
Section 3 – Forecasts of Aviation Demand

GENERAL

Forecasts of future levels of aviation activity are the basis for effective decisions in airport planning. These projections are used to determine the need for new or improved facilities. In general, forecasts should be realistic, based upon the latest available data, be supported by information in the study, and provide an adequate justification for airport planning and development. This planning process will eventually result in various facility development recommendations tied to the demand projected within respective forecast periods.

In all likelihood, activity growth will not occur as projected. There undoubtedly will be peaks and valleys over the next 20 years that the planning process depicts in a linear fashion. Therefore, the facility development recommendations may have to be adjusted accordingly. Slower than projected growth may delay or even negate the need for recommendations, especially for those in outlying years. Naturally, the opposite may hold true for faster than projected growth.

This update started with the preparation of a reliable activity baseline, which was accomplished in Section 2. The next step will be a review of factors affecting aviation activity, followed by discussion of other local, regional, and national aviation and related forecasts, and a review of various forecast methodologies. A forecast range will then be developed and compared to other forecasts for reasonableness.

FORECAST ELEMENTS

To establish the demands likely to be placed on Wiscasset Municipal Airport, forecasts will include all relevant aviation demand elements, including both the type and level of aviation activity expected at the airport over the 20-year planning period. The specific activity elements to be forecasted include:

- Based aircraft
- Operations
- Peak activity
- Critical aircraft
- Fuel sales
- ARC and RDC

AVIATION FORECAST PERIODS

Forecasts in this plan were prepared for short-, intermediate-, and long-term periods. The short-term (2014 through 2018) forecasts are used to justify near-term development and support operational planning and environmental improvement programs. Intermediate-term forecasts

(2019-2023) are typically used in planning capital improvements and long-term forecasts (2024-2033 years) are used in general planning.

PREVIOUS AVIATION FORECASTS

Applicable forecasts prepared specifically for Wiscasset Municipal Airport are reviewed in this section. This includes three different forecast sources prepared by the FAA, as well as forecasts from the last master plan. In addition, forecasts from the Maine Aviation System Plan (MASPU) are presented. The primary focus of forecast review will be on general aviation activity (this includes private, corporate, air taxi and charter aircraft and operations).

FAA FORECASTS

Three different forecast sources prepared by the FAA are reviewed in this section. The first is from the annual update of the National Integrated Plan of Airport Systems (NPIAS) prepared earlier this year for the period 2011-2015. This particular document is primarily used as a tool for capital budgeting to determine required funding through the AIP. The second document, FAA Aviation/Aerospace Forecasts 2010-2030, is also updated annually by the FAA and represents a national overview of projected activity levels. It is especially useful in projecting the changes in fleet mix at both commercial service and general aviation airports. The third forecast source prepared by the FAA is the Terminal Area Forecast (TAF). This effort is more site-specific than the other two documents in terms of based aircraft and operations for an individual airport. The FAA sources are briefly discussed below.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS (NPIAS)

The NPIAS data was compiled in 2009 and is used by the FAA in administering the AIP. The report estimates an increase of 5% over the next five years for AIP eligible infrastructure development for all segments of civil aviation with the exception of large hubs and new airports. The NPIAS supports the goals identified in the FAA Flight Plan for safety and capacity by identifying airport improvements to achieve those goals. It is anticipated that 57% of the development will be used to rehabilitate existing infrastructure and 43% will be used to accommodate growth and travel including more passengers, cargo and activity, and larger aircraft.

General aviation encompasses a diverse range of commercial and recreational uses. General aviation airports are comprised of 84% of the total NPIAS airports and 28% of the total development included in the NPIAS report. Development estimates at general aviation airports increased 17% due to the focus of bringing these airports to the recommended design standards and the expanded eligibility for AIP funding for hangars, fuel facilities, and other items contained in Vision 100-Century of Aviation Reauthorization Act. The availability of non-primary entitlement funding has allowed the inclusion of lower priority items to be funded under the AIP.

The downturn in the economy has dampened prospects for the general aviation industry in the near term; however, the long-term outlook remains favorable. Growth in business aviation demand in the long term will be a direct result of the world economy. The number of general aviation hours flown through the year 2030 is anticipated to increase an average of 2.5% a year.

Total operations in the general aviation market have been declining since 2000 at an annual rate of 3.9%. This decline is attributed to economic conditions and high fuel prices in the later part of the decade.

The general aviation industry started declining in 2008 with the onset of the economic downturn. The weakening became even greater in 2009 with record declines by several measures of activity. United States manufacturers of general aviation aircraft delivered 48.9% fewer aircraft in 2009 than in 2008. This was the second consecutive year of decline in shipments that was preceded by four years of sustained growth. Turbojets and turboprops were down 46.2% and 16.5%, respectively. Single-engine piston deliveries decreased by 56% and multi-engine piston aircraft deliveries decreased by 62.6%.

Over the past several years, the demand for business jet aircraft has grown. This growth has been driven by new product offerings, the introduction of very light jets, and increasing foreign demand. Fractional ownership is considered to be an important factor in determining the growth of business jet operations. Fractional ownership occurs when a corporation or individual purchases an interest in an aircraft and pays a fixed fee for operations and maintenance. Forecasts for very light jets include 400 new aircraft to enter the United States fleet over the next three years with an average of 216 aircraft a year for the balance of the forecast period. Very light jets are able to operate at smaller airports with shorter runways.

Fractional, corporate, and on-demand charter flights have become a practical alternative to travel on commercial flights due to increasing flight delays at some airports and corporate safety/security concerns for corporate staff. Despite the impact of the recession, forecasts for the business jet market anticipate robust growth in the long term and predict business usage of general aviation aircraft will expand at a faster rate than personal/recreational use.

The general aviation fleet is anticipated to increase at an average annual rate of 0.9% over the 21-year forecast period. The turbine-powered fleet is anticipated to increase at an average annual rate of 3% with the turbine jet portion increasing at an annual rate of 4.2%.

The FAA published the final rule for sport aircraft in 2004 which establishes new light-sport aircraft categories and allows aircraft manufacturers to build and sell completed aircraft without obtaining type and production certificates. These aircraft will be built to industry consensus standards, which in turn will reduce development costs and subsequent aircraft acquisition costs. Specific conditions will be placed on the design of the aircraft to limit them to slower and simpler

performance aircraft. This will reduce the training time for new pilots and offer more flexibility in the type of aircraft a pilot will be able to operate. This is viewed by many individuals in the general aviation industry as a revolutionary change in the regulation of recreational aircraft. The FAA anticipates there to be 16,300 of these aircraft in the national fleet by 2030.

Data contained in the NPIAS is based on individual airport master plans and capital improvement plans. State system plans also are used as a data source for the NPIAS.

FAA AEROSPACE FORECASTS

The FAA forecasts the fleet mix and hours flown for single-engine and multi-engine piston aircraft, turboprops, turbojets, rotorcraft, sport, experiment, and other miscellaneous aircraft types such as gliders or balloons. The General Aviation and Air Taxi Activity and Avionics Survey are used as a baseline for estimating fleet size, hours flown, and utilization. The FAA Aerospace Forecasts includes the period from 2009 through 2025 and uses 2007 statistics as it is the latest available from the General Aviation and Air Taxi Activity and Avionics Survey.

Current forecasts assume that business use of general aviation aircraft will increase more rapidly than personal/sport use. The active general aviation fleet is anticipated to increase at an average annual rate of 1.0% over the forecast period. The turbine powered fleet including rotorcraft is anticipated to increase at an average annual rate of 3.2% with the turbine jet fleet increasing at an average annual rate of 4.8%.

The piston powered aircraft is anticipated to increase at an average annual rate of 0.1%; however, this increase is not anticipated until 2013. Single-engine piston aircraft are anticipated to grow at an average annual rate of 0.1% and multi-engine piston aircraft are anticipated to decrease at an average annual rate of 1.0%.

The number of general aviation hours flown is anticipated to increase by an average annual rate of 1.8%. This increase reflects increased flying by business and corporate aircraft as well as small annual percentage increases in utilization rates for piston aircraft. Hours flown by turbine aircraft including rotorcraft are anticipated to increase an average annual rate of 3.6% and piston powered aircraft are anticipated to increase at an average annual rate of 0.4%. Jet aircraft are anticipated to increase at an average annual rate of 5.2% resulting mainly from the increasing size of the business jet fleet including increases in the fractional ownership fleet.

The number of active general aviation pilots is anticipated to increase at an average annual rate of 0.5%. The number of student pilots is forecast to increase at an average annual rate of 0.4%. It is anticipated that a total of 20,600 sport pilots will be certified by the end of the forecast period. The number of private pilots is anticipated to remain steady over the forecast period.

TERMINAL AIRPORT FORECASTS

The FAA TAF for Wiscasset Municipal Airport was reviewed and determined to be of little consequence to this update. The data provided is minimal and would have no impact on forecasted changes.

MAINE SYSTEMS PLAN FORECASTS

MaineDOT completed the MASPU in 2001, which is now 13 years old and out of date and is of no value to this update.

LOCAL AVIATION FORECASTS

The 2001 AMPU identified a 3.6% annual growth rate for based aircraft and a 2.1% annual growth rate for operations. As illustrated in Figure 3.1, based aircraft actually increased by about 48% during the period from 2000 through 2013, or 3.7% per year (31 to 48 aircraft). During the same period, operations increased by 44%, or 3.4% per year (7,500 to 10,800). In both aircraft and operations, the airport exceeded the 2001 projections. During the same period, fuel sales at KIWI increased by 112%, from 19,600 to 41,600 gallons (see Figure 2.11).

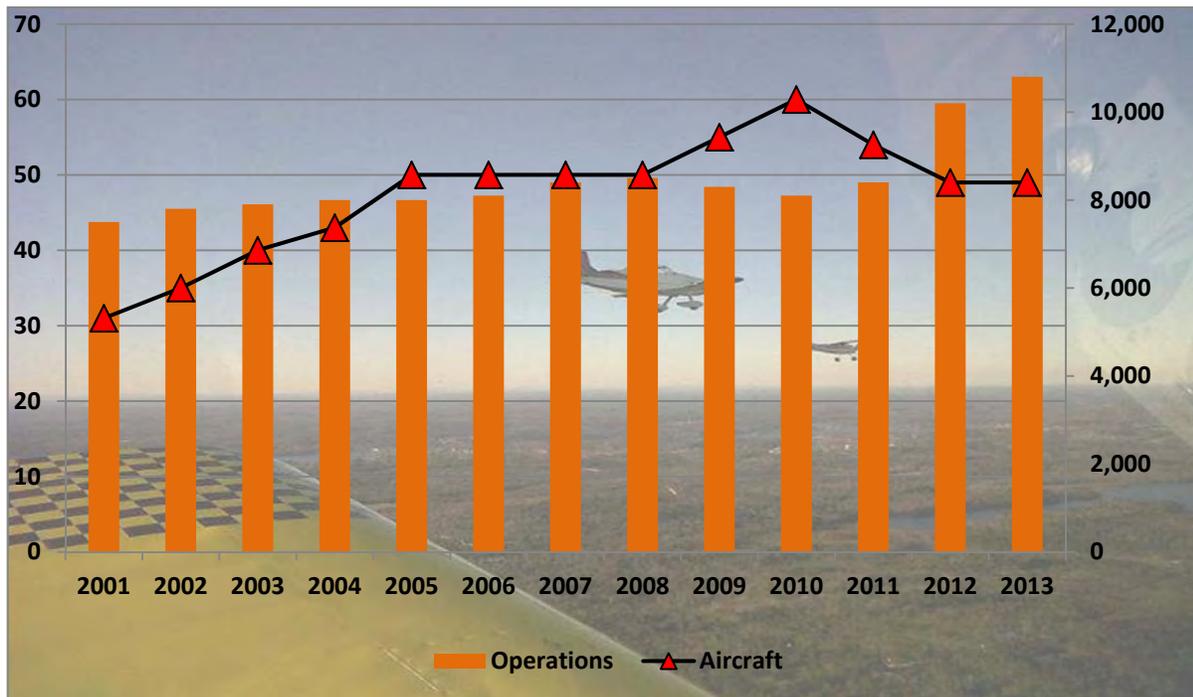


Figure 3.1 – Growth Rate of Based Aircraft and Operations (2001-2013)

FORECAST METHODOLOGY

The forecasts in this study are prepared using a combination of trend analysis and professional judgment based on the history of the airport and trends in general aviation. The base year for these forecasts is 2013 as this is the last full year data was available. Historical aviation trends over time will be used to project future aviation activity levels.

WISCASSET MUNICIPAL AIRPORT FORECASTS

Historic performance for Wiscasset Municipal Airport during the past 10 years is important for determining general aviation activity in the future. Contrary to national trends, the trend since the last update in 2001 through 2013 has been one of growth in terms of based aircraft, operations, and airport development. As noted earlier, based aircraft have increased in numbers from a seasonally adjusted 31 in 2001 to 48 at the end of 2013. Operations increased by 44% from 7,500 in 2001 to 10,800 in 2013. And most notably, and as a reflection of the number of aircraft and operations, the number of hangar units has increased from four in 2001 to 32 at the end of 2013, with one additional hangar construction starting in the spring of 2014.

Rising fuel prices and aircraft costs over the past decade have reduced the number of recreational activity nationwide, but not at Wiscasset. As discussed in Section 2, fuel sales have steadily increased. Also as discussed in Section 2, the population in Lincoln County increased by 2.5% and the medium household income was up by over 23%. Both population and income had a higher growth rate than the state, and the income grew slightly faster than the national average.

The airport was selected in 2010 as the summer home for the Texas Flying Legends Museum, a Houston, Texas based organization. The organization will use the airport during the summer each year, basing a variety of World War II aircraft on the field, with pilot and maintenance crew support. This new opportunity, along with the projected rapid growth of the region is considered to be the key factors in determining forecasts and facility requirements at the airport in the future.

The airport's historic growth and county changes in income and population are positive indicators that the airport should continue to not only flourish, but continue to grow. In addition, the airport has strong community and political support and is well received by the aviation community. All of these factors suggest based aircraft and operations, and all other corresponding factors will continue to grow.

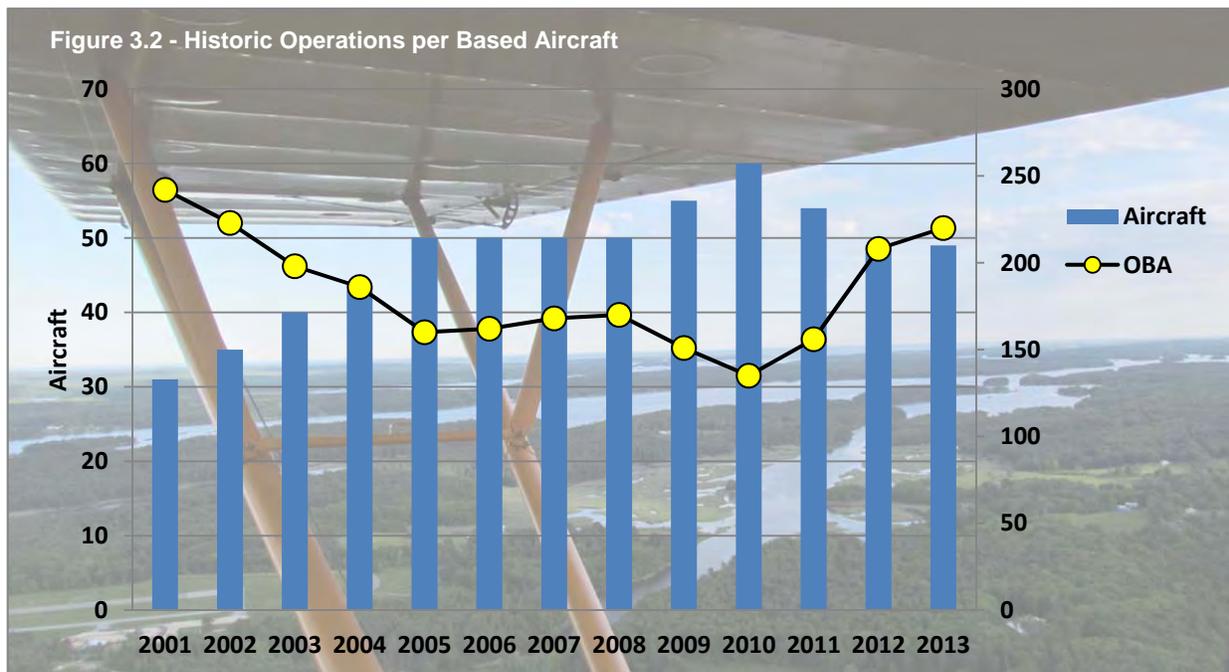
The projected growth rate for Wiscasset over the course of the next 10-20 years is 4.4% per year for based aircraft and operations. The design aircraft may not change appreciably because of the runway length, however it is anticipated that as the business and tourism community expands in the region, in particularly the area between Wiscasset and Boothbay Harbor, the number of air taxi operations will also increase, including the use of small business and private jets.

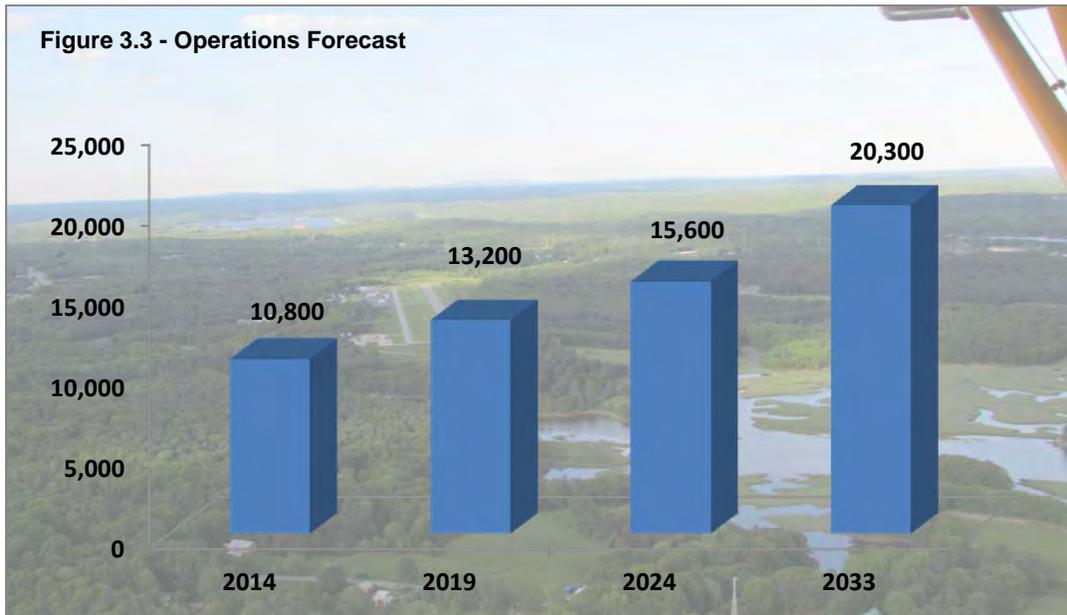
BASED AIRCRAFT FORECASTS

The number of based aircraft is expected to reflect seasonal patterns of increased activity in the summer months, reflecting an overall growth from about 48 aircraft (on average today) to as many as 90 aircraft during peak periods in 2033. This change represents an 87% increase over the 20-year period, averaging about 4.4% per year.

OPERATIONS FORECASTS

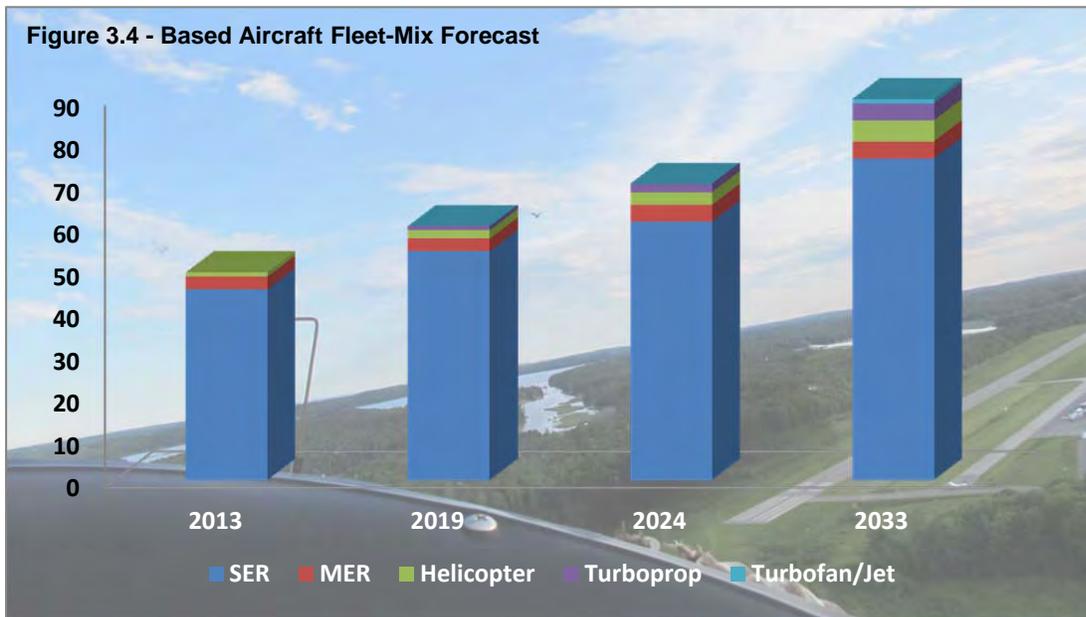
All things being equal, operations should increase at the same rate as based aircraft, about 4.4% per year. However, the volatility of the price of aviation fuel and insurance costs makes this a difficult assessment. As shown in Figure 3.2, the operations to based aircraft (OBA) ratio took a nose dive in the early 2000, leveled off in the latter part of the last decade, and have started showing signs of recovery. The uptick is likely due to the availability of favorable market price of fuel at Wiscasset. There’s no reason to believe that this upward trend will continue if the airport continues to offer fuel at below market prices. Thus a 4.4% increase in operations is realistic. This would result in approximately 20,300 operations per year in 2033. Figure 3.3 presents operations forecasts for the next 20 years.





FLEET MIX FORECASTS

The existing annually adjusted aircraft fleet mix consists of 92% (45) single engine, 6% (3) multiengine, and 2% (1) helicopter. This ratio is anticipated to change slightly over the next 20 years with the introduction of one or two additional helicopters and several turboprop aircraft. There are no indications that any turbojet/jet aircraft will be added to the based aircraft fleet as long as the runway remains at its current 3,400 foot length. For planning purposes the forecasted fleet mix will reflect the data shown in Figure 3.4.



DESIGN AIRCRAFT

As discussed in Section 2, the current design aircraft is the Beech 200 King Air. Because of the clear local and regional growth, and availability of Jet fuel at Wiscasset, the move upward to larger business jet is inevitable. This is anticipated to slowly change to a small business jet, something similar to the Cessna CJ2 shown in Figure 3.5. The CJ2's dimensions are



- Wingspan: 49'-10"
- Length: 47'-8"
- Height: 14'-0"
- MGTOW: 12,500
- Approach Speed: 118 knots (136 mph)
- Airport Reference Code: B-II

AIRPORT AND RUNWAY REFERENCE CODES

The current ARC is B-II and the RFC for both runway ends is B-II-4000. Even with the anticipated change in the design aircraft, the ARC will remain B-II.

PEAK-HOUR FORECASTS

Peak-hour (PH) operations are calculated to help determine facility requirements such as itinerant aircraft parking and passenger and pilot terminal spatial needs. The months of July and August are typically the busiest period for Wiscasset Municipal Airport.

We know from earlier analysis (Figure 2.5) that the peak month at KIWI is July with 21% of annual operations. Thus calculating the Peak Month Average Day (PMAD) is 1/30th of PM. Peak Hour (PH) is assumed to be 20% of PMAD.

- $PM = \text{Total Operations} * 21\%$
- $PMAD = PM/30$
- $PH = PMAD * 20\%$

Table 3.1 uses the above calculations to determine the PH forecasts for the next 20 years.

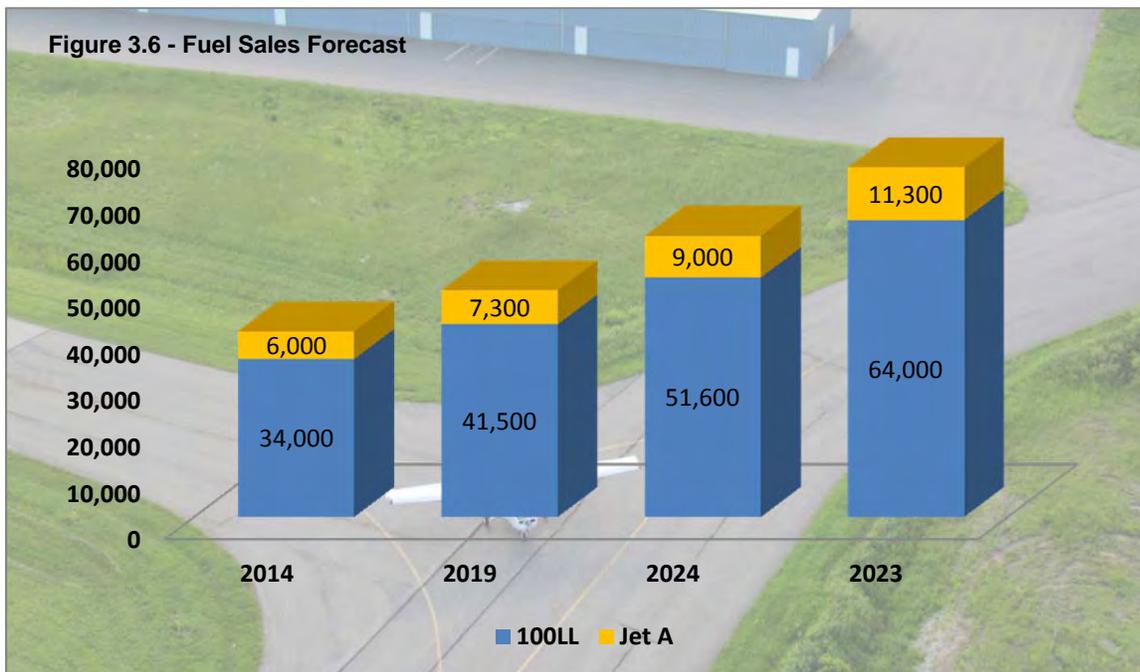
FUEL SALES FORECASTS

Forecasts are anticipated to increase at the same rate as based aircraft at an annual rate of 4.4% throughout the 20-year planning period, based off of the average sales during the past two year, which was 41,000 gallons. Of the 41,000 gallons, 15% was Jet A and the remaining 85% was 100LL. The same percentages will be carried forward throughout the planning years.

Figure 3.6 identifies the preferred fuel sales forecasts.

Table 3.1 – Peak Hour Forecast

Analysis	2014	2019	2024	2033
Operations	10,800	13,175	15,550	20,300
PM	2,268	2,767	3,266	4,263
PMAD	76	92	109	142
PH	15	18	22	28



SUMMARY

Table 3.2 is a summary of the preferred forecasts for Wiscasset Municipal Airport.

Table 3.2 – Forecast Summary

Element	2014	2019	2024	2033
Design Aircraft	King Air 200	King Air 200	King Air 200	Cessna CJ2
ARC	B-II	B-II B-II B-II		
Based Aircraft				
SER	45	54	61	76
MER	3	3 4 4		
Helicopter	1	2 3 5		
Turboprop	0	1 2 4		
Turbojet/Jet	0	0 0 1		
Total	49	60	69	90
Operations				
Local	5,400	6,600	7,800	10,150
Itinerant	5,400	6,600	7,800	10,150
Total	10,800	13,200	15,600	20,300
Peaking Operations				
PM	2,268	2,767	3,266	4,263
PMAD	76	92	109	142
PH	15	18	22	28
Fuel Sales				
Jet A	6,000	7,300	9,000	11,300
100LL	34,000	41,500	51,000	64,000
Total	40,000	48,800	60,000	75,300