation CJ2	12,501	95.00	50.0	168	426	3.39
14	BeechJet-400	15,500	95.00	90.0	190	401	4.28
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	2.83
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	3.23
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	2.74
18	Cessna Caravan	8,000	95.00	50.0	4	8	2.42
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	2.59
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	2.33
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	2.22
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.72

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
3	Sabreliner-60	11	4.73	30,661	6.85	0.0004	13.8

Total CDF = 0.0004

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.3,2,4.49,2.97988E+000,7.95065E+003,4.73,30661.312,13.8,6.0,B,266.00,1.00,R

This file name = PCN Results Rigid 11-21-2018 09;34;18.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix1.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 228.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	3.15
2	Swearingen Merlin	13,230	95.00	55.0	5	17	2.94
3	Sabreliner-60	18,340	95.00	214.0	2	3	4.54
4	Premier 1	12,501	95.00	50.0	6	15	3.07
5	Piper Cheyenne	12,050	95.00	50.0	30	75	3.20
6	Piaggio Avanti	12,100	95.00	50.0	2	5	2.90
7	Phenom 100	10,582	100.00	50.0	123	295	3.25
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	3.13
9	Falcon 10	18,740	95.00	50.0	7	22	3.71
10	Citation Mustang	8,645	95.00	50.0	64	135	2.83
11	Citation M2	10,700	95.00	50.0	47	110	3.09
12	Citation SP	11,850	95.00	50.0	62	153	3.26
13	Citation CJ2	12,501	95.00	50.0	168	426	3.46
14	BeechJet-400	15,500	95.00	90.0	190	401	4.35
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	2.88
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	3.29
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	2.79
18	Cessna Caravan	8,000	95.00	50.0	4	8	2.47
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	2.65
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	2.37
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	2.26
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.77

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
3	Sabreliner-60	13	4.80	29,591	6.74	0.0004	13.4

Total CDF = 0.0004

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.3,2,4.54,2.97988E+000,6.77668E+003,4.80,29590.901,13.4,6.0,B,228.00,1.00,R

This file name = PCN Results Rigid 11-21-2018 09;34;43.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix1.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 323.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	3.00
2	Swearingen Merlin	13,230	95.00	55.0	5	17	2.78
3	Sabreliner-60	18,340	95.00	214.0	2	3	4.43
4	Premier 1	12,501	95.00	50.0	6	15	2.93
5	Piper Cheyenne	12,050	95.00	50.0	30	75	3.05
6	Piaggio Avanti	12,100	95.00	50.0	2	5	2.77
7	Phenom 100	10,582	100.00	50.0	123	295	3.10
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	2.96
9	Falcon 10	18,740	95.00	50.0	7	22	3.51
10	Citation Mustang	8,645	95.00	50.0	64	135	2.71
11	Citation M2	10,700	95.00	50.0	47	110	2.94
12	Citation SP	11,850	95.00	50.0	62	153	3.11
13	Citation CJ2	12,501	95.00	50.0	168	426	3.29
14	BeechJet-400	15,500	95.00	90.0	190	401	4.19
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	2.75
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	3.14
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	2.67
18	Cessna Caravan	8,000	95.00	50.0	4	8	2.36
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	2.53
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	2.27
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	2.16
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.64

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
3	Sabreliner-60	10	4.64	32,059	7.00	0.0003	14.5

Total CDF = 0.0003

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.3,2,4.43,2.97988E+000,1.00071E+004,4.64,32059.212,14.5,6.0,B,323.00,1.00,R

This file name = PCN Results Rigid 11-21-2018 09;35;09.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix1.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 321.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	3.01
2	Swearingen Merlin	13,230	95.00	55.0	5	17	2.79
3	Sabreliner-60	18,340	95.00	214.0	2	3	4.43
4	Premier 1	12,501	95.00	50.0	6	15	2.93
5	Piper Cheyenne	12,050	95.00	50.0	30	75	3.06
6	Piaggio Avanti	12,100	95.00	50.0	2	5	2.77
7	Phenom 100	10,582	100.00	50.0	123	295	3.10
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	2.97
9	Falcon 10	18,740	95.00	50.0	7	22	3.52
10	Citation Mustang	8,645	95.00	50.0	64	135	2.71
11	Citation M2	10,700	95.00	50.0	47	110	2.95
12	Citation SP	11,850	95.00	50.0	62	153	3.11
13	Citation CJ2	12,501	95.00	50.0	168	426	3.29
14	BeechJet-400	15,500	95.00	90.0	190	401	4.19
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	2.75
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	3.15
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	2.67
18	Cessna Caravan	8,000	95.00	50.0	4	8	2.37
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	2.53
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	2.27
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	2.16
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.64

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
3	Sabreliner-60	10	4.64	32,015	6.99	0.0003	14.5

Total CDF = 0.0003

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.3,2,4.43,2.97988E+000,9.92844E+003,4.64,32015.410,14.5,6.0,B,321.00,1.00,R

This file name = PCN Results Rigid 11-21-2018 09;35;59.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix1.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 40.0 lbs/in^3 (Subgrade Category is D(74))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	3.79
2	Swearingen Merlin	13,230	95.00	55.0	5	17	3.59
3	Sabreliner-60	18,340	95.00	214.0	2	3	5.04
4	Premier 1	12,501	95.00	50.0	6	15	3.70
5	Piper Cheyenne	12,050	95.00	50.0	30	75	3.85
6	Piaggio Avanti	12,100	95.00	50.0	2	5	3.49
7	Phenom 100	10,582	100.00	50.0	123	295	3.90
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	3.84
9	Falcon 10	18,740	95.00	50.0	7	22	4.51
10	Citation Mustang	8,645	95.00	50.0	64	135	3.38
11	Citation M2	10,700	95.00	50.0	47	110	3.70
12	Citation SP	11,850	95.00	50.0	62	153	3.92
13	Citation CJ2	12,501	95.00	50.0	168	426	4.16
14	BeechJet-400	15,500	95.00	90.0	190	401	5.02
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	3.45
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	3.95
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	3.33
18	Cessna Caravan	8,000	95.00	50.0	4	8	2.95
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	3.14
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	2.81
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	2.67
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	3.33

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(74)
3	Sabreliner-60	10	5.29	24,051	6.60	0.0082	10.7

Total CDF = 0.0082

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.1,2,5.04,2.97988E+000,3.63977E+002,5.29,24050.697,10.7,6.0,D,40.00,1.00,R

This file name = PCN Results Rigid 11-21-2018 09;36;27.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix1.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 172.0 lbs/in^3 (Subgrade Category is C(147))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	3.27
2	Swearingen Merlin	13,230	95.00	55.0	5	17	3.06
3	Sabreliner-60	18,340	95.00	214.0	2	3	4.63
4	Premier 1	12,501	95.00	50.0	6	15	3.19
5	Piper Cheyenne	12,050	95.00	50.0	30	75	3.33
6	Piaggio Avanti	12,100	95.00	50.0	2	5	3.01
7	Phenom 100	10,582	100.00	50.0	123	295	3.37
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	3.26
9	Falcon 10	18,740	95.00	50.0	7	22	3.85
10	Citation Mustang	8,645	95.00	50.0	64	135	2.93
11	Citation M2	10,700	95.00	50.0	47	110	3.20
12	Citation SP	11,850	95.00	50.0	62	153	3.38
13	Citation CJ2	12,501	95.00	50.0	168	426	3.59
14	BeechJet-400	15,500	95.00	90.0	190	401	4.46
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	2.99
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	3.41
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	2.89
18	Cessna Caravan	8,000	95.00	50.0	4	8	2.56
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	2.73
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	2.45
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	2.33
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.87

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(147)
3	Sabreliner-60	15	4.93	27,959	6.84	0.0006	12.6
				Total CDF =		0.0006	

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.2,2,4.63,2.97988E+000,5.12908E+003,4.93,27959.078,12.6,6.0,C,172.00,1.00,R

This file name = PCN Results Flexible 11-28-2018 18;18;30.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix1.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 12.00 (Subgrade Category is B(10))
Evaluation pavement thickness = 29.40 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	2.77
2	Swearingen Merlin	13,230	95.00	55.0	5	17	2.02
3	Sabreliner-60	18,340	95.00	214.0	2	3	2.26
4	Premier 1	12,501	95.00	50.0	6	15	2.14
5	Piper Cheyenne	12,050	95.00	50.0	30	75	2.91
6	Piaggio Avanti	12,100	95.00	50.0	2	5	1.53
7	Phenom 100	10,582	100.00	50.0	123	295	3.40
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	3.36
9	Falcon 10	18,740	95.00	50.0	7	22	2.86
10	Citation Mustang	8,645	95.00	50.0	64	135	2.70
11	Citation M2	10,700	95.00	50.0	47	110	2.92
12	Citation SP	11,850	95.00	50.0	62	153	3.22
13	Citation CJ2	12,501	95.00	50.0	168	426	3.77
14	BeechJet-400	15,500	95.00	90.0	190	401	5.20
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	2.19
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	3.79
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	2.56
18	Cessna Caravan	8,000	95.00	50.0	4	8	1.44
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	2.50
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	2.09
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	1.61
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	1.16

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(10)
3	Sabreliner-60	>5,000,000	17.40	52,349	16.28	0.0000	22.7

Total CDF = 0.0000

When computing the numbers of coverages to failure, the coverages for none of the aircraft converged at a pavement thickness greater than 99 percent of the evaluation thickness. This means that the life of the pavement is unlimited and the pavement is very strong in relation to the aircraft loading. The relative aircraft load evaluations are also unreliable. Consider reviewing the procedures used to determine the evaluation thickness and the strength of the support. The thicknesses for unlimited operations of each of the aircraft are as follows.

Results Table 2a. Thicknesses for Unlimited Operations

T-6 Texan	9.71
Swearingen Merlin	7.44
Sabreliner-60	17.40
Premier 1	9.99
Piper Cheyenne	9.81
Piaggio Avanti	9.83
Phenom 100	9.43
KingAir-B-100	6.49
Falcon 10	12.23
Citation Mustang	8.31
Citation M2	9.24
Citation SP	9.72
Citation CJ2	9.99
BeechJet-400	13.91
Aero Commander 690 UF	9.08
Pilatus PC-12	9.13
Cessna 425 Corsair	8.28
Cessna Caravan	7.99
Scota TBM 900 UF	7.68
Piper Malibu/Meridian UF	6.92
Eclipse 400/500-UF	6.92
Mitsubishi MU-2 UF	9.61

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.0,2,2.26,2.97988E+000,1.01423E+304,17.40,52349.052,22.7,29.4,B,12.00,1.00,F

This file name = PCN Results Flexible 3-18-2019 16;52;57.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 1.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 19.80 (Subgrade Category is A(15))
Evaluation pavement thickness = 19.80 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Deps	6D Coverages	Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	1.65	
2	Swearingen Merlin	13,230	95.00	55.0	5	17	1.24	
3	Sabreliner-60	18,340	95.00	214.0	2	3	1.68	
4	Premier 1	12,501	95.00	50.0	6	15	1.27	
5	Piper Cheyenne	12,050	95.00	50.0	30	75	1.73	
6	Piaggio Avanti	12,100	95.00	50.0	2	5	0.91	
7	Phenom 100	10,582	100.00	50.0	123	295	2.02	
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	1.98	
9	Falcon 10	18,740	95.00	50.0	7	22	1.70	
10	Citation Mustang	8,645	95.00	50.0	64	135	1.60	
11	Citation M2	10,700	95.00	50.0	47	110	1.73	
12	Citation SP	11,850	95.00	50.0	62	153	1.91	
13	Citation CJ2	12,501	95.00	50.0	168	426	2.24	
14	BeechJet-400	15,500	95.00	90.0	190	401	3.37	
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	1.30	
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	2.25	
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	1.52	
18	Cessna Caravan	8,000	95.00	50.0	4	8	0.86	
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	1.48	
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	1.24	
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	0.95	
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	0.69	

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on A(15)
3	Sabreliner-60	>5,000,000	12.90	43,238	11.79	0.0000	19.5
					Total CDF =	0.0000	

When computing the numbers of coverages to failure, the coverages for none of the aircraft converged at a pavement thickness greater than 99 percent of the evaluation thickness. This means that the life of the pavement is unlimited and the pavement is very strong in relation to the aircraft loading. The relative aircraft load evaluations are also unreliable. Consider reviewing the procedures used to determine the evaluation thickness and the strength of the support. The thicknesses for unlimited operations of each of the aircraft are as follows.

Results Table 2a. Thicknesses for Unlimited Operations

T-6 Texan	5.77
Swearingen Merlin	4.14
Sabreliner-60	12.90
Premier 1	5.93
Piper Cheyenne	5.82
Piaggio Avanti	5.83
Phenom 100	5.60
KingAir-B-100	3.69
Falcon 10	7.26
Citation Mustang	4.93
Citation M2	5.49
Citation SP	5.77
Citation CJ2	5.93
BeechJet-400	9.01
Aero Commander 690 UF	5.39
Pilatus PC-12	5.42
Cessna 425 Corsair	4.92
Cessna Caravan	4.74
Scota TBM 900 UF	4.56
Piper Malibu/Meridian UF	4.11
Eclipse 400/500-UF	4.11
Mitsubishi MU-2 UF	5.71

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.3,2,1.68,2.97988E+000,1.01423E+304,12.90,43237.745,19.5,19.8,A,19.80,1.00,F

This file name = PCN Results Rigid 11-21-2018 09;37;04.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix1.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 301.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	3.04
2	Swearingen Merlin	13,230	95.00	55.0	5	17	2.82
3	Sabreliner-60	18,340	95.00	214.0	2	3	4.45
4	Premier 1	12,501	95.00	50.0	6	15	2.96
5	Piper Cheyenne	12,050	95.00	50.0	30	75	3.09
6	Piaggio Avanti	12,100	95.00	50.0	2	5	2.80
7	Phenom 100	10,582	100.00	50.0	123	295	3.13
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	2.99
9	Falcon 10	18,740	95.00	50.0	7	22	3.55
10	Citation Mustang	8,645	95.00	50.0	64	135	2.73
11	Citation M2	10,700	95.00	50.0	47	110	2.98
12	Citation SP	11,850	95.00	50.0	62	153	3.14
13	Citation CJ2	12,501	95.00	50.0	168	426	3.33
14	BeechJet-400	15,500	95.00	90.0	190	401	4.22
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	2.78
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	3.18
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	2.69
18	Cessna Caravan	8,000	95.00	50.0	4	8	2.38
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	2.55
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	2.29
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	2.18
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.67

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
3	Sabreliner-60	11	4.67	31,551	6.95	0.0003	14.2

Total CDF = 0.0003

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.3,2,4.45,2.97988E+000,9.18773E+003,4.67,31550.512,14.2,6.0,B,301.00,1.00,R

This file name = PCN Results Rigid 11-21-2018 09;37;41.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix1.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 236.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	3.14
2	Swearingen Merlin	13,230	95.00	55.0	5	17	2.93
3	Sabreliner-60	18,340	95.00	214.0	2	3	4.53
4	Premier 1	12,501	95.00	50.0	6	15	3.06
5	Piper Cheyenne	12,050	95.00	50.0	30	75	3.19
6	Piaggio Avanti	12,100	95.00	50.0	2	5	2.89
7	Phenom 100	10,582	100.00	50.0	123	295	3.23
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	3.11
9	Falcon 10	18,740	95.00	50.0	7	22	3.69
10	Citation Mustang	8,645	95.00	50.0	64	135	2.82
11	Citation M2	10,700	95.00	50.0	47	110	3.07
12	Citation SP	11,850	95.00	50.0	62	153	3.25
13	Citation CJ2	12,501	95.00	50.0	168	426	3.44
14	BeechJet-400	15,500	95.00	90.0	190	401	4.33
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	2.87
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	3.28
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	2.78
18	Cessna Caravan	8,000	95.00	50.0	4	8	2.46
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	2.63
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	2.36
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	2.25
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.76

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
3	Sabreliner-60	13	4.79	29,820	6.77	0.0004	13.5

Total CDF = 0.0004

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.3,2,4.53,2.97988E+000,7.00671E+003,4.79,29820.415,13.5,6.0,B,236.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;11;54.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 3.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 417.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 9.60 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Gulfstream-G-V	90,900	95.00	188.0	9	43	8.67
2	Gulfstream-G-IV	75,000	95.00	185.0	9	40	8.01
3	Learjet-35A/65A	18,000	95.00	171.0	21	48	3.96
4	Learjet 70 Series	21,500	95.00	65.0	13	53	3.65
5	Hawker-800	27,520	95.00	135.0	109	346	5.02
6	Hawker 4000	39,500	95.00	90.0	5	23	4.99
7	Gulfstream-G-III	70,200	95.00	175.0	1	4	7.06
8	Gulfstream 280	39,600	95.00	90.0	41	189	5.39
9	Gulfstream 150	26,100	95.00	100.0	21	54	4.91
10	Embraer ERJ 145	48,501	95.00	90.0	28	143	5.93
11	Challenger-CL-604	48,200	95.00	145.0	242	963	6.71
12	Westwind II	23,500	95.00	75.0	72	281	4.01
13	Learjet 60	23,500	95.00	100.0	34	84	4.75
14	Learjet-50	21,500	95.00	201.0	14	32	4.38
15	Learjet 40	21,000	95.00	65.0	214	858	3.97
16	Learjet 31	15,500	95.00	55.0	56	210	3.16
17	Learjet 200	13,500	95.00	55.0	1	4	2.54
18	BAe Systems Hawk	20,001	95.00	75.0	4	10	3.82
19	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.64
20	Falcon 8X	73,000	95.00	105.0	1	6	6.21
21	Bombardier Global Express	95,000	95.00	90.0	2	14	7.69
22	Bombardier 5000	92,500	95.00	90.0	17	120	8.19
23	Phenom 300	17,698	95.00	50.0	61	184	3.55
24	KingAir-F-90	10,950	95.00	58.0	8	18	2.80
25	SuperKingAir-350	15,100	95.00	92.0	252	722	3.59
26	Falcon-900	45,500	95.00	145.0	9	35	6.02
27	Falcon-2000	41,000	95.00	197.0	26	83	6.17
28	Falcon-50	38,800	95.00	208.0	48	145	6.16
29	Embraer 500 Legacy	37,570	95.00	90.0	4	18	4.82
30	Citation XLS	20,200	95.00	75.0	368	969	4.49
31	Citation-X	36,000	95.00	189.0	62	191	6.02
32	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.05
33	Citation Latitude	30,800	95.00	85.0	176	739	4.89

34	Cessna CJ4	17,110	95.00	65.0	131	474	3.50
35	Cessna Conquest	9,925	95.00	95.0	24	39	3.12
36	Beech 1900	17,120	95.00	65.0	3	11	3.06
37	T-6 Texan	5,617	100.00	50.0	18	44	2.85
38	Swearingen Merlin	13,230	95.00	55.0	4	14	2.65
39	Sabreliner-60	18,340	95.00	214.0	1	1	4.22
40	Premier 1	12,501	95.00	50.0	4	10	2.77
41	Piper Cheyenne	12,050	95.00	50.0	22	55	2.90
42	Piaggio Avanti	12,100	95.00	50.0	2	5	2.65
43	Phenom 100	10,582	100.00	50.0	92	220	2.94
44	KingAir-B-100	11,800	95.00	52.0	243	818	2.80
45	Falcon 10	18,740	95.00	50.0	5	16	3.32
46	Citation Mustang	8,645	95.00	50.0	48	101	2.58
47	Citation M2	10,700	95.00	50.0	35	82	2.80
48	Citation SP	11,850	95.00	50.0	46	114	2.95
49	Citation CJ2	12,501	95.00	50.0	125	317	3.13
50	BeechJet-400	15,500	95.00	90.0	143	302	4.03
51	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.61
52	Pilatus PC-12	10,450	95.00	50.0	340	789	2.99
53	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.29
54	Cessna Caravan	8,000	95.00	50.0	35	71	2.46
55	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.41
56	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.17
57	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.06
58	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.53

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	PCN on CDF	B(295)
1	Gulfstream-G-V	63	8.79	107,898	10.96	0.0504	38.0
				Total CDF =	0.0504		

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.0,9,8.67,4.29132E+001,8.50719E+002,8.79,107897.687,38.0,9.6,B,417.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;16;04.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 4.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 312.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 11.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Learjet 70 Series	21,500	95.00	65.0	21	85	3.89
2	Hawker-800	27,520	95.00	135.0	13	41	4.82
3	Hawker 4000	39,500	95.00	90.0	109	503	5.81
4	Gulfstream G100	24,650	95.00	75.0	5	20	3.92
5	Gulfstream 280	39,600	95.00	90.0	41	189	5.63
6	Gulfstream 150	26,100	95.00	100.0	21	54	5.06
7	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.19
8	Challenger-CL-604	48,200	95.00	145.0	242	963	6.97
9	Westwind II	23,500	95.00	75.0	72	281	4.19
10	Learjet 60	23,500	95.00	100.0	34	84	4.91
11	Learjet-50	21,500	95.00	201.0	14	32	4.50
12	Learjet 40	21,000	95.00	65.0	214	858	4.15
13	Learjet 31	15,500	95.00	55.0	56	210	3.32
14	Learjet 200	13,500	95.00	55.0	1	4	2.66
15	BAe Systems Hawk	20,001	95.00	75.0	4	10	3.97
16	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.81
17	Falcon 8X	73,000	95.00	105.0	1	6	6.50
18	Phenom 300	17,698	95.00	50.0	61	184	3.72
19	KingAir-F-90	10,950	95.00	58.0	8	18	2.91
20	SuperKingAir-350	15,100	95.00	92.0	252	722	3.74
21	Falcon-900	45,500	95.00	145.0	9	35	6.24
22	Falcon-2000	41,000	95.00	197.0	26	83	6.36
23	Falcon-50	38,800	95.00	208.0	48	145	6.34
24	Embraer 500 Legacy	37,570	95.00	90.0	4	18	5.04
25	Citation XLS	20,200	95.00	75.0	368	969	4.67
26	Citation-X	36,000	95.00	189.0	62	191	6.18
27	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.28
28	Citation Latitude	30,800	95.00	85.0	176	739	5.11
29	Cessna CJ4	17,110	95.00	65.0	131	474	3.66
30	Cessna Conquest	9,925	95.00	95.0	24	39	3.22
31	Beech 1900	17,120	95.00	65.0	3	11	3.21
32	T-6 Texan	5,617	100.00	50.0	18	44	2.99
33	Swearingen Merlin	13,230	95.00	55.0	4	14	2.78

34	Sabreliner-60	18,340	95.00	214.0	1	1	4.32
35	Premier 1	12,501	95.00	50.0	4	10	2.90
36	Piper Cheyenne	12,050	95.00	50.0	22	55	3.04
37	Piaggio Avanti	12,100	95.00	50.0	2	5	2.78
38	Phenom 100	10,582	100.00	50.0	92	220	3.08
39	KingAir-B-100	11,800	95.00	52.0	243	818	2.95
40	Falcon 10	18,740	95.00	50.0	5	16	3.49
41	Citation Mustang	8,645	95.00	50.0	48	101	2.69
42	Citation M2	10,700	95.00	50.0	35	82	2.93
43	Citation SP	11,850	95.00	50.0	46	114	3.09
44	Citation CJ2	12,501	95.00	50.0	125	317	3.28
45	BeechJet-400	15,500	95.00	90.0	143	302	4.16
46	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.73
47	Pilatus PC-12	10,450	95.00	50.0	340	789	3.13
48	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.39
49	Cessna Caravan	8,000	95.00	50.0	35	71	2.57
50	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.51
51	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.26
52	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.14
53	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.65

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
8	Challenger-CL-604	1,285	7.04	125,046	11.78	0.0000	44.4
					Total CDF =	0.0000	

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
8,Challenger-CL-604,48200.000,14.2,242,6.97,9.62874E+002,2.11468E+007,7.04,125045.554,44.4,11.5,B,312.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;16;59.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 4.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 386.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 7.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Learjet 70 Series	21,500	95.00	65.0	21	85	3.76
2	Hawker-800	27,520	95.00	135.0	13	41	4.71
3	Hawker 4000	39,500	95.00	90.0	109	503	5.63
4	Gulfstream G100	24,650	95.00	75.0	5	20	3.79
5	Gulfstream 280	39,600	95.00	90.0	41	189	5.45
6	Gulfstream 150	26,100	95.00	100.0	21	54	4.95
7	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.00
8	Challenger-CL-604	48,200	95.00	145.0	242	963	6.78
9	Westwind II	23,500	95.00	75.0	72	281	4.05
10	Learjet 60	23,500	95.00	100.0	34	84	4.79
11	Learjet-50	21,500	95.00	201.0	14	32	4.41
12	Learjet 40	21,000	95.00	65.0	214	858	4.02
13	Learjet 31	15,500	95.00	55.0	56	210	3.21
14	Learjet 200	13,500	95.00	55.0	1	4	2.57
15	BAe Systems Hawk	20,001	95.00	75.0	4	10	3.86
16	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.69
17	Falcon 8X	73,000	95.00	105.0	1	6	6.29
18	Phenom 300	17,698	95.00	50.0	61	184	3.59
19	KingAir-F-90	10,950	95.00	58.0	8	18	2.83
20	SuperKingAir-350	15,100	95.00	92.0	252	722	3.63
21	Falcon-900	45,500	95.00	145.0	9	35	6.08
22	Falcon-2000	41,000	95.00	197.0	26	83	6.22
23	Falcon-50	38,800	95.00	208.0	48	145	6.21
24	Embraer 500 Legacy	37,570	95.00	90.0	4	18	4.88
25	Citation XLS	20,200	95.00	75.0	368	969	4.54
26	Citation-X	36,000	95.00	189.0	62	191	6.07
27	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.11
28	Citation Latitude	30,800	95.00	85.0	176	739	4.95
29	Cessna CJ4	17,110	95.00	65.0	131	474	3.54
30	Cessna Conquest	9,925	95.00	95.0	24	39	3.14
31	Beech 1900	17,120	95.00	65.0	3	11	3.10
32	T-6 Texan	5,617	100.00	50.0	18	44	2.89
33	Swearingen Merlin	13,230	95.00	55.0	4	14	2.68

34	Sabreliner-60	18,340	95.00	214.0	1	1	4.24
35	Premier 1	12,501	95.00	50.0	4	10	2.80
36	Piper Cheyenne	12,050	95.00	50.0	22	55	2.93
37	Piaggio Avanti	12,100	95.00	50.0	2	5	2.69
38	Phenom 100	10,582	100.00	50.0	92	220	2.98
39	KingAir-B-100	11,800	95.00	52.0	243	818	2.85
40	Falcon 10	18,740	95.00	50.0	5	16	3.37
41	Citation Mustang	8,645	95.00	50.0	48	101	2.61
42	Citation M2	10,700	95.00	50.0	35	82	2.83
43	Citation SP	11,850	95.00	50.0	46	114	2.99
44	Citation CJ2	12,501	95.00	50.0	125	317	3.16
45	BeechJet-400	15,500	95.00	90.0	143	302	4.07
46	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.64
47	Pilatus PC-12	10,450	95.00	50.0	340	789	3.03
48	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.31
49	Cessna Caravan	8,000	95.00	50.0	35	71	2.49
50	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.44
51	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.20
52	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.08
53	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.56

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	PCN on CDF	B(295)
8	Challenger-CL-604	1,434	6.87	56,839	7.61	0.0923	17.3

Total CDF = 0.0923

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
8,Challenger-CL-604,48200.000,14.2,242,6.78,9.62874E+002,1.04284E+004,6.87,56838.887,17.3,7.5,B,386.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;17;47.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 4.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 183.0 lbs/in^3 (Subgrade Category is C(147))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Learjet 70 Series	21,500	95.00	65.0	21	85	4.18
2	Hawker-800	27,520	95.00	135.0	13	41	5.09
3	Hawker 4000	39,500	95.00	90.0	109	503	6.20
4	Gulfstream G100	24,650	95.00	75.0	5	20	4.23
5	Gulfstream 280	39,600	95.00	90.0	41	189	6.01
6	Gulfstream 150	26,100	95.00	100.0	21	54	5.35
7	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.61
8	Challenger-CL-604	48,200	95.00	145.0	242	963	7.39
9	Westwind II	23,500	95.00	75.0	72	281	4.52
10	Learjet 60	23,500	95.00	100.0	34	84	5.18
11	Learjet-50	21,500	95.00	201.0	14	32	4.69
12	Learjet 40	21,000	95.00	65.0	214	858	4.46
13	Learjet 31	15,500	95.00	55.0	56	210	3.59
14	Learjet 200	13,500	95.00	55.0	1	4	2.88
15	BAe Systems Hawk	20,001	95.00	75.0	4	10	4.21
16	BAe HS 125 Series	25,001	95.00	75.0	2	8	4.11
17	Falcon 8X	73,000	95.00	105.0	1	6	6.99
18	Phenom 300	17,698	95.00	50.0	61	184	4.02
19	KingAir-F-90	10,950	95.00	58.0	8	18	3.11
20	SuperKingAir-350	15,100	95.00	92.0	252	722	3.98
21	Falcon-900	45,500	95.00	145.0	9	35	6.59
22	Falcon-2000	41,000	95.00	197.0	26	83	6.67
23	Falcon-50	38,800	95.00	208.0	48	145	6.64
24	Embraer 500 Legacy	37,570	95.00	90.0	4	18	5.38
25	Citation XLS	20,200	95.00	75.0	368	969	4.96
26	Citation-X	36,000	95.00	189.0	62	191	6.52
27	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.65
28	Citation Latitude	30,800	95.00	85.0	176	739	5.47
29	Cessna CJ4	17,110	95.00	65.0	131	474	3.94
30	Cessna Conquest	9,925	95.00	95.0	24	39	3.38
31	Beech 1900	17,120	95.00	65.0	3	11	3.45
32	T-6 Texan	5,617	100.00	50.0	18	44	3.21
33	Swearingen Merlin	13,230	95.00	55.0	4	14	3.01

34	Sabreliner-60	18,340	95.00	214.0	1	1	4.48
35	Premier 1	12,501	95.00	50.0	4	10	3.12
36	Piper Cheyenne	12,050	95.00	50.0	22	55	3.26
37	Piaggio Avanti	12,100	95.00	50.0	2	5	2.99
38	Phenom 100	10,582	100.00	50.0	92	220	3.31
39	KingAir-B-100	11,800	95.00	52.0	243	818	3.20
40	Falcon 10	18,740	95.00	50.0	5	16	3.78
41	Citation Mustang	8,645	95.00	50.0	48	101	2.88
42	Citation M2	10,700	95.00	50.0	35	82	3.14
43	Citation SP	11,850	95.00	50.0	46	114	3.32
44	Citation CJ2	12,501	95.00	50.0	125	317	3.52
45	BeechJet-400	15,500	95.00	90.0	143	302	4.40
46	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.93
47	Pilatus PC-12	10,450	95.00	50.0	340	789	3.36
48	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.56
49	Cessna Caravan	8,000	95.00	50.0	35	71	2.75
50	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.69
51	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.41
52	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.28
53	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.85

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	PCN on CDF	C(147)
8	Challenger-CL-604	1,292	7.46	31,697	5.90	335.5551	9.2

Total CDF = 335.5551

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
8,Challenger-CL-604,48200.000,14.9,242,7.39,9.62874E+002,2.86950E+000,7.46,31697.032,9.2,6.0,C,183.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;18;38.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 3.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 293.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Gulfstream-G-V	90,900	95.00	188.0	9	43	9.03
2	Gulfstream-G-IV	75,000	95.00	185.0	9	40	8.30
3	Learjet-35A/65A	18,000	95.00	171.0	21	48	4.11
4	Learjet 70 Series	21,500	95.00	65.0	13	53	3.86
5	Hawker-800	27,520	95.00	135.0	109	346	5.22
6	Hawker 4000	39,500	95.00	90.0	5	23	5.27
7	Gulfstream-G-III	70,200	95.00	175.0	1	4	7.33
8	Gulfstream 280	39,600	95.00	90.0	41	189	5.68
9	Gulfstream 150	26,100	95.00	100.0	21	54	5.10
10	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.23
11	Challenger-CL-604	48,200	95.00	145.0	242	963	7.02
12	Westwind II	23,500	95.00	75.0	72	281	4.23
13	Learjet 60	23,500	95.00	100.0	34	84	4.94
14	Learjet-50	21,500	95.00	201.0	14	32	4.52
15	Learjet 40	21,000	95.00	65.0	214	858	4.19
16	Learjet 31	15,500	95.00	55.0	56	210	3.35
17	Learjet 200	13,500	95.00	55.0	1	4	2.69
18	BAe Systems Hawk	20,001	95.00	75.0	4	10	4.00
19	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.85
20	Falcon 8X	73,000	95.00	105.0	1	6	6.55
21	Bombardier Global Express	95,000	95.00	90.0	2	14	8.08
22	Bombardier 5000	92,500	95.00	90.0	17	120	8.61
23	Phenom 300	17,698	95.00	50.0	61	184	3.76
24	KingAir-F-90	10,950	95.00	58.0	8	18	2.94
25	SuperKingAir-350	15,100	95.00	92.0	252	722	3.78
26	Falcon-900	45,500	95.00	145.0	9	35	6.28
27	Falcon-2000	41,000	95.00	197.0	26	83	6.39
28	Falcon-50	38,800	95.00	208.0	48	145	6.37
29	Embraer 500 Legacy	37,570	95.00	90.0	4	18	5.09
30	Citation XLS	20,200	95.00	75.0	368	969	4.71
31	Citation-X	36,000	95.00	189.0	62	191	6.21
32	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.33
33	Citation Latitude	30,800	95.00	85.0	176	739	5.16

34	Cessna CJ4	17,110	95.00	65.0	131	474	3.70
35	Cessna Conquest	9,925	95.00	95.0	24	39	3.23
36	Beech 1900	17,120	95.00	65.0	3	11	3.24
37	T-6 Texan	5,617	100.00	50.0	18	44	3.02
38	Swearingen Merlin	13,230	95.00	55.0	4	14	2.80
39	Sabreliner-60	18,340	95.00	214.0	1	1	4.34
40	Premier 1	12,501	95.00	50.0	4	10	2.93
41	Piper Cheyenne	12,050	95.00	50.0	22	55	3.07
42	Piaggio Avanti	12,100	95.00	50.0	2	5	2.81
43	Phenom 100	10,582	100.00	50.0	92	220	3.11
44	KingAir-B-100	11,800	95.00	52.0	243	818	2.98
45	Falcon 10	18,740	95.00	50.0	5	16	3.52
46	Citation Mustang	8,645	95.00	50.0	48	101	2.71
47	Citation M2	10,700	95.00	50.0	35	82	2.96
48	Citation SP	11,850	95.00	50.0	46	114	3.12
49	Citation CJ2	12,501	95.00	50.0	125	317	3.31
50	BeechJet-400	15,500	95.00	90.0	143	302	4.19
51	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.76
52	Pilatus PC-12	10,450	95.00	50.0	340	789	3.16
53	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.41
54	Cessna Caravan	8,000	95.00	50.0	35	71	2.59
55	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.54
56	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.28
57	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.16
58	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.68

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
1	Gulfstream-G-V	79	9.23	39,680	6.33	11506.2901	11.7

Total CDF =11506.2901

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.0,9,9.03,4.29132E+001,3.72954E-003,9.23,39679.794,11.7,6.0,B,293.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;19;55.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 3.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 203.0 lbs/in^3 (Subgrade Category is C(147))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr 6D Coverages	Thick
1	Gulfstream-G-V	90,900	95.00	188.0	9	43	9.35
2	Gulfstream-G-IV	75,000	95.00	185.0	9	40	8.63
3	Learjet-35A/65A	18,000	95.00	171.0	21	48	4.23
4	Learjet 70 Series	21,500	95.00	65.0	13	53	4.06
5	Hawker-800	27,520	95.00	135.0	109	346	5.43
6	Hawker 4000	39,500	95.00	90.0	5	23	5.50
7	Gulfstream-G-III	70,200	95.00	175.0	1	4	7.62
8	Gulfstream 280	39,600	95.00	90.0	41	189	5.93
9	Gulfstream 150	26,100	95.00	100.0	21	54	5.30
10	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.53
11	Challenger-CL-604	48,200	95.00	145.0	242	963	7.30
12	Westwind II	23,500	95.00	75.0	72	281	4.46
13	Learjet 60	23,500	95.00	100.0	34	84	5.13
14	Learjet-50	21,500	95.00	201.0	14	32	4.65
15	Learjet 40	21,000	95.00	65.0	214	858	4.41
16	Learjet 31	15,500	95.00	55.0	56	210	3.55
17	Learjet 200	13,500	95.00	55.0	1	4	2.84
18	BAe Systems Hawk	20,001	95.00	75.0	4	10	4.17
19	BAe HS 125 Series	25,001	95.00	75.0	2	8	4.06
20	Falcon 8X	73,000	95.00	105.0	1	6	6.90
21	Bombardier Global Express	95,000	95.00	90.0	2	14	8.49
22	Bombardier 5000	92,500	95.00	90.0	17	120	9.04
23	Phenom 300	17,698	95.00	50.0	61	184	3.97
24	KingAir-F-90	10,950	95.00	58.0	8	18	3.07
25	SuperKingAir-350	15,100	95.00	92.0	252	722	3.93
26	Falcon-900	45,500	95.00	145.0	9	35	6.51
27	Falcon-2000	41,000	95.00	197.0	26	83	6.60
28	Falcon-50	38,800	95.00	208.0	48	145	6.57
29	Embraer 500 Legacy	37,570	95.00	90.0	4	18	5.31
30	Citation XLS	20,200	95.00	75.0	368	969	4.90
31	Citation-X	36,000	95.00	189.0	62	191	6.46
32	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.59
33	Citation Latitude	30,800	95.00	85.0	176	739	5.41

34	Cessna CJ4	17,110	95.00	65.0	131	474	3.90
35	Cessna Conquest	9,925	95.00	95.0	24	39	3.34
36	Beech 1900	17,120	95.00	65.0	3	11	3.42
37	T-6 Texan	5,617	100.00	50.0	18	44	3.17
38	Swearingen Merlin	13,230	95.00	55.0	4	14	2.97
39	Sabreliner-60	18,340	95.00	214.0	1	1	4.45
40	Premier 1	12,501	95.00	50.0	4	10	3.07
41	Piper Cheyenne	12,050	95.00	50.0	22	55	3.22
42	Piaggio Avanti	12,100	95.00	50.0	2	5	2.95
43	Phenom 100	10,582	100.00	50.0	92	220	3.26
44	KingAir-B-100	11,800	95.00	52.0	243	818	3.15
45	Falcon 10	18,740	95.00	50.0	5	16	3.72
46	Citation Mustang	8,645	95.00	50.0	48	101	2.85
47	Citation M2	10,700	95.00	50.0	35	82	3.10
48	Citation SP	11,850	95.00	50.0	46	114	3.28
49	Citation CJ2	12,501	95.00	50.0	125	317	3.47
50	BeechJet-400	15,500	95.00	90.0	143	302	4.35
51	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.89
52	Pilatus PC-12	10,450	95.00	50.0	340	789	3.31
53	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.53
54	Cessna Caravan	8,000	95.00	50.0	35	71	2.72
55	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.66
56	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.38
57	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.26
58	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.81

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(147)
1	Gulfstream-G-V	91	9.60	36,596	6.46	21676.8733	11.1

Total CDF =21676.8733

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.9,9,9.35,4.29132E+001,1.97967E-003,9.60,36595.885,11.1,6.0,C,203.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;20;45.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 3.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 420.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 11.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Deps	6D Coverages	Thick
1	Gulfstream-G-V	90,900	95.00	188.0	9	43	8.66	
2	Gulfstream-G-IV	75,000	95.00	185.0	9	40	8.00	
3	Learjet-35A/65A	18,000	95.00	171.0	21	48	3.95	
4	Learjet 70 Series	21,500	95.00	65.0	13	53	3.65	
5	Hawker-800	27,520	95.00	135.0	109	346	5.02	
6	Hawker 4000	39,500	95.00	90.0	5	23	4.99	
7	Gulfstream-G-III	70,200	95.00	175.0	1	4	7.05	
8	Gulfstream 280	39,600	95.00	90.0	41	189	5.38	
9	Gulfstream 150	26,100	95.00	100.0	21	54	4.90	
10	Embraer ERJ 145	48,501	95.00	90.0	28	143	5.92	
11	Challenger-CL-604	48,200	95.00	145.0	242	963	6.70	
12	Westwind II	23,500	95.00	75.0	72	281	4.00	
13	Learjet 60	23,500	95.00	100.0	34	84	4.75	
14	Learjet-50	21,500	95.00	201.0	14	32	4.38	
15	Learjet 40	21,000	95.00	65.0	214	858	3.96	
16	Learjet 31	15,500	95.00	55.0	56	210	3.16	
17	Learjet 200	13,500	95.00	55.0	1	4	2.54	
18	BAe Systems Hawk	20,001	95.00	75.0	4	10	3.82	
19	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.64	
20	Falcon 8X	73,000	95.00	105.0	1	6	6.20	
21	Bombardier Global Express	95,000	95.00	90.0	2	14	7.68	
22	Bombardier 5000	92,500	95.00	90.0	17	120	8.18	
23	Phenom 300	17,698	95.00	50.0	61	184	3.54	
24	KingAir-F-90	10,950	95.00	58.0	8	18	2.80	
25	SuperKingAir-350	15,100	95.00	92.0	252	722	3.59	
26	Falcon-900	45,500	95.00	145.0	9	35	6.02	
27	Falcon-2000	41,000	95.00	197.0	26	83	6.16	
28	Falcon-50	38,800	95.00	208.0	48	145	6.16	
29	Embraer 500 Legacy	37,570	95.00	90.0	4	18	4.82	
30	Citation XLS	20,200	95.00	75.0	368	969	4.49	
31	Citation-X	36,000	95.00	189.0	62	191	6.01	
32	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.04	
33	Citation Latitude	30,800	95.00	85.0	176	739	4.88	

34	Cessna CJ4	17,110	95.00	65.0	131	474	3.49
35	Cessna Conquest	9,925	95.00	95.0	24	39	3.11
36	Beech 1900	17,120	95.00	65.0	3	11	3.06
37	T-6 Texan	5,617	100.00	50.0	18	44	2.85
38	Swearingen Merlin	13,230	95.00	55.0	4	14	2.65
39	Sabreliner-60	18,340	95.00	214.0	1	1	4.22
40	Premier 1	12,501	95.00	50.0	4	10	2.76
41	Piper Cheyenne	12,050	95.00	50.0	22	55	2.89
42	Piaggio Avanti	12,100	95.00	50.0	2	5	2.65
43	Phenom 100	10,582	100.00	50.0	92	220	2.94
44	KingAir-B-100	11,800	95.00	52.0	243	818	2.80
45	Falcon 10	18,740	95.00	50.0	5	16	3.32
46	Citation Mustang	8,645	95.00	50.0	48	101	2.57
47	Citation M2	10,700	95.00	50.0	35	82	2.79
48	Citation SP	11,850	95.00	50.0	46	114	2.95
49	Citation CJ2	12,501	95.00	50.0	125	317	3.12
50	BeechJet-400	15,500	95.00	90.0	143	302	4.03
51	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.61
52	Pilatus PC-12	10,450	95.00	50.0	340	789	2.98
53	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.28
54	Cessna Caravan	8,000	95.00	50.0	35	71	2.46
55	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.41
56	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.17
57	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.06
58	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.53

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
1	Gulfstream-G-V	82	8.86	150,328	13.16	0.0012	56.4
				Total CDF =	0.0012		

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.0,9,8.66,4.29132E+001,3.59962E+004,8.86,150328.382,56.4,11.5,B,420.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;21;34.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 3.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 158.0 lbs/in^3 (Subgrade Category is C(147))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Gulfstream-G-V	90,900	95.00	188.0	9	43	9.59
2	Gulfstream-G-IV	75,000	95.00	185.0	9	40	8.85
3	Learjet-35A/65A	18,000	95.00	171.0	21	48	4.32
4	Learjet 70 Series	21,500	95.00	65.0	13	53	4.19
5	Hawker-800	27,520	95.00	135.0	109	346	5.55
6	Hawker 4000	39,500	95.00	90.0	5	23	5.68
7	Gulfstream-G-III	70,200	95.00	175.0	1	4	7.81
8	Gulfstream 280	39,600	95.00	90.0	41	189	6.12
9	Gulfstream 150	26,100	95.00	100.0	21	54	5.42
10	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.73
11	Challenger-CL-604	48,200	95.00	145.0	242	963	7.49
12	Westwind II	23,500	95.00	75.0	72	281	4.60
13	Learjet 60	23,500	95.00	100.0	34	84	5.25
14	Learjet-50	21,500	95.00	201.0	14	32	4.75
15	Learjet 40	21,000	95.00	65.0	214	858	4.55
16	Learjet 31	15,500	95.00	55.0	56	210	3.66
17	Learjet 200	13,500	95.00	55.0	1	4	2.93
18	BAe Systems Hawk	20,001	95.00	75.0	4	10	4.28
19	BAe HS 125 Series	25,001	95.00	75.0	2	8	4.18
20	Falcon 8X	73,000	95.00	105.0	1	6	7.11
21	Bombardier Global Express	95,000	95.00	90.0	2	14	8.73
22	Bombardier 5000	92,500	95.00	90.0	17	120	9.29
23	Phenom 300	17,698	95.00	50.0	61	184	4.10
24	KingAir-F-90	10,950	95.00	58.0	8	18	3.16
25	SuperKingAir-350	15,100	95.00	92.0	252	722	4.05
26	Falcon-900	45,500	95.00	145.0	9	35	6.69
27	Falcon-2000	41,000	95.00	197.0	26	83	6.77
28	Falcon-50	38,800	95.00	208.0	48	145	6.74
29	Embraer 500 Legacy	37,570	95.00	90.0	4	18	5.48
30	Citation XLS	20,200	95.00	75.0	368	969	5.04
31	Citation-X	36,000	95.00	189.0	62	191	6.60
32	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.75
33	Citation Latitude	30,800	95.00	85.0	176	739	5.56

34	Cessna CJ4	17,110	95.00	65.0	131	474	4.01
35	Cessna Conquest	9,925	95.00	95.0	24	39	3.42
36	Beech 1900	17,120	95.00	65.0	3	11	3.51
37	T-6 Texan	5,617	100.00	50.0	18	44	3.27
38	Swearingen Merlin	13,230	95.00	55.0	4	14	3.06
39	Sabreliner-60	18,340	95.00	214.0	1	1	4.52
40	Premier 1	12,501	95.00	50.0	4	10	3.17
41	Piper Cheyenne	12,050	95.00	50.0	22	55	3.32
42	Piaggio Avanti	12,100	95.00	50.0	2	5	3.05
43	Phenom 100	10,582	100.00	50.0	92	220	3.37
44	KingAir-B-100	11,800	95.00	52.0	243	818	3.27
45	Falcon 10	18,740	95.00	50.0	5	16	3.85
46	Citation Mustang	8,645	95.00	50.0	48	101	2.93
47	Citation M2	10,700	95.00	50.0	35	82	3.20
48	Citation SP	11,850	95.00	50.0	46	114	3.38
49	Citation CJ2	12,501	95.00	50.0	125	317	3.59
50	BeechJet-400	15,500	95.00	90.0	143	302	4.45
51	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.98
52	Pilatus PC-12	10,450	95.00	50.0	340	789	3.42
53	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.60
54	Cessna Caravan	8,000	95.00	50.0	35	71	2.79
55	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.73
56	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.45
57	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.32
58	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.90

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(147)
1	Gulfstream-G-V	94	9.86	34,708	6.28	34128.8794	10.5

Total CDF =34128.8794

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,Flex OrRig
1,Gulfstream-G-V,90900.000,31.9,9,9.59,4.29132E+001,1.25739E-003,9.86,34708.000,10.5,6.0,C,158.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;22;21.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 3.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 262.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Gulfstream-G-V	90,900	95.00	188.0	9	43	9.13
2	Gulfstream-G-IV	75,000	95.00	185.0	9	40	8.39
3	Learjet-35A/65A	18,000	95.00	171.0	21	48	4.15
4	Learjet 70 Series	21,500	95.00	65.0	13	53	3.93
5	Hawker-800	27,520	95.00	135.0	109	346	5.28
6	Hawker 4000	39,500	95.00	90.0	5	23	5.34
7	Gulfstream-G-III	70,200	95.00	175.0	1	4	7.41
8	Gulfstream 280	39,600	95.00	90.0	41	189	5.76
9	Gulfstream 150	26,100	95.00	100.0	21	54	5.16
10	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.32
11	Challenger-CL-604	48,200	95.00	145.0	242	963	7.10
12	Westwind II	23,500	95.00	75.0	72	281	4.30
13	Learjet 60	23,500	95.00	100.0	34	84	5.00
14	Learjet-50	21,500	95.00	201.0	14	32	4.56
15	Learjet 40	21,000	95.00	65.0	214	858	4.27
16	Learjet 31	15,500	95.00	55.0	56	210	3.41
17	Learjet 200	13,500	95.00	55.0	1	4	2.74
18	BAe Systems Hawk	20,001	95.00	75.0	4	10	4.05
19	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.91
20	Falcon 8X	73,000	95.00	105.0	1	6	6.65
21	Bombardier Global Express	95,000	95.00	90.0	2	14	8.22
22	Bombardier 5000	92,500	95.00	90.0	17	120	8.75
23	Phenom 300	17,698	95.00	50.0	61	184	3.83
24	KingAir-F-90	10,950	95.00	58.0	8	18	2.98
25	SuperKingAir-350	15,100	95.00	92.0	252	722	3.83
26	Falcon-900	45,500	95.00	145.0	9	35	6.35
27	Falcon-2000	41,000	95.00	197.0	26	83	6.45
28	Falcon-50	38,800	95.00	208.0	48	145	6.43
29	Embraer 500 Legacy	37,570	95.00	90.0	4	18	5.16
30	Citation XLS	20,200	95.00	75.0	368	969	4.77
31	Citation-X	36,000	95.00	189.0	62	191	6.28
32	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.42
33	Citation Latitude	30,800	95.00	85.0	176	739	5.24

34	Cessna CJ4	17,110	95.00	65.0	131	474	3.76
35	Cessna Conquest	9,925	95.00	95.0	24	39	3.27
36	Beech 1900	17,120	95.00	65.0	3	11	3.29
37	T-6 Texan	5,617	100.00	50.0	18	44	3.06
38	Swearingen Merlin	13,230	95.00	55.0	4	14	2.85
39	Sabreliner-60	18,340	95.00	214.0	1	1	4.37
40	Premier 1	12,501	95.00	50.0	4	10	2.97
41	Piper Cheyenne	12,050	95.00	50.0	22	55	3.11
42	Piaggio Avanti	12,100	95.00	50.0	2	5	2.85
43	Phenom 100	10,582	100.00	50.0	92	220	3.16
44	KingAir-B-100	11,800	95.00	52.0	243	818	3.03
45	Falcon 10	18,740	95.00	50.0	5	16	3.59
46	Citation Mustang	8,645	95.00	50.0	48	101	2.75
47	Citation M2	10,700	95.00	50.0	35	82	3.00
48	Citation SP	11,850	95.00	50.0	46	114	3.17
49	Citation CJ2	12,501	95.00	50.0	125	317	3.36
50	BeechJet-400	15,500	95.00	90.0	143	302	4.24
51	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.80
52	Pilatus PC-12	10,450	95.00	50.0	340	789	3.20
53	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.44
54	Cessna Caravan	8,000	95.00	50.0	35	71	2.63
55	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.57
56	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.31
57	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.19
58	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.72

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	PCN on CDF	B(295)
1	Gulfstream-G-V	84	9.34	38,665	6.24	13998.8273	11.3

Total CDF =13998.8273

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.0,9,9.13,4.29132E+001,3.06548E-003,9.34,38664.955,11.3,6.0,B,262.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;22;57.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 3.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 160.0 lbs/in^3 (Subgrade Category is C(147))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Gulfstream-G-V	90,900	95.00	188.0	9	43	9.58
2	Gulfstream-G-IV	75,000	95.00	185.0	9	40	8.84
3	Learjet-35A/65A	18,000	95.00	171.0	21	48	4.31
4	Learjet 70 Series	21,500	95.00	65.0	13	53	4.18
5	Hawker-800	27,520	95.00	135.0	109	346	5.54
6	Hawker 4000	39,500	95.00	90.0	5	23	5.67
7	Gulfstream-G-III	70,200	95.00	175.0	1	4	7.80
8	Gulfstream 280	39,600	95.00	90.0	41	189	6.11
9	Gulfstream 150	26,100	95.00	100.0	21	54	5.42
10	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.72
11	Challenger-CL-604	48,200	95.00	145.0	242	963	7.48
12	Westwind II	23,500	95.00	75.0	72	281	4.60
13	Learjet 60	23,500	95.00	100.0	34	84	5.24
14	Learjet-50	21,500	95.00	201.0	14	32	4.75
15	Learjet 40	21,000	95.00	65.0	214	858	4.54
16	Learjet 31	15,500	95.00	55.0	56	210	3.65
17	Learjet 200	13,500	95.00	55.0	1	4	2.93
18	BAe Systems Hawk	20,001	95.00	75.0	4	10	4.28
19	BAe HS 125 Series	25,001	95.00	75.0	2	8	4.18
20	Falcon 8X	73,000	95.00	105.0	1	6	7.10
21	Bombardier Global Express	95,000	95.00	90.0	2	14	8.72
22	Bombardier 5000	92,500	95.00	90.0	17	120	9.28
23	Phenom 300	17,698	95.00	50.0	61	184	4.09
24	KingAir-F-90	10,950	95.00	58.0	8	18	3.15
25	SuperKingAir-350	15,100	95.00	92.0	252	722	4.04
26	Falcon-900	45,500	95.00	145.0	9	35	6.68
27	Falcon-2000	41,000	95.00	197.0	26	83	6.76
28	Falcon-50	38,800	95.00	208.0	48	145	6.73
29	Embraer 500 Legacy	37,570	95.00	90.0	4	18	5.47
30	Citation XLS	20,200	95.00	75.0	368	969	5.03
31	Citation-X	36,000	95.00	189.0	62	191	6.59
32	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.74
33	Citation Latitude	30,800	95.00	85.0	176	739	5.56

34	Cessna CJ4	17,110	95.00	65.0	131	474	4.00
35	Cessna Conquest	9,925	95.00	95.0	24	39	3.42
36	Beech 1900	17,120	95.00	65.0	3	11	3.50
37	T-6 Texan	5,617	100.00	50.0	18	44	3.27
38	Swearingen Merlin	13,230	95.00	55.0	4	14	3.05
39	Sabreliner-60	18,340	95.00	214.0	1	1	4.52
40	Premier 1	12,501	95.00	50.0	4	10	3.17
41	Piper Cheyenne	12,050	95.00	50.0	22	55	3.32
42	Piaggio Avanti	12,100	95.00	50.0	2	5	3.04
43	Phenom 100	10,582	100.00	50.0	92	220	3.36
44	KingAir-B-100	11,800	95.00	52.0	243	818	3.27
45	Falcon 10	18,740	95.00	50.0	5	16	3.84
46	Citation Mustang	8,645	95.00	50.0	48	101	2.93
47	Citation M2	10,700	95.00	50.0	35	82	3.19
48	Citation SP	11,850	95.00	50.0	46	114	3.38
49	Citation CJ2	12,501	95.00	50.0	125	317	3.58
50	BeechJet-400	15,500	95.00	90.0	143	302	4.45
51	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.98
52	Pilatus PC-12	10,450	95.00	50.0	340	789	3.41
53	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.60
54	Cessna Caravan	8,000	95.00	50.0	35	71	2.79
55	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.73
56	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.44
57	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.31
58	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.90

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(147)
1	Gulfstream-G-V	94	9.85	34,784	6.28	33341.8983	10.5

Total CDF =33341.8983

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.9,9,9.58,4.29132E+001,1.28706E-003,9.85,34783.947,10.5,6.0,C,160.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;23;51.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 3.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 424.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 11.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Gulfstream-G-V	90,900	95.00	188.0	9	43	8.65
2	Gulfstream-G-IV	75,000	95.00	185.0	9	40	7.99
3	Learjet-35A/65A	18,000	95.00	171.0	21	48	3.95
4	Learjet 70 Series	21,500	95.00	65.0	13	53	3.64
5	Hawker-800	27,520	95.00	135.0	109	346	5.01
6	Hawker 4000	39,500	95.00	90.0	5	23	4.98
7	Gulfstream-G-III	70,200	95.00	175.0	1	4	7.04
8	Gulfstream 280	39,600	95.00	90.0	41	189	5.37
9	Gulfstream 150	26,100	95.00	100.0	21	54	4.90
10	Embraer ERJ 145	48,501	95.00	90.0	28	143	5.91
11	Challenger-CL-604	48,200	95.00	145.0	242	963	6.69
12	Westwind II	23,500	95.00	75.0	72	281	4.00
13	Learjet 60	23,500	95.00	100.0	34	84	4.75
14	Learjet-50	21,500	95.00	201.0	14	32	4.37
15	Learjet 40	21,000	95.00	65.0	214	858	3.95
16	Learjet 31	15,500	95.00	55.0	56	210	3.15
17	Learjet 200	13,500	95.00	55.0	1	4	2.53
18	BAe Systems Hawk	20,001	95.00	75.0	4	10	3.81
19	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.63
20	Falcon 8X	73,000	95.00	105.0	1	6	6.19
21	Bombardier Global Express	95,000	95.00	90.0	2	14	7.67
22	Bombardier 5000	92,500	95.00	90.0	17	120	8.17
23	Phenom 300	17,698	95.00	50.0	61	184	3.54
24	KingAir-F-90	10,950	95.00	58.0	8	18	2.79
25	SuperKingAir-350	15,100	95.00	92.0	252	722	3.59
26	Falcon-900	45,500	95.00	145.0	9	35	6.01
27	Falcon-2000	41,000	95.00	197.0	26	83	6.16
28	Falcon-50	38,800	95.00	208.0	48	145	6.15
29	Embraer 500 Legacy	37,570	95.00	90.0	4	18	4.81
30	Citation XLS	20,200	95.00	75.0	368	969	4.48
31	Citation-X	36,000	95.00	189.0	62	191	6.01
32	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.04
33	Citation Latitude	30,800	95.00	85.0	176	739	4.88

34	Cessna CJ4	17,110	95.00	65.0	131	474	3.49
35	Cessna Conquest	9,925	95.00	95.0	24	39	3.11
36	Beech 1900	17,120	95.00	65.0	3	11	3.06
37	T-6 Texan	5,617	100.00	50.0	18	44	2.84
38	Swearingen Merlin	13,230	95.00	55.0	4	14	2.64
39	Sabreliner-60	18,340	95.00	214.0	1	1	4.21
40	Premier 1	12,501	95.00	50.0	4	10	2.76
41	Piper Cheyenne	12,050	95.00	50.0	22	55	2.89
42	Piaggio Avanti	12,100	95.00	50.0	2	5	2.65
43	Phenom 100	10,582	100.00	50.0	92	220	2.93
44	KingAir-B-100	11,800	95.00	52.0	243	818	2.80
45	Falcon 10	18,740	95.00	50.0	5	16	3.31
46	Citation Mustang	8,645	95.00	50.0	48	101	2.57
47	Citation M2	10,700	95.00	50.0	35	82	2.79
48	Citation SP	11,850	95.00	50.0	46	114	2.94
49	Citation CJ2	12,501	95.00	50.0	125	317	3.12
50	BeechJet-400	15,500	95.00	90.0	143	302	4.03
51	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.60
52	Pilatus PC-12	10,450	95.00	50.0	340	789	2.98
53	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.28
54	Cessna Caravan	8,000	95.00	50.0	35	71	2.46
55	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.41
56	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.17
57	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.05
58	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.53

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
1	Gulfstream-G-V	81	8.85	150,693	13.18	0.0012	56.5
					Total CDF =	0.0012	

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.0,9,8.65,4.29132E+001,3.66219E+004,8.85,150693.300,56.5,11.5,B,424.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;24;58.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 3.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 336.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Gulfstream-G-V	90,900	95.00	188.0	9	43	8.89
2	Gulfstream-G-IV	75,000	95.00	185.0	9	40	8.19
3	Learjet-35A/65A	18,000	95.00	171.0	21	48	4.05
4	Learjet 70 Series	21,500	95.00	65.0	13	53	3.78
5	Hawker-800	27,520	95.00	135.0	109	346	5.15
6	Hawker 4000	39,500	95.00	90.0	5	23	5.17
7	Gulfstream-G-III	70,200	95.00	175.0	1	4	7.24
8	Gulfstream 280	39,600	95.00	90.0	41	189	5.57
9	Gulfstream 150	26,100	95.00	100.0	21	54	5.02
10	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.13
11	Challenger-CL-604	48,200	95.00	145.0	242	963	6.92
12	Westwind II	23,500	95.00	75.0	72	281	4.15
13	Learjet 60	23,500	95.00	100.0	34	84	4.87
14	Learjet-50	21,500	95.00	201.0	14	32	4.47
15	Learjet 40	21,000	95.00	65.0	214	858	4.10
16	Learjet 31	15,500	95.00	55.0	56	210	3.28
17	Learjet 200	13,500	95.00	55.0	1	4	2.63
18	BAe Systems Hawk	20,001	95.00	75.0	4	10	3.93
19	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.77
20	Falcon 8X	73,000	95.00	105.0	1	6	6.43
21	Bombardier Global Express	95,000	95.00	90.0	2	14	7.92
22	Bombardier 5000	92,500	95.00	90.0	17	120	8.43
23	Phenom 300	17,698	95.00	50.0	61	184	3.68
24	KingAir-F-90	10,950	95.00	58.0	8	18	2.88
25	SuperKingAir-350	15,100	95.00	92.0	252	722	3.70
26	Falcon-900	45,500	95.00	145.0	9	35	6.18
27	Falcon-2000	41,000	95.00	197.0	26	83	6.32
28	Falcon-50	38,800	95.00	208.0	48	145	6.30
29	Embraer 500 Legacy	37,570	95.00	90.0	4	18	4.99
30	Citation XLS	20,200	95.00	75.0	368	969	4.62
31	Citation-X	36,000	95.00	189.0	62	191	6.14
32	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.22
33	Citation Latitude	30,800	95.00	85.0	176	739	5.05

34	Cessna CJ4	17,110	95.00	65.0	131	474	3.62
35	Cessna Conquest	9,925	95.00	95.0	24	39	3.19
36	Beech 1900	17,120	95.00	65.0	3	11	3.17
37	T-6 Texan	5,617	100.00	50.0	18	44	2.95
38	Swearingen Merlin	13,230	95.00	55.0	4	14	2.74
39	Sabreliner-60	18,340	95.00	214.0	1	1	4.29
40	Premier 1	12,501	95.00	50.0	4	10	2.86
41	Piper Cheyenne	12,050	95.00	50.0	22	55	3.00
42	Piaggio Avanti	12,100	95.00	50.0	2	5	2.75
43	Phenom 100	10,582	100.00	50.0	92	220	3.05
44	KingAir-B-100	11,800	95.00	52.0	243	818	2.92
45	Falcon 10	18,740	95.00	50.0	5	16	3.45
46	Citation Mustang	8,645	95.00	50.0	48	101	2.67
47	Citation M2	10,700	95.00	50.0	35	82	2.90
48	Citation SP	11,850	95.00	50.0	46	114	3.06
49	Citation CJ2	12,501	95.00	50.0	125	317	3.24
50	BeechJet-400	15,500	95.00	90.0	143	302	4.13
51	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.70
52	Pilatus PC-12	10,450	95.00	50.0	340	789	3.09
53	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.36
54	Cessna Caravan	8,000	95.00	50.0	35	71	2.55
55	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.49
56	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.23
57	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.12
58	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.62

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	PCN on CDF	B(295)
1	Gulfstream-G-V	77	9.07	41,089	6.45	8534.2477	12.2

Total CDF =8534.2477

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Gulfstream-G-V,90900.000,31.0,9,8.89,4.29132E+001,5.02835E-003,9.07,41089.371,12.2,6.0,B,336.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;25;46.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 4.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 447.0 lbs/in^3 (Subgrade Category is A(552))
flexural strength = 650.0 psi
Evaluation pavement thickness = 11.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Deps	6D Coverages	Thick
1	Learjet 70 Series	21,500	95.00	65.0	21	85	3.67	
2	Hawker-800	27,520	95.00	135.0	13	41	4.62	
3	Hawker 4000	39,500	95.00	90.0	109	503	5.50	
4	Gulfstream G100	24,650	95.00	75.0	5	20	3.70	
5	Gulfstream 280	39,600	95.00	90.0	41	189	5.33	
6	Gulfstream 150	26,100	95.00	100.0	21	54	4.87	
7	Embraer ERJ 145	48,501	95.00	90.0	28	143	5.86	
8	Challenger-CL-604	48,200	95.00	145.0	242	963	6.64	
9	Westwind II	23,500	95.00	75.0	72	281	3.96	
10	Learjet 60	23,500	95.00	100.0	34	84	4.72	
11	Learjet-50	21,500	95.00	201.0	14	32	4.35	
12	Learjet 40	21,000	95.00	65.0	214	858	3.92	
13	Learjet 31	15,500	95.00	55.0	56	210	3.12	
14	Learjet 200	13,500	95.00	55.0	1	4	2.51	
15	BAe Systems Hawk	20,001	95.00	75.0	4	10	3.79	
16	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.60	
17	Falcon 8X	73,000	95.00	105.0	1	6	6.14	
18	Phenom 300	17,698	95.00	50.0	61	184	3.50	
19	KingAir-F-90	10,950	95.00	58.0	8	18	2.77	
20	SuperKingAir-350	15,100	95.00	92.0	252	722	3.56	
21	Falcon-900	45,500	95.00	145.0	9	35	5.98	
22	Falcon-2000	41,000	95.00	197.0	26	83	6.12	
23	Falcon-50	38,800	95.00	208.0	48	145	6.12	
24	Embraer 500 Legacy	37,570	95.00	90.0	4	18	4.77	
25	Citation XLS	20,200	95.00	75.0	368	969	4.45	
26	Citation-X	36,000	95.00	189.0	62	191	5.97	
27	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.00	
28	Citation Latitude	30,800	95.00	85.0	176	739	4.84	
29	Cessna CJ4	17,110	95.00	65.0	131	474	3.46	
30	Cessna Conquest	9,925	95.00	95.0	24	39	3.09	
31	Beech 1900	17,120	95.00	65.0	3	11	3.03	
32	T-6 Texan	5,617	100.00	50.0	18	44	2.82	
33	Swearingen Merlin	13,230	95.00	55.0	4	14	2.62	

34	Sabreliner-60	18,340	95.00	214.0	1	1	4.20
35	Premier 1	12,501	95.00	50.0	4	10	2.73
36	Piper Cheyenne	12,050	95.00	50.0	22	55	2.86
37	Piaggio Avanti	12,100	95.00	50.0	2	5	2.62
38	Phenom 100	10,582	100.00	50.0	92	220	2.91
39	KingAir-B-100	11,800	95.00	52.0	243	818	2.77
40	Falcon 10	18,740	95.00	50.0	5	16	3.28
41	Citation Mustang	8,645	95.00	50.0	48	101	2.55
42	Citation M2	10,700	95.00	50.0	35	82	2.76
43	Citation SP	11,850	95.00	50.0	46	114	2.92
44	Citation CJ2	12,501	95.00	50.0	125	317	3.09
45	BeechJet-400	15,500	95.00	90.0	143	302	4.00
46	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.58
47	Pilatus PC-12	10,450	95.00	50.0	340	789	2.95
48	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.26
49	Cessna Caravan	8,000	95.00	50.0	35	71	2.44
50	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.39
51	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.15
52	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.04
53	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.50

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	PCN on CDF	A(552)
8	Challenger-CL-604	1,335	6.71	136,234	11.62	0.0000	47.9

Total CDF = 0.0000

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
8,Challenger-CL-604,48200.000,13.5,242,6.64,9.62874E+002,6.74856E+007,6.71,136233.681,47.9,11.5,A,447.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;26;24.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 4.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 127.0 lbs/in^3 (Subgrade Category is C(147))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Learjet 70 Series	21,500	95.00	65.0	21	85	4.37
2	Hawker-800	27,520	95.00	135.0	13	41	5.26
3	Hawker 4000	39,500	95.00	90.0	109	503	6.46
4	Gulfstream G100	24,650	95.00	75.0	5	20	4.40
5	Gulfstream 280	39,600	95.00	90.0	41	189	6.26
6	Gulfstream 150	26,100	95.00	100.0	21	54	5.53
7	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.89
8	Challenger-CL-604	48,200	95.00	145.0	242	963	7.62
9	Westwind II	23,500	95.00	75.0	72	281	4.72
10	Learjet 60	23,500	95.00	100.0	34	84	5.35
11	Learjet-50	21,500	95.00	201.0	14	32	4.87
12	Learjet 40	21,000	95.00	65.0	214	858	4.67
13	Learjet 31	15,500	95.00	55.0	56	210	3.76
14	Learjet 200	13,500	95.00	55.0	1	4	3.01
15	BAe Systems Hawk	20,001	95.00	75.0	4	10	4.38
16	BAe HS 125 Series	25,001	95.00	75.0	2	8	4.29
17	Falcon 8X	73,000	95.00	105.0	1	6	7.28
18	Phenom 300	17,698	95.00	50.0	61	184	4.21
19	KingAir-F-90	10,950	95.00	58.0	8	18	3.23
20	SuperKingAir-350	15,100	95.00	92.0	252	722	4.14
21	Falcon-900	45,500	95.00	145.0	9	35	6.84
22	Falcon-2000	41,000	95.00	197.0	26	83	6.90
23	Falcon-50	38,800	95.00	208.0	48	145	6.87
24	Embraer 500 Legacy	37,570	95.00	90.0	4	18	5.60
25	Citation XLS	20,200	95.00	75.0	368	969	5.15
26	Citation-X	36,000	95.00	189.0	62	191	6.71
27	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.90
28	Citation Latitude	30,800	95.00	85.0	176	739	5.72
29	Cessna CJ4	17,110	95.00	65.0	131	474	4.12
30	Cessna Conquest	9,925	95.00	95.0	24	39	3.48
31	Beech 1900	17,120	95.00	65.0	3	11	3.61
32	T-6 Texan	5,617	100.00	50.0	18	44	3.35
33	Swearingen Merlin	13,230	95.00	55.0	4	14	3.14

34	Sabreliner-60	18,340	95.00	214.0	1	1	4.59
35	Premier 1	12,501	95.00	50.0	4	10	3.25
36	Piper Cheyenne	12,050	95.00	50.0	22	55	3.40
37	Piaggio Avanti	12,100	95.00	50.0	2	5	3.12
38	Phenom 100	10,582	100.00	50.0	92	220	3.45
39	KingAir-B-100	11,800	95.00	52.0	243	818	3.36
40	Falcon 10	18,740	95.00	50.0	5	16	3.96
41	Citation Mustang	8,645	95.00	50.0	48	101	3.00
42	Citation M2	10,700	95.00	50.0	35	82	3.27
43	Citation SP	11,850	95.00	50.0	46	114	3.47
44	Citation CJ2	12,501	95.00	50.0	125	317	3.68
45	BeechJet-400	15,500	95.00	90.0	143	302	4.54
46	Aero Commander 690 UF	10,325	95.00	50.0	8	18	3.05
47	Pilatus PC-12	10,450	95.00	50.0	340	789	3.50
48	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.66
49	Cessna Caravan	8,000	95.00	50.0	35	71	2.86
50	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.80
51	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.51
52	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.37
53	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.97

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	PCN on CDF	C(147)
8	Challenger-CL-604	1,335	7.70	29,548	5.68	729.8571	8.5

Total CDF = 729.8571

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
8,Challenger-CL-604,48200.000,14.9,242,7.62,9.62874E+002,1.31926E+000,7.70,29547.830,8.5,6.0,C,127.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;27;15.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 4.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 297.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr 6D Coverages	Thick
1	Learjet 70 Series	21,500	95.00	65.0	21	85	3.92
2	Hawker-800	27,520	95.00	135.0	13	41	4.84
3	Hawker 4000	39,500	95.00	90.0	109	503	5.85
4	Gulfstream G100	24,650	95.00	75.0	5	20	3.94
5	Gulfstream 280	39,600	95.00	90.0	41	189	5.67
6	Gulfstream 150	26,100	95.00	100.0	21	54	5.09
7	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.22
8	Challenger-CL-604	48,200	95.00	145.0	242	963	7.01
9	Westwind II	23,500	95.00	75.0	72	281	4.23
10	Learjet 60	23,500	95.00	100.0	34	84	4.93
11	Learjet-50	21,500	95.00	201.0	14	32	4.52
12	Learjet 40	21,000	95.00	65.0	214	858	4.18
13	Learjet 31	15,500	95.00	55.0	56	210	3.35
14	Learjet 200	13,500	95.00	55.0	1	4	2.68
15	BAe Systems Hawk	20,001	95.00	75.0	4	10	3.99
16	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.84
17	Falcon 8X	73,000	95.00	105.0	1	6	6.54
18	Phenom 300	17,698	95.00	50.0	61	184	3.75
19	KingAir-F-90	10,950	95.00	58.0	8	18	2.93
20	SuperKingAir-350	15,100	95.00	92.0	252	722	3.77
21	Falcon-900	45,500	95.00	145.0	9	35	6.27
22	Falcon-2000	41,000	95.00	197.0	26	83	6.38
23	Falcon-50	38,800	95.00	208.0	48	145	6.36
24	Embraer 500 Legacy	37,570	95.00	90.0	4	18	5.08
25	Citation XLS	20,200	95.00	75.0	368	969	4.70
26	Citation-X	36,000	95.00	189.0	62	191	6.20
27	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.32
28	Citation Latitude	30,800	95.00	85.0	176	739	5.15
29	Cessna CJ4	17,110	95.00	65.0	131	474	3.69
30	Cessna Conquest	9,925	95.00	95.0	24	39	3.23
31	Beech 1900	17,120	95.00	65.0	3	11	3.23
32	T-6 Texan	5,617	100.00	50.0	18	44	3.01
33	Swearingen Merlin	13,230	95.00	55.0	4	14	2.80

34	Sabreliner-60	18,340	95.00	214.0	1	1	4.33
35	Premier 1	12,501	95.00	50.0	4	10	2.92
36	Piper Cheyenne	12,050	95.00	50.0	22	55	3.06
37	Piaggio Avanti	12,100	95.00	50.0	2	5	2.80
38	Phenom 100	10,582	100.00	50.0	92	220	3.11
39	KingAir-B-100	11,800	95.00	52.0	243	818	2.97
40	Falcon 10	18,740	95.00	50.0	5	16	3.52
41	Citation Mustang	8,645	95.00	50.0	48	101	2.71
42	Citation M2	10,700	95.00	50.0	35	82	2.95
43	Citation SP	11,850	95.00	50.0	46	114	3.12
44	Citation CJ2	12,501	95.00	50.0	125	317	3.30
45	BeechJet-400	15,500	95.00	90.0	143	302	4.18
46	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.75
47	Pilatus PC-12	10,450	95.00	50.0	340	789	3.15
48	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.40
49	Cessna Caravan	8,000	95.00	50.0	35	71	2.59
50	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.53
51	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.27
52	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.15
53	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.67

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	PCN on CDF	B(295)
8	Challenger-CL-604	1,282	7.07	35,269	5.85	86.6232	9.9

Total CDF = 86.6232

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
8,Challenger-CL-604,48200.000,14.2,242,7.01,9.62874E+002,1.11157E+001,7.07,35268.501,9.9,6.0,B,297.00,1.00,R

This file name = PCN Results Rigid 12-17-2018 11;29;49.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 4.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 194.0 lbs/in^3 (Subgrade Category is C(147))
flexural strength = 650.0 psi
Evaluation pavement thickness = 6.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Learjet 70 Series	21,500	95.00	65.0	21	85	4.15
2	Hawker-800	27,520	95.00	135.0	13	41	5.07
3	Hawker 4000	39,500	95.00	90.0	109	503	6.15
4	Gulfstream G100	24,650	95.00	75.0	5	20	4.19
5	Gulfstream 280	39,600	95.00	90.0	41	189	5.96
6	Gulfstream 150	26,100	95.00	100.0	21	54	5.32
7	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.56
8	Challenger-CL-604	48,200	95.00	145.0	242	963	7.34
9	Westwind II	23,500	95.00	75.0	72	281	4.49
10	Learjet 60	23,500	95.00	100.0	34	84	5.15
11	Learjet-50	21,500	95.00	201.0	14	32	4.67
12	Learjet 40	21,000	95.00	65.0	214	858	4.43
13	Learjet 31	15,500	95.00	55.0	56	210	3.57
14	Learjet 200	13,500	95.00	55.0	1	4	2.86
15	BAe Systems Hawk	20,001	95.00	75.0	4	10	4.19
16	BAe HS 125 Series	25,001	95.00	75.0	2	8	4.08
17	Falcon 8X	73,000	95.00	105.0	1	6	6.94
18	Phenom 300	17,698	95.00	50.0	61	184	3.99
19	KingAir-F-90	10,950	95.00	58.0	8	18	3.09
20	SuperKingAir-350	15,100	95.00	92.0	252	722	3.95
21	Falcon-900	45,500	95.00	145.0	9	35	6.55
22	Falcon-2000	41,000	95.00	197.0	26	83	6.63
23	Falcon-50	38,800	95.00	208.0	48	145	6.60
24	Embraer 500 Legacy	37,570	95.00	90.0	4	18	5.34
25	Citation XLS	20,200	95.00	75.0	368	969	4.93
26	Citation-X	36,000	95.00	189.0	62	191	6.49
27	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.62
28	Citation Latitude	30,800	95.00	85.0	176	739	5.44
29	Cessna CJ4	17,110	95.00	65.0	131	474	3.92
30	Cessna Conquest	9,925	95.00	95.0	24	39	3.36
31	Beech 1900	17,120	95.00	65.0	3	11	3.43
32	T-6 Texan	5,617	100.00	50.0	18	44	3.19
33	Swearingen Merlin	13,230	95.00	55.0	4	14	2.99

34	Sabreliner-60	18,340	95.00	214.0	1	1	4.46
35	Premier 1	12,501	95.00	50.0	4	10	3.09
36	Piper Cheyenne	12,050	95.00	50.0	22	55	3.24
37	Piaggio Avanti	12,100	95.00	50.0	2	5	2.97
38	Phenom 100	10,582	100.00	50.0	92	220	3.28
39	KingAir-B-100	11,800	95.00	52.0	243	818	3.18
40	Falcon 10	18,740	95.00	50.0	5	16	3.75
41	Citation Mustang	8,645	95.00	50.0	48	101	2.86
42	Citation M2	10,700	95.00	50.0	35	82	3.12
43	Citation SP	11,850	95.00	50.0	46	114	3.30
44	Citation CJ2	12,501	95.00	50.0	125	317	3.50
45	BeechJet-400	15,500	95.00	90.0	143	302	4.37
46	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.91
47	Pilatus PC-12	10,450	95.00	50.0	340	789	3.33
48	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.54
49	Cessna Caravan	8,000	95.00	50.0	35	71	2.73
50	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.67
51	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.39
52	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.27
53	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.83

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(147)
8	Challenger-CL-604	1,293	7.41	32,074	5.94	282.9504	9.3

Total CDF = 282.9504

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
8,Challenger-CL-604,48200.000,14.9,242,7.34,9.62874E+002,3.40298E+000,7.41,32073.976,9.3,6.0,C,194.00,1.00,R

This file name = PCN Results Flexible 3-18-2019 17;25;55.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 3.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 14.00 (Subgrade Category is A(15))
Evaluation pavement thickness = 22.30 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Gulfstream-G-V	90,900	95.00	188.0	9	43	7.56
2	Gulfstream-G-IV	75,000	95.00	185.0	9	40	6.85
3	Learjet-35A/65A	18,000	95.00	171.0	21	48	3.26
4	Learjet 70 Series	21,500	95.00	65.0	13	53	3.04
5	Hawker-800	27,520	95.00	135.0	109	346	5.35
6	Hawker 4000	39,500	95.00	90.0	5	23	3.90
7	Gulfstream-G-III	70,200	95.00	175.0	1	4	3.66
8	Gulfstream 280	39,600	95.00	90.0	41	189	5.60
9	Gulfstream 150	26,100	95.00	100.0	21	54	4.63
10	Embraer ERJ 145	48,501	95.00	90.0	28	143	6.16
11	Challenger-CL-604	48,200	95.00	145.0	242	963	8.02
12	Westwind II	23,500	95.00	75.0	72	281	4.14
13	Learjet 60	23,500	95.00	100.0	34	84	4.72
14	Learjet-50	21,500	95.00	201.0	14	32	3.35
15	Learjet 40	21,000	95.00	65.0	214	858	4.60
16	Learjet 31	15,500	95.00	55.0	56	210	2.97
17	Learjet 200	13,500	95.00	55.0	1	4	1.10
18	BAe Systems Hawk	20,001	95.00	75.0	4	10	2.54
19	BAe HS 125 Series	25,001	95.00	75.0	2	8	2.23
20	Falcon 8X	73,000	95.00	105.0	1	6	3.66
21	Bombardier Global Express	95,000	95.00	90.0	2	14	6.30
22	Bombardier 5000	92,500	95.00	90.0	17	120	9.38
23	Phenom 300	17,698	95.00	50.0	61	184	3.46
24	KingAir-F-90	10,950	95.00	58.0	8	18	1.92
25	SuperKingAir-350	15,100	95.00	92.0	252	722	3.86
26	Falcon-900	45,500	95.00	145.0	9	35	5.06
27	Falcon-2000	41,000	95.00	197.0	26	83	5.62
28	Falcon-50	38,800	95.00	208.0	48	145	5.93
29	Embraer 500 Legacy	37,570	95.00	90.0	4	18	3.57
30	Citation XLS	20,200	95.00	75.0	368	969	5.42
31	Citation-X	36,000	95.00	189.0	62	191	6.01
32	Citation Sovereign	30,775	95.00	85.0	492	2,064	6.07
33	Citation Latitude	30,800	95.00	85.0	176	739	5.51

34	Cessna CJ4	17,110	95.00	65.0	131	474	3.57
35	Cessna Conquest	9,925	95.00	95.0	24	39	2.67
36	Beech 1900	17,120	95.00	65.0	3	11	1.88
37	T-6 Texan	5,617	100.00	50.0	18	44	2.26
38	Swearingen Merlin	13,230	95.00	55.0	4	14	1.65
39	Sabreliner-60	18,340	95.00	214.0	1	1	1.52
40	Premier 1	12,501	95.00	50.0	4	10	1.65
41	Piper Cheyenne	12,050	95.00	50.0	22	55	2.37
42	Piaggio Avanti	12,100	95.00	50.0	2	5	1.32
43	Phenom 100	10,582	100.00	50.0	92	220	2.82
44	KingAir-B-100	11,800	95.00	52.0	243	818	2.79
45	Falcon 10	18,740	95.00	50.0	5	16	2.26
46	Citation Mustang	8,645	95.00	50.0	48	101	2.22
47	Citation M2	10,700	95.00	50.0	35	82	2.39
48	Citation SP	11,850	95.00	50.0	46	114	2.65
49	Citation CJ2	12,501	95.00	50.0	125	317	3.12
50	BeechJet-400	15,500	95.00	90.0	143	302	4.57
51	Aero Commander 690 UF	10,325	95.00	50.0	8	18	1.75
52	Pilatus PC-12	10,450	95.00	50.0	340	789	3.16
53	Cessna 425 Corsair	8,600	95.00	50.0	2	4	1.05
54	Cessna Caravan	8,000	95.00	50.0	35	71	2.02
55	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.06
56	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	1.71
57	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	1.25
58	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	0.99

Results Table 2. PCN Values

No.	Critical Aircraft Name	Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on CDF	A(15)
11	Challenger-CL-604	>5,000,000	15.92	84,240	13.06	0.0000	23.9	

Total CDF = 0.0000

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
11,Challenger-CL-604,48200.000,11.6,242,8.02,9.62874E+002,1.01423E+304,15.92,84239.754,23.9,22.3,A,14.00,1.00,F

This file name = PCN Results Rigid 3-18-2019 17;33;55.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes\Mix 4.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 447.0 lbs/in^3 (Subgrade Category is A(552))
flexural strength = 650.0 psi
Evaluation pavement thickness = 11.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Learjet 70 Series	21,500	95.00	65.0	21	85	3.67
2	Hawker-800	27,520	95.00	135.0	13	41	4.62
3	Hawker 4000	39,500	95.00	90.0	109	503	5.50
4	Gulfstream G100	24,650	95.00	75.0	5	20	3.70
5	Gulfstream 280	39,600	95.00	90.0	41	189	5.33
6	Gulfstream 150	26,100	95.00	100.0	21	54	4.87
7	Embraer ERJ 145	48,501	95.00	90.0	28	143	5.86
8	Challenger-CL-604	48,200	95.00	145.0	242	963	6.64
9	Westwind II	23,500	95.00	75.0	72	281	3.96
10	Learjet 60	23,500	95.00	100.0	34	84	4.72
11	Learjet-50	21,500	95.00	201.0	14	32	4.35
12	Learjet 40	21,000	95.00	65.0	214	858	3.92
13	Learjet 31	15,500	95.00	55.0	56	210	3.12
14	Learjet 200	13,500	95.00	55.0	1	4	2.51
15	BAe Systems Hawk	20,001	95.00	75.0	4	10	3.79
16	BAe HS 125 Series	25,001	95.00	75.0	2	8	3.60
17	Falcon 8X	73,000	95.00	105.0	1	6	6.14
18	Phenom 300	17,698	95.00	50.0	61	184	3.50
19	KingAir-F-90	10,950	95.00	58.0	8	18	2.77
20	SuperKingAir-350	15,100	95.00	92.0	252	722	3.56
21	Falcon-900	45,500	95.00	145.0	9	35	5.98
22	Falcon-2000	41,000	95.00	197.0	26	83	6.12
23	Falcon-50	38,800	95.00	208.0	48	145	6.12
24	Embraer 500 Legacy	37,570	95.00	90.0	4	18	4.77
25	Citation XLS	20,200	95.00	75.0	368	969	4.45
26	Citation-X	36,000	95.00	189.0	62	191	5.97
27	Citation Sovereign	30,775	95.00	85.0	492	2,064	5.00
28	Citation Latitude	30,800	95.00	85.0	176	739	4.84
29	Cessna CJ4	17,110	95.00	65.0	131	474	3.46
30	Cessna Conquest	9,925	95.00	95.0	24	39	3.09
31	Beech 1900	17,120	95.00	65.0	3	11	3.03
32	T-6 Texan	5,617	100.00	50.0	18	44	2.82
33	Swearingen Merlin	13,230	95.00	55.0	4	14	2.62

34	Sabreliner-60	18,340	95.00	214.0	1	1	4.20
35	Premier 1	12,501	95.00	50.0	4	10	2.73
36	Piper Cheyenne	12,050	95.00	50.0	22	55	2.86
37	Piaggio Avanti	12,100	95.00	50.0	2	5	2.62
38	Phenom 100	10,582	100.00	50.0	92	220	2.91
39	KingAir-B-100	11,800	95.00	52.0	243	818	2.77
40	Falcon 10	18,740	95.00	50.0	5	16	3.28
41	Citation Mustang	8,645	95.00	50.0	48	101	2.55
42	Citation M2	10,700	95.00	50.0	35	82	2.76
43	Citation SP	11,850	95.00	50.0	46	114	2.92
44	Citation CJ2	12,501	95.00	50.0	125	317	3.09
45	BeechJet-400	15,500	95.00	90.0	143	302	4.00
46	Aero Commander 690 UF	10,325	95.00	50.0	8	18	2.58
47	Pilatus PC-12	10,450	95.00	50.0	340	789	2.95
48	Cessna 425 Corsair	8,600	95.00	50.0	2	4	2.26
49	Cessna Caravan	8,000	95.00	50.0	35	71	2.44
50	Scota TBM 900 UF	7,394	95.00	50.0	52	102	2.39
51	Piper Malibu/Meridian UF	6,000	95.00	50.0	35	62	2.15
52	Eclipse 400/500-UF	6,000	95.00	50.0	8	14	2.04
53	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.50

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	PCN on CDF	A(552)
8	Challenger-CL-604	1,335	6.71	136,234	11.62	0.0000	47.9

Total CDF = 0.0000

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
8,Challenger-CL-604,48200.000,13.5,242,6.64,9.62874E+002,6.74856E+007,6.71,136233.681,47.9,11.5,A,447.00,1.00,R

This file name = PCN Results Rigid 3-20-2019 15;09;59.txt
Library file name = T:\1719\Design Data\Airplane Design Mixes and PCN Results\Mix 1.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 386.0 lbs/in^3 (Subgrade Category is B(295))
flexural strength = 650.0 psi
Evaluation pavement thickness = 8.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	T-6 Texan	5,617	100.00	50.0	24	59	2.92
2	Swearingen Merlin	13,230	95.00	55.0	5	17	2.71
3	Sabreliner-60	18,340	95.00	214.0	2	3	4.36
4	Premier 1	12,501	95.00	50.0	6	15	2.84
5	Piper Cheyenne	12,050	95.00	50.0	30	75	2.97
6	Piaggio Avanti	12,100	95.00	50.0	2	5	2.69
7	Phenom 100	10,582	100.00	50.0	123	295	3.01
8	KingAir-B-100	11,800	95.00	52.0	325	1,094	2.87
9	Falcon 10	18,740	95.00	50.0	7	22	3.41
10	Citation Mustang	8,645	95.00	50.0	64	135	2.63
11	Citation M2	10,700	95.00	50.0	47	110	2.86
12	Citation SP	11,850	95.00	50.0	62	153	3.02
13	Citation CJ2	12,501	95.00	50.0	168	426	3.20
14	BeechJet-400	15,500	95.00	90.0	190	401	4.11
15	Aero Commander 690 UF	10,325	95.00	50.0	11	25	2.67
16	Pilatus PC-12	10,450	95.00	50.0	454	1,054	3.05
17	Cessna 425 Corsair	8,600	95.00	50.0	46	97	2.60
18	Cessna Caravan	8,000	95.00	50.0	4	8	2.30
19	Scota TBM 900 UF	7,394	95.00	50.0	69	135	2.47
20	Piper Malibu/Meridian UF	6,000	95.00	50.0	47	83	2.22
21	Eclipse 400/500-UF	6,000	95.00	50.0	12	21	2.11
22	Mitsubishi MU-2 UF	11,575	95.00	50.0	1	2	2.56

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(295)
3	Sabreliner-60	4	4.43	66,489	9.84	0.0000	30.1
					Total CDF =	0.0000	

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
3,Sabreliner-60,18340.000,8.3,2,4.36,2.97988E+000,2.31255E+006,4.43,66488.505,30.1,8.0,B,386.00,1.00,R

APPENDIX C

GEOTECHNICAL TESTING REPORT

Pavement Evaluation Report

Wiley Post Airport
Bethany, Oklahoma
October 4, 2018
Terracon Project No. 03175234

Prepared for:
MacArthur Associated Consultants
Edmond, Oklahoma

Prepared by:
Terracon Consultants, Inc.
Oklahoma City, Oklahoma

terracon.com

Terracon

Environmental ■ Facilities ■ Geotechnical ■ Materials

October 4, 2018

Terracon

MacArthur Associated Consultants
25 N.W. 146th Street
Edmond, Oklahoma 73013

Attn: Mr. Sam Pappas
P: [405] 848 2471
F: [405] 848 2474
E: SPappas@macokc.com

Re: Pavement Evaluation Report
Wiley Post Airport
5915 Philip J. Rhoads Avenue
Bethany, Oklahoma
Terracon Project No. 03175234

Dear Mr. Pappas:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering services for the above referenced project. These services were performed in general accordance with our Proposal No. P03175234 (Revision 3) dated August 16, 2018. This geotechnical engineering report presents the results of the Falling Weight Deflectometer (FWD) Survey that was conducted to evaluate the structural capacity of the various runway and pavement sections at Wiley Post Airport.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.
Cert. Of Auth. #CA-4531 exp. 6/30/[illegible]

REGISTERED PROFESSIONAL ENGINEER
JEFFERY LYNN DEAN
10-4-2018
16998
OKLAHOMA

Jeff Dean, P.E.
Oklahoma No. 16998

Norman Tan, P.E.
Department Manager

JD:N:\Terrain\projects\2018\03185234\project doc[illegible]

Copies to: Addressee (1 via email)

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EXECUTIVE SUMMARY

A pavement evaluation survey was conducted on the runways, taxiways and parking areas at Wiley Post Airport in Bethany, Oklahoma. A Falling Weight Deflectometer (FWD) was used to test the pavement, at 28 selected locations, to develop modulus values of the pavement layers and evaluate the load transfer efficiency (LTE) across the joints of selected Portland cement (PC) concrete pavement panels. There were no borings or pavement cores were taken from any of the pavement sections to determine the subgrade strengths or pavement section thicknesses. An updated pavement information sheet detailing the pavement typical sections for the various pavement segments at Wiley Post Airport was developed and provided by MacArthur Associated Consultants for use in analyzing the FWD data.

This geotechnical executive summary should be used in conjunction with the entire report for design and/or construction purposes. It should be recognized that specific details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled General Comments should be read for an understanding of the report limitations.

PAVEMENT EVALUATION REPORT
WILEY POST AIRPORT
5915 PHILIP J. RHODES AVENUE
BETHANY, OKLAHOMA
Terracon Project No. 03175234
October 3, 2018

1.0 INTRODUCTION

This report presents the results of our geotechnical engineering services performed for the evaluation of the various airport pavement sections including the runways, taxiways, and parking areas at Wiley Post Airport in Bethany Oklahoma. The purpose of these services is to provide information relative to:

- Pavement layer and subgrade modulus values
- Load transfer efficiency of PC concrete pavement panels

2.0 PROJECT INFORMATION

2.1 Project Description

ITEM	DESCRIPTION
Location	Wiley Post Airport is located at 5915 Philip J. Rhoads Avenue in Bethany, Oklahoma.
Project scope	The project involves the evaluation of the airport pavement sections which includes the runways, taxiways, and parking areas for the planes.

3.0 PAVEMENT TESTING

3.1 Falling Weight Deflectometer Tests

Terracon employed an FWD subcontractor to conduct Falling Weight Deflectometer (FWD) tests at 28 selected locations throughout the airport. These included the two main runways (17R/35L and 35R/17L), the cross-wind runway (13-31) and other taxiways and parking areas within the airport. Pavement cores and subgrade sample or tests were not collected from any of the pavement sections for evaluation or for use in analyzing the FWD data. A pavement information sheet detailing the pavement typical sections for the various pavement segments at Wiley Post Airport was developed and provided by MacArthur Associated Consultants for use in analyzing the

FWD data. Additionally, no borings or Dynamic Cone Penetrometer (DCP) tests were conducted to evaluate the pavement subgrade.

A JILS-20 FWD was used to conduct the pavement testing for this project. The tests were conducted according to standards outlined in ASTM D4694-09 and D4695-03. The testing pattern for the PC concrete pavement sections was in accordance to the recommendations detailed in the FAA Advisory Circular 150/5370-11B. The test at each location consisted of four seating drops and eight recording drops to determine modulus values for each pavement layer as detailed in the pavement information sheet provided by MacArthur. The testing patterns are illustrated in Figures 2, 3, and 4 of the FWD report.

The testing pattern for runway sections composed of PC concrete consisted of:

- 2 drops in the center of the panel (drops 1 & 5) to evaluate the modulus value of each pavement layer.
- 4 drops across the pavement joints perpendicular to the direction of travel (drops 2,3,6,&7) to evaluate load transfer efficiency (LTE) for the joint between adjacent panels.
- 2 drops at the panel corner (drops 4&9) to evaluate load transfer efficiency (LTE) across the panel joints at the corner.
- 1 drop at the edge of the panel, parallel to the direction of travel, (drop 8) to evaluate load transfer efficiency (LTE) laterally across adjacent panels.

The testing pattern for taxiways and parking areas composed of PC concrete consisted of:

- 1 drop in the center of the panel (drop 1) to evaluate the modulus value of each pavement layer.
- 1 or 2 drops across the pavement joints perpendicular to the direction of travel (drops 2&3) to evaluate load transfer efficiency (LTE) for the joint between adjacent panels.
- 1 drop at the edge joint of the panel, parallel to the direction of travel (drop 8) to evaluate load transfer efficiency (LTE) laterally across adjacent panels.

The testing pattern for runways and taxiways composed of asphalt consisted of four drops, in a staggered pattern, each side of the runway centerline as shown in Figure 4 of the report in Appendix A.

A copy of the Falling Weight Deflectometer Report providing the details of the FWD testing program and the results of each FWD test is presented in Appendix A.

4.0 ANALYSIS OF RESULTS

4.1 PC Concrete Pavement Sections

The FWD results from the tests conducted on the PC concrete pavement sections provide the following range of layer modulus values:

- PC concrete pavement, E(PCC) - 1480 ksi. to 6500 ksi.
- Asphalt base (if present), E(AC) - 400 ksi. to 1921 ksi.
- Cement stabilized/modified base (if present), E(B) - 5 ksi. to 1000 ksi.
- Subgrade (top 24 inches), E(S1) - 5 ksi. to 50 ksi.
- Subgrade (below 24 inches), E(S2) - 7 ksi. to 94 ksi.

The load transfer efficiency (LTE) ranged from:

- 55 to 96 between the panels tested in the direction of travel
- 35 to 94 at the corners of the panels tested
- 20 to 95 between adjacent panels

Table 5 of the FWD report provides Joint Performance Ratings as viewed by FAA. Since plans or pavement core information were not available, the cause for the variability of LTE values is speculative. It could be attributed to corrosion of any reinforcing steel at the joints or the deterioration of joints that rely strictly on aggregate interlock for load transfer.

4.2 Asphalt Pavement Sections

The FWD results from the asphalt pavement sections provide the following range of layer modulus values:

- Asphalt pavement, E(1) adjusted to 70°F - 164 ksi. to 1618 ksi.
- Base, E(2) - 20 ksi. to 234 ksi.
- Subgrade (top 24 inches), E(3) - 1.2 ksi. to 26 ksi.
- Subgrade (below 24 inches), E(4) - 15.7 ksi. to 74.5 ksi.

Since the pavement was not cored and the subgrade was not sampled or tested, the FWD data reduction relied strictly upon the pavement thickness values provided in the pavement information sheet provided by MacArthur. The modulus values listed in Tables 2, 3, and 4 of the report provided the lowest root mean square values using the pavement information available. Pavement cores and subgrade testing such as the Kessler Dynamic Cone Penetrometer (DCP) would provide additional information that could possibly reduce the variability of the reported modulus values.

5.0 GENERAL COMMENTS

The analysis and pavement modulus values presented in this report are based upon the data obtained from the FWD tests conducted at the selected locations used in conjunction with the pavement information provided. This report does not reflect variations that may occur between FWD tests across the site.

This report has been prepared for the exclusive use of *MacArthur Associated Consultants* for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, express or implied, are intended or made.

Terracon

APPENDIX A

OF GEOTECH REPORT

FALLING WEIGHT DEFLECTOMETER REPORT

September 24, 2018

To: Terracon Consultants, Inc.
4701 North Stiles Ave
Oklahoma City, OK 73105

Subject: Falling Weight Deflectometer
Wiley Post Airport, Oklahoma City, Oklahoma

Dear Mr. Dean,

We are pleased to submit this report summarizing the falling weight deflectometer (FWD) field results conducted on August 30 and 31, 2018 at Wiley Post Airport in Oklahoma City, Oklahoma. FWD survey/testing was performed to estimate from back-calculation analyses the modulus of existing pavement layers at specific locations within the referenced project site.

We thank you for giving us the opportunity to work on this important project. We will be available to address any questions you have or provide additional information needed.

Sincerely,
EINCK, Corp.

LICENSED PROFESSIONAL ENGINEER
NAJI
KHOURY
26534
OKLAHOMA

Naji Khoury, Ph.D., P.E.
Principal

FALLING WEIGHT DEFLECTOMETER MODULUS TESTING

WILEY POST AIRPORT, OKLAHOMA CITY, OK

Prepared for

Terracon Consultants, Inc.
4701 North Stiles Ave
Oklahoma City, OK 73105

Prepared by

EINCK, Corp
243 Meadowvale Road,
Lutherville, MD 21093

September 24, 2018

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1. Introduction

EINCK, Corp. (EINCK) conducted falling weight deflectometer (FWD) testing at Wiley Post Airport in Oklahoma City, Oklahoma. Testing sections consist of the main runways (i.e., RW 17L-35R and RW 17R-35L), crosswind runway (RW 13-31), taxiways and aprons as requested by Terracon (refer to Appendix A). This study was to perform FWD survey and estimate pavement section moduli using back-calculation technique. EINCK did not perform any other field testing such as visual inspection of the existing pavement, coring/borings, or dynamic cone penetration testing.

2. Procedure and Field-Testing Operation

EINCK, Corp. used JILS-20 FWD equipment for this project. We performed FWD testing in accordance with the ASTM standards (D4694 - 09 and D4695 – 03), *FAA Advisor Circular (FAA Specs.)*, and instruction from the pavement engineer with Terracon. The deflection tests consisted of four seating drops and eight recording drops per test point. Below is the used drop sequence:

1. Two seating drops of a load of approximately 20,000 lbs
2. Four recording drops at 20,000 lbs
3. Two seating drops of a load of approximately 27, 000 lbs
4. Four recoding drops at 27, 000 lbs

FWD test types, locations and spacing were provided by Terracon (See Appendix A and Figures 1, 2, 3 and 4). We illustrated the FWD test points layout for the *PCC pavement slabs* at each location in Figure 2 and Figure 3. Note that the rectangle locations shown in Figure 1 represent testing with up to 9 points (including center of slab and LTEs) as illustrated in Figure 2 (offset right from centerline) or Figure 3 (offset left from centerline); however, the circle locations in Figure 1 represent testing up to 3 points (point 1 thru 3) – testing layout is provided by Terracon.

Figure 4 shows the layout of testing points (10 and 20 feet offset Left and Right from centerline) for the *HMA pavement sections* with spacing of about 500 feet in the traffic direction between locations, as recommended by Terracon.

We have included selected site photos (Photo 1 to 3, Appendix A) at typical FWD test locations during our field survey.

3. Pavement Structure

Pavement information were provided by Terracon, as presented here in Table 1 and Appendix A. Note that the back-calculation procedure is sensitive and dependent on the thickness of the provided individual pavement layers. Limited number of pavement data or inaccuracy of information will influence the back-calculation results and their reliability. Dynamic cone penetrometer (DCP) testing were not performed by EINCK, Corp. and were not available during preparation of this report.

Figure 1 – Tested FWD Locations

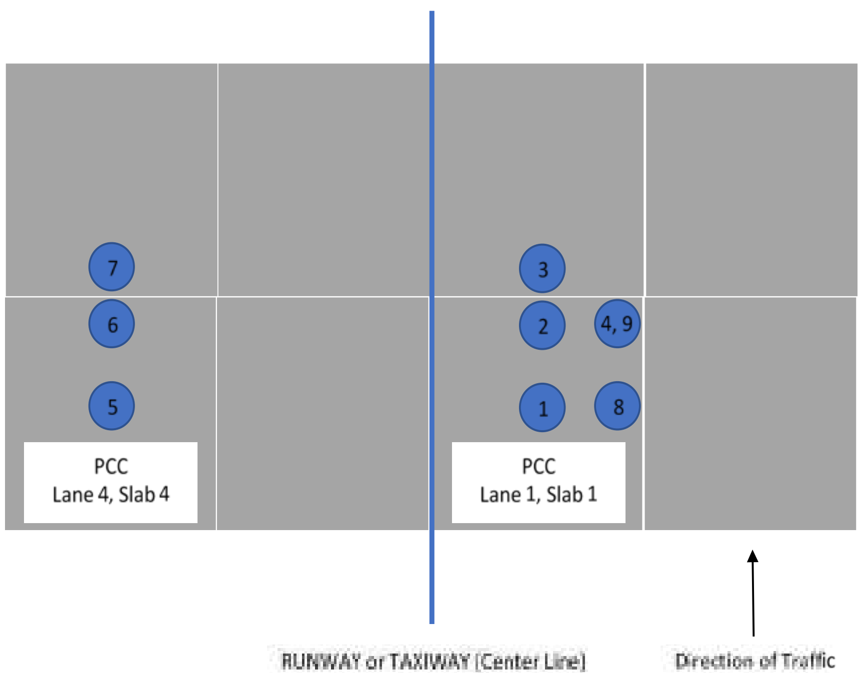


Figure 2 – Testing Points Layout for PCC Runway or Taxiway with Centerline at Slab Joint (Offset Right)

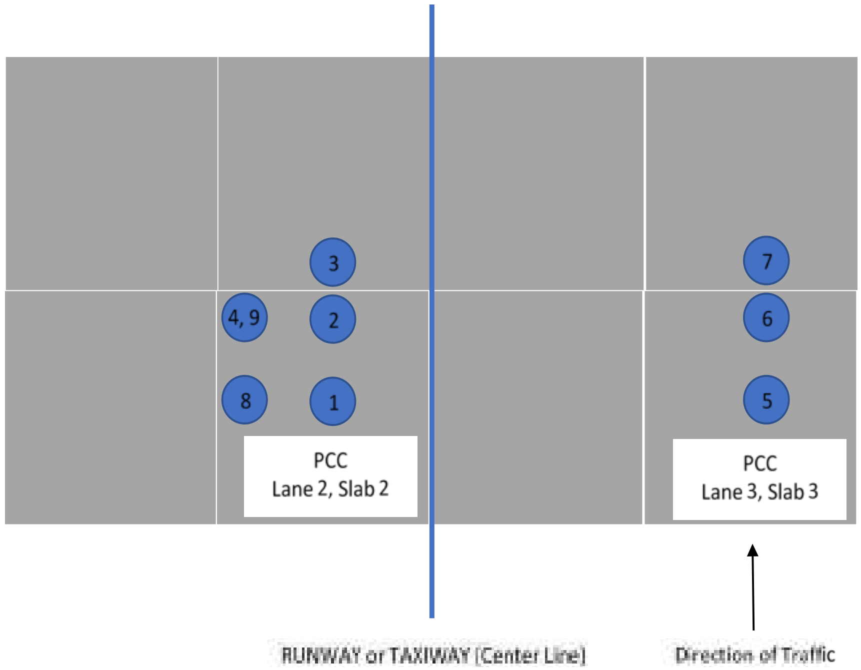


Figure 3 – Testing Points Layout for PCC Runway or Taxiway with Centerline at Slab Joint (Offset Left)

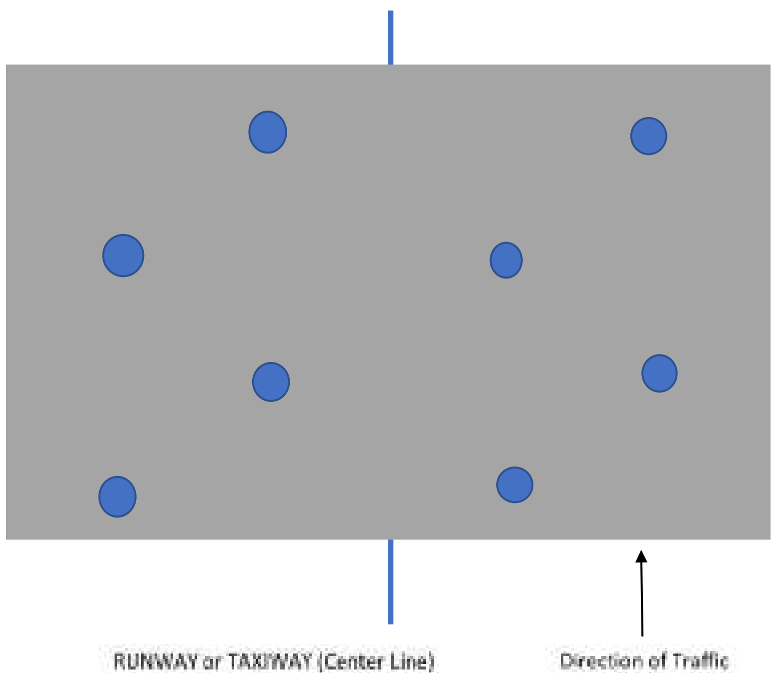


Figure 4 – Testing Points Layout for HMA Pavement (with 10 feet and 20 feet Offset Right or Left)

Table 1 – Pavement information (provided by Terracon)

Boring	Pavement Type	Latitude+	Longitude+	AC Thickness (in.)	PCC Thickness (in.)	AC Thickness (in.)	PCC Thickness (in.)	Stabilized Layer Thickness (in.)	Total Thickness (in)
Loc1	PCC	35.541127	-97.64549	n/e	8.00	n/e	n/e	6.00	14.00
Loc2		35.535198	-97.64553	n/e	6.00	2.00	n/e	6.00	14.00
Loc3		35.529592	-97.64549	n/e	6.00	10.00	n/e	6.00	22.00
Loc4		35.528202	-97.64377	n/e	6.00	8.00	n/e	n/e	14.00
Loc5		35.531329	-97.64754	n/e	6.00	8.00	n/e	n/e	14.00
Loc6		35.533558	-97.65033	n/e	6.00	8.00	n/e	n/e	14.00
Loc7		35.535166	-97.65053	n/e	6.00	n/e	n/e	8.00	14.00
Loc8		35.535204	-97.64742	n/e	6.00	n/e	n/e	8.00	14.00
Loc9		35.529652	-97.64759	n/e	6.00	n/e	n/e	n/e	6.00
Loc10		35.532188	-97.64918	n/e	6.00	n/e	n/e	n/e	6.00
Loc11	Asphalt	35.532985	-97.64917	14.00	n/e	n/e	n/e	3.00	17.00
Loc11				8.00	n/e	n/e	n/e	8.00	16.00
Loc12	PCC	35.541885	-97.64923	n/e	6.00	n/e	n/e	8.00	14.00
Loc13		35.543720	-97.64746	n/e	6.00	n/e	n/e	8.00	14.00
Loc14		35.543887	-97.64339	n/e	9.60	1.00	6.00	n/e	16.60
Loc15		35.542019	-97.64305	n/e	11.50	n/e	n/e	8.00	19.50
Loc16		35.541982	-97.63904	n/e	7.50	n/e	n/e	8.00	15.50
Loc17		35.538035	-97.64305	n/e	6.00	2.00	n/e	n/e	8.00
Loc18		35.535202	-97.64310	n/e	6.00	n/e	n/e	n/e	6.00
Loc19		35.535201	-97.63895	n/e	6.00	n/e	n/e	n/e	6.00
Loc20		35.532723	-97.64303	n/e	11.50	n/e	n/e	8.00	19.50
Loc21		35.532513	-97.64128	n/e	6.00	n/e	n/e	n/e	6.00
Loc21a		35.532160	-97.64057	n/e	6.00	n/e	n/e	n/e	6.00
Loc22		35.531797	-97.64023	n/e	6.00	n/e	n/e	n/e	6.00
Loc23		35.525004	-97.64372	n/e	11.50	n/e	n/e	8.00	19.50
Loc24		35.524654	-97.64164	n/e	6.00	n/e	n/e	4.00	10.00
Loc25		35.526052	-97.64167	n/e	11.50	n/e	n/e	8.50	20.00
Loc26		35.528791	-97.64134	n/e	6.00	n/e	n/e	n/e	6.00
Loc27		35.526753	-97.63891	n/e	6.00	n/e	n/e	n/e	6.00
Loc28		35.526897	-97.63843	n/e	6.00	n/e	n/e	n/e	6.00

+ GPS should not be used in any planning

4. Back-calculation Analyses & Results

We performed back-calculation analyses using AASHTO Back-calculation Tool (BCT). We used in our back-calculation BCT analyses including the asphalt layer, Portland cement (PCC), stabilized base and/or a 2-ft compacted subgrade layer on top of an infinite half-space subgrade layer. The use of a 2-ft compacted subgrade is based on a recent study by Federal Highway Administration (FHWA), *Publication NO. FHWA-HRT-16-010* (Bruinsma et al., 2017). The study showed that a four-layer system with a 2-ft (0.6-m) compacted subgrade layer on top of an infinite half-space subgrade: (a) provided the lower root mean square (RMS) values among the other layer combinations considered; and (b) can be the most realistic design inputs for the MEPDG software.

Selected/typical seed, minimum, and maximum values for layer moduli as well as assumed Poisson's ratio values were selected based on typical values recommended by FHWA, AASHTO, FAA and published studies. Figure 5 shows selected seed, minimum and maximum values for a typical location.

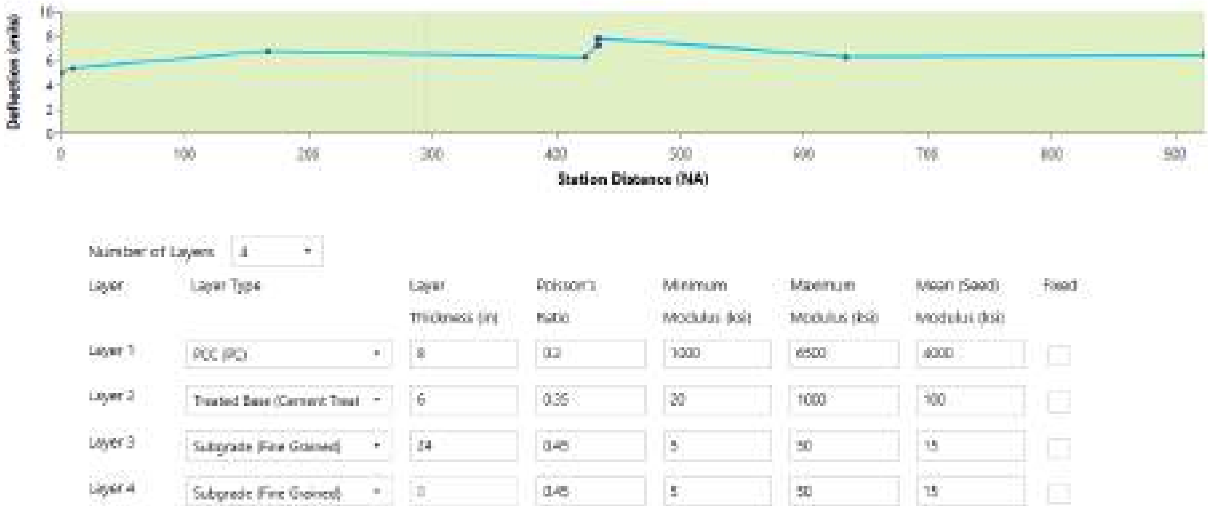


Figure 5 – Input layer modulus and Poisson's ratio values for back-calculation for a selected location

We summarized the FWD test results for PCC and Asphalt pavement sections in Table 2 and Tables 3 and 4, respectively. The FWD field testing data are available when requested.

Based on FAA (2011) and the calculated average Winkler foundation radius of relative stiffness (in), the general recommendations for the ranges of LTE as summarized in Table 5. Figure 6 shows both the transverse and longitudinal joint LTE values for the tested slabs and how they fall within the ranges of LTE.

In Tables 3 and 4, the adjusted modulus values were determined based on the ATAF recommended by the FHWA, see Eqn. 1.

$$ATAF = 10^{slope(Tr-Tm)} \qquad (1)$$

Where, the slopes range from -0.013 to -0.032. A typical value -0.021 was used in this study, as there is no specific data available (FHWA, 2018). Tr is the reference temperature in ^oC and Tm is the measured temperature in ^oC. Please note that the LTE performance ratings and ATAF may be changed based on the initial typical parameter values used in their calculations and therefore, the pavement engineer should perform a final analysis for lambda and ATAF.

Table 2 – FWD Test results for PCC Pavement Sections

Location No.	Offset	Point No. 1 E(PCC) (ksi)	1 E(AC) (ksi)	1 E(PCC) (ksi)	1 E(B) (ksi)	1 E(S1) (ksi)	1 E(S2) (ksi)	2 LTE	3 LTE	4 LTE	5 E(PCC) (ksi)	5 E(AC) (ksi)	5 E(PCC) (ksi)	5 E(B) (ksi)	5 E(S1) (ksi)	5 E(S2) (ksi)	6 LTE	7 LTE	8 LTE	9 LTE
Loc1	Left	6500	--	--	1000	50	39	93	--	89	5500	--	--	500	50	34	91	--	76	77
Loc2	Right	4676	1921	--	329	8	39	71	--	82	4900	1899	--	36	25	35	55	69	45	52
Loc3	Left	3679	400	--	20	6	50	77	--	80	500*	401	--	20	14	34	73	--	40	43
	Left										2375	402	--	20	6	41				
Loc4	Left	3627	408	--	--	5	39	55	--	57	3656	409	--	--	5	35	70	--	76	76
Loc5	Right	2125	402	--	--	5	31	74	85	85	1015	406	--	--	5	34	71	--	38	58
Loc6	Left	1571	405	--	--	5	18	76	82	77	1581	400	--	--	5	24	70	75	45	65
Loc7	Right	5409	--	--	21	5	23	92	91	--	--	--	--	--	--	--	--	--	--	--
Loc8	Left	4893	--	--	85	5	25	87	96	--	--	--	--	--	--	--	--	--	--	--
Loc9	Right	2888	--	--	--	5	7	85	90	--	--	--	--	--	--	--	--	--	--	--
Loc10	Right	4000	--	--	--	19	18	82	87	83	4000	--	--	--	22	19	79	84	45	35
Loc11	See Table for HMA Results																			
Loc12	Left	2705	--	--	202	5	27	88	--	91	4900	--	--	19	5	28	92	95	69	73
Loc13	Right	5000	--	--	100	8	18	92	--	94	--	--	--	--	--	--	--	--	--	--
Loc14	Right	4787	1700	4823	--	33	22	87	90	--	--	--	--	--	--	--	--	--	67	--
Loc15	Right	1480	--	--	5	2	94	83	--	--	--	--	--	--	--	--	--	--	81	--
Loc16	Right	5863	--	--	233	6	40	88	--	--	--	--	--	--	--	--	--	--	92	--
Loc17	Left	3615	409	--	--	5	21	74	--	--	--	--	--	--	--	--	--	--	20	--
Loc18	Left	4863	--	--	--	12	29	89	92	--	--	--	--	--	--	--	--	--	40	--
Loc19	Left	3656	--	--	--	7	23	74	72	--	--	--	--	--	--	--	--	--	89	--
Loc20	Left	5500	--	--	496	29	41	94	--	--	--	--	--	--	--	--	--	--	92	--
Loc21	Left	4123	--	--	--	5	20	91	94	--	--	--	--	--	--	--	--	--	67	--
Loc21a	Left	4986	--	--	--	17	28	74	88	--	--	--	--	--	--	--	--	--	91	--
Loc22	Left	2526	--	--	--	5	19	77	--	--	--	--	--	--	--	--	--	--	69	--
Loc23	Left	6000	--	--	750	50	39	92	91	--	--	--	--	--	--	--	--	--	94	--
Loc24	Left	2914	407	--	--	9	32	49	59	--	--	--	--	--	--	--	--	--	85	--
Loc25	Right	5676	--	--	30	49	38	92	93	--	--	--	--	--	--	--	--	--	95	--
Loc26	Left	4755	--	--	--	5	16	90	85	--	--	--	--	--	--	--	--	--	70	--
Loc27	Right	5208	--	--	--	15	31	88	88	--	--	--	--	--	--	--	--	--	88	--
Loc28	Left	1753	--	--	--	9	18	68	--	--	--	--	--	--	--	--	--	--	75	--

* Over a crack

Note: The Modulus (E) from left to right for each point represent the modulus of each layer with depth (from Top to bottom of pavement)

Table 3 – FWD Test Results for HMA Pavement Sections RW 17R-35R (NB)

Station No.	Offset	HMA Thickness (in)	Base Thickness (in)	Asphalt Temperature (^{o}F)	Asphalt E(1)(ksi)	Adjusted @ 70^{o}F E(1)(ksi)	Base E(2)(ksi)	2-ft Subgrade E(3)(ksi)	Infinite Subgrade E(4)(ksi)
0+00	10 feet	14.00	7.00	105.1	116	298	50.0	1.3	34.2
0+00*		14.00	7.00	104.5	113	287	50.0	1.2	33.8
5+01		14.00	7.00	106.3	606	1618	486.1	6.7	74.5
10+01		14.00	7.00	105.6	112	293	50.0	13.0	27.9
15+00		8.00	4.00	112.5	344	1084	184.9	11.9	24.5
20+00		8.00	4.00	111.5	111	340	25.0	6.0	15.7
25+00		8.00	4.00	111.3	298	908	25.2	8.2	22.4
27+36		8.00	4.00	110.9	143	431	25.0	1.8	15.8
0+00	20 feet	14.00	3.00	103.4	66	164	25.0	4.6	22
5+01		14.00	3.00	105.2	148	384	25.0	3.5	24
10+00		14.00	3.00	104.2	146	368	25.0	12.4	30.7
15+01		8.00	3.00	108.6	319	906	244.9	24.5	26.2
20+08		8.00	3.00	108.3	82	232	25.0	6.7	18.5
23+70		8.00	3.00	100.2	355	802	25.4	3.7	15.4
Average	--	11.0	4.4	107	211	580	90.5	7.5	28
Stdev	--	3.1	1.7	3.6	152.7	420.6	132.6	6.3	14.9
COV	--	28.3	39.3	3.4	72.2	72.6	146.5	83.8	54.1

*: Repeated for repeatability analysis

Station 0+00 has a gps coordinate of approximately 35.53298 and -97.64916 (approximarely 10 feet north of the intersection of crosswind and RW 17R-35L runways)

Table 4 – FWD Test Results for HMA Pavement Sections RW 17R-35R (SB)

Station No.	Offset	HMA Thickness (in)	Base Thickness (in)	Asphalt Temperature (°F)	Asphalt E(1)(ksi)	Adjusted @ 70°F E(1)(ksi)	Base E(2)(ksi)	2-ft Subgrade E(3)(ksi)	Infinite Subgrade E(4)(ksi)
26+16	10 feet	8.00	8.00	110.0	132	389	20.0	6.1	18.9
22+46		8.00	8.00	110.7	145	435	20.0	4.8	18.9
17+56		8.00	8.00	111.7	458	1412	101.4	20.5	29.1
12+46		14.00	3.00	107.2	116	316	20.0	10.1	34.6
7+46		14.00	3.00	107.6	97	268	20.0	2.8	24.3
2+46		14.00	3.00	107.8	69	191	20.0	3.1	21.3
27+36	20 feet	8.00	8.00	100.9	383	883	50.0	2.0	27
25+00		8.00	8.00	109.0	257	738	50.5	4.5	20
20+00		8.00	8.00	109.2	267	769	50.7	17.9	26.6
14+99		8.00	8.00	111.9	506	1567	82.2	12.6	27.4
9+99		14.00	3.00	106.0	251	662	50.0	10.1	28.4
5+00		14.00	3.00	105.6	448	1172	234.0	26.0	29.9
0+00		14.00	3.00	105.8	130	341	50.0	1.4	33.0
Average	--	10.8	5.7	108	251	703	59.1	9.4	26
Stdev	--	3.1	2.6	3.0	152.6	448.3	58.4	7.9	5.1
COV	--	28.9	45.6	2.8	60.9	63.7	98.8	83.8	19.6

Station 0+00 has a gps coordinate of approximately 35.53298 and -97.64916 (approximarely 10 feet north of the intersection of crosswind and RW 17R-35L runways)

Table 5 – Pavement Joint Performance Ratings (FAA, 2018)

LTE (%)	Average Radius of Relative Stiffness, λ_k (30 in)
72 to 90	Acceptable
50 to 72	Fair
Less than 50	Poor

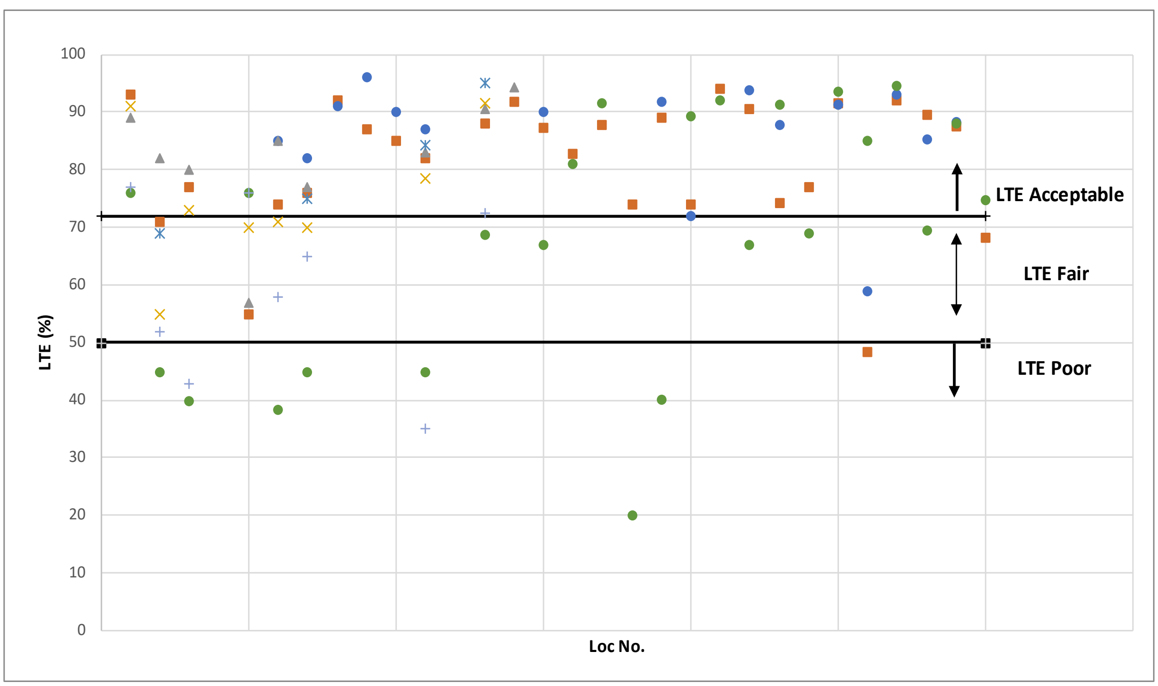


Figure 6 – Plot of LTE values for the tested slabs

5. Limitations

The procedures and methodologies used to complete this project are consistent with standard and/or accepted/recognized practices in similar pavement and geotechnical investigations. EINCK, Corp. assumes no responsibility for survey limitations due to inherent technological limitations and interpretations made by others based on work performed by or recommendations made by us.

6. References

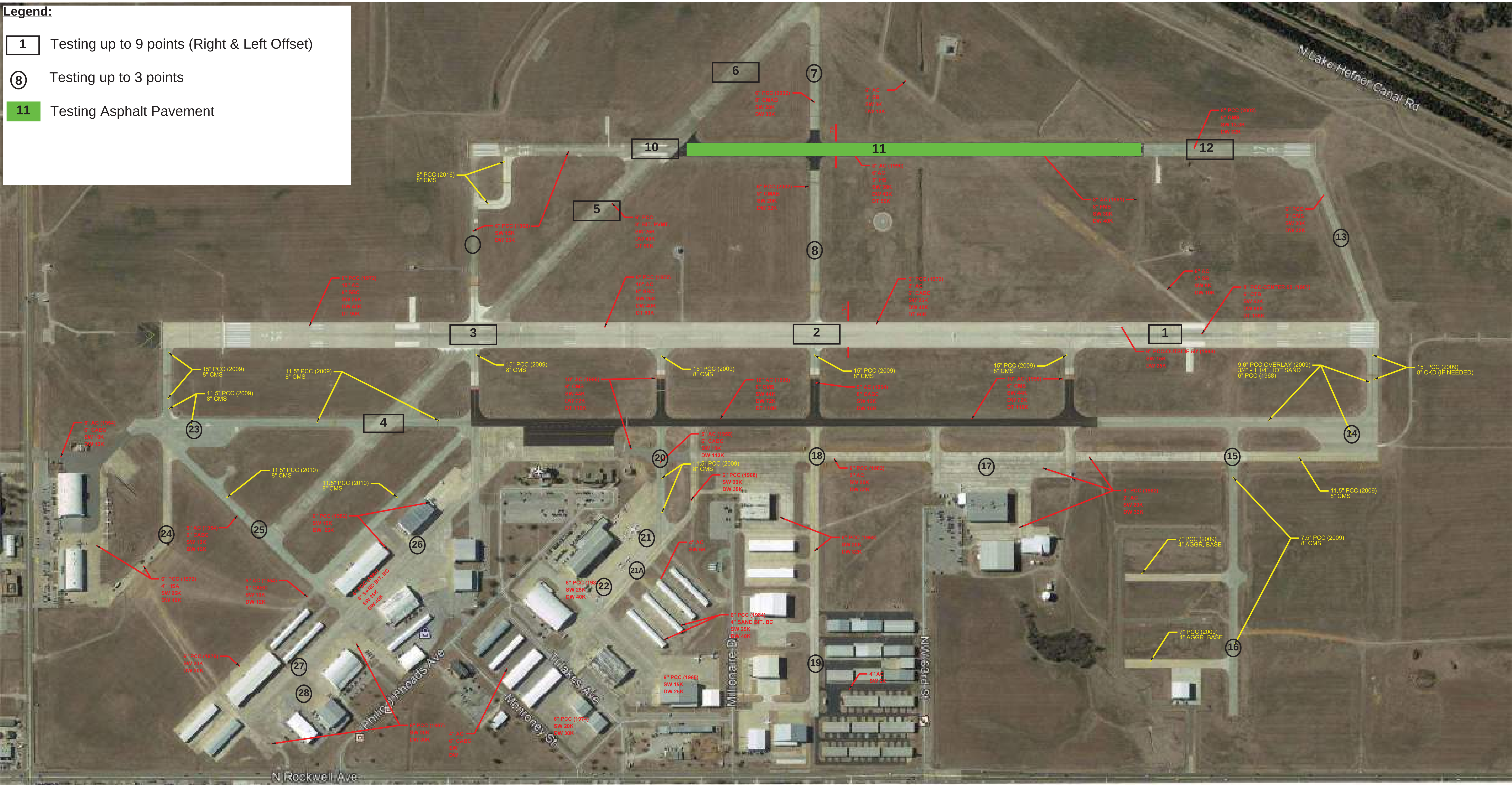
Bruinsma, J. E., Vandenbossche, J.M., Chatti, K., and Smith, K.D., (2017) Using Falling Weight Deflectometer Data with Mechanistic Empirical Design and Analysis, Volume II: Case Study Reports, Final Report, Submitted to FHWA, *Publication NO. FHWA-HRT-16-010* March 2017.

Federal Aviation Administration (FAA) (2011) Advisory Circular: Use of Nondestructive Testing in the Evaluation of Airport Pavements, 150/5370-11B, AAS-100, September 30, 2011, pp. 80.

MDOT (1994) Temperature Adjustment Factor for Falling Weight Deflectometer Deflections on Full Depth Asphalt Concrete Pavements, Missouri Department of Transportation, RDT 96-002, November 1994.

APPENDIX B – FWD TEST LOCATIONS

OF GEOTECH REPORT



Legend:
1 Testing up to 9 points (Right & Left Offset)
8 Testing up to 3 points
11 Testing Asphalt Pavement
N Lake Hefner Canal Rd
N Rockwell Ave
8" PCC (2016)
8" CMS
15" PCC (2009)
8" CMS
11.5" PCC (2009)
8" CMS
11.5" PCC (2010)
8" CMS
9.6" PCC OVERLAY (2009)
3/4" + 1 1/4" HOT SAND
6" PCC (1968)
15" PCC (2009)
8" CKD (IF NEEDED)
7" PCC (2009)
4" AGGR. BASE
7.5" PCC (2009)
8" CMS

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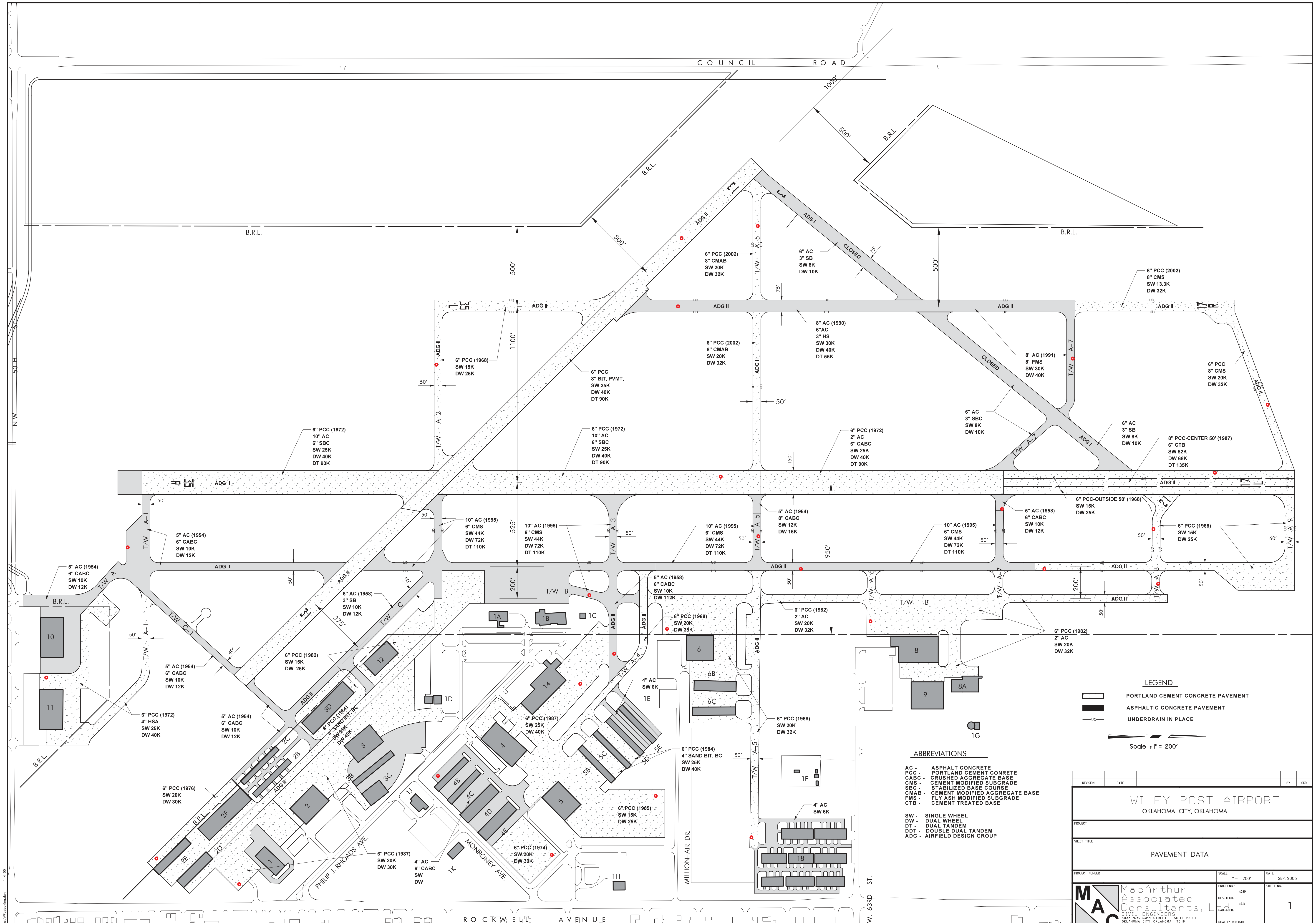
Photo 1 – Typical FWD Tests at PCC Joint Upstream for LTE Evaluation

Photo 2 – Typical FWD Tests at Asphalt Pavement with 20 feet Offset Right from Centerline

Photo 3 – Typical FWD Tests at Center Lane of PCC Slab


COUNCIL ROAD
ROCKWELL AVENUE
N.W. 50TH ST.
N.W. 63RD ST.
MILLION-AIR DR.
PHILIP J. RHOADS AVE.
MONRONEY AVE.
B.R.L.
LEGEND
PORTLAND CEMENT CONCRETE PAVEMENT
ASPHALTIC CONCRETE PAVEMENT
UNDERDRAIN IN PLACE
Scale : 1" = 200'
ABBREVIATIONS
AC - ASPHALT CONCRETE
PCC - PORTLAND CEMENT CONRETE
CABC - CRUSHED AGGREGATE BASE
CMS - CEMENT MODIFIED SUBGRADE
SBC - STABILIZED BASE COURSE
CMAB - CEMENT MODIFIED AGGREGATE BASE
FMS - FLY ASH MODIFIED SUBGRADE
CTB - CEMENT TREATED BASE
SW - SINGLE WHEEL
DW - DUAL WHEEL
DT - DUAL TANDEM
DDT - DOUBLE DUAL TANDEM
ADG - AIRFIELD DESIGN GROUP
WILEY POST AIRPORT
OKLAHOMA CITY, OKLAHOMA
PAVEMENT DATA
SEP. 2005
1" = 200'
1
MacArthur Associated Consultants, L.L.C.
CIVIL ENGINEERS

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Boring	Location
Loc1	R/W 17L
Loc2	R/W 17L-35R
Loc3	R/W 35R
Loc4	R/W 13-31
Loc5	R/W 13-31
Loc6	R/W 13-31
Loc7	T/W A-5
Loc8	T/W A-5
Loc9	T/W A-2
Loc10	R/W 13-31
Loc11	R/W 17R-35L
Loc12	R/W 17R
Loc13	TW A-9 West
Loc14	T/W A-9
Loc15	T/W A-8
Loc16	T/W A-8 East
Loc17	T/W B
Loc18	T/W A-5
Loc19	T/W A-5
Loc20	T/W A-3
Loc21	BLDG 14
Loc21a	BLDG 5C/5D Apron
Loc22	BLDG 14/5B Apron
Loc23	T/W A
Loc24	T/W A-1
Loc25	T/W C-1
Loc26	T/W C-1
Loc27	BLDG 28
Loc28	BLDG 1

EB lane back-calculated modulus versus station locations

Station No.	Station No.	Offset	HMA Thickness (in)	Base Thickness (in)	Asphalt Temperature (°F)	Asphalt E(1)(ksi)	Adjusted @ 70°F E(1)(ksi)	Base E(2)(ksi)	Infinite Subgrade E(3)(ksi)	Infinite Subgrade E(3)(psi)	CBR
2616	26+16	10 feet	8.00	8.00	110.0	75	220	20.0	15.3	15340.0	
2246	22+46		8.00	8.00	110.7	72	215	20.0	14.6	14580.0	
1746	17+56		8.00	8.00	111.7	603	1859	48.7	28.0	27980.0	
1246	12+46		14.00	3.00	107.2	81	220	20.0	27.2	27240.0	
746	7+46		14.00	3.00	107.6	53	147	20.0	14.4	14380.0	
246	2+46		14.00	3.00	107.8	50	139	20.0	13.8	13800.0	
2736	27+36	20 feet	8.00	8.00	100.9	198	456	25.0	13	12680.0	
2500	25+00		8.00	8.00	109.0	182	521	25.0	15	14620.0	
2000	20+00		8.00	8.00	109.2	326	940	25.2	25.3	25300.0	
1499	14+99		8.00	8.00	109.4	636	1840	25.0	24.6	24560.0	
999	9+99		14.00	3.00	106.0	195	516	20.0	23.5	23540.0	
500	5+00		14.00	3.00	105.6	457	1196	161.0	29.4	29400.0	
0	0+00		14.00	3.00	105.8	71	188	20.0	11.3	11300.0	
Average	Average	--	10.8	5.7	108	231	650	34.6	20	19593.8	
Stdev	Stdev	--	3.1	2.6	2.8	210.1	620.5	38.8	6.7	6727.2	
COV	COV	--	28.9	45.6	2.6	91.1	95.4	112.0	34.3	34333.2	

Station 0+00 has a gps coordinate of approximately 35.53298 and -97.64916 (approximarely 10 feet north of the intersection of crosswind and RW 17R-35L runways)

Color Denotes if section was used in the PCN calclulation

EB lane back-calculated modulus versus station locations

Station No.	Station No.	Offset	HMA Thickness (in)	Base Thickness (in)	Asphalt Temperature (°F)	Asphalt E(1)(ksi)	Adjusted @ 70°F E(1)(ksi)	Base E(2)(ksi)	Infinite Subgrade E(3)(ksi)	E(3)(Psi)	CBR
0	0+00	10 feet	14.00	3.00	105.1	58	150	50.0	10.9		
0*	0+00*		14.00	3.00	104.5	57	144	50.0	10.6	10580.0	9.0
501	5+01		14.00	3.00	106.3	435	1160	95.4	34.3	34300.0	
1001	10+01		14.00	3.00	105.6	88	230	50.0	24.0	23980.0	
1500	15+00		8.00	8.00	112.5	578	1820	58.9	21.8	21800.0	
2000	20+00		8.00	8.00	111.5	76	234	20.0	13.1	13080.0	13.0
2500	25+00		8.00	8.00	111.3	193	589	20.0	18.5	18500.0	
2736	27+36		8.00	8.00	110.9	193	584	20.0	18.5	18500.0	
250	2+50	20 feet	14.00	3.00	103.4	50	123	20.0	16.1	16140.0	
751	7+71		14.00	3.00	105.2	88	228	20.0	14.9	14920.0	
1250	12+50		14.00	3.00	104.2	110	277	20.0	25.9	25860.0	
1751	17+51		8.00	8.00	108.6	414	1175	108.8	26.0	25960.0	
2258	22+58		8.00	8.00	108.3	54	152	20.0	15.9	15900.0	
2620	26+20		8.00	8.00	100.2	158	356	20.0	11.4	11360.0	
Average	Average	--	11.0	5.5	107	182	516	40.9	19		
Stdev	Stdev	--	3.1	2.6	3.6	169.8	514.8	29.9	6.9		
COV	COV	--	28.3	47.2	3.4	93.1	99.8	73.1	37.1		

*: Repeated for repeatability analysis

Station 0+00 has a gps coordinate of approximately 35.53298 and -97.64916 (approximarely 10 feet north of the intersection of crosswind and RW 17R-35L runways)

Color Denotes section was used in the PCN calclulation

NOTE: CBR Values were calculated using the following equation: **Mrsg=**

2555 X CBR^0.64

APPENDIX D

WILEY POST AIRPORT MASTER PLAN EXTRACTED PAGES

ARC Code	Table Name	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
A-I	Eclipse 400/500	56	34	35	20	34	25	17	31	29	28
A-I	Kodiak Quest	0	0	2	2	0	0	2	1	3	1
A-I	Lancair 4	2	0	0	0	0	0	0	0	0	0
A-I	Lancair Evolution/Legacy	1	0	0	0	0	0	0	14	5	0
A-I	Mitsubishi MU-2	28	14	18	15	12	6	8	4	6	2
A-I	Piper Lance	3	0	0	0	0	0	0	0	0	0
A-I	Piper Malibu/Meridian	350	285	346	337	329	263	208	208	195	116
A-I	Socata TBM 7/850/900	36	44	44	71	129	146	168	157	177	172
TOTAL		**476**	**377**	**445**	**445**	**504**	**440**	**403**	**415**	**415**	**319**
A-II	Cessna 425 Corsair	27	28	34	40	60	58	63	89	105	115
A-II	Cessna Caravan	60	45	26	41	33	80	38	29	40	8
A-II	De Havilland Twin Otter	9	2	2	5	2	2	1	8	0	2
A-II	Pilatus PC-12	547	579	620	1,020	1,177	1,163	1,199	1,276	1,340	1,134
TOTAL		**643**	**654**	**682**	**1,106**	**1,272**	**1,303**	**1,301**	**1,402**	**1,485**	**1,259**
B-I	Aero Commander 690	142	228	181	158	132	169	88	106	61	26
B-I	Beech 99 Airliner	4	4	2	0	0	1	0	0	0	0
B-I	Beechjet 400	659	450	525	475	388	443	469	503	475	475
B-I	Cessna 526 Jet Trainer	0	0	2	0	0	0	0	0	0	0
B-I	Citation CJ1/CJ2	538	543	612	391	342	406	545	651	501	418
B-I	Citation I/SP	184	239	165	153	158	84	117	198	233	154
B-I	Citation M2	0	0	0	0	0	0	0	0	0	117
B-I	Citation Mustang	18	25	80	194	205	253	304	187	98	160
B-I	Falcon 10	74	33	64	64	37	12	6	6	2	17
B-I	Hawker 1000	8	4	6	2	2	2	2	1	0	0
B-I	Honda Jet	0	0	0	0	0	2	0	0	4	5
B-I	King Air 90/100	1,271	1,069	1,248	1,311	1,281	1,150	1,038	1,021	870	811
B-I	L-29 Delfin	0	2	1	0	0	0	0	0	0	0
B-I	L-39 Albatross	3	3	2	0	0	0	0	0	0	0
B-I	Phenom 100	0	32	57	111	132	142	232	259	322	306
B-I	Piaggio Avanti	150	124	149	214	205	49	4	17	12	5
B-I	Piper Cheyenne	269	180	141	87	85	107	98	102	113	74
B-I	Premier 1	62	46	50	42	44	28	16	19	21	14
B-I	Rockwell Sabre 40/60	259	132	159	82	86	23	28	7	0	3
B-I	Swearingen Merlin	14	16	18	19	10	12	23	23	18	12
B-I	T-6 Texan	557	483	865	896	1,084	750	780	758	125	60
TOTAL		**4,212**	**3,613**	**4,327**	**4,199**	**4,191**	**3,633**	**3,750**	**3,858**	**2,855**	**2,657**
B-II	BAe Jetstream	0	0	2	0	0	2	0	6	0	0
B-II	Beech 1900	60	18	23	17	27	8	11	10	17	11
B-II	Cessna Conquest	109	58	58	58	43	80	115	101	84	80
B-II	Citation CJ3/CJ4	686	568	615	576	544	545	492	500	319	436
B-II	Citation II/SP/Latitude	1,528	1,264	1,369	1,218	958	679	727	621	701	587
B-II	Citation V/VII/Sovereign	1,002	729	868	1,366	2,067	1,557	1,585	1,708	1,744	1,640
B-II	Citation X	202	180	207	202	324	135	170	170	107	205
B-II	Citation XLS	751	643	645	745	1,041	1,203	1,296	1,182	1,199	1,227
B-II	Dornier 328	18	2	8	6	4	8	2	3	7	2
B-II	Embraer 500/450 Legacy	0	0	0	0	0	0	0	0	4	12
B-II	Embraer EMB-110/120	0	0	0	2	0	1	0	0	2	0
B-II	Falcon 20/50	401	255	110	160	147	169	163	180	175	160
B-II	Falcon 2000	85	79	64	88	83	87	61	75	39	88
B-II	Falcon 900	85	37	70	68	155	164	45	13	27	29
B-II	King Air 200/300/350	1,501	1,089	1,145	1,115	1,059	927	891	813	767	839
B-II	King Air F90	42	49	94	51	74	61	33	39	8	26
B-II	Phenom 300	0	0	12	14	61	104	118	183	223	204
B-II	Saab 340	0	0	4	0	0	0	0	0	0	0
B-II	Shorts 330/360	4	0	2	2	2	0	0	0	0	0
TOTAL		**6,474**	**4,971**	**5,296**	**5,688**	**6,589**	**5,730**	**5,709**	**5,604**	**5,423**	**5,546**
B-III	Aerospatiale ATR 42/72	0	2	0	0	0	0	0	0	0	0
B-III	Bombardier Global 5000	2	2	1	2	2	4	6	0	64	57
B-III	Bombardier Global Express	5	3	3	2	9	15	2	0	0	6
B-III	CASA 235	0	0	0	0	0	0	0	7	2	0
B-III	De Havilland Dash 8 Series	0	0	1	0	0	0	0	0	0	0
B-III	Falcon 7X/8X	0	0	2	2	23	4	12	30	16	4
B-III	Saab 2000	0	0	0	2	0	0	1	0	0	0
TOTAL		**7**	**7**	**7**	**8**	**34**	**23**	**21**	**37**	**82**	**67**
C-I	AV-8B Harrier	0	0	0	0	1	0	0	0	0	0
C-I	BAe HS 125 Series	16	6	4	6	9	2	16	23	4	8
C-I	BAe Systems Hawk	2	0	0	10	35	28	24	33	1	12
C-I	Fuji T-1	8	3	3	1	0	0	0	0	0	0
C-I	Learjet 20 Series	76	14	14	2	14	11	4	5	0	2
C-I	Learjet 31	243	144	79	82	142	103	240	238	164	187
C-I	Learjet 40 Series	302	307	573	554	698	803	813	534	496	713
C-I	Learjet 50 Series	39	13	18	24	73	19	67	60	56	46
C-I	Learjet 60 Series	511	524	411	307	247	207	161	126	82	112
C-I	Rockwell Sabre 75	1	3	2	0	0	0	0	0	0	0
C-I	T-45 Goshawk	0	0	0	0	0	0	1	0	0	0
C-I	Westwind II	676	566	539	565	543	445	480	326	260	240
TOTAL		**1,874**	**1,580**	**1,643**	**1,551**	**1,762**	**1,618**	**1,806**	**1,345**	**1,063**	**1,320**

ARC Code	Table Name	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
C-II	Beech Starship	19	1	12	21	9	0	0	0	0	0
C-II	Bombardier CRJ 100/200/700	2	2	0	0	0	0	2	4	0	2
C-II	Challenger 300/600/604	348	407	503	535	530	565	611	563	493	807
C-II	Embraer ERJ-135/140/145	12	4	8	14	16	12	14	26	89	94
C-II	Fairchild A-10	0	0	0	1	1	0	1	0	0	0
C-II	Gulfstream 100/150	6	10	4	20	20	8	10	8	4	1
C-II	Gulfstream 200/280	112	133	76	78	89	54	77	60	14	71
C-II	Gulfstream G100	35	22	19	44	23	50	88	152	170	137
C-II	Gulfstream G-III	49	61	49	31	8	8	0	10	0	2
C-II	Hawker 4000	0	0	6	0	3	3	6	5	34	15
C-II	Hawker 800	335	225	344	346	397	440	367	551	292	362
C-II	Learjet 70 Series	0	0	0	0	0	0	0	6	35	44
C-II	Lockheed Jetstar	1	0	0	0	0	0	0	0	0	0
TOTAL		**919**	**865**	**1,021**	**1,090**	**1,096**	**1,140**	**1,176**	**1,385**	**1,131**	**1,535**
C-III	Boeing 737 (200 thru 700 series)	0	1	0	0	1	0	4	0	0	0
C-III	De Havilland Dash 8 Q-400	0	0	4	0	1	0	4	0	0	0
C-III	P-3 Orion	1	0	0	0	0	0	0	0	0	0
TOTAL		**1**	**1**	**4**	**0**	**2**	**0**	**8**	**0**	**0**	**0**
C-IV	Boeing 757-200	0	0	0	1	0	0	0	0	0	0
C-IV	Boeing 767-200/300	0	0	0	0	1	0	0	0	0	0
C-IV	Boeing C-17	1	0	0	0	0	0	0	0	0	0
C-IV	C-130 Hercules	0	1	2	1	1	0	0	0	0	0
TOTAL		**1**	**1**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**0**
C-V	Airbus A350/360	4	5	1	0	0	0	0	0	0	0
TOTAL		**4**	**5**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
C-VI	C-5 Galaxy	0	0	0	0	0	0	0	1	0	0
TOTAL		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
D-I	F/A-18 Hornet	1	1	1	2	2	0	0	0	0	0
D-I	F-15 Eagle	0	3	2	0	1	0	0	0	0	0
D-I	Learjet 35/36	149	189	106	144	94	63	64	99	43	71
D-I	T-38 Talon	0	0	0	1	0	0	0	0	1	0
TOTAL		**150**	**193**	**109**	**147**	**97**	**63**	**64**	**99**	**44**	**71**
D-II	Gulfstream 450	89	86	64	61	32	20	58	34	34	29
TOTAL		**89**	**86**	**64**	**61**	**32**	**20**	**58**	**34**	**34**	**29**
D-III	Boeing 737 800/900	0	0	0	0	0	0	0	0	0	2
D-III	Gulfstream 500/600	31	28	30	60	60	29	24	24	12	29
TOTAL		**31**	**28**	**30**	**60**	**60**	**29**	**24**	**24**	**12**	**31**
E-I	F-16 Falcon/Viper	0	2	0	0	0	0	0	1	0	0
TOTAL		**0**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**

ARC CODE SUMMARY

ARC Code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
A-I	476	377	445	445	504	440	403	415	415	319
A-II	643	654	682	1,106	1,272	1,303	1,301	1,402	1,485	1,259
B-I	4,212	3,613	4,327	4,199	4,191	3,633	3,750	3,858	2,855	2,657
B-II	6,474	4,971	5,296	5,688	6,589	5,730	5,709	5,604	5,423	5,546
B-III	7	7	7	8	34	23	21	37	82	67
C-I	1,874	1,580	1,643	1,551	1,762	1,618	1,806	1,345	1,063	1,320
C-II	919	865	1,021	1,090	1,096	1,140	1,176	1,385	1,131	1,535
C-III	1	1	4	0	2	0	8	0	0	0
C-IV	1	1	2	2	2	0	0	0	0	0
C-V	4	5	1	0	0	0	0	0	0	0
C-VI	0	0	0	0	0	0	0	1	0	0
D-I	150	193	109	147	97	63	64	99	44	71
D-II	89	86	64	61	32	20	58	34	34	29
D-III	31	28	30	60	60	29	24	24	12	31
E-I	0	2	0	0	0	0	0	1	0	0
Total	**14,881**	**12,383**	**13,631**	**14,357**	**15,641**	**13,999**	**14,320**	**14,205**	**12,544**	**12,834**

APPROACH CATEGORY

AC	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
A	1,119	1,031	1,127	1,551	1,776	1,743	1,704	1,817	1,900	1,578
B	10,693	8,591	9,630	9,895	10,814	9,386	9,480	9,499	8,360	8,270
C	2,799	2,452	2,671	2,643	2,862	2,758	2,990	2,731	2,194	2,855
D	270	307	203	268	189	112	146	157	90	131
E	0	2	0	0	0	0	0	1	0	0
Total	**14,881**	**12,383**	**13,631**	**14,357**	**15,641**	**13,999**	**14,320**	**14,205**	**12,544**	**12,834**

DESIGN GROUP

DG	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
I	6,712	5,765	6,524	6,342	6,554	5,754	6,023	5,718	4,377	4,367
II	8,125	6,576	7,063	7,945	8,989	8,193	8,244	8,425	8,073	8,369
III	39	36	41	68	96	52	53	61	94	98
IV	1	1	2	2	2	0	0	0	0	0
V	4	5	1	0	0	0	0	0	0	0
VI	0	0	0	0	0	0	0	1	0	0
Total	**14,881**	**12,383**	**13,631**	**14,357**	**15,641**	**13,999**	**14,320**	**14,205**	**12,544**	**12,834**

Exhibit 2G
TFMSC TURBINE OPERATIONS

WILEY POST
AIRPORT

Appendix C
Airport Layout Plans

Appendix C
AIRPORT LAYOUT PLAN

As part of this master plan, the Federal Aviation Administration (FAA) requires the development of Airport Layout Plan (ALP) drawings detailing specific parts of the 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 of the airport. The ALP drawings will be reviewed by the FAA to be sure all applicable federal regulations are met. The FAA will use the ALP as the basis for justification for funding decisions.

It should be noted that FAA require that any changes to the airfield (i.e., runway and taxiway system, navigational aids, etc.) 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 upon 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 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.

2) 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.

3) 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.

4) The ALP can be a working tool for the airport sponsor, including its development and maintenance staff.

5) An approved ALP is necessary for the airport to receive financial assistance under the terms of the *Airport and Airway Improvement Act of 1982*, as amended, and to be able to impose and use Passenger Facility Charges. An airport must keep its ALP current and follow that plan because those are grant assurance requirements of the Airport Improvement Program (AIP) and previous airport development programs, including the 1970 *Airport Development Aid Program* (ADAP) and *Federal Aid Airports Program* (FAAP) of 1946, as amended.

The FAA requires that any planned changes to the airfield (i.e., runway and taxiway system, etc.) be represented on the drawings. However, the ALP drawing set is not intended to provide design engineering accuracy.

AIRPORT LAYOUT PLAN DRAWING SET

The ALP drawing set for the Airport Master Plan 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 Airport Master Plan.

AIRPORT LAYOUT PLAN DRAWING

An official ALP drawing has been developed for Wiley Post Airport, a draft of which is included in this appendix. The ALP drawing graphically presents the existing and future airport facilities and layout plan. The ALP drawing includes, but is not limited to, such elements as the physical airport features, wind data tabulation, location of airfield facilities (i.e., runways, taxiways, navigational aids), and landside development. Also presented on the ALP 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 subsequent planning and design efforts, and can be easily updated in the future to reflect new development and more detail concerning existing conditions as made available through design surveys.

TERMINAL AREA PLAN DRAWING

The Terminal Area Plan drawing presents a large-scale depiction of areas with significant terminal facility development. This drawing is an enlargement of a portion of the ALP. The drawing includes the landside facility areas as well as the supporting infrastructure, including access roads and parking facilities. The terminal area drawings include a listing of all airport buildings and identifies the aircraft apron areas.

FAR PART 77 AIRPORT AIRSPACE DRAWING

Federal Aviation Regulation (F.A.R.) Part 77, *Objects Affecting Navigable Airspace*, was established for use by local authorities to control the height of objects near airports. The FAR Part 77 Airport Airspace drawing included in this Airport Master Plan is a graphic depiction of this regulatory criterion. The FAR Part 77 Airport Airspace drawing is a tool to aid local authorities in determining if proposed development could present a hazard to aircraft using the airport. The FAR Part 77 Airport Airspace drawing can be a critical tool for the airport sponsor's use in reviewing proposed development near the airport.

The FAR Part 77 Airport 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 FAR Part 77 imaginary surfaces include the primary surface, approach surface, transitional surface, horizontal surface, and conical surface.

The airport sponsor should do all in their power to ensure development stays below the FAR Part 77 surfaces to protect the role of the airport. The drawing includes a table detailing the penetrations to any of the FAR Part 77 surfaces. A recommended action or disposition is also presented for each penetration. This drawing is based on the planned future condition of the Airport.

Penetrations of the FAR Part 77 surfaces indicate an obstruction. Once an obstruction is identified, the FAA determines if the obstruction is a hazard to air navigation. When an obstruction is determined to be a hazard, a variety of actions can be taken to mitigate the hazard. The table included on the drawing presents a recommended action or disposition; however, the FAA is responsible to make the final determination as to what course of action should be taken. Potential mitigating measures include removing the hazard, lowering the hazard, adding an obstruction light, increasing instrument approach visibility minimums, or displacing runway landing thresholds. The following discussion will describe those surfaces that make up the recommended FAR Part 77 surfaces.

Primary Surface: The Primary Surface is longitudinally centered on the runways and extends 200 feet beyond each runway end. The elevation of any point on the Primary Surface is the same as the elevation along the nearest associated point on the runway centerline. The Primary Surface for Runway 17L-35R is 1,000 feet wide as centered on the runway and 500 feet wide for Runway 17R-35L and Runway 13-31. Ultimately, the Runway 17R-35L primary surface will also be 1,000 feet wide once instrument approach minimums are improved to ¾-mile or ½-mile.

Approach Surface: An Approach Surface is also established for each runway end. The Approach Surface begins at the end of the Primary Surface, extends upward and outward, and is centered along an extended runway centerline. The dimensions of the Approach Surface leading to each runway is based upon the type of instrument approach available (instrument or visual) or planned.

Runway 17L and 35R are equipped with precision instrument landing systems (ILSs) and Runway 35L is ultimately planned to be equipped with a precision ILS; therefore, the Approach Surface extends a horizontal distance of 10,000 feet at a 50:1 slope with an additional 40,000 feet at a slope of 40:1. The outer width of the Approach Surface is 16,000 feet. With visibility minimums of not lower than ¾-mile, the Approach Surface to Runways 17R and 35L (existing) extend a horizontal distance of 10,000 feet at a 34:1 slope. The outer width of the Approach Surface is 3,500 feet. As a visual-only runway, the Approach Surfaces to Runways 13 and 31 have an outer width of 1,500 feet and extend a horizontal distance of 5,000 feet at a 20:1 slope.

Transitional Surface: Each runway has a Transitional Surface that begins at the outside edge of the Primary Surface at the same elevation as the runway. The Transitional Surface also connects with the Approach Surfaces of runways with a precision approach (existing 17L, 35R and ultimate 35L). The Transitional Surface rises at a slope of 7:1, up to a height 150 feet above the highest runway elevation. At that point, the Horizontal Surface begins where the Transitional Surface ends.

Horizontal Surface: The Horizontal Surface is established at 150 feet above the highest elevation of the runway surface. Having no slope, the Horizontal Surface connects the Transitional and Approach Surfaces to the Conical Surface at a distance of 10,000 feet from the end of the Primary Surfaces of each runway.

Conical Surface: The Conical Surface begins at the outer edge of the Horizontal Surface. The Conical Surface then continues for an additional 4,000 feet horizontally at a slope of 20:1. Therefore, at 4,000 feet from the Horizontal Surface, the elevation of the Conical Surface is 350 feet above the highest airport elevation.

INNER APPROACH SURFACE DRAWING

The Inner Approach Surface drawing provides greater detail of penetrations to the Approach Surface and the Threshold Siting Surface within a few thousand feet of the runway end. Any penetrations are documented in the obstruction table. The obstruction table includes a description of the object, its top elevation, the depth of penetration, and a recommended disposition to mitigate the penetration.

DEPARTURE SURFACE DRAWING

For primary runways supporting instrument operations, a separate drawing depicting the Departure Surface is required. The Departure Surface, when clear, allows pilots to follow standard departure procedures. The Departure Surface emanates from the departure end of the runway to a distance of

10,200 feet. The inner width is 1,000 feet and the outer width is 6,466 feet. The slope of the Departure Surface is 40:1.

Obstacles frequently penetrate the Departure Surface. Where object penetrations exist, the departure procedure can be adjusted by:

a) Non-standard climb rates, and/or
b) Non-standard (higher) departure minimums.

Therefore, it is important for the airport sponsor to identify and remove Departure Surface obstacles whenever possible in order to enhance takeoff operations at the airport. The airport sponsor should also prevent any new obstacles from developing.

AIRPORT LAND USE DRAWING

The objective of the Airport 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, which 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.

EXHIBIT A - AIRPORT PROPERTY MAP

The Airport Property Map provides a drawing depicting the airport property boundary, the various tracts of land that were acquired to develop the airport, the method of acquisition, and other information on the property under airport control that is 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.

U.S. Department
of Transportation
Federal Aviation Administration

Federal Aviation Administration
Southwest Region, Airports Division
Arkansas/Oklahoma District Office

FAA-ASW-630
10101 Hillwood Parkway
Fort Worth, Texas 76117

August 4, 2022

Mr. Jeff Mulder
Director, Department of Airports
Oklahoma City Airport Trust
7100 Terminal Drive, Box 937
Oklahoma City, OK 73159-0937
Jeff.Mulder@okc.gov

Federal Aviation Administration (FAA)
Conditional Approval for Wiley Post (PWA) Airport Layout Plan
Airport Improvement Program Grant Number 3-40-0073-024-2017

Dear Mr. Mulder:

The Wiley Post Airport Layout Plan (ALP) set updates, prepared by Coffman Associates, Inc., dated July 15, 2022 and bearing your signature, is conditionally approved and the updated Airport Master Plan is acceptable from a planning standpoint based on our review. A signed copy of the approved ALP is enclosed.

An aeronautical study (2022-ASW-5188-NRA) was conducted on the updated ALP. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground. An aeronautical determination and subsequent approval of an ALP does not relieve the airport sponsor from submitting OE/AAA studies for future construction or plans.

In making this determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal.

The FAA has only limited means to prevent the construction of structures near an airport. The airport sponsor has the primary responsibility to protect the airport environs through such means as local zoning ordinances, property acquisition, avigation easements, letters of agreement or other means. The appropriate local agencies are encouraged to adopt compatible land use and height restrictive zoning based on the updated plan.

Airport Layout Plan
The principal planning changes reflected on this updated ALP, not captured by the January, 25, 2010 FAA-approved ALP on file, include the following:

- Reflecting RDC C/D-III-2400 design standards as the existing/ultimate condition for primary Runway 17L-35R. Runway 17R-35L, the parallel runway, is planned to meet RDC B-II-5000 design standards in the existing condition and D-II-5000 standards in the ultimate condition. Runway 13-31, the crosswind runway, is planned to meet RDC B-I(S)-VIS design standards in both the existing and ultimate condition. Critical aircraft and aviation demand forecasts were approved by the FAA on January 7, 2021.

- Extending Runway 17L-35R to 7,700 feet. The extension would allow the runway to accommodate larger/heavier aircraft during hot weather conditions. The runway should also be strengthened to up to 170,000 pounds dual-wheel loading (DWL).
- Runway 17R-35L is planned to be extended to 6,000 feet long and 100 feet wide to better serve mid-sized business jets. The pavement should also be strengthened to 73,900 pounds DWL.
- An aligned taxiway on Runway 13-31 has been reclaimed as runway pavement resulting in a full length of 4,562'.
- Taxiway improvements to mitigate direct-access points, non-standard intersections, and excess taxiway pavement. New holding aprons are also reflected based on AC 150/5300-13B design.
- Taxiway designations are updated to reflect FAA Engineering Brief 89.
- New parallel taxiways on the east and west sides of Runway 17R-35L to improve aircraft circulation and to support future landside developments on the west side.
- Added existing and proposed oil/gas well sites.
- Addition of new apron pavement and hangars to reflect current and projected needs.
- Proposed avigation easements totaling 23.7 acres to establish control over RPZs.
- Redevelopment of the former Gulfstream hangars south of NW 50th Street for non-aeronautical uses.

Exhibit A

The principal changes reflected on this updated Exhibit A, not captured by the current FAA-approved version on file, include the following:

- Updates to conform with FAA's SOP 2.00 for FAA Review and Approval of ALPs and 3.00 for the Exhibit A Property Inventory Map. Exhibit A map updated to reflect properties acquired using federal funds. Tract 5-1 note added to reflect its Section 163 review and determination, completed on April 28, 2022.

This ALP approval is conditioned on acknowledgement that any development on airport property requiring Federal environmental approval must receive such written approval from FAA prior to commencement of the subject development. This ALP approval is also conditioned on acceptance of the plan under local land use laws. We encourage appropriate agencies to adopt land use and height restrictive zoning based on the plan.

Approval of the plan does not indicate that the United States will participate in the cost of any development proposed. AIP funding requires evidence of eligibility and justification at the time a funding request is ripe for consideration. When construction of any proposed structure or development indicated on the plan is undertaken, such construction requires normal 45-day advance notification to FAA for review in accordance with applicable Federal Aviation Regulations (i.e., Parts 77, 157, 152, etc.). More notice is generally beneficial to ensure that all statutory, regulatory, technical and operational issues can be addressed in a timely manner.

The FAA Reauthorization Act of 2018, section 163(d), has limited the FAA's review and approval authority for ALPs. The Act limits the FAA's authority to those portions of the ALP that:

- Materially impact the safe and efficient operation of aircraft at, to, or from the airport;

- Adversely affect the safety of people or property on the ground adjacent to the airport as a result of aircraft operations; or

- Adversely affect the value of prior Federal investments to a significant extent.

FAA's approval of this ALP is limited to existing facilities only (or those specific areas that FAA retains approval authority). The FAA has not made a determination on whether or not it retains review and approval authority for any proposed facilities depicted on the ALP associated with this letter. Under Title 49 U.S.C. § 47107(a)(16) (as revised per section 163(d) of Pub.L. 115-254), FAA will separately determine whether it retains approval authority for each individual proposed facility depicted on an ALP before construction occurs.

Although section 163(d) has limited the FAA's review and approval authority of proposed projects depicted on an ALP, airport sponsors must continue to maintain an up-to-date ALP in accordance with Federal law, 49 U.S.C. § 47107(a)(16).

Please attach this letter to the Airport Layout Plan and retain it in the airport. We wish you great success in your plans for the development of the airport.

Sincerely,

Glenn Boles
Glenn Boles (Aug 4, 2022 14:58 CDT)

Glenn A. Boles, Manager
Arkansas/Oklahoma Airports
District Office

cc: Nick Young, Airports Division Manager, Oklahoma Aeronautics Commission
Kristy Slater, General Aviation Manager, OKC Department of Airports
Eric Pfeifer, Principal, Coffman Associates, Inc.
Tim House, Program Manager, FAA Arkansas/Oklahoma District Office

AIRPORT LAYOUT PLAN

Prepared for the

WILEY POST AIRPORT

Oklahoma City, Oklahoma

INDEX OF DRAWINGS

1. TITLE SHEET
2. AIRPORT DATA SHEET
3. AIRPORT LAYOUT PLAN DRAWING
4. AIRPORT AIRSPACE DRAWING
5. AIRPORT AIRSPACE DRAWING RUNWAY 17L & 35R APPROACH
6. RUNWAY 17L APPROACH SURFACE PROFILE
7. RUNWAY 35R APPROACH SURFACE PROFILE
8. APPROACH SURFACE PROFILES
9. INNER PORTION OF RUNWAY 17L APPROACH SURFACE DRAWING
10. INNER PORTION OF RUNWAY 35R APPROACH SURFACE DRAWING
11. INNER PORTION OF RUNWAY 13 APPROACH SURFACE DRAWING
12. INNER PORTION OF RUNWAY 31 APPROACH SURFACE DRAWING
13. INNER PORTION OF RUNWAY 17R APPROACH SURFACE DRAWING
14. INNER PORTION OF RUNWAY 35L APPROACH SURFACE DRAWING
15. RUNWAY 17L-35R DEPARTURE SURFACE DRAWING
16. RUNWAY 17R-35L DEPARTURE SURFACE DRAWING
17. TERMINAL AREA DRAWING
18. AIRPORT LAND USE DRAWING
19. EXHIBIT "A" AIRPORT PROPERTY INVENTORY MAP

VICINITY MAP

COUNTY MAP

LOCATION MAP

FOR APPROVAL BY

Jeff Mulder
Jeff Mulder (Aug 4, 2022 15:26 CDT)
Aug 4, 2022
DATE

0 100 200 300
SCALE IN FEET

NO.	REVISIONS	DATE	BY	APPD.

WILEY POST AIRPORT

TITLE SHEET

Oklahoma City, Oklahoma

Eric S. Pfeifer
Larry O. Johnson
Mike W. Dmyterko

April 2022 — SHEET 1 OF 19

Coffman Associates
Airport Consultants

RUNWAY DATA TABLE

RUNWAY DATA TABLE	RUNWAY 17L-35R				RUNWAY 17R-35L						RUNWAY 13-31			
	EXISTING		ULTIMATE		EXISTING		FUTURE		ULTIMATE		EXISTING		ULTIMATE	
RUNWAY IDENTIFICATION	17L	35R	17L	35R	17R	35L	17R	35L	17R	35L	13	31	13	31
RUNWAY DESIGN CODE (RDC)	C-II-2400		C/D-II-2400		B-II-5000		B-II-2400		D-II-2400		B-I(S)-VIS		Same	
APPROACH REFERENCE CODE (APRC)	D/IV/2400		Same		D/IV/5000		B/II/2400 & D/V/2400		B/II/2400 & D/V/2400		B/I(S)/VIS		Same	
DEPARTURE REFERENCE CODE (DPRC)	D/V		Same		D/V		B/II & D/V		B/II & D/V		B/I(S), D/V		Same	
RUNWAY SURFACE MATERIAL	Concrete		Same		Asphalt/Concrete		Same		Same		Concrete		Same	
RUNWAY PAVEMENT STRENGTH WHEEL (IN THOUSAND LBS.) #1	35 (S), 50 (D), 90 (2D)		170 (D)		30 (S), 45 (D)		Same		Same		35 (S), 50 (D), 90 (2D)		170 (D)	
RUNWAY PAVEMENT STRENGTH PCN	N/A		Same		N/A		Same		N/A		N/A		N/A	
RUNWAY PAVEMENT SURFACE TREATMENT	Grooved		Same		Grooved		Same		Grooved		Grooved		Same	
RUNWAY EFFECTIVE GRADIENT	0.1%		Same		0.2%		Same		0.2%		0.0%		Same	
RUNWAY WIND COVERAGE (16 KNOTS/16 MPH)	99.82%		Same		99.82%		Same		Same		95.98%		Same	
RUNWAY DIMENSIONS (L X W)	7,199' x 150'		7,700' x 150'		5,002' x 75'		6,002' x 100'		6,002' x 100'		4,214' x 100'		4,582' x 100'	
RUNWAY DISPLACED THRESHOLD	None	350'	Same	Same	None	None	Same	Same	800'	None	None	None	None	None
Runway Safety Area Dimensions (width x length beyond end) - Design Std.	1000' x 500'	1000' x 500'	Same	Same	600' x 150'	600' x 150'	1,000' x 500'	1,000' x 500'	Same	Same	240' x 120'	240' x 120'	Same	Same
Runway Safety Area Dimensions (width x length beyond end) - Actual	1000' x 500'	840' x 500'	Same	Same	300' x 150'	600' x 150'	1,000' x 500'	1,000' x 500'	Same	Same	240' x 120'	240' x 120'	Same	Same
RUNWAY END COORDINATES (NAD83) LAT	N 35° 32' 35.81"	N 35° 31' 38.41"	N 35° 32' 44.30"	Same	N 35° 32' 35.80"	N 35° 31' 46.48"	Same	Same	Same	N 35° 31' 36.50"	N 35° 31' 56.98"	N 35° 31' 36.58"	Same	N 35° 31' 34.48"
RUNWAY END COORDINATES (NAD83) LONG	W 97° 38' 43.41"	W 97° 38' 40.78"	W 97° 38' 41.81"	Same	W 97° 38' 52.18"	W 97° 38' 37.10"	Same	Same	Same	W 97° 38' 37.38"	W 97° 39' 07.90"	W 97° 38' 31.82"	Same	W 97° 38' 28.87"
RUNWAY LIGHTING	HIRL		Same		MIRL		Same		Same		MIRL		Same	
RUNWAY PROTECTION ZONE DIMENSIONS	1000' x 2500' x 1750'	1000' x 1700' x 1510'	Same	Same	500' x 1000' x 700'	500' x 1000' x 700'	Same	1000' x 2500' x 1750'	1000' x 1700' x 1510'	1000' x 2500' x 1750'	250' x 1000' x 450'	250' x 1000' x 450'	Same	Same
RUNWAY MARKINGS	Precision	Precision	Same	Same	Nonprecision	Nonprecision	Same	Precision	Same	Precision	Nonprecision	Nonprecision	Basic/Visual	Basic/Visual
14 CFR PART 77 APPROACH CATEGORY	50:1/40:1	50:1/40:1	Same	Same	34:1	34:1	Same	50:1/40:1	Same	50:1/40:1	20:1	20:1	Same	Same
14 CFR PART 77 APPROACH TYPE	PIR	PIR	Same	Same	NP-C	NP-C	Same	PIR	NP-D	PIR	V	V	Same	Same
VISIBILITY MINIMUMS	1/2 mile	1/2 mile	Same	Same	1 mile	1 mile	Same	1/2 mile	3/4 mile	1/2 mile	Visual	Visual	Same	Same
TYPE OF AERO NAUTICAL SURVEY REQUIRED FOR APPROACH	VGS	VGS	Same	Same	NVGS	NVGS	VGS	VGS	VGS	VGS	NVGS	NVGS	Same	Same
DEPARTURE SURFACE (YES/NO)	Yes	Yes	Same	Same	Yes	Yes	Same	Same	Same	Same	No	No	Same	Same
OBJECT FREE AREA (Standard Beyond Runway End)	1000' x 800'	1,000' x 800'	Same	Same	800' x 500'	800' x 500'	600' x 800'	800' x 800'	Same	1,000' x 800'	240' x 250'	240' x 250'	Same	Same
OBJECT FREE AREA (Actual Lx W)	1000' x 800'	840' x 800'	Same	Same	800' x 500'	800' x 500'	600' x 800'	800' x 800'	Same	1,000' x 800'	240' x 250'	240' x 250'	Same	Same
OBSTACLE FREE ZONE (Standard Beyond Runway End)	200' x 400'	200' x 400'	Same	Same	200' x 400'	200' x 400'	Same	Same	Same	Same	200' x 250'	200' x 250'	Same	Same
OBSTACLE FREE ZONE (Actual L x W)	200' x 400'	200' x 400'	Same	Same	200' x 400'	200' x 400'	Same	Same	Same	Same	200' x 250'	200' x 250'	Same	Same
OBSTACLE CLEARANCE SURFACE (EB 99, updated 2018)	Rw Type 5	Rw Type 5	Same	Same	Rw Type 4	Rw Type 4	Same	Rw Type 5	Rw Type 4	Rw Type 5	Rw Type 4	Rw Type 4	Same	Same
INSTRUMENT APPROACH PROCEDURES	ILS or LOC	ILS or LOC	Same	Same	N/A	N/A	Same	Same	Same	Same	N/A	N/A	Same	Same
	RNAV GPS	RNAV GPS	Same	Same	RNAV GPS	RNAV GPS	Same	Same	RNAV GPS	RNAV GPS	N/A	N/A	Same	Same
	VOR	VOR	Same	Same	VOR-A	VOR-A	Same	Same	VOR-A	VOR-A	Circling Approach	Circling Approach	Same	Same
RUNWAY VISUAL NAVIGATIONAL AIDS	MALSR	MALSR	Same	Same	None	None	Same	Same	None	MALSR	N/A	N/A	Same	Same
	PAPI-4	PAPI-4	Same	Same	PAPI-2	PAPI-4	Same	Same	Same	PAPI-4	N/A	N/A	PAPI-2	PAPI-2
					REIL	REIL	Same	Same	Same	None	None	None	REIL	REIL
TOUCHDOWN ZONE ELEVATION (TDZE)	1280.5' MSL	1289.4' MSL	1291.0' MSL	Same	1288.7' MSL	1276.5' MSL	Same	Same	1276.0' MSL	1283.0' MSL	1288.1' MSL	1296.8' MSL	Same	1298.1' MSL
TAXIWAY and TAXILANE WIDTH	50'/60'		75'		35'		Same		Same		50'		Same	
TAXIWAY and TAXILANE SAFETY AREA DIMENSIONS	79'		118'		79'		Same		Same		79'		Same	
TAXIWAY and TAXILANE OBJECT FREE AREA WIDTH	131' / 115'		186' / 160'		131' / 115'		Same		Same		131' / 115'		Same	
TAXIWAY/TAXILANE CENTERLINE TO FIXED OR MOVABLE OBJECT	65.5' / 57.5'		93' / 81'		65.5' / 57.5'		Same		Same		65.5' / 57.5'		Same	
TAXIWAY/TAXILANE LIGHTING	MITL		Same		MITL		Same		Same		MITL		Same	
VERTICAL DATUM	NAVD 88		Same		NAVD 88		Same		Same		NAVD 88		Same	
HORIZONTAL DATUM	NAD 83		Same		NAD 83		Same		Same		NAD 83		Same	
TAXIWAY EDGE SAFETY MARGIN	10'		Same		10'		Same		Same		10'		Same	
TAXIWAY HOLDING MARKING/HOLD SIGN	250'		262'		200'		250'		250'		125'		Same	

1. PAVEMENT STRENGTHS ARE EXPRESSED IN SINGLE (S), DUAL (D), DUAL TANDEM (2D) WHEEL LOAD CAPACITIES.

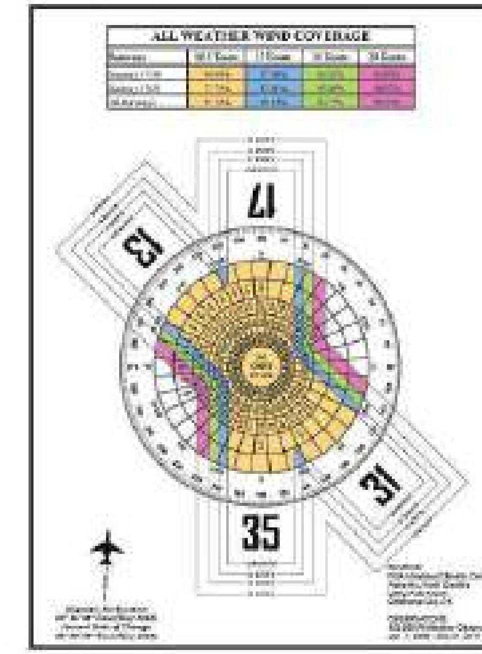
RUNWAY DECLARED DISTANCE	EXISTING		ULTIMATE		EXISTING		ULTIMATE		EXISTING		ULTIMATE	
	17L	35R	17L	35R	17R	35L	17R	35L	13	31	13	31
TAKE OFF RUN AVAILABLE (TORA)	7,199'	7,199'	7,700'	7,700'	5,002'	5,002'	6,002'	6,002'	4,214'	4,214'	4,582'	4,582'
TAKEOFF DISTANCE AVAILABLE (TODA)	7,199'	7,199'	7,700'	7,700'	5,002'	5,002'	6,002'	6,002'	4,214'	4,214'	4,582'	4,582'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	6,844'	7,199'	7,345'	7,700'	5,002'	5,002'	6,002'	5,002'	4,214'	4,214'	4,582'	4,582'
LANDING DISTANCE AVAILABLE (LDA)	6,844'	6,844'	7,345'	7,345'	5,002'	5,002'	5,402'	5,002'	4,214'	4,214'	4,582'	4,582'

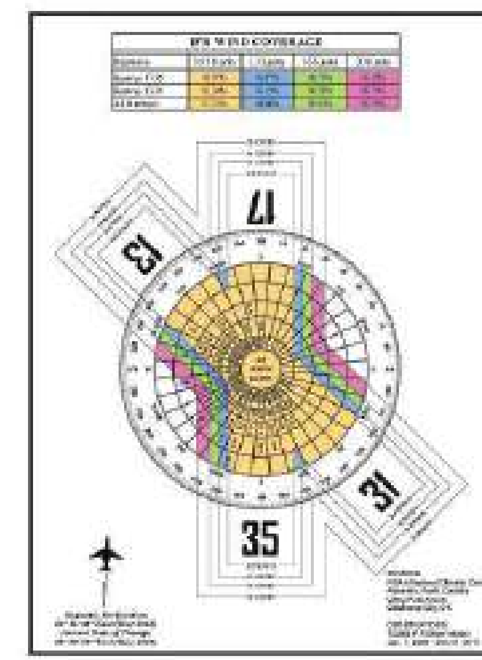
MODIFICATIONS TO STANDARDS APPROVAL TABLE			
APPROVAL DATE	AIRSPACE CASE NUMBER	STANDARD MODIFIED	DESCRIPTION
NONE			

OBSTACLE FREE ZONE (OFZ) OBJECT PENETRATIONS		
OBJECT	PENETRATION	DISPOSITION
None	-	-

AIRPORT NAVAID (Owned by FAA)
None

AIRPORT DATA		
OWNER: City of Oklahoma City	CITY: Oklahoma City	COUNTY: Oklahoma, OK
Wiley Post Airport (PWA)	EXISTING	ULTIMATE
AIRPORT REFERENCE CODE (ARC)	C-II	D-II
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH	93.2 (JUL)	Same
AIRPORT ELEVATION (NAVD 88)	1299.0' MSL	Same
AIRPORT NAVIGATIONAL AIDS	ILS OR LOC RWY 17L, 35R	Same
	RNAV (GPS) 17L, 35R, 17R, 35L	Same
	MALSR, HIRL, MIRL, PAPI, REIL	Same
	VOR/DME 17L-35R	Same
	ASR, VOR-A	Same
	Rotating Beacon	Same
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude 35° 32' 2.98" N	Latitude 35° 32' 2.38" N
	Longitude 97° 38' 45.59" W	Longitude 97° 38' 45.17" W
MISCELLANEOUS FACILITIES	MITL	Same
	ASOS	Same
	Lighted Windcone	Same
CRITICAL DESIGN AIRCRAFT	C/II/B1	D/II/2
CRITICAL DESIGN AIRCRAFT TYPE	Bombardier Challenger 600	Gulfstream G550
WINGSPAN OF DESIGN AIRCRAFT (FEET)	64.3'	93.5'
APPROACH SPEED OF DESIGN AIRCRAFT (KNOTS)	125 knots	145 knots
UNDERCARRIAGE WIDTH OF DESIGN AIRCRAFT (FEET)	MGW 13'	MGW 15.9'
MAGNETIC DECLINATION	3° 41' E (2019-06-18)	Same
SOURCE: https://www.ngdc.noaa.gov/geomag-web/	Annual rate of changing 0° 6' W	Same
NPIAS CODE	National Reliever	Same
STATE SYSTEM PLAN ROLE	Reliever Airport	Same





TRUE NORTH

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

0 100 200 300
PLOT SCALE 1" = 100'

GENERAL NOTES:

1. Depiction of features and objects, including related elevations and clearances, within the Federal Aviation Regulations (FAR) Part 77 Approach Surface are depicted on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS.
2. Details concerning terminal improvements are depicted on the TERMINAL AREA DRAWINGS.
3. Vertical Datum NAVD 88 and Horizontal Datum NAD 83.

NO.	REVISIONS	DATE	BY	APP'D.
	-	—	—	—
	-	—	—	—

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WILEY POST AIRPORT

AIRPORT DATA DHEET

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022 SHEET 2 OF 19

Coffman Associates
Airport Consultants
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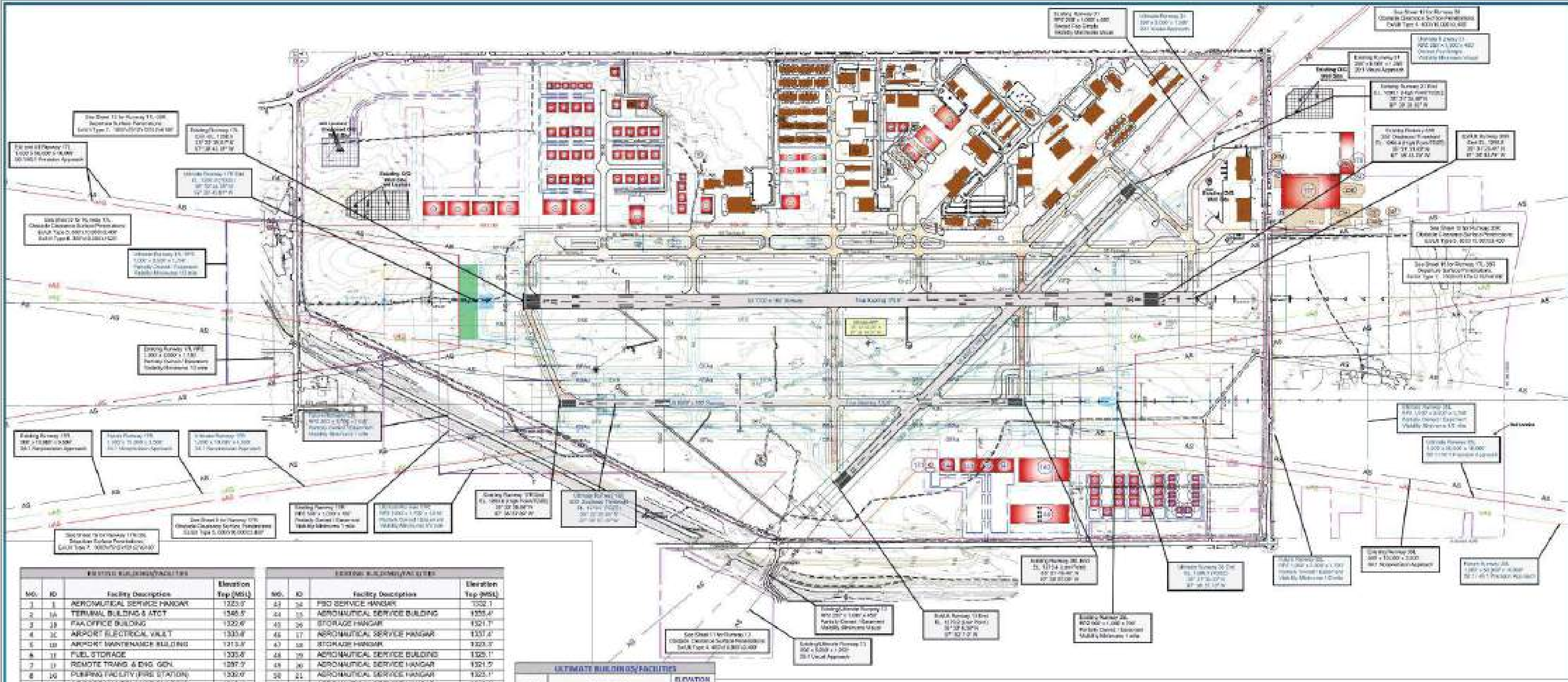


EXISTING BUILDINGS/FACILITIES			
NO.	ID	Facility Description	Elevation Top (MSL)
1	1	AERONAUTICAL SERVICE HANGAR	1323.0'
2	1A	TERMINAL BUILDING & ATCT	1346.5'
3	1B	FAA OFFICE BUILDING	1322.6'
4	1C	AIRPORT ELECTRICAL VAULT	1303.6'
5	1D	AIRPORT MAINTENANCE BUILDING	1313.5'
6	1E	FUEL STORAGE	1335.6'
7	1F	REMOTE TRANS. & ENG. GEN.	1287.5'
8	1G	PUMPING FACILITY (FIRE STATION)	1302.0'
9	1H	AIRPORT MAINTENANCE BUILDING	1313.4'
10	1I	SHAMROCK TRAINING FACILITY	1325.5'
11	1J	C.E. PAGE AVIATION BUILDING	1313.8'
12	1L	BUILDING	
13	2	FBO SERVICE HANGAR	1336.9'
14	2A	T-HANGAR	1315.6'
15	2C	T-HANGAR	1316.2'
16	2D	T-HANGAR	1319.6'
17	2E	T-HANGAR	1318.2'
18	2F	T-HANGAR	1328.9'
19	3	AERONAUTICAL SERVICE HANGAR	1331.3'
20	3B	T-HANGAR	1312.6'
21	3C	AERONAUTICAL SERVICE HANGAR	1320.3'
22	3D	T-HANGAR	1324.4'
23	4	AERONAUTICAL SERVICE HANGAR	1328.6'
24	4B	T-HANGAR	1311.7'
25	4C	T-HANGAR	1311.4'
26	4D	T-HANGAR	1317.1'
27	4E	T-HANGAR	1316.1'
28	5	AERONAUTICAL SERVICE HANGAR	1323.2'
29	5B	T-HANGAR (To Be Removed)	1312.0'
30	5C	T-HANGAR (To Be Removed)	1311.9'
31	5D	T-HANGAR (To Be Removed)	1311.8'
32	5E	T-HANGAR (To Be Removed)	1310.5'
33	6	AERONAUTICAL SERVICE HANGAR	1331.8'
34	6A	HANGAR	
35	6B	T-HANGAR	1311.8'
36	6C	T-HANGAR	1308.5'
37	8	FBO SERVICE HANGAR	1325.7'
38	8A	PAINT HANGAR	1325.2'
39	9	FBO SERVICE HANGAR	1323.7'
40	10	AERONAUTICAL SERVICE HANGAR	1336.0'
41	11	AERONAUTICAL SERVICE HANGAR	1341.5'
42	12	AERONAUTICAL SERVICE HANGAR	1331.3'

EXISTING BUILDINGS/FACILITIES			
NO.	ID	Facility Description	Elevation Top (MSL)
43	14	FBO SERVICE HANGAR	1332.1
44	15	AERONAUTICAL SERVICE BUILDING	1335.4'
45	16	STORAGE HANGAR	1321.7'
46	17	AERONAUTICAL SERVICE HANGAR	1337.4'
47	18	STORAGE HANGAR	1323.3'
48	19	AERONAUTICAL SERVICE BUILDING	1325.1'
49	20	AERONAUTICAL SERVICE HANGAR	1321.5'
50	21	AERONAUTICAL SERVICE HANGAR	1323.1'
51	21A	AERONAUTICAL SERVICE HANGAR	1340.9'
52	22	AERONAUTICAL SERVICE HANGAR	1336.5'
53	23	AERONAUTICAL SERVICE HANGAR	1336.2'
54	24	PWA HANGAR	1316.7'
55	24A	PWA HANGAR	1315.7'
56	24B	PWA HANGAR	1316.0'
57	24C	PWA HANGAR	1317.7'
58	24D	PWA HANGAR	1315.6'
59	24E	PWA HANGAR	1314.6'
60	24F	PWA HANGAR	1315.3'
61	24G	PWA HANGAR	1314.9'
62	24H	PWA HANGAR	1314.9'
63	24I	PWA HANGAR	1316.1'
64	24K	PWA HANGAR	1316.7'
65	24L	HANGAR	
66	24M	HANGAR	
67	24N	HANGAR	
68	24P	HANGAR	
69	24Q	HANGAR	
70	24R	HANGAR	
71	24S	HANGAR	
72	25	AERONAUTICAL SERVICE HANGAR (TBR)	1346.8'
73	25A	AERONAUTICAL SERVICE BUILDING	1332.6'
74	25B	PAINT HANGAR (TBR)	1327.5'
75	25C	AERONAUTICAL SERVICE BUILDING	1316.1'
76	25D	AERONAUTICAL SERVICE BUILDING	1312.9'
77	25E	AERONAUTICAL SERVICE BUILDING	1310.1'
78	25F	AERONAUTICAL SERVICE BUILDING	1316.0'
79	25G	AERONAUTICAL SERVICE BUILDING	1307.4'
80	25H	WATER TANK (TBR)	1325.3'
81	25I	AERONAUTICAL SERVICE BUILDING	1322.5'
82	25M	AERONAUTICAL SERVICE BUILDING	1324.8'
83	26	HANGAR	
84	27	FUEL STORAGE	

ULTIMATE BUILDINGS/FACILITIES		
NO.	DESCRIPTION	ELEVATION AGL (MSL)
86	T-HANGAR (10 units)	22'
87	T-HANGAR (8 units)	22'
88	T-HANGAR (10 units)	22'
89	T-HANGAR (8 units)	22'
90	CONVENTIONAL HANGAR (160 x 160)	35'
91	CONVENTIONAL HANGAR (275 x 137)	35'
92	CONVENTIONAL HANGAR (70' x 70')	35'
93-95	CONVENTIONAL HANGAR (160 x 160)	35'
96	CONVENTIONAL HANGAR (250 x 160)	35'
97	CONVENTIONAL HANGAR (250 x 160)	35'
98	CONVENTIONAL HANGAR (250 x 160)	35'
99-129	CONVENTIONAL HANGAR (100 x 100)	35'
130-135	CONVENTIONAL HANGAR (70' x 70')	35'
136	CONVENTIONAL HANGAR (200 x 200)	35'
137	CONVENTIONAL HANGAR (200 x 250)	35'
138	CONVENTIONAL HANGAR (200 x 250)	35'
139	CONVENTIONAL HANGAR (200 x 250)	35'
140	CONVENTIONAL HANGAR (220 x 250)	35'
141	CONVENTIONAL HANGAR (160 x 250)	35'
142	CONVENTIONAL HANGAR (160 x 160)	35'
143	CONVENTIONAL HANGAR (200 x 250)	35'
144	CONVENTIONAL HANGAR (180 x 120)	35'
145	CONVENTIONAL HANGAR (300 x 200)	35'
146-150	CONVENTIONAL HANGAR (100 x 100)	35'
151-165	CONVENTIONAL HANGAR (70' x 70')	35'
170	ATCT TOWER (Location #1)	35'
171	ATCT TOWER (Location #2)	35'
172	CONVENTIONAL HANGAR (200 x 160)	35'
173	CONVENTIONAL HANGAR (250 x 160)	35'
174	CONVENTIONAL HANGAR (200 x 200)	35'
175	CONVENTIONAL HANGAR (100 x 100)	35'
176	CONVENTIONAL HANGAR (180 x 120)	35'
177	CONVENTIONAL HANGAR (600 x 270)	35'
178	CONVENTIONAL HANGAR (445 x 200)	35'

LEGEND

PAGS/PAWS			
NAME	TYPE	LATITUDE	LONGITUDE
PWA A	3GC	35° 31' 59.250" N	97° 38' 49.531" W
PWA B	3GC	35° 32' 09.903" N	97° 38' 49.621" W
PWA C	3AC	35° 31' 31.910" N	97° 38' 46.565" W

SIGNATURES

FEDERAL AVIATION ADMINISTRATION
Southwest Region

Glenn Boles
Glenn Boles (Aug 4, 2022 14:56 CDT)

SPONSOR APPROVAL

Jeff Mulder
Jeff Mulder (Aug 4, 2022 15:26 CDT)

Wiley Post Airport

SCALE IN FEET

NO.	REVISIONS	DATE	BY	APPD.

WILEY POST AIRPORT

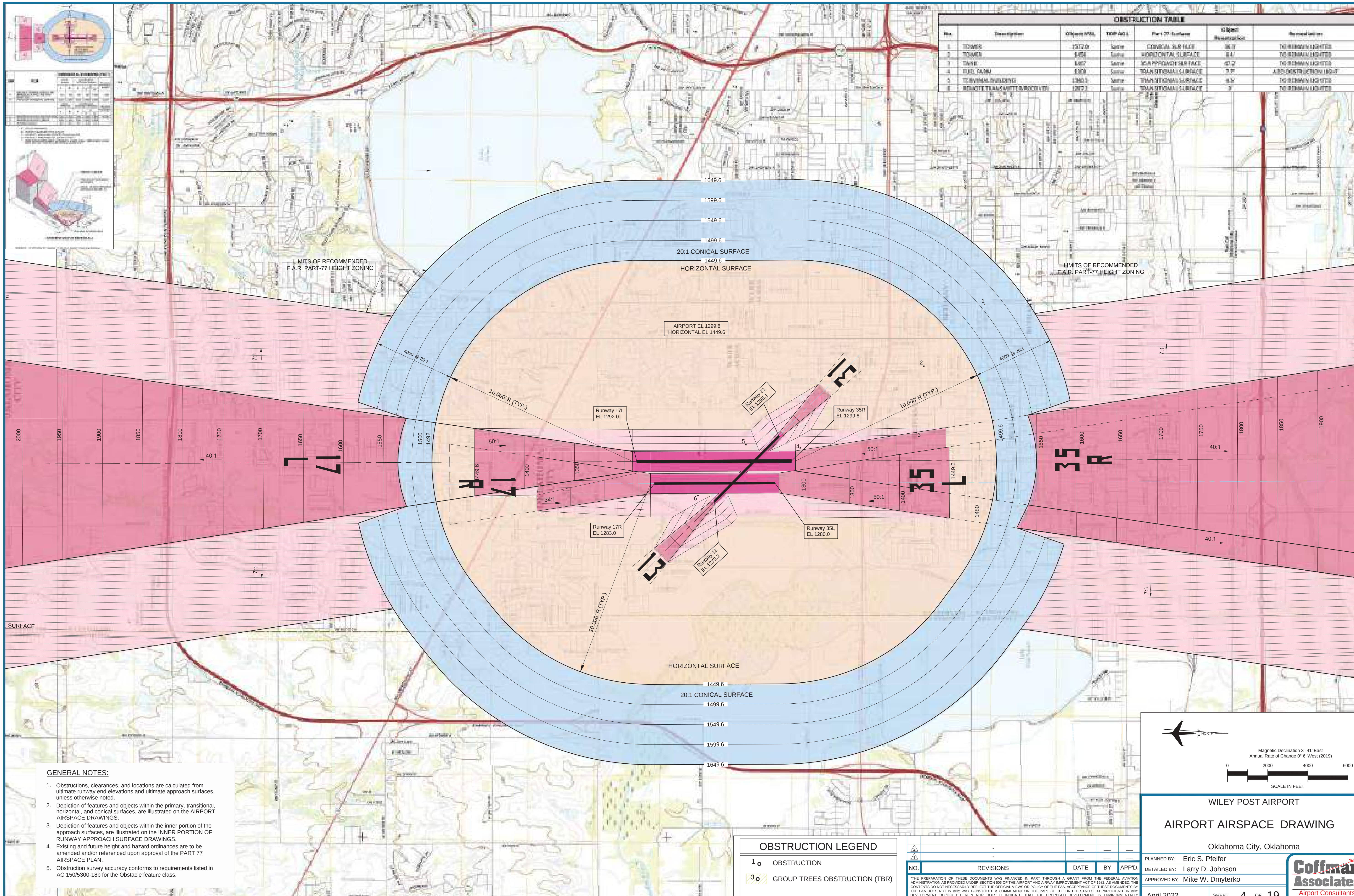
AIRPORT LAYOUT PLAN DRAWING

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry O. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022 SHEET 3 OF 19

Coffman Associates
Airport Consultants



OBSTRUCTION TABLE

No.	Description	Object MSL	TOP AGL	Part 77 Surface	Object Penetration	Remediation
1	TOWER	1572.0	Same	CONICAL SURFACE	36.3'	TO REMAIN LIGHTED
2	TOWER	1458	Same	HORIZONTAL SURFACE	8.4'	TO REMAIN LIGHTED
3	TANK	1467	Same	35R APPROACH SURFACE	67.2'	TO REMAIN LIGHTED
4	FUEL FARM	1308	Same	TRANSITIONAL SURFACE	7.7'	ADD OBSTRUCTION LIGHT
5	TERMINAL BUILDING	1340.3	Same	TRANSITIONAL SURFACE	4.3'	TO REMAIN LIGHTED
6	REMOTE TRANSMITTER/RECEIVER	1287.1	Same	TRANSITIONAL SURFACE	9'	TO REMAIN LIGHTED

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 inner portion of the approach surfaces, are illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS.
4. Existing and future height and hazard ordinances are to be amended and/or referenced upon approval of the PART 77 AIRSPACE PLAN.
5. Obstruction survey accuracy conforms to requirements listed in AC 150/5300-18b for the Obstacle feature class.

OBSTRUCTION LEGEND

1 ○ OBSTRUCTION

3 ○ GROUP TREES OBSTRUCTION (TBR)

NO.	REVISIONS	DATE	BY	APP'D.
2	-			
1	-			

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WILEY POST AIRPORT

AIRPORT AIRSPACE DRAWING

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

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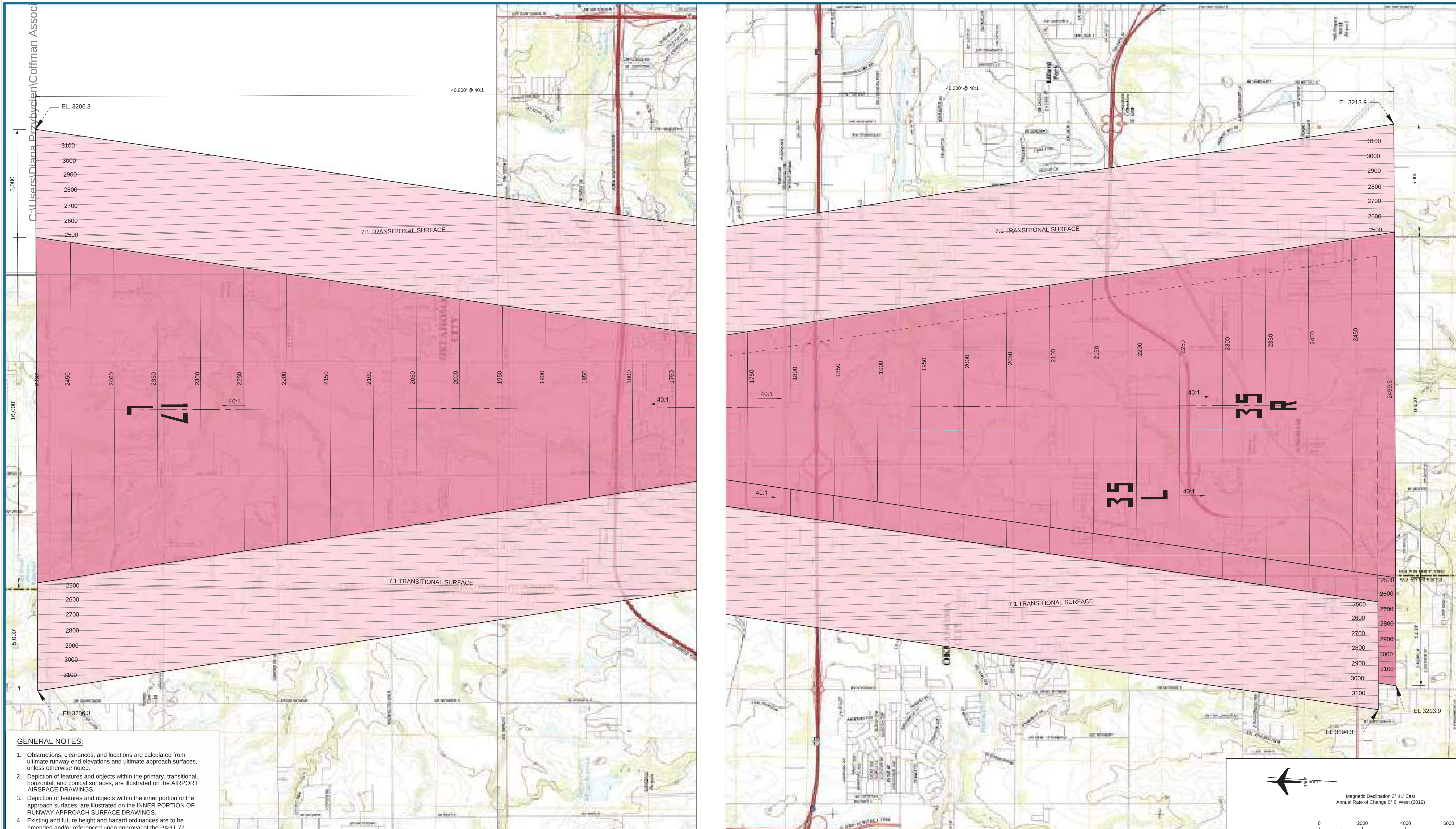

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4. Existing and future height and hazard ordinances are to be amended and/or referenced upon approval of the PART 77 AIRSPACE PLAN.
5. Obstruction survey accuracy conforms to requirements listed in AC 150/5300-18b for the Obstacle feature class.

OBSTRUCTION TABLE

No.	Description	Object MSL	TOP AGL	Part 77 Surface	Object Penetration	Resolution
	None					
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

NO.	REVISIONS	DATE	BY	APP'D.
2	-	—	—	—
1	-	—	—	—

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WILEY POST AIRPORT

AIRPORT AIRSPACE DRAWING RUNWAY OUTER APPROACH

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022

SHEET 5 OF 19

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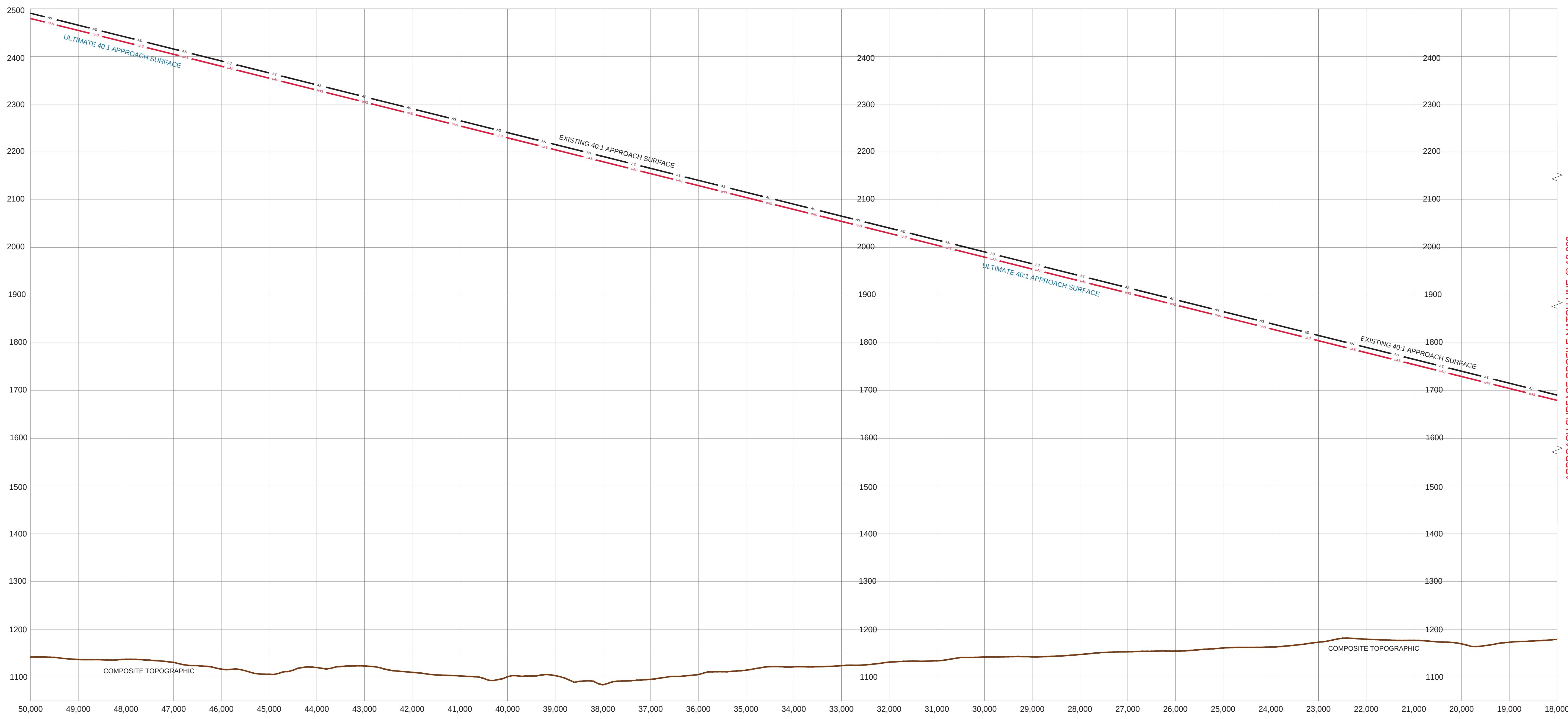
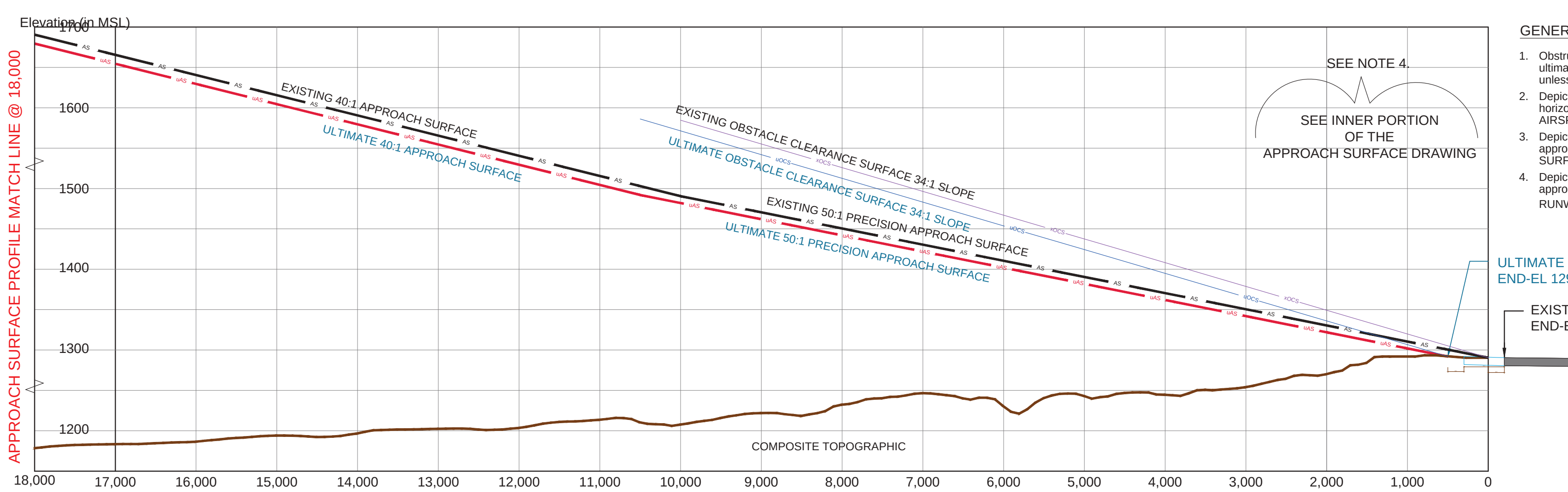


Runway 17L Approach Surfaces Profile



Runway 17L Approach Surfaces Profile

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 RUNWAY 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 TABLE

No.	Object Name	Elevation TOP MSL	Existing 50:1 Approach	Existing 34:1 OCS	Ultimate 50:1 Approach	Ultimate 34:1 OCS	Remediation
-	NONE	-	-	-	-	-	-

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

TRUE NORTH

0 1000 2000 3000
HORIZONTAL SCALE IN FEET

0 100 200 300
VERTICAL SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
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1	-	__	__	__

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WILEY POST AIRPORT

RUNWAY 17L APPROACH SURFACE PROFILE

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022 SHEET 6 OF 19

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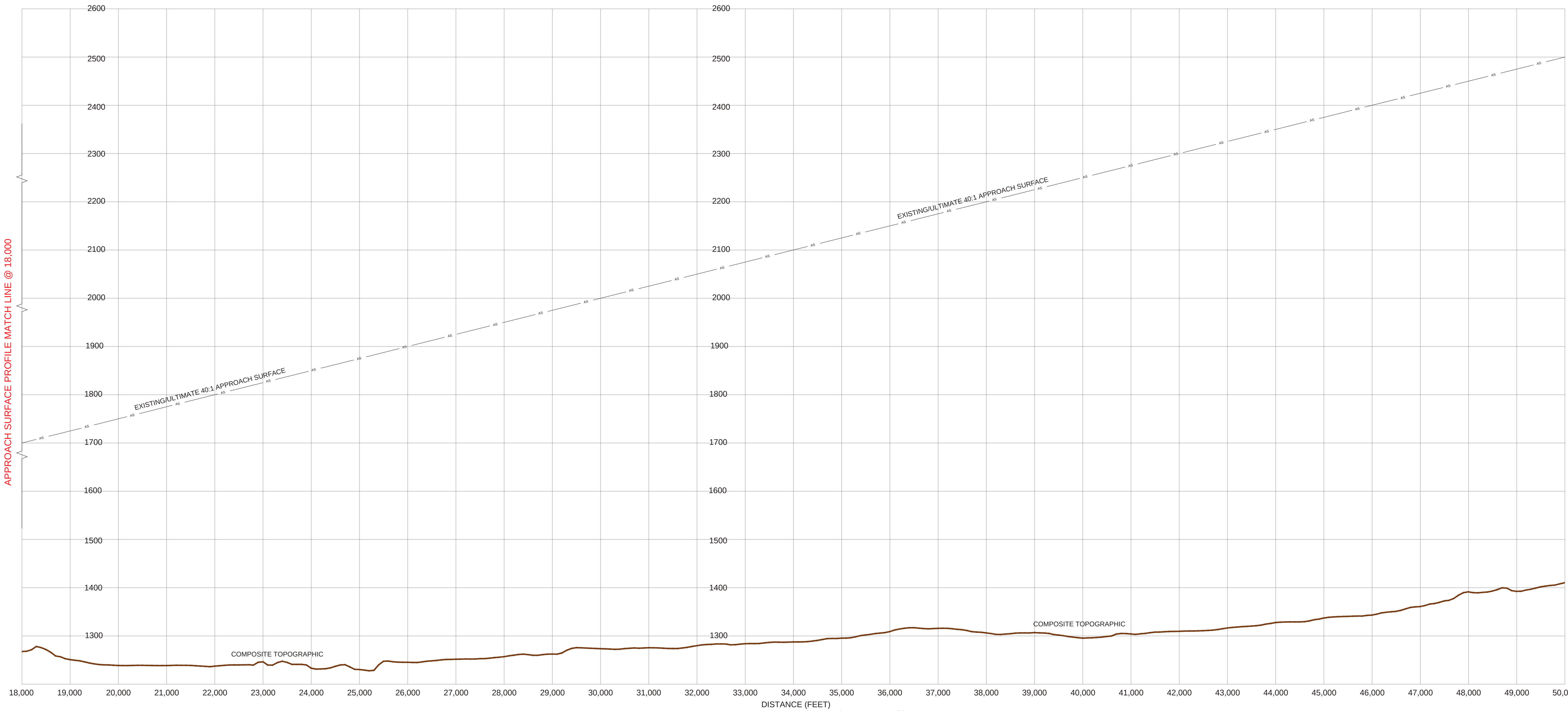
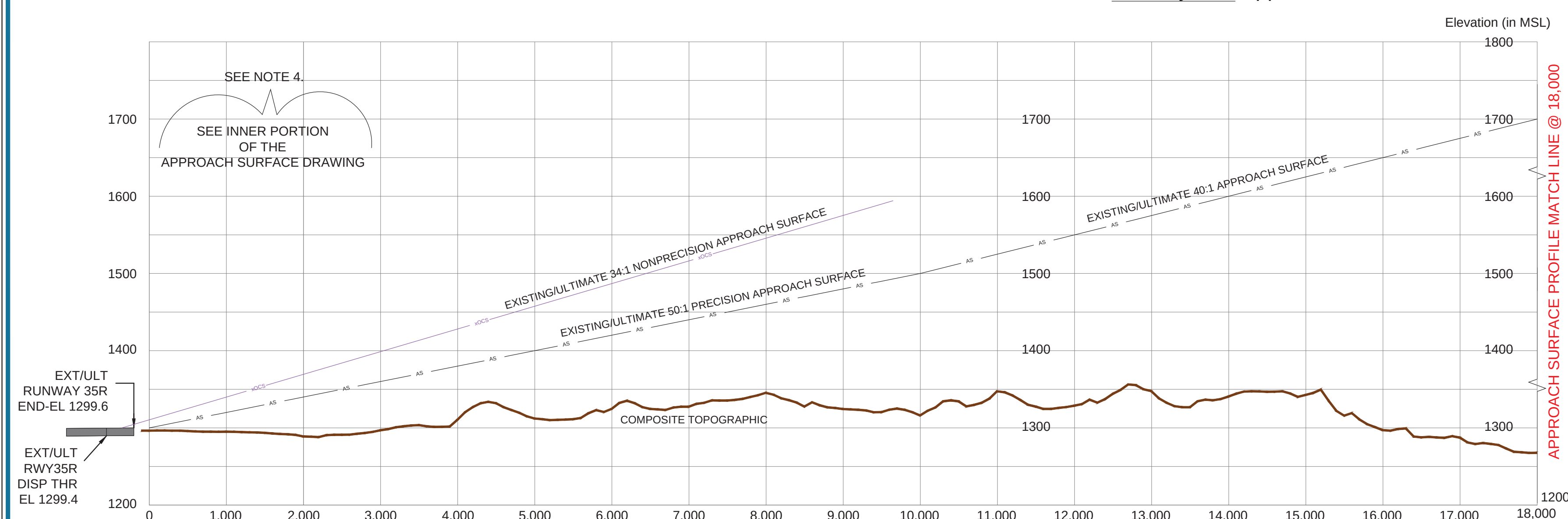


Runway 35R Approach Surfaces Profile



Runway 35R Approach Surfaces Profile

OBSTRUCTION TABLE							
No.	Object Name	Elevation TOP MSL	Existing 50:1 Approach	Existing 40:1 OCS	Ultimate 50:1 Approach	Ultimate 40:1 OCS	Remediation
	NONE	-	-	-	-	-	-

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 RUNWAY 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.

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

TRUE NORTH

0 1000 2000 3000
HORIZONTAL SCALE IN FEET

0 100 200 300
VERTICAL SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
2	-	—	—	—
1	-	—	—	—

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WILEY POST AIRPORT

RUNWAY 35R APPROACH SURFACE PROFILE

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022

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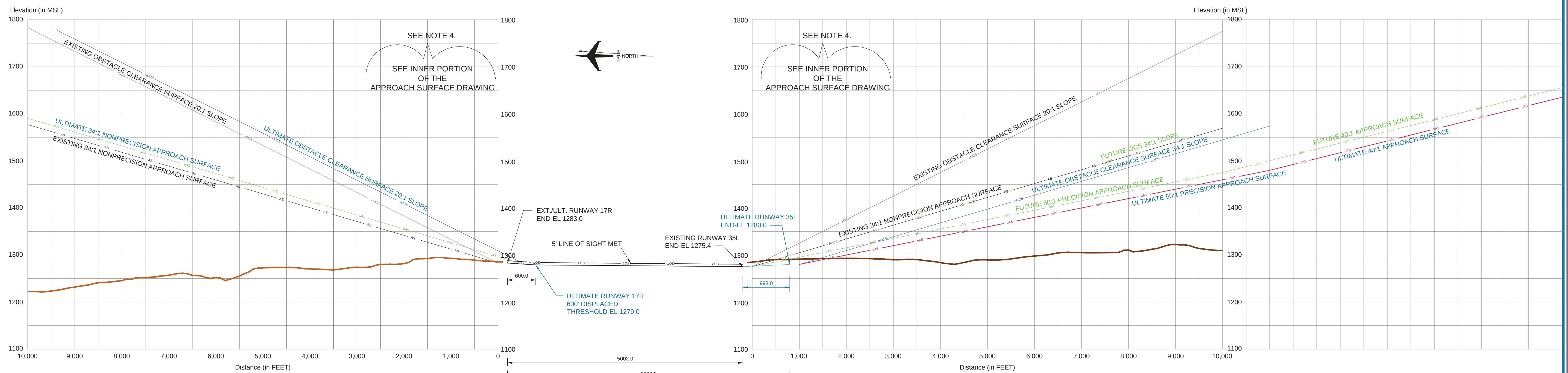


Runway 17R Approach Surfaces Profile

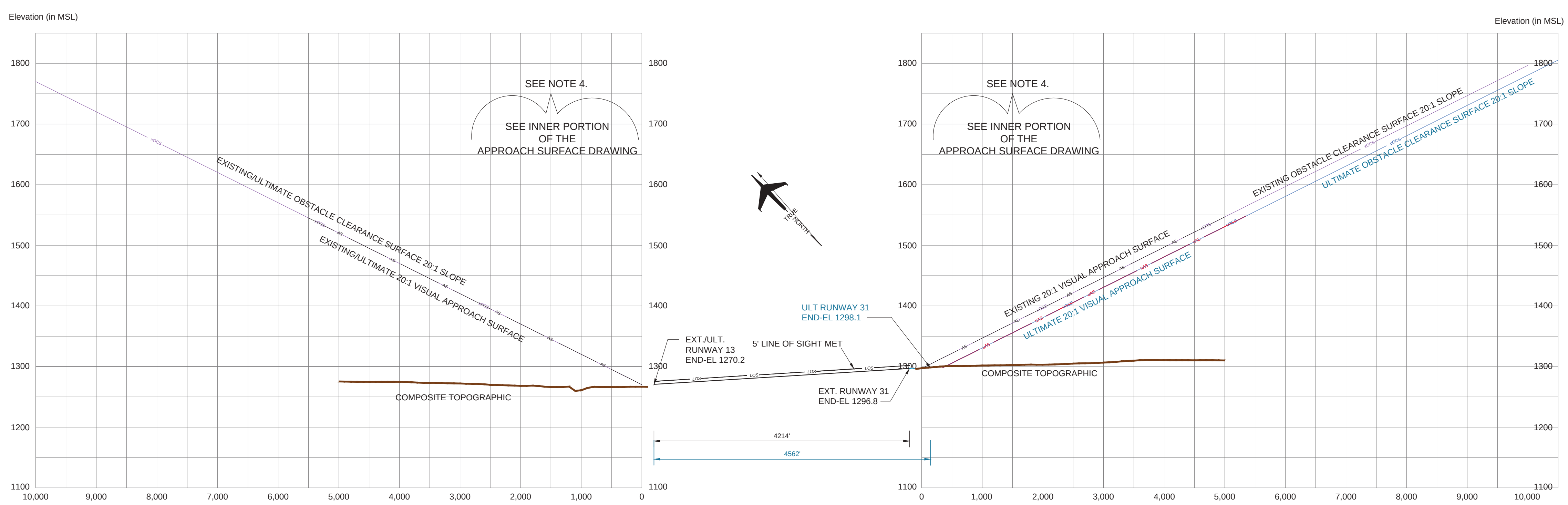
Runway 35L Approach Surfaces Profile

OUTER PORTION OF RUNWAY 17R OBSTRUCTION TABLE							
No.	Object Name	Elevation TOP MSL	Existing 34:1 Approach	Existing 20:1 OCS	Ultimate 34:1 Approach	Ultimate 20:1 OCS	Remediation
-	None	-	-	-	-	-	-

OUTER PORTION OF RUNWAY 35L OBSTRUCTION TABLE							
No.	Object Name	Elevation TOP MSL	Existing 34:1 Approach	Existing 20:1 OCS	Ultimate 50:1 Approach	Ultimate 34:1 OCS	Remediation
-	None	-	-	-	-	-	-

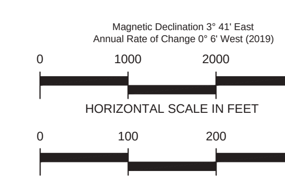
GENERAL NOTES:

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 RUNWAY 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.



Runway 13 Approach Surfaces Profile

Runway 31 Approach Surfaces Profile



OUTER PORTION OF RUNWAY 13 OBSTRUCTION TABLE							
No.	Object Name	Elevation TOP MSL	Existing 20:1 Approach	Existing 20:1 OCS	Ultimate 20:1 Approach	Ultimate 20:1 OCS	Remediation
-	None	-	-	-	-	-	-

OUTER PORTION OF RUNWAY 31 OBSTRUCTION TABLE							
No.	Object Name	Elevation TOP MSL	Existing 20:1 Approach	Existing 20:1 OCS	Ultimate 20:1 Approach	Ultimate 20:1 OCS	Remediation
-	None	-	-	-	-	-	-

NO.	REVISIONS	DATE	BY	APP'D.
2	-			
1	-			

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WILEY POST AIRPORT

APPROACH SURFACE PROFILES

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmytyerko

April 2022 SHEET 8 OF 19

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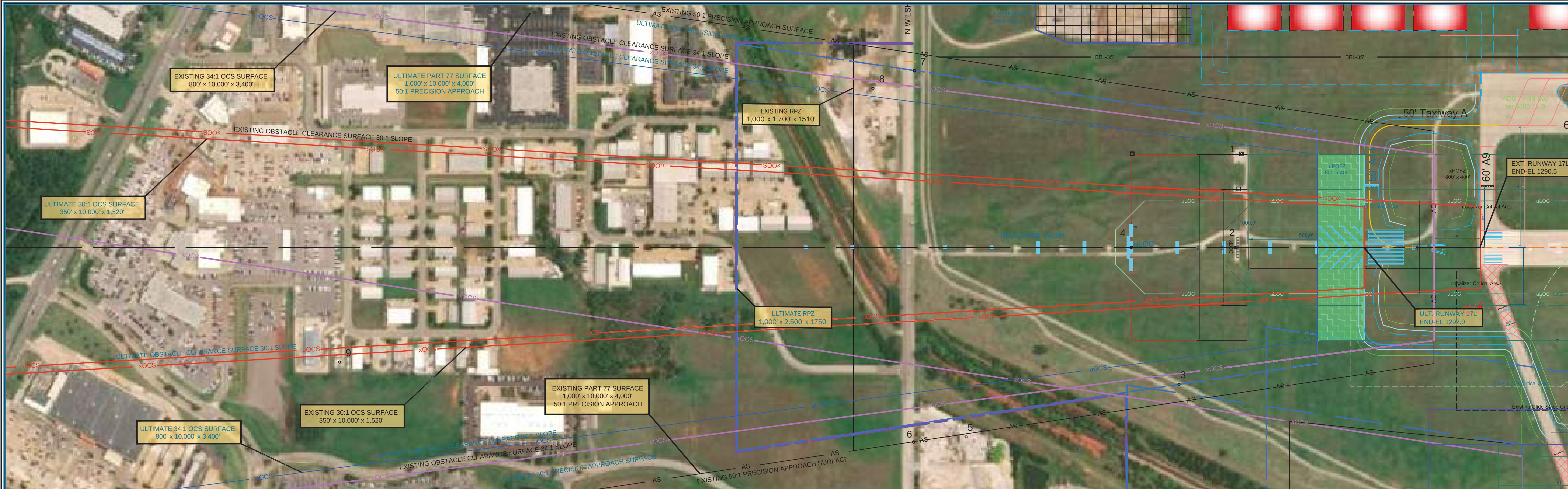

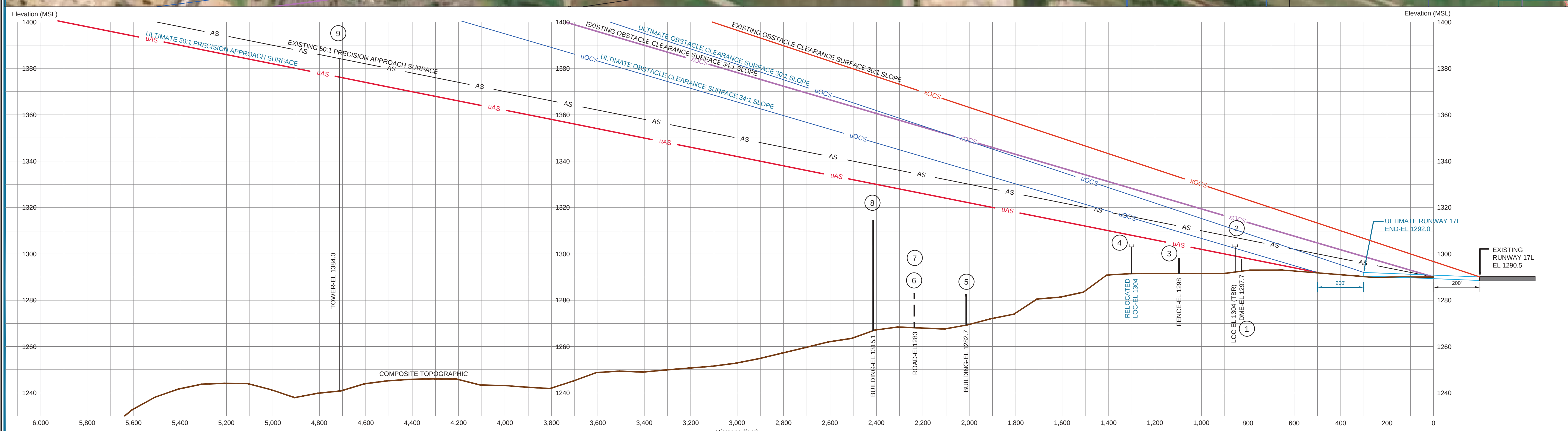

OBSTRUCTION TABLE							
No.	Object Name	Elevation TOP MSL	Existing 50:1 Approach	Existing 34:1 OCS	Ultimate 50:1 Approach	Ultimate 34:1 OCS	Remediation
9	TOWER	1384	0'	0'	7.8'	0'	Mark/Light Tower

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for non-interstate Roads, 17' for interstate Roads, and 23' for railroad.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, are illustrated on the AIRPORT AIRSPACE DRAWING.

TRUE NORTH

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

0 200 400 600
HORIZONTAL SCALE IN FEET

0 20 40 60
VERTICAL SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
2	-	—	—	—
1	-	—	—	—

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WILEY POST AIRPORT

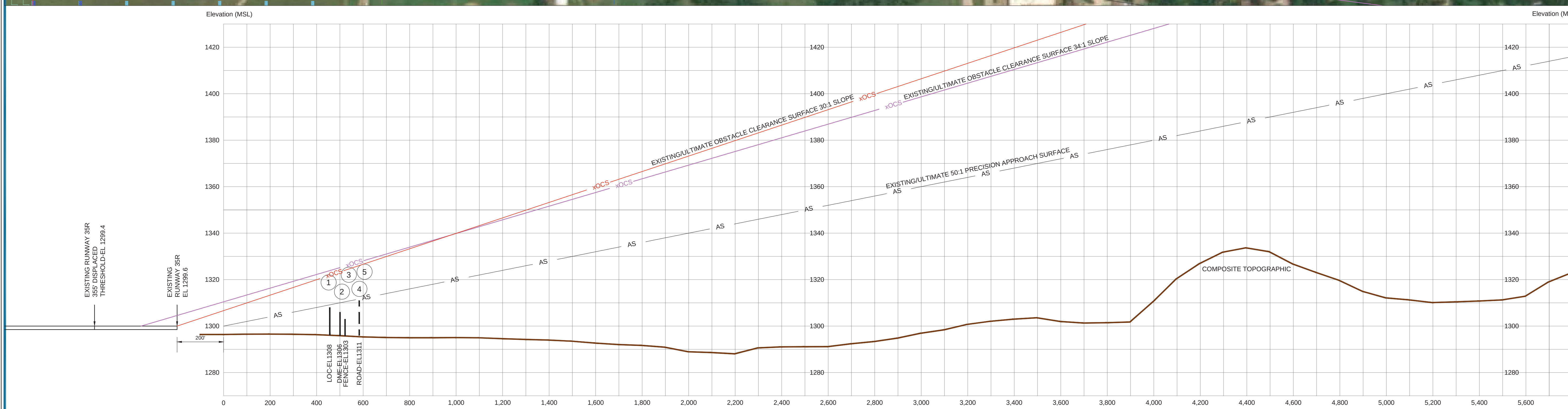
INNER PORTION OF RUNWAY 17L APPROACH SURFACE DRAWING

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022

Coffman Associates
Airport Consultants
www.coffmanassociates.com



OBSTRUCTION TABLE							
No.	Object Name	Elevation TOP MSL	Existing 50:1 Approach	Existing 34:1 OCS	Ultimate 50:1 Approach	Ultimate 34:1 OCS	Remediation
	NONE	-	-	-	-	-	-

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for non-interstate Roads, 17' for interstate Roads, and 23' for railroad.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, are illustrated on the AIRPORT AIRSPACE DRAWING.

TRUE NORTH

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

0 200 400 600
HORIZONTAL SCALE IN FEET

0 20 40 60
VERTICAL SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
2	-	—	—	—
1	-	—	—	—

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WILEY POST AIRPORT

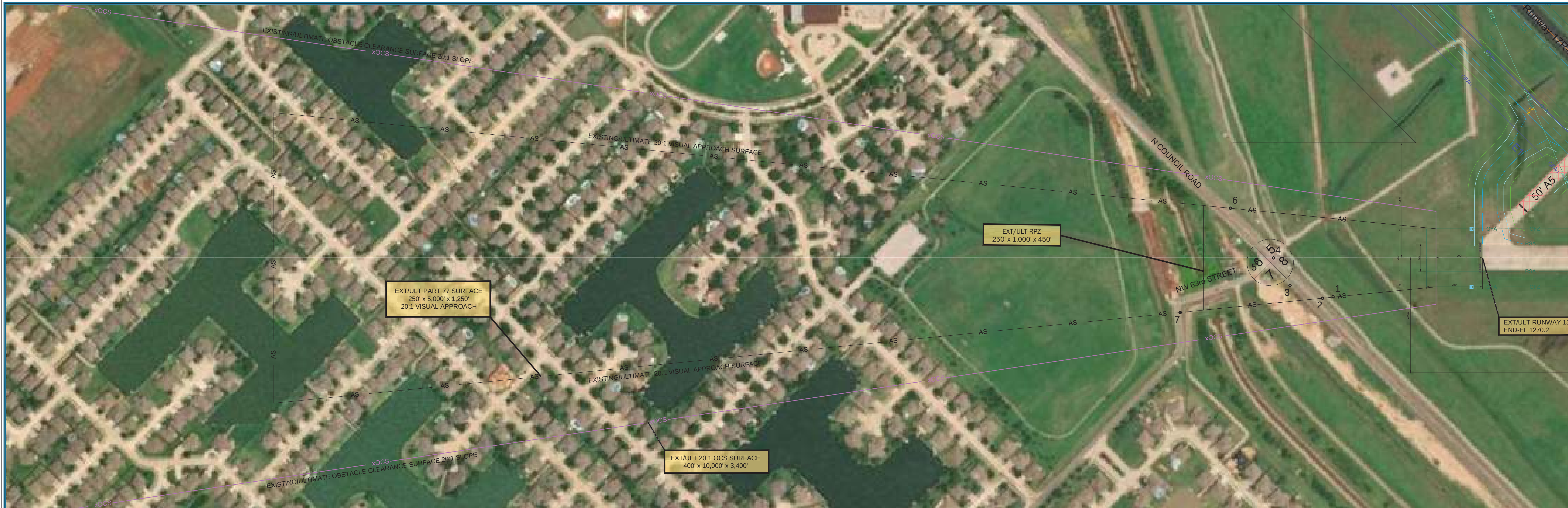
INNER PORTION OF RUNWAY 35R APPROACH SURFACE DRAWING

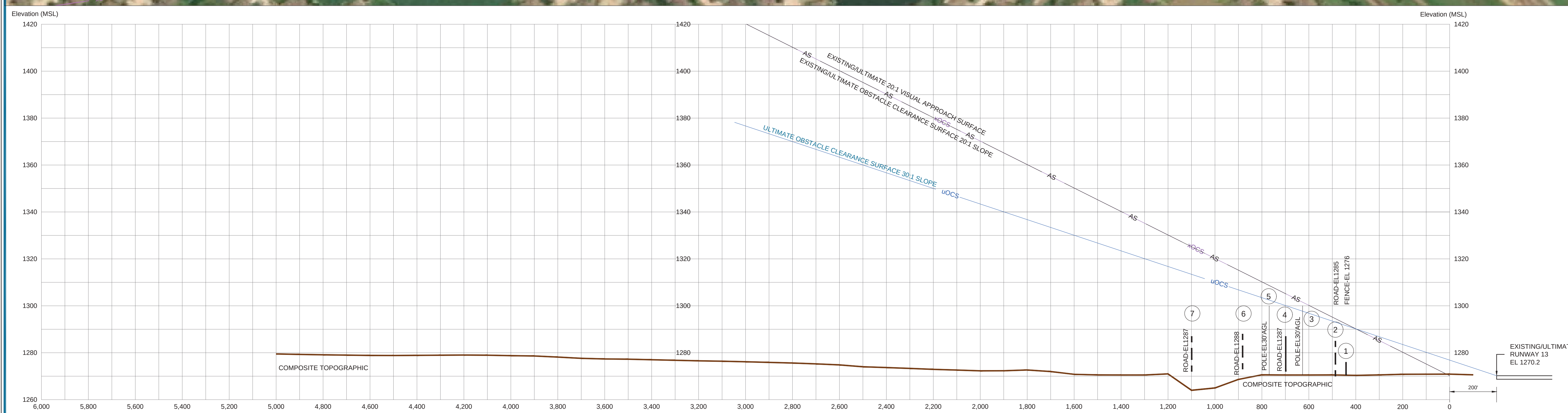
Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022

SHEET 10 OF 19





OBSTRUCTION TABLE							
No.	Object Name	Elevation TOP MSL	Existing 20:1 Approach	Existing 20:1 OCS	Ultimate 20:1 Approach	Ultimate 20:1 OCS	Remediation
-	NONE	-	-	-	-	-	-

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for non-interstate Roads, 17' for interstate Roads, and 23' for railroad.
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TRUE NORTH

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

0 200 400 600
HORIZONTAL SCALE IN FEET

0 20 40 60
VERTICAL SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
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WILEY POST AIRPORT

INNER PORTION OF RUNWAY 13 APPROACH SURFACE DRAWING

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

Coffman Associates
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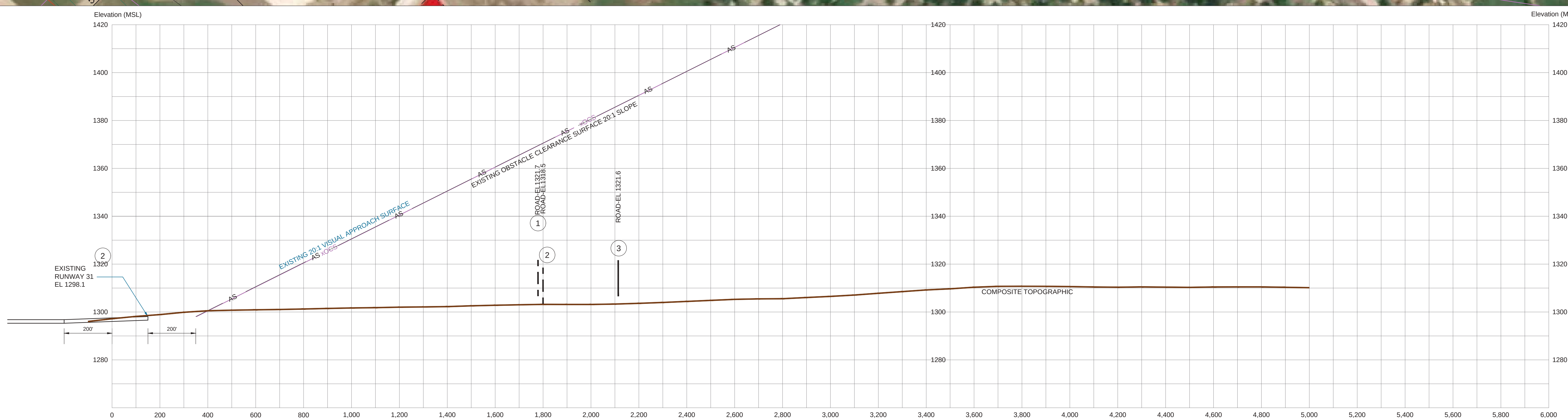
April 2022



OBSTRUCTION TABLE

No.	Object Name	Elevation TOP MSL	Existing 20:1 Approach	Existing 20:1 OCS	Ultimate 20:1 Approach	Ultimate 20:1 OCS	Remediation
	NONE	-	-	-	-	-	-

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for non-interstate Roads, 17' for interstate Roads, and 23' for railroad.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, are illustrated on the AIRPORT AIRSPACE DRAWING.

TRUE NORTH

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

0 200 400 600
HORIZONTAL SCALE IN FEET

0 20 40 60
VERTICAL SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
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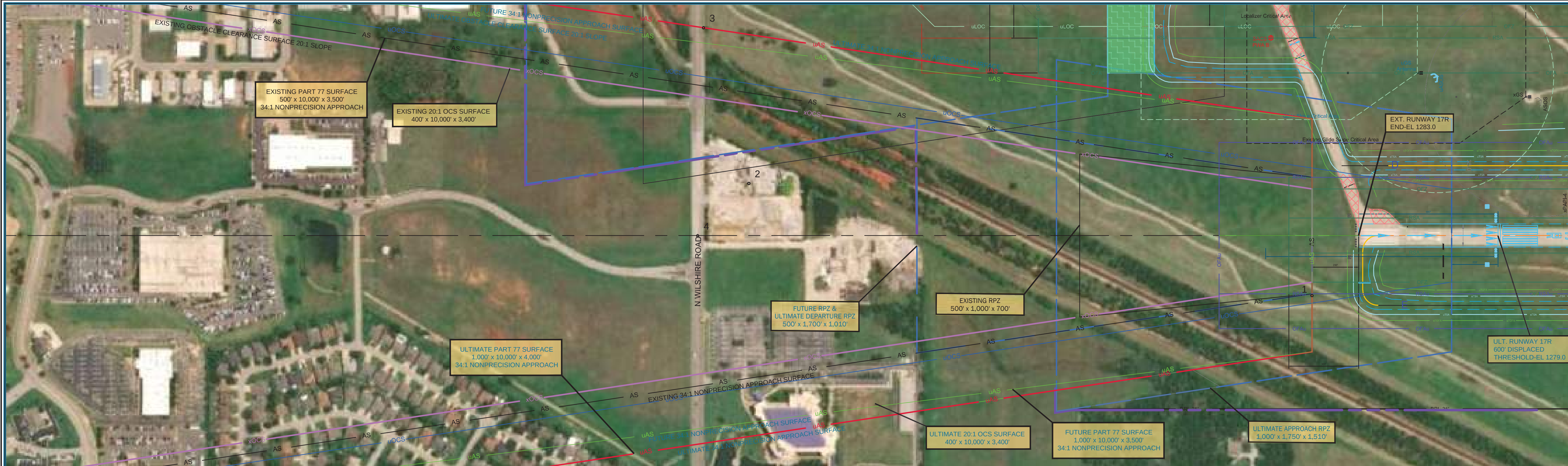
WILEY POST AIRPORT

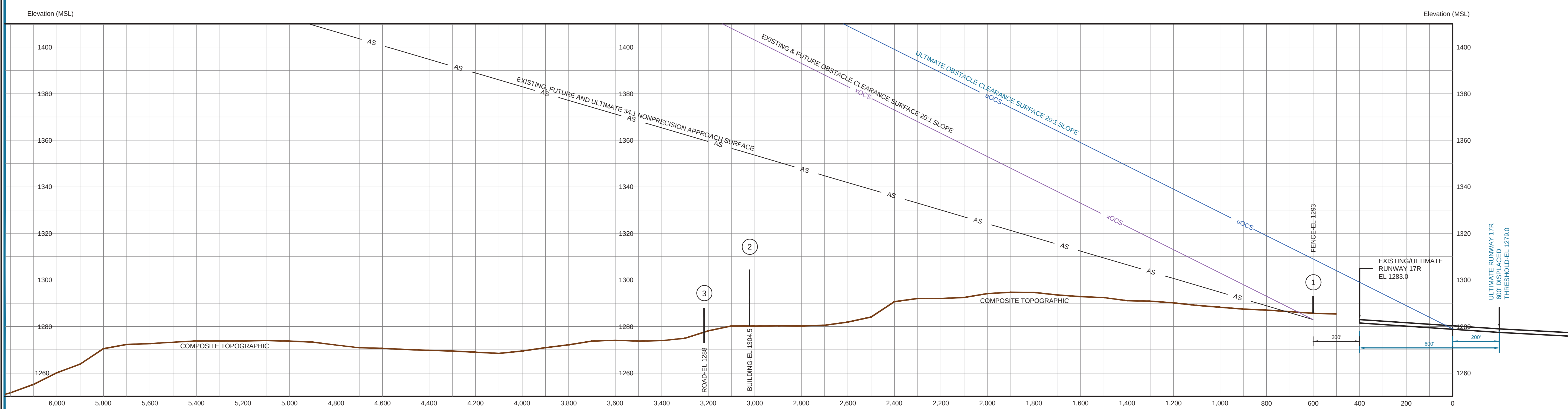
INNER PORTION OF RUNWAY 31 APPROACH SURFACE DRAWING

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022





OBSTRUCTION TABLE						
No.	Object Name	Elevation TOP MSL	Ultimate 34:1 Approach	Existing 20:1 OCS	Ultimate 20:1 OCS	Remediation
1	Fence	1293	10'	N/A	N/A	Relocate Fence

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for non-interstate Roads, 17' for interstate Roads, and 23' for railroad.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, are illustrated on the AIRPORT AIRSPACE DRAWING.

TRUE NORTH

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

0 200 400 600
HORIZONTAL SCALE IN FEET

0 20 40 60
VERTICAL SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.

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WILEY POST AIRPORT

INNER PORTION OF RUNWAY 17R APPROACH SURFACE DRAWING

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
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April 2022 SHEET 13 OF 19

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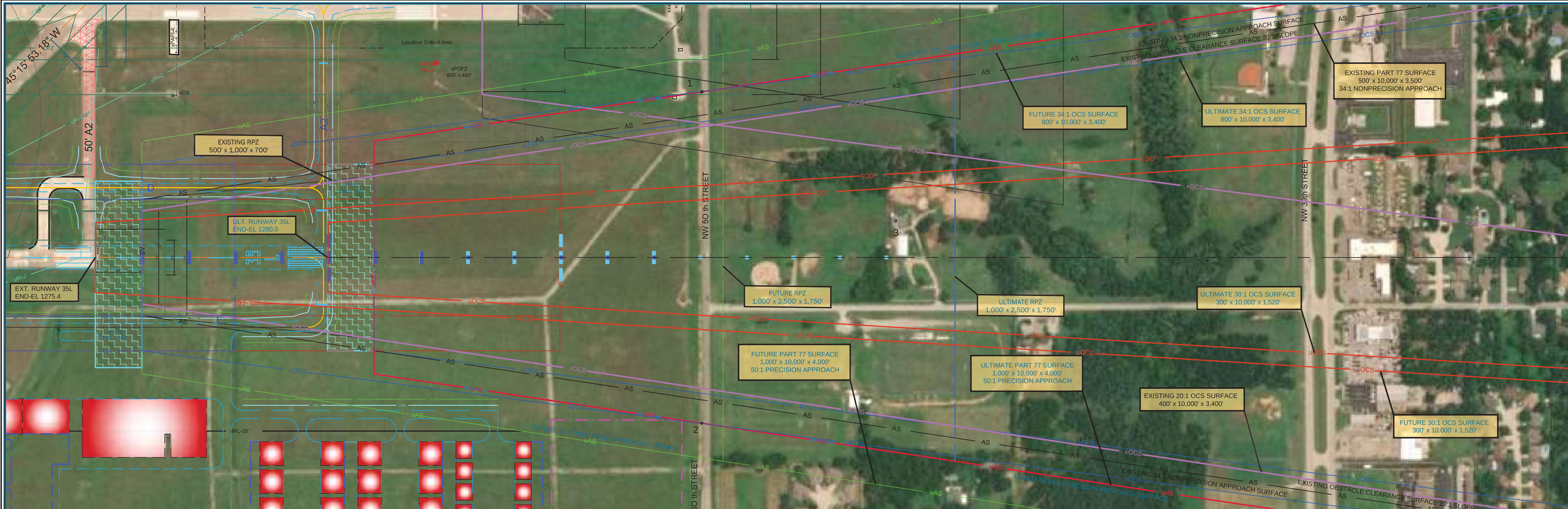

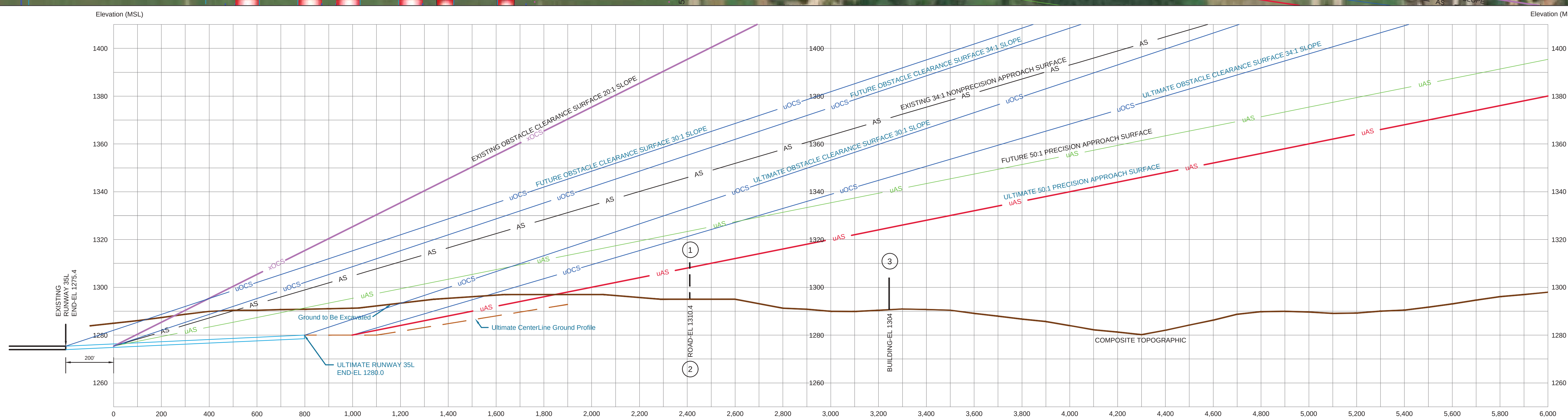

OBSTRUCTION TABLE							
No.	Object Name	Elevation TOP MSL	Existing 50:1 Approach	Existing 34:1 OCS	Ultimate 50:1 Approach	Ultimate 34:1 OCS	Remediation
1	NW 50th St	1310.4	0'	0'	2.1'	0'	To Remain

GENERAL NOTES:

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2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, are illustrated on the AIRPORT AIRSPACE DRAWING.

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

HORIZONTAL SCALE IN FEET (0, 200, 400, 600)

VERTICAL SCALE IN FEET (0, 20, 40, 60)

NO.	REVISIONS	DATE	BY	APP'D.
2	-	__	__	__
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WILEY POST AIRPORT

INNER PORTION OF RUNWAY 35L APPROACH SURFACE DRAWING

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
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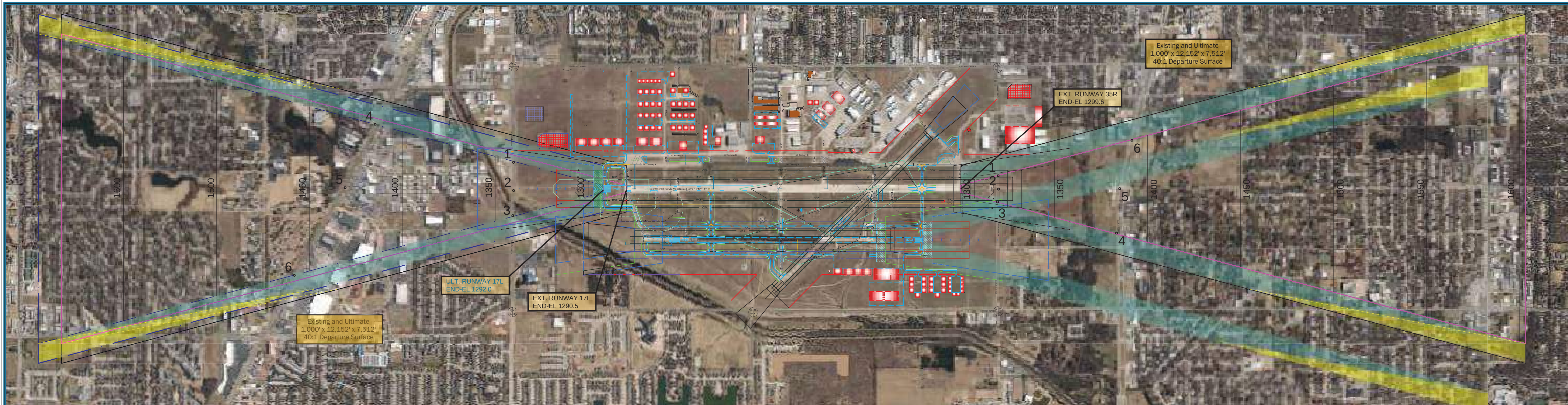
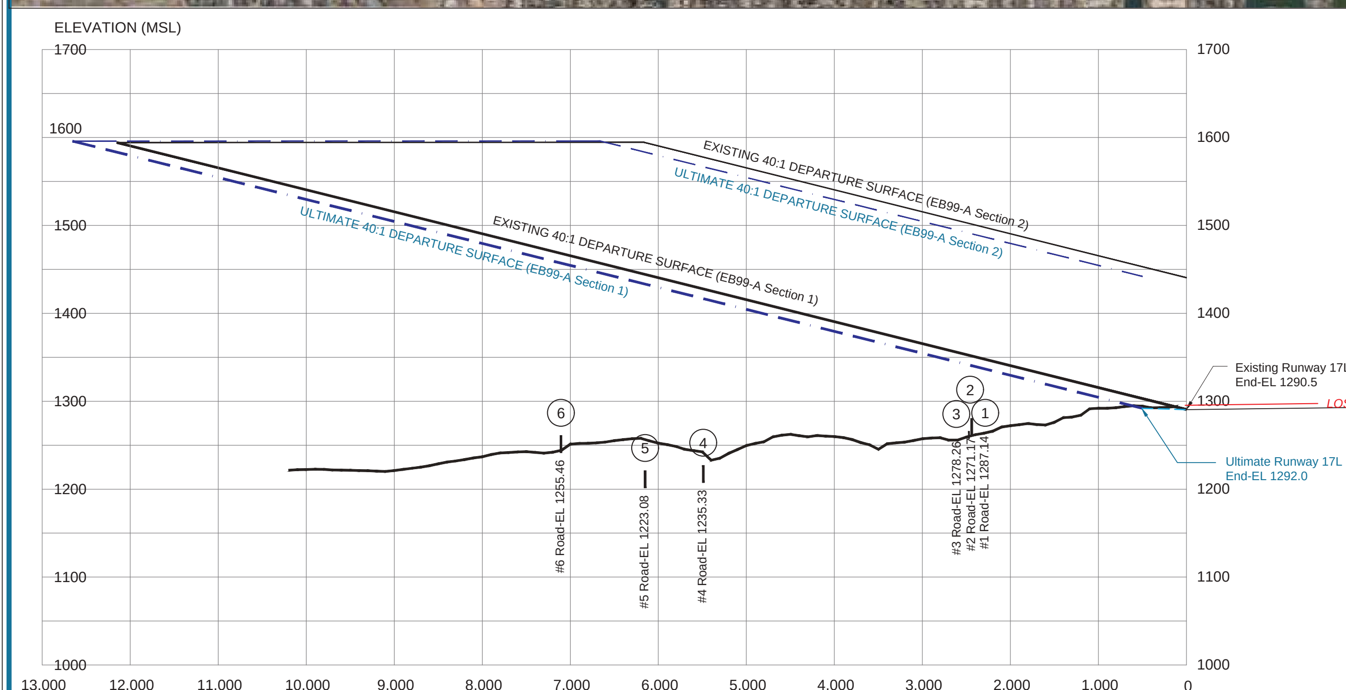
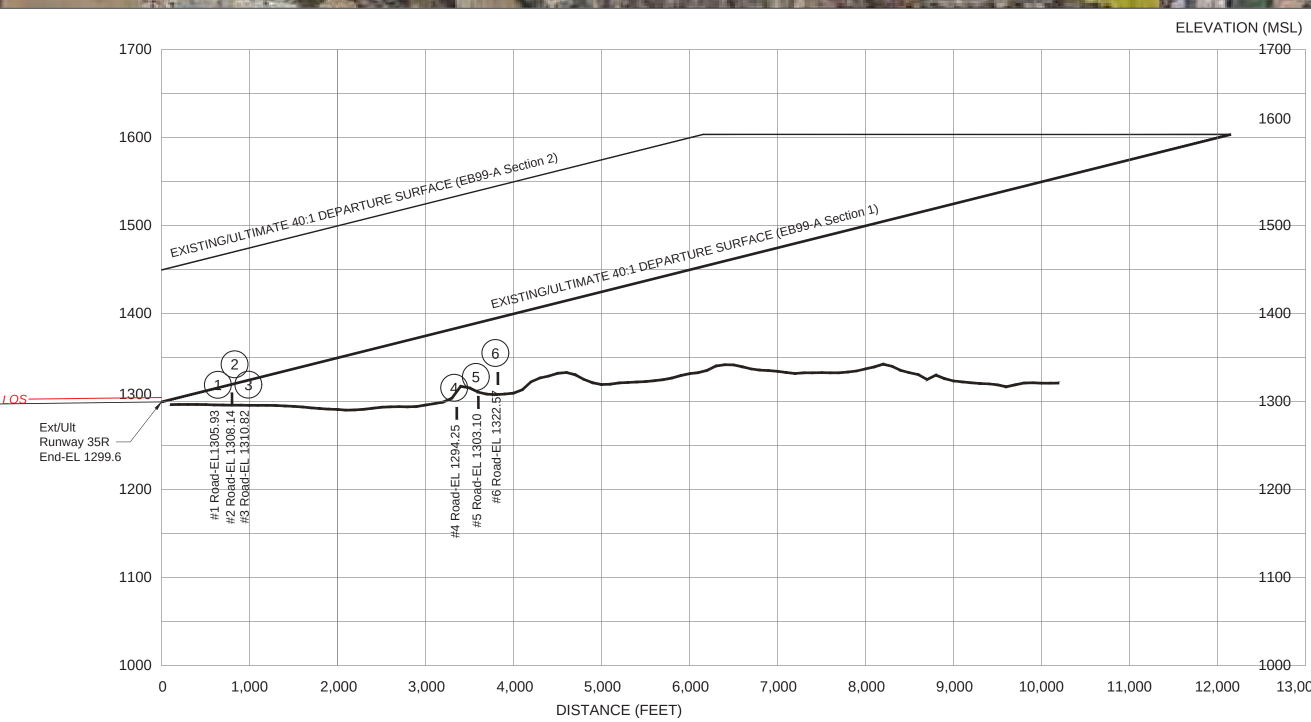




RUNWAY 17L DEPARTURE SURFACE



RUNWAY 35R DEPARTURE SURFACE

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

TRUE NORTH

HORIZONTAL SCALE IN FEET (0, 1000, 2000, 3000)

VERTICAL SCALE IN FEET (0, 100, 200, 300)

Runway 17R OBSTRUCTION TABLE

No.	Object Name	Elevation TOP MSL	Departure OCS Penetration	Remediation
	NONE			-

Runway 35L OBSTRUCTION TABLE

No.	Object Name	Elevation TOP MSL	Departure OCS Penetration	Remediation
	NONE			

GENERAL NOTES:

Elevation Contours from the USGS National Map Website, Published 07/042019.

NO.	REVISIONS	DATE	BY	APP'D.
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WILEY POST AIRPORT
RUNWAY 17L-35R DEPARTURE SURFACE DRAWING

Oklahoma City, Oklahoma

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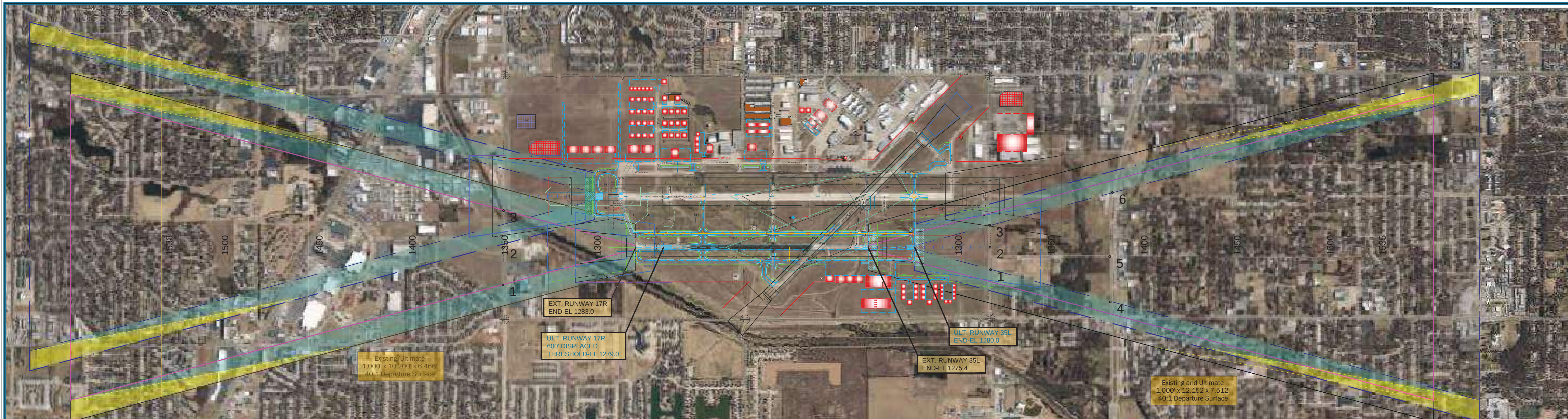
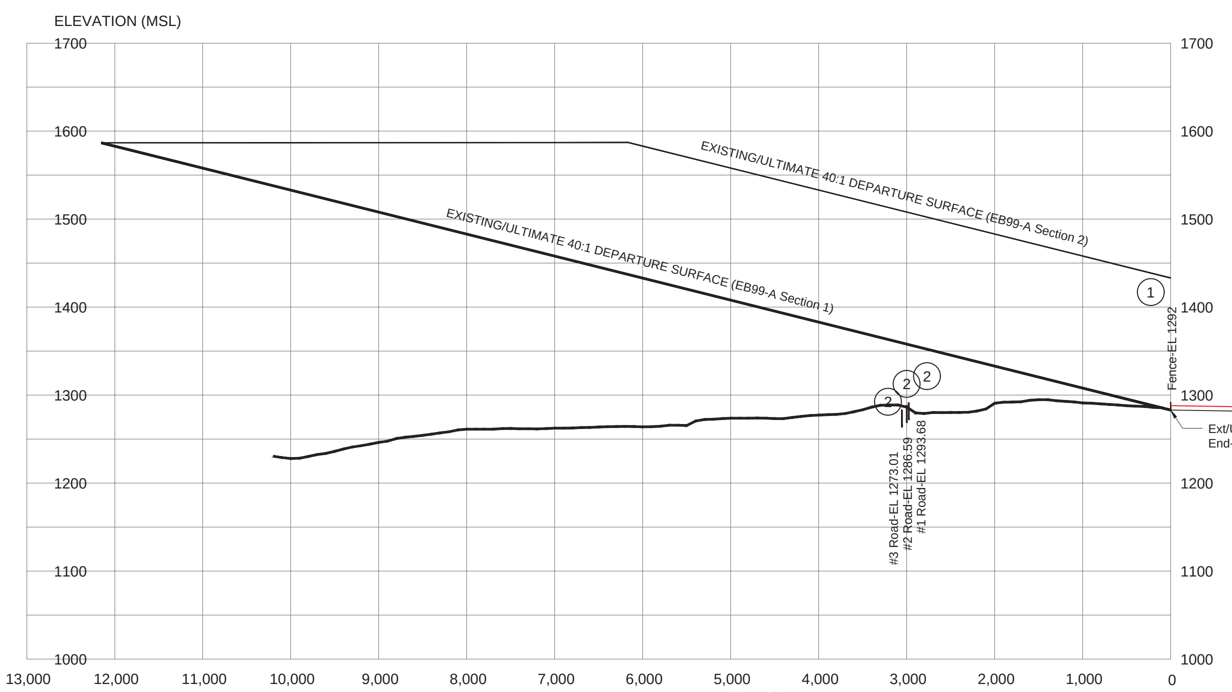
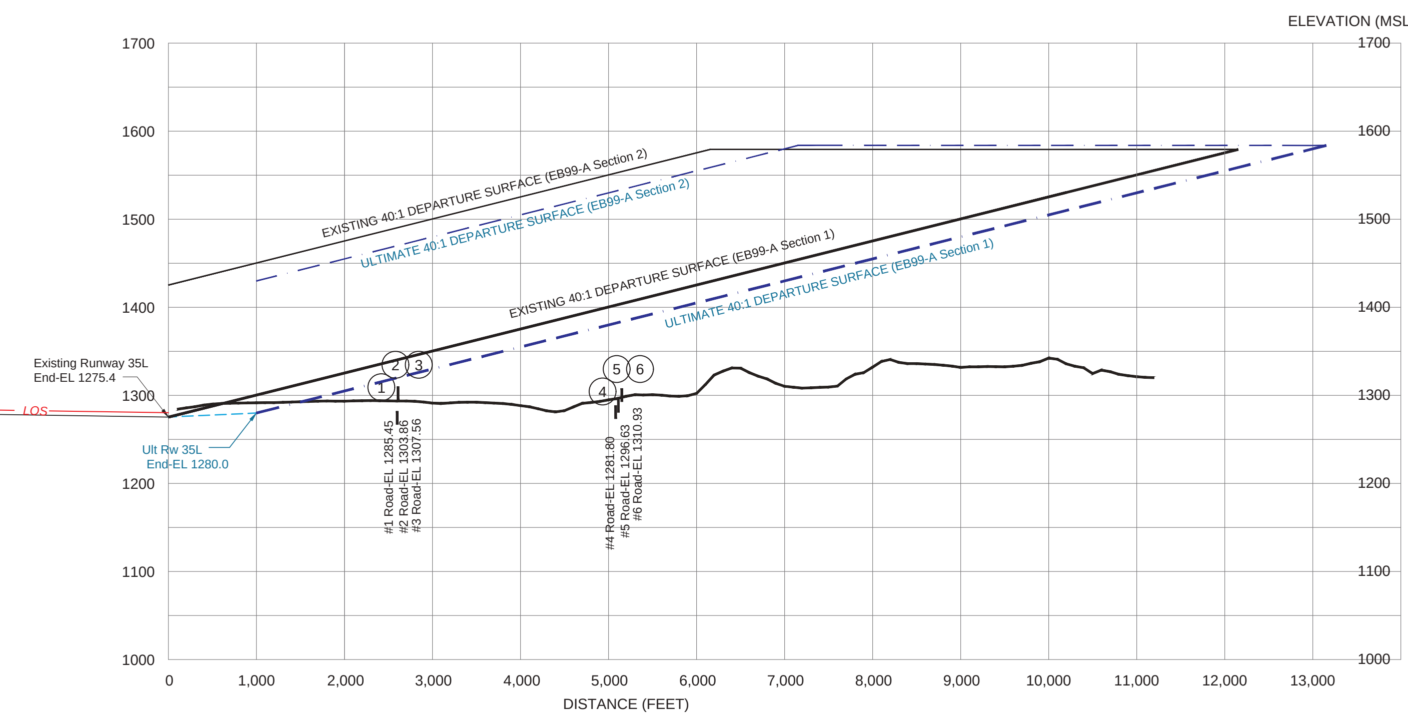




RUNWAY 17R DEPARTURE SURFACE



RUNWAY 35L DEPARTURE SURFACE

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

TRUE NORTH

HORIZONTAL SCALE IN FEET (0, 1000, 2000, 3000)

VERTICAL SCALE IN FEET (0, 100, 200, 300)

Runway 17R OBSTRUCTION TABLE				
No.	Object Name	Elevation TOP MSL	Departure OCS Penetration	Remediation
	NONE			-

Runway 35L OBSTRUCTION TABLE				
No.	Object Name	Elevation TOP MSL	Departure OCS Penetration	Remediation
	NONE			

GENERAL NOTES:

Elevation Contours from the USGS National Map Website, Published 07/042019.

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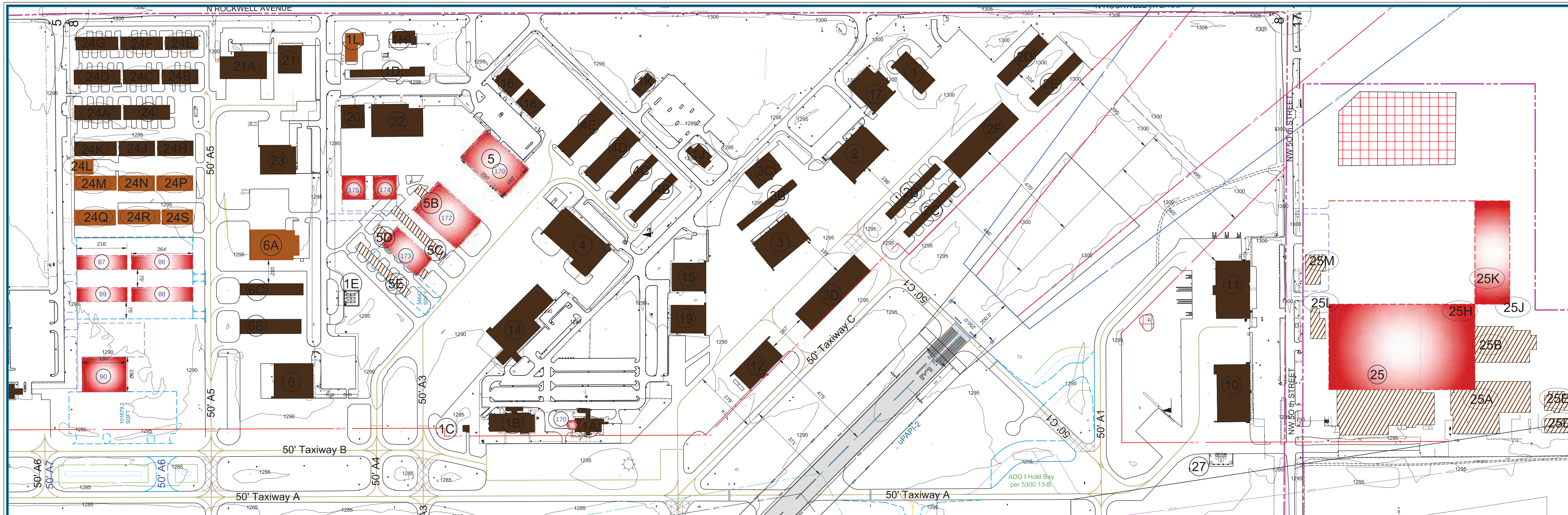
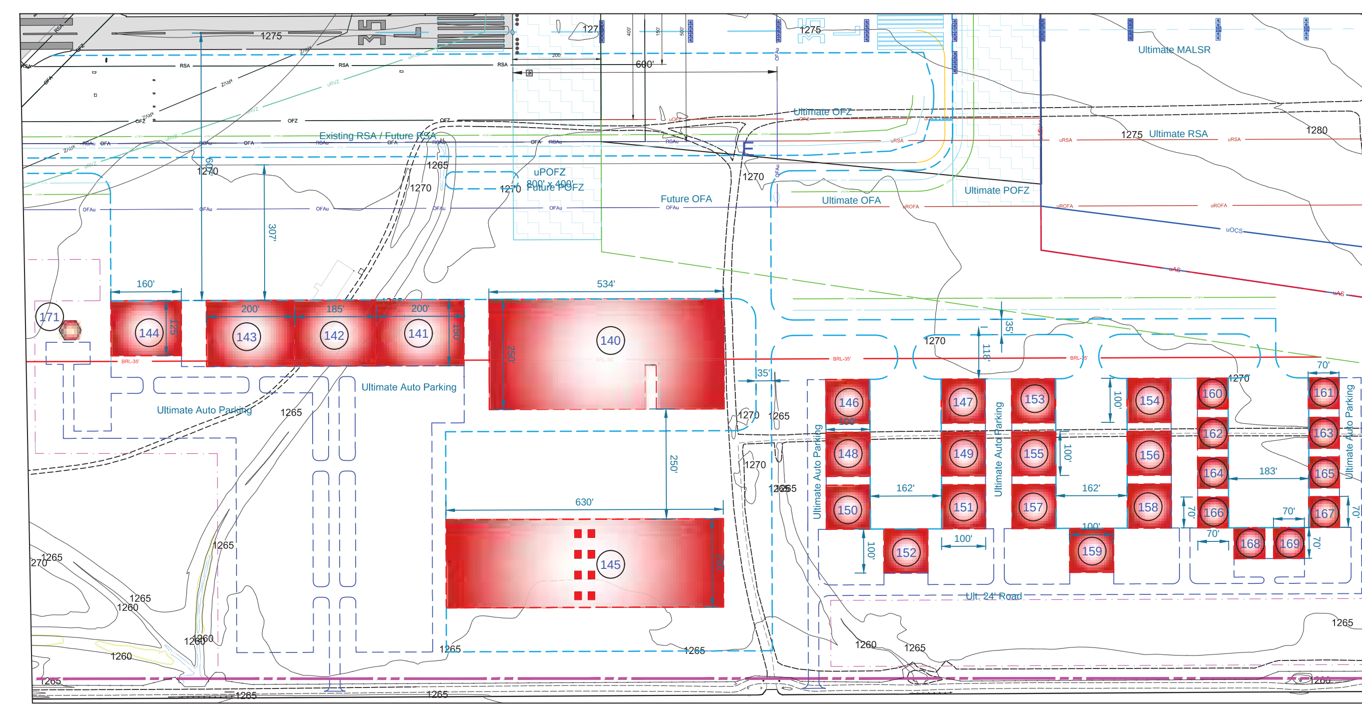
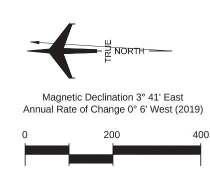


NO.	ID	Facility Description	Elevation Top (MSL)
1	1	AERONAUTICAL SERVICE HANGAR	1323.5'
2	1A	TERMINAL BUILDING & ATCT	1348.5'
3	1B	FAA OFFICE BUILDING	1322.6'
4	1C	AIRPORT ELECTRICAL VAULT	1303.0'
5	1D	AIRPORT MAINTENANCE BUILDING	1313.9'
6	1E	FUEL STORAGE	1303.6'
7	1F	REMOTE TRANS. & ENG. GEN.	1287.2'
8	1G	PUMPING FACILITY (FIRE STATION)	1302.0'
9	1H	AIRPORT MAINTENANCE BUILDING	1313.4'
10	1J	EMBROCK TRAINING FACILITY	1328.5'
11	1K	C.E. PAGE AVIATION BUILDING	1313.6'
12	1L	BUILDING	
13	2	FBO SERVICE HANGAR	1334.5'
14	2B	T-HANGAR	1315.0'
15	2C	T-HANGAR	1318.2'
16	2D	T-HANGAR	1316.4'
17	2E	T-HANGAR	1318.2'
18	2F	T-HANGAR	1328.9'
19	3	AERONAUTICAL SERVICE HANGAR	1301.7'
20	3B	T-HANGAR	1312.6'
21	3C	AERONAUTICAL SERVICE HANGAR	1328.3'
22	3D	T-HANGAR	1324.4'
23	4	AERONAUTICAL SERVICE HANGAR	1328.6'
24	4B	T-HANGAR	1311.7'
25	4C	T-HANGAR	1311.4'
26	4D	T-HANGAR	1317.1'
27	4E	T-HANGAR	1318.1'
28	5	AERONAUTICAL SERVICE HANGAR	1303.2'
29	5B	T-HANGAR (To Be Removed)	1312.0'
30	5C	T-HANGAR (To Be Removed)	1311.8'
31	5D	T-HANGAR (To Be Removed)	1311.8'
32	5E	T-HANGAR (To Be Removed)	1318.5'
33	6	AERONAUTICAL SERVICE HANGAR	1301.8'
34	6A	HANGAR	
35	6B	T-HANGAR	1311.9'
36	6C	T-HANGAR	1308.5'
37	8	FBO SERVICE HANGAR	1323.3'
38	8A	PAINT HANGAR	1325.2'
39	9	FBO SERVICE HANGAR	1323.7'
40	10	AERONAUTICAL SERVICE HANGAR	1338.6'
41	11	AERONAUTICAL SERVICE HANGAR	1341.8'
42	12	AERONAUTICAL SERVICE HANGAR	1331.3'

NO.	ID	Facility Description	Elevation Top (MSL)
43	14	FBO SERVICE HANGAR	1352.1'
44	15	AERONAUTICAL SERVICE BUILDING	1333.4'
45	16	STORAGE HANGAR	1321.7'
46	17	AERONAUTICAL SERVICE HANGAR	1337.4'
47	18	STORAGE HANGAR	1323.7'
48	19	AERONAUTICAL SERVICE BUILDING	1329.7'
49	20	AERONAUTICAL SERVICE HANGAR	1321.8'
50	21	AERONAUTICAL SERVICE HANGAR	1323.7'
51	21A	AERONAUTICAL SERVICE HANGAR	1340.9'
52	22	AERONAUTICAL SERVICE HANGAR	1346.9'
53	23	AERONAUTICAL SERVICE HANGAR	1336.2'
54	24	PWA HANGAR	1316.7'
55	24A	PWA HANGAR	1315.7'
56	24B	PWA HANGAR	1318.0'
57	24C	PWA HANGAR	1317.7'
58	24D	PWA HANGAR	1315.6'
59	24E	PWA HANGAR	1314.8'
60	24F	PWA HANGAR	1315.3'
61	24G	PWA HANGAR	1314.9'
62	24H	PWA HANGAR	1314.9'
63	24J	PWA HANGAR	1314.1'
64	24K	PWA HANGAR	1318.7'
65	24L	HANGAR	
66	24M	HANGAR	
67	24N	HANGAR	
68	24P	HANGAR	
69	24Q	HANGAR	
70	24R	HANGAR	
71	24S	HANGAR	
72	25	AERONAUTICAL SERVICE HANGAR (TBR)	1346.0'
73	25A	AERONAUTICAL SERVICE BUILDING	1332.8'
74	25B	PAINT HANGAR (TBR)	1327.3'
75	25C	AERONAUTICAL SERVICE BUILDING	1318.1'
76	25D	AERONAUTICAL SERVICE BUILDING	1312.9'
77	25E	AERONAUTICAL SERVICE BUILDING	1319.7'
78	25H	AERONAUTICAL SERVICE BUILDING	1318.0'
79	25J	AERONAUTICAL SERVICE BUILDING	1307.4'
80	25K	WATER TANK (TBR)	1326.3'
81	25L	AERONAUTICAL SERVICE BUILDING	1322.5'
82	25M	AERONAUTICAL SERVICE BUILDING	1324.5'
83	26	HANGAR	
84	27	FUEL STORAGE	

NO.	DESCRIPTION	ELEVATION AGL (MSL)
86	T-HANGAR (10 units)	22'
87	T-HANGAR (8 units)	22'
88	T-HANGAR (10 units)	22'
89	T-HANGAR (8 units)	22'
90	CONVENTIONAL HANGAR (100' x 150')	35'
91	CONVENTIONAL HANGAR (175' x 125')	35'
92	CONVENTIONAL HANGAR (70' x 70')	30'
93-95	CONVENTIONAL HANGAR (100' x 100')	35'
96	CONVENTIONAL HANGAR (250' x 160')	35'
97	CONVENTIONAL HANGAR (250' x 160')	35'
98	CONVENTIONAL HANGAR (250' x 160')	35'
99-120	CONVENTIONAL HANGAR (100' x 100')	35'
121-135	CONVENTIONAL HANGAR (70' x 70')	30'
136	CONVENTIONAL HANGAR (200' x 150')	35'
137	CONVENTIONAL HANGAR (200' x 150')	35'
138	CONVENTIONAL HANGAR (200' x 150')	35'
139	CONVENTIONAL HANGAR (200' x 150')	35'
140	CONVENTIONAL HANGAR (534' x 250')	35'
141	CONVENTIONAL HANGAR (200' x 150')	35'
142	CONVENTIONAL HANGAR (185' x 150')	35'
143	CONVENTIONAL HANGAR (200' x 150')	35'
144	CONVENTIONAL HANGAR (160' x 125')	35'
145	CONVENTIONAL HANGAR (630' x 200')	35'
146-159	CONVENTIONAL HANGAR (100' x 100')	35'
160-169	CONVENTIONAL HANGAR (70' x 70')	30'
170	ATCT TOWER (Location #1)	50'
171	ATCT TOWER (Location #2)	50'
172	CONVENTIONAL HANGAR (250' x 160')	35'
173	CONVENTIONAL HANGAR (250' x 150')	35'
174	CONVENTIONAL HANGAR (200' x 100')	35'
175	CONVENTIONAL HANGAR (100' x 100')	35'
176	CONVENTIONAL HANGAR (100' x 100')	35'
177	CONVENTIONAL HANGAR (630' x 320')	35'
178	CONVENTIONAL HANGAR (480' x 150')	35'
179	CONVENTIONAL HANGAR (630' x 320')	35'





NO.	REVISIONS	DATE	BY	APP'D.
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WILEY POST AIRPORT

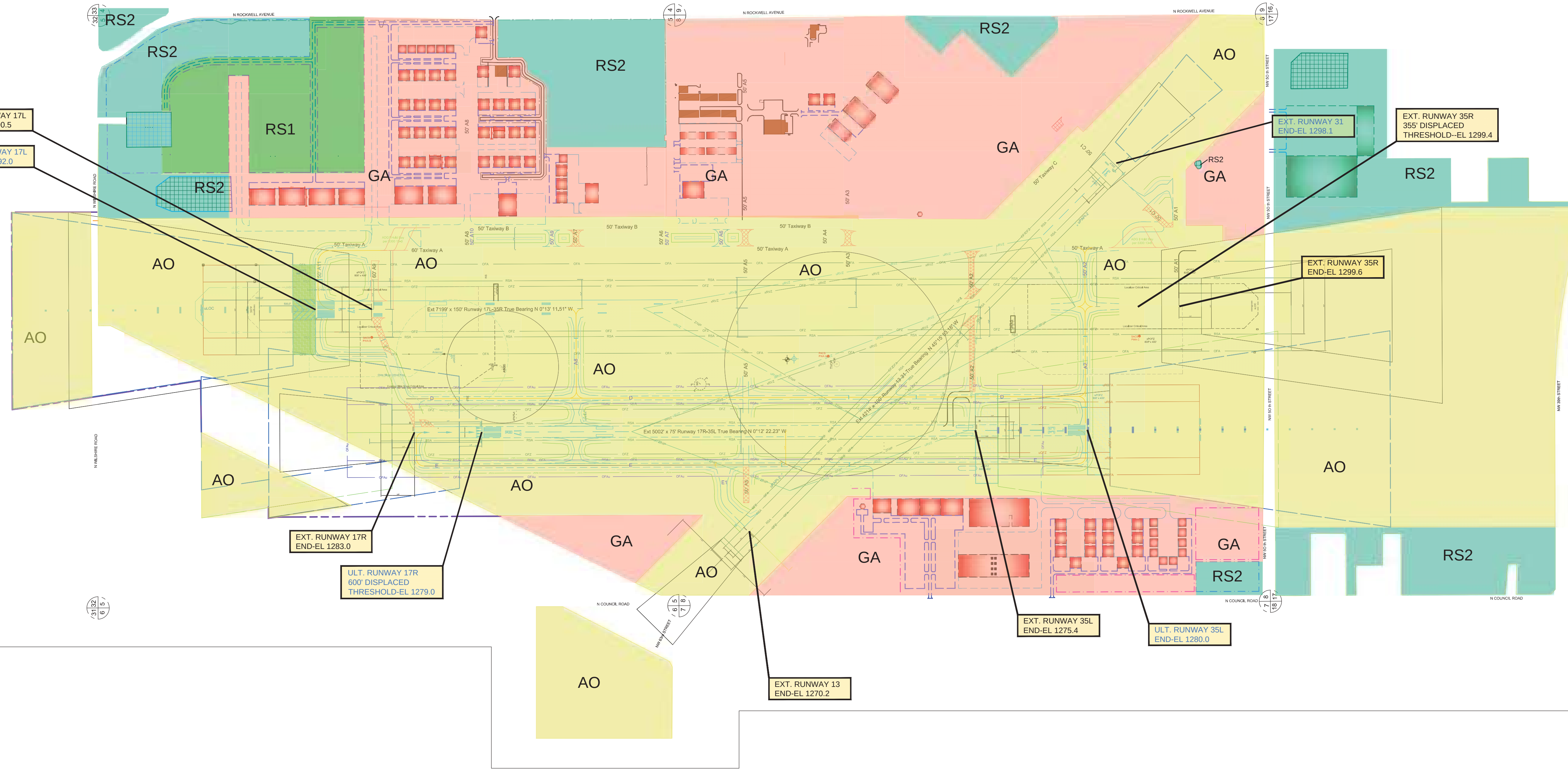
TERMINAL AREA DRAWING

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022 SHEET 17 OF 19

Coffman Associates
Airport Consultants
www.coffmanassociates.com

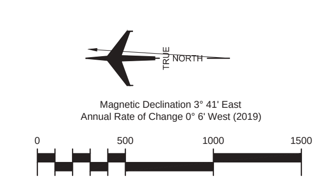


GENERAL NOTES:

1. Depiction of features and objects, including related elevations and clearances, within the Inner Approach of the CFR 14 Part 77 are depicted on the INNER PORTION OF THE RUNWAY APPROACH SURFACE DRAWINGS.
2. Details concerning terminal improvements depicted on the TERMINAL AREA DRAWING.
3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE DRAWING.
4. NAVD 88 Datum was used for all vertical elevations and NAD 83 for all horizontal elevations.
5. Any property planned for non-aeronautical uses is subject to the Section 163 determination process and any federally obligated properties will need to go through the land release process.

On-Airport Land Use Legend

- AIRPORT OPERATION (AO)
- GENERAL AVIATION (GA)
- REVENUE SUPPORT (RS1) (Aeronautical Use)
- REVENUE SUPPORT (RS2) (Non Aeronautical Use)



NO.	REVISIONS	DATE	BY	APP'D.

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WILEY POST AIRPORT

AIRPORT LAND USE DRAWING

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022 SHEET 18 OF 19

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Airport Consultants
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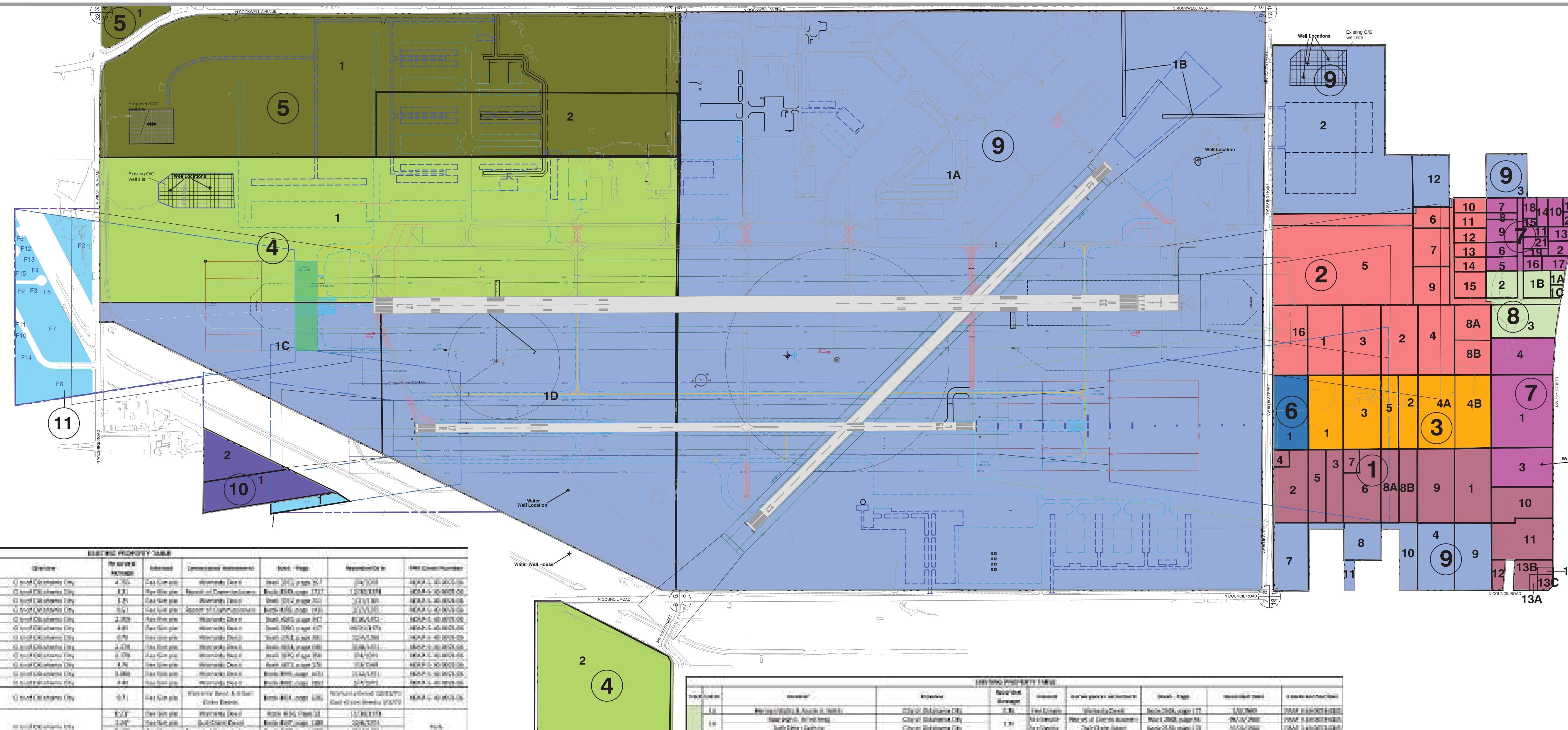

EXISTING PROPERTY TABLE

[illegible]

EXISTING PROPERTY TABLE

[illegible]

FUTURE PROPERTY TABLE

[illegible]

FOR APPROVAL BY

Airport Manager — DATE

TRUE NORTH

Magnetic Declination 3° 41' East
Annual Rate of Change 0° 6' West (2019)

0 500 1000 1500

SCALE IN FEET

NO.	REVISIONS	DATE	BY	APP'D.
2	-	___	___	___
1	-	___	___	___

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WILEY POST AIRPORT

AIRPORT PROPERTY MAP
EXHIBIT A

Oklahoma City, Oklahoma

PLANNED BY: Eric S. Pfeifer
DETAILED BY: Larry D. Johnson
APPROVED BY: Mike W. Dmyterko

April 2022

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Airport Consultants
www.coffmanassociates.com

Appendix D

Runway 17R-35L Widening Purpose and Need

APPENDIX D
RUNWAY 17R-35L WIDENING PURPOSE AND NEED

This appendix to the master plan details the purpose and need for widening the parallel runway (Runway 17R-35L) at Wiley Post Airport (PWA). This includes a background describing PWA's role in the national airspace system, an explanation of existing runway limitations, a summary of how operators at PWA are impacted by the runway limitations, and recommended improvements to the parallel runway to mitigate the negative impacts.

BACKGROUND

PWA's role within the National Plan of Integrated Airports System (NPIAS)[1] is that of a general aviation reliever. In this role, PWA's purpose is to relieve the Will Rogers World Airport (OKC) of general aviation traffic so that it can fulfill its role as a primary commercial service airport. The FAA's *Asset 2: In-Depth Review of the 497 Unclassified Airports*[2], further defines PWA as an airport of national importance, which are those that "support the national and state system by providing communities with access to national and international markets in multiple states and throughout the United States."

PWA is a vital part of the national airspace system whose facilities should be capable of serving all varieties of general aviation activity including corporate/business aviation, flight training, aeromedical flights, law enforcement, disaster relief, and private/recreational flying. The types of general aviation aircraft that routinely operate at PWA range from piston-powered single-engine aircraft up to and including the largest business jets in the national fleet including Aircraft Approach Category (AAC) C and D jets such as the Gulfstream G280/G450/G550/G650, Bombardier Learjets 45/55/60, Bombardier Challenger 600/601/604, and Cessna Citation III/VI/VII, among others. According to the FAA's Traffic Flow Management System Counts (TFMSC), PWA has averaged over 2,900 annual operations by AAC C and D aircraft over the past 12 years. The master plan projects the number of operations by these types of jets will increase at PWA over time, which agrees with the FAA's own national projections of general aviation activity presented in the *Aerospace Forecasts*[3] report. Based on the most current available data PWA has 90 based jets, 38 of which are AAC C and D.

EXISTING RUNWAY LIMITATIONS

Runway 17R-35L is the parallel runway at PWA and measures 5,002 feet long and 75 feet wide, meeting Runway Design Code (RDC) B-II-5000 design standards. The primary runway (Runway 17L-35R) meets RDC C-III-2400 standards and accommodates most jet traffic at PWA. However, there are several unique conditions in place that result in significant impacts to PWA aircraft operations, particularly larger jets. The limiting conditions are as follows:

1. The primary limiting condition that is highlighted in this appendix is due to delays in departing aircraft, but arrivals have been impacted as well. Aircraft needing a 100-foot wide runway are delayed in arriving to and departing from PWA due to conflicting traffic at OKC. OKC is located approximately seven nautical miles due south of PWA and has the same north/south primary runway alignment as PWA. Based on the

[1] FAA's NPIAS report is available for download at: https://www.faa.gov/airports/planning_capacity/npias/
[2] FAA's general aviation airports reports are available for download at: https://www.faa.gov/airports/planning_capacity/ga_study/
[3] *FAA Aerospace Forecasts 2020-2040* report is available for download at: https://www.faa.gov/data_research/aviation/aerospace_forecasts/

memo from Oklahoma City Approach Control that is attached to this appendix the main issue deals with the delay of departing or re-sequence of arriving aircraft operating at PWA while traffic within the OKC traffic pattern is cleared. Priority is given to aircraft operating from Will Rogers and if there's a departure or arrival at Will Rogers that conflicts with PWA traffic using Runway 17L-35R, the PWA traffic is adversely impacted. Category C and D aircraft at PWA will only utilize 17L-35R due to 17R-35L being too narrow for safe operations. Upon an IFR departure request for 17L-35R, these aircraft have had to wait upwards of 10, 20, and even 30 minutes for IFR release while being offered immediate IFR departure availability on 17R-35L. These impacted aircraft would decline the use of 17R-35L for departure, but could operate on that runway without delay if it were widened to 100 feet. Additionally, in-bound arrival traffic have been forced to re-sequence their landings on 17L-35R due to traffic conflicts at Will Rogers. They were offered immediate landing availability on 17R-35L, but declined due to the 75 ft width. Although the re-sequence is not that much of a delay time wise, it does cause a considerable extra cost to the operator to keep those aircraft airborne for an additional approach and causes increased workload for the air traffic controllers.

2. When Runway 17L-35R, the primary runway at PWA, is occupied or unavailable, many mid- and large-sized business jets are forced to divert to OKC due to safety concerns with the narrow Runway 17R-35L pavement. These diversions result in a loss of operations and revenue for PWA and associated businesses that cater to jet traffic. This runs counter of the intent of PWA relieving OKC of general aviation traffic. If widened, these aircraft could utilize the parallel runway and would avoid having to divert to OKC.
3. Larger aircraft operations at PWA, particularly Category C and D aircraft, are often delayed due to conflicting traffic on the primary runway. If widened to 100 feet, impacted aircraft could operate without delay on 17R-35L.
4. The primary runway is equipped with an ILS, which is used extensively by operators throughout the region for instrument approach training as opposed to using Will Roger's ILS runways. These flight training operations on the primary runway can cause delays and diversions for larger aircraft at PWA. When the primary runway is being used for instrument approach training, larger aircraft would get re-sequenced for landing due to the larger aircraft being faster and overtaking the slower training aircraft conducting approaches. If 17R-35L were widened, these larger aircraft could avoid re-sequencing for the primary runway and use 17R-35L without delay.

IMPACTED OPERATIONS

The FAA requires documentation of 500 annual operations that are impacted by these conditions to justify funding a project through the Airport Improvement Program (AIP). Based on letters of support and estimates of impacted operations from several operators at PWA, the limited width available on Runway 17R-35L at PWA results in at least 90 impacted (delayed/re-sequenced/diverted) operations each month including reported impacts by smaller jets within AAC B. Extrapolating this figure for a full year results in 1,080 annual impacted operations. The table below details the estimated number of AAC C/D operations that are impacted by the limited width of Runway 17R-35L. Counting reported C/D aircraft operations alone results in an estimated 780 impacted operations annually. This should be considered a low range estimate since other significant PWA operators (an FBO and three large operators) have not responded to the information request although the airport manager has noted verbal complaints from many aircraft operators in the past. Furthermore, many other locally based and itinerant jet aircraft operators could not be reached to provide feedback, but given the known limitations, the above scenarios would likely be occurring to them as well. Based on our best estimates, the data we have collected represents about 50 to 60 percent of the known AAC C/D operations that are negatively impacted at PWA due to the above limitations.

AAC C/D Operations Impacted by Limited Runway 17R-35L Width
Wiley Post Airport

Operator	Description	Aircraft	AAC	Operations Impacted per Month
American Jet Charter	Major charter operator at PWA	Challenger 604	C	8
		Challenger 350	C	
		Lear 60	C	
		Citation VII	C	
		Gulfstream IV SP	D	
Atlantic Aviation	National FBO serving PWA	Tenant/Itinerant Jet Customers	C/D	15
Continental Resources	Corporate operator at PWA	Citation X+	C	5
Midfirst Bank	Corporate operator at PWA	Challenger 604	C	11
Valair FBO/MRO	FBO/MRO serving PWA and jet aircraft operators from across the country	Tenant/Itinerant Jet Customers	C/D	15
WW Steel	Corporate operator at PWA	Challenger 604	C	11
Express Employment	Corporate operator at PWA	Challenger 604	C	Unknown
		IAI 1125	C	
		IAI 1124	C	
Private Jets	Major charter operator at PWA	Gulfstream IV	D	Unknown
		Learjet 45 (2)	C	
		Learjet 40 (2)	C	
		Learjet 31A	C	
Reported Monthly AAC C/D Impacted Operations				65
Reported Annual AAC C/D Impacted Operations				780
Estimated Annual AAC C/D Impacted Operations (Assumes Reported Represents 50-60% of Actual)				**1,300 - 1,560**

AAC – Aircraft Approach Category **|** FBO – Fixed Base Operator **|** MRO – Maintenance/Repair/Overhaul Operator
Source: Estimates of impacted operations reported by operators to PWA management.

Respondents to a request for information on impacted operations due to the limited width of Runway 17R-35L include:

- American Jet Charter, a major charter operator at PWA. Estimates up to eight impacted operations per month. American Jet Charter operates the following Category C/D aircraft for charter operations: Gulfstream IV SP, Challenger 604, Challenger 350, Lear 60, and Cessna Citation VII.
- Love’s Travel Stops and Country Stores, a corporate operator at PWA with Citation jet aircraft. Estimates up to 11 impacted operations per month.
- Continental Resources, a corporate operator at PWA. Estimates up to 11 impacted operations per month. Continental Resources operates the following Category C aircraft: Cessna Citation X+.
- Atlantic Aviation, a national Fixed Base Operator (FBO) serving PWA. Estimates up to 15 impacted operations per month from either their tenant base or itinerant operations including Category C/D aircraft.
- Oklahoma Jet Charter, a major charter operator at PWA with several jet and turboprop aircraft. Estimates up to eight impacted operations per month. Their estimate was provided verbally and is not in writing.
- WW Steel, a corporate operator at PWA operating a Challenger 604. Estimates up to 11 impacted operations per month. Their estimate was provided verbally and is not in writing.
- Midfirst Bank, a corporate operator at PWA operating a Challenger 604. Estimates up to 11 impacted operations per month. Their estimate was provided verbally and is not in writing.
- Valair FBO and Maintenance/Repair/Overhaul (MRO), an FBO/MRO serving PWA and aircraft operators from across the country. Estimates up to 15 impacted operations per month from either their tenant base

or itinerant operations including Category C/D aircraft. Their estimate was provided verbally and is not in writing.

- Jeff Sandusky, a tenant of PWA. Reported on a situation in which simultaneously arriving aircraft to PWA caused confusion and bottlenecks that can lead to diminished operational safety.

Many operators report experiencing 15-, 20-, and up to 30-minute delays every month due to the conditions outlined in the Existing Runway Limitations section, which increases operational costs substantially due to extra fuel burn. Flight diversions caused by the existing runway limitations result in a loss of significant revenue for PWA businesses. Documentation of these impacted operators is included as an attachment to this appendix. Flight diversions and re-sequencing also increases workloads for air traffic controllers in the already congested airspace surrounding Oklahoma City.

RECOMMENDATION

The master plan identifies the need to improve the parallel runway to meet RDC C/D-II-2400 design standards so that PWA is better equipped to fulfill its role as a general aviation reliever of national importance. The evidence provided in the above narratives along with the work effort of PWA staff and the consultant provides the justification needed to improve the runway and eliminate the existing conditions that are hampering operations at PWA. Improving to these standards and eliminating the unique operational limitations at the airport would dictate widening Runway 17R-35L to 100 feet and implementing the best possible GPS LPV approaches by conducting an AGIS survey. As a result, PWA would be fully capable of accommodating the variety of jets that are currently impacted by delays and diversions.

The parallel runway widening project involves adding 12.5 feet of runway pavement on both sides of the existing runway for a total width of 100 feet. The estimated total cost for the design/construction of the runway widening and associated AGIS survey is $6.2 million in 2020 dollars.

Federal Aviation Administration

Memorandum

Date: December 2, 2019

To: Kristy Slater, General Aviation Manager, City of Oklahoma City

From: Victoria Cassidy, Air Traffic Manager, Oklahoma City ATCT

Subject: Widening Runway 17R/35L at Wiley Post Airport

Mrs. Slater,

Thank you for giving us the opportunity to respond to the proposed widening of Runway 17R/35L at Wiley Post Airport. There are several reasons we believe the widening of 17R/35L would benefit Wiley Post Airport, Oklahoma City Approach Control, and especially our customers.

Last year, Will Rogers Airport conducted over 31,000 military operations. The widening of 17R/35L at Wiley Post Airport would allow Oklahoma City Approach Control to utilize Wiley Post Airport as a relief to the military traffic at Will Rogers. Routinely we have up to four military aircraft in our local traffic pattern. Under current procedures, we do not divert military aircraft to Wiley Post Airport to relieve Will Rogers' pattern traffic because it would saturate 17L/35R. The widening of the parallel runway would allow the military to utilize 17R/35L as they require 100 feet minimum runway width for traffic pattern practice. Aircraft include TEXII, T1, C130, E3, T38, MC12. Widening of 17R/35L would reduce military delays at Will Rogers and benefit Wiley Post Airport and their customers.

In addition, when 17L/35R is unavailable or occupied, some aircraft will refuse 17R/35L and divert either to another airport or request to be re-sequenced to 17L/35R citing safety concerns about the narrow runway. This creates unanticipated complexity for PWA Tower and Oklahoma City Approach Control and would be mitigated by the availability of a widened parallel runway.

My staff routinely attends the safety meeting conducted by Wiley Post Airport and a common complaint by operators on the field is long wait times. Because many operators will not or cannot utilize the narrow runway, they must wait for 17L/35R. Due to its proximity to Will Rogers, PWA departures are often delayed due to conflicting airborne traffic. This is compounded when several aircraft are awaiting departure and their sequence is determined by their place in line rather than the readiness of the crew. If a widened 17R/35L is available, then large and small aircraft will be able to utilize it for landing, departing, and offsetting, which will result in a more efficient operation for our customers

The airport manager at Wiley Post has expressed the need for traffic data on runway 17R/35L, however, due to the complexity of the air traffic network, it is nearly impossible for us at Oklahoma City ATCT, or anyone not physically in the control tower at Wiley Post, to determine the actual runway used for operations. Although OKC clears aircraft for approaches to particular runways, we have no conclusive way to determine which runway an aircraft actually landed on. I understand from speaking with the airport manager that she requested the controllers at Wiley Post document the arrivals and departures from runway 17R/35L in an attempt to obtain definitive data, but due to the limited staffing in the contract tower, the additional workload proved to be unfeasible.

I hope that this information assists you in obtaining a better understanding of the complex and extraordinary circumstances surrounding the safe operation of aircraft at Wiley Post Airport. By maximizing the utilization of 17R/35L, the efficiency of arrivals and departures will be greatly improved. Increasing the width of the runway will improve the quality of service for the airport users and increase overall safety and efficiency in the entire air traffic system in Oklahoma City.

Please feel free to contact me if you have any questions or need further information.

AMERICAN JET CHARTER

P.O. BOX 23917
Oklahoma City, OK 73123
Phone (405) 495-5453 Fax (405) 495-5472
www.american-jet.com

January 20, 2020

Dear Ms. Slater,

I am writing this letter as a charter operator that has been based at Wiley Post Airport for the past 34 years. It is my understanding that Wiley Post is under consideration for a project to widen runway 17R/35L and in need of some example operations and scenarios that will help justify this widening project to the FAA. American Jet Charter operates a 12 passenger Challenger 604, a 9 passenger Challenger 350, an 8 passenger Lear 60, a 9 passenger Citation VII, and 8 passenger Citation Encore, an 8 passenger Citation Bravo, a 7 passenger King Air E90, and a 4 passenger 58 Baron from Wiley Post for charter and owner flights on a regular basis and have seen the need for the widening of this runway. We are also adding a Gulfstream IV SP this spring that will operate on charters and owner flights from Wiley Post and would certainly need 17R/35L to be 100 feet wide to be able to utilize it safely.

Our larger jet aircraft must utilize the primary runway for departures and arrivals as under most conditions our flight crews do not feel safe using 17R/35L due to its narrow width of 75 ft. It is also my understanding in our meetings with some of the air traffic personnel at Wiley Post and Oklahoma City Approach Control that our departures and arrivals on the primary runway can be impacted by operations going on at Will Rogers due to the proximity of how the two airports runways line up. We have experienced some of these problems over the past couple of years and it has been quite the impact to our operations when it does occur. The primary impact we've experienced is having to hold on the ground for release of our IFR departures due to conflicting aircraft operating at Will Rogers. Just this month we had a flight delayed for almost 10 minutes for a Southwest 737 landing on runway 13 at Will Rogers. The amount of time we've been required to hold on the ground awaiting release has been up to 15 minutes in some instances. While awaiting release our flight crews have been offered the option to depart from 17R/35L with no delay, but as I've mentioned above, we cannot utilize that runway due to its narrow width. Based on the input from our flight crews over the last several years these departure delays occur for us an average of 2 to 4 times monthly. These delays can be a significant burden on our operations since we are transporting passengers to important business meetings and other events which could have time constraints. There is also the burden of the cost for the extra fuel burn while waiting to be released to consider.

In addition to the above delays on the ground awaiting departures we have also experienced delays on arrival. The primary runway is the only runway at Wiley Post with and ILS and as such it is used extensively for instrument approach procedure training by many of the flight schools based around the Oklahoma City metro area. Give the slower speed of these training operations and the much higher speed of our jet operations this type of traffic doesn't mix well utilizing the same runway. We have had to slow down on approach and also on occasion be re-sequenced for landing which delayed our arrival and cost us additional fuel burn. These arrival delays have occurred on average 2 to 4 times per month. If 17R/35L had been widened to 100 feet then we could have just moved over to that runway instead of being re-sequenced or delayed.

Thank you for your consideration in this project and should you need anything additional or have any questions I can be reached at 405-641-0893

Sincerely,

James Hensley
President

March 9, 2020

Kristy Slater

Wiley Post Airport

As the General Manager of Atlantic Aviation PWA, I speak with customers frequently about their travel in and out of the airport. I wanted to provide insight from my perspective in the matter of widening runway 17R/35L. On average, I hear about 10-15 times per month from tenants and transient crews about trouble they have experienced with the runway in question. In general, this usually leads to diversions to surrounding airports. Luckily, we have an Atlantic facility at Will Rogers World Airport and are able to mirror services crews need at that location. Otherwise, this would be a complete loss of revenue due to runway insufficiencies. Most of the feedback I get concern safety for larger aircraft depending on weather conditions and aircraft limitations. I have repeatedly heard complaints about wait times for 17L/35R; the shorter runway is often not a viable solution due to safety concerns. If the width of runway 17R/35L was addressed, I believe we would nearly eliminate all complaints of long hold times.

While my perspective is not as technical as a pilot's is, I hope it can provide some insight to this important airport community concern. Thank you.

Evin Jefferson
General Manager- Atlantic Aviation PWA

Evin.jefferson@atlanticaviation.com

From: Jered Hamel <Jered.Hamel@loves.com>
Sent: Friday, January 31, 2020 10:36 AM
To: Slater, Kristy K <kristy.slater@okc.gov>
Subject: Re: [EXT] RE: Justification Examples For 17R/35L Widening

Dear Ms. Slater,

I am writing this email as an operator at Wiley Post Airport. From conversations I have had with you and others it is my understanding that Wiley Post is under consideration for a project to widen runway 17R/35L and needs some example operations and scenarios that will help justify this project to the FAA. Our flight department operates Cessna Citation aircraft. Although not category CII aircraft, we still receive delays on departure being behind that category aircraft from Wiley Post for Pronto LLC on a regular basis and have seen the need for the widening of this runway.

Our aircraft must utilize the primary runway for departures and arrivals as we do not utilize 17R/35L due to its narrower width of 75 ft. It is my understanding in our meetings with some of the air traffic personnel at Wiley Post and Oklahoma City Approach Control that our departures and arrivals on the primary runway can be impacted by operations going on at Will Rogers due to the proximity of how the two airports runways line up. We have experienced some of these problems over the past couple of years and it has been quite the impact to our operations when it does occur. The primary impact we've experienced is having to hold on the ground for release of our IFR departure due to conflicting aircraft operating at Will Rogers. The amount of time we've been required to hold on the ground awaiting release has been 10 to 30 minutes in some instances or more depending on the weather conditions for that particular day. While awaiting release we've been offered the option to depart from 17R/35L with no delay, but as I've mentioned above, we cannot utilize that runway due to its narrow width. Based on my best guess over the last several years these departure delays occur for us an average of 5 to 7 times a month. These delays can be a significant burden on our operations being that we are taking our passengers to important business meetings and other events which have time constraints. There is also the burden of the cost for the extra fuel burn while waiting for release to consider.

In addition to the above delays on the ground waiting for departure, we have also experienced arrival delays. The primary runway is the only runway at Wiley Post with an ILS and as such it is used extensively for instrument approach procedure training around the Oklahoma City metro area. Given the slower approach speeds of these training flights and the much higher speeds of our jet operations, these type of traffic operations can and do cause conflicts for the primary runway. We have had to slow down on approach and on occasion be re-sequenced for landing. These arrival delays have occurred on an average every week we are returning back to Wiley Post, and we fly every week! If 17R/35L had been widened, it can be utilized more and less re-sequencing delays would result.

Thank you for your consideration in this project and should you need anything additional or have any questions I can be reached at my information below.

Thank You for your time and consideration in growing Wiley Post.

Jered Hamel

Pronto LLC

Aviation Manager – Chief Pilot

Love's Travel Stops & Country Stores

o: 405-463-8411

c: 620-242-3762

f: 405-789-0622

jered.hamel@loves.com

Loves.com

Follow us on: Facebook | Twitter | LinkedIn | Instagram

From: Tim Jamison <Tim.Jamison@clr.com>
Sent: Saturday, February 1, 2020 5:17 PM
To: Slater, Kristy K
Subject: Rwy 17R / 35L
Attachments: clr2018sig5_d6b5d1ee-d7ba-409b-b2ca-c8f57dc54a8d.png; clr2018sig5_1f6dedbc-3106-4de3-ba61-75ac830194d2.png

Dear Ms. Slater,

I am writing this email as an operator at Wiley Post Airport. From conversations I have had with you and others it is my understanding that Wiley Post is under consideration for a project to widen runway 17R/35L and needs some example operations and scenarios that will help justify this project to the FAA. I operate a Citation XLS+ and Citation 750+ from Hangar 25 at Wiley Post for Continental Resources, Inc. on a regular basis and have seen the need for the widening of this runway.

Our aircraft must utilize the primary runway for departures and arrivals as we do not feel safe utilizing 17R/35L due to its narrow width of 75 ft. Crosswind and runway contamination and our aircraft weight also limit the use. It is my understanding in our meetings with some of the air traffic personnel at Wiley Post and Oklahoma City Approach Control that our departures and arrivals on the primary runway can be impacted by operations going on at Will Rogers due to the proximity of how the two airports runways line up. We have experienced some of these problems over the past couple of years and it has been quite the impact to our operations when it does occur. Over the past few years we have averaged over 200 take off and 200 landings at PWA per year. The primary impact we’ve experienced is having to hold on the ground for release of our IFR departure due to conflicting aircraft operating at Will Rogers. The amount of time we’ve been required to hold on the ground awaiting release has been in excess of 20 minutes in some instances While awaiting release we’ve been offered the option to depart from 17R/35L with no delay, but as I’ve mentioned above, we cannot utilize that runway due to its narrow width and limited length. Based on my best guess over the last several years these departure delays 5 times or more each month. These delays place a significant burden on our operations being that we are taking our passengers to important business meetings and other events which have time constraints. There is also the burden of the cost for the extra fuel burn while waiting for release to consider. Our aircraft burn 75 & 150 gallons respectively per hour on the ground.

In addition to the above delays on the ground awaiting departure we have also experienced delays on arrival. The primary runway is the only runway at Wiley Post with an ILS and as such, it is used extensively for instrument approach procedure training around the Oklahoma City metro area. Given the slower speed of these training operations and the much higher speed of our jet operations this type of traffic doesn’t mix well utilizing the same runway. We have had to slow down on approach and/or have to be vectored out and slowed down as much as 100 kts and be re-sequenced for landing which delayed our arrival and cost us additional fuel burn. These arrival delays have occurred on average of 6 times per month. If 17R/35L had been widened to a width that we could use for landing we could just move over to that runway instead of being re-sequenced. Another potential issue is having to divert to another airport.

Thank you for your consideration in this project and should you need anything additional or have any questions I can be reached at 580-747-4508 or tim.jamison@clr.com.

Tim Jamison

Chief Pilot and Aviation Manager

Continental Resources, Inc.
6101 N Rockwell Ave
Bethany, OK 73008
P/F 405-234-9600
Cell 580-747-4508
tim.jamison@clr.com

From: Jeff Sandusky <JSandusky@cirrusaircraft.com>
Sent: Friday, November 8, 2019 5:15 PM
To: Slater, Kristy K <kristy.slater@okc.gov>; Evin Jefferson <evin.jefferson@atlanticaviation.com>; Jeff Sandusky <JSandusky@cirrusaircraft.com>
Subject: KPWA 17R/35L Possible Improvements

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Kristy Slater,
Wiley Post Airport,

It is my understanding that there is the possibility of improving / widening the 17R/35L Runway at KPWA Wiley Post Airport.
I would like to express how important this project is to myself along with other operators of both Turbine and Non Turbine Aircraft.
During peak operating times of the airport, I commonly see many aircraft both in the pattern and arrivals coming into KPWA simultaneously with significantly different approach speeds.
This causes a difficult situation for the controllers resulting in a difficult situation for the pilots.
Anytime a pilot is in the critical phase of flight with sudden changes increases the risk of a safety concern.

Please review the radar path of N-105JS arriving at KPWA yesterday 11-7-19 at approx. 4:54 pm CST.
This is a common example of multiple aircraft inbound to KPWA simultaneously with very different airspeeds.
N-105JS should have been selected to be number 1 to land, but due to different aircraft size and speed, N-105JS was selected by Tower to land number 2 behind a Jet, with another Jet being

number 3 to land.
Tower then directed N-105JS to turn outbound clearing the first Jet to land 35R number 1, N-105JS cleared to land number 2 on 35R, and the third Jet to land number 3 on 35R.
Well, It did not work out.
N-105JS arrived at the airport prior to the Jet cleared to land number 1, N-105JS was then turned outbound to let the number 1 Jet land.
But the number 1 Jet slowed significantly putting a bottle neck on runway 35R.
N-105JS was then turned inbound with a runway change to 35L and cleared to land 35L.
The Number 1 Jet remained cleared to land 35R while the number 3 Jet was then cleared to land Number 2 on 35R.

Everything worked out just fine and there was not a safety of flight issue at any time, BUT N-105JS is based at KPWA, very familiar with the airport environment, and specifically the 35L runway.

Take this same scenario and make a minor change.
Let's say N-105JS would have been a much larger aircraft, or the pilot was not familiar with the Runway Environment of the smaller 17R/35L, or the weather/wind would have been marginal, or even worse a combination.
OR if for some reason 17L/35R would have been closed for any length of time!

As future air traffic increases, the number of these situations will increase and any improvement to 17R/35L will increase the utilization of Wiley Post Airport KPWA while improving Safety.

Please review the radar and communication arrival of N-105JS along with the 2 other Jets arriving at KPWA on 11-7-19 at approx. 4:54 pm CST.

Please Help Us Help You In Continuing to Improve Aviation Safety.

Thank You,

Jeff Sandusky – N-105JS
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