Chapter Three:

FACILITY REQUIREMENTS AND ALTERNATIVE DEVELOPMENT ANALYSIS

The objective of this section is to identify the adequacy of existing facilities and outline what may be needed to meet future demand. Airport facilities are organized into two components: airside and landside. Airside facilities include those related to the approach, departure, and ground movement of aircraft on the airport, including runways, taxiways, navigational approach aids, airport signage, marking, and lighting. Landside facilities enable the interface of air and ground transportation. Landside facility components include terminal facilities, aircraft hangars and tiedowns, aircraft parking aprons, automobile parking, and various airport support facilities.

AIRSIDE FACILITY REQUIREMENTS

RUNWAY ELIGIBILITY

Any airport included in the National Plan of Integrated Airport Systems (NPIAS) is eligible for funding for a single runway through the Airport Improvement Program (AIP), unless the airport qualifies for a crosswind or secondary runway. To help the Federal Aviation Administration (FAA) determine funding eligibility, each runway at an airport is assigned a runway type. The four runway types described in FAA Order 5100.38D, *Airport Improvement Program (AIP) Handbook*, are primary, crosswind, secondary, and additional. Primary, crosswind, and secondary runways are eligible for AIP funding, if justified. Additional runways, which are those that do not meet requirements for any other runway type, are ineligible for AIP funding. **Table 3A** presents the eligibility requirements for each runway type. Runway 1-19, which is 5,700 feet long by 60 feet wide and provides instrument approach capability, is the primary runway at Portales Municipal Airport (PRZ) and is eligible for AIP funding.

TABLE 3A: Runway Eligibility

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

Table 3A Source: FAA Order 5100.38D, AIP Handbook

FAA Advisory Circular (AC) 150/5300-13B, *Airport Design*, Change 1, 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 computed on the basis of exceeding a 10.5-knot (12 miles per hour [mph]) component for airport reference codes (ARC) A-I and B-I; a 13-knot (15 mph) component for ARC A-II and B-II; a 16-knot (18 mph) component for ARC A-III, B-III, C-I through C-III, and D-I through D-III; and a 20-knot (23 mph) component for ARC A-IV through E-IV. **Exhibit 1B** (presented previously) details the associated wind coverage. As shown, primary Runway 1-19 does not provide greater than the 95 percent coverage threshold in 10.5-knot or 13-knot conditions; therefore, Runway 8-26 qualifies as a crosswind runway, based on the requirements outlined in **Table 3A**. Both runways should be maintained through the planning period.

RUNWAY ORIENTATION

Primary Runway 1-19 is oriented in a northeast/southwest configuration and Runway 8-26 is oriented in an east/west configuration. A runway's designation is based on its magnetic headings, which are determined by the magnetic declination for the area. The magnetic declination in the area of PRZ is 6° 19' E ± 0° 21', which changes by 0° 6' W per year. Runway 1-19 has a true heading of 023°/203°. Adjusting for the magnetic declination, the current magnetic heading of Runway 1-19 is 014°/194°. Runway 8-26 has a true heading of 090°/270° and a magnetic heading of 084°/264° when accounting for magnetic declination. The results of this analysis indicate that Runway 1-19 should be redesignated as Runway 2-20 this year (2025), while Runway 8-26 should remain as-is until 2035. The airport sponsor should coordinate with the FAA to confirm these changes are necessary and update all appropriate publications. Re-marking of runways with new designations can be done in conjunction with a pavement maintenance project.

RUNWAY LENGTH REQUIREMENTS

AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length needs. The determination of runway length requirements for the airport is based on five primary factors:

1. Mean maximum temperature of the hottest month
2. Airport elevation
3. Runway gradient
4. Critical aircraft type expected to use the runway
5. Stage length of the longest nonstop destination (specific to larger aircraft)

The mean maximum daily temperature of the hottest month for Portales Municipal Airport is 93.3 degrees Fahrenheit (°F), which occurs in July. The airport has a field elevation of 4,078 feet mean sea level (MSL) with a 0.60 percent runway grade on the primary runway.

Airplanes operate on a wide variety of available runway lengths. Many factors govern the sustainability of runway lengths for aircraft, such as elevation, temperature, wind, aircraft weight, wing flap settings, runway condition (wet or dry), runway gradient, vicinity airspace obstructions, and any special operating procedures. Airport operators can pursue policies that maximize the sustainability of the runway length.

Policies, such as area zoning and height and hazard restrictions, can protect an airport's runway length. Airport ownership (fee simple or easement) of land leading to the runway ends reduces the possibility of natural growth or human-made obstructions. Runway planning should include an evaluation of the aircraft types expected to use the airport now and in the future. Future planning should be realistic, supported by the FAA-approved forecasts, and based on the critical aircraft (or family of aircraft).

General Aviation (GA) Aircraft

Most operations at Portales Municipal Airport are conducted using smaller GA aircraft that weigh less than 12,500 pounds. FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, recommends that airports be designed to serve at least 95 percent of small airplanes. The advisory circular further defines the fleet categories as follows:

- *95 Percent of Small Airplane Fleet*: This category applies to airports that are primarily intended to serve medium-population communities with diverse usage and 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 fringes of metropolitan areas, or relatively large population communities that are remote from metropolitan areas.

Portales Municipal Airport is also utilized by aircraft that weigh more than 12,500 pounds, including small- to medium-sized business jet aircraft. Runway length requirements for business jets that weigh less than 60,000 pounds have also been calculated. These calculations take into consideration the runway gradient and landing length requirements for contaminated (wet) runways; business jets tend to need greater runway length when landing on wet surfaces because of their increased approach speeds. AC 150/5325-4B stipulates that runway length determination for business jets must consider a grouping of airplanes with similar operating characteristics. The AC provides separate family groupings of airplanes, each of which is based on its representative percentage of aircraft in the national fleet. The first group is those business jets that comprise 75 percent of the national fleet, and the second group is those that comprise 100 percent of the national fleet.

Table 3B presents a partial list of common aircraft in each aircraft grouping. A third grouping considers business jets that weigh more than 60,000 pounds. Runway length determination for these aircraft must be based on the performance characteristics of the individual aircraft.

TABLE 3B: Business Jet Categories for Runway Length Determination

Category	Aircraft	Maximum Takeoff Weight
75 Percent of the National Fleet	Lear 35	20,350 pounds
75 Percent of the National Fleet	Lear 45	20,500 pounds
75 Percent of the National Fleet	Cessna 550	14,100 pounds
75 Percent of the National Fleet	Cessna 560XL	20,000 pounds
75 Percent of the National Fleet	Cessna 650 (VII)	22,000 pounds
75 Percent of the National Fleet	IAI Westwind	23,500 pounds
75 Percent of the National Fleet	Beechjet 400	15,800 pounds
75 Percent of the National Fleet	Falcon 50	18,500 pounds

(Table continues)

TABLE 3B (continued): Business Jet Categories for Runway Length Determination

Category	Aircraft	Maximum Takeoff Weight
75–100 Percent of the National Fleet	Lear 55	21,500 pounds
75–100 Percent of the National Fleet	Lear 60	23,500 pounds
75–100 Percent of the National Fleet	Hawker 800XP	28,000 pounds
75–100 Percent of the National Fleet	Hawker 1000	31,000 pounds
75–100 Percent of the National Fleet	Cessna 650 (III/IV)	22,000 pounds
75–100 Percent of the National Fleet	Cessna 750 (X)	36,100 pounds
75–100 Percent of the National Fleet	Challenger 604	47,600 pounds
75–100 Percent of the National Fleet	IAI Astra	23,500 pounds
Greater than 60,000 Pounds	Gulfstream II	65,500 pounds
Greater than 60,000 Pounds	Gulfstream IV	73,200 pounds
Greater than 60,000 Pounds	Gulfstream V	90,500 pounds
Greater than 60,000 Pounds	Global Express	98,000 pounds
Greater than 60,000 Pounds	Gulfstream 650	99,600 pounds

Table 3B Source: FAA AC 150/5325-4B, Runway Length Requirements for Airport Design

Table 3C summarizes the recommended runway lengths for different aircraft types that utilize PRZ. It should be noted that utilization of the 90 percent category for runway length determination for large airplanes that weigh less than 60,000 pounds is generally not considered by the FAA unless there is a demonstrated need at an airport (e.g., a business jet operator that flies out frequently with heavy loads).

TABLE 3C: General Aviation Runway Length Recommendations

Aircraft Type	Recommended Runway Length
Small airplanes with fewer than 10 passenger seats: 95 percent of these small airplanes	5,400 feet
Small airplanes with fewer than 10 passenger seats: 100 percent of these small airplanes	5,700 feet
Small airplanes with 10 or more passenger seats	5,700 feet
Large airplanes that weigh 60,000 pounds or less: 75 percent of these large airplanes at 60 percent useful load	6,800 feet
Large airplanes that weigh 60,000 pounds or less: 100 percent of these small airplanes at 60 percent useful load	9,200 feet

Table 3C Source: FAA AC 150/5325-4B, Runway Length Requirements for Airport Design

Another method to determine runway length requirements at Portales Municipal Airport is to examine aircraft flight planning manuals under conditions specific to the airport. The existing and ultimate critical aircraft were analyzed for takeoff length requirements at a design temperature of 93.3°F at a field elevation of 4,078 feet mean sea level (MSL) with a 0.60 percent runway grade. **Table 3D** provides a detailed runway length analysis, as obtained from Ultranav software, which computes operational parameters for specific aircraft based on flight manual data. The analysis includes the maximum takeoff weight (MTOW) allowable and the percent useful load from 60 percent to 100 percent.

The analysis shows that the current length of 5,700 feet available on Runway 1-19 is adequate for most of the aircraft analyzed at 60 percent of their useful load, while higher payloads result in greater restrictions. The existing critical aircraft, the Citation I/SP, is capable of taking off at 100 percent of its useful load, while the ultimate critical aircraft, the King Air 300 (represented by the King Air 350), can take off at 90 percent of its useful load.

TABLE 3D: Aircraft Takeoff Length Requirements for Runway 1-19

Aircraft Name	Maximum Takeoff Weight	60% Useful Load	70% Useful Load	80% Useful Load	90% Useful Load	100% Useful Load
Beechjet 400A	16,300 pounds	5,302'	5,819'*	6,262'*	6,262'*	6,262'*
King Air C90GTi	10,100 pounds	3,196'	3,433'	3,964'	3,956'	4,217'
Citation I/SP	11,850 pounds	3,894'	4,243'	4,464'	4,464'	4,464'
Citation (525) CJI	10,600 pounds	6,483'*	7,432'*	8,355'*	8,355'*	8,355'*
Citation (525A) CJ2	12,375 pounds	4,390'	4,750'	5,157'	5,596'	5,710'*
Hawker 800XP	28,000 pounds	5,745'*	5,910'*	5,910'*	5,910'*	5,910'*
Hawker 800/850 XP	28,000 pounds	5,749'*	5,906'*	5,906'*	5,906'*	5,906'*
King Air 200 GT	12,500 pounds	4,393'	4,514'	4,630'	4,744'	4,767'
King Air 350	15,000 pounds	4,858'	5,051'	5,252'	5,674'	6,067'*
Lear 35A	19,600 pounds	8,676'*	9,826'*	9,826'*	9,826'*	9,826'*
Pilatus PC-12	9,921 pounds	2,852'	3,110'	3,383'	3,671'	3,973'
Premier 1A	12,500 pounds	3,000'	3,542'	3,852'	4,209'	4,631'

Table 3D Source: Ultranav Software

*Most figures are less than or equal to the longest runway length available at Portales Municipal Airport; figures marked with an asterisk are greater than that length (5,700').

Table 3E presents the runway length required for landing under three operational categories: Title 14 Code of Federal Regulations (CFR) Part 91, CFR Part 135, and CFR Part 91k. CFR Part 91 operations are those conducted by individuals or companies that own their aircraft. CFR Part 135 applies to all for-hire charter operations, including most fractional ownership operations. CFR Part 91K includes operations in fractional ownership that utilize their own aircraft under the direction of pilots specifically assigned to those aircraft. Part 91k and Part 135 rules regarding landing operations require an operator to land at the destination airport within 60 percent of the effective runway length. An additional rule allows an operator to land within 80 percent of the effective runway length if the operator has an approved destination airport analysis in the aircraft's program operating manual. The landing length analysis accounts for both scenarios.

The landing length analysis shows that most of the aircraft analyzed can land on the available runway length at Portales Municipal Airport during both wet and dry runway conditions; however, operators using the 60 percent rule become more restricted, especially during wet conditions.

TABLE 3E: Aircraft Landing Length Requirements for Runway 1-19

Aircraft Name	Maximum Landing Weight	Dry: Part 91	Dry: 80% Rule	Dry: 60% Rule	Wet: Part 91	Wet: 80% Rule	Wet: 60% Rule
Beechjet 400A	15,700 pounds	4,057'	5,071'	6,762'*	5,889'*	7,361'*	9,815'*
King Air C90GTi	9,600 pounds	1,576'	1,970'	2,627'	N/A	N/A	N/A
Citation I/SP	11,350 pounds	2,631'	3,289'	4,385'	3,025'	3,781'	5,042'
Citation (525) CJ1	9,800 pounds	3,230'	4,038'	5,383'	4,395'	5,494'	7,325'*
Citation (525A) CJ2	11,500 pounds	3,460'	4,325'	5,767'*	4,980'	6,225'*	8,300'*
Hawker 800XP	23,350 pounds	2,909'	3,636'	4,858'	4,401'	5,501'	7,335'*
Hawker 800/850 XP	23,350 pounds	2,909'	3,636'	4,858'	4,401'	5,501'	7,335'*
King Air 200 GT	12,500 pounds	1,384'	1,730'	2,307'	N/A	N/A	N/A
King Air 350	15,000 pounds	2,917'	3,646'	4,863'	3,355'	4,194'	5,592'
Lear 35A	15,300 pounds	3,508'	4,385'	5,847'*	4,912'	6,140'*	8,187'*
Pilatus PC-12	9,921 pounds	4,622'	5,778'*	7,703'*	N/A	N/A	N/A
Premier 1A	11,600 pounds	3,410'	4,263'	5,683'	4,337'	5,421'	7,228'*

Table 3E Source: Ultranav Software

*Most figures are less than or equal to the longest runway length available at Portales Municipal Airport; figures marked with an asterisk are greater than that length (5,700').
N/A = not applicable (turboprop aircraft landing lengths are not adjusted for wet runway conditions)

Runway Length Summary

Many factors are considered when determining appropriate runway length for safe and efficient operations of aircraft at PRZ. The airport should strive to accommodate turboprop aircraft and smaller jets to the greatest extent possible, as demand dictates. At 5,700 feet long, Runway 1-19 is the longest runway available and is capable of accommodating the small aircraft fleet, as well as many turboprops and small business jets, under moderate loading conditions. The existing critical aircraft, the Citation I/SP, is capable of taking off fully loaded, even during hot weather, but the ultimate critical aircraft, represented by the King Air 350, is unable to operate on the existing runway length at 100 percent useful load.

The FAA's recommended runway length to accommodate 75 percent of the business jet fleet at 60 percent useful load is 6,800 feet, increasing to 9,200 feet to accommodate 100 percent of these aircraft; as such, prudent planning would include the consideration of extending primary Runway 1-19 up to 6,800 feet to better accommodate these more demanding aircraft. The alternatives to follow will also include options to extend Runway 8-26 to 5,400 feet to meet the runway length needed to support 95 percent of small aircraft with fewer than 10 passengers.

It should be noted that justification for any runway extension to meet the needs of turbine aircraft would require regular use (500 annual itinerant operations), which is the minimum threshold required to obtain FAA grant funding assistance.

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. Runway 1-19 is 60 feet wide, which meets the existing runway design code (RDC) B-I(small)-5000. In the ultimate RDC B-II-5000 condition, the runway width standard increases to 75 feet; as such, planning should consider widening Runway 1-19 to 75 feet to meet the ultimate design standard. Similarly, Runway 8-26 is 60 feet wide, which meets the existing RDC B-I(small)-5000 classification for this runway. With an ultimate RDC of B-II-5000, planning should consider a width increase to 75 feet to meet the ultimate design standard.

RUNWAY PAVEMENT STRENGTH

Airport pavements must be able to withstand repeated operations by aircraft of significant weight; therefore, the strength rating of a runway is an important consideration in facility planning. While each runway is assigned a specific strength rating, aircraft that weigh more than a runway's published strength rating are not precluded from using the runway. All federally obligated airports must remain open to the public, and it is typically up to the pilot of an aircraft to determine if a runway can support the aircraft safely. An airport sponsor cannot restrict an aircraft from using a runway simply because its weight exceeds the published strength rating. On the other hand, the airport sponsor has an obligation to properly maintain the runway and protect its useful life (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 operating limitation. Many airport pavements are capable of supporting limited operations with gross weights in excess of the published figures." The directory also states that operators of aircraft that exceed an airport's pavement strength rating should contact the airport sponsor for permission to operate at the airport.

The current runway strength reported for both runways at PRZ is 12,500 pounds single wheel loading (SWL), which is adequate to accommodate the smaller aircraft that operate at the airport. There is no reported pavement strength for dual wheel (D), dual tandem wheel (2D), or multiple dual tandem wheel (2D/2D2) landing gear at PRZ. Consideration should be given to evaluating the pavement strength to ensure the most frequently operating heavy aircraft are adequately supported. At a minimum, airfield pavement should be planned to support aircraft within the ultimate design group (B-II), which have MTOWs up to 38,000 pounds D.

RUNWAY GRADE

The FAA has instituted various line-of-sight requirements to facilitate coordination among aircraft and between aircraft and vehicles that are operating on active runways. This allows departing and arriving aircraft to verify the locations and actions of other aircraft and vehicles on the ground that could create conflicts.

Line-of-sight standards for an individual runway are based on the availability of a parallel taxiway. When a partial parallel taxiway is available, any point five feet above the runway centerline must be mutually visible with any other point five feet above the runway centerline. Based on available mapping, both runways currently meet the line-of-sight standards. If an extension to either runway at PRZ is proposed at some point in the future, line-of-sight should be considered during the design phase to ensure FAA standards are met.

The surface gradient of a runway affects aircraft performance and pilot perception. The surface gradient is the maximum allowable slope for a runway. For runways designated in approach categories A and B (applicable to Runways 1-19 and 8-26), the maximum longitudinal grade is 2.0 percent. Runway 1-19 has a longitudinal grade of 0.60 percent, while Runway 8-26 has a longitudinal grade of 0.18 percent. Both runways at PRZ conform to FAA design standards for longitudinal gradient.

AIRFIELD DESIGN STANDARDS

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

It is important that the RSA, ROFA, and ROFZ remain under the direct ownership of the airport sponsor to ensure these areas remain free of obstacles and can be readily accessed by maintenance and safety personnel. The airport should also own or maintain sufficient land use control over RPZs to ensure these areas remain free of incompatible developments. Alternatives to owning RPZs include maintaining positive control through avigation easements or ensuring proper zoning measures are taken to maintain compatible land use.

Runway Safety Area (RSA)

The RSA is an established surface surrounding a runway that is designed or prepared to increase safety or decrease potential damage if an aircraft undershoots, overshoots, or makes an excursion from the runway. The RSA is centered on the runway centerline and its dimensions are based on the established RDC.

The FAA states in AC 150/5300-13B, *Airport Design*, Change 1, that the RSA must be cleared and graded and cannot contain hazardous surface variations. In addition, the RSA must be drained by grading or storm sewers and must be capable of supporting snow removal and aircraft rescue and firefighting (ARFF) equipment, as well as the occasional passage of aircraft without damaging the aircraft. The RSA must remain free of obstacles other than those considered fixed by function, such as runway lights.

The FAA places high significance on maintaining adequate RSAs at all airports. The FAA established the Runway Safety Area Program under Order 5200.8 (effective October 1, 1999). The Order states: "The objective of the Runway Safety Area Program is that all RSAs at federally obligated airports…shall conform to 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 RSAs for runways at each airport and perform airport inspections.

Table 3F summarizes the standard RSA dimensions in the existing and ultimate conditions and whether these standards are met in each scenario.

TABLE 3F: RSA Standards

Design Standards	Runway 1-19: Existing RDC B-I(small)-5000	Runway 1-19: Ultimate RDC B-II-5000	Runway 8-26: Existing RDC B-I(small)-VIS	Runway 8-26: Ultimate RDC B-II-5000
RSA Dimensions	240' beyond runway end x 120' wide	300' beyond runway end x 150' wide	240' beyond runway end x 120' wide	300' beyond runway end x 150' wide
Meets Standard?	No; a service road traverses a corner of the RSA near Runway 1 and should be rerouted.	No; a service road traverses a corner of the RSA near Runway 1 and should be rerouted.	Yes	No; a service road traverses a corner of the RSA near Runway 8 and should be rerouted.

Table 3F Sources: FAA AC 150/5300-13B, Airport Design, Change 1; Coffman Associates Analysis

Runway Object Free Area (ROFA)

The ROFA can be described as a two-dimensional surface area that surrounds all airfield runways. This area must remain clear of obstructions, aside from those that are deemed fixed by function, such as runway lighting systems. This surface does not have to be graded like the RSA; however, the ROFA must be clear of any penetrations of the lateral elevation of the RSA. Like the RSA, the ROFA is centered on the runway centerline and its size is determined based on the established RDC.

Table 3G summarizes the standard ROFA dimensions in the existing and ultimate conditions and whether these standards are met in each scenario.

TABLE 3G: ROFA Standards

Design Standards	Runway 1-19: Existing RDC B-I(small)-5000	Runway 1-19: Ultimate RDC B-II-5000	Runway 8-26: Existing RDC B-I(small)-VIS	Runway 8-26: Ultimate RDC B-II-5000
ROFA Dimensions	240' beyond runway end x 250' wide	300' beyond runway end x 500' wide	240' beyond runway end x 250' wide	300' beyond runway end x 500' wide
Meets Standard?	No; a service road traverses a portion of the ROFA near Runway 1 and should be rerouted.	No; a service road passes through the ROFA near Runway 1 and Runway 19 and should be rerouted.	Yes	No; a service road traverses a portion of the ROFA near Runway 8 and should be rerouted.

Table 3G Sources: FAA AC 150/5300-13B, Airport Design, Change 1; Coffman Associates Analysis

Runway Obstacle Free Zone (ROFZ)

The ROFZ is defined as a portion of airspace centered on the runway, and its elevation at any point is equal to the elevation of the closest point on the runway centerline. The function of the ROFZ is to ensure the safety of aircraft conducting operations by preventing object penetrations to this portion of airspace. Potential penetrations to this airspace include taxiing and parked aircraft. Any obstructions within this portion of airspace must be mounted on frangible couplings and be fixed in their positions by function (such as runway lights).

Table 3H summarizes the standard ROFZ dimensions in the existing and ultimate conditions and whether these standards are met in each scenario.

TABLE 3H: ROFZ Standards

Design Standards	Runway 1-19: Existing RDC B-I(small)-5000	Runway 1-19: Ultimate RDC B-II-5000	Runway 8-26: Existing RDC B-I(small)-VIS	Runway 8-26: Ultimate RDC B-II-5000
ROFZ Dimensions	200' beyond runway end x 250' wide	200' beyond runway end x 400' wide	200' beyond runway end x 250' wide	200' beyond runway end x 400' wide
Meets Standard?	No; a service road traverses the existing RSA, ROFA, and ROFZ.	No; a service road traverses the ultimate ROFZ near the Runway 1 threshold and should be rerouted.	Yes	No; a service road traverses the ROFZ near the Runway 8 threshold and should be rerouted.

Table 3H Sources: FAA AC 150/5300-13B, Airport Design, Change 1; Coffman Associates Analysis

Runway Protection Zone (RPZ)

An RPZ is a trapezoidal area centered on the extended runway centerline, beginning 200 feet from the end of the runway. The RPZ is established to enhance the safety and protection of people and property on the ground. Airport ownership and/or control of the RPZ and implementation of compatible land use principles comprise the optimal method of ensuring the public’s safety in these areas. The RPZ dimensions are based on the established RDC of 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 150/5300-13B, Change 1, 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
- Unstaffed navigational aids (NAVAIDS) and facilities, such as those required for airport facilities that are fixed by function in regard to the RPZ
- Aboveground fuel tanks associated with backup generators for unstaffed NAVAIDS

In September 2022, the FAA published AC 150/5190-4B, *Airport Land Use Compatibility Planning*, which states that airport owner control over RPZs is preferred. Airport owner control over RPZs may be achieved through one of the following methods:

- Ownership of the RPZ property (fee simple)
- Possessing sufficient interest in the RPZ property through easements, deed restrictions, etc.
- Possessing sufficient land use control authority to regulate land use in the jurisdiction that contains the RPZ
- Possessing and exercising the power of eminent domain over the property
- Possessing and exercising permitting authority over proponents of development within the RPZ (e.g., where the sponsor is a state)

AC 150/5190-4B further states that "control is preferably exercised through acquisition of sufficient property interest and includes clearing RPZ areas (and keeping them clear) of objects and activities that would impact the safety of people and property on the ground." The FAA recognizes that land ownership, environmental, geographical, and other considerations can complicate land use compatibility within RPZs. Regardless, airport sponsors must comply with FAA grant assurances, including (but not limited to) Grant Assurance 21, *Compatible Land Use*. Sponsors are expected to take appropriate measures to "protect against, remove, or mitigate land uses that introduce incompatible development within RPZs."

For a proposed project that would shift an RPZ into an area with existing incompatible land uses, such as a runway extension or construction of a new runway, the sponsor is expected to have or secure sufficient control of the RPZ, ideally through fee simple ownership. Where existing incompatible land uses are present, the FAA expects sponsors to "seek all possible opportunities to eliminate, reduce, or mitigate existing incompatible land uses" through acquisition, land exchanges, right-of-first refusal to purchase, agreement with property owners on land uses, easements, or other such measures. These efforts should be revisited during master plan or airport layout plan (ALP) updates, and periodically thereafter, and should be documented to demonstrate compliance with FAA grant assurances. If new or proposed incompatible land uses impact an RPZ, the FAA expects the airport to take the above actions to control the property within the RPZ and adopt a strong public stance opposing the incompatible land uses.

For new incompatible land uses that result from a sponsor-proposed action (i.e., an airfield project, such as a runway extension; a change in the critical aircraft that increases the RPZ dimension; or lower minimums that increase the RPZ dimension), the airport sponsor is expected to conduct an alternatives evaluation. The intent of the alternatives evaluation is to identify a variety of alternatives that can be used to develop a recommended development concept for the airport to use as a basis for future airport development projects. For incompatible off-airport development, the sponsor should coordinate with the FAA Airports District Office (ADO) as soon as the sponsor is aware of the development and the alternatives evaluation should be conducted within 30 days of the sponsor becoming aware of the development within the RPZ.

The following items are typically necessary in an alternatives evaluation:

- The sponsor's statement of the purpose of and need for the proposed action (airport project, land use change, or development)
- Identification of any other interested parties and proponents
- Identification of any federal, state, and/or local transportation agencies involved
- Analysis of sponsor control of the land within the RPZ
- A summary of all alternatives considered, including the following:
    - Alternatives that preclude introducing the incompatible land use within the RPZ (e.g., zoning action, purchase, and design alternatives, such as implementation of declared distances, displaced thresholds, runway shift or shortening, or raising minimums)
    - Alternatives that minimize the impact of the land use in the RPZ (e.g., rerouting a new roadway through less of the RPZ, etc.)
    - Alternatives that mitigate risk to people and property on the ground (e.g., tunnelling, depressing and/or protecting a roadway through the RPZ, implementing operational measures to mitigate any risks, etc.)
- A narrative discussion and exhibits or figures depicting the alternative
- Rough order of magnitude cost estimates associated with each alternative, regardless of potential funding sources
- A practicability assessment based on the feasibility of the alternative in terms of constructability, cost, operational impacts, and other factors

Once the alternatives evaluation has been submitted to the ADO, the FAA will determine whether the sponsor has made an adequate effort to pursue and give full consideration to appropriate and reasonable alternatives. **The FAA will not approve or disapprove the airport sponsor's preferred alternative; rather, the FAA will only evaluate whether an acceptable level of alternatives analysis has been completed before the sponsor makes the decision to allow or disallow the proposed land use within the RPZ.**

In summary, the RPZ guidance published in September 2022 shifts the responsibility of protecting the RPZ to the airport sponsor. The airport sponsor is expected to take action to control the RPZ or demonstrate that appropriate actions have been taken. It is ultimately up to the airport sponsor to permit or not permit existing or new incompatible land uses within an RPZ, with the understanding that the sponsor still has grant assurance obligations and the FAA retains the authority to review and approve or disapprove portions of the ALP that would adversely impact the safety of people and property within the RPZ.

RPZs include both 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) govern the property interests and clearing requirements the airport sponsor should pursue. None of the runways at Portales Municipal Airport have displaced thresholds, so the approach and departure RPZs on each runway occur in the same location 200 feet from the end of each runway. The existing RPZs at the airport are presented on **Exhibit 3A** and detailed further in **Table 3J**.

TABLE 3J: Runway Protection Zones Summary

RDC	Runway	Visibility Minimums	RPZ Dimensions	Uncontrolled RPZ	Notes/Potential Incompatibilities
Runway 1-19 Existing RDC B-I(small)-5000	1	1-mile	1,000' length; 250' inner width; 450' outer width	N/A	The existing Runway 1 RPZ is located on airport property and does not contain incompatible land uses.
Runway 1-19 Existing RDC B-I(small)-5000	19	1-mile	1,000' length; 250' inner width; 450' outer width	N/A	The existing Runway 19 RPZ is located on airport property and does not contain incompatible land uses.
Runway 1-19 Ultimate RDC B-II-5000	1	1-mile	1,000' length; 500' inner width; 700' outer width	N/A	The ultimate Runway 1 RPZ is located on airport property and does not contain incompatible land uses.
Runway 1-19 Ultimate RDC B-II-5000	19	1-mile	1,000' length; 500' inner width; 700' outer width	N/A	The ultimate Runway 19 RPZ is located on airport property and does not contain incompatible land uses.
Runway 8-26 Existing RDC B-I(small)-VIS	8	Visual	1,000' length; 250' inner width; 450' outer width	N/A	The existing Runway 8 RPZ is located on airport property and does not contain incompatible land uses.
Runway 8-26 Existing RDC B-I(small)-VIS	26	Visual	1,000' length; 250' inner width; 450' outer width	0.3 acres (approximate)	Approximately 0.3 acres within the existing Runway 26 RPZ are uncontrolled. Additionally, the Burlington Northern Santa Fe (BNSF) Railroad and a public road (Airport Road) traverse a portion of the RPZ.
Runway 8-26 Ultimate RDC B-II-5000	8	1-mile	1,000' length; 500' inner width; 700' outer width	N/A	The ultimate Runway 8 RPZ is located on airport property and does not contain incompatible land uses.
Runway 8-26 Ultimate RDC B-II-5000	26	1-mile	1,000' length; 500' inner width; 700' outer width	0.9 acres (approximate)	Approximately 0.9 acres within the ultimate Runway 26 RPZ are uncontrolled. Additionally, the BNSF Railroad, a public road (Airport Road), and Highway 70 traverse a portion of the RPZ.

Table 3J Source: Coffman Associates Analysis

RUNWAY VISIBILITY ZONE (RVZ)

The runway visibility zone is an area formed by imaginary lines that connect intersecting runways. The purpose of the RVZ is to facilitate coordination among aircraft and between aircraft and vehicles that are operating on active runways. Having a clear line of sight allows pilots of departing aircraft and arriving aircraft to verify the locations and actions of other aircraft and vehicles on the ground that could create conflicts. By FAA standards, any point five feet above the runway centerline and within the runway visibility zone must be mutually visible with any other point five feet above the runway centerline and within the runway visibility zone. These standards apply to airports without airport traffic control towers (ATCTs) or with part-time ATCT operations. The RVZ at PRZ is depicted on **Exhibit 3A**. The RVZ at PRZ is generally unobstructed, except for the automated weather observation system (AWOS) located southeast of the Runway 1-19 and Runway 8-26 intersection, helicopter parking, and the aboveground fuel tanks located on the main apron to the north of Taxiway B. Consideration should be given to relocating this equipment outside the RVZ.

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. As previously determined, the applicable ADG for Runway 1-19 and Runway 8-26 in the existing condition is ADG I, and ADG II for both runways in the ultimate condition. **Table 3K** presents the various taxiway design standards related to ADG I and II. The table also shows the 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 pavement can and should be planned to the most appropriate TDG design standards, based on usage.

TABLE 3K: Taxiway Dimensions and Standards

Standards Based on Wingspan	Purpose	ADG I	ADG II
Taxiway Safety Area (TSA) Width	Taxiway and Taxilane Protection	49'	79'
Taxiway Object Free Area (TOFA) Width	Taxiway and Taxilane Protection	89'	124'
Taxilane Object Free Area (TLOFA) Width	Taxiway and Taxilane Protection	79'	110'
Taxiway Centerline to Parallel Taxiway Centerline	Taxiway and Taxilane Separation	70'	101.2'
Taxiway Centerline to Fixed or Moveable Object	Taxiway and Taxilane Separation	44.5'	62'
Taxilane Centerline to Parallel Taxilane Centerline	Taxiway and Taxilane Separation	64'	94.5'
Taxilane Centerline to Fixed or Moveable Object	Taxiway and Taxilane Separation	39.5'	55'
Taxiway Wingtip Clearance	Wingtip Clearance	20'	22.5'
Taxilane Wingtip Clearance	Wingtip Clearance	15'	15.5'

TABLE 3K (continued): Taxiway Dimensions and Standards

Standards Based on Taxiway Design Group	TDG 1A/1B	TDG 2A/2B
Taxiway Width Standard	25'	35'
Taxiway Edge Safety Margin	5'	7.5'
Taxiway Shoulder Width	10'	15'

Table 3K Source: FAA AC 150/5300-13B, Airport Design

Taxiway Width

All taxiways at PRZ measure 25 feet wide, meeting the standard for existing TDG 1A. In the ultimate condition, the design standard transitions to TDG 2A, as described in Chapter Two. The taxiway width standard for TDG 2A is 35 feet wide; as such, consideration should be given to widening the taxiway pavement by 10 feet to meet the standard in the ultimate condition.

Taxiway Safety Areas

Each taxiway on the airfield has an associated taxiway safety area (TSA) and taxiway object free area (TOFA). The TSA is defined as a surface prepared to support the occasional passage of aircraft and ARFF equipment. Like the RSA, the TSA must be cleared and graded and kept free of objects (except those that are fixed by function) and surface water accumulation. Like the ROFA, the TOFA is defined as an area adjacent to the TSA that is clear of objects not fixed by function to provide vertical and horizontal wingtip clearance. The applicable TSA and TOFA widths for the taxiway system at PRZ are 49 feet and 89 feet wide, respectively, based on the existing ADG I condition. In the ultimate condition, the TSA and TOFA widths for the taxiway system at the airport are 79 feet and 124 feet wide, respectively, based on the ultimate ADG II condition.

Currently, tiedowns closest to Taxiway A are located within the existing TSA and TOFA areas. In the ultimate condition, the TSA and TOFA further expand and encompass two rows of tiedowns (see **Exhibit 3B**). Consideration will be given to removing/relocating these tiedowns in the alternatives section of this chapter.

The taxilane object free area (TLOFA) varies depending on the type(s) of aircraft using the taxilane. The TLOFA should be cleared of objects except those needed for air navigation or aircraft ground maneuvering purposes. The TLOFAs on taxilanes at PRZ meet applicable design standards.

Taxiway and Taxilane Design Considerations

The taxiway system of an airport is primarily intended to facilitate aircraft movements to and from the runway system. Some taxiways are constructed to increase the allowable frequency of aircraft operations as air traffic increases.

FAA AC 150/5300-13B, *Airport Design*, Change 1, provides guidance on recommended taxiway and taxilane layouts to enhance safety by avoiding runway incursions. A runway incursion is defined as “any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.”

The following list presents taxiway design guidelines and the basic rationale behind each recommendation:

1. Taxi Method: Taxiways are designed for cockpit-over-centerline taxiing, with pavement that is sufficiently wide to allow a certain amount of wander. On turns, sufficient pavement should be provided to maintain the edge safety margin from the landing gear. When constructing new taxiways, existing intersections should be upgraded to eliminate judgmental oversteering, which occurs when a pilot must intentionally steer the cockpit outside the marked centerline to ensure the aircraft remains on the taxiway pavement.

2. Curve Design: Taxiways should be designed so the nose gear steering angle is no more than 50 degrees, which is the generally accepted value to prevent excessive tire scrubbing.

3. Three-Path Concept: To maintain pilot situational awareness, taxiway intersections should provide a pilot with a maximum of three choices of travel. Ideally, these are right- and left-angle turns and a continuation straight ahead.

4. Channelized Taxiing: To support visibility of airfield signage, taxiway intersections should be designed to meet standard taxiway width and fillet geometry.

5. Designated Hot Spots and Runway Incursion Mitigation (RIM) Locations: A hot spot is a location on the airfield with elevated risk of a collision or runway incursion. For areas the FAA designates as hot spots or RIM locations, mitigation measures should be prioritized.

6. Intersection Angles: Turns should be designed to be 90 degrees wherever possible. For acute-angle intersections, standard angles of 30, 45, 60, 120, 135, and 150 degrees are preferred.

7. Runway Incursions: Taxiways should be designed to reduce the probability of runway incursions.

    a. *Increase Pilot Situational Awareness*: A pilot who knows where he/she is on the airport is less likely to improperly enter a runway. Complexity leads to confusion. Keep taxiway systems simple using the three-node concept.

    b. *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.

    c. *Limit Runway Crossings*: The taxiway layout can reduce the opportunity for human error. The benefits are twofold: through a simple reduction in the number of occurrences and a reduction in air traffic controller workload.

    d. *Avoid High-Energy Intersections*: These are intersections in the middle thirds 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.

    e. *Increase Visibility*: Right-angle intersections between taxiways and runways provide the best visibility. Acute-angle runway exits provide 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.

    f. *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.

    g. *Indirect Access*: Do not design taxiways to lead directly from an apron to a runway. Such a configuration can lead to confusion when a pilot typically expects to encounter a parallel taxiway.

    h. *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 possible.

8. Runway/Taxiway Intersections:

    a. *Right Angle*: Right-angle intersections are the standard for all runway/taxiway intersections, except where there is a need for an acute-angled 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. Right-angle taxiways also provide optimal orientation of the runway holding position signs so they are visible to pilots.

    b. *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. The construction of high-speed exits is typically only justified for runways that experience regular use by jet aircraft in approach categories C and above.

c. *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, which make it difficult to provide proper signage, marking, and lighting.

9. **Taxiway/Runway/Apron Incursion Prevention**: Apron locations that allow direct access to a runway should be avoided. Pilot situational awareness can be increased by designing taxiways in a manner that forces pilots to consciously make turns. Taxiways that originate from aprons and form straight lines across runways at mid-span should be avoided.

    a. *Wide-Throat Taxiways*: Avoid wide-throat taxiway entrances. Such large expanses of pavement may cause pilot confusion and make lighting and marking more difficult.

    b. *Direct Access from Apron to 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.

The taxiway system at PRZ generally provides for the efficient movement of aircraft, and there are no FAA-designated hot spots; however, certain portions of the taxiways do not meet current FAA recommendations for taxiway design. These include acute-angled connections between taxiways and runways and taxiway crossings through the high-energy portion (middle third) of each runway. The alternatives will evaluate potential modifications to the taxiway geometry at PRZ to align with the FAA's preferred design standards.

Runway-to-Taxiway Separation

Design standards for the separation distances between runways and parallel taxiways are based on the RDC for the runway. Each runway is classified as B-I(small)-5000 in the existing condition, which has a runway-to-taxiway separation standard of 150 feet. Parallel Taxiways A and B are separated from their respective runways by 240 feet. Planning for each runway considers a transition to an ultimate RDC of B-II-5000, which has a runway-to-taxiway separation standard of 240 feet. As the existing runway-to-taxiway separation currently exceeds the existing design standard and meets the ultimate design standard, Taxiways A and B should remain in their existing locations for the duration of the planning period.

Aircraft Parking Apron

According to FAA AC 150/5300-13B, Change 1, aircraft parking positions should be located to ensure aircraft components (tail, wingtip, nose, etc.) do not:

1. Conflict with the object free area for the adjacent runway or taxiways:

    a. Runway object free area (ROFA)
    b. Taxiway object free area (TOFA)
    c. Taxilane object free area (TLOFA)

2. Or violate any of the following aeronautical surfaces and areas:

    a. Runway approach or departure surface
    b. Runway visibility zone (RVZ)
    c. Runway obstacle free zone (ROFZ)
    d. Navigational aid equipment critical areas

All the object free areas and aeronautical surfaces listed above are free from obstructions, with the exception of the tiedowns located closest to Taxiway A, as previously detailed.

HOLDING APRONS

Holding aprons are an important feature during peak periods at a general aviation airport. Pilots can pull off main taxiways onto a holding apron to perform final preflight checks and engine run-ups, as these activities can take several minutes, and other aircraft that are ready for takeoff can then proceed to the runway threshold for departure without delay.

Holding aprons have specific design and separation standards that are intended to allow other aircraft to bypass aircraft using the holding apron; specifically, the location on the holding apron where aircraft park should meet the taxiway-to-taxiway separation standard, which is based on the ADG of the critical aircraft.

Currently, none of the runway ends at PRZ are served by holding aprons. When planning for capacity improvements, the FAA considers activity levels that could trigger improvements. In the case of holding aprons, this equates to 75,000 annual operations or 20,000 annual itinerant operations. The operations forecasts in Chapter Two included the potential for more than 20,000 annual itinerant operations at PRZ by the end of the planning period; as such, future facility planning should include the addition of a holding apron or holding aprons on primary Runway 1-19.

INSTRUMENT APPROACH CONSIDERATIONS

Approach minimums should be as low as practical, considering possible safety and financial constraints. The best practical approach minimums will ultimately allow aircraft to operate in reduced visibility conditions while increasing operational safety and airport capacity.

PRZ currently has one published instrument approach, which is the area navigation (RNAV) global positioning system (GPS) serving Runway 1. The RNAV-GPS instrument approach procedure provides for visibility minimums as low as one-mile and cloud ceilings of 600 feet. This approach also has a circling minimum, which allows pilots to land on any active runway at the airport while providing flexibility for a pilot to land on the runway most closely aligned with the prevailing wind at the time.

Based on historical wind conditions at the airport, Runway 19 is the most commonly used runway. For planning purposes, the alternatives in the next section will include GPS-based instrument approach procedures with minimums not lower than one-mile to runway ends not currently equipped with an approach.

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 on the runway, electronic visual approach aids are commonly provided at airports. None of the runway ends at PRZ are equipped with functioning visual approach aids. Consideration should be given to installing two-box precision approach path indicator (PAPI-2) systems along Runway 1-19 and Runway 8-26 in the short-term, with a potential transition to a PAPI-4 system on Runway 1-19 if/when increased jet activity warrants such an upgrade.

Runway end identifier lights (REILs) are flashing lights located at the runway threshold 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 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 that are not planned for a more sophisticated approach lighting system. None of the runways at PRZ are equipped with REILs. The alternatives will consider the inclusion of REILs on both ends of Runway 1-19 and Runway 8-26.

AIRFIELD MARKING, LIGHTING, AND SIGNAGE

Both Runway 1-19 and Runway 8-26 have standard markings for non-precision instrument runways. The runways are marked with threshold markings, designation markings, and aiming point markings. These markings should be maintained throughout the planning period.

Holding positions are markings on taxiways leading to runways that provide adequate runway clearance for holding aircraft. The design standard for the location of hold lines on taxiways is a function of the RDC of the runway. In the existing condition for each runway, the separation standard for hold lines is 125 feet from the runway centerline. The separation standard increases to 200 feet from the runway centerline in the ultimate condition. Currently, all hold lines on taxiways are located at least 125 feet from a runway centerline, which meets the existing separation standard but falls short of the 200-foot separation requirement in the ultimate runway environment. Future planning should include relocation of holding positions to meet the ultimate design standard.

Both Runway 1-19 and Runway 8-26 are equipped with medium intensity runway lights (MIRL). This system should be maintained for each runway. Taxiways at PRZ are currently equipped with edge reflectors. Consideration should be given to installing medium intensity taxiway lighting (MITL) on all taxiway pavement.

As mentioned in Chapter One, airfield signage serves as another means of navigation for pilots. Airfield signage informs pilots of their locations on the airport and directs them to major airport facilities, such as runways, certain taxiways, and aprons. Currently, the airport is equipped with lighted airfield location signage at each runway/taxiway intersection. These signs should be maintained through the planning period and updated with light-emitting diode (LED) lighting where necessary.

WEATHER FACILITIES

PRZ is equipped with a lighted wind cone at each runway end and a segmented circle co-located with the wind cone near Runway 19. These wind cones provide information to pilots regarding wind speed and direction and should be maintained through the planning period. The segmented circle consists of visual indicators that are designed to provide traffic pattern information to pilots. This equipment should be maintained through the planning period.

The airport is also equipped with an AWOS-3, which is located southeast of the runways' intersection. An AWOS provides weather observations 24 hours per day. At the time of this writing, there are plans to replace the AWOS due to outdated equipment. FAA siting criteria indicate that the AWOS should be located between 1,000 and 3,000 feet from the runway threshold and between 500 and 1,000 feet perpendicular to the runway centerline. The AWOS also has a 500-foot radius critical area, which must be kept free of obstructions that could interfere with its sensors. The existing AWOS is located in the RVZ and, when replaced, should be relocated to an area outside the RVZ.

AIRSIDE FACILITY REQUIREMENTS SUMMARY

The intent of this section has been to outline the airfield facilities required to meet potential aviation demands projected for Portales Municipal Airport through the long-term planning period. A summary of airside requirements is included on **Exhibit 3C**.

AIRSIDE ALTERNATIVES

This section identifies and evaluates various airside development factors at Portales Municipal Airport to meet the requirements set forth in the previous section. Airside facilities are, by nature, the focal point of an airport complex. Because of their primary role and the fact that they physically dominate airport land use, airfield facility needs are often the most critical factor in the determination of viable development options. 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 PRZ will meet the aviation needs of the City of Portales and the region, both during and beyond the 20-year planning period.

The following alternatives examine airside improvement opportunities to meet existing and ultimate airfield design standards. The primary airside planning issues to be considered in this alternatives analysis are:

- Meeting ultimate RDC B-II-5000 design standards on Runway 1-19 and Runway 8-26;
- Runway 1-19 and Runway 8-26 extension options to better accommodate turbine operations;
- Mitigation of non-standard conditions in safety areas;
- Corrective measures for non-standard taxiway geometry; and
- Installation of visual approach aids and lighting upgrades.

AIRSIDE ALTERNATIVE 1

Airside Alternative 1, depicted on **Exhibit 3D**, focuses on an option for PRZ to resolve existing safety area conditions. This includes a slight safety area deficiency in the vicinity of Runway 1, where the airport's service road traverses the existing condition (B-I[small]) RSA and ROFA, and an uncontrolled portion of Runway 26 that contains incompatible land uses (rail line, Highway 70, and Airport Road). The RVZ is also obstructed by the AWOS equipment, which is proposed to be relocated.

To bring the safety areas into compliance with existing B-I(small) standards, Alternative 1 proposes a reroute of the service road around the ROFA. Declared distances are proposed to shift the Runway 8 RPZ inside the property line and off the BNSF Railroad and airport access road. Declared distances are used by the FAA to define the effective runway length for landing and takeoff when a displaced threshold is involved. They are considered a reasonable alternative to mitigate existing runway shortcomings or deficient safety areas; however, they are considered an interim mitigation, and the preferred condition is a runway that fully meets design standards without the need for declared distances. The four types of declared distances, as defined in FAA AC 150/5300-13B, *Airport Design*, Change 1, are as follows:

- Takeoff run available (TORA): the runway length declared available and suitable for satisfying takeoff run requirements; the TORA does not take into consideration RSA/ROFA design standards
- Takeoff distance available (TODA): the TORA plus the length of any remaining runway and/or clearway beyond the departure end of the TORA that is available for satisfying takeoff distance requirements
- Accelerate-stop distance available (ASDA): the runway declared available for the acceleration and deceleration of an aircraft aborting takeoff; the ASDA takes into consideration RSA/ROFA standards, thereby improving safety margins for users
- Landing distance available (LDA): the runway length declared available and suitable for landing, taking into account the RSA standard

The Runway 26 threshold is proposed to be displaced by 165 feet, which is the distance needed to bring the RPZ off incompatible land uses and onto airport property. This displacement results in the declared distances presented in **Table 3L**.

TABLE 3L: Declared Distances for Runway 8-26

Declared Distances	Runway 8	Runway 26
TORA	4,395'	4,560'
TODA	4,560'	4,560'
ASDA	4,560'	4,560'
LDA	4,560'	4,395'

AIRSIDE ALTERNATIVE 2

Airside Alternative 2, depicted on **Exhibit 3E,** is based on meeting ultimate runway design standards and considers an extension to each runway and mitigation for non-standard safety area conditions. Several airfield upgrades are also considered.

Airside Alternative 2 proposes the following:

1. Extend Runway 1-19 by 1,100 feet to the south, resulting in an ultimate runway length of 6,800 feet. This is the FAA-recommended length to accommodate 75 percent of the business jet fleet (aircraft less than 60,000 pounds) at 60 percent useful load. Related projects include an extension to Taxiway A, relocation of existing visual aids and signage, installation of MIRL, and a reroute of the airport's service road around the ultimate safety areas. This extension would also result in safety areas near the Runway 1 end extending beyond airport property. This includes unowned property within the RSA, ROFA, ROFZ and RPZ. This property is proposed for fee simple acquisition and encompasses approximately 15.1 acres.

2. Extend the Runway 8 end by 545 feet with a 305-foot reduction in pavement on the Runway 26 end. This brings the length of Runway 8-26 to 4,800 feet. While this does not achieve the recommended 5,400 feet needed to support smaller airplanes with fewer than 10 passengers at 95 percent useful load, it provides additional length, shifts the Runway 26 RPZ onto airport property, and keeps the ultimate Runway 8 RPZ from impacting Roosevelt Road. This is the maximum length possible on Runway 8-26 without the need for property acquisition and a potential reroute of Roosevelt Road. Related projects include modifications to Taxiway B to correspond to the new runway ends, relocation of existing visual aids and signage, installation of MIRL, and a reroute of the airport's service road around the ultimate safety areas.

3. Acquire or obtain an avigation easement over 6.4 acres of RPZ land associated with the Runway 8 approach end.

4. Widen Runways 1-19 and 8-26 to 75 feet to meet the ultimate B-II design standard.

5. Install PAPI-4 systems on Runway 1-19 and PAPI-2 systems Runway 8-26.

6. Construct a holding bay on Taxiway A near the Runway 19 threshold.

7. Relocate the AWOS outside the RVZ.

AIRSIDE ALTERNATIVE 3

Airside Alternative 3, depicted on **Exhibit 3F**, is similar to Alternative 2 with two primary changes: a longer extension to Runway 8-26 and taxiway geometry reconfiguration.

Alternative 3 proposes an ultimate length of 5,700 feet for the crosswind runway, which is the recommended length to accommodate 100 percent of small airplanes. This would be achieved by extending Runway 8 by 1,445 feet and removing 305 feet of pavement on the Runway 26 end to bring the Runway 26 RPZ onto airport property and clear it of incompatible land uses. On the Runway 8 end, there are significant potential impacts due to the extended safety areas. The RSA, ROFA, ROFZ, and RPZ would all extend beyond the airport's property line, which would require some level of property acquisition if this alternative is selected. At a minimum, the RSA, ROFA, and ROFZ would need to be acquired fee simple, while the RPZ would need to be protected by an easement; however, the primary challenge is the introduction of Roosevelt Road into the Runway 8 RPZ. As stated, a public road is generally considered to be an incompatible land use within an RPZ and airport sponsors are required to evaluate mitigative options when such a condition exists. For a project that would introduce a new incompatibility into an RPZ, the FAA is unlikely to approve the project unless it includes a plan to mitigate the RPZ incompatibility. For this reason, Alternative 3 illustrates an option to reroute Roosevelt Road around the ultimate RPZ and close the portion of roadway that would pass through the RPZ.

Taxiway geometry changes are also proposed in Alternative 3, including a reconfiguration of Taxiways A and B near the runways' intersection to achieve standard right-angle connections. This includes removal of existing taxiway pavement and construction of new pavement, as shown on **Exhibit 3F**.

LANDSIDE FACILITY REQUIREMENTS

Components included within this section include general aviation terminal facilities, aircraft hangars and tiedowns, aircraft parking aprons, automobile parking, and airport support facilities.

TERMINAL FACILITIES AND PARKING

The terminal facilities located on general aviation airports typically provide space for a variety of activities, as well as pilot services. Terminal services at PRZ are provided in a terminal building that consists of approximately 3,470 square feet (sf) and includes a pilots' lounge, multi-purpose conference room, employee offices, and restrooms.

To estimate terminal facility needs, the number of itinerant passengers expected to use terminal facilities during the design hour are taken into consideration. The terminal area space requirements are based on the allocation of a range of designated square feet per design hour itinerant passenger. Identifying the number of design hour passengers is achieved by multiplying the number of itinerant design hour operations by the number of passengers expected on the aircraft. General aviation space requirements are based on providing 200 square feet per design hour itinerant passenger. The analysis examines the national trends and increased activity at the airport and shows a progressive increase in the passenger count, which was used to account for larger, more sophisticated aircraft using the airport. Current and projected terminal building requirements are included in **Table 3M**.

TABLE 3M: General Aviation Terminal Services Requirements for Portales Municipal Airport

Peak Period Characteristics	Available	Short-Term	Intermediate-Term	Long-Term
Design Hour Operations	18	20	22	26
Passenger Multiplier	–	1.5	1.7	2.0
Total Design Hour Itinerant Passengers	–	31	38	52
Total Building Space:	**3,470 sf**	**3,900 sf**	**4,800 sf**	**6,500 sf**

Table 3M Source: Coffman Associates Analysis

When considering the square footage for the existing terminal building, the analysis shows the need for expansion of the terminal building in terms of capacity to meet the long-term demand through the planning period.

AIRCRAFT STORAGE 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 (and, consequently, more expensive) aircraft; therefore, many aircraft owners prefer enclosed hangar space to outside tiedowns.

The demand for aircraft storage hangars is dependent on the number and types of aircraft expected to be based at the airport in the future. For planning purposes, it is necessary to estimate hangar requirements based on forecasted operational activity; however, hangar development should be based on actual demand trends and financial investment conditions.

A variety of aircraft storage options are typically available at airports, including T-hangars, executive box hangars, and conventional hangars. A T-hangar is 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 configured in the shape of a "T" and provide space for the aircraft nose and wings, but no space for turning the aircraft within the hangar. Conventional/executive hangars provide open space, free from roof support structures, and have the capability to store multiple aircraft simultaneously, depending on their size. Conventional hangars are typically greater than 10,000 sf in size, while executive box hangars can range in size from 2,000 sf up to 10,000 sf.

PRZ has five separate hangar facilities that provide approximately 43,050 total sf of hangar space. T-hangars comprise three of the five hangar facilities, while the remaining hangars are comprised of two executive box hangars that total approximately 6,060 sf of hangar space.

Planning for future aircraft storage needs is based on typical owner preferences and standard sizes for hangar space. For determining ultimate aircraft storage needs, a planning standard of 1,200 sf per based aircraft is utilized for T-hangars. For executive box and conventional hangars, an ultimate planning standard of 3,000 sf per turboprop, 5,000 sf per jet, and 1,500 per helicopter is utilized for box hangars, as these hangars are capable of housing larger aircraft.

Ultimate hangar requirements are presented in **Table 3N**. While some based aircraft may utilize aircraft parking apron space instead of enclosed hangar space, the overall percentage of aircraft seeking hangar space is projected to increase during the long-term planning period.

TABLE 3N: Aircraft Hangar Requirements

Hangar Development Requirements	Currently Available	Short-Term Need	Intermediate-Term Need	Long-Term Need
Total On-Airport Based Aircraft to be Hangered	24	20	23	30
Hangar Area Requirements: T-Hangar	36,990 sf	38,200 sf	39,100 sf	42,700 sf
Hangar Area Requirements: Executive Box/Conventional Hangar Area	6,060 sf	8,190 sf	16,200 sf	25,700 sf
Total Hangar Area:	**43,050 sf**	**46,390 sf**	**55,300 sf**	**68,400 sf**

The analysis above indicates a potential need for more than 25,350 sf of new hangar storage capacity through the long-term planning period. This includes a mixture of hangar types, with the largest projected need in the box/conventional hangar category. Due to the projected increase in based aircraft, the existing demand for hangar space, annual general aviation operations, and hangar storage needs, facility requirements will continue to be met through a combination of hangar types.

It should be noted that hangar requirements are general in nature and based on aviation demand forecasts. The actual need for hangar space will depend on usage within the hangars. For example, some hangars may be utilized entirely for non-aircraft storage, such as maintenance; however, they have an aircraft storage capacity from a planning standpoint, even though the needs of an individual user may differ from the calculated space necessary.

AIRCRAFT PARKING APRONS

The aircraft parking apron is an expanse of paved area intended for aircraft parking and circulation. A main apron is typically located near the airside entry point, such as the terminal building or fixed based operator (FBO) facility. Ideally, the main apron is large enough to accommodate transient airport users, as well as a portion of locally based aircraft. Smaller aprons are often available adjacent to FBO or specialty aviation service operator (SASO) hangars and at other locations around the airport. At PRZ, the apron is located adjacent to and northwest of the terminal building.

To determine future apron needs, a planning criterion of 800 square yards (sy) was used for single- and multi-engine itinerant aircraft, while a planning criterion of 1,600 sy was used to determine the area for transient turboprop and jet aircraft. A parking apron should also provide space for locally based aircraft that require temporary tiedown storage. Locally based tiedowns are typically utilized by smaller single-engine aircraft; thus, a planning standard of 650 sy per position is utilized.

The total apron parking requirements are presented in **Table 3P**. The existing parking apron at PRZ encompasses approximately 24,788 sy. Using the planning standards described above and factoring in assumptions regarding operational and based aircraft growth, additional apron space is projected to be needed by the short term. By the long term, approximately 27,800 sy of aircraft parking apron is needed.

TABLE 3P: Aircraft Parking Apron Requirements

Aircraft Parking Positions	Available	Short-Term	Intermediate-Term	Long-Term
Based/Local GA Aircraft	0	7	7	9
Transient GA Aircraft	39	17	19	22
Corporate Jet Aircraft	0	0	1	2
Helicopter	0	0	0	0
Total Parking Positions:	**39**	**24**	**28**	**35**
Total Apron Area:	**24,788 sy**	**17,800 sy**	**22,200 sy**	**27,800 sy**

Table 3P Source: Coffman Associates Analysis

There are currently 39 marked parking positions available for transient aircraft at the airport, including one helipad for helicopter parking. As shown in **Table 3Q** on the following page, the current number of aircraft parking positions available in the existing condition is sufficient for the total number of marked parking positions needed at PRZ in the planning period.

VEHICLE PARKING REQUIREMENTS

Vehicle parking spaces for airport users have also been evaluated. Currently, the airport has approximately eight individual marked parking spaces, which are located east of the terminal building. This planning study assumes 30 percent of based aircraft will require a vehicle parking space. Parking for the terminal building was determined by multiplying the design hour operations by passengers per operation.

Table 3Q details the vehicle parking requirements for the airport.

TABLE 3Q: General Aviation Vehicle Parking Spaces

Vehicle Parking Positions	Available	Short-Term	Intermediate-Term	Long-Term
Terminal Parking Spaces	15*	31	38	52
Based Aircraft Owner Spaces	0	7	7	9
Design Hour Operations	18	20	22	26
Passenger Multiplier	0	1.5	1.7	2.0
Total Parking Positions:	**25**	**38**	**45**	**61**

*The terminal parking lot at PRZ currently has currently has 15 defined parking spaces; however, the existing parking lot could support more parking spaces and consideration should be given to painting defined parking spaces at PRZ.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within classifications of airfield, terminal building, or general aviation areas have also been identified. These other areas provide certain functions related to the overall operation of the airport and are considered supporting functions.

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)

PRZ does not have an ARFF building located on the airfield. Because PRZ is a general aviation airport, the FAA does not mandate that ARFF services be provided. PRZ is anticipated to remain a general aviation airport through the planning period, so no on-site ARFF facilities are planned.

AVIATION FUEL STORAGE

The airport currently has a 12,000-gallon 100LL fuel storage tank and a 12,000-gallon Jet A fuel storage tank, which are located south of the terminal apron. In addition, the airport has one 1,800-gallon Jet A fuel truck. Based on historical fuel flowage records from the last five years, the airport pumped an average of 13,962 gallons of 100LL fuel and 9,633 gallons of Jet A fuel per year. Dividing the total fuel flowage by the total number of operations provides a ratio of fuel flowage per operation.

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 100LL and Jet A fuel. Based on these usage assumptions and projected design day operations, no additional storage for 100LL or Jet A fuel is projected to be needed. **Table 3R** summarizes the forecasted fuel storage requirements through the planning period.

Fuel storage requirements are typically based on keeping a two-week supply of fuel during an average month; however, more frequent deliveries can reduce the fuel storage capacity requirements. Generally, fuel tanks should be of adequate capacity to accept a fuel refueling tanker, which holds approximately 8,000 gallons, while maintaining a reasonable level of fuel in the storage tank. Ultimate aircraft demand experienced at the airport will determine the need for additional fuel capacity. It is important that airport personnel plan for adequate levels of fuel storage capacity through the long-term planning period of this study.

TABLE 3R: Fuel Storage Requirements

Fuel Usage and Supply	Capacity	2024 Need	Short-Term	Intermediate-Term	Long-Term
100LL Daily Usage	12,000 gallons	45 gallons	51 gallons	56 gallons	65 gallons
100LL 14-Day Supply	12,000 gallons	632 gallons	715 gallons	778 gallons	908 gallons
100LL Annual Usage	12,000 gallons	16,400 gallons	18,600 gallons	20,200 gallons	23,600 gallons
Jet A Daily Usage	12,000 gallons	31 gallons	35 gallons	38 gallons	45 gallons
Jet A 14-Day Supply	12,000 gallons	436 gallons	493 gallons	537 gallons	627 gallons
Jet A Annual Usage	12,000 gallons	11,300 gallons	12,800 gallons	14,000 gallons	16,300 gallons

Table 3R Sources: Historical fuel flowage data provided by airport staff; fuel supply projections prepared by Coffman Associates

PERIMETER FENCING AND GATES

Perimeter fencing is used at airports primarily to secure the aircraft operational area. The physical barrier of perimeter fencing:

- Gives notice of legal boundary of the outermost limits of the facility or security-sensitive area;
- Assists in controlling and screening authorized entries into a secured area by deterring entry elsewhere along the boundary;
- Supports surveillance, detection, assessment, and other security functions by providing a zone for installing intrusion detection equipment and closed-circuit television (CCTV);
- Deters casual intruders from penetrating the aircraft operations areas on the airport;
- Creates a psychological deterrent;
- Demonstrates a corporate concern for facilities; and
- Limits inadvertent access to aircraft operations on the airport.

While not a requirement, the entirety of PRZ is fenced for security purposes. This fencing should be maintained during the course of the planning period.

LANDSIDE FACILITY REQUIREMENTS SUMMARY

The intent of this section has been to outline the landside facilities required to meet potential aviation demands projected for Portales Municipal Airport through the long-term planning period. A summary of landside requirements is included on **Exhibit 3G**.

LANDSIDE ALTERNATIVES

Generally, landside issues are related to those facilities necessary or desired for the safe and efficient parking and storage of aircraft, movement of pilots and passengers to and from aircraft, and overall revenue support functions, including airport support facilities.

To maximize airport efficiency, it is important to locate facilities together when they are intended to serve similar functions. The best approach to landside facility planning is to consider the development like a community, for which land use planning is the guide. For airports, the land use guidance in the terminal area should generally be dictated by aviation activity levels. Consideration will also be given to non-aviation uses that can provide additional revenue support to the airport and support economic development for the region.

Landside planning considerations (summarized below) will focus on strategies that follow a philosophy of separating activity levels. Potential landside facility development at PRZ is focused on the northeast side of airport property, where existing facilities (terminal building, hangars, etc.) are already located.

LANDSIDE PLANNING CONSIDERATIONS

1. Consider the building restriction line (BRL) when planning vertical infrastructure
2. Expand the terminal building
3. Increase aircraft storage capacity
4. Expand the aircraft parking apron

Consideration #1: Building Restriction Line (BRL)

The BRL is a line that identifies suitable and unsuitable building area locations on the airport. The BRL encompasses the RPZs, the ROFA, navigational aid critical areas required for terminal instrument procedures, and other areas necessary for meeting airport line-of-sight criteria.

Two primary factors contribute to the determination of the BRL: the type of runway (utility or other-than-utility) and the capability of the instrument approaches. Runway 1-19 and Runway 8-26 are identified as utility runways.

The BRL is the product of Title 14 Code of Federal Regulations (CFR) Part 77 transitional surface clearance requirements. These requirements stipulate that no object be located in the primary surface, defined as being no closer than 250 feet from a non-precision instrument runway centerline and no closer than 500 feet from a runway served by a precision instrument approach. For Portales Municipal Airport, the primary surface is 500 feet wide (250 feet on either side of the runway centerline). From the primary surface, the transitional surface extends outward at a slope of one vertical foot to every seven horizontal feet.

The location of the BRL is dependent on the selected allowable structure height. Traditionally, the BRL is set at a point where the transitional surface is 20 feet or 35 feet above the runway elevation. The alternatives consider a 35-foot BRL in relation to the runway system and existing and proposed land uses. There are no structures located within the BRL that need to be relocated. **It should be noted that the BRL is not a standard; rather, it is a guideline to use when planning vertical infrastructure on the airport.** The FAA may require structures inside the BRL to be equipped with obstruction lights.

Consideration #2: Expand Terminal Building Capacity

As mentioned earlier in the chapter, planning for the long term identifies the need for 6,500 sf of space for the terminal building, which is an approximately 3,030-sf expansion of the existing terminal building.

Consideration #3: Hangar Capacity

As previously discussed, ultimate hangar requirements indicate a potential need for 68,400 sf of aircraft storage capacity through the long-term planning period, which is approximately 25,350 sf more than what is currently available.

Consideration #4: Aprons

PRZ has approximately 24,788 sy of apron space for aircraft parking and circulation. Based on projected growth in based aircraft and transient operations, an additional 3,012 sy of apron capacity is needed over the next 20 years.

LANDSIDE ALTERNATIVE 1

Landside Alternative 1, depicted on **Exhibit 3H**, focuses primarily on the expansion of aircraft storage, with an access road and taxilanes that would support the additional hangars. The proposed hangar layout depicts hangar development to the north of existing T-hangar development at PRZ, and hangar development on the east side of the airport, to the north of Taxiway B. Features of the landside alternative include the following:

1. A mixture of executive box hangars and five-unit T-hangars on the north side of the airport. An access road constructed on the northeast side of the airport would connect to Airport Road; this road would ultimately lead to the proposed hangar development on the north side of the airport.
2. Construction of six-unit T-hangars south of the existing hangar development and north of Taxiway B. Vehicular parking would also be constructed to the north of the proposed development.
3. A 3,030-sf expansion of the terminal building.
4. Construction of a maintenance facility to the east of the existing T-hangar development.
5. Painting of parking spaces in the existing terminal parking lot to better define vehicular parking spaces.
6. Removal of the tiedowns on the existing apron that are within the TOFA.
7. 7.8 acres set aside on the northeast side of the airport for an aeronautical reserve.
8. 11.3 acres set aside on the east side of the airport for an aeronautical reserve.
9. 16.2 acres set aside on the northeast side of the airport for a non-aeronautical reserve.

LANDSIDE ALTERNATIVE 2

Landside Alternative 2, depicted on **Exhibit 3J**, focuses primarily on the expansion of aircraft storage, with an access road and taxilanes that would support the additional hangars. The proposed hangar layout depicts hangar development to the north of existing T-hangar development at PRZ, and hangar development on the east side of the airport, north of Taxiway B.

Features of the landside alternative include the following:

1. A mixture of executive box hangars and five-unit T-hangars on the north side of the airport. An access road constructed on the east side of the existing T-hangar development would connect to Airport Road; this road would ultimately lead to the proposed hangar development on the north side of the airport.

2. Construction of nine executive hangars of varying sizes to the north of Taxiway B. Hangar users would access the runway system via a proposed taxilane that would connect to Taxiway B to access the airfield. Proposed vehicular access to this development would be constructed off Airport Road.

3. A 3,030-sf expansion of the terminal building.

4. Construction of a maintenance facility to the east of the existing T-hangar development.

5. Painting of parking spaces in the existing terminal parking lot to better define vehicular parking spaces.

6. Expansion of the existing terminal apron to the north, including four additional tiedown parking positions.

7. Removal of the tiedowns on the existing apron that are within the TOFA.

8. 7.9 acres set aside on the north side of the airport for an aeronautical reserve.

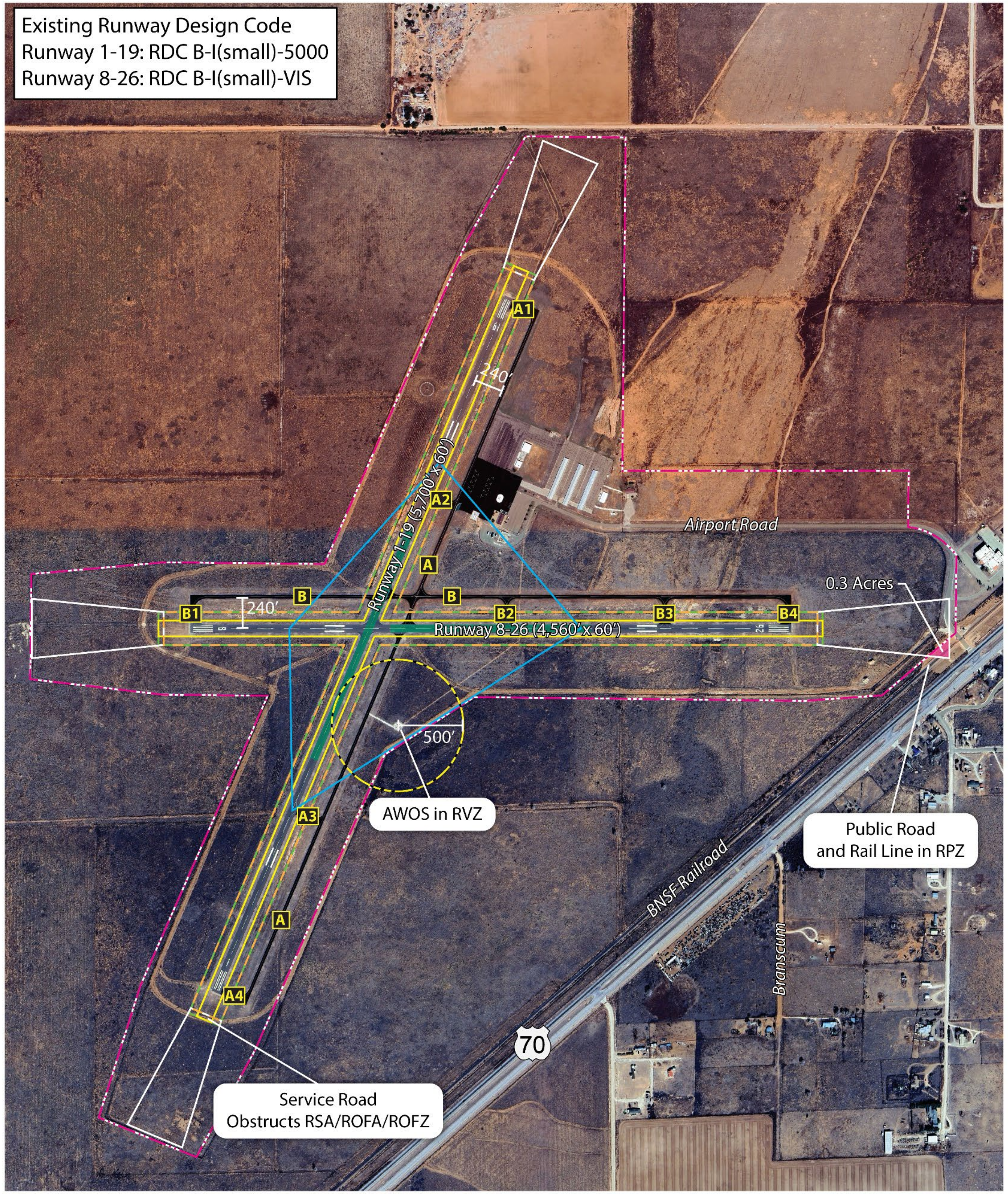
9. 9.7 acres set aside on the east side of the airport for an aeronautical reserve.

10. 16.2 acres set aside on the northeast side of the airport for a non-aeronautical reserve.

SUMMARY

This chapter is intended to present an outline of airside and landside facilities needed at PRZ and potential alternatives to meet safety requirements and demand. FAA design standards are frequently updated with the intent of improving the safety and efficiency of aircraft movements on and around airports, which can lead to certain pavement geometries that previously qualified as standard being classified as non-standard.

The next step in this narrative report and ALP update is to arrive at a recommended development concept. Additional consultation with the FAA and New Mexico Department of Transportation (NMDOT) may also be required. Once a consolidated development plan is identified, a capital improvement program will be presented that includes a list of prioritized projects tied to aviation demand and/or necessity.



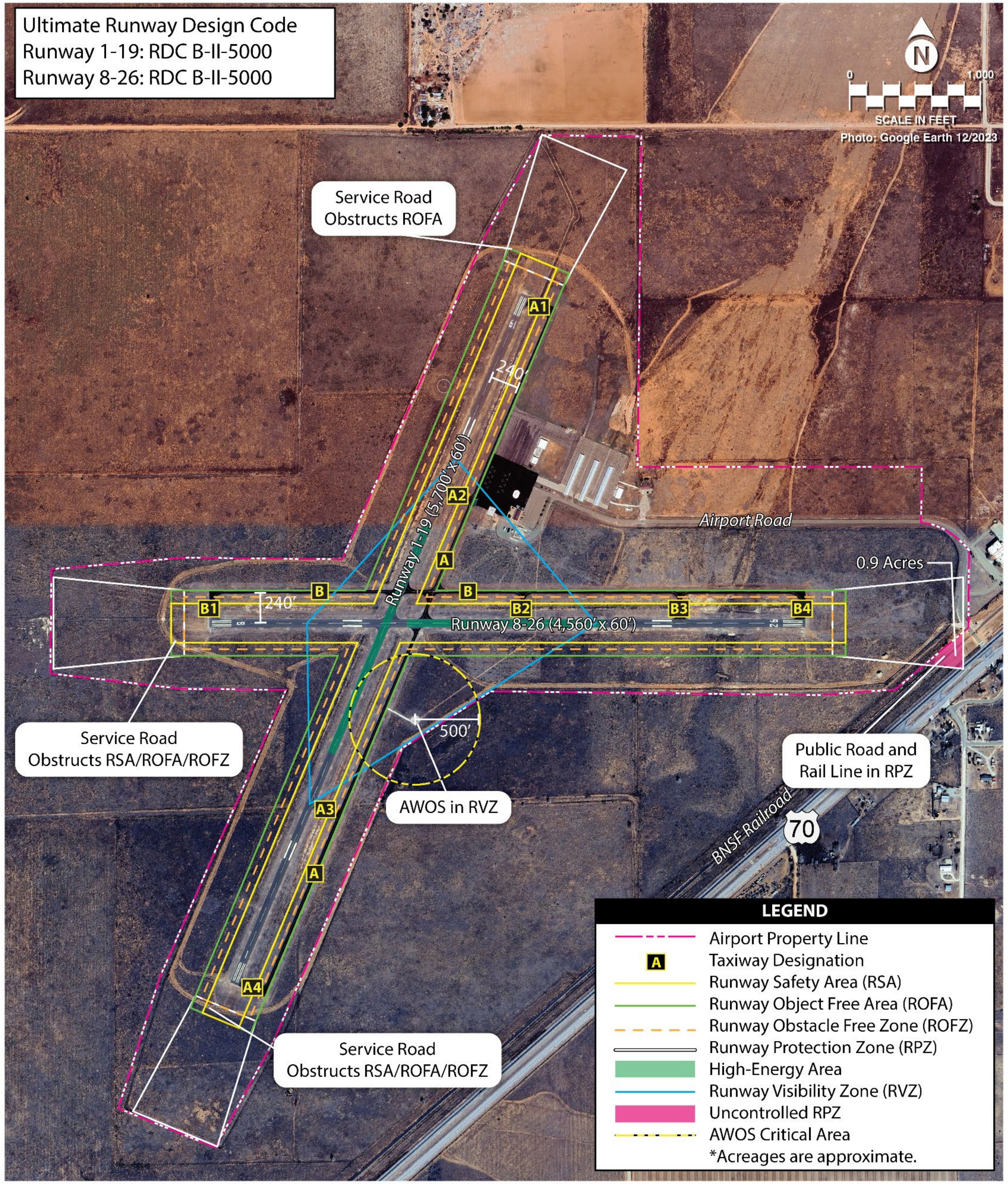


Exhibit 3A
EXISTING AND ULTIMATE SAFETY AREAS

LEGEND

- ADG I (Existing) TOFA - 89'
- ADG I (Existing) TSA - 49'
- ADG II (Ultimate) TOFA - 124'
- ADG II (Ultimate) TSA - 79'

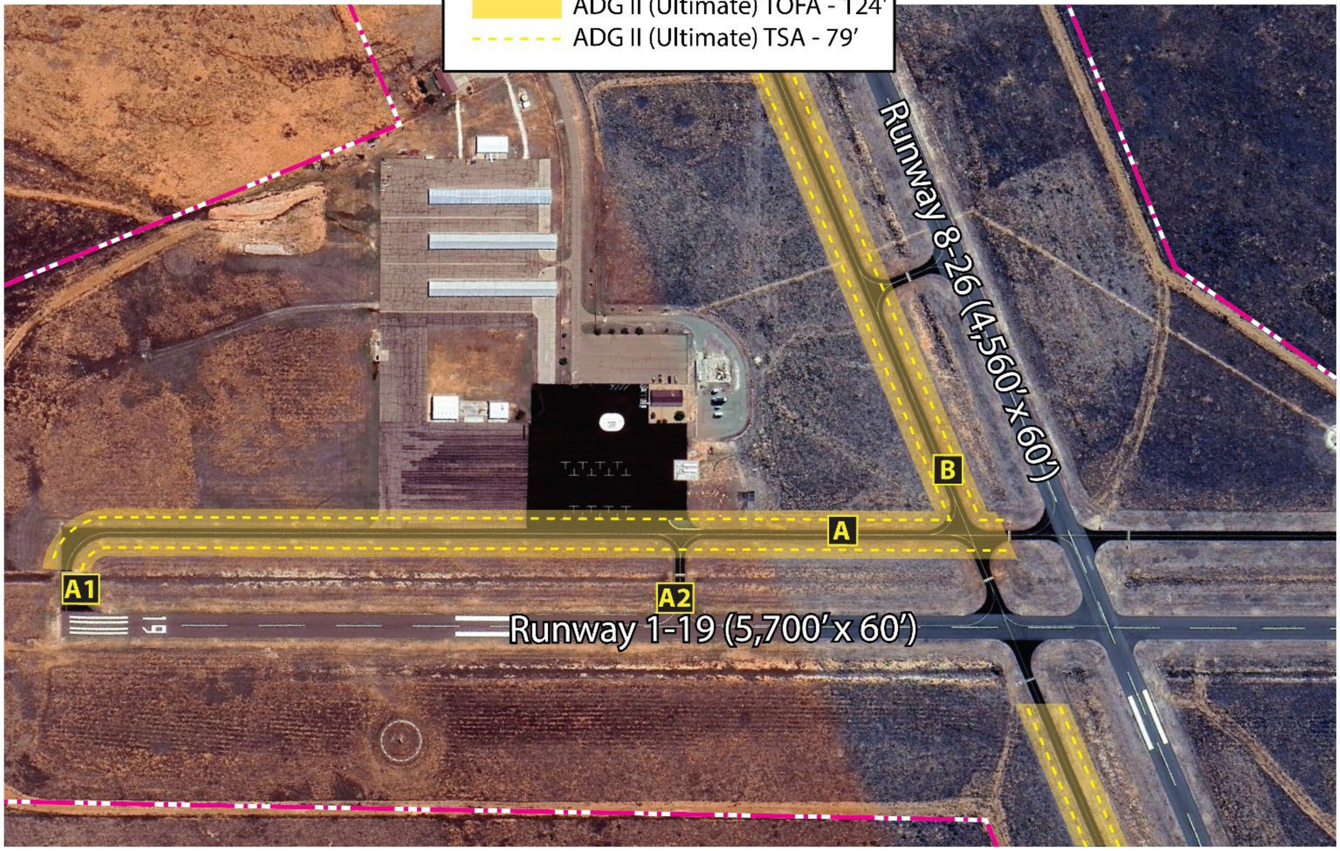


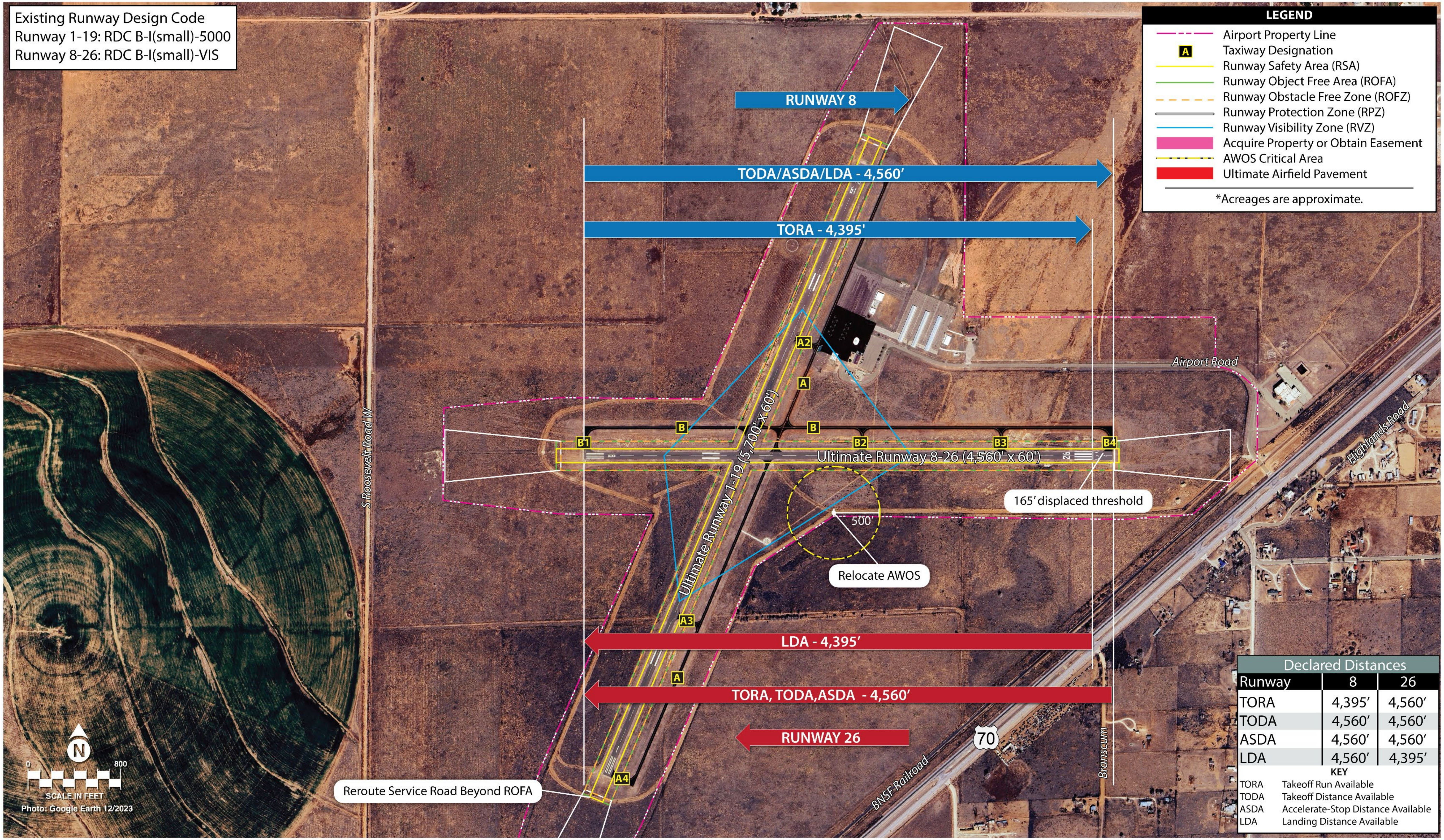
Exhibit 3B: TOFA AND TSA
EXISTING AND ULTIMATE DESIGN STANDARDS

	EXISTING Runway 1-19	ULTIMATE Runway 2-20	EXISTING Runway 8-26	ULTIMATE Runway 8-26
Runways				
Runway Design Code (RDC)	B-I(small)-5000	B-II-5000	B-I(small)-VIS	B-II-5000
Dimensions	5,700' x 60'	6,800' x 75'	4,560' x 60'	5,400' x 75'
Pavement Strength	12,500 lbs. SWL	38,000 lbs. D	12,500 lbs. SWL	15,000 lbs. SWL
Safety Areas				
Runway Safety Area (RSA)	Service road in RSA	Reroute service road outside ultimate RSA	Standard RSA	Reroute the service road outside ultimate RSA
Runway Object Free Area (ROFA)	Service road in ROFA	Reroute service road outside ultimate ROFA	Standard ROFA	Reroute service road outside ultimate ROFA
Runway Obstacle Free Zone (ROFZ)	Service road in ROFZ	Maintain	Standard ROFZ	Reroute service road outside ultimate ROFZ
Runway Protection Zone (RPZ)	Standard RPZs	Reroute service road outside ultimate ROFZ	A portion of Runway 26 RPZ is uncontrolled and contains incompatibilities	Consider mitigative actions
Taxiways				
Design Group	1A	2A	1A	2A
Parallel Taxiway	Taxiway A	Maintain	Taxiway B	Maintain
Parallel Taxiway Separation	240'	Maintain	240'	Maintain
Widths	25'	35'	25'	35'
Connecting Taxiway Width	25'	35'	25'	35'
Holding Aprons	None	Consider addition of holding bay	None	Maintain
Notable Conditions	Acute-angle taxiway connections and high-energy crossings	Consider mitigative actions	Acute-angle taxiway connections and high-energy crossings	Consider mitigative actions
Navigational and Weather Aids				
Instrument Approaches	RNAV GPS approach (Runway 1)	Consider approach to Runway 19	None	Consider approaches
Weather Aids	Segmented circle/lighted wind cone; add AWOS	Relocate AWOS outside RVZ		
Approach Aids	None	Install PAPIs/REILs	None	Install PAPIs/REILs
Lighting and Marking				
Runway Lighting	MIRL	Maintain	MIRL	Maintain
Runway Marking	Non-precision	Maintain	Non-precision	Maintain
Taxiway Lighting	Edge reflectors	MITL	Edge reflectors	MITL
Runway/Taxiway Signage	Runway/taxiway identifier signage	Maintain	Runway/taxiway identifier signage	Maintain

KEY

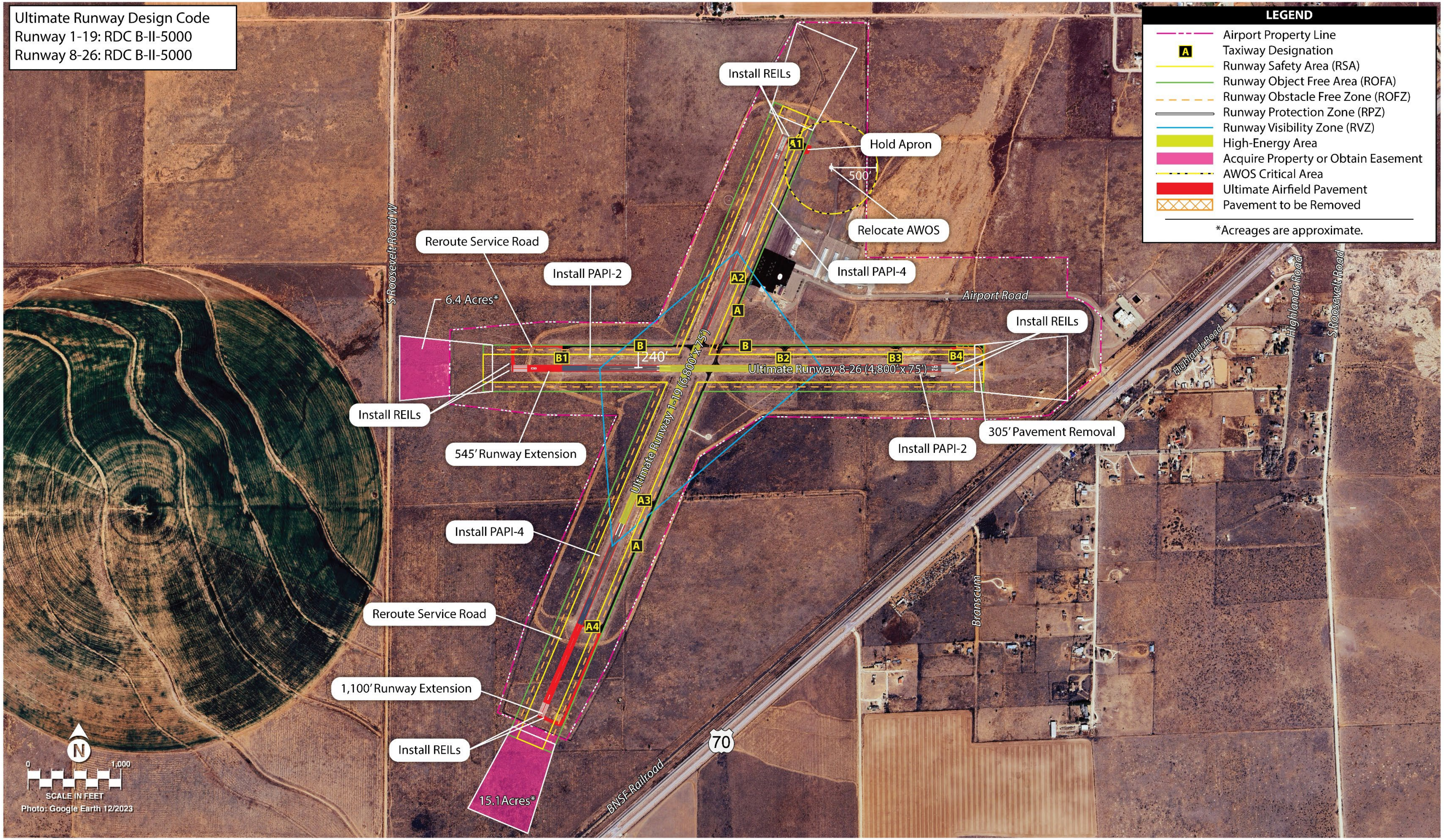
GPS - Global Positioning System
MIRL - Medium Intensity Runway Lighting
MITL - Medium Intensity Taxiway Lighting
PAPI - Precision Approach Path Indicator
REIL - Runway End Identification Lights
RNAV - Area Navigation
RVZ - Runway Visibility Zone
SWL - Single Wheel Loading

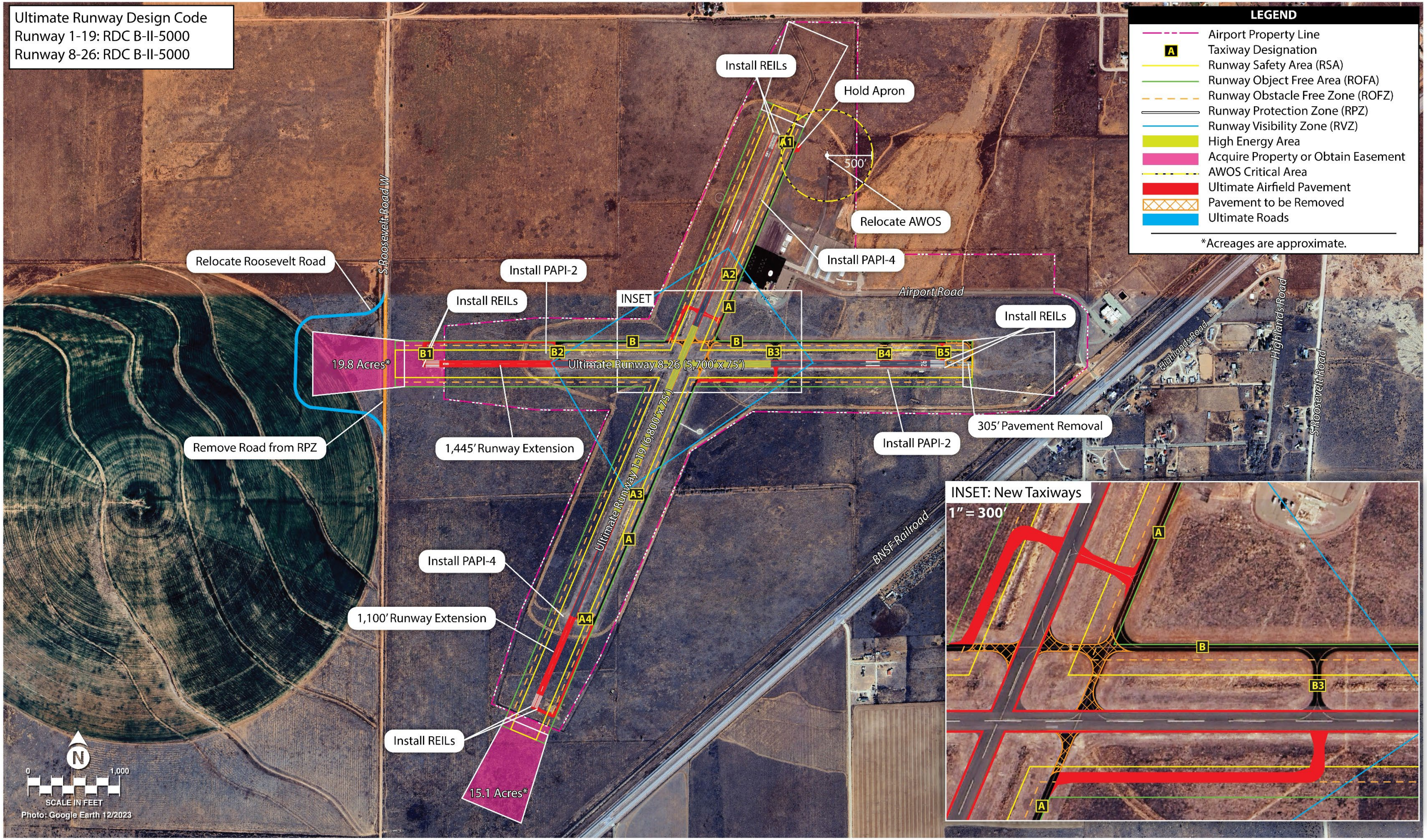
Exhibit 3C
AIRSIDE FACILITY REQUIREMENTS



Declared Distances		
Runway	8	26
TORA	4,395'	4,560'
TODA	4,560'	4,560'
ASDA	4,560'	4,560'
LDA	4,560'	4,395'

KEY
- TORA Takeoff Run Available
- TODA Takeoff Distance Available
- ASDA Accelerate-Stop Distance Available
- LDA Landing Distance Available


Ultimate Runway Design Code
Runway 1-19: RDC B-II-5000
Runway 8-26: RDC B-II-5000
LEGEND
Airport Property Line
Taxiway Designation
Runway Safety Area (RSA)
Runway Object Free Area (ROFA)
Runway Obstacle Free Zone (ROFZ)
Runway Protection Zone (RPZ)
Runway Visibility Zone (RVZ)
High-Energy Area
Acquire Property or Obtain Easement
AWOS Critical Area
Ultimate Airfield Pavement
Pavement to be Removed
*Acreages are approximate.
Install REILs
Hold Apron
500'
Relocate AWOS
Install PAPI-4
Reroute Service Road
Install PAPI-2
6.4 Acres*
240'
Ultimate Runway 8-26 (4,800' x 75')
Ultimate Runway 1-19 (6800' x 75')
Airport Road
Install REILs
305' Pavement Removal
Install PAPI-2
Install REILs
545' Runway Extension
Install PAPI-4
Reroute Service Road
1,100' Runway Extension
Install REILs
15.1Acres*
S Roosevelt Road W
S Roosevelt Road
Highlands Road
Branscum
BNSF Railroad
70
SCALE IN FEET
0
1,000
Photo: Google Earth 12/2023


Ultimate Runway Design Code
Runway 1-19: RDC B-II-5000
Runway 8-26: RDC B-II-5000
LEGEND
Airport Property Line
Taxiway Designation
Runway Safety Area (RSA)
Runway Object Free Area (ROFA)
Runway Obstacle Free Zone (ROFZ)
Runway Protection Zone (RPZ)
Runway Visibility Zone (RVZ)
High Energy Area
Acquire Property or Obtain Easement
AWOS Critical Area
Ultimate Airfield Pavement
Pavement to be Removed
Ultimate Roads
*Acreages are approximate.
Install REILs
Hold Apron
500'
Relocate AWOS
Install PAPI-4
Airport Road
Install REILs
Relocate Roosevelt Road
S Roosevelt Road W
Install PAPI-2
Install REILs
INSET
19.8 Acres*
Ultimate Runway 8-26 (5,700' x 75')
Remove Road from RPZ
1,445' Runway Extension
Install PAPI-2
305' Pavement Removal
Highlands Road
S Roosevelt Road
Ultimate Runway 1-19 (6,800' x 75')
BNSF Railroad
Install PAPI-4
1,100' Runway Extension
Install REILs
15.1 Acres*
A1
A2
A
B
B1
B2
B3
B4
B5
A3
A4
INSET: New Taxiways
1" = 300'
SCALE IN FEET
0
1,000
N
Photo: Google Earth 12/2023

Aircraft Storage Hangar Requirements

	Available	Short Term	Intermediate Term	Long Term
Aircraft to be Hangared	24	20	23	30
T-Hangar Space (sf)	36,990	38,200	39,100	42,700
Box Hangar Space (sf)	6,060	8,190	16,200	25,700
Total Hangar Space (sf)	**43,050**	**46,390**	**55,300**	**68,400**

Aircraft Parking Apron

	Available	Short Term	Intermediate Term	Long Term
Aircraft Parking Positions	39	24	28	35
Total Apron Area (sy)	24,788	17,800	27,800	27,800

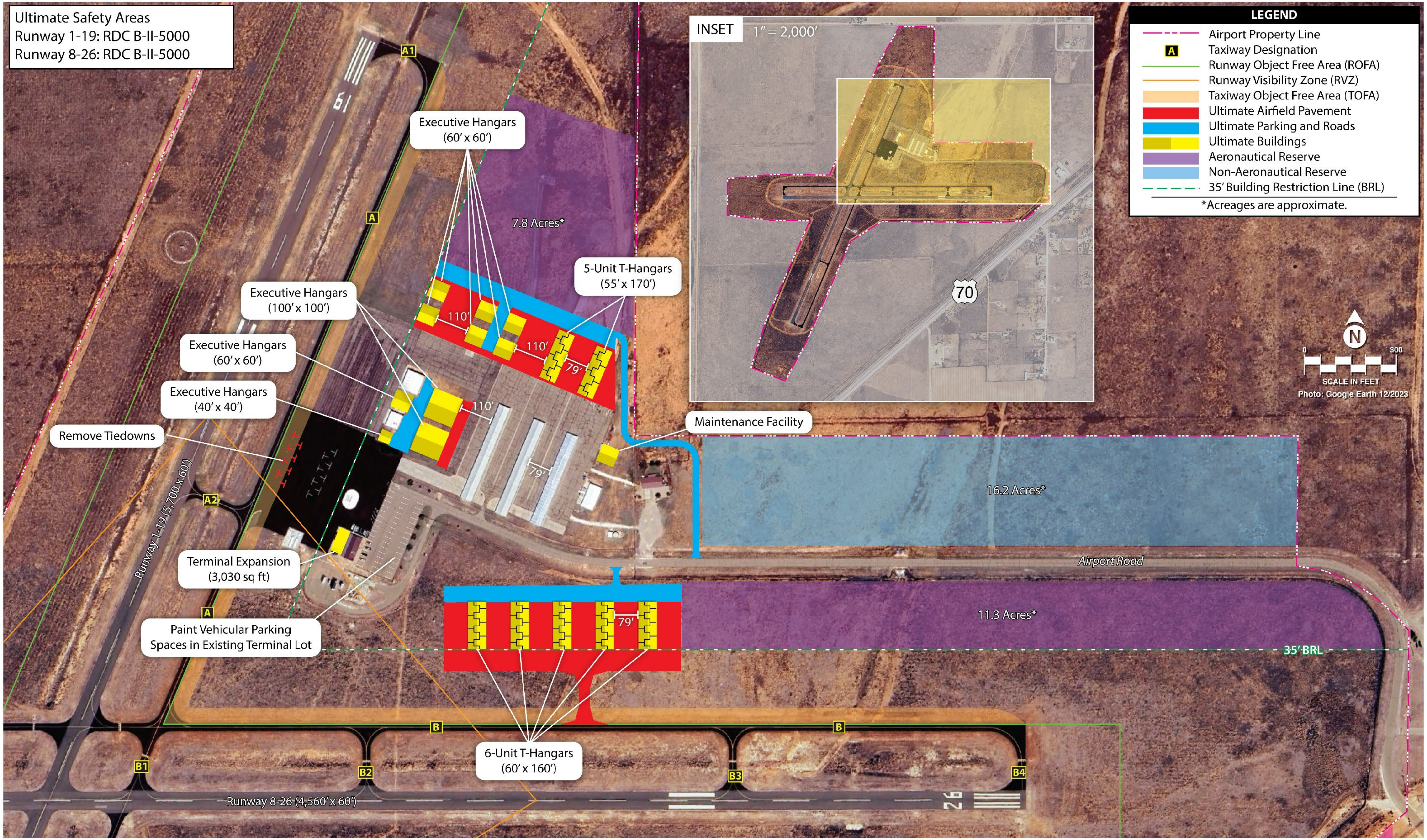
General Aviation Terminal Facilities and Parking

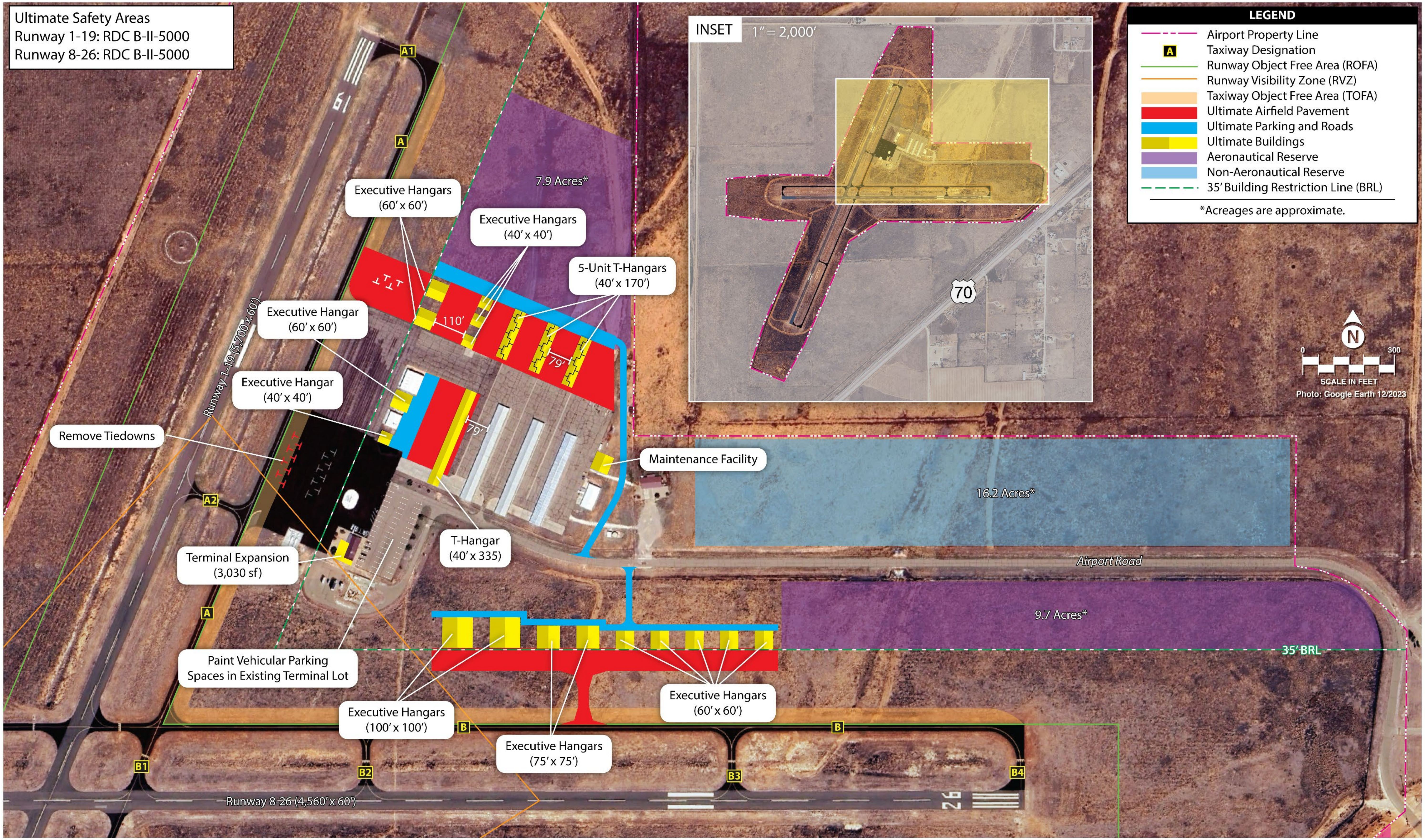
	Available	Short Term	Intermediate Term	Long Term
Building Space (sf)	3,470	3,900	4,800	6,500
Total GA Parking Spaces	15	31	38	52

Support Facilities

	Available	Short Term	Intermediate Term	Long Term
14-Day Fuel Storage - 100LL (gallons)	12,000	715	778	908
14-Day Fuel Storage - Jet A (gallons)	12,000	493	537	627

Exhibit 3G
LANDSIDE FACILITY REQUIREMENTS


Ultimate Safety Areas
Runway 1-19: RDC B-II-5000
Runway 8-26: RDC B-II-5000
INSET
1" = 2,000'
70
LEGEND
Airport Property Line
Taxiway Designation
Runway Object Free Area (ROFA)
Runway Visibility Zone (RVZ)
Taxiway Object Free Area (TOFA)
Ultimate Airfield Pavement
Ultimate Parking and Roads
Ultimate Buildings
Aeronautical Reserve
Non-Aeronautical Reserve
35' Building Restriction Line (BRL)
*Acreages are approximate.
N
0
300
SCALE IN FEET
Photo: Google Earth 12/2023
A1
A
A2
Executive Hangars (60' x 60')
7.8 Acres*
5-Unit T-Hangars (55' x 170')
Executive Hangars (100' x 100')
Executive Hangars (60' x 60')
Executive Hangars (40' x 40')
Remove Tiedowns
110'
110'
79'
110'
79'
Maintenance Facility
16.2 Acres*
Airport Road
Runway 1-19 (5,700' x 60')
Terminal Expansion (3,030 sq ft)
Paint Vehicular Parking Spaces in Existing Terminal Lot
79'
11.3 Acres*
35' BRL
B
B
B1
B2
B3
B4
6-Unit T-Hangars (60' x 160')
Runway 8-26 (4,560' x 60')
26
19


Ultimate Safety Areas
Runway 1-19: RDC B-II-5000
Runway 8-26: RDC B-II-5000
INSET
1" = 2,000'
70
LEGEND
Airport Property Line
Taxiway Designation
Runway Object Free Area (ROFA)
Runway Visibility Zone (RVZ)
Taxiway Object Free Area (TOFA)
Ultimate Airfield Pavement
Ultimate Parking and Roads
Ultimate Buildings
Aeronautical Reserve
Non-Aeronautical Reserve
35' Building Restriction Line (BRL)
*Acreages are approximate.
SCALE IN FEET
Photo: Google Earth 12/2023
7.9 Acres*
Executive Hangars (60' x 60')
Executive Hangars (40' x 40')
5-Unit T-Hangars (40' x 170')
Executive Hangar (60' x 60')
Executive Hangar (40' x 40')
110'
79'
Remove Tiedowns
Maintenance Facility
16.2 Acres*
T-Hangar (40' x 335)
Terminal Expansion (3,030 sf)
Airport Road
9.7 Acres*
35' BRL
Paint Vehicular Parking Spaces in Existing Terminal Lot
Executive Hangars (100' x 100')
Executive Hangars (75' x 75')
Executive Hangars (60' x 60')
Runway 1-19 (5,700' x 60')
Runway 8-26 (4,560' x 60')
A1
A
A2
B
B1
B2
B3
B4