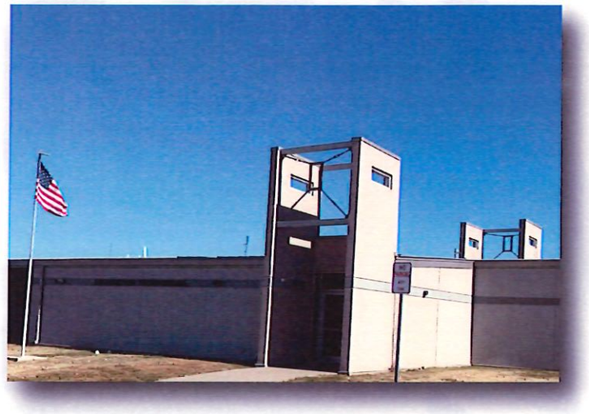
Halliburton Field
Hangar Development Plan



Parkhill

Mead & Hunt

Halliburton Field
Hangar Development Plan

March 2023

Parkhill

Mead & Hunt

Contents

Tables

Illustrations

Halliburton Field

Introduction

This Hangar Development Plan (Plan) is intended to provide a reasonable and feasible schematic hangar development concept for Halliburton Field (DUC or the Airport). It is tailored to meet the specific needs of DUC but adheres to all Federal Aviation Administration (FAA) design standards. Using the anticipated long-term demand for general aviation (GA) hangars, this Plan evaluates and illustrates the existing and future layout of airport facilities and provide the basis for which the City of Duncan can adequately plan and program for future capital expenditures. The Plan's scope includes an inventory of DUC's existing facilities, confirms the existing and future dimensional criteria, prepares alternative development schemes for review and evaluation, provides planning-level cost estimates, and updates the Airport Layout Plan (ALP) drawing sheet.

Airport Role and Facilities

DUC, located in Stephens County, is approximately two miles south of downtown Duncan and contained entirely within City of Duncan corporate boundary. DUC is owned and operated by the City of Duncan, with the City Council having overall management and operational responsibility of the facility. DUC is designated as a General Aviation airport by the FAA and is categorized as a Regional Business facility by the Oklahoma Aeronautics Commission (OAC).

Airside Facilities

DUC is operated with a single north-south oriented runway and supported by a full-length parallel taxiway system. **Figure 1**, entitled *EXISTING AIRPORT LAYOUT,* provides a graphic presentation of the existing airport facilities. Additional airport information includes:

- ***Airport Reference Point:*** **Latitude N 34° 28' 16.7000" and Longitude W 97° 57' 35.5000" (estimated)**
- ***FAA Site Number:*** **18932.*A**
- ***Airport Elevation:*** **1,114.3 feet above mean sea level (AMSL)**
- ***Acreage:*** **560.0 acres**
- ***Mean Normal Temperature of hottest month:*** **94.9° F (August)**

Runway/Taxiway System

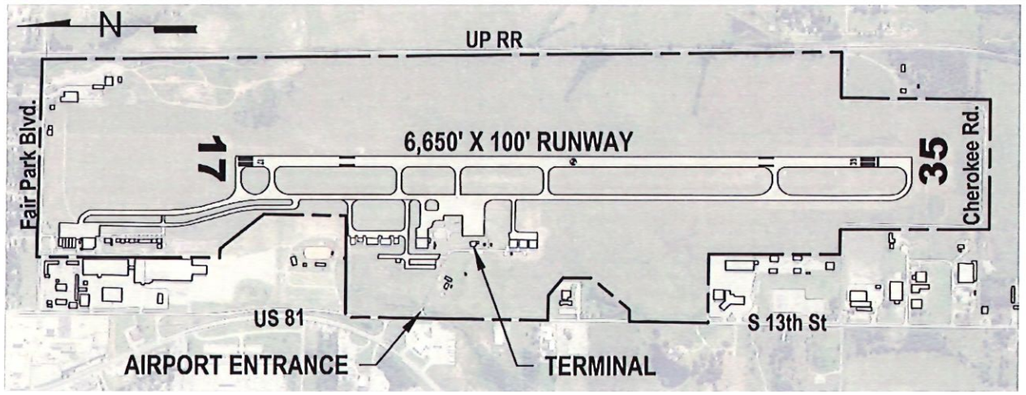
Using information from the existing ALP and other sources, the key components of the airfield are outlined and described in the text below. In addition, a copy of the current DUC ALP that was amended in 2018 in included for reference in Appendix One of this document.

Runway 17/35

- Runway Design Code (RDC): RDC C-II-4000
- Dimension (Width): 100'
- Dimensions (Length): Runway 17 – TORA: 6,650' Runway 35 – TORA: 6,650'
  Runway 17 – TODA: 6,650' Runway 35 – TODA: 6,650'
  Runway 17 – ASDA: 6,326' Runway 35 – ASDA: 6,650'
  Runway 17 – LDA: 6,326' Runway 35 – LDA: 6,326'
- Displaced Threshold (DT): Runway 35 – 324'
- Pavement/Strength: Grooved Concrete/Single Wheel – 44K lbs., Dual Wheel – 56K lbs.,

	Dual Double Tandem Wheel – 101K lbs.
▪ Edge Lights:	Medium Intensity Runway Lights (MIRLs)
▪ End Lights:	Runway End Identifier Lights (REILs) – Runway 35
▪ Approach Lights:	Omni-Directional Approach Lights (ODALs) – Runway 17
▪ Visual Slope Indicator:	4-light Precision Approach Slope Indicator (PAPI) – Runway 17
▪	4-light Visual Approach Slope Indicator (VASI) – Runway 35
▪ Instrument Approach:	RNAV (GPS) to each runway end
▪ Traffic Pattern:	Runway 17 – left, Runway 35 – left
▪ Obstructions:	None – 34:1 approach slope surface is clear to each runway end

Figure 1 EXISTING AIRPORT LAYOUT



Runway 17/35 Taxiway System. The west side of the runway is served by a full-length parallel taxiway (i.e., Taxiway A) and seven connector/exit taxiways. that are designed to varying standards and dimensions. This taxiway system is constructed of concrete that is 50' feet in width.

Hangar Development Area Site Analysis

The boundaries of the project study area for the future hangar development area have been defined as all airport owned property west of Taxiway A, east of South 13th Street (Old Highway 81), south of the County Fairgrounds and Rodeo Arena, and north of Cherokee Road near the Runw35 threshold. **Figure 2**, entitled *EXISTING FACILITIES/SITE ANALYSIS,* provides a graphic presentation of the key site conditions and facilities within the project study area.

Existing Airport Facilities. The existing airport facilities located within the hangar development area include the terminal building located in the north central portion adjacent to the terminal apron. Fixed Base Operator (FBO) hangars are located north of the terminal building. The terminal building and FBO hangars are equipped with large aprons providing direct access to Taxiway A. Four executive hangars are located north of the FBO hangars with connector taxiways providing aircraft access from Taxiway A. A 12-unit T-hangar is located west of the large FBO hangar and a smaller executive hangar is sited north of the T-hangar. Aircraft access to these hangars is provided by an extension of the south connecting taxiway. Three large corporate hangars located south of the terminal building and DUC's fuel storage facility is sited between the

RUNWAY 17/35 6650' x 100'

TAXIWAY 'A'

EXISTING MUNICIPAL WATER

APRON

EXISTING DRAINAGE SWALE

IRRIGATION PIVOT

ABOVE GROUND FUEL TANKS (TO BE RELOCATED)

COUNTY FAIRGROUNDS & RODEO ARENA

EXISTING DRAINAGE/ STEEP TOPOGRAPHY

SECURITY FENCING

ELECTRICAL SUBSTATION

HWY 81

S 13th St

AIR EVAC LIFETEAM 25 w/ HELIPAD

EXISTING OVERHEAD UTILITIES

EXISTING DRAINAGE SWALE

EXISTING VEHICULAR ACCESS

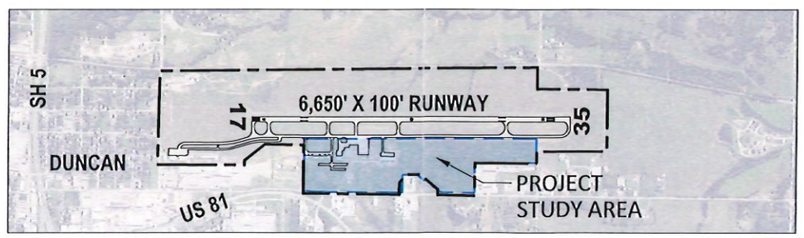
EXISTING SANITARY SEWER

Parkhill www.parkhill.com

Prepared By: Mead&Hunt www.meadhunt.com

EXISTING LAND USE

- AIRPORT PROPERTY/PROJECT STUDY AREA
- DUNCAN AIRPORT INDUSTRIAL DEVELOPMENT AREA
- COMMERCIAL
- INDUSTRIAL
- PUBLIC
- RESIDENTIAL



Key Map

BUILDINGS

1. PUBLIC TERMINAL BUILDING
2. FBO HANGAR
3. 12 UNIT T-HANGAR
4. EXECUTIVE HANGAR
5. CORPORATE HANGAR
6. AIRFIELD ELECTRICAL VAULT
7. MEDIVAC FACILITY
F. FUEL
E. ELECTRICAL BOX

N

0 100 200 400 600

GRAPHIC SCALE IN FEET

LEGEND

- BUILDING RESTRICTION LINE (35' HT.) — BRL
- RUNWAY SAFETY AREA — RSA
- RUNWAY OBJECT FREE AREA — ROFA
- AIRPORT PROPERTY LINE
- FENCE
- OVERHEAD UTILITIES — OE
- DRAINAGE SWALE
- BEACON
- LIGHTED WIND CONE

Halliburton Field (DUC) Duncan, Oklahoma

HANGAR DEVELOPMENT PLAN

Figure 2 **Existing Facilities/Site Analysis**

terminal building and the corporate hangars. The Air Evac Lifeteam 25 medivac facilities, consisting of a helipad, above-ground fuel storage, and two buildings are located south of the airport entrance road just southwest of the T-hangar.

Vehicular Access. The airport entrance road provides access to the terminal building, the T-hangar, and the three corporate hangars from South 13th Street. A connection from South 13th Street to State Highway 81 is provided and South 13th Street provides access to downtown Duncan.

Utilities. Overhead electric is provided along South 13th Street with access to airport property near the northern end of the hangar development area boundary. Belowground electric is dispersed to all airport facilities from the electrical vault located south of the terminal building. Municipal water is supplied from the north to the terminal building through an underground pipe adjacent Taxiway A. Sanitary sewer is provided from the north through the County Fairgrounds and Rodeo Arena as well as from the west along South 13th Street. Currently, a large irrigation pivot is in the open field south of the three corporate hangars, but DUC staff indicate it is to be removed in the future.

Topography/Drainage. The development area slopes generally to the west and south. An existing drainage swale is located adjacent to and west of Taxiway A.

Developable Property. Existing site drainage and steep slopes generally prohibit development west of the T-hangar and south of the Air Evac Lifeteam 25 facilities. An existing security fence largely surrounds the development area along the north airport property line, west along South 13th Street, north of the airport entrance road, south of the Air Evac Lifeteam 25 facilities, and follows the airport property line to the south.

Land Use. Existing land uses surrounding the development area are predominantly a mixture of public, commercial, and industrial along South 13th Street. Residential uses occur west of South 13th Street slightly south of the development area. Directly north land uses consist of the public use County Fairgrounds and Rodeo Arena. Within the middle third of the development area, the City of Duncan has identified the Duncan Airport Industrial Development Area specifically for industrial uses on DUC.

Critical Design Aircraft Confirmation

Knowledge of the types of aircraft currently using, and those that are expected to use the Airport are an important design consideration. Airfield geometry is designed in accordance with the appropriate Runway Design Code (RDC) standards as specified in FAA's Advisory Circular (AC) 150/5300-13B, *Airport Design*. The RDC is a coding system used to relate design criteria to the operational and physical characteristics of the Design Aircraft (or Critical Aircraft) that is determined the most demanding aircraft, or group of aircraft with similar characteristics, using or projected to use an airport on a regular basis.

The RDC is comprised of three components and two of these relate specifically to the Design Aircraft. The first aircraft component, depicted by a letter (i.e., A, B, C, D, or E), is the Aircraft Approach Category (AAC) and is related to the aircraft approach speed. The second aircraft component, depicted by a roman numeral (i.e., I, II, III, IV, V, or VI), is the Airplane Design Group (ADG) and is related to the aircraft wingspan and tail height.

Historical Data

Aircraft Operations

Critical Design Aircraft determination begins with exploring historical aircraft operations (an operation is defined as either a take-off or a landing). Historical data for DUC comes from the FAA's *Terminal Area Forecasts, 2021-2045* and is presented in **Table 1**. According to the TAF, there have been 8,750 estimated operations at DUC for each of the past 11 years. Aircraft operations are further refined into itinerant and local categories. Itinerant operations are those that originate and terminate at different airports. Local operations are those and originate and terminate at the same airport and are most often performed by pilots conducting touch-and-go procedures.

Table 1 HISTORICAL AIRCRAFT OPERATIONS, FY 2011-2021

Fiscal Year	Itinerant Operations				Local Operations		Total Operations
	Air Carrier	Air Taxi	General Aviation	Military	General Aviation	Military	
2011	0	250	2,500	0	6,000	0	8,750
2012	0	250	2,500	0	6,000	0	8,750
2013	0	250	2,500	0	6,000	0	8,750
2014	0	250	2,500	0	6,000	0	8,750
2015	0	250	2,500	0	6,000	0	8,750
2016	0	250	2,500	0	6,000	0	8,750
2017	0	250	2,500	0	6,000	0	8,750
2018	0	250	2,500	0	6,000	0	8,750
2019	0	250	2,500	0	6,000	0	8,750
2020	0	250	2,500	0	6,000	0	8,750
2021	0	250	2,500	0	6,000	0	8,750

Source: FAA Terminal Area Plan, 2021-2045, January 2022.
Note: Fiscal Year is from October 1 through September 30.

The TAF further refines the operations data by categories based on broad aircraft types, which are air carrier, air taxi, general aviation (GA), and military. Air carrier are defined as commercial aircraft operations conducted by aircraft with more than 60 seats. Air taxi operations are defined as commercial aircraft operations conducted by aircraft with 60 or fewer seats on non-scheduled or for-hire flights. GA operations are all civilian non-commercial aircraft activity and military operations are conducted by military aircraft.

Based Aircraft

Table 2 presents the historical based aircraft at DUC using information from FAA's TAF and Form 5010 Airport Master Record. Based aircraft are those that stored at an airport in a hangar or apron and do not include itinerant aircraft temporarily stored for maintenance purposes. The FAA categorizes based aircraft by engine type with the main categories being single engine piston, multi-engine piston, jet aircraft with turbine engines (includes both turboprops and turbojets), helicopter, and other (which include experimental sport, glider, and ultralight aircraft).

Table 2 HISTORICAL BASED AIRCRAFT, FY 2011-2021

Fiscal Year	Single Engine	Multi Engine	Jet	Helicopter	Other	Total Based Aircraft
2011[1]	25	1	0	0	0	26
2012[1]	25	1	0	0	0	26
2013[1]	25	1	0	0	0	26
2014[1]	30	4	1	1	0	36
2015[1]	29	5	1	1	0	36
2016[1]	29	5	1	1	0	36
2017[1]	24	10	4	2	0	40
2018[1]	24	10	4	2	0	40
2019[1]	26	9	4	1	0	40
2020[1]	27	9	4	1	0	41
2021[2]	25	7	4	1	0	37

Sources: [1] FAA Terminal Area Plan, 2021-2045, January 2022.
[2] FAA Form 5010 Airport Master Record for Halliburton Field/Duncan Municipal Airport, December 2, 2021.
Note: Fiscal Year is from October 1 through September 30.

Based aircraft have fluctuated over the past 11 years with an overall increase. Currently there are 25 based single engine piston aircraft, 7 multi engine piston aircraft, 4 based turbine engine aircraft, and 1 helicopter based at DUC. DUC records indicate that the four jets based at DUC include two business jet and two turboprop aircraft.

Aircraft Operations by RDC

A historical snapshot assessment of the DUC operational data recorded in FAA's Traffic Flow Management System Counts (TFMSC) for fiscal years 2011 through 2021 has been generated for review and presented in **Table 3**. TFMSC data is compiled from Instrument Flight Rules (IFR) filed flight plans to or from an airport, and/or when flights are radar detected by the National Airspace System. The TFMSC is an incomplete data source as it excludes most Visual Flight Rules (VFR) and some non-enroute IFR traffic. However, it has a very high confidence level for recording virtually all GA business jet and turboprop aircraft operations. It provides a very good baseline estimate of the larger and more sophisticated aircraft currently operating at an airport, aircraft that nearly always file IFR flight plans regardless of weather conditions. Given the focus of this Plan, the TFMSC data for DUC was compiled by ADG category, as it is on this category that most taxiway/taxilane design standards are based. **Table 3** provides the 11-year average of TFMSC data for each ADG category of aircraft operating at DUC. The complete TFMSC Report that includes aircraft specific operational data is provided in Appendix Two of this Plan.

Table 3 SUMMARY OF TFMSC AVERAGE AIRCRAFT OPERATIONS BY RDC, FY 2011-2021

ADG	Representative Aircraft[1]	Average Operations	Percentage
I	Beech Bonanza 35, Beech King Air 90, Cessna Citation M2, Bombardier Learjet 45, Piper Cherokee	905	74.3%
II	Beechcraft Super King Air 200/300, Cessna Citation Sovereign, Pilatus PC-12	308	25.3%
III	Gulfstream GV/G500	5	0.4%
Total		**1,218**	**100%**

Source: Mead & Hunt analysis from FAA Traffic Flow Management System Counts (TFMSC) data, January 2022.
Notes: See Appendix One for complete aircraft listing.
Fiscal Year is from October 1 through September 30.

As can be noted, the TFMSC Report documented an average of 1,218 total operations at DUC between 2011 and 2021, with 905 average annual operations (approximately 74.3 percent of this activity) being attributed to ADG I aircraft. An average of 308 annual operations (approximately 25.3 percent of this activity) were recorded by ADG II aircraft. An average of 5 annual operations (less than 1 percent) were conducted by ADG III aircraft.

DUC stakeholders indicate that the largest future aircraft types to be based at or use DUC for maintenance, repair, or overall services are likely to be turboprop aircraft such as the Cessna 421 and Beechcraft King Air 200/300, as well as small to mid-sized business jets such as the Bombardier Learjet 45XR, Embraer Phenom 100, and Cessna Citation Sovereign/Latitude/Longitude. These aircraft are within ADG categories I or II. No aircraft in the ADG III category are expected to make use of DUC facilities on more than rare occasions, as demonstrated by the historical TFMSC data.

Based on this information, the Critical Design Aircraft for this Plan is confirmed to be the composite of aircraft within the ADG II category. This conforms with the existing ALP, which shows the existing RDC to be C-II. However, since the Airport will continue to be used predominantly by smaller aircraft, this Plan will continue to plan and program for aviation facilities meeting the design criteria associated with both ADG I and II categories. Therefore, the provision of future aircraft storage facilities and access taxiway system near the terminal building should be designed using ADG II standards, striving to separate the two categories of aircraft storage facilities where possible.

Hangar Development Area Design Standards

The existing FAA design standards applicable to DUC and used in formulizing this Plan have been excerpted from AC 150/5300-13B and are presented in **Table 4**. As highlighted in the table, ADG II criteria will be used for the DUC development areas expected to be used by the larger aircraft. The table also provides the Taxiway Design Group (TDG) dimensional standards used in designing taxiway pavements. TDG 2 is appropriate at DUC as determined by the Critical Design Aircraft analysis presented previously. It should also be noted that FAA's recent update of the Airport Design AC (i.e., AC 150/5300-13B) includes some revisions to the ADG II taxiway dimensional criteria, which reduce the previously recommended taxiway and taxilane OFAs from 131 feet to 124 feet and 115 feet to 110 feet, respectively.

Table 4 HANGAR DEVELOPMENT DESIGN STANDARDS MATRIX

3/31/2022 AC 150/5300-13B

Table 4-1. Design Standards Based on Airplane Design Group (ADG)

DUC Existing Standards

Item	ADG					
	I	II	III	IV	V	VI
Taxiway and Taxilane Protection						
TSA (maximum ADG wingspan)	49 ft (14.9 m)	79 ft (24.1 m)	118 ft (36 m)	171 ft (52 m)	214 ft (65 m)	262 ft (80 m)
TOFA [2]	89 ft (27.1 m)	124 ft (38 m)	171 ft (52 m)	243 ft (74 m)	285 ft (87 m)	335 ft (102 m)
TLOFA [2]	79 ft (24.1 m)	110 ft (34 m)	158 ft (48 m)	224 ft (68 m)	270 ft (82 m)	322 ft (98 m)
Taxiway and Taxilane Separation						
Taxiway centerline to parallel taxiway centerline [1]	70 ft (21.3 m)	101.5 ft (30.9 m)	144.5 ft (44 m)	207 ft (63 m)	249.5 ft (76.1 m)	298.5 ft (91 m)
Taxiway centerline to fixed or movable object [2]	44.5 ft (13.6 m)	62 ft (18.9 m)	85.5 ft (26.1 m)	121.5 ft (37 m)	142.5 ft (43 m)	167.5 ft (51 m)
Taxilane centerline to parallel taxilane centerline [1]	64 ft (19.5 m)	94.5 ft (28.8 m)	138 ft (42 m)	197.5 ft (60.2 m)	242 ft (74 m)	292 ft (89 m)
Taxilane centerline to fixed or movable object [2]	39.5 ft (12.2 m)	55 ft (16.8 m)	79 ft (24.1 m)	112 ft (34 m)	135 ft (41 m)	161 ft (49 m)
Wingtip Clearance						
Taxiway wingtip clearance	20 ft (6.1 m)	22.5 ft (6.9 m)	26.5 ft (8.1 m)	36 ft (11 m)	35.5 ft (10.8 m)	36.5 ft (11.1 m)
Taxilane wingtip clearance	15 ft (4.6 m)	15.5 ft (4.7 m)	20 ft (6.1 m)	26.5 ft (8.1 m)	28 ft (8.5 m)	30 ft (9.1 m)

Note 1: See Figure 4-5.
Note 2: See Figure 4-6.
Note 3: See paragraphs 4.5.3.1 and 4.5.4.1 for TSA and TOFA standards at fillets.

Table 4-2. Design Standards Based on Taxiway Design Group (TDG)

DUC Existing Standards

Item	TDG							
	1A	1B	2A	2B	3	4	5	6
Taxiway/Taxilane Width [1]	25 ft (7.6 m)	25 ft (7.6 m)	35 ft (10.7 m)	35 ft (10.7 m)	50 ft (15.2 m)	50 ft (15.2 m)	75 ft (22.9 m)	75 ft (22.9 m)
Taxiway Edge Safety Margin [1]	5 ft (1.5 m)	5 ft (1.5 m)	7.5 ft (2.3 m)	7.5 ft (2.3 m)	10 ft (3 m)	10 ft (3 m)	14 ft (4.3 m)	14 ft (4.3 m)
Taxiway Shoulder Width [2]	10 ft (3 m)	10 ft (3 m)	15 ft (4.6 m)	15 ft (4.6 m)	20 ft (6.1 m)	20 ft (6.1 m)	30 ft (9.1 m)	30 ft (9.1 m)
Taxiway/Taxilane Centerline to Parallel Taxiway/Taxilane Centerline w/180 Degree Turn	See Table 4-6 and Table 4-7.							

Note 1: See Figure 4-4.
Note 2: When the most demanding aircraft has four engines and is TDG 6, the standard taxiway shoulder width is 40 feet (12.2 m).

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

Required Aviation Facilities

Converting the previous information to the type and number of aircraft hangar spaces needed in the next 20 years involves applying professional judgment to stakeholder growth plans and understanding the market forces at work at both the national and local levels.

National Aviation Growth Trends

Long-term nationwide aviation expectations are provided in FAA's *Aerospace Forecast 2021-2041*, which serve as a point of comparison between national and local trends. Major assumptions employed in the forecasts and the projections relevant to this Plan are summarized here:

- The U.S. active GA aircraft fleet is expected to increase slightly at a 0.1 percent compound annual growth rate (CAGR).
- Active piston-powered fixed-wing aircraft are projected to decrease at a CAGR of 0.9 percent.

  - Active single-engine piston-powered aircraft are forecast to decline at a CAGR of 0.9 percent.
  - Active multi-engine piston-powered aircraft are projected to decline at a 0.4 percent CAGR.
- Active turbine-powered, fixed-wing aircraft are expected to increase at a 1.7 percent CAGR.
  - Active turboprop aircraft are expected increase at a CAGR of 0.6 percent.
  - Active turbojet aircraft are projected to increase at a CAGR of 2.3 percent.
- Active light sport aircraft (i.e., aircraft with weight, capacity, and performance restrictions) are projected to increase significantly by a CAGR of 4.0 percent.
- Anticipated GA aircraft hours flown will increase at a CAGR of 1.0 percent.
  - Hours flown by the GA piston-powered fleet will decrease by a CAGR of 0.5 percent.
  - Hours flown by the GA turbine-powered fleet will increase by a CAGR of 2.5 percent

Regional Socioeconomic Growth Trends

Regional socioeconomic data generally correlates with aviation activity within the same geographic region. Population, employment, income, and gross regional product (GRP) are indicators that typically influence aviation activity. Population is an indication of the general number of persons served by an airport, and therefore influences the potential customer base. Employment levels gauge economic activity and vitality. Income statistics reflect the degree to which an airport's customer base has sufficient disposable income to spend on aviation activities such as airline ticket purchases, pilot training, aircraft ownership, and aircraft charter or rental. GRP is the value of goods and services produced in an area and serves as an index for the health of the overall economy.

The economic and demographic forecasting firm Woods & Poole, Inc, is used for the regional socioeconomic data projections in this Plan. The projections indicate a somewhat slow but steady increase during the 20-year period. Pertinent data expectations for Stephens County (smallest geographic unit for which projections are provided) are summarized here:

- Population is expected to increase from 43,565 in 2021 to 44,260 in 2041, a CAGR of 0.1 percent.
- Employment is expected to increase from 24,056 in 2021 to 25,357 in 2041, a CAGR of 0.3 percent.
- Per capita personal income is expected to increase from $46,696 in 2021 to $110,936, a CAGR of 4.4 percent.
- GRP is expected to increase from $1.458 million in 2021 to $1.598 million in 2041, a CAGR of 0.5 percent.

Local Aviation Growth Factors

Engagement with DUC stakeholders indicate the potential for aviation growth over both the short- and long-term periods is substantial. Investment from both private and government entities is anticipated. The City of Duncan is very supportive of the aviation industries at DUC. The OAC expects to provide funding of approximately $475,000 over three years for pavement repair and taxilane construction. Local entities are cooperating with Red River Technology Center that will bring airframe and powerplant mechanic training to high school students with the intent of employing mechanics at DUC. Existing flight training at DUC is provided by an existing Code of Federal Regulations Title 14 (14 CFR) Part 61 flight school with the intent to eventually provide a 14 CFR Part 141 flight school. DUC's FBO will continue marketing their turbine engine maintenance, repair, and overhaul capabilities to an expanding regional market. Additionally, FBO personnel indicate the desire to operate a 14 CFR Part 135 air charter company in the future.

Required Aviation Facilities

Using the preceding information, a determination of future aviation facilities indicates that hangar storage spaces for turbine-powered aircraft will remain strong based on local and national factors. As many as six

Beechcraft Super King Air 200/300 aircraft and one Bombardier Learjet 45XR might require storage in the short-term (0-5 year) period. Additionally, FBO personnel indicate there is an immediate need to relocate two Cessna 421 multi-engine piston aircraft from the existing maintenance hangar to a stand-alone executive hangar and to provide approximately the same amount of hangar space for aircraft maintenance activities, including a dedicated "clean room" space allocated for avionics repair and maintenance.

Growth needs during the intermediate-term (6-10 year) period are more difficult to predict. However, the continued marketing of the FBO's turbine engine maintenance capabilities will attract more turboprop and business jets to both base their aircraft at DUC and use the facilities for maintenance. Increased flight training at DUC is anticipated to increase based single engine piston aircraft and require addition apron space for the training aircraft. While growth rates for traditional piston-powered aircraft are expected to decrease nationally and locally, the increased use of Light Sport Aircraft should offset the declines and maintain a high level of demand for smaller aircraft storage spaces such as T-hangars or smaller executive hangars.

Long-term (11-20 year) period growth needs are even more difficult to predict with any degree of accuracy. However, a dedicated FBO hangar would improve the overall airport user experience by consolidating many airport services in one location. Space near the existing terminal building should be reserved for a FBO hangar served with direct apron access. As DUC's aviation facilities and services are expanded and initiated, adequate space for an extension of the terminal building should also be reserved. In fact, the existing structure was designed to be expanded to the south so this option will be retained.

Table 5 provides the approximate amount of aviation facilities required during the 20-year planning period covered by this Plan. They form the basis for the development of alternatives that will be presented and evaluated in the next section.

Table 5 FUTURE AVIATION FACILITY NEEDS

Time Frame	T-hangar Spaces	Executive Hangar	Corporate Hangar	Maintenance Facility	FBO	Terminal Building
Short-Term (0-5 Years)	4	3	2	10,000 sf		
Intermediate-Term (6-10 Years)	2	1	2			
Long-Term (11-20 Years)	4	2	4	5,500 sf	10,000 sf	2,500 sf
Total	**10**	**6**	**8**	**15,500**	**10,000 sf**	**2,500 sf**

Source: Mead & Hunt analysis.

Hangar Development Area Alternatives

The intent of this Plan is to identify a long-term hangar development concept for DUC that can best accommodate the future storage requirements of various ADG I and II aircraft operators at the facility. The Plan must facilitate a cost-effective development program that can be easily phased for expansion in response to on-going hangar demand, as well as provide a variety of aircraft storage options to potential tenants. It does so through a comprehensive and thorough examination of alternative development schemes that meet the needs of airport users as well as the strategic vision of the City of Duncan.

Two alternatives have been prepared and analyzed. Alternative One illustrates a potential layout for a new access taxiway that extends from the existing terminal apron, south of the terminal building to serve a future hangar development area. For Alternative Two, the new access taxiway would be constructed further to the

south, south of the existing corporate hangars extending to the west from the existing parallel taxiway and provide airside access to a larger hangar development area. An outline of the key development components for each alternative is presented in the following text.

Alternative One

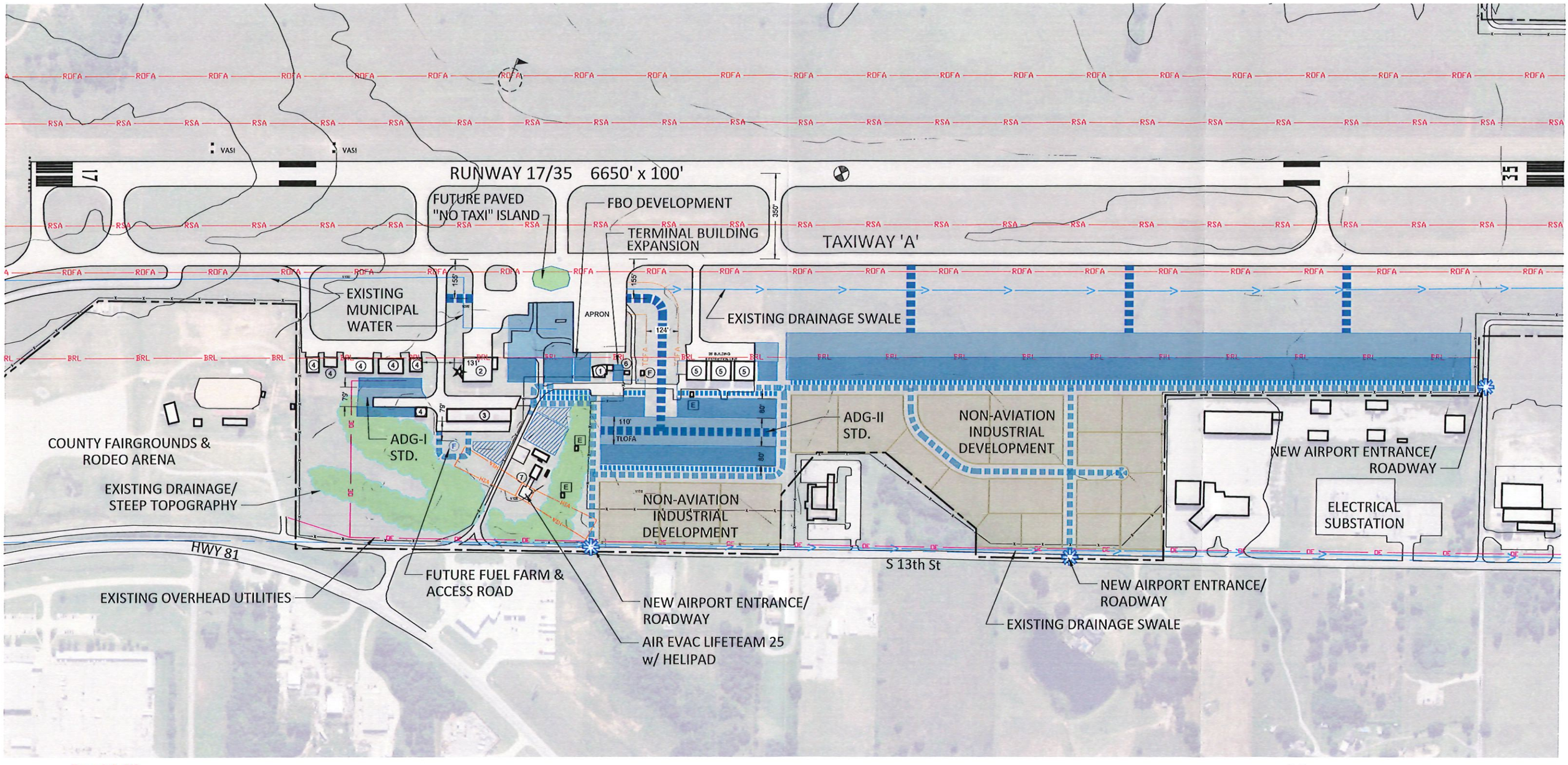
Alternative One illustrates the addition of a new ADG II access taxiway (35-foot in width) that extends to the west, just south of the terminal building, between the existing above-ground fuel storage tank and the new corporate hangars. There is adequate space/separation in this area to accommodate the object free area requirements of the proposed taxiway. However, the existing FBO has expressed interest in the future relocation of the fuel storage facility. The taxiway would terminate at a proposed north-south taxilane that would serve the future hangar development area. **Figure 3,** entitled *GA DEVELOPMENT PLAN - ALTERNATIVE ONE*, depicts the overall airport planning considerations for this alternative.

Airside (Taxiway System):

- ADG/TDG - Existing & Future
  - ADG II Taxiway and Taxilane Object Free Area (OFA) @ 124 feet and 110 feet
  - TDG 2 @ 35-foot taxiway width
- New Access Taxiway/Taxilane Development
  - Construct +/- 650 lineal feet of taxiway to the west from the terminal apron
    - Would likely require Categorical Exclusion (CatEx) environmental clearance
  - Construct +/-725 lineal feet of taxilane (north-south alignment) as needed to support new hangar facilities
    - Would likely require CatEx environmental clearance
- Proposed Taxiway Width
  - 35 feet
- Airfield Lighting
  - Install taxiway edge lights (MITL) or reflectors in conjunction with specified extensions

Landside:

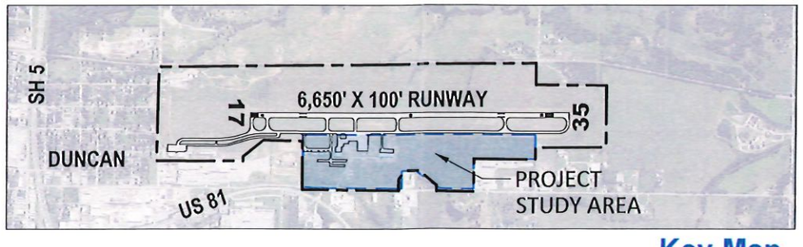
- On-Airport Land Uses
  - Designate new future hangar storage development area west of the terminal building (+/- 3.0 acres) with auto parking
  - Designate new future non-aviation development area between the new hangar storage development area and South 13th Street (+/- 4.3 acres)
    - May require an FAA Section 163 determination for property release from aeronautical use obligations



Parkhill www.parkhill.com
Prepared By: Mead&Hunt www.meadhunt.com

DEVELOPMENT LEGEND

- INDUSTRIAL DEVELOPMENT AREA (18.3 acres)
- HANGAR DEVELOPMENT AREA (10 acres)
- APRON/RAMP DEVELOPMENT AREA (10.2 acres)
- AIRPORT SUPPORT DEVELOPMENT AREA (1 acre)
- TAXIWAY/TAXILANE
- ROADWAY
- AUTO PARKING



Key Map

BUILDINGS

1. PUBLIC TERMINAL BUILDING
2. FBO HANGAR
3. 12 UNIT T-HANGAR
4. EXECUTIVE HANGAR
5. CORPORATE HANGAR
6. AIRFIELD ELECTRICAL VAULT
7. MEDIVAC FACILITY
F. FUEL
E. ELECTRICAL BOX

N

0 100 200 400 600
GRAPHIC SCALE IN FEET

LEGEND

- BUILDING RESTRICTION LINE (35' HT.) — BRL
- RUNWAY SAFETY AREA — RSA
- RUNWAY OBJECT FREE AREA — ROFA
- AIRPORT PROPERTY LINE — PL
- FENCE
- OVERHEAD UTILITIES — OE
- DRAINAGE SWALE
- BEACON
- LIGHTED WIND CONE

Halliburton Field (DUC) Duncan, Oklahoma

HANGAR DEVELOPMENT PLAN

Figure 3 **GA Development Plan - Alternative One**

  - Identify/designate aviation infill development opportunities within existing aviation development areas (e.g., large FBO maintenance/storage hangars with apron, small aircraft storage facilities, and expansion area for terminal building and associated auto parking)
  - Reconfigure portion of existing Airport Industrial Development Area to differentiate future aviation vs. non-aviation development boundaries
    - May require an FAA Section 163 determination for property release from aeronautical use obligations
  - Relocate existing above-ground fuel storage facility – not required for future taxiway OFA clearances, but identified as a potential project by FBO owner (see future relocated site adjacent to existing 12-unit T-hangar)
- Off-Airport Land Uses
  - No changes required
- Future Vehicular Access
  - Designate future right-of-way (ROW) property for development of new airport entrance/access road to serve existing terminal building and future hangar development areas
  - Reserve future ROW property for development of new airport entrance/access road to serve both future aviation facility expansion and Airport Industrial Park development
- Future Utility Infrastructure
  - Utilize future roadway ROW property to coordinate/plan future utility easements and/or existing relocations (e.g., water, gas, electric, and sewer)
- Property Acquisition
  - None required

Alternative One Summary:

- Maintains existing/future runway and taxiway design standards as depicted on current ALP
- Provides a long-term expansion plan for DUC to support both future aviation and non-aviation development opportunities
- Identifies a plan that can be implemented in phases, as demand dictates, to reduce or minimize up-front development costs (layout reflects a total of +/- 650 lineal feet of taxiway and +/-725 lineal feet of taxilane development)
- Avoids relocation of existing airport facilities (except for some utilities) to accommodate the proposed new access taxiway development and/or roadway extensions
- Requires some modifications/extensions of existing on-site utility infrastructure
- Requires some environmental clearance processing (likely a CatEx) to support the initial airside and landside development projects
- Requires some future FAA ALP coordination to determine potential Section 163 property release from aeronautical use obligations to permit future non-aviation development of existing airport property

Alternative Two

Alternative Two illustrates the addition of a new ADG II access taxiway (35-foot in width) that extends to the west from the parallel taxiway, near the midpoint of the runway. The taxiway would terminate at a proposed north-south taxilane and could serve as an initial development phase of the future hangar development area. Ultimately, the taxiway could be further extended to the west, connecting to a second taxilane that would serve an additional bay of aircraft storage hangars. **Figure 4**, entitled *GA DEVELOPMENT PLAN - ALTERNATIVE TWO*, depicts the overall airport planning considerations for this option.

Airside (Taxiway System):

- Airplane Design Group (ADG)/Taxiway Design Group (TDG) - Existing & Future
  - ADG II Taxiway and Taxilane OFA @ 124 feet and 110 feet
  - TDG 2 @ 35-foot taxiway width
- New Access Taxiway/Taxilane Development
  - Construct +/- 700 lineal feet of taxiway to the west from Taxiway A (Phase One)
    - Would likely require CatEx environmental clearance
  - Construct +/-750 lineal feet of taxilane (north leg of north-south alignment) as needed to support new hangar facilities (Phase One)
  - Construct +/-650 lineal feet of taxilane (south leg of north-south alignment) as needed to support new hangar facilities (Phase Two)
    - Would likely require CatEx environmental clearance
  - Construct +/- 400 lineal feet of taxiway to the west from Phase One Taxilane A (Phase Three)
    - Would likely require CatEx environmental clearance
  - Construct +/-650 lineal feet of taxilane (north leg of north-south alignment) as needed to support new hangar facilities (Phase Three)
    - Would likely require CatEx environmental clearance
- Proposed Taxiway Width
  - 35 feet
- Airfield Lighting
  - Install taxiway edge lights (MITL) or reflectors in conjunction with specified extensions

Landside:

- On-Airport Land Uses
  - Designate new future hangar storage development area west and south of the terminal building (+/- 6.5 acres) with auto parking
  - Identify/designate aviation infill development opportunities within existing aviation development areas (e.g., large FBO maintenance/storage hangars with apron, small and large aircraft storage facilities, and expansion area for terminal building and associated auto parking)
  - Reconfigure portion of existing Airport Industrial Development Area to differentiate future aviation vs. non-aviation development boundaries
    - May require an FAA Section 163 determination for property release from aeronautical use obligations

RUNWAY 17/35 6650' x 100'

EXISTING MUNICIPAL WATER

FUTURE PAVED "NO TAXI" ISLAND

FBO DEVELOPMENT

TERMINAL BUILDING EXPANSION

TAXIWAY 'A'

APRON

ADG-II STD.

EXISTING DRAINAGE SWALE

FUTURE FUEL FARM

ADG-I STD.

COUNTY FAIRGROUNDS & RODEO ARENA

EXISTING DRAINAGE/ STEEP TOPOGRAPHY

NON-AVIATION OFFICE PARK DEVELOPMENT

NEW AIRPORT ENTRANCE/ ROADWAY

ELECTRICAL SUBSTATION

HWY 81

EXISTING OVERHEAD UTILITIES

NEW AIRPORT ENTRANCE/ ROADWAY

ADG-II STD.

S 13th St

NEW AIRPORT ENTRANCE/ ROADWAY

EXISTING DRAINAGE SWALE

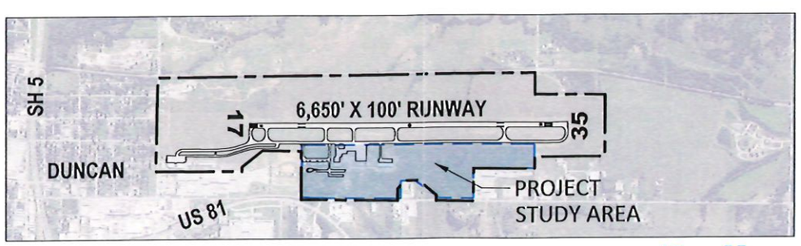
AIR EVAC LIFETEAM 25 w/ HELIPAD

Parkhill www.parkhill.com

Prepared By: Mead&Hunt www.meadhunt.com

DEVELOPMENT LEGEND

- OFFICE PARK DEVELOPMENT AREA (10.5 acres)
- HANGAR DEVELOPMENT AREA (13.2 acres)
- APRON/RAMP DEVELOPMENT AREA (12.9 acres)
- AIRPORT SUPPORT DEVELOPMENT AREA (0.7 acres)
- TAXIWAY/TAXILANE
- ROADWAY
- AUTO PARKING



Key Map

N

0 100 200 400 600

GRAPHIC SCALE IN FEET

BUILDINGS

1. PUBLIC TERMINAL BUILDING
2. FBO HANGAR
3. 12 UNIT T-HANGAR
4. EXECUTIVE HANGAR
5. CORPORATE HANGAR
6. AIRFIELD ELECTRICAL VAULT
7. MEDIVAC FACILITY
- (F) FUEL
- [E] ELECTRICAL BOX

LEGEND

- BUILDING RESTRICTION LINE (35' HT.) — BRL
- RUNWAY SAFETY AREA — RSA
- RUNWAY OBJECT FREE AREA — ROFA
- AIRPORT PROPERTY LINE — PL
- FENCE — x
- OVERHEAD UTILITIES — OE
- DRAINAGE SWALE
- BEACON
- LIGHTED WIND CONE

Halliburton Field (DUC) Duncan, Oklahoma

HANGAR DEVELOPMENT PLAN

Figure 4 **GA Development Plan - Alternative Two**

  - Relocate existing above-ground fuel storage facility – not required for future hangar development infill clearances, but identified as a potential project by FBO operator (see future relocated site adjacent to existing FBO hangar/apron)
- Off-Airport Land Uses
  - No changes required
- Future Vehicular Access
  - Designate future ROW property for development of new airport entrance/access road to serve existing terminal building and future hangar development areas
  - Reserve future ROW property for development of new airport entrance/access road to serve both future aviation facility expansion and Airport Office Park development
- Future Utility Infrastructure
  - Utilize future roadway ROW property to coordinate/plan future utility easements and/or existing relocations (e.g., water, gas, electric, and sewer)
- Property Acquisition
  - None required

Alternative Two Summary:

- Maintains existing/future runway and taxiway design standards as depicted on current ALP
- Provides a long-term expansion plan for DUC to support both future aviation and non-aviation development opportunities
- Identifies a plan that can be implemented in phases, as demand dictates, to reduce or minimize up-front development costs (layout reflects a total of +/- 1,100 lineal feet of taxiway and +/-2,050 lineal feet of taxilane development)
- Avoids relocation of existing airport facilities (except for some utilities) to accommodate the proposed new access taxiway development and/or roadway extensions
- Requires some modifications/extensions of existing on-site utility infrastructure
- Requires some environmental clearance processing (likely a CatEx) to support the initial airside and landside development projects
- Requires some future FAA ALP coordination to determine potential Section 163 property release from aeronautical use obligations to permit future non-aviation development of existing airport property

Conceptual Hangar Development Plan

After a detailed assessment by the City of Duncan, DUC stakeholders, and the OAC, Alternative Two has been chosen as the preferred hangar development option for DUC.

Implementation Plan

This section establishes a funding strategy for the hangar development area that maximizes the potential to receive federal and state grants and assists in establishing economic viability. It represents the identified airport-related improvement needs and the fiscal realities of funding those needs. Both short- and long-term budgeting and financial decision can be made with a comprehensive understanding of the financial implications involved.

The future demand of airport facilities is difficult to predict accurately, especially during the latter stages of the 20-year planning period. Therefore, emphasis is placed on the initial portion of the planning period – the first five years. In this phase, projections are more definable, and the magnitude of program accomplishment is more pronounced. Carefully guided development within the initial years is essential to the future expansion of DUC and the continued enhancement of aviation facilities.

Project List, Cost Estimates, and Phasing Plan

The list of anticipated capital improvement projects for DUC is presented in **Tables 6**, **7**, and **8**. The list is a result of the aviation demand, the facility requirements analysis, and the Conceptual Hangar Development Plan. Projects are prioritized based on the City of Duncan's preference and arranged to facilitate an orderly sequence of improvements with regards to strategic vision, forecast demand triggers, and funding considerations. The project list is divided into three phases: short-term (1-5 years), intermediate term (6-10 years), and long-term (11-20 years). The short-term projects are listed in priority order by year; the intermediate- and long-term projects are listed in priority order without year distinction.

Individual project costs have been prepared using unit pricing extended by the size of the project and tempered with specific considerations related to the region, DUC, and the individual sites. The estimates are intended for planning purposes only and should not be used for construction costs estimates. The cost estimates are based on 2022 costs with no escalation made for inflationary factors.

The proposed improvement projects for each phase are illustrated graphically in **Figure 5**. The proposed scheduling of the projects is merely a suggestion and variance from them will almost certainly be necessary, especially during the later phases. Many of the projects will be implemented on a demand dictated basis. If demand does not increase as rapidly as anticipated, some proposed projects should be revised, delayed, or potentially eliminated. Therefore, the projected phasing of the improvements will continue to be updated from year to year throughout the implementation period of this study.

Summary

It is recognized that maintenance and operating expenses will increase as DUC develops and additional facilities are completed. Airport revenues generated by the additional facilities should also increase and help defray the increased expenses. DUC should strive to become as financially self-sufficient as possible. The relationship between revenues and expenses must be constantly monitored so that future imbalances can be anticipated and provided for in the budgeting and capital improvement process.

If aviation demand continues to indicate that improvements are required, and if the proposed improvements prove to be environmentally acceptable, the financial implications presented here are likely to be acceptable for the FAA, the OAC, and the City of Duncan. However, this programming analysis is not a financial commitment on the part of any entity (i.e., FAA, OAC, or the City of Duncan). If the cost of any improvement project is not financially feasible, then it should not be pursued.

Table 6 PHASE I (1-5 YEARS) DEVELOPMENT PLAN PROJECT COSTS

Project Description		Note	Total Costs	Federal [a]	OAC [b]	Local [c]	Other [d]
2022 Projects							
A.1	Design and engineer new access taxiway/taxilane and existing terminal apron and T-hangar taxilane pavements,		$187,169	$168,452	$0	$18,717	$0
	Sub-Total/2022 Projects		**$187,169**	**$168,452**	**$0**	**$18,717**	**$0**
2023 Projects							
A.2	Construct new access taxiway/taxilane extending west from Taxiway A to serve future GA hangar development area (Phase		$615,000	$0	$475,000	$140,000	$0
A.3	Rehabilitate existing terminal apron and T-hangar taxilane pavements		$375,000	$337,500	$0	$37,500	$0
	Sub-Total/2023 Projects		**$990,000**	**$337,500**	**$475,000**	**$177,500**	**$0**
2024 Projects							
A.4	Finalize construction of new access taxiway/taxilane extending west from Taxiway A to serve future GA hangar		$1,000,000	$900,000	$0	$100,000	$0
A.5	Construct various GA hangar projects with auto parking (To Be Determined)		$500,000	$0	$0	$0	$0
	Sub-Total/2024 Projects		**$1,000,000**	**$900,000**	**$0**	**$100,000**	**$0**
2025 Projects							
A.6	Widen segment of existing airport entrance road & modify existing perimeter fencing to accommodate future expansion of GA		$650,000	$585,000	$0	$65,000	$0
A.7	Design and engineer new FBO hangar and apron with auto parking		$253,000	$0	$0	$0	$253,000
A.8	Construct various GA hangar projects with auto parking (To Be Determined)		$1,200,000	$0	$0	$0	$0
	Sub-Total/2025 Projects		**$650,000**	**$585,000**	**$0**	**$65,000**	**$0**
2026 Projects							
A.9	Construct new FBO hangar and apron with auto parking		$4,000,000	$0	$0	$0	$4,000,000
A.10	Construct various GA hangar projects with auto parking (To Be Determined)		$800,000	$0	$0	$0	$800,000
	Sub-Total/2026 Projects		**$4,000,000**	**$0**	**$0**	**$0**	**$4,000,000**
	Total/Phase I (2022-2026)		**$6,827,169**	**$1,990,952**	**$475,000**	**$361,217**	**$4,000,000**

Notes: Cost estimates, based upon 2022 data, are intended for preliminary planning purposes and do not reflect a detail engineering evaluation.

[a] Federal–
- [1] FAA Airport Improvement Program (AIP) Non-Primary Entitlement Funds
- [2] FAA Discretionary Funds

[b] Oklahoma Aeronautics Commission (OAC) - Aviation Grants

[c] City of Duncan

[d] Private or Third Party Financing

Source: Parkhill and Mead & Hunt.

Table 7 PHASE II (6-10 YEARS) DEVELOPMENT PLAN PROJECT COSTS

Project Description		Note	Total Costs	Federal [a]	OAC [b]	Local [c]	Other [d]
B.1	Construct north taxilane extension to serve GA hangar development area (Phase II)		$500,000	$450,000	$0	$50,000	$0
B.2	Construct various GA hangar projects with auto parking (To Be Determined)		$800,000	$0	$0	$0	$800,000
B.3	Design and engineer new airport entrance road extending east from S. 13th Street, including hangar access roads and		$100,000	$0	$0	$100,000	$0
B.4	Construct new airport entrance road extending east from S. 13th Street and Phase I of hangar access road		$1,000,000	$0	$0	$1,000,000	$0
B.5	Design, engineer, and prepare environmental documentation to support construction of taxilane expansion to serve GA Executive Hangar development area		$100,000	$90,000	$0	$10,000	$0
B.6	Construct taxilane expansion to serve GA Executive Hangar development area		$750,000	$675,000	$0	$75,000	$0
B.7	Design, engineer, and prepare environmental clearance documentation to support construction of new bulk above-ground fuel storage facility &		$100,000	$90,000	$0	$10,000	$0
B.8	Construct new bulk above-ground fuel storage facility with taxilane pavement extension and overhead electric utility relocation, including removal of existing		$1,000,000	$900,000	$0	$100,000	$0
B.9	Construct various GA hangar projects with auto parking (To Be Determined)		$600,000	$0	$0	$0	$600,000
	Total/Phase II (2027-2031)		**$4,950,000**	**$2,205,000**	**$0**	**$1,345,000**	**$1,400,000**

Notes: Cost estimates, based upon 2022 data, are intended for preliminary planning purposes and do not reflect a detail engineering evaluation.

[a] Federal--
[1] FAA Airport Improvement Program (AIP) Non-Primary Entitlement Funds
[2] FAA Discretionary Funds
[b] Oklahoma Aeronautics Commission (OAC) - Aviation Grants
[c] City of Duncan
[d] Private or Third Party Financing

Source: Parkhill and Mead & Hunt.

Table 8 PHASE III (11-20 YEARS) DEVELOPMENT PLAN PROJECT COSTS

Project Description		Note	Total Costs	Federal [a]	OAC [b]	Local [c]	Other [d]
C.1	Construct various GA hangar projects with auto parking (To Be Determined)		$1,500,000	$1,350,000	$0	$150,000	$0
C.2	Construct Phase II of hangar access road		$200,000	$0	$0	$0	$0
C.3	Design and engineer new south taxilane extension to serve GA hangar development area (Phase IIIa), including environmental		$150,000	$135,000	$0	$15,000	$0
C.4	Construct south taxilane extension to serve GA hangar development area (Phase III)		$750,000	$675,000	$0	$75,000	$0
C.5	Design, engineer, and prepare environmental clearance documentation (i.e., likely a categorical exclusion) to support south extension of hangar access		$60,000	$0	$0	$0	$0
C.6	Construct south extension of hangar access road (Phase III) with perimeter fencing and access gate modifications		$500,000	$450,000	$0	$50,000	$0
C.7	Construct various GA hangar projects with auto parking (To Be Determined)		$2,000,000	$0	$0	$0	$2,000,000
	Total/Phase III (2032-2041)		**$5,160,000**	**$2,610,000**	**$0**	**$290,000**	**$2,000,000**
	GRAND TOTALS		**$16,937,169**	**$6,805,952**	**$475,000**	**$1,996,217**	**$7,400,000**

Notes: Cost estimates, based upon 2022 data, are intended for preliminary planning purposes and do not reflect a detail engineering evaluation.

[a] Federal–
- [1] FAA Airport Improvement Program (AIP) Non-Primary Entitlement Funds
- [2] FAA Discretionary Funds

[b] Oklahoma Aeronautics Commission (OAC) - Aviation Grants

[c] City of Duncan

[d] Private or Third Party Financing

Source: Parkhill and Mead & Hunt.

RUNWAY 17/35 6650' x 100'

VASI

VASI

17

35

EXISTING MUNICIPAL WATER

FUTURE PAVED "NO TAXI" ISLAND

A.3

TERMINAL BUILDING EXPANSION

350'

A.1, A.2, A.4

TAXIWAY 'A'

A.7, A.9

B.8

APRON

B.8

EXISTING DRAINAGE SWALE

C.5, C.6

FUTURE AVIATION DEVELOPMENT AREA

C.3, C.4

HANGAR DEVELOPMENT AREA

HANGAR DEVELOPMENT AREA

HANGAR DEVELOPMENT AREA

HANGAR DEVELOPMENT AREA

124' TOFA

TLOFA

TLOFA

110'

80'

79'

A.6

B.5, B.6

B.7, B.8

A.3

B.1

COUNTY FAIRGROUNDS & RODEO ARENA

AIR EVAC LIFETEAM 25 w/ HELIPAD

FUTURE AVIATION-RELATED AND NON AVIATION DEVELOPMENT

ELECTRICAL SUBSTATION

HWY 81

B.3, B.4

NEW AIRPORT ENTRANCE/ ROADWAY

C.2

S 13th St

EXISTING OVERHEAD UTILITIES

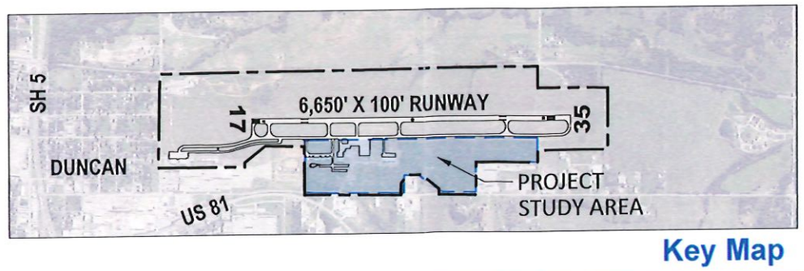
EXISTING DRAINAGE SWALE

Parkhill www.parkhill.com

Prepared By: Mead&Hunt www.meadhunt.com

PHASING LEGEND

- PHASE A (0-5 YEARS)
- PHASE B (6-10 YEARS)
- PHASE C (11-20 YEARS)



Key Map

N

0 100 200 400 600

GRAPHIC SCALE IN FEET

BUILDINGS

1. PUBLIC TERMINAL BUILDING
2. FBO HANGAR
3. 12 UNIT T-HANGAR
4. EXECUTIVE HANGAR
5. CORPORATE HANGAR
6. AIRFIELD ELECTRICAL VAULT
7. MEDIVAC FACILITY
- F. FUEL
- E. ELECTRICAL BOX

LEGEND

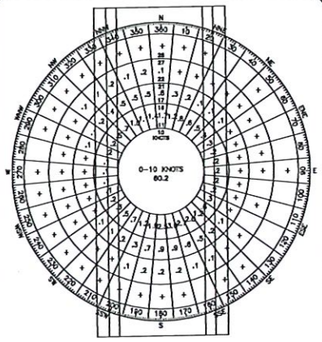
- BUILDING RESTRICTION LINE (35' HT.) — BRL
- RUNWAY SAFETY AREA — RSA
- RUNWAY OBJECT FREE AREA — ROFA
- AIRPORT PROPERTY LINE — PP
- FENCE — X
- OVERHEAD UTILITIES — OE
- WATER LINES
- SEWER LINES
- DRAINAGE SWALE
- BEACON
- LIGHTED WIND CONE

Halliburton Field (DUC) Duncan, Oklahoma

HANGAR DEVELOPMENT PLAN

Figure 5 **GA Development Phasing Plan**

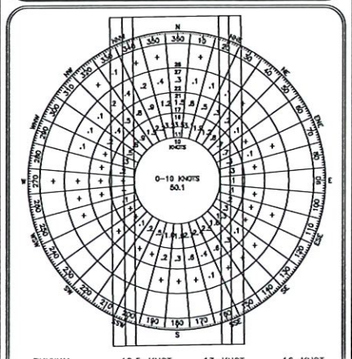
ALL WEATHER WIND ROSE



RUNWAY	10.5-KNOT	13-KNOT	16-KNOT
R/W 17/35	93.93%	97.23%	99.19%

SOURCE: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL CLIMATIC DATA CENTER, STATION 13967, OKLAHOMA CITY, OKLAHOMA.
PERIOD OF RECORD 1990-1999.

IFR WIND ROSE



RUNWAY	10.5-KNOT	13-KNOT	16-KNOT
R/W 17	50.27%	52.19%	53.24%
R/W 35	63.99%	67.10%	69.19%
COMBINED	91.97%	95.41%	98.41%

SOURCE: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL CLIMATIC DATA CENTER, STATION 13967, OKLAHOMA CITY, OKLAHOMA.
PERIOD OF RECORD 1990-1999.

MODIFICATION OF STANDARDS

ITEM	EXISTING	STANDARD	COMMENTS	AIRSPACE CASE NO.	APPROVAL DATE
PARALLEL TAXIWAY CENTERLINE	350'	400'	WILL REMAIN AS NON-STANDARD CONDITION UNTIL REQUIRED RECONSTRUCTION OF EXISTING TAXIWAY		

RUNWAY END COORDINATES

RUNWAY	EXISTING			FUTURE/ULTIMATE		
	LATITUDE	LONGITUDE	TDZE	LATITUDE	LONGITUDE	TDZE
17	34°28'48.02"	97°57'35.98"	1112.7'	SAME	SAME	SAME
35	34°27'45.46"	97°57'35.06"	1097.0'	SAME	SAME	SAME

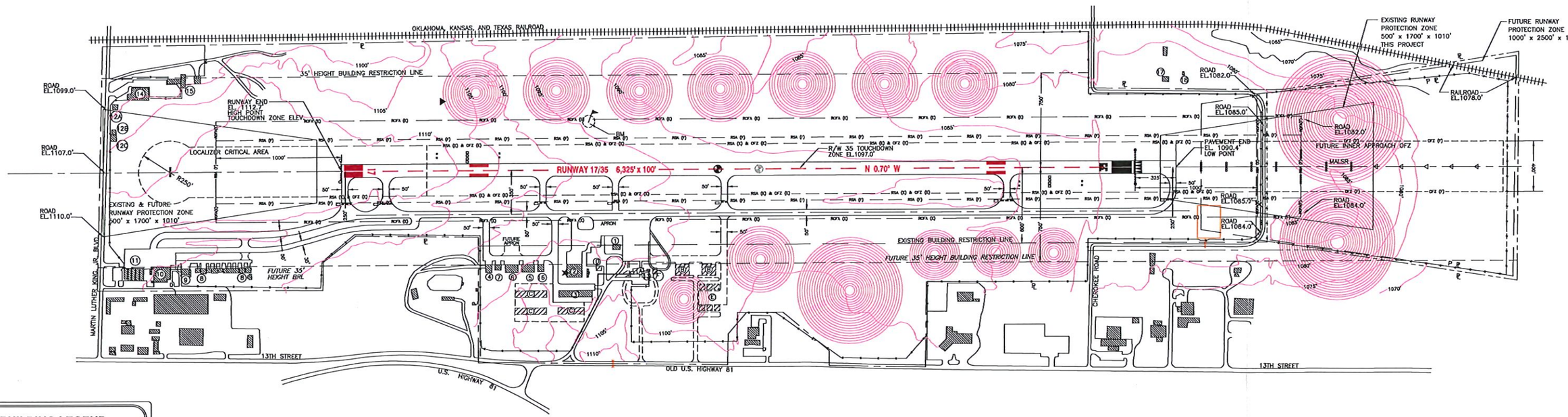
NOTE: TDZE (TOUCH-DOWN ZONE ELEVATION) IS THE HIGHEST POINT WITHIN THE FIRST 3000' OF THE RUNWAY END.

TRUE NORTH

N

6° 7.4' E
MAG. DEC.
AUGUST 2000
-0'4.2' ANNUAL CHANGE

0 200 400 800 1200
GRAPHIC SCALE IN FEET



BUILDING LEGEND

NO.	BUILDING	ELEVATION
1	BUILDING TO BE REMOVED	1113.5'
2	EXECUTIVE HANGAR	1125.3'
3	12 UNIT T-HANGAR	1109.8'
4	EXECUTIVE HANGAR	1116.0'
5	EXECUTIVE HANGAR	1119.5'
6	EXECUTIVE HANGAR	1121.7'
7	EXECUTIVE HANGAR	1115.0'
8	INDIVIDUAL T-HANGARS (11)	1123.8'
9	EXECUTIVE HANGAR	1131.2'
10	HALLIBURTON SERVICES	1141.3'
11	HALLIBURTON SERVICES	1145.4'
12A	INDIVIDUAL HANGARS (TBR)	1111.0'
12B	INDIVIDUAL HANGARS (TBR)	1112.3'
12C	INDIVIDUAL HANGARS (TBR)	1108.7'
13	AIRFIELD ELECTRICAL VAULT	1108.0'(E)
14	DUNCAN POWER & LIGHT	1112.3'
15	ANIMAL SHELTER	1111.3'
16	EXECUTIVE HANGAR	1121.2'
17	RESIDENCE	1102.0'(E)
18	BARN	1102.0'(E)
A	TERMINAL BUILDING	1120.0'(E)
B	FBO HANGAR (FUT)	TO BE DETERMINED
C	FUTURE T-HANGARS	TO BE DETERMINED
D	FUTURE FIRE STATION	TO BE DETERMINED
E	FUTURE EXECUTIVE HANGARS	TO BE DETERMINED

(TBR) - TO BE REMOVED
(E) - ESTIMATED

NOTE: ORIGINAL ALD FILE PREPARED BY BARNARD DUNKELBERG & COMPANY.

REVISIONS

NO.	DESCRIPTION	DATE
1	GRADE & DRAIN RUNWAY 35 SAFETY AREA AND	AUG. 2006
	DISPLACE R/W THRESHOLD 325'.	
	BY COBB ENGINEERING CO.	

AIRPORT DATA

ITEM	EXISTING	FUTURE
AIRPORT ELEVATION (AMSL)	1113.0'	SAME
AIRPORT REFERENCE POINT (ARP) LAT.	34° 28' 15"	34° 28' 15"
AIRPORT REFERENCE POINT (ARP) LON.	97° 57' 36"	97° 57' 36"
AIRPORT REFERENCE CODE	C-II	C-II
MEAN MAX. TEMP. HOTTEST MONTH (°F)	97°	97°
AIRPORT PROPERTY (ACRES)	497.34±	500 ±
AIRPORT & TERMINAL NAVAIDS	VOR/LOC/GPS/BEACON	VOR/LOC/GPS/BEACON
UNICOM FREQUENCY	122.8	122.8
TAXIWAY MARKING	CENTERLINE	SAME
TAXIWAY LIGHTING	MITL	MITL
TAXIWAY WIDTH	50'	SAME

RUNWAY DATA

ITEM	RUNWAY 17/35 EXISTING	RUNWAY 17/35 ULTIMATE
AIRPORT REFERENCE CODE	C-II	C-III
RUNWAY WIDTH & LENGTH	100' x 6325'	100' x 6550'
SAFETY AREA WIDTH	400'	500'
SAFETY AREA LENGTH BEYOND END	1000'/1000'	1000'/1000'
OBJECT FREE AREA WIDTH	800'	SAME
OBJECT FREE AREA LENGTH BEYOND END	1000'/1000'	1000'/1000'
OBSTACLE FREE ZONE WIDTH	400'	SAME
OBSTACLE FREE ZONE LENGTH BEYOND END	200'/200'	200'/2600'
APPROACH VISIBILITY MINIMUMS	VISUAL/1 -MILE	1-MILE/1/2-MILE
PART 77 CATEGORY	B/C	C/PIR
PART 77 APPROACH SURFACE SLOPE	20:1/34:1	34:1/50:1
INSTRUMENT RUNWAY	NO/NON-PREC.	NON-PREC/PRECISION
PAVEMENT TYPE	PC CONCRETE	SAME
PAVEMENT STRENGTH (GROSS WT x 1000#)	S 44 DTW 100 D 58 DTW 101	SAME
NAVIGATIONAL AIDS	VOR,LOC,GPS	SAME
LANDING AIDS	REILS,VASI	REILS/PAPI
RUNWAY MARKING	NONPREC	PRECISION
RUNWAY LIGHTING	MIRL	SAME

LAYOUT PLAN LEGEND

ITEM	EXISTING	FUTURE
BUILDING RESTRICTION LINE	BRL	BRL
AIRPORT PROPERTY LINE	P.L.	P.L.
FENCE		
RUNWAY SAFETY AREA	RSA (S)	RSA (F)
RUNWAY OBJECT FREE AREA	ROFA (S)	ROFA (F)
RUNWAY PROTECTION ZONE		
BUILDINGS		
AIRFIELD PAVEMENT		
BEACON		
LIGHTED WIND CONE & SEGMENTED CIRCLE		
RUNWAY END IDENTIFIER LIGHTS (REILS)		
VISUAL APPROACH SLOPE INDICATOR (VASI)		
RUNWAY THRESHOLD LIGHTING		
LOCALIZER ANTENNA		
MED. INTENSITY APPROACH LIGHTING SYST. (MALS)		
R/W ALIGNMENT INDICATOR LIGHTS (RAIL)		
PRECISION APPROACH PATH INDICATOR (PAPI)		
HOLDLINES		
HOLD SIGNS		
AUTOMATED WEATHER OBSERVATION STATION (AWOS)		
FUEL STORAGE		
PIVOTS (TO BE REMOVED)		

SPONSOR SIGNATURE | TITLE | DATE

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. Magnetic declination obtained from United States Geological Survey.
3. No threshold siting surface object penetrations.
4. No OFZ object penetrations.
5. NAD 83 Datum coordinates and runway end elevations were obtained from FAA records, dated 10/03/96.
6. Ground contours as presented were taken from ALP dated May 1988, prepared by Barnard Dunkelberg & Co., Tulsa, OK.
7. No known runway monuments located on airport.

HALLIBURTON FIELD
DUNCAN, OKLAHOMA

AS-BUILT AIRPORT LAYOUT DRAWING

CEC CORPORATION
OKLAHOMA CITY, OKLAHOMA

FIGURE NUMBER

METRIC SCALE

SCALE 1" = 400'

DATE JAN 2018

DRAWING NUMBER

Halliburton Field

Appendix One: Existing DUC ALP/2018

Halliburton Field

Appendix Two: DUC TFMSC Report/2021 Fiscal Year

2021	**981**
I	**705**
Jet	196
BE40 - Raytheon/Beech Beechjet 400/T-1	2
C25M - Cessna Citation M2	104
C501 - Cessna I/SP	4
C510 - Cessna Citation Mustang	3
C525 - Cessna CitationJet/CJ1	4
E50P - Embraer Phenom 100	8
H25B - BAe HS 125/700-800/Hawker 800	2
HDJT - HONDA HA-420 HondaJet	2
LJ31 - Bombardier Learjet 31/A/B	3
LJ40 - Learjet 40; Gates Learjet	2
LJ45 - Bombardier Learjet 45	59
PRM1 - Raytheon Premier 1/390 Premier 1	2
T38 - Northrop T-38 Talon	1
Piston	379
BE33 - Beech Bonanza 33	6
BE35 - Beech Bonanza 35	27
BE36 - Beech Bonanza 36	8
BE55 - Beech Baron 55	3
BE58 - Beech 58	4
BT36 - Beechcraft Bonanza	8
C150 - Cessna 150	1
C172 - Cessna Skyhawk 172/Cutlass	13
C177 - Cessna 177 Cardinal	9
C180 - Cessna 180	5
C182 - Cessna Skylane 182	16
C206 - Cessna 206 Stationair	12
C310 - Cessna 310	40
C340 - Cessna 340	21
C421 - Cessna Golden Eagle 421	20
M20P - Mooney M-20C Ranger	3
M600 - Piper PA-46 M600	2
P28A - Piper Cherokee	30
P32R - Piper 32	44
PA24 - Piper PA-24	3
PA28 - Piper Cherokee	1
PA30 - Piper PA-30	4
PA32 - Piper Cherokee Six	2
PA44 - Piper Seminole	22
PA46 - Piper Malibu	4
RV6 - AIEP Air Beetle	1
S22T - Cirrus SR-22 Turbo	4
SR20 - Cirrus SR-20	1
SR22 - Cirrus SR 22	63
T6 - North American T-6 Texan	2

Turbine	130
AC90 - Gulfstream Commander	20
BE10 - Beech King Air 100 A/B	5
BE9L - Beech King Air 90	26
C425 - Cessna 425 Corsair	22
P46T - Piper Malibu Meridian	4
TBM7 - Socata TBM-7	4
TBM9 - Socata TBM	1
TEX2 - Raytheon Texan 2	48
II	**272**
Jet	141
C25B - Cessna Citation CJ3	14
C550 - Cessna Citation II/Bravo	2
C560 - Cessna Citation V/Ultra/Encore	5
C56X - Cessna Excel/XLS	23
C680 - Cessna Citation Sovereign	61
C68A - Cessna Citation Latitude	10
C700 - Cessna Citation Longitude	2
C750 - Cessna Citation X	2
CL30 - Bombardier (Canadair) Challenger 300	4
CL60 - Bombardier Challenger 600/601/604	6
E55P - Embraer Phenom 300	2
FA20 - Dassault Falcon/Mystère 20	4
GLF4 - Gulfstream IV/G400	6
Piston	14
AC95 - Gulfstream Jetprop Commander 1000	14
Turbine	117
B350 - Beech Super King Air 350	63
BE20 - Beech 200 Super King	25
BE30 - Raytheon 300 Super King Air	2
C208 - Cessna 208 Caravan	1
C441 - Cessna Conquest	6
PC12 - Pilatus PC-12	20
III	**4**
Jet	4
GLF5 - Gulfstream V/G500	4

Parkhill Mead & Hunt