

# Section 4 – Facility Requirements

## AIRSIDE CAPACITY AND FACILITY REQUIREMENTS

This Section investigates the capacity of the airport, its ability to meet current demand, and the facilities required to meet forecasted needs as established in Section 3. The objective of this analysis is to determine the adequacy of existing facilities and determine improvements needed to satisfy future requirements.

Facility requirements include issues related to capacity and demand as well as the FAA design standards, safety, and services for airport users.

The airside and landside capacity needs are determined by comparing the capacity of the existing facilities to forecasted demand. Additional facilities are recommended in cases where demand exceeds capacity. The time frame for assessing development needs will be broken down into three periods: short (zero-five years), intermediate (six-10 years), and long term (11-20 years).

The following discusses capacity and requirements for airside facilities.

### ***RUNWAY REQUIREMENTS***

The existing runway is examined with respect to dimensional criteria, length, and width.

### ***RUNWAY LENGTH AND WIDTH ANALYSIS***

The length of the runway is a function of many factors including design aircraft, physical characteristics of aircraft at time of flight, weather conditions, and runway conditions. The required width of the runway is a function of the approach minimums, aircraft approach category, and aircraft design group.

#### **Runway Length**

The existing runway length is 3,397 feet long. The proposed runway length was evaluated using a standard FAA process to determine general runway length based on a wide variety of generic aircraft including existing and forecasted aircraft that use the Wiscasset Municipal Airport. In addition, the required runway length was analyzed using specific aircraft performance data for the existing and forecasted aircraft.

An analysis using FAA Design Software indicates that the runway at Wiscasset Municipal Airport will support a wide range of small general aviation aircraft, including up to 95% of all "small" aircraft. Small aircraft are defined as those aircraft with a maximum gross takeoff weight of 12,500 pounds or less. Other aircraft are classified as either "large" or "heavy" and include the B-25

Mitchell to be used by the Texas Flying Legends, which is 21,120 pounds. Table 4.1 identifies the recommended runway lengths based on the FAA Airport Design software.

**Table 4.1 – Runway Length Analysis (Generic Aircraft Assessment)**

Aircraft Size and Approach Speed	Runway Length (feet)
Small airplanes with approach speed of less than 30 knots	300
Small airplanes with approach speed of less than 50 knots	810
Small airplanes with less than 10 passenger seats	
75% of these small airplanes	2,400
95% of these small airplanes	2,950
100% of these small airplanes	3,500
Small airplanes with 10 or more passenger seats	4,070
Large airplanes of 60,000 pounds or less	
75% of these large airplanes at 60% useful load	4,730
75% of these large airplanes at 90% useful load	6,060
100% of these large airplanes at 60% useful load	5,160
100% of these large airplanes at 90% useful load	7,490

Note: Based on airport elevation of 71.4' MSL; mean daily maximum temperature of 78°F, and a maximum difference of runway centerline elevation of 14.5 feet.

Source: FAA Airport Design, Version 4.2D

An assessment was also conducted using specific aircraft operating requirements for aircraft that currently use the airport and are forecasted to use the airport. The takeoff and landing runway length requirements are identified in Table 4.2.

**Table 4.2 – Runway Length Analysis (Aircraft Specific)**

Aircraft	Landing Length		Takeoff Length	
	ISA	KIWI	ISA	KIWI
Cessna 172 Skyhawk	1,200	1,418	1,100	1,307
Piper PA 32 Saratoga	1,760	2,360	1,612	1,874
Pilatus PC12	2,579	2,943	2,845	3,238
Beech King Air 200	2,579	2943	2,845	1,307
Cessna Citation CJ2	3,420	3,874	2,980	3390

Based on this analysis, it is recommended that the runway be considered for an approximate 600 foot extension for a total runway length of 4,000 feet to accommodate the aircraft proposed to use the Wiscasset Municipal Airport. This possible extension will be further studied in Section 5, Alternatives Development, to determine the feasibility of extending the runway. A recommendation will be made based on the results of the findings.

## Geometric Standards

The runway width and clearance standard dimensions are listed in Table 4.3. This data is based on an ARC of B-II.

**Table 4.3 – Runway/Airport Dimensional Standards**

Standard	Measurement (feet)
Runway Width	75
Runway Centerline to Parallel Taxiway Centerline	240
Runway Centerline to Edge of Aircraft Parking	250
Runway Shoulder Width	10
Runway Safety Area (RSA) Width	150
RSA Length Beyond Runway End	300
Runway Object Free Area (OFA) Width	500
Runway OFA Length Beyond Runway End	300
Runway Obstacle Free Zone (OFZ) Width	400
Runway OFZ Length Beyond Runway End	200
Runway OFZ Inner Approach Width	400
Runway Protection Zone (RPZ) Runway End Width	500
RPZ Outer Width	700
RPZ Length	1,000

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

It should be noted that the airport does not currently own a large portion of the land within the RPZ to Runway 7. “The RPZ function is to enhance the protection of people and property on the ground. Where practical, airport owners should own the property under the runway approach and departure areas to at least the limits of the RPZ. It is desirable to clear the entire RPZ of all above-ground objects. Where this is impractical, airport owners, as a minimum, should maintain the RPZ clear of all facilities supporting incompatible activities.”<sup>12</sup>

<sup>12</sup> FAA Advisory Circular 150/5300-13A.

A portion of Chewonki Campground is located within the RPZ to Runway 7. A campground is considered to be an incompatible use as this creates a place for public assembly and a safety issue to both the people on the ground and pilots and passengers flying over the campground within the RPZ.

### **TAXIWAY REQUIREMENTS**

The taxiway was extended to a full parallel taxiway since the last AMPU. Other than a change in signage, there are no further improvements needed to meet capacity requirements. The stub taxiways should also be renamed.

### **LIGHTING REQUIREMENTS**

The airport needs the following lighting upgrades and replacements.

- **Runway Lights.** The current system was installed during the 1968 runway extension and is now 44 years old. The system suffers from occasional cable failures and needs frequent light unit replacements. In addition, the lights are a combination of halogen and incandescent bulbs. The airport would like to consider either LED (wired) or LED solar lights.
- **Taxiway Lights.** The taxiway lighting system is in excellent condition, but may need replacement and/or upgrading during the 20 year planning period.
- **Runway End Identifier Lights (REIL).** Only Runway 25 is equipped with REILS, however both runway ends are served by an instrument approach procedure. REILS for Runway 7 should be a high priority, and should be installed when the runway lights are replaced.
- **Obstruction Lights.** The airport has three obstruction lights; two on the Chewonki Campground and one along Route 144 (see Navaids). The lights are L-810 low intensity units and are subject to frequent outages. Given the location and height of the two poles on the Campground, and because of an agreement with Central Maine Power, who has the sole responsibility of replacement, coordination and repairs is time consuming. The airport feels that changing these to LED units would provide better and more reliable service.
- **Signage.** Taxiway signs need to change to reflect the proper taxiway designations.

### **LANDSIDE REQUIREMENTS**

#### **AIRCRAFT PARKING APRON REQUIREMENTS**

Currently, 80% of the based aircraft are located in hangars with the remaining 20% parking on the aircraft parking apron. Planning guidelines typically assumes that 25% of proposed based aircraft will use the aircraft parking apron and 50% of all itinerant aircraft will use the aircraft parking apron. Table 4.4 identifies the itinerant aircraft apron requirements.

**Table 4.4 – Itinerant Aircraft Apron Requirements**

Condition	2014	2019	2024	2033
PMAD (50% of total)	38	46	55	71
Peak-day operational demand (110% PMAD)	42	51	60	78
50% of peak-day operational demand	8	10	12	16
75% of peak-day itinerant aircraft	14	18	21	27
<b>Itinerant aircraft-parking apron area (3,500 square feet)</b>	<b>51,205</b>	<b>61,985</b>	<b>73,439</b>	<b>95,673</b>

Table 4-5 identifies the apron requirements for based aircraft, which assumes that 90% of based aircraft will continue to park inside hangars.

**Table 4.5 – Based Aircraft Apron Requirements**

Condition	2014	2019	2024	2033
Based Aircraft	49	60	69	90
Percent of Based Aircraft Using Apron	20%	20%	20%	20%
Based Aircraft on Apron	10	12	14	18
<b>Apron Size (at 3,240 SF per aircraft)</b>	<b>32,400</b>	<b>38,880</b>	<b>45,360</b>	<b>58,320</b>

Table 4-6 identifies the total apron requirements needed throughout the 20-year planning period.

**Table 4.6 – Itinerant Aircraft Apron Requirements**

Condition	2014	2019	2024	2033
a. Itinerant Needs	51,205	61,985	73,439	95,673
b. Based Aircraft Needs	32,400	38,880	45,360	58,320
c. Total Apron Requirements (a+b)	83,605	100,865	118,799	153,993
d. Existing Apron Size	120,000	120,000	120,000	120,000
e. Surplus (Deficit) (d-c)	<b>36,395</b>	<b>19,135</b>	<b>1,201</b>	<b>(33,993)</b>

### **HANGAR REQUIREMENTS**

Currently, there are 44 based aircraft, on average) parked in hangars, which comprises 90% of the total based aircraft. As discussed previously, the assumption is that the number of based aircraft in hangars will remain high, close to the 90% mark. Table 4-7 identifies hangar requirements at the airport throughout the 20-year planning period.

### **AUTOMOBILE PARKING**

Automobile parking space is based on industry guidelines of 1.3 parking spaces per PH passenger/pilot enplanements.

The airport currently has 24 automobile parking spaces with two spaces meeting ADA requirements. Table 4.8 identifies the automobile parking requirements throughout the 20-year planning period.

**Table 4.7 Hangar Requirements**

Condition	2014	2019	2024	2033
a. Based Aircraft	49	60	69	90
b. Percent of Aircraft Hangared	80%	80%	80%	80%
c. Based Aircraft in Hangars	40	48	55	72
d. Existing Hangar Space	44	44	44	44
e. Surplus (Deficit) (d-c)	4	(4)	(11)	(28)

**Table 4.8 – Automobile Parking Requirements**

Element	2014	2019	2024	2033
Required automobile parking spaces	18	27	31	42
Existing automobile parking spaces	24	24	24	24
Additional spaces needed – surplus/(deficit)	6	(3)	(7)	(18)

### **TERMINAL BUILDING**

The terminal building requirements used a rule-of-thumb of 50 square feet per PH passenger for computing the gross area needed for passenger processing in a terminal building at a general-aviation airport. Table 4.9 identifies terminal building requirements throughout the 20-year planning period.

**Table 4.9 – Terminal Building Requirements (in square feet)**

Element	2014	2019	2024	2033
Terminal building requirements	700	1,050	1,200	1,600
Existing terminal building for passenger processing	1,200	1,200	1,200	1,200
Total additional area needed surplus/(deficit)	500	150	0	(400)

### **FUEL SALES**

As noted in Section 3 (see [Fuel Sales Forecast](#)), sales are expected to steadily increase from the current annual average of 40,000 gallons to 75,000 gallons, an almost 100% increase. While the current capacity of 12,000 gallons each of both 100LL and Jet A is sufficient to handle demand, the system, which was purchase using airport funds only, is approximately 20 years old. The assumption is the system will be ready for replacement in the next 10 years.

### **SUMMARY**

Table 4.10 identifies a summary of the preferred forecasts for Wiscasset Municipal Airport. The numbers indicate the existing and requirements.

**Table 4.10 – Facility Requirements Summary**

Element	Existing	2014	2019	2024	2033
Runway length	3,397 feet	3,397 feet	3,397 feet	3,397 feet	3,397 feet
Runway width	75 feet	75 feet	75 feet	75 feet	75 feet
Aircraft-parking apron	120,000 sf.	83,605 sf.	100,865 sf.	118,799 sf.	153,993 sf.
Hangar requirements	44	40	48	55	72
Auto Parking Spaces	24	18	27	31	42
Terminal building requirements	1,200 sf	700 sf	1,050 sf	1,200 sf	1,600 sf