CHAPTER 3

Aviation Activity Forecasts

Introduction and Overview

This chapter provides a summary of historical aviation activity and new aviation activity forecasts for Lake County Airport (LKV) for the 20-year master plan horizon (2024-2044). The most recent Federal Aviation Administration (FAA) approved aviation activity forecasts for LKV were developed in the 2013 Airport Master Plan Report.

The new aviation activity forecasts use calendar year 2024 as the baseline; however, 2023 was the last full year of data available when the preliminary forecasts were developed. The base year will be maintained for consistency in any subsequent forecast revisions required to obtain final FAA forecast approval. The forecast covers a 20-year period with five-year reporting intervals. Multiple forecasting methodologies are used in this analysis and the models that provide the most valid outlooks are presented for comparison.

The forecasts are unconstrained and assume Lake County will be able to make the facility improvements necessary to accommodate the anticipated demand, unless specifically noted. The County will consider if any unconstrained demand will not or cannot be reasonably met through the evaluation of airport development alternatives later in the master plan.

FAA Forecasting Process

The FAA provides aviation activity forecasting guidance for airport master planning projects. *FAA Advisory Circular (AC) 150/5070-6B, Airport Master Plans*, outlines seven standard steps involved in the forecast process:

1. Identify Aviation Activity Measures: The level and type of aviation activities likely to impact facility needs. For general aviation, this typically includes based aircraft and operations.
2. Previous Airport Forecasts: May include the FAA Terminal Area Forecast (TAF), state or regional system plans, and previous master plans.
3. Gather Data: Determine what data are required to prepare the forecasts, identify data sources, and collect historical and forecast data.
4. Select Forecast Methods: There are several appropriate methodologies and techniques available, including regression analysis, trend analysis, market share or ratio analysis, exponential smoothing, econometric modeling, comparison with other airports, survey techniques, cohort analysis, choice and distribution models, range projections, and professional judgment.
5. Apply Forecast Methods and Evaluate Results: Prepare the actual forecasts and evaluate for reasonableness.
6. Summarize and Document Results: Provide supporting text and tables as necessary.
7. Compare Forecast Results with FAA's TAF[1]: Follow guidance in FAA Order 5090.5, Field Formulation of the National Plan of Integrated Airport Systems and Airport Capital Improvement Program. In part, the Order indicates that forecasts should not vary significantly from the TAF. When there is more than 10% variance in the five-year term, or 15% in the 10-year term, documentation will be provided for careful consideration by the FAA. The aviation demand forecasts are then submitted to the FAA for their approval.

2024 UPDATE TO FAA FORECAST AND APPROVAL PROCESS

In 2024, the FAA updated its airport master planning forecasting guidance for smaller general aviation (GA) airports with fewer than 90,000 annual operations through the memorandum Forecast Review and Approval Instructions (August 12, 2024). Under this updated guidance, planning forecasts for qualifying airports may be streamlined to focus primarily on the existing and anticipated critical aircraft for each runway. Additionally, standard forecast consistency checks against the FAA TAF are no longer required. Where applicable, airport sponsors may attest that current and expected operations will not exceed 90,000 within the foreseeable future, defined by the FAA as the mid-term period (Year 10 of the standard 20-year planning horizon).

Current activity estimates and projections (described below) for Lake County confirm that operations will remain well below the 90,000-operation threshold throughout both the mid-term period and the full 20-year planning horizon. Consequently, per FAA guidance, a full aviation activity forecast is not required for this Airport Master Plan.

However, because the project's approved scope of work was finalized prior to the release of this updated guidance, a full forecast task was included. To ensure all contracted scope requirements were fulfilled, the following forecast chapter was prepared. Per consultation with the FAA planning team and the airport sponsor, this chapter is provided for reference only. While the findings—including the identification of the critical aircraft—were reviewed with FAA staff, the FAA will not issue a formal review or approval of the forecast.

KEY ACTIVITY ELEMENTS

As noted above, general aviation airport activity forecasting focuses on two key activity segments: based aircraft and aircraft operations (takeoffs & landings). Detailed breakdowns of these activity segments include:

- Aircraft fleet mix;
- Peak activity;
- Distribution of local and itinerant operations; and
- Determination of the critical aircraft.

The critical aircraft represents the most demanding aircraft type or family of aircraft that uses an airport on a regular basis (a minimum of 500 annual takeoffs & landings per year). Per *AC 150/5000-17, Critical Aircraft and Regular Use Determination*, the critical aircraft is used to establish a variety of FAA design categories, which then establish design standards for airfield facilities. FAA airport design standard groupings reflect the physical requirements of specific aircraft types and sizes. Design items, such as runway length evaluations, are determined by the requirements of current/future critical aircraft. The activity forecasts also support the evaluation of several demand-based facility requirements including runway and taxiway capacity, aircraft parking, and hangar capacity.

1 This requirement only applies to airports with greater than 90,000 annual operations. See "2024 Update to FAA Forecast and Approval Process" section.

Table 3-1 describes the data sources used in this chapter.

Table 3-1: Forecasting Data Sources

Source	Description
FAA National Based Aircraft Inventory Program	The FAA National Based Aircraft Inventory Program database assigns all eligible active civilian aircraft to individual airports, as reported and verified by airport owners. Aircraft reported by more than one airport are researched by airport management, with the final resolution approved by FAA. Inactive and other aircraft that do not meet FAA criteria may be listed, but they are not included in the airport's current "validated count." The FAA requires airport owners to update their counts periodically to reflect changes in activity. The accuracy of based aircraft counts at individual airports has improved significantly with more consistent airport verification and reporting. The current level of verification was not common in previous airport master plan data.
FAA Terminal Area Forecast (TAF)	The FAA TAF, published in January 2024, was used in this forecast evaluation. The TAF provides historical data and long-term projections for annual operations and based aircraft at all NPIAS airports, including LKV. The forecasts are based on overall growth rates assigned by FAA and do not necessarily correspond to the previous airport master plan, or other existing forecasts. The airport master plan's recommended based aircraft and operations forecasts will be compared to the TAF as part of the FAA forecast review/ approval process.
FAA National Aerospace Forecast	The 2024-2044 Aerospace Forecast was referenced in this forecast evaluation. The FAA Aerospace Forecast is a national level forecast of civil aviation activity that helps guide local forecasts by serving as a point of comparison between local and national trends.
Traffic Flow Management System Counts (TFMSC)	The TFMSC includes data collected from FAA instrument flight rules (IFR) flight plan filings. This activity is categorized by aircraft type, and it provides airport origin-destination and time of day information for all flights. The advantage of the TFMSC data is its degree of detail and insights into the more demanding aircraft operating at the Airport, such as jets and turboprops, that regularly file IFR flight plans. TFMSC data is the most reliable indicator of business aviation activity at the Airport, which is critical in documenting activity required for critical aircraft designation and the operations fleet mix.
State Aviation System Plans	The Oregon Aviation Plan (OAP v6.0) is the current state aviation system plan for Oregon, adopted in 2019. OAP v6.0 includes facility data, activity forecasts, system-wide minimum standards and performance measures for Oregon's public-use airports.
Socioeconomic Data	Socioeconomic data is provided by the Bureau of Economic Analysis (BEA), and the Oregon Employment Department (OED). Population data are provided by the Portland State University - Population Research Center (PRC). The PRC produces the annual population estimates and long-term forecasts for Oregon and its counties and cities, as well as the estimates by age and sex for the state and its counties. These estimates are used by the state and local governments, various organizations, and agencies for revenue sharing, funds allocation, and planning purposes. The 2023-2073 PRC population forecast is the primary resource for evaluating changes in local area population during the airport master plan 20-year planning horizon. The BEA datasets for Lake County were used for this analysis. Data categories considered include population, employment, earnings and income, and gross regional product.
Previous Airport Planning	The 2013 Airport Master Plan Report provides the most recent FAA-approved airport layout plan (ALP) drawing for the Airport. More recent project design and environmental documents also provide valuable information.
Fixed Base Operator (FBO)	Historical fuel flowage data provided to airport management by the airport tenants providing aircraft services was reviewed. This information was consulted when developing aircraft operations forecasts.

Source: Century West Engineering

FAA Forecast Terminology

Aircraft Operation
A count of a takeoff, landing, or touch-and-go. Each time an aircraft touches the runway to takeoff or land, it counts as an operation.

Aircraft Approach Category (AAC)
Classification of an aircraft by approach speed, with A being the slowest and E being the fastest.

Airplane Design Group (ADG)
Classification of an aircraft by its size (wingspan and tail height) with I being the smallest and VI being the largest.

Airport Reference Code (ARC)
Used to determine facility size and setback requirements. The ARC is a composite of the AAC and ADG of the critical aircraft. ARC is no longer used in FAA Advisory Circulars. Instead AAC and ADG are identified independently. Though the term is no longer in use, previous studies described in this document may reference ARC.

Based Aircraft
Aircraft that are stored at the Airport either full-time or seasonally (more than half a calendar year).

Critical Aircraft
The most demanding aircraft, or family of aircraft (in terms of size and/or speed) generating at least 500 annual operations at an airport. The critical aircraft is used to establish the applicable AAC and ADG (for existing and forecast activity).

General Aviation (GA)
Aviation activities conducted by recreational, business, and charter users not operating as airlines under FAR Part 121, Part 135, or military regulations.

Air Taxi
Aviation activities conducted by on-demand or scheduled operators certified under FAR Part 135. The majority of air taxi activity is conducted with aircraft also operated by general aviation users.

Itinerant Operation
An operation that originates at one airport and terminates at a different airport. For example, an aircraft flying from the Airport to another airport.

Local Operation
An operation that originates and terminates at the same airport. For example, an aircraft takes off from the Airport, remains near the airport to practice flight maneuvers, and then lands at the Airport. Touch-and-go operations occur in the airport traffic pattern and they are categorized as local operations.

Touch-and-Go
A maneuver where an aircraft lands and takes off without leaving the runway. A touch-and-go is counted as two aircraft operations.

Source: Century West Engineering, FAA and industry terminology.

Population and Economic Conditions

POPULATION

Historical population and economic data for the region was presented in Chapter 2. This section describes existing long-term population and economic forecasts for reference. Long-term population and economic forecasts are summarized in **Tables 3-2 and 3-3**.

The Population Research Center at Portland State University (PRC-PSU) prepares long-term population forecasts for the state of Oregon, counties, and cities. These data are used by local government to project future demand for services, housing, and to effectively manage growth as required by the State of Oregon land use planning law. The current PSU Coordinated Preliminary Population Forecast for Lake County was published in December 2022. The forecast provides projections for the county, its established Urban Growth Boundaries (UGB) for incorporated cities, and the unincorporated areas outside UGBs. The forecast uses a 2024 base year and provides projections through 2070. The 2044 projection coincides with the end of the current airport master planning period and provides relevant information about long-term expectations for the population of Lake County.

The population within an airport's service area, in broad terms, affects the type and scale of aviation facilities and services that can be supported. Changes in population often reflect broader economic conditions that may also affect airport activity.

The PSU forecast projects strong long-term growth trends for Lake County, with annual population growth averaging just under 1% through 2044. The projected net increase in population for these areas during the next 20 years is about 18%. The majority of population growth is projected to be concentrated in the incorporated cities of Lake County, which are also expected to experience similar, or slightly higher growth rates.

The State of Oregon's population is forecast to increase at an annual rate of approximately 0.58% during the next five years, or about 2.91% overall. A detailed summary of the population forecasts for the State, County, UGBs, and unincorporated Lake County is presented in **Table 3-2**.

Table 3-2: Population Forecast Summary

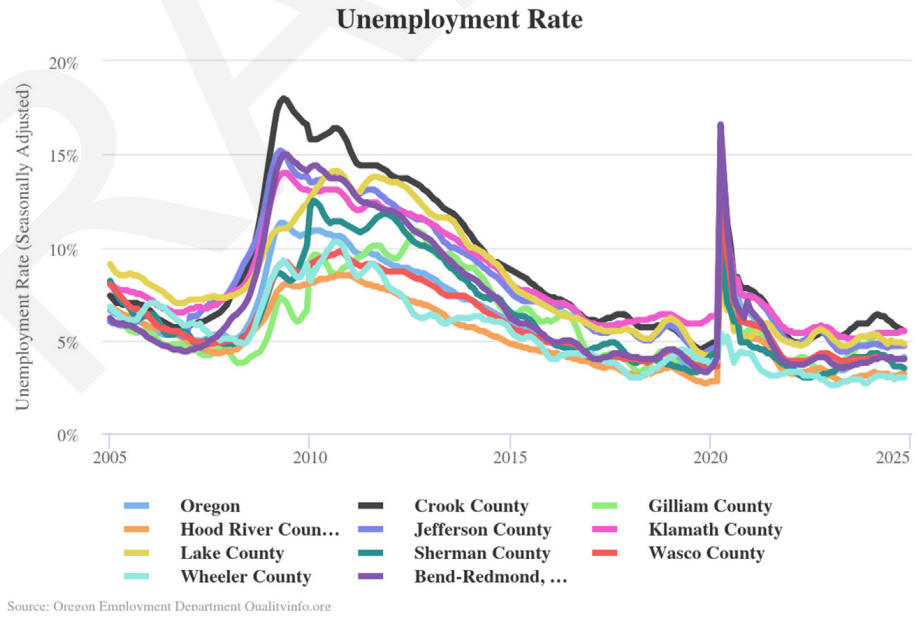
	AAGR[1]	2024[3]	2029[4]	2034[4]	2039[4]	2044[4]	Percent Change
Oregon[2]	0.58%	4,259,132	4,383,000	N/A	N/A	N/A	2.91%
Lake County	**0.82%**	**8,221**	**8,180**	**8,314**	**8,546**	**9,613**	**17.84%**
Lakeview UGB	1.00%	2,403	3,394	3,489	3,607	4,078	21.98%
Paisley UGB	1.14%	246	254	264	274	311	25.47%
Unincorporated Lake County	0.67%	5,572	4,532	4,561	4,665	5,223	14.39%

Source: Population Research Center, Portland State University, December 2024.
1. AAGR 2024-2044, except Oregon (2023-2033)
2. Oregon's Annual Population Forecast 2023-2033
3. 2024 Certified Population Estimates July 1, 2024
4. 2022 UGB Forecasts 2021-2070

EMPLOYMENT

The December 2024 OED Industry Employment Projection for the local ten county region (Crook, Jefferson, Gilliam, Klamath, Wasco, Sherman, Wheeler, Hood River, Bend-Redmond and Lake County) is presented in **Table 3-3**. OED predicts an 8% increase in employment for the region between 2023 and 2033, which mirrors its employment forecast for Oregon (statewide). Based on current forecasts, employment levels will grow at just under 1% annually during the 10-year period. The forecast population and economic growth within the region (service area for LKV) is expected to contribute to increased aviation demand in the master planning horizon.

Figure 3-1: Historical Unemployment (Lake County and Adjacent Counties)



The current leading employment sectors in Lake County include trade, transportation, utilities, and private educational and health services. By 2033, private educational and health services, professional and business services and construction are forecasted to experience the most aggressive employment growth by 13% respectively.

Peak unemployment levels during the height of the Great Recession and the COVID-19 pandemic for the region reached 16.6%. In comparison, Lake County had a peak unemployment level of 8.3% during the same period demonstrating an ability to navigate economic downturns in comparison to local economy. Historical unemployment rates for the local 10-county region are presented in **Figure 3-1**.

Table 3-3: Projected Employment by Industry

Crook, Deschutes, Gilliam, Hood River, Jefferson, Klamath, Lake, Sherman, Wasco, and Wheeler Counties	2023	2033	Change	% Change
Total employment	**174,400**	**187,900**	**13,500**	**8%**
Total payroll employment	162,800	175,700	12,900	8%
Total private	138,600	150,900	12,300	9%
Natural resources and mining	6,600	6,700	100	2%
Mining and logging	500	500	0	0%
Construction	11,000	12,400	1,400	13%
Manufacturing	12,500	13,300	800	6%
Durable goods	8,400	9,000	600	7%
Nondurable goods	4,000	4,300	300	8%
Trade, transportation, and utilities	28,200	29,300	1,100	4%
Wholesale trade	4,300	4,600	300	7%
Retail trade	19,700	20,100	400	2%
Transportation, warehousing, and utilities	4,300	4,600	300	7%
Information	2,700	2,900	200	7%
Financial activities	7,300	7,600	300	4%
Professional and business services	15,200	17,100	1,900	13%
Private educational and health services	26,300	29,800	3,500	13%
Health care and social assistance	24,700	28,000	3,300	13%
Leisure and hospitality	22,800	25,400	2,600	11%
Accommodation and food services	18,800	20,900	2,100	11%
Other services	6,000	6,300	300	5%
Government	24,200	24,800	600	2%
Federal government	2,900	2,800	-100	-3%
State government	2,800	3,000	200	7%
Local government	18,600	19,100	500	3%
Local government education	9,000	8,800	-200	-2%
Self-employment	11,600	12,200	600	5%

Source: Oregon Employment Department, Workforce and Economic Research Division (Published December 17, 2024)

National General Aviation Activity Trends

The first quarter of the 21st Century has presented numerous challenges for the General Aviation (GA) industry. On a national level, most measures of GA activity declined sharply during the Great Recession, rebounded, then declined and rebounded again during and after the COVID-19 pandemic.

Aircraft manufacturing, for example, hit a low point in 2010 after several years of growth, then rebounded and experienced relatively stable year-over-year growth through 2023 with one notable exception. The COVID-19 pandemic abruptly slowed worldwide deliveries of GA aircraft in 2020, yielding an 11.8% (418 aircraft) decrease compared to 2019. During this period, business jet deliveries declined by 18.5% (247 aircraft), turboprops by 15.6% (82 aircraft), and helicopters by 19.2% (168 aircraft), while piston-powered aircraft declined by less than 1% (three aircraft). Deliveries for 2023 continued to show signs of recovery with four consecutive years of net increases. 4,070 civil aircraft deliveries were recorded in 2023, which represents a 30.6% increase (953 aircraft) over the recent low from 2020[2].

The FAA performs an annual assessment of U.S. civil aviation through its *FAA Aerospace Forecast.* The 20-year forecasts are updated annually by evaluating recent events and established trends affecting a wide range of commercial and GA segments. Broad economic conditions and current forecasts are examined in order to provide reasonable expectations for aviation within the broader U.S. and global economy. The FAA forecasts examine in detail several key aviation industry indicators including fuel prices, production, and supply; aircraft manufacturing trends; aircraft ownership trends; fleet and pilot attrition; flight training trends; advances in fuel, engine, avionics, and airspace technology (ADS-B NextGen, etc.); and on-demand air travel. This array of factors is reflected in the FAA's overall assessment of future U.S. aviation activity. The 2024-2044 forecast factored in the post-COVID-19 pandemic response period (through 2023) in both historical data and forecasts. Overall, the long-term outlook for general aviation is notably stronger than presented in the 2023-2043 forecast.

The active U.S. GA fleet has fluctuated within a slight overall decline since 2001. This trend coincides with other GA industry trends including aviation fuel consumption, hours flown, IFR enroute air traffic, operations at towered airports, active pilots, etc. The total U.S. GA fleet in 2023 was 209,730, down about 6% since 2010. However, it is worth noting that the GA fleet has experienced four consecutive years of modest growth since 2020. The strongest growth among aircraft segments is for turbojets and light sport aircraft.

The *FY 2024-2044 Aerospace Forecast* predicts that the active GA aircraft fleet will grow at an average annual rate of approximately 0.4% through 2044 (forecast assumptions summarized below). Although the FAA maintains a favorable long-term outlook for general aviation, many of the activity segments associated with piston engine aircraft and aviation gasoline (AVGAS) consumption are not projected to return to "pre-Great Recession" levels within the 20-year forecast.

Key takeaways from the FAA 2024-2044 Aerospace Forecast Highlights are summarized below:

Positive Activity Indicators

- Turbine aircraft (turboprop, turbojet, helicopter) fleet and hours flown will grow.
- Sport and experimental aircraft fleet and hours flown will grow.
- Piston rotorcraft fleet and hours flown will grow.
- Jet fuel consumption will grow.
- The number of active sport, commercial, airline transport, rotorcraft only, and instrument rated pilots will grow.
- Total GA fleet will grow.
- GA enroute instrument flight rules (IFR) air traffic will grow.
- GA operations at towered airports will grow.

Negative Activity Indicators

- Fixed-wing piston aircraft fleet and hours flown will decline.
- AVGAS consumption will decline.
- The number of active private pilots will decline.

2 GAMA Aircraft Shipment Report (2023 year end).

The cited measures of national general aviation activity are intended to reflect the broad expectations defined by FAA, which have varying relevancy to LKV. A growing percentage of the single-engine aircraft based at the Airport are kit-built or light-sport aircraft (LSA). These aircraft have very similar facilities and operational requirements as traditional single-engine piston (SEP) aircraft, and for planning purposes are included in the SEP group.

It is recognized that trends experienced at individual airports often deviate from system-wide trends and generally reflect localized factors. In its current forecast, the FAA expects general aviation to experience modest growth overall. The FAA's annual growth assumptions for individual general aviation activity segments are summarized in **Table 3-4**.

Table 3-4: FAA Long Range Forecast Assumptions (U.S. General Aviation)

Activity Component	Forecast Average Annual Growth Rate (2024-2044)
Aircraft in U.S. Fleet	
Single Engine Piston Aircraft in U.S. Fleet	-0.20%
Multi-Engine Piston Aircraft in U.S. Fleet	-0.30%
Turboprop Aircraft in U.S. Fleet	1.00%
Turbojet Aircraft in U.S. Fleet	2.60%
Experimental Aircraft in U.S. Fleet	0.70%
Light Sport Aircraft in U.S. Fleet	3.00%
Piston Helicopters in U.S. Fleet	0.80%
Turbine Helicopters in U.S. Fleet	2.00%
Active GA Fleet (# of Aircraft)	0.40%
Active Pilots in U.S.	
Sport Pilots	2.40%
Private Pilots	-0.10%
Commercial Pilots	0.10%
Airline Transport Pilots	0.70%
Instrument Rated Pilots	0.40%
Student Pilots (Indicator of flight training activity)	-- (See note 1)
Active GA Pilots (All Ratings, Excluding Student Pilots)	0.40%
Hours Flown in U.S.	
Fixed Wing Piston Aircraft	-0.70%
Fixed Wing Turbine Aircraft	2.10%
Rotorcraft Piston Aircraft	1.50%
Rotorcraft Turbine Aircraft	2.20%
Experimental Aircraft	1.20%
Light Sport Aircraft	3.50%
Total GA Fleet Hours	0.80%
Fuel Consumption in U.S.	
AVGAS (Gallons consumed - GA only)	-0.50%
Jet Fuel (Gallons consumed - GA only)	1.70%

Source: FY 2024-2044 FAA Aerospace Forecast
1. Change in FAA certificate expiration; now excluded from forecast

Current Aviation Activity

New aviation activity forecasts are required for the master plan's 20-year planning period (2024-2044). Calendar year 2024 was used as the baseline to define current activity and the projections of based aircraft and aircraft operations (takeoffs and landings). Detailed breakouts of fleet mix and other operational factors will be applied to the recommended forecasts.

BASED AIRCRAFT

An updated count of 14 based aircraft at LKV was verified by airport management and FAA in Summer of 2024 following a review of the FAA's National Based Aircraft Inventory (www.basedaircraft.com). This update provides the "validated count" based aircraft, using FAA criteria, to represent the baseline activity level for the master plan evaluations. It is noted that an additional 3 aircraft are listed in the airport inventory but are not included in the validated count for a variety of reasons. These include invalid registrations, expired airworthiness certificates, or duplicate listings (aircraft shown at more than one airport). In the event that a significant number of these aircraft are returned to active service or otherwise are verified on site in the future, it could result in growth that may exceed the recommended forecast rate.

Table 3-5: Based Aircraft and Fleet Mix (2024)

Aircraft Type	
Single-Engine	12
Multi-Engine	2
Jet	0
Helicopter	0
Total	**14**

Source: Airport Management

The new validated based aircraft count for the Airport was approved and accepted by FAA in summer of 2024. The FAA requires that the (2024) validated count serve as the common baseline for all based aircraft forecast models in the Airport Master Plan. Other existing FAA data sources reporting based aircraft (5010-1 Airport Record Form, Terminal Area Forecast, etc.) will be updated for consistency with the current validated count. The 2024 based aircraft total for LKV is summarized in **Table 3-5**.

AIRCRAFT OPERATIONS

Since LKV is a non-towered airport, actual air traffic counts are not generated. Based on limited data availability, developing an estimate of current operations by reviewing known activity segments is recommended. The baseline estimate represents a combination of locally based and transient activity, which includes instrument flight plan data (TFMSC). The (2024) baseline will be used for all forecast operations models developed for the master plan.

FAA Automatic Dependent Surveillance-Broadcast (ADS-B) data is becoming increasingly available as a source to verify actual aircraft activity, including activity at specific airports. However, current ADS-B applications are limited and do not provide fully detailed datasets for airports like LKV. It is anticipated that in the future, ADS-B will provide increasingly accurate assessments of aircraft activity that are compiled system wide.

Instrument Flight Plan Data (TFMSC)

The FAA tracks flight activity for aircraft operating under IFR in the national airspace system using Traffic Flow Management System Counts (TFMSC). The TFMSC data captures all filed civil aircraft instrument flight plans by originating or destination airports. For planning purposes, military aircraft are not included in the FAA instrument flight plan data.

A 10-year summary of TFMSC instrument flight plan data for LKV is provided in **Table 3-6**. The data are summarized by aircraft approach category (AAC) and airplane design group (ADG). These designations are like those previously used by FAA to define Airport Reference Code (ARC). See **Table 3-15**, presented later in this chapter, for information about the AAC and ADG categories.

TFMSC data provides a reliable accounting of instrument flight plans filed to and from an airport and includes relevant aircraft-specific data such as type, AAC and ADG. However, TFMSC data only includes aircraft that have an active instrument flight plan filed on arrival or departure to/from the facility. This means that operations by aircraft that cancel their IFR flight plan enroute and proceed under VFR, or aircraft that depart an airport VFR and file an IFR flight plan enroute are not included in the count. To account for those operations, FAA directs planners to normalize the data by examining TFMSC-reported arrivals and departures, identify the higher of the arrival or departure count by aircraft type and multiply by two, effectively balancing arrivals and departures by aircraft type. This accounts for any operations performed under VFR and not included in the TFMSC data.

For non-towered airports such as LKV, TFMSC data provides the only tabulated operational data specifically attributed to the airport. Although IFR flight plans account for only a small percentage of aircraft operations at most non-towered airports, they reliably capture the majority of activity generated by turbine business-class aircraft, which operate predominantly on IFR flight plans. At LKV, this data provides the best indication of business class turbine aircraft activity.

Table 3-6: LKV – Instrument Flight Plan Data – Annual Aircraft Operations (2014-2023)

AAC/ADG	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
A-I	40	70	42	90	98	54	58	76	102	144
A-II	158	140	114	142	202	194	168	240	116	118
A-III	0	0	0	0	0	0	0	0	0	0
A-IV	0	0	0	0	0	0	0	0	0	0
B-I	90	72	44	40	30	26	26	28	14	26
B-II	64	74	94	86	80	54	44	56	44	32
B-III	0	0	0	0	0	0	0	0	0	0
B-IV	0	0	0	0	4	2	0	0	0	0
C-I	4	2	4	0	10	2	12	2	2	4
C-II	2	0	0	2	4	4	0	10	6	8
C-III	0	0	2	0	2	0	0	2	0	0
C-IV	0	0	2	0	2	2	0	0	0	0
C-V	0	0	0	0	0	0	0	0	0	0
D-I	0	10	2	0	0	0	0	0	2	0
D-II	0	0	0	0	0	0	0	0	0	0
D-III	0	0	0	2	0	0	0	0	0	0
D-IV	4	0	0	0	0	2	0	0	0	0
D-V	0	0	0	0	0	0	0	0	0	0
No Data	0	0	0	0	0	0	0	0	0	0
Total	**362**	**368**	**304**	**362**	**432**	**340**	**308**	**414**	**286**	**332**

Source: FAA TFMSC Report – 04/27/24 Lakeview Airport

ESTIMATING OPERATIONS AT NON-TOWERED AIRPORTS

As previously noted, developing accurate operations estimates for non-towered airports is inherently challenging. FAA Order 5090.5, Formulation of the NPIAS and ACIP, outlines alternative methods for estimating aircraft operations at facilities with limited data. Due to the varied nature of activity at LKV, no single method was sufficient to account for all operations. **Table 3-7** presents these methods in order of preference (as presented in the Order) and states whether and how each was applied at LKV. The process is further discussed in the following sections.

Table 3-7: FAA Order 5090.5 Alternative Methods for Estimating Aircraft Operations

Method	LKV Application
1. Traffic Flow Management System Counts (TFMSC)	Used to identify operations by IFR aircraft with filed flight plans to and from LKV.
2. Flight Tracking Systems (i.e. ADS-B)	Not used at LKV due to inconsistent adoption of ADS-B equipment by aircraft operating at LKV , challenges with differentiating ADSB operations from TFMSC operations (potential double-counts), and expense related to acquiring the data from commercial providers.
3. Airport or aircraft operator report	USFS/BLM reported eight years of operations counts for SEAT aircraft. Airport management reported rotorcraft operations estimates for military training purposes.
4. ACRP Report 129: Evaluating Methods for Counting Aircraft Operations at Non-Towered Airports	ACRP 129 recommends extrapolation of short-term sample counts to estimate annual operations. Sample counts were not scoped or available from other sources. This method was not used at LKV.
5. Based Aircraft Multiplier (OPBA)	OPBA was used to account for operations not otherwise accounted for by the other methods described above.

AIRCRAFT OPERATIONS – BASELINE (2024)

The updated estimate of current aircraft operations at LKV is based on four activity segments: TFMSC data, estimated single engine air tanker (SEAT) operations, military activity, and an operations per based aircraft (OPBA) ratio applied to the validated based aircraft count.

Instrument Flight Plan Data (TFMSC)

The FAA tracks flight activity for aircraft operating under instrument flight rules (IFR) in the national airspace system using Traffic Flow Management System Counts (TFMSC). The TFMSC data captures all filed civil aircraft instrument flight plans by originating or destination airports. For planning purposes, military aircraft are not included in the FAA instrument flight plan data.

TFMSC data provides a reliable accounting of instrument flight plans filed to and from an airport and includes relevant aircraft-specific data such as type, AAC and ADG. For non-towered airports such as LKV, TFMSC data provides the only tabulated operational data specifically attributed to the airport. Although IFR flight plans account for only a small percentage of aircraft operations at most non-towered airports, they reliably capture the majority of activity generated by turbine business-class aircraft, which operate predominantly on IFR flight plans.

Single Engine Air Tankers (SEAT)

The Bureau of Land Management (BLM) and the United States Forest Service (USFS) jointly operate an aerial firefighting base out of LKV. Under contract for a limited period during the year, two or more Air Tractors (AT-802s) conduct aerial firefighting activities generating a considerable number of operations per year. Historical data provided by BLM and USFS is summarized in **Table 3-8**.

Table 3-8: SEAT Operations (LKV)

SEAT Operations	2017	2018	2019	2020	2021	2022	2023	2024	Average
AT-802	822	180	258	646	590	338	102	552	436
CAGR									**-4.86%**

Source: BLM/USFS

Military Operations

Military activity at LKV is limited and typically consists of helicopters including Oregon Air National Guard aircraft. Airport management has reported periodic observations of military activity. For planning purposes, 416 annual operations are assumed which include common training activities.

Operations per Based Aircraft

The input used to estimate general user activity involves assigning a common aircraft utilization factor to the non-duplicated based aircraft. The OPBA ratio is a common method of estimating air traffic at non-towered airports. With flight training accounted for, this OPBA captures other activity from locally based aircraft and transient aircraft, including the 332 operations documented in the FAA's TFMSC instrument flight plan data for 2023. Based on the 2024 non-duplicated validated based aircraft count (14) and an OPBA of 350, this activity is estimated at 4,900 annual operations.

Table 3-9 summarizes the estimate of LKV aircraft operations for 2024. It is noted that the updated baseline (6,200) is 0.99% higher than the FAA TAF annual operations total (6,139) for 2024.

Table 3-9: Baseline – LKV Air Traffic Estimate (2024)

	Activity Segment	Base Metric (Aircraft Fleet)[1]	Operations Data[2]	Total Operations
A	TFMSC		332	332
B	Single Engine Air Tanker Operations		552	552
C	Non-Duplicated LKV-Based Aircraft OPBA	14	350[3]	4,900
D	Military			416
	Total Aircraft Operations (2024)			**6,200**

1. Number of active aircraft (2024), reported by operators.
2. 2023/2024 operations reported by LKV-based operators and TFMSC.
3. OPBA Ratio, consistent with FAA NPIAS guidance, includes TFMSC activity.

LKV AVIATION FUEL ACTIVITY

Aircraft fueling data provides a general indication about an airport's activity trends over time. The ability to compare overall fueling volumes and volumes by grade often provides some insight into aircraft-specific activity. **Table 3-10** summarizes the LKV aviation gasoline (AVGAS) and jet fuel sales for 2021-2024 previously presented in Chapter 2.

Table 3-10: Historical Fuel Sales (LKV)

	2021	2022	2023	2024[1]
AVGAS	14,489	17,739	17,325	3,506
Jet Fuel	28,124	30,893	33,985	9,753
Total	**42,613**	**48,632**	**51,310**	**13,258**

Source: Lake County
1. 2024 data is incomplete representing a partial year

AVGAS

The fuel data highlights a significant increase in volume during the 4-year period. To illustrate this, the AVGAS volume increased by 19.57% (2,836 gallons) over 2021-2023, resulting in an average annual growth rate (AAGR) of 9.35%. Assuming similar AVGAS volumes in the preceding years, LKV will likely continue to experience steady growth in fuel sales.

This is important to note since it represents a stronger local trend compared to national AVGAS consumption during this period (+0.3% annual average growth 2010-2023), and it significantly outperforms the current FAA long-term forecast decline (-0.5% annual average) in AVGAS consumption through 2044.

It is recognized that future AVGAS consumption will be affected by external regulatory changes, the ability to bring the next generation AVGAS blend(s) to market for full adoption, and growth in aircraft electrification adoption or use of alternate fuels. However, the recent historical AVGAS trend at LKV documents strong underlying aeronautical demand that is expected to continue during the current 20-year planning period.

Jet Fuel

Jet fuel sales at LKV during this period reveal strong growth in business aviation activity. The linear trend line projection for 2021-2023 jet fuel sales reflects an AAGR of approximately 9.93%. Jet fuel sales for this period outpace the national forecasted growth rate of 1.70% and the historical growth rate (2010-2023) of 2.9%.

The documented increase in jet fuel sales at the Airport during this period can be attributed to the varying activity levels from transient business aircraft, helicopter activity, and the seasonal activity of contracted Air Tractors for aerial firefighting use.

Updated Aviation Activity Forecasts

The updated (2024) based aircraft count and aircraft operations estimate presented in **Tables 3-5 and 3-9** are used as the basis for all new forecasts presented in this chapter. Since the baseline data were developed independently, they do not necessarily correspond to the TAF for 2024. TAF projections for 2024-2044 for based aircraft and annual aircraft operations are provided for FAA comparison, as required in their review and approval of master plan forecasts.

BASED AIRCRAFT

Four new based aircraft forecast models were developed by using a variety of methods, including the application of the FAA TAF regional and historical based aircraft trends, forecasted growth in local economic output, and FAA national general aviation fleet forecast rates. The annual growth rates established by each of these models were applied to the 2024 based aircraft count to develop 2024-2044 forecasts. All of the projections assume that based aircraft growth can be accommodated in hangars or stored in tiedown positions during the planning period. The based aircraft forecast models are briefly described below and summarized at the end of this section; **Table 3-11** and **Figure 3-2** present the preliminary based aircraft forecasts.

The current TAF (APO Terminal Area Forecast Detail Report, Issued January 2024) projects no growth in based aircraft at LKV in the period coinciding with the master plan's 20-year planning period (2024-2044). As noted earlier, the TAF is provided for reference only and is not presented as one of the preliminary forecasts in the master plan. As an existing forecast, its base year number for 2024 has not been revised to match the updated baseline number used in each of the forecast models. It is noted that the recently updated 2024 validated based aircraft count for LKV is 21.43% lower than the 2024 TAF total.

10-Year TAF Historical Trend

The 10-year TAF Historical Trend Model provides a simple evaluation of historical based aircraft reported by the TAF at LKV over the last 10 years. As noted previously the last airport master plan was completed in 2013, which is approximately 10 years prior to this master planning study. As accurate historical based aircraft data between planning studies is limited the FAA TAF provides an estimation of based aircraft during this 10-year period. In 2014 the TAF reported 15 based aircraft with an increase to 17 in 2024, which results in an average annual growth of 1.26%. The change in historic based aircraft totals for LKV from 2014 to 2024, although small, appears to be relatively consistent with actual based aircraft counts. Although the TAF forecasts for 2024-2044 are presented for comparison only, the historical numbers are updated periodically to reflect reported changes in the Airport's 5010 (Airport Master Record) updated by Airport Management.

Data anomalies (repeated years with no changes in aircraft totals) both before and subsequent to this period make valid assessments of those years challenging. Based on these factors, a two-point 10-year (2014-2024) historic trend analysis was developed for LKV, which reflects an annual growth rate of 1.26%; and an increase of 4 aircraft (28.46% overall increase).

FAA Aerospace Forecast - General Aviation (GA) Fleet Model

The FAA produces a national forecast of commercial and GA activity that is updated annually. The current version, FAA Aerospace Forecast - Fiscal Years 2024-2044, provides 20-year projections of key activity segments from a 2023 base year. The FAA forecasts of the active GA aircraft fleet and flight activity are relevant for analysis and application to the master plan forecasting exercise for LKV.

The FAA forecast projects the active national GA and air taxi fleet by aircraft category beginning with forecast year 2024, five-year increments from 2025 to 2040, then a final projection for 2044. The projections reflect expectations within the fleet including factors such as new aircraft manufacturing trends and fleet attrition, and broad national economic assumptions.

This forecast provides a "bottom-up" model that reflects growth expectations (raw numbers and annual growth rates) for each aircraft category independently, with the net increases/decreases tallied into totals. The forecast differentiates fixed wing aircraft, rotorcraft, experimental, and light sport aircraft. For fixed wing aircraft, the fleets are further categorized as single engine piston, multi engine piston, turboprop, and turbojet. Rotorcraft are categorized as piston or turbine.

The FAA Aerospace Forecast GA Fleet Model was developed by applying the forecast growth rates for each aircraft type included in the LKV based aircraft fleet and projected new based aircraft based on activity levels over the 20-year planning period. It is important to note that although current based aircraft do not include any helicopters or LSA/experimental aircraft it is assumed based on industry and local trends that these aircraft will be added to the airport over the 20-year planning period.

The model reflects long-term FAA assumptions that include declines in the single- and multi-engine piston aircraft fleet over the next 20 years, averaging -0.2% and -0.3% annually, respectively. The forecast projects the piston fleet to lose 6,280 aircraft by 2044. However, the outlook for other aircraft segments shows net increases across the board, with annual growth rates ranging from 0.7% to 3% during the forecast period. It is noted that the projected decline in the single-engine piston fleet appears to be offset by growth in light sport aircraft (LSA) and or experimental aircraft—the majority of which are single-engine piston (or electric) fixed wing aircraft. The

FAA projects that fixed wing piston fleet will lose 6,280 aircraft by 2044, but the number of LSA and experimental aircraft will increase by 6,920.

Reflecting the mix of aircraft types based and operating at LKV, a composite annual growth rate of 1.26% is generated in this model. The **FAA Aerospace Forecast GA Fleet Model has an AAGR of 1.26%**, which projects an increase of 4 aircraft, from 14 to 18, during the 20-year planning period (2024-2044). This model produced a 28.40% net increase in based aircraft over the 20-year planning period. This composite fleet model reflects modest growth expectations for the national GA fleet during the next 20 years.

Non-Towered FAA Northwest Mountain Region Trend

The FAA Terminal Area Forecast (2024-2044) for the Northwest-Mountain Region (OR, WA, ID, MT, WY, UT, CO) projects that the based aircraft fleet will grow at an average annual rate of 0.82% between 2024 and 2044 for all GA non-towered airports. This indicates that although the forecast rate of growth is modest, the seven-state region is expected to be among the strongest in the nation for GA based aircraft growth over the next 20 years.

The **Non-Towered FAA Northwest Mountain Region Trend Model has an AAGR of 0.82%**, which projects an increase of 2 aircraft, from 14 to 16, during the 20-year planning period (2024-2044). This model produced a 17.74% net increase in based aircraft over the 20-year planning period.

Lake County Per Capita Personal Income Forecast

The Bureau of Economic Analysis historical economic data for Lake County and the State of Oregon were reviewed to gauge long term economic expectations as a potential indicator of airport activity trends. The use of regional socioeconomic conditions as a potential indicator of airport activity trends is a generally accepted practice in instances where historical aviation data are limited. Although this model does not assume a statistical correlation between airport activity and personal income, it does assume that changes in airport activity will be similar to the anticipated growth in the local area.

The Bureau of Economic Analysis indicates that per capita personal income in Lake County grew at a rate of 3.79% between 2014 and 2023, which trails the 5.57% growth rate recorded for Oregon during the same period. Assuming this growth continues throughout the 20-year planning period growth in based aircraft should reflect a similar growth rate.

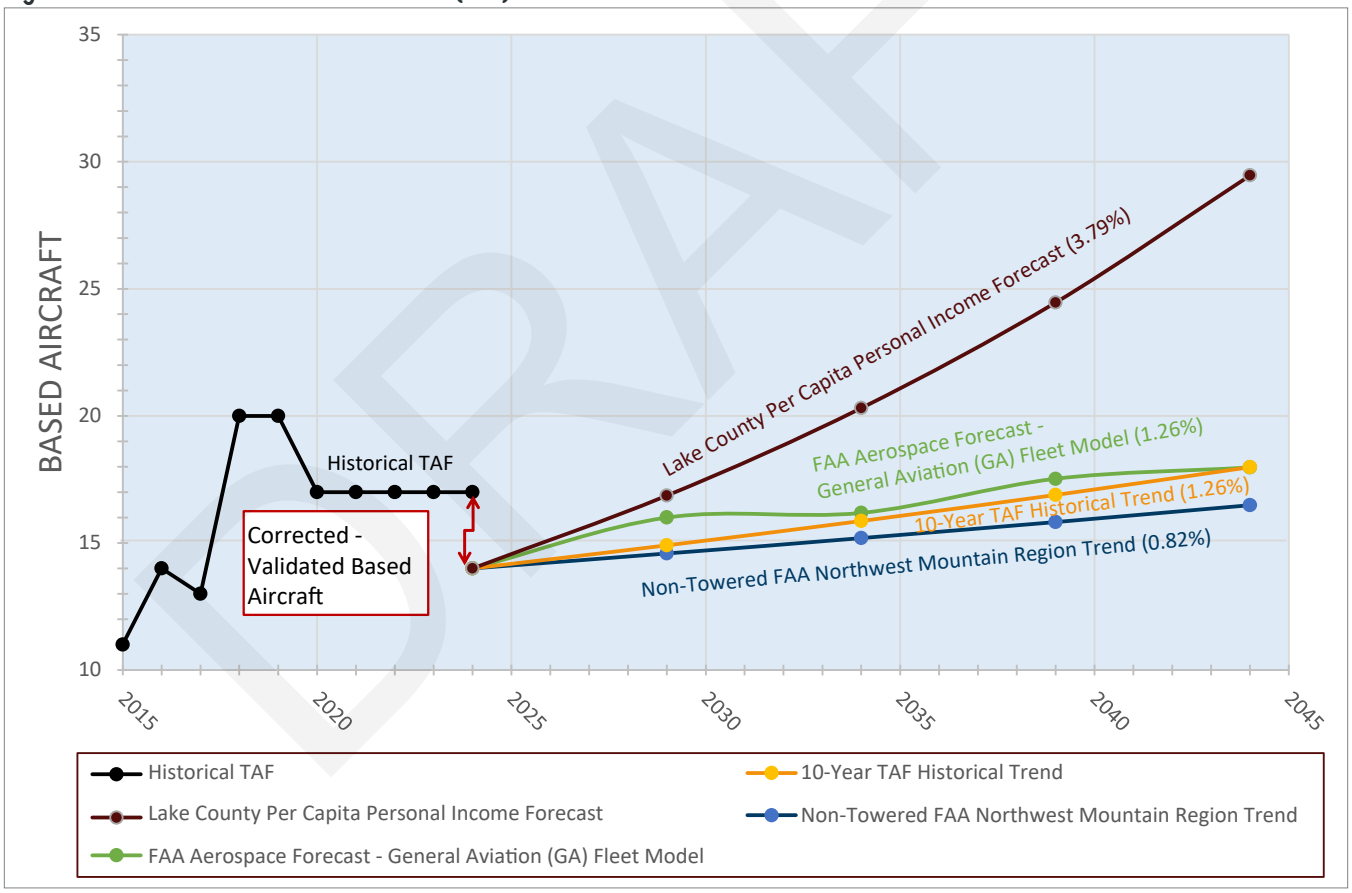
The **Lake County Per Capita Personal Income Forecast Model has an AAGR of 3.79%**, which projects an increase of 15 aircraft, from 14 to 29, during the 20-year planning period (2024-2044). This model produced a 110.43% net increase in based aircraft over the 20-year planning period.

Table 3-11: Based Aircraft Forecast Models (LKV)

Aircraft Type	Growth Rate	2024	2029	2034	2039	2044
Lake County Per Capita Personal Income Forecast	3.79%	14	17	20	24	29
Non-Towered FAA Northwest Mountain Region Trend	0.82%	14	15	15	16	16
FAA Aerospace Forecast - General Aviation (GA) Fleet Model	**1.26%**	**14**	**16**	**16**	**18**	**18**
10-Year TAF Historical Trend	1.26%	14	15	16	17	18

Source: Century West Engineering

Figure 3-2: Based Aircraft Forecast Models (LKV)



Source: Century West Engineering

RECOMMENDED BASED AIRCRAFT FORECAST SUMMARY

The four based aircraft forecast models described above projected a range of 2 to 15 additional based aircraft at LKV by 2044. The average annual growth rates for three of the projections remained relatively close to 1%, while one projection nearly tripled the next highest growth rate.

The **National Aerospace Forecast Model** is recommended as the based aircraft forecast for use in the LKV Master Plan. The forecast reflects an expectation that future growth in based aircraft at LKV will be consistent with national trends in aircraft fleets. **The recommended forecast results in a net increase of 4 based aircraft over the 20-year planning period, which reflects an AAGR of 1.26%**. The definition of based aircraft fleet mix is derived from the recommended based aircraft forecast.

Based aircraft forecasts are primarily intended to identify future facility needs in forthcoming sections of the master plan, particularly aircraft storage – apron parking and hangar space. Identifying development reserves is recommended for defining activity-dependent facility needs that may exceed forecast growth. To protect these needs, a development reserve that accommodates a number equal to the 20-year forecast increase of based aircraft (+4) is recommended. Accordingly, the long-term planning of landside facilities at LKV should be capable of accommodating 8 additional based aircraft (forecast + reserve) over the next 20 years.

BASED AIRCRAFT FLEET MIX

As noted in **Table 3-12**, the current based aircraft fleet at LKV includes single-engine and multi-engine piston aircraft. Single-engine piston aircraft currently account for the majority (86%) of LKV based aircraft. The remaining based aircraft are multi-engine piston aircraft (14%). These distributions are expected to remain relatively unchanged during the 20-year planning, although as noted below, it is likely that changes within these aircraft groups will occur.

The ongoing system-wide retirement of legacy general aviation piston aircraft will continue through the planning period. The addition of new LSA and experimental aircraft as replacements to traditional piston aircraft is also expected to continue. The industry wide strength of fixed wing and rotor turbine aircraft production is also expected to affect the local based aircraft fleet at LKV, since many of these types of aircraft are already present. Operational fleet mix projections, presented later in the chapter, are expected to experience changes driven in part by transient aircraft, rather than exclusively by based aircraft. **Table 3-12** summarizes the current and forecast based aircraft fleet mix for the planning period.

Table 3-12: Based Aircraft Forecast - Fleet Mix Summary (LKV)

Aircraft Type	Updated Aircraft Count (2024)	2029	2034	2039	2044
Single Engine Piston*	12	13	13	14	14
Multi Engine Piston	2	2	2	2	2
Jet	0	0	0	1	1
Helicopter	0	1	1	1	1
Ultralight	0	0	0	0	0
TOTAL	**14**	**16**	**16**	**18**	**18**

Source: Century West Engineering
*Includes Experimental (Single Engine Piston) and Light Sport Aircraft

AIRCRAFT OPERATIONS

Five new aircraft operations forecast models were developed by using a variety of methods, including applying FAA national general aviation forecast rates and FAA TAF regional forecast rates, historical fuel sales transactions trend, OPBA methodology, and the Oregon Aviation Plan top-down forecasts for LKV. The annual growth rates established by each of these models were applied to the 2024 baseline aircraft operations total (presented earlier in **Table 3-9**) to develop 2024-2044 forecasts. The limited availability of historical airport operations data does not support complex statistical analyses such as regression analysis to identify potential correlations between airport activity and other external events.

All of the projections assume that existing activity segments are established at a level that can be sustained or grow incrementally during the planning period at rates comparable to other general aviation airports. The growth in business aviation activity, which is documented in increases in annual jet fuel sales volumes, reveals a strong business aviation component. This activity reflects the local area economy, and the services provided to corporate aircraft at LKV.

The operations forecast models were prepared for comparison to the TAF. The current TAF for LKV (APO TAF Detail Report 2023-2050, Issued January 2024) is provided for comparison only, as the TAF is not considered an acceptable forecast by FAA for master planning purposes. The TAF is presented as published and was not adjusted to match the updated baseline operations total.

The aircraft operations forecast models are briefly described below and summarized at the end of this section; **Table 3-13** and **Figure 3-3** present the preliminary aircraft operations forecasts.

FAA National Aerospace GA Hours Flown Growth Rate

The FAA National Aerospace GA Hours Flown Growth Rate - Fiscal Years 2024- 2044, described earlier, projects a 0.8% average annual increase in general aviation hours flown within the FAA system through 2044. This growth rate was applied to the 2024 base year operations estimate for LKV to develop projections for the 20-year master planning period. This model assumes that aircraft activity at LKV will be consistent with FAA national expectations over the next 20 years.

The **FAA National Aerospace GA Hours Flown Growth Rate has an AAGR of 0.8%**, which projects annual operations to increase from 6,200 to 7,271 during the 20-year planning period (2024-2044).

FAA Non-Towered NW Mountain Region TAF

The FAA Terminal Area Forecast (2024-2044) for the Northwest-Mountain Region projects that aircraft operations (all airports) will grow at an average annual rate of 1.13% between 2024 and 2044. By filtering out airports with air traffic towers, the remaining facilities include general aviation airports more similar to LKV. The resulting model projects a 1.36% average annual growth through 2044. This indicates that although the forecast rate of growth is modest, the seven-state region is expected to be among the strongest in the nation for growth in GA aircraft flight activity over the next 20 years.

The **FAA Non-Towered NW Mountain Region TAF Model has an AAGR of 1.36%**, which projects annual operations to increase from 6,200 to 7,504, during the 20-year planning period (2024-2044).

Oregon Aviation Plan Model

The 2019 Oregon Aviation Plan (OAP) developed by the Oregon Department of Aviation includes operation forecasts for Oregon airports. The OAP Top-Down forecast model projects aircraft operations at all Oregon airports including LKV will grow at an average annual rate of 0.90% from 2015 to 2035. The methodology uses the FAA's projected AAGR of national general aviation hours flown, as found in the 2017 FAA Aerospace Forecast (0.90%). This top-down model assumes that the general aviation operations at Oregon airports will increase at the same rate as the number of hours flown nationally.

The **Oregon Aviation Plan Model has an AAGR of 0.90%** which projects annual operations to increase from 6,200 to 7,417, during the 20-year planning period (2024-2044).

Fuel Sales Transactions Model

As noted previously, comparing fuel flowage volumes can often provide some insight into aircraft-specific activity. Transaction volumes provide insight on the number of aircraft buying fuel at the Airport versus total gallons sold which can be skewed by aircraft with larger fuel tanks or high fuel consumption. Historical transaction history from 2021-2023 demonstrates an AAGR of 1.47% for both 100LL and Jet A combined. Applying this rate to the 2024-2044 planning period, the resulting model projects strong growth for aircraft operations at LKV.

The **Fuel Sales Transactions Model has an AAGR of 1.47%** which projects annual operations to increase from 6,200 to 8,301, during the 20-year planning period (2024-2044).

Operations Per Based Aircraft (OPBA) Formula

This model utilizes the same methodology that was used to calculate the baseline aircraft operations estimate presented earlier. The modified OPBA formula (350 OPBA) was applied to the recommended based aircraft forecast to project future aircraft operations through the planning period. The recommended OPBA is comparable to ratios often found at small GA airports. This model assumes that aircraft operations at Lake County Airport will increase at the same rate as forecast based aircraft.

The **Operations Per Based Aircraft Formula Model projects an average annual growth rate of 0.96%**. When applied to the current baseline operations, this model projects an increase from **6,200 to 7,505 annual aircraft operations** at the Airport by 2044. This represents a 21.06% increase above the current air traffic level over the planning period.

TAF 2024-2044

The current TAF (APO Terminal Area Forecast Detail Report, Issued January 2024) projects LKV annual operations to increase from 6,139 to 7,540 operations in the period coinciding with the master plan's 20-year planning period (2024-2044), which reflects an AAGR of 1.03% over 20 years. As noted earlier, the TAF is provided for reference only and is not presented as one of the preliminary forecasts in the master plan. As an existing forecast, its base year number for 2024 has not been revised to match the updated baseline number used in each of the forecast models. It is noted that the 2024 baseline aircraft operations estimate for LKV is 0.99% higher than the 2024 TAF total.

RECOMMENDED AIRCRAFT OPERATIONS FORECAST SUMMARY

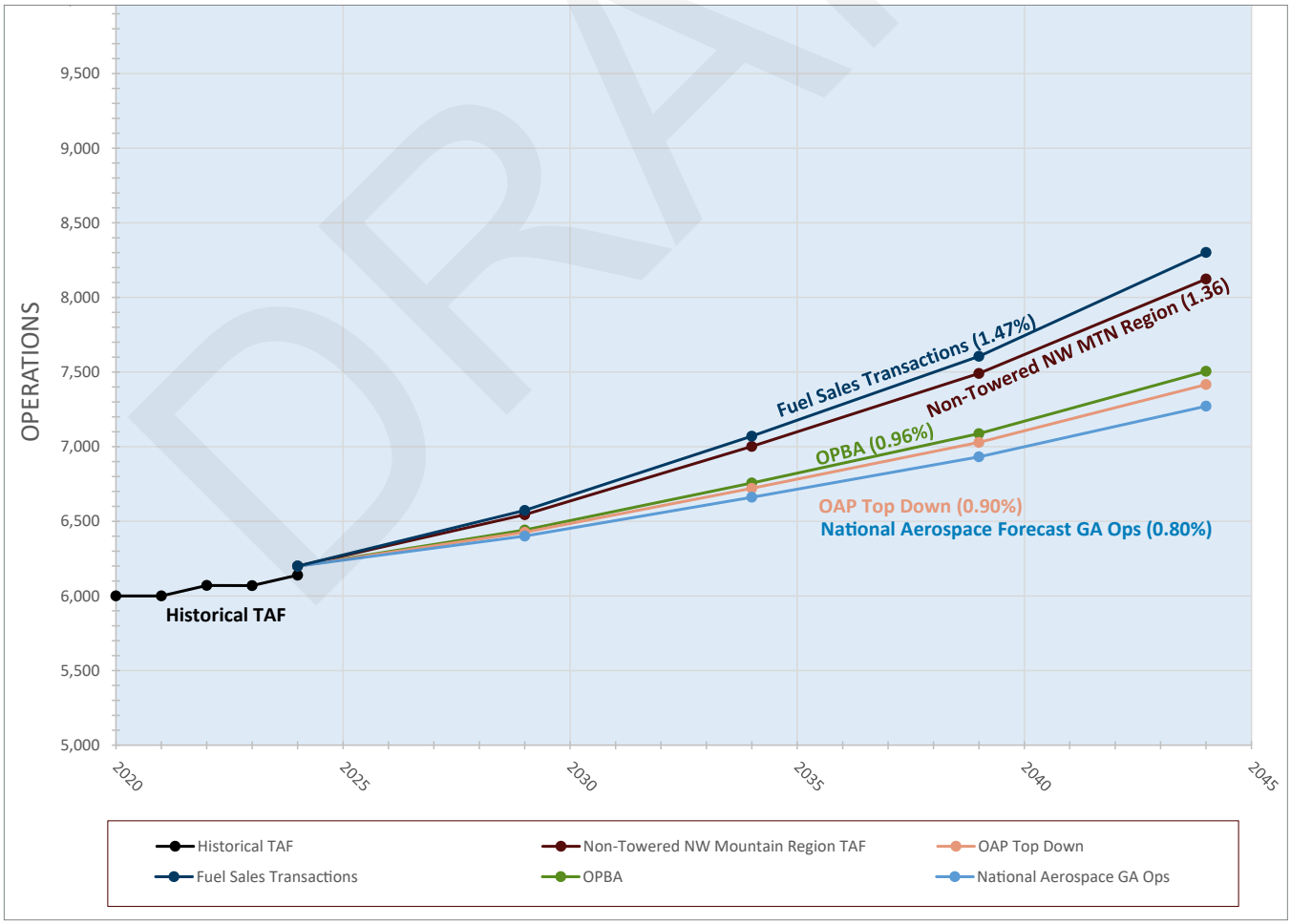
Based on a review of the preliminary forecast models, the **Operations Per Based Aircraft Model** is recommended as the preferred aircraft operations forecast for use in the LKV Master Plan. The model has an **AAGR of 0.96%**, which projects annual operations to increase from 6,200 to 7,505, during the 20-year planning period (2024-2044). This model best captures the current activity levels at LKV and is expected to continue to grow in conjunction with the growth in based aircraft at the airport and provides a reasonable basis to project future activity. The aircraft operations forecast models that were evaluated, including the recommended model, are summarized in **Table 3-13** and depicted on **Figure 3-3**.

Table 3-13: Forecast Annual Operations Rates (LKV)

Forecast Model	AAGR	2024	2029	2034	2039	2044
OPBA	**0.96%**	**6,200**	**6,503**	**6,822**	**7,155**	**7,505**
OAP Top Down	0.90%	6,200	6,484	6,781	7,092	7,417
Non-Towered NW Mountain Region TAF	1.36%	6,200	6,633	7,097	7,593	8,123
Fuel Sales Transactions	1.47%	6,200	6,669	7,174	7,717	8,301
National Aerospace Forecast	0.80%	6,200	6,452	6,714	6,987	7,271

Source: Century West Engineering

Figure 3-3: Aircraft Operations Forecast Models (LKV)



Source: Century West Engineering

LOCAL AND ITINERANT OPERATIONS

Aircraft operations consist of aircraft takeoffs and landings that are classified as local or itinerant. Local operations are conducted in the vicinity of an airport and include flights that begin and end at the airport. These may include flights to local practice areas for flight training, touch and go operations in the airport traffic pattern, sightseeing and other flights that do not involve a landing at another airport. Itinerant operations include flights between airports, including cross-country flights. Itinerant operations are also associated with business and personal travel.

As noted previously, Jet A fuel sales have increased significantly in recent years; however, none of the validated based aircraft consume Jet A. This indicates a significant increase in transient activity assuming the majority of aircraft consuming Jet A originate from an airport other than LKV. It is important to note that SEAT operations account for a portion of Jet A fuel consumption and are not included in the validated based aircraft count since they are based at the airport for less than 6 months out of the year. The TAF provides additional insight into itinerant and local traffic splits. The TAF published in January 2024, depicts a 75%/25% split between itinerant/local traffic. The TAF for LKV has maintained this split since 2015 and forecasts the distribution to remain relatively unchanged throughout the 20-year planning period (2024-2024).

A 70%/30% itinerant/local air traffic distribution is recommended for forecast aircraft operations during the planning period. The recommendation assumes that the current operational split will be maintained at approximately the same proportion of traffic during the planning period. This assumption is based on the TAF splits, fuel consumption trends and the expectation that LKV will continue to attract business activity in the future. The local and itinerant distribution for each forecast year is summarized in **Table 3-14**.

Table 3-14: Itinerant/Local Operations Mix (LKV)

Forecast Model	2024	2029	2034	2039	2044
Total Itinerant Operations (70%)	4,712	4,943	5,185	5,439	5,704
Local Operations (30%)	1,488	1,561	1,637	1,717	1,801
Total Local & Itinerant Operations (100%)	**6,200**	**6,504**	**6,822**	**7,156**	**7,505**

Source: Century West Engineering

AIRCRAFT OPERATIONS FLEET MIX

Based on available data, it is estimated that small single-engine piston aircraft, multi-engine piston aircraft, and helicopters account for approximately 83% of current LKV operations. Fixed wing turbine aircraft (turboprops and jets) account for the remaining 17% of operations. Some shifts in activity are anticipated in the current planning period, consistent with national trends and local conditions. For national trends, aircraft activity segments are expected to follow the FAA's hours flown forecast for GA and air taxi aircraft in the FAA National Aerospace Forecast during the 20-year planning period. This includes modest declines in fixed wing piston activity, while helicopters and jet operations are expected to increase in both overall levels and in their portion of total activity. The upward trend for jets, turboprops and helicopter operations reflects the local trend observed in recent years of Jet A fuel sales.

The aircraft operations fleet mix forecast is summarized in **Table 3-15**. Additional information about the current and future critical aircraft for LKV's runway is provided in the following section.

Table 3-15: Operations Fleet Mix (LKV)

Forecast Model	2024	2029	2034	2039	2044
Single Engine Piston	4,400 (71%)	4,489 (69%)	4,530 (66%)	4,552 (64%)	4,551 (61%)
Multi Engine Piston	350 (6%)	353 (5%)	351 (5%)	347 (5%)	342 (5%)
Turbo Prop	950 (15%)	1,092 (17%)	1,278 (19%)	1,490 (21%)	1,729 (23%)
Jet	100 (2%)	118 (2%)	143 (2%)	173 (2%)	207 (3%)
Helicopters	400 (6%)	452 (7%)	520 (8%)	594 (8%)	676 (9%)
Total Operations	**6,200 (100%)**	**6,504 (100%)**	**6,822 (100%)**	**7,156 (100%)**	**7,505 (100%)**

Source: Century West Engineering

AIRCRAFT OPERATIONS FLEET MIX (CRITICAL AIRCRAFT DETAIL)

Historical TFMSC and local operator data presented earlier in **Table 3-6** and **Table 3-7** documented the activity for the known Aircraft Approach Category/Airplane Design Group (AAC/ADG) groupings currently operating at LKV used to determine the current critical aircraft for the runway. As noted previously, the combined volume of B-II and greater aircraft activity reported by TFMSC at LKV has declined in recent years. However, data provided by BLM presents significant operations from two AT-802s, which have historically exceeded the FAA's regular use threshold of 500 annual operations.

Critical Aircraft

The selection of design standards for airfield facilities is based upon the characteristics of the most demanding aircraft that are expected to use the airport. This group of aircraft or aircraft type is designated as critical aircraft. For airports with multiple runways, each runway is assigned a design category based on its critical aircraft. The FAA provides the following definitions:

> *"The critical aircraft is the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport. Regular use is 500 annual operations, including both itinerant and local operations, but excluding touch-and-go operations. An operation is either a takeoff or landing." (FAA AC 150/5000-17)*

The FAA groups aircraft into five categories (A-E) based upon their approach speeds. Aircraft Approach Categories (AAC) A and B include small propeller aircraft, many small or medium business jet aircraft, and some larger aircraft with approach speeds of less than 121 knots (nautical miles per hour). Categories C, D, and E consist of the remaining business jets, and larger jet and propeller aircraft generally associated with commercial and military use with approach speeds of 121 knots or more. The FAA also establishes six (I-VI) Airplane Design Groups (ADG), based on the wingspan and tail height of the aircraft. The categories range from ADG I, for aircraft with wingspans of less than 49 feet, to ADG VI for the largest commercial and military aircraft.

The combination of ADG and AAC for the critical aircraft creates the Runway Design Code (RDC), which is used to define applicable airfield design standards. This aircraft-specific designation was previously identified as the Airport Reference Code, or "ARC" on FAA-approved airport layout plan (ALP) drawings.

Table 3-16 summarizes FAA technical criteria used to determine the applicable AAC/ADG for aircraft based on physical characteristics; representative aircraft are also depicted.

Table 3-16: Representative Critical Aircraft by AAC and ADG

Aircraft Approach Category (AAC)	Aircraft Approach Speed knots	Airplane Design Group (ADG)	Aircraft Wingspan
A	less than or equal to 91	I	less than or equal to 49’
B	92 to 121	II	50’ to 79’
C	122 to 141	III	80’ to 118’
D	142 to 166	IV	119’ to 171’

A-I (small) 12,500 lbs. or less

Beech Baron 55
Beech Bonanza
Cessna 182
Piper Archer

B-I (small) 12,500 lbs. or less

Beech Baron 58
Beech King Air C90
Cessna 402
Cessna 421

A-II, B-II (small) 12,500 lbs. or less

Super King Air 200
Pilatus PC-12
DCH Twin Otter
Cessna Caravan

B-II Greater than 12,500 lbs.

Super King Air 300, 350
Beech 1900
Cessna Citation
Falcon 20, 50

A-III, B-III Greater than 12,500 lbs.

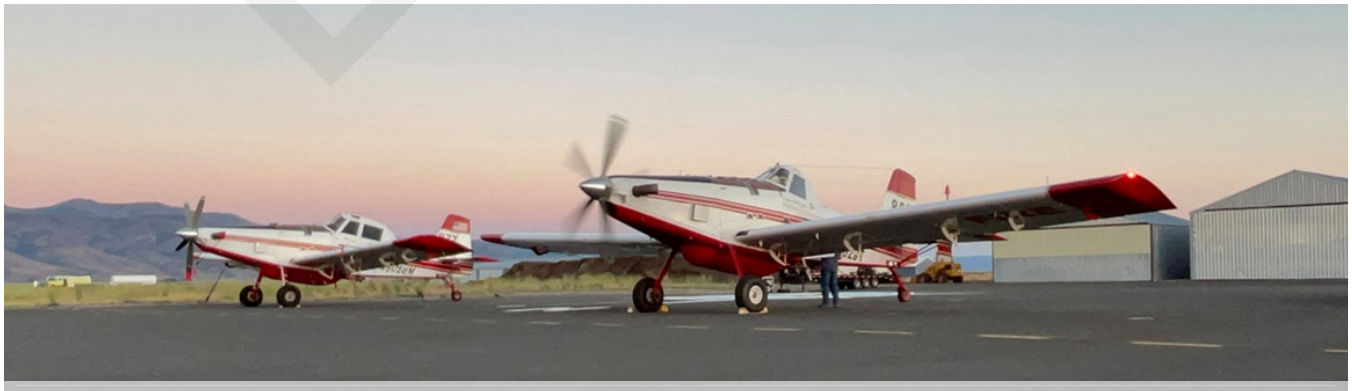
DHC Dash 7, Dash 8
Q-200, Q-300
DC-3
Convair 580

C-I, D-I

Lear 25, 35, 55, 60
Israeli Westwind
HS 125-700

Source: Century West Engineering

Runway 17/35: Current and Future Critical Aircraft (RDC B-II)



Air tractor (AT-802) Source: Airport Management

CURRENT/FUTURE CRITICAL AIRCRAFT

The identification of the current and future critical aircraft for each runway is required to define the appropriate design standards for the facilities. A review of 2023 FAA TFMSC and operator data for LKV provides a detailed insight of the distribution of operations by AAC and ADG. Evaluations of applicable design standards will be conducted in the facility requirements chapter. **Table 3-17** summarizes current and forecast aircraft operations by various RDC groupings. Examples of the critical aircraft are provided in **Table 3-16**.

Table 3-17: Operations Fleet Mix By RDC/Type

	2024	2029	2034	2039	2044	20-Year AAGR%
TOTAL OPS - A-I	4,300	4,510	4,731	4,963	5,205	0.96%
TOTAL OPS - B-I	800	839	880	923	968	0.96%
TOTAL OPS - A/B-II	600	629	660	692	726	0.96%
TOTAL OPS - C-I and Larger	100	105	110	115	121	0.96%
TOTAL OPS – HELI	400	420	440	462	484	0.96%
TOTAL OPS - ALL A/C	**6,200**	**6,503**	**6,822**	**7,155**	**7,505**	**0.96%**

Source: Century West Engineering

Runway Design Code - Runway 17/35

According to a combination of historical operator and TFMSC data, the AT-802 makes up the majority of B-II operations. Operations data provided by BLM/USFS contractors and presented in **Table 3-7** indicate that the AT-802s have historically exceeded the FAA regular use aircraft threshold of 500 operations. TFMSC data represented in **Table 3-6** indicates an additional 77 operations by aircraft B-II and larger.

Based on historical data, AT-802s represent the most demanding aircraft type using Runway 17/35 on a regular basis. The AT-802s fall into AAC B and ADG II based on their approach speed and wingspan. Since the existing RDC reflects the combination of the two standards, the appropriate existing RDC for Runway 17/35 is B-II. A representative aircraft in this category is the Air Tractor (AT-802), an agricultural aircraft that can be modified for firefighting purposes.

Runway Design Code – Future FAA Funding Eligibility

While the Air Tractor AT-802 accounts for the majority of B-II operations at LKV, these operations are primarily driven by federally contracted SEAT aircraft. Because activity by federal aircraft is generally ineligible to support future airport infrastructure funding, the operational data was reviewed excluding federally contracted flights. This adjusted analysis identified the critical aircraft for funding eligibility as the B-I (small) category, represented by the multi-engine piston Beechcraft Baron 58 (BE-58).

However, based on historical demand and local support for BLM and USFS firefighting missions, Lake County will continue designing to FAA requirements that accommodate the AT-802 (B-II). Therefore, the BE-58 (B-I small) will serve as the critical aircraft for FAA grant funding eligibility, while airport facilities continue to accommodate B-II operational needs.

Based on current and forecast activity, the recommended Runway Design Codes (RDC) for LKV are:

- *Runway 17/35 (Existing RDC): B-II*
- *Runway 17/35 (Future RDC): B-II*
- *Runway 17/35 (Funding RDC): B-I (small)*

Operational Peaks

Activity peaking is evaluated to identify potential capacity related issues that may need to be addressed through facility improvements or operational changes. The Peak Month represents the month of the year with the greatest number of aircraft operations (takeoffs and landings). The peak month for most general aviation airports occurs during the summer when weather conditions and daylight are optimal. For planning purposes, traffic at LKV, peak month operations are estimated to be 15% of annual operations during the planning period.

Peak Day operations are defined by the average day in the peak month (Design Day) and the busy day in the typical week during peak month (Busy Day). The Design Day is calculated by dividing peak month operations by 30. For planning purposes, the Busy Day is estimated to be 25% higher than the average day in the peak month (Design Day x 1.25), based on common activities generating surges in flight activity.

The peak activity period in the Design Day is the Design Hour. For planning purposes, the Design Hour operations are estimated to account for 20% of Design Day operations (Design Day x 0.20).

The operational peaks for each forecast year are summarized in **Table 3-18**. This level of peaking is consistent with the mix of airport traffic and is expected to remain relatively unchanged during the planning period. These measures of activity are considered when calculating runway/taxiway capacity and transient aircraft parking requirements. No significant runway or taxiway capacity issues have been identified based on current or forecast peak activity levels. However, the concentration of transient business jets on the main apron during peak periods contributes to congestion in the terminal area.

Table 3-18: Peak Operations (LKV)

Aircraft Type	2024	2029	2034	2039	2044
Annual Operations	6,200	6,504	6,822	7,156	7,505
Peak Month Operations (11%)	682	715	750	787	826
Design Day Operations (average day in peak month)	23	24	25	26	28
Busy Day Operations (assumed 125% of design day)	28	30	31	33	34
Design Hour Operations (assumed 20% of design day)	5	5	5	5	6

Source: Century West Engineering

Military Activity

The FAA TAF lists 0 annual itinerant military operations at LKV for 2024 and maintains this level of activity through 2050. However, known military activity is reported by airport management. For planning purposes, the 2024 baseline estimate of aircraft operations presented in **Table 3-9** includes 416 military operations, which is considered to represent a typical level of military activity at the Airport, including flight training, search and rescue, emergency response, etc. For planning purposes this level of military activity will be maintained during the current planning period.

Air Taxi Activity

Air taxi activity includes for-hire charter flights, medevac flights, and some scheduled commercial air carriers operating under FAR Part 135. The current FAA TAF lists 1,224 annual air taxi operations at LKV in 2024, with moderate growth in activity projected through 2050. The current TAF projects growth in Air Taxi & Commuter traffic from 1,224 annual operations to 1,465 by 2044.

Based on the updated (2024) estimate of air traffic for the Airport, current air taxi activity is estimated to account for approximately 24% of overall airport operations. Based on a review of available operations data, 1,504 air taxi operations were estimated at LKV for 2024. Air Taxi operations are projected to increase at approximately the same rate as overall airport activity over the planning period.

Forecast Summary

A summary of the based aircraft and annual aircraft operations forecast is presented in **Table 3-19**. The forecast projects moderate growth over the 20-year planning period that is consistent with FAA's long-term expectations for general aviation in the region.

Table 3-19: Forecast Summary

Activity	2023	2028	2033	2038	2043
Itinerant Operations					
General Aviation	3,108	3,264	3,427	3,599	3,778
Air Taxi	1,504	1,579	1,657	1,740	1,826
Military	100	100	100	100	100
Total Itinerant Operations	**4,712**	**4,943**	**5,185**	**5,439**	**5,704**
Local Operations	1,488	1,561	1,637	1,717	1,801
Total Local & Itinerant Operations	**6,200**	**6,504**	**6,822**	**7,156**	**7,505**
Based Aircraft	14	16	16	18	18
Operations Per Based Aircraft[1]	443	407	426	398	417

Source: Century West Engineering
1. OPBA calculation excludes military operations

FIFTY-YEAR FORECAST

Fifty-year demand forecasts were prepared as required in the FAA-approved master plan scope of work by extrapolating the AAGR for the recommended 20-year (2024-2044) based aircraft and aircraft operations forecasts. The purpose of the 50-year projection is to provide an estimate of demand that can be used to approximate long-term aviation use land requirements for the Airport. **Table 3-20** summarizes the 50-year forecast, in addition to the intermediate 30- and 40-year projections.

Table 3-20: 50-Year Forecast (LKV)

	2024	2044	2054	2064	2074
Annual Operations	6,200	7,505	8,258	9,086	9,997
Based Aircraft	14	18	20	22	24

Source: Century West Engineering