# **APPENDIX D: RUNWAY LENGTH**

## Purpose

A runway length analysis was completed to FAA standards identified in <u>FAA AC 150/5325-4B</u>, <u>Runway</u> <u>Length Requirements for Airport Design</u> in this airport master plan study for the Riddick Field Airport. Due to the technical nature of this analysis, a separate appendix has been prepared to calculate recommended runway lengths for the design aircraft identified in the aviation forecasts.

# Aircraft Up to 60,000 Pounds

A runway length analysis was performed using the FAA's current methodology found in <u>FAA AC</u> <u>150/5325-4B</u>. The design approach identifies a recommended runway length based on a family grouping of design aircraft.

At U05 the design aircraft is an A/B-I(S) aircraft which means less than 12,500 pounds and also includes a few specific aircraft also less than 12,500 pounds.

#### Small Airplanes Up to 12,500 Pounds

#### FAA Design Curves

The FAA design approach identified in Chapter 2 of <u>FAA AC 150/5325-4B</u> for most small aircraft less than 12,500 pounds requires several steps to be performed to determine runway length:

- 1. **Identify Number of Passenger Seats:** Classify design aircraft as one of two categories; "Less than 10 Passenger Seats" and "10 Passenger Seats or Greater"
- Select Percentage of Fleet: Airplanes classified as "Less than 10 Passenger Seats" are grouped into two percentage categories based on the airport's location and the amount of existing or planned aviation activities. The categories include "95 Percent of Fleet" and "100 Percent of Fleet".
- 3. **Consider Future Airport Expansion:** Consider runway length requirements during Instrument Meteorological Conditions (IMC) or expansions to accommodate airplanes more than 12,500 pounds.
- 4. **Determine Airport Data:** Evaluate the airport elevation, mean daily temperature in hottest month and runway condition to adjust runway length.
- 5. Calculate Runway Length Based on Curves: Utilize FAA runway length curves published in AC 150/5325-4B.

### Table D - 1 − FAA AC 150/5345-4B Runway Length Requirements (< 12,500 lbs.)

Airport and Runway Data	
Airport Elevation	5,212 feet
Mean Daily Maximum Temperature of Hottest Month	80.3°F
Aircraft Classification	Recommended Runway Length
Small Airplanes 12,500 Pounds or less	
Less than 10 passenger seats at 100 percent of fleet	6,300 feet
Less than 10 passenger seats at 95 percent of fleet	6,150 feet

Source: FAA AC 150/5325-4B, KLJ Analysis

Note: Runway length requirements estimated based on charts for airport planning purposes only.

Small airplanes certificated for less 10 passenger seats require a runway length of 6,300 feet which meets the needs of 100 percent of fleet. Figure D-1 includes the evaluated figure from AC 150/5325-4B. The figure from the AC for aircraft with 10 or more passenger seats is not included because the graph chart specifically states ... "For airport elevations above 3,000 feet, use the 100 percent of fleet grouping from the less than 10 passenger figure".

#### FAA Figure 2-1: Small Airplanes with Fewer than 10 Passenger Seats

Figure 2-1. Small Airplanes with Fewer than 10 Passenger Seats (Excludes Pilot and Co-pilot)

#### Example:

Temperature (mean day max hot month): 59° F (15° C) Airport Elevation: Mean Sea Level

Note: Dashed lines shown in the table are mid values of adjacent solid lines.

Recommended Runway Length:

For 95% = 2,700 feet (823 m) For 100% = 3,200 feet (975 m)

Riddick Field (U05) Elev - 5,212' Temp - 80.3 deg (Aug)



Mean Daily Maximum Temperature of the Hottest Month of Year (Degrees F)

Runway Length @ 95 Percent of Fleet: 6,150 feet Runway Length @ 100 Percent of Fleet: 6,300 feet

#### **Individual Aircraft**

<u>FAA AC 150/5325-4B</u> states airport planners can "determine the recommended runway length from airplane flight manuals for the airplanes to be accommodated by the airport in lieu of the runway length curves depicted in figures 2-1 or 2-2." This method is recommended to evaluate the runway length needs of various small aircraft operating at U05.

The first aircraft evaluated was the Beechcraft King Air 200 turboprop (ARC B-II) with a maximum takeoff weight of 12,500 pounds. The second aircraft evaluated was the Pilatus PC-12. Each of these aircraft are used at times for medical flights to Riddick Field.





Recommended Runway Length Flaps Up: **4,700 feet** Recommended Runway Length Flaps Approach: **4,640 feet** 







Accelerate Stop Distance 15 degree Flaps: **4,020 feet** Takeoff Total Distance 15 degree Flaps: **4,170 feet** Accelerate Stop Distance 30 degree Flaps: **3,550 feet** Takeoff Total Distance 30 degree Flaps: **3,800 feet**