COUNTY of VENTURA
Department of Airports

Chapter 2

FORECASTS

The definition of demand that may reasonably be expected to occur during the useful life of an airport's key components (e.g., runways, taxiways, terminal buildings, etc.) is an important factor in facility planning. In airport forecasting, this involves projecting potential aviation activity for at least a 20-year timeframe. Aviation demand forecasting for the Oxnard Airport (OXR) will primarily consider based aircraft, aircraft operations, and peak activity periods.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. FAA will review individual airport forecasts with the objective of comparing them to its *Terminal Area Forecasts* (TAF) and the *National Plan of Integrated Airport Systems* (NPIAS). While the TAF forecasts are a point of comparison for airport forecasts, they primarily serve other purposes, such as asset allocation by the FAA.

When reviewing a sponsor's airport forecast, the FAA must ensure that the forecast is based on reasonable planning assumptions, uses current data, and is developed using appropriate forecast methods. As stated in FAA Order 5090.5, *Formulation of the National Plan of Integrated Airport Systems (NPIAS) and Airports Capital Improvement* Plan (ACIP), forecasts should be:

- Realistic;
- Based on the latest available data;
- Reflective of current conditions at the airport (as a baseline);
- Supported by information in the study; and
- Able to provide adequate justification for airport planning and development.

The forecast process for an airport planning study consists of basic steps that vary in complexity depending upon the issues addressed and the level of effort required. The steps include a review of previous forecasts, determination of data needs, identification of data sources, collection of data, selection of forecast methods, preparation of the forecasts, and evaluation and documentation of the results. FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, outlines seven standard steps involved in the forecast process for master plans, ALP Updates, Part 150 Studies, and other airport forecasting efforts:

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) **Review Previous Airport Forecasts**: May include the FAA *Terminal Area Forecast*, state or regional system plans, previous master plans, and other FAA approved airport forecasts.
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 data tables as necessary.
7) **Compare Forecast Results with FAA's TAF**: For general aviation airports, such as Oxnard Airport, forecasts for based aircraft and total operations are considered consistent with the TAF if they meet the following criteria:
   - Forecasts differ by less than 10 percent in the 5-year forecast period and 15 percent in the 10-year forecast period, or
   - Forecasts do not affect the timing or scale of an airport project, or
   - Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.5, *Formulation of the NPIAS and ACIP*.

Aviation activity can be affected by many influences on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over 20 years with any certainty. Therefore, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The following forecast analysis for OXR was produced following these basic guidelines. Existing forecasts are examined and compared against current and historic activity. The historical aviation activity is then examined, along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation demand projections for OXR that will permit airport management to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

The forecasts for this study utilize a base year of 2022, with a long-range forecast year of 2042.

AIRPORT SERVICE AREA

The initial step in determining the aviation demand for an airport is to define its generalized service area for various segments of aviation the airport can accommodate. The airport service area is determined primarily by evaluating the location of competing airports, their capabilities, their services, and their relative attraction and convenience. In determining the aviation demand for an airport, it is necessary to identify the role of that airport, as well as the specific areas of aviation demand the airport is intended to serve. The primary role of Oxnard Airport is to relieve congestion at Los Angeles area commercial service airports and to serve general aviation demand in the area.

The airport service area is a geographical area where there is a potential market for airport services. Access to general aviation airports and transportation networks enter the equation to determine the size of a service area. Also, to be factored are subjective criteria, such as the services and amenities available.

Defining a service area for an airport is an important factor in the forecasting process. Once a general service area is identified, various statistical comparisons can be made for projecting aviation demand. For example, in rural areas, where there may be one general aviation airport in each county, the service area could reasonably be defined as the entire county. This would facilitate comparisons to county population and other factors pertaining to that county for forecasting purposes.

In urban areas, where there are many general aviation airports, the definition of a service area is not as simple. Aircraft owners in urban areas have many more choices when it comes to basing their aircraft. The number one reason aircraft owners select an airport at which to base their aircraft is convenience to home or work. Other reasons may include the capability of the runway system, services available, availability of hangar space, airport congestion, etc.

The service area will generally represent where most, but not all, based aircraft will come from. It is not unusual for some based aircraft to be registered outside the region or even outside the state. Particularly in urban areas, airport service areas will likely overlap to some extent as well.

The generalized service area of an airport can be estimated by its proximity to other airports providing similar levels of service. OXR is one of three airports serving the general aviation needs in the Ventura County area. **Table 2A** summarizes available facilities at airports in proximity to OXR. There are varying levels of service located at each airport. Camarillo Airport (CMA) is six nautical miles (nm) to the east of OXR. CMA has a comparable runway that is 6,013 feet long. CMA has an instrument approach to Runway 26 with a visibility minimum of ¾-mile. Point Mugu Naval Air Station (NTD) is seven nm to the south-east with an 11,102-foot-long runway. This military base is not open to the public. Saint Paula Airport (SZP) is 11 nm to the north-east with a 2,665-foot-long runway. This airport is limited to use by smaller aircraft due to the runway length. Van Nuys Airport (VNY), Whiteman Airport (WHP), and Santa Monica Airport (SMO) are all reliever general aviation airports located 30+ nm to the east of OXR.

For purposes of this forecast analysis, OXR, CMA, and SZP serve the general aviation needs for Ventura County therefore, Ventura County is considered the service area for each of these airports. They have overlapping service areas as an aircraft owner is likely to choose one of these three airports at which to base their aircraft.

TABLE 2A | Area Airports

Identifier	Airport	Nautical Miles/Direction from OXR	FAA Service Level²	Based Aircraft¹	Local Ops	Itinerant Ops	Annual Operations¹	Longest Runway (ft.)¹	Lowest Visibility Minimum¹
OXR	Oxnard Airport	NA	Regional GA	122	55,600	32,300	87,900	5,953	1-mile ILS
CMA	Camarillo Airport	6 nm/E	National GA - Reliever	383	103,600	83,500	187,100	6,013	¾-mile LPV
NTD/PVT	Point Mugu NAS Airport	7 nm/SE	NA/Naval Base	UK	UK	UK	UK	11,102	½-mile/ILS
SZP	Saint Paula Airport	11 nm/NE	NA	309	UK	UK	97,000	2,665	NA
SBA	Santa Barbara Municipal	34 nm/WNW	Commercial Service	141	34,300	56,700	91,000	6,052	½-mile/ILS
VNY	Van Nuys Airport	36 nm/E	National GA - Reliever	243	80,600	143,400	224,000	8,001	¾-mile ILS
WHP	Whiteman Airport	40 nm/E	Regional GA - Reliever	223	60,900	37,300	98,200	4,120	1-mile GPS
SMO	Santa Monica Airport	40 nm/ESE	Local GA - Reliever	74	27,700	39,800	67,500	3,500	1-mile GPS

PVT: Private Military Airport;UK: Unknown

Source: ¹www.airnav.com; ²NPIAS

SOCIOECONOMIC FORECASTS

Socioeconomic conditions also provide an important baseline for preparing aviation demand forecasts. Local socioeconomic variables, such as population and employment, are indicators for understanding the dynamics of the community and can relate to local trends in aviation activity. Analysis of the demographics of the airport service area will give a more comprehensive understanding of the socioeconomic situations influencing the region which supports OXR. The following is a summary of the demographic and socioeconomic data for Ventura County and the State of California, as well as forecasts of those socioeconomic characteristics.

Table 2B summarizes historical and forecast population, employment, and income estimates for Ventura County and the State of California. Population in Ventura County is forecast to grow at an average annual rate of 0.47 percent. Statewide population growth is projected to be slightly higher at 0.62 percent. Ventura County employment is projected to grow at 1.04 percent, while the state is projected to add jobs at an annual rate of 1.46 percent. Income levels are very similar between the state and county for both historical and forecast scenarios.

TABLE 2B | Socioeconomic Forecast Data

	HISTORICAL		FORECAST			CAGR
	2010	2022	2027	2032	2042	2022-2042
Ventura County						
Population	825,144	843,696	863,528	883,827	925,867	0.47%
Employment	424,867	484,907	519,601	546,213	596,286	1.04%
Income¹	$47,893	$61,051	$65,915	$70,908	$81,029	1.43%
State of California						
Population	37,319,550	39,522,028	40,906,071	42,239,008	44,681,832	0.62%
Employment	19,642,445	24,197,137	27,106,637	28,880,442	32,335,947	1.46%
Income¹	$45,170	$62,867	$67,878	$73,171	$84,227	1.47%

¹Per capita personal income in 2012 dollars.
CAGR: Compound annual growth rate

Source: Woods & Poole Complete Economic and Demographic Data Source (CEDDS) 2022

NATIONAL AVIATION TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for the large air carriers, regional/commuter air carriers, general aviation, and FAA workload measures. The forecasts are prepared to meet the budget and planning needs of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public. The current edition used in preparation of this study was FAA *Aerospace Forecasts – Fiscal Years 2022-2042*, published in March 2022. The FAA primarily uses the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets. The following discussion is summarized from the FAA Aerospace Forecasts.

FAA GENERAL AVIATION FORECASTS

The FAA forecasts the fleet mix and hours flown for single engine piston aircraft, multi-engine piston aircraft, turboprops, business jets, piston and turbine helicopters, light sport, experimental, and others (gliders and balloons). The FAA forecasts "active aircraft," not total aircraft. An active aircraft is one that is flown at least one hour during the year. As previously mentioned, from 2010 through 2013, the FAA undertook an effort to have all aircraft owners re-register their aircraft. This effort resulted in a 10.5 percent decrease in the number of active general aviation aircraft, mostly in the piston category.

The COVID-19 pandemic of 2020-2021 also had a significant impact on the aviation industry; however, the impact was less acute in the general aviation sector as more people began to see private aviation as a viable alternative to commercial airlines, which were severely impacted. In fact, some sectors of general aviation saw increases in activity such as charters and fractionals.

The long-term outlook for general aviation is relatively stable, as growth at the high-end offsets continuing retirements at the traditional low end of the segment. The active general aviation fleet is forecast to grow between 2022 and 2042. While steady growth in both gross domestic product (GDP) and corporate profits results in continued growth of the turbine and rotorcraft fleets, the largest segment of the fleet – fixed-wing piston aircraft – continues to decline over the forecast period. Against the growing fleet, the number of general aviation hours flown is projected to increase by an average of 0.91 percent per year during the same period, as growth in turbine, rotorcraft, and experimental hours more than offset a decline in fixed-wing piston hours. Following declining numbers of pilots from 2010-2016, growth in pilots has returned and is forecast to grow by 0.27 percent through 2042. **Table 2C** shows the primary general aviation demand indicators as forecast by the FAA.

Exhibit 2A presents the historical and FAA forecast of the U.S. active general aviation aircraft fleet and operations.

TABLE 2C | FAA National General Aviation Forecast

Demand Indicator	2022	2042	CAGR 2022-2042
Total General Aviation Fleet	**204,590**	**208,905**	**0.10%**
Total Fixed Wing Piston	133,815	112,915	-0.85%
Total Fixed Wing Turbine	26,480	38,455	1.88%
Total Helicopters	9,955	13,530	1.55%
Total Other (experimental, light sport, etc.)	34,340	44,005	1.25%
Total General Aviation Operations	**28,300,413**	**32,027,144**	**0.62%**
Local	13,731,399	15,767,539	0.69%
Itinerant	14,569,014	16,259,605	0.55%
Total General Aviation Hours Flown[1]	**22,665,047**	**27,165,249**	**0.91%**
Total Pistons	13,527,555	12,091,335	-0.56%
Total Turbine	9,137,492	15,073,915	2.53%
Total General Aviation Pilots[2]	**474,450**	**500,720**	**0.27%**

[1]Excludes Experimental, Light Sport, and Others (gliders, balloons, etc.)
[2]Excludes student pilots
CAGR: compound annual growth rate

Source: FAA Aerospace Forecast - Fiscal Years 2022-2042

UNMANNED AIRCRAFT SYSTEMS (UAS)

UAS are commonly referred to as drones which have been experiencing healthy growth in the U.S. and around the world the past few years. According to the *FAA Aerospace Forecasts Fiscal Years 2022-2042*:

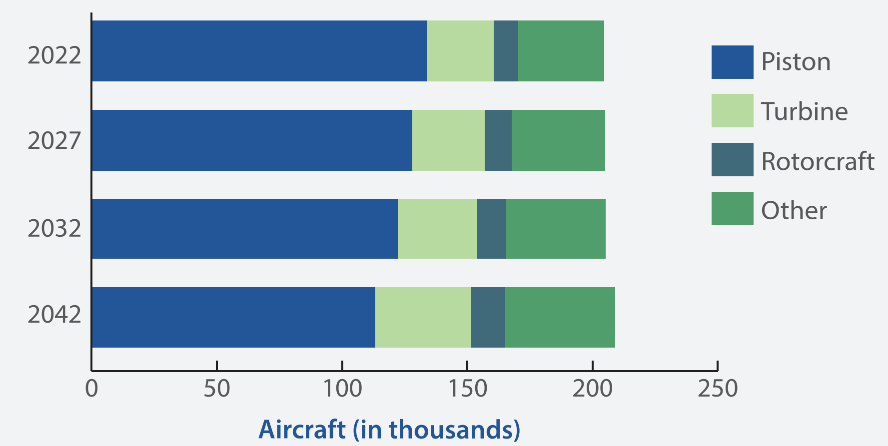
> "A drone consists of a remotely piloted aircraft and its associated elements – including the control station and the associated communication links – that are required for the safe and efficient operation in the national airspace system (NAS). The introduction of drones in the NAS has opened up numerous possibilities, especially from a commercial perspective. This has also brought challenges including drones' safe and secure integration into the NAS. Despite these challenges, the drone sector holds enormous promise; potential uses range from individuals flying solely for recreational purposes to large companies delivering commercial packages and delivering medical supplies. Public service uses, such as conducting search and rescue support missions following natural disasters, are proving promising as well."

On December 21, 2015, the FAA launched an online registration system for recreational/model small drones. This required all drones weighing more than 0.55 pounds (or 250 grams) and fewer than 55 pounds (or 25 kilograms) be registered. The registrations system captures the number of registered pilots but does not capture individual drone aircraft. Nonetheless, the registrations information does provide a basic understanding of the growth in drone activity from which the FAA has made a growth forecast for the next five years.

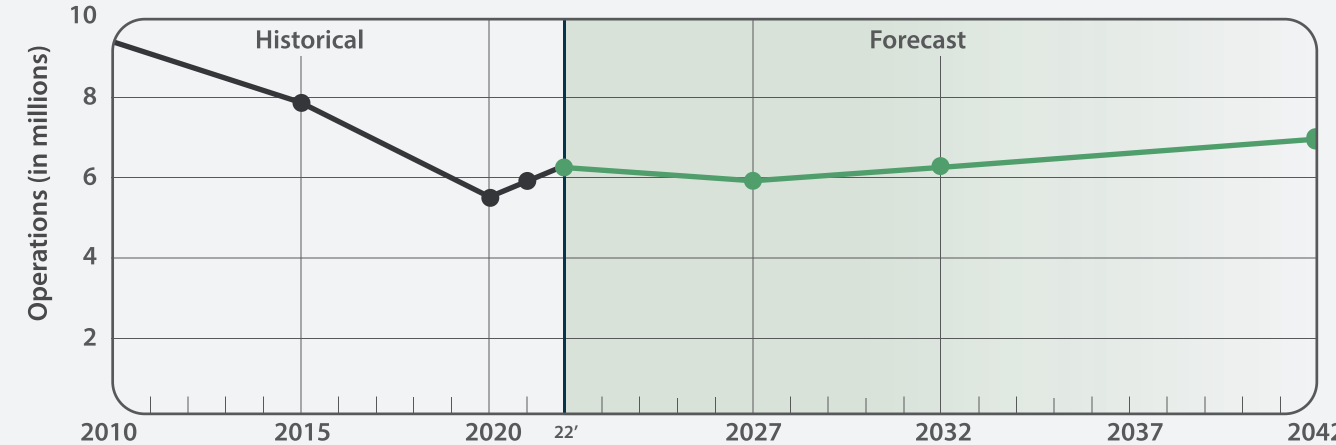
Trends in Recreational/Model Aircraft

Through an examination of the drone aircraft registrations and renewals, the FAA estimated that there were as many as 1.58 million small drones in the national fleet. FAA developed three forecasts which are presented in **Table 2D**. By 2026, FAA is forecasting as many as 1.83 million small drones.

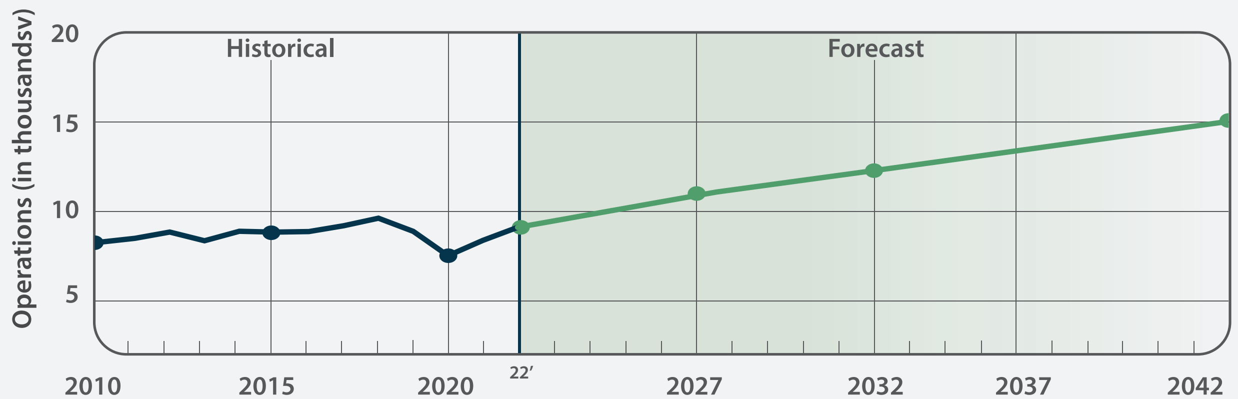
U.S. Active General Aviation Aircraft



U.S. Air Taxi Operations



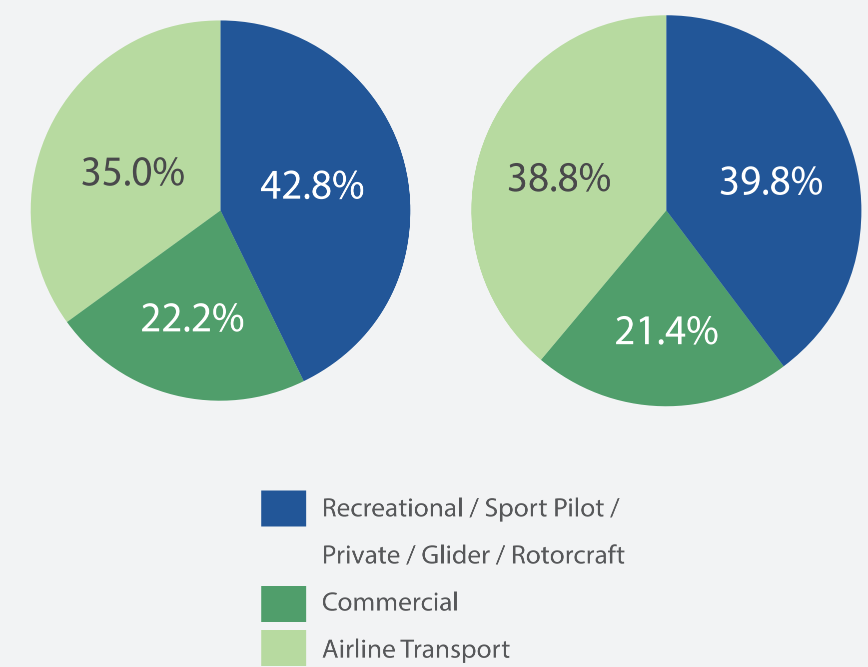
Active General Avaition & Air Taxi Hours Flown



Active Pilots By Certificate

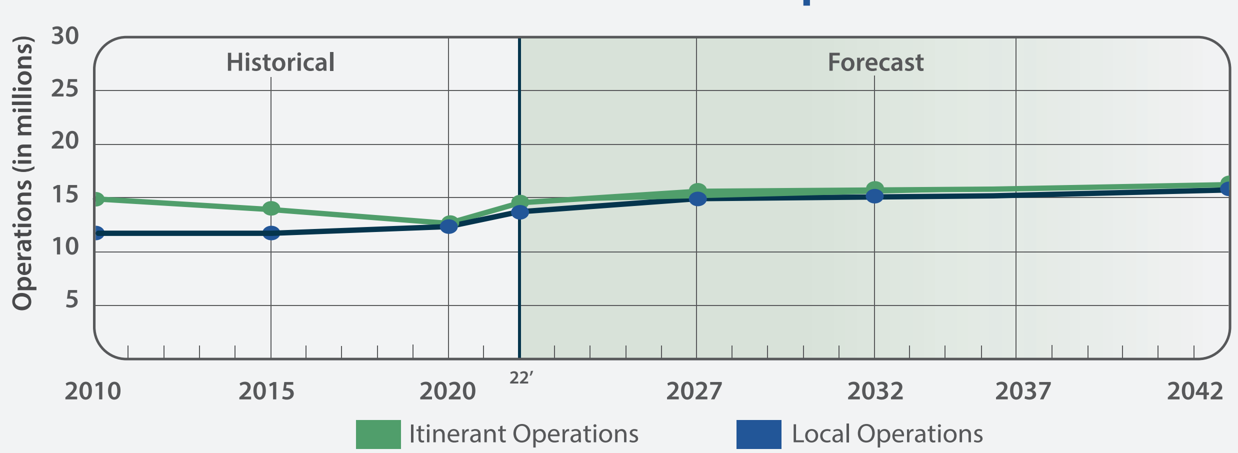
2022
Total Active Pilots: **474,450***

2042
Total Active Pilots: **500,720**



**Excludes Student Pilot Certificates*

U.S. General Aviation Operations



Source: FAA Aerospace Forecasts FY2022-2042

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TABLE 2D | Total Recreational/Model Fleet

Fiscal Year	Low*	Base**	High**
2021	607,200	1,582,200	1,582,200
Forecast			
2022	650,900	1,696,500	1,698,100
2023	684,800	1,757,600	1,764,500
2024	709,600	1,796,500	1,818,200
2025	726,200	1,803,900	1,827,200
2026	737,800	1,807,500	1,836,000
CAGR	3.97%	2.70%	3.02%

CAGR: Compound annual growth rate
*Effective/Active fleet counts combined with multiplicity of aircraft ownership.
**New registration counts combined with multiplicity of aircraft ownership
Source: FAA Aerospace Forecasts FY 2022-2042

Trends in Commercial/Non-Model UAS Aircraft

Online registration for commercial/non-model small drones went into effect on April 1, 2016. These are commercial drones weighing less than 55 pounds. Unlike recreational/model ownership, each aircraft must be registered individually. Registrations of commercial/non-model UAS aircraft have been increasing year-over-year according to the FAA. **Table 2E** shows the FAA forecast for this category of UAS. It is estimated that there were up to 622,000 commercial/non-model UAS in 2021 which is forecast to increase to 968,000 by 2026.

TABLE 2E | Total Commercial/Non-Model Fleet

Fiscal Year	Low*	Base**	High**
2021	328,000	622,000	622,000
Forecast			
2022	292,000	699,000	729,000
2023	301,000	757,000	809,000
2024	320,000	801,000	869,000
2025	339,000	834,000	918,000
2026	355,000	858,000	968,000
CAGR	1.59%	6.64%	9.25%

CAGR: Compound annual growth rate
*Effective/Active fleet counts combined with multiplicity of aircraft ownership.
**New registration counts combined with multiplicity of aircraft ownership
Source: FAA Aerospace Forecasts FY 2022-2042

Trends in Large UAS

Drones weighing 55 pounds or more cannot be operated as recreational remote piloted aircraft. They are registered with FAA using the existing aircraft registration system. At present most large drones are flown by government entities, but commercial operators have steadily increased in 2021 with most new large drone operators active in agricultural spraying operations. The FAA estimates there were 285 large drones operating in the NAD in 2021. By 2026, FAA is forecasting 568 commercial large drones will be operating.

UAS and Ventura County Airports

The FAA has initiated several UAS test programs including the UAS Test Site Program. Currently, there are seven designated UAS test sites in the U.S. The County of Ventura Department of Airports has partnered with the test site designated for the University of Alaska Fairbank's Alaska Center for Unmanned Aircraft Systems Integration (ACUASI), which is also known as the Pan-Pacific UAS Test Range Complex. This partnership is intended to capitalize on the growth in UAS and in doing so Ventura County could benefit from (i) increased rent revenues, (ii) the ability to be an early adaptor of technologies that improve airport operations, safety and noise reduction, and (iii) establishing a more diverse tenant population, diminishing the impact of economic downturns. The UAS partnership may also lead to new capital investment and jobs in the community.

Advanced Air Mobility (AAM)

The AAM segment has some cross over with the functions of drone. AAM is defined as "a safe and efficient system for air passenger and cargo transportation, inclusive of small package delivery and other urban drone services, which support a mix of onboard/ground-piloted and increasingly autonomous operations."

AAM technology presents considerable opportunities for economic growth over the coming decades. The FAA Forecasts indicate that package delivery is likely to experience economic growth over the next decade. Passenger service, on the other hand, promise larger markets for AAM services, but safety challenges, infrastructure, public acceptance, and evolving technology, may slow full integration in the short term. Nevertheless, flight testing continues with numerous commercial companies conducting test flights. An example is the advancements that Joby Aviation has made with its Electric Vertical Takeoff and Landing Aircraft (eVTOL) which is expected to receive FAA certification in 2023 or 2024. Currently, this aircraft can fly over 150 miles on one battery charge and can carry four passengers.

One of the major challenges of eVTOL entering the marketplace is infrastructure. A system of vertiports for AAM services appears to be the preferred method. Joby Aviation and Archer have partnered with parking garage operator REEF Technology with the goal of using parking garage rooftops as vertiports. Other options may include establishing vertiports at existing airports. For example, there could be an eVTOL air taxi service from CMA or OXR to LAX in the future. Future infrastructure planning for both airports should consider establishing vertiports to take advantage of the emerging AAM market.

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth; however, the judgment of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and assessment of the local situation, is important in the final determination of the preferred forecast. The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered include trend line/time-series projections, correlation/regression analysis, and market share analysis. The forecast analyst may decide to employ one or all these methods to arrive at a reasonable single forecast. The following is a description of those methodologies utilized to develop the forecasts of aviation demand.

Trend Line/Time Series Extension: Trend line/time-series projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical data, and then extending them into the future, a basic trend line projection is produced. An assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections.

Ratio Projection: The ratio projection methodology examines the historical relationship between two variables as a ratio. A common example in aviation demand forecasting is to consider the number of based aircraft as a ratio of the service area population where there may be 1.8 aircraft per 1,000 people. This ratio can then be carried to future years in comparison to projections of population.

Market Share Analysis: Market share analysis involves historical review of airport activity as a percentage, or share, of a larger regional, state, or national aviation market. A historical market share trend is determined, providing an expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections but can provide a useful check on the validity of other forecasting techniques.

Socioeconomic Methodologies: Though trend line extrapolation and market share analysis may provide mathematical and formulaic justification for demand projections, many factors beyond historical levels of activity may identify trends in aviation and impact aviation demand locally. Socioeconomic or correlation analysis examines the direct relationship between two or more sets of historical data from which future aviation activity projections are developed.

Professional Judgement: Judgmental methods are educated estimations of future events based on the industry knowledge, experience, and intuition of the forecaster. This method permits the inclusion of a broad range of relevant information into the forecasting process and is usually used to refine the results of the other methods.

Forecasts will age the farther they are from the base year, thus the less reliable a forecast may become, due to changing local and national conditions. Nonetheless, the FAA indicates that a 20-year forecast be developed for long-range airport planning. Facility and financial planning usually require at least a 10-year view because it often takes more than five years to complete a major facility development program. However, it is important to use forecasts that do not overestimate revenue-generating capabilities or understate demand for facilities required to meet public (user) needs.

A wide range of factors are known to influence the aviation industry and can have significant impacts on the extent and nature of aviation activity in both the local and national markets. Historically, the nature and trend of the national economy have had direct impacts on the level of aviation activity. Recessionary periods have been closely followed by declines in aviation activity. Nonetheless, over time trends emerge and provide the basis for airport planning.

Future facility requirements, such as hangar and apron needs, are derived from projections of various aviation demand indicators. Using a broad spectrum of local, regional, and national socioeconomic and aviation information, and analyzing the most current aviation trends, forecasts are presented for the following aviation demand indicators:

- Based Aircraft
- Based Aircraft Fleet Mix
- General Aviation Operations
- Air Taxi and Military Operations
- Operational Peaks

This forecasting effort was completed in January 2023, with a base year of 2022. The negative impacts of the COVID-19 pandemic appear to have largely passed and were not as impactful to certain general aviation airports, especially reliever type airports.

EXISTING FORECASTS

Consideration is given to any forecasts of aviation demand for the airport that have been completed in the recent past. These are typically sourced from the FAA *Terminal Area Forecast* (TAF), previous airport planning studies, and state or regional aviation plans.

FAA *TERMINAL AREA FORECAST* (TAF February 2023)

On an annual basis, the FAA publishes the *Terminal Area Forecast* (TAF) for each airport included in the *National Plan of Integrated Airport Systems* (NPIAS). The TAF is a generalized forecast of airport activity used by FAA primarily for internal planning purposes. It is available to airports and consultants to use as a point of comparison while developing local forecasts. The 2022 TAF was published in February 2023 and is based on the federal fiscal year (October-September).

Table 2F presents the 2022 TAF for OXR. The TAF estimates that there are 130 based aircraft and 79,774 annual operations in 2022. Based aircraft were forecast to increase by 0.75 percent annually with 151 based aircraft by 2042. Total operations were forecast to increase from 79,774 in 2022 to 93,530 in 2042 for an annual growth rate of 0.75 percent.

TABLE 2F | 2022 FAA Terminal Area Forecast

	2022	2027	2032	2042	CAGR 2022-2042
ANNUAL OPERATIONS					
Itinerant					
Air Carrier	2	2	2	2	0.00%
Air Taxi	4,424	5,038	5,387	6,167	1.67%
General Aviation	25,035	28,395	28,400	28,410	0.63%
Military	221	221	221	221	0.00%
Total Itinerant	**29,682**	**33,656**	**34,010**	**34,800**	**0.80%**
Local					
General Aviation	50,050	52,082	54,197	58,688	0.80%
Military	42	42	42	42	0.00%
Total Local	**50,092**	**52,124**	**54,239**	**58,730**	**0.80%**
Total Operations	***79,774***	***85,780***	***88,249***	***93,530***	**0.80%**
BASED AIRCRAFT	**130**	**136**	**141**	**151**	**0.75%**

CAGR - Compound annual growth rate
Source: FAA Terminal Area Forecast (TAF)*, February 2023*

AIRPORT LAYOUT PLAN UPDATE (2022)

An airport layout plan and narrative report (ALP update) was completed for OXR in early 2022. The base year for the forecast in the study was 2017. **Table 2G** summarizes the FAA approved forecasts from that study. These forecasts are five years old and will serve as a comparison point for the forecasts developed in this study.

TABLE 2G | 2022 ALP Update Forecast Summary

Year	Based Aircraft	LOCAL OPERATIONS			ITINERANT OPERATIONS				Grand Total
		General Aviation	Military	Total Local	General Aviation	Air Taxi	Military	Total Itinerant	
2017	141	37,300	200	37,500	25,900	4,700	200	30,800	**68,300**
2023	150	39,800	300	40,100	27,500	5,300	200	33,000	**73,100**
2028	159	42,100	300	42,400	29,200	5,700	200	35,100	**77,500**
2038	176	46,700	300	47,000	32,300	6,500	200	39,000	**86,000**
CAGR	1.06%	1.08%	1.95%	1.08%	1.06%	1.56%	0.00%	1.13%	**1.10%**

CAGR = Compound Annual Growth Rate

GENERAL AVIATION FORECAST

General aviation encompasses all portions of civil aviation except commercial service and military operations. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity at the airport, certain elements of this activity must be forecast. These indicators of general aviation demand include based aircraft, aircraft fleet mix, operations, and peak periods.

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft for OXR, other demand indicators can be projected. The process of developing forecasts of based aircraft begins with an analysis of aircraft ownership in the primary general aviation service area through a review of historical aircraft registrations. An initial forecast of service area registered aircraft is developed and will be used as one data point to arrive at a based aircraft forecast for OXR.

BASED AIRCRAFT FORECAST

Forecasts of based aircraft may directly influence needed facilities and the applicable design standards. The needed facilities may include hangars, aprons, taxilanes, etc. The applicable design standards may include separation distances and object clearing surfaces. The size and type of based aircraft are also an important consideration. The addition of numerous small aircraft may have no effect on design standards, while the addition of a few larger business jets can have a substantial impact on applicable design standards.

Because of the numerous variables known to influence aviation demand, several separate forecasts of based aircraft are developed. Each of the forecasts is then examined for reasonableness, and any outliers are discarded or given less weight. The remaining forecasts collectively will create a planning envelope. A single planning forecast is then selected for use in developing facility needs for the airport. The selected forecast of based aircraft can be one of the several forecasts developed or, based on the experience and judgment of the forecaster, it can be a blend of the several forecasts.

Based Aircraft Inventory

The FAA has established a based aircraft inventory database in which it is possible to cross-reference based aircraft claimed by one airport with other airports. This database evolves daily as aircraft are added or removed, and it does not provide an annual history of based aircraft. It is the responsibility of the sponsor (owner) of each airport to input based aircraft information into the FAA database (www.basedaircraft.com). The FAA based aircraft database currently shows 120 verified aircraft. The FAA directs that the base year for a forecasting effort use only the verified based aircraft number as the starting point; therefore, the base year (2022) based aircraft number for OXR is 120.

Registered Aircraft

The process of developing forecasts of based aircraft begins with an analysis of aircraft ownership in the primary general aviation service area (Ventura County) through a review of historical aircraft registrations. **Table 2H** presents historical data regarding aircraft registered in Ventura County since 2000. These figures are derived from the FAA aircraft registration database that categorized registered aircraft by county based on the zip code of the registered aircraft. Although this information generally provides a correlation to based aircraft, it is not uncommon for some aircraft to be registered in the county but based at an airport outside the county or vice versa.

TABLE 2H | Historical Registered Aircraft - Ventura County

Year	SEP	MEP	Turboprop	Jet	Helicopter	Other[1]	Total
2000	895	77	12	15	60	30	1,089
2001	895	68	48	15	63	31	1,120
2002	892	68	46	15	63	30	1,114
2003	870	61	74	21	67	36	1,129
2004	883	56	79	24	64	35	1,141
2005	930	60	80	28	63	37	1,198
2006	980	81	13	24	66	35	1,199
2007	1,005	89	19	24	64	43	1,244
2008	984	87	36	32	65	44	1,248
2009	991	85	37	28	70	44	1,255
2010	975	76	38	24	75	46	1,234
2011	957	72	31	21	71	45	1,197
2012	900	66	30	21	58	39	1,114
2013	819	63	30	22	50	50	1,034
2014	837	55	22	23	49	34	1,020
2015	815	52	18	23	48	39	995
2016	812	50	24	24	51	42	1,003
2017	788	52	18	23	49	41	971
2018	739	49	24	18	47	52	929
2019	713	42	19	15	47	41	877
2020	706	43	17	14	54	39	873
2021	686	43	14	17	61	27	848
2022	673	41	12	22	63	18	829

[1]Includes balloons, gliders, and others.

Source: FAA Aircraft Registration Database

In 2009, there were 1,255 aircraft registered in Ventura County. Beginning in 2010, the FAA initiated a three-year program nationally in which aircraft owners were required to re-register their aircraft. This resulted in about a 20 percent decline in the number of registered aircraft in the county. Since 2016, the number of registered aircraft has steadily declined, year-over-year, and there are 829 registered aircraft in the county as of 2022.

Now that the number of registered aircraft within the county is known, several projections of future registered aircraft are considered over the 20-year planning horizon. **Exhibit 2B** graphically summarizes the registered aircraft forecasts.

The first registered aircraft forecast considers the county maintaining its market share of active aircraft in the U.S. as projected by FAA. In 2022, the county had 0.405 percent of the U.S. active aircraft. By keeping this market share constant, a forecast emerges that shows very modest growth to 846 registered aircraft in 2042.

The next registered aircraft forecast applies the statewide TAF growth rate of 0.83 percent for based aircraft over the next 20 years. By applying this growth rate to the current number of registered aircraft in the county, a forecast emerges. This forecast results in 978 registered aircraft by 2042.

The last forecast considers the relationship between population growth and registered aircraft. In 2022, Ventura County had 0.98 registered aircraft per 1,000 residents. By holding this ratio constant through the plan years, a forecast emerges. The constant ratio forecast results in 910 registered aircraft by 2042 and a CAGR of 0.47 percent.

Registered Aircraft Forecast Summary

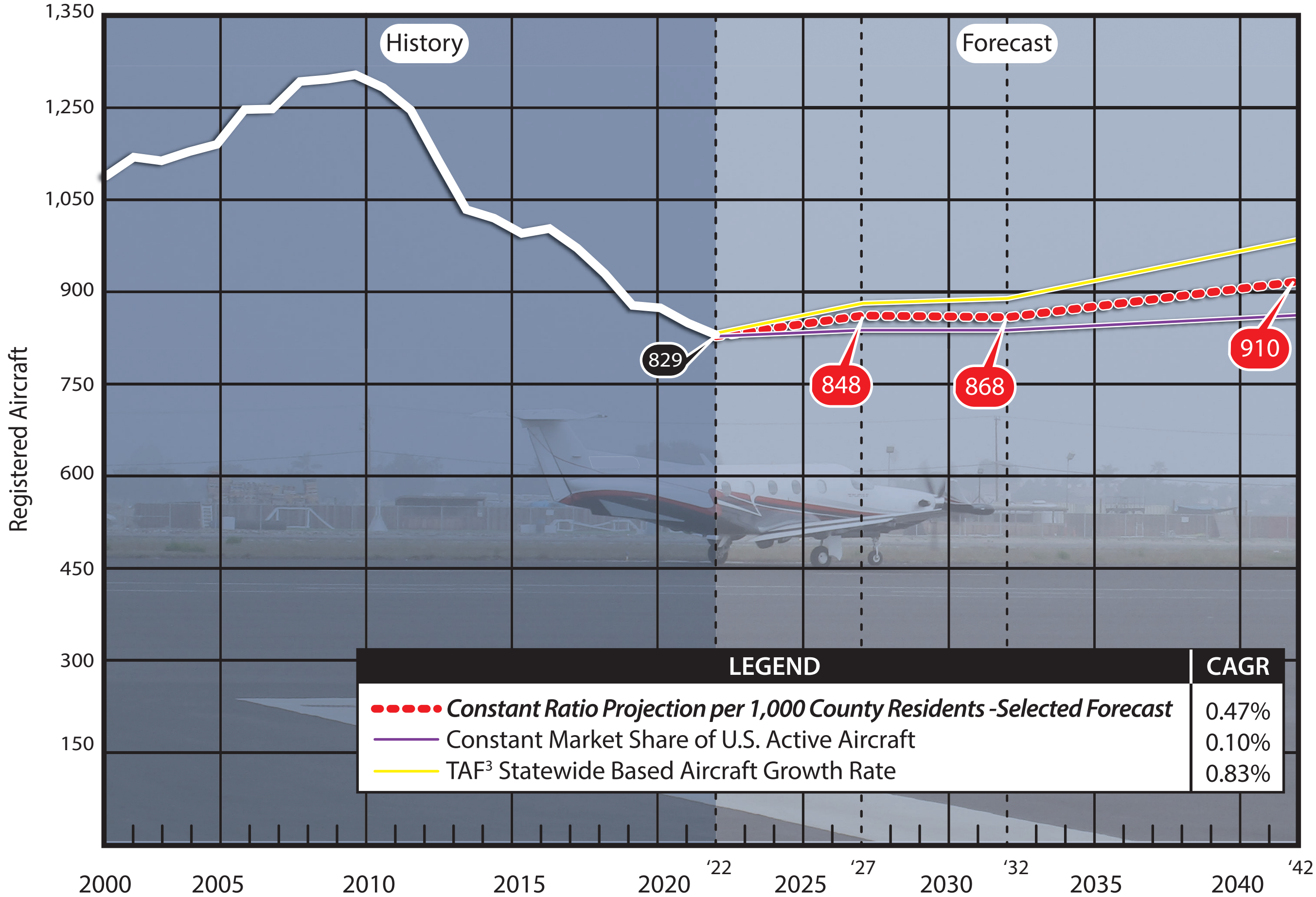
Exhibit 2B summarizes the three registered aircraft forecasts produced for the airport service area (Ventura County). The table provides the ability to see how the projection for each compares to the others, which is an indication of the reasonableness of each forecast.

It is at this stage that the forecast analyst must select one of the projections or choose to develop a blended forecast. All three forecasts of registered aircraft for Ventura County appear reasonable. There are no wild swings, and the three forecasts present a tight planning envelope. Since the forecast related to population growth is the one that utilizes data specific to the location, it is the selected forecast of registered aircraft.

The registered aircraft projection is one variable to be used in the development of a based aircraft forecast. The following section will present several potential based aircraft forecasts, as well as the selected based aircraft forecast, to be utilized in this study.

Constant Ratio of Based Aircraft to Population Forecast

Trends comparing the number of based aircraft with the airport's service area population were analyzed. A constant ratio of based aircraft per 1,000 people results in based aircraft growing at the same rate as the service area population. This yields 132 based aircraft by 2042, which is an annual growth rate of 0.47 percent.



Year	Ventura County Registrations	US Active Aircraft[1]	Market Share of US Active Aircraft	Service Area Population[2]	Aircraft Per 1,000 Residents
2022	829	204,590	0.405%	843,696	0.98
Constant Market Share of U.S. Active Aircraft (CAGR 0.10%)					
2027	830	204,925	0.405%	863,528	0.96
2032	831	205,195	0.405%	883,827	0.94
2042	846	208,905	0.405%	925,867	0.91
TAF[3] Statewide Based Aircraft Growth Rate (CAGR 0.83%)					
2027	864	204,925	0.422%	863,528	1.00
2032	900	205,195	0.439%	883,827	1.02
2042	978	208,905	0.468%	925,867	1.06
Constant Ratio Projection per 1,000 County Residents (CAGR 0.47%) - SELECTED					
2027	848	204,925	0.414%	863,528	0.98
2032	868	205,195	0.423%	883,827	0.98
2042	910	208,905	0.435%	925,867	0.98

[1]FAA Aerospace Forecasts - Fiscal Years 2022-2042
[2]Woods & Poole Complete Economic and Demographic Data Source (CEDDS) 2022
[3]TAF published in Feb. 2023

Increasing Market Share of Based Aircraft to Registered Aircraft Forecast

The airport captured 14.5 percent of aircraft registered in Ventura County in 2022. This forecast considers the possibility of the airport capturing an increasing percentage of county registered aircraft. This projection yields 200 based aircraft by 2042, equating to a 2.59 percent annual growth rate.

TAF Statewide Based Aircraft Growth Rate

The Terminal Area Forecast that the FAA develops also can be examined from a statewide perspective. The 2022 statewide TAF (published Feb. 2023) shows an overall statewide growth rate of 0.83 percent. By applying this annual growth rate to the base year (120) a forecast results. This forecast has a long-term projection of 142 based aircraft.

Increasing Share of Population

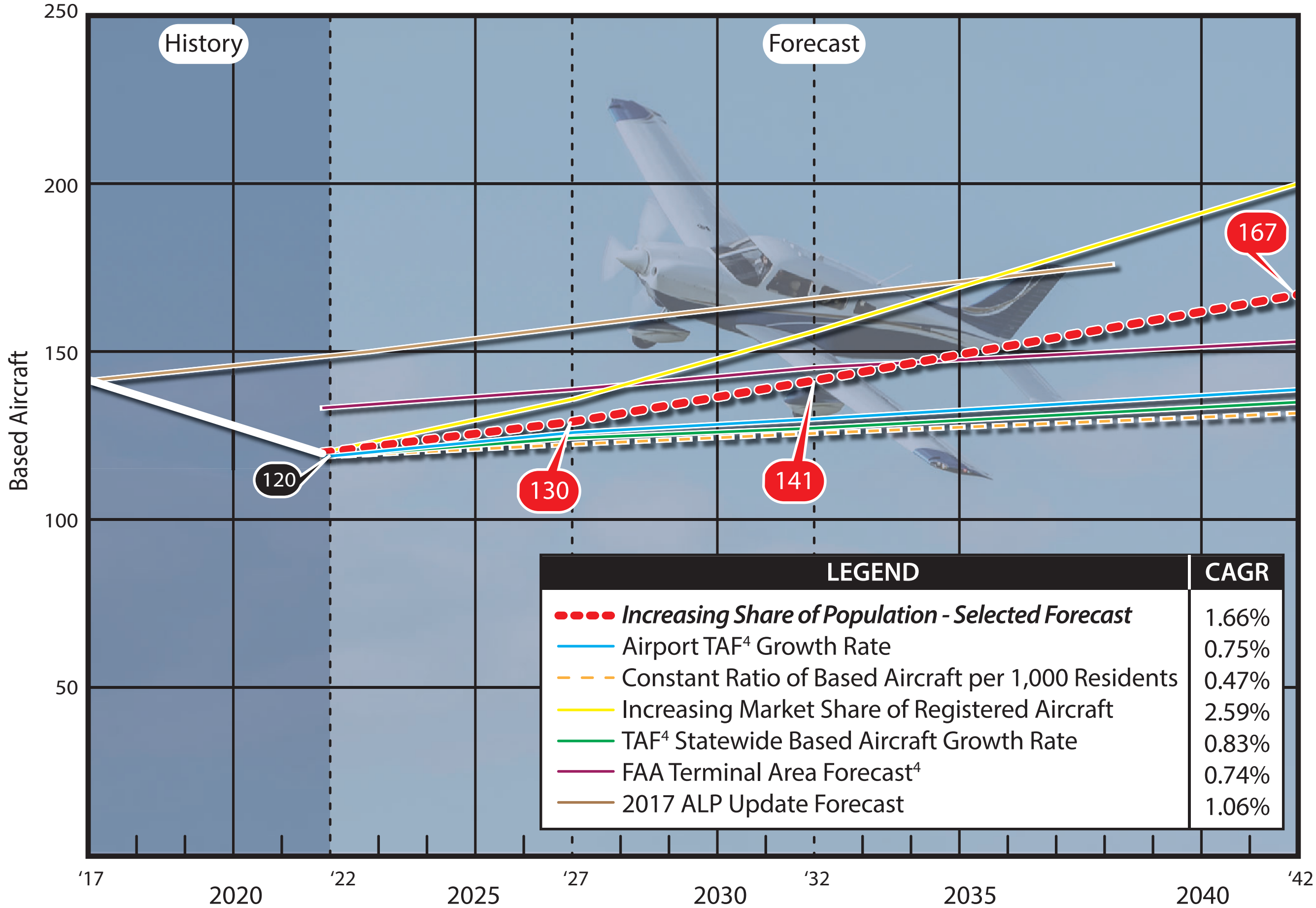
In 2022, the airport's 120 based aircraft accounted for 0.14 based aircraft per 1,000 people in the county. By increasing this ratio for each of the plan years, a long-term forecast of 167 based aircraft and an annual growth rate of 1.66 percent results.

Airport TAF Growth Rate

The TAF for the airport has an annual growth rate of 0.75 percent; however, as noted, the TAF has a base year figure of 132 based aircraft. By applying the 0.75 percent growth rate to the actual base year figure of 120 aircraft, a forecast emerges. This forecast results in 139 based aircraft by 2042.

Based Aircraft Forecast Summary

The based aircraft forecasts are summarized on **Exhibit 2C**. The next step is for the forecast analyst to choose a selected forecast to be used to determine future facility needs. While each of the five forecasts of based aircraft form a reasonable planning envelope, a specific forecast or a blended forecast must be chosen for FAA planning studies. Additional local factors should also be considered. Currently, airport management is in discussions with hangar developers for a five-acre and a seven-acre site on the airport. Once completed, these hangars can house additional aircraft. In addition, Santa Monica Airport is planned for closure in 2028. Currently, there are 175 aircraft based there. Over the next five years, a portion of those aircraft owners may choose to base their aircraft at OXR. As a result of these additional factors, it is prudent to choose a forecast on the higher end of the planning envelope so that airport management can proactively address demand should it materialize. Therefore, the selected forecast is the one based on an increasing market ratio of the population to based aircraft. This forecast results in 167 based aircraft by the long-term planning period. The based aircraft forecast to be utilized for planning purposes is:



Year	Based Aircraft[1]	Registered Aircraft[2]	Market Share of Registered Aircraft	Service Area Population[3]	Based Aircraft Per 1,000 Residents
2017	141	971	14.5%	849,338	0.17
2022	120	829	14.5%	843,696	0.14
Constant Ratio of Based Aircraft per 1,000 Residents (CAGR = 0.47%)					
2027	123	848	14.5%	863,528	0.14
2032	126	868	14.5%	883,827	0.14
2042	132	910	14.5%	925,867	0.14
Increasing Market Share of Registered Aircraft (CAGR = 2.59%)					
2027	136	848	16.0%	863,528	0.16
2032	156	868	18.0%	883,827	0.18
2042	200	910	22.0%	925,867	0.22
TAF[4] Statewide Based Aircraft Growth Rate (CAGR = 0.83%)					
2027	125	848	14.73%	863,528	0.14
2032	130	868	14.97%	883,827	0.15
2042	142	910	15.61%	925,867	0.15
Airport TAF[4] Growth Rate (CAGR = 0.75%)					
2027	125	848	14.73%	863,528	0.14
2032	129	868	14.85%	883,827	0.15
2042	139	910	15.28%	925,867	0.15
Increasing Share of Population (CAGR = 1.66%) - SELECTED					
2027	130	848	15.27%	863,528	0.15
2032	141	868	16.28%	883,827	0.16
2042	167	910	18.32%	925,867	0.18

[1]Airport and FAA records [2]FAA aircraft registration database for Ventura County and Coffman Associates forecast.
[3]Woods & Poole CEDDS Data for Ventura County [4]TAF published in Feb. 2023

BASED AIRCRAFT FORECASTS

- 2027 – 130 Based Aircraft
- 2032 – 141 Based Aircraft
- 2042 – 167 Based Aircraft

BASED AIRCRAFT FLEET MIX

The fleet mix of based aircraft is oftentimes more important to airport planning and design than the total number of aircraft. For example, the presence of one, or a few, business jets can impact the design standards more than many smaller, single engine piston-powered aircraft.

Knowing the aircraft fleet mix expected to utilize OXR is necessary to properly plan for facilities that will best serve the level of activity and the type of activities occurring at the airport. The existing fleet mix of aircraft based at the airport is comprised of 87 single engine piston aircraft, 15 multi-engine piston aircraft, eight turboprops, two jets, and eight helicopters for a total of 120 based aircraft.

The based aircraft fleet mix, as presented in **Table 2J**, was compared to the existing and forecast U.S. general aviation fleet mix trends as presented in *FAA Aerospace Forecast – Fiscal Years 2022-2042*, as well as to trends occurring at the airport. The national trend in general aviation continues to be toward a greater percentage of larger, more sophisticated aircraft. While single engine piston-powered aircraft will continue to account for the largest share of based aircraft at the airport, these aircraft are forecast to drop as a percentage of the fleet mix. Multi-engine piston-powered aircraft are expected to decrease in number and decrease as a percentage of the fleet mix during the planning period of this study. Consistent with national aviation trends, growth is anticipated to occur within turboprop, jet, and helicopter categories.

TABLE 2J | Based Aircraft Fleet Mix

	EXISTING		FORECAST					
Aircraft Type	**2022**	**Percent**	**2027**	**Percent**	**2032**	**Percent**	**2042**	**Percent**
Single Engine Piston	87	72.50%	88	67.69%	89	63.12%	96	57.49%
Multi-Engine Piston	15	12.50%	15	11.54%	14	9.93%	14	8.38%
Turboprop	8	6.67%	10	7.69%	13	9.22%	18	10.78%
Jet	2	1.67%	7	5.38%	13	9.22%	22	13.17%
Helicopter	8	6.67%	10	7.69%	12	8.51%	17	10.18%
Totals	**120**	**100.00%**	**130**	**100.00%**	**141**	**100.00%**	**167**	**100.00%**

Source: Airport Records: Coffman Associates analysis

GENERAL AVIATION ANNUAL OPERATIONS

General aviation operations are classified as either local or itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Generally, local operations are characterized by training operations. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Typically, itinerant operations increase with business and commercial use, since business aircraft are not typically used for large scale training activities. Local operations include a portion of general aviation and military operations, while itinerant operations include general aviation, military, and air taxi (for-hire operators, such as air cargo, life flight, charters, and fractionals).

Each operational segment is forecast individually, then the segments are combined to arrive at a total operations forecast. **Table 2K** shows historical total operations since 2000 as counted by the control tower. As can be seen, 2022 represented the highest total since 2005.

TABLE 2K | Historical Operations

	ITINERANT			LOCAL		
Year	Air Taxi/ Air Carrier	Itinerant GA	Military	Local GA	Military	Total Ops
2000	15,422	43,158	1,461	28,138	64	88,243
2001	14,046	44,506	958	26,885	37	86,432
2002	13,406	44,822	1,523	28,981	18	88,750
2003	11,529	41,369	822	29,730	0	83,450
2004	20,086	39,495	1,344	35,145	14	96,084
2005	10,456	49,979	1,240	40,183	4	101,862
2006	7,355	44,916	1,073	33,044	4	86,392
2007	6,586	32,489	404	36,931	16	76,426
2008	6,027	33,577	113	44,210	63	84,010
2009	5,222	26,201	115	29,839	25	61,402
2010	4,297	24,511	88	26,331	90	55,317
2011	3,634	24,957	198	27,629	367	56,785
2012	4,079	24,233	169	25,940	190	54,611
2013	5,506	23,846	218	29,457	468	59,495
2014	6,047	27,233	218	37,388	342	71,228
2015	5,398	28,371	178	40,506	292	74,745
2016	4,953	28,263	184	40,361	390	74,151
2017	4,629	25,366	187	36,594	156	66,932
2018	4,898	28,113	153	40,444	190	73,798
2019	4,829	26,927	156	39,142	42	71,096
2020	4,786	26,674	300	43,878	120	75,758
2021	4,596	22,748	229	38,126	48	65,747
2022	4,659	27,385	192	55,579	56	87,871

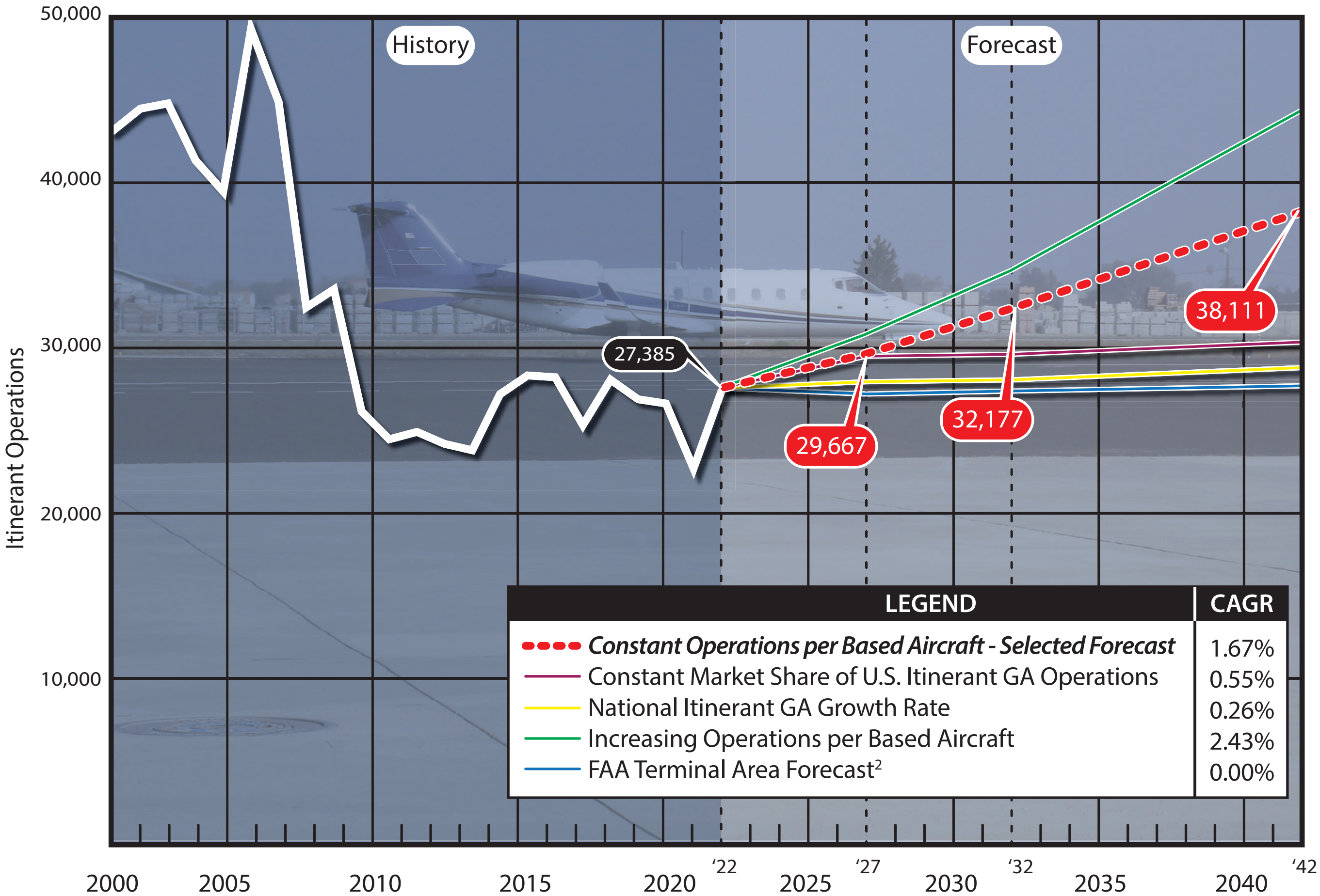
Source: FAA OPSNET database of OXR tower counts.

Itinerant General Aviation Operations Forecast

Four itinerant general aviation operations forecasts have been developed and are shown on **Exhibit 2D**.

The first forecast of itinerant general aviation operations considers the relationship between the FAA's national itinerant general aviation operations forecast and the historical itinerant general aviation operations at the airport. Itinerant general aviation operations were 0.188 percent of the national total. By maintaining this ratio as a constant through the plan years a forecast emerges. This forecast results in an annual growth rate of 0.55 percent and a long-term total of 30,563 itinerant general aviation operations.

The second itinerant general aviation operations forecast applies the FAA's forecast national growth rate for itinerant general aviation operations (0.26 percent) to airport itinerant general aviation operations and extends that growth rate into the future years. This forecast results in very modest growth with a long-term total of 28,845 itinerant general aviation operations.



Year	OXR Itinerant GA Operations	U.S. Itinerant GA Operations[1]	Market Share	OXR Based Aircraft	Itinerant GA Operations per Based Aircraft
2022	27,385	14,569,014	0.188%	120	228
Constant Market Share of U.S. Itinerant GA Operations (CAGR = 0.55%)					
2027	29,391	15,636,300	0.188%	130	226
2032	29,772	15,838,715	0.188%	141	211
2042	30,563	16,259,605	0.188%	167	183
National Itinerant GA Growth Rate (CAGR = 0.26%)					
2027	27,743	15,636,300	0.347%	130	213
2032	28,105	15,838,715	0.368%	141	199
2042	28,845	16,259,605	0.412%	167	173
Increasing Operations per Based Aircraft (CAGR 2.43%)					
2027	30,600	15,636,300	0.196%	130	235
2032	34,500	15,838,715	0.218%	141	245
2042	44,300	16,259,605	0.272%	167	265
Constant Operations per Based Aircraft (CAGR 1.67%) - SELECTED					
2027	29,667	15,636,300	0.190%	130	228
2032	32,177	15,838,715	0.203%	141	228
2042	38,111	16,259,605	0.234%	167	228

[1]FAA Aerospace Forecasts - Fiscal Years 2022-2042

[2]TAF published in Feb. 2023

The third forecast considers the relationship between general aviation itinerant operations and based aircraft. In 2022, there were 228 itinerant general aviation operation per based aircraft. This forecast considers an increasing ratio of itinerant general aviation operations to based aircraft because of the national trend toward higher utilization rates of multi-engine, turboprops, jets, and helicopters. This forecast results in 265 itinerant general aviation operations per based aircraft and an annual growth rate of 2.43 percent. The long-term total for itinerant general aviation operations is 44,300 by 2042.

The last itinerant general aviation operations forecast also utilizes the based aircraft forecast, however, in this scenario, the ratio is maintained at a constant 228 per based aircraft. This forecast results in 38,111 itinerant general aviation operations by the long-term planning period and an annual growth rate of 1.67 percent. This forecast is the selected forecast for itinerant general aviation operations at the airport for the following primary reasons:

1. The selected forecast falls within the planning envelope defined by the four forecasts.
2. Since itinerant general aviation operations been within a relatively tight range for the last several years, a moderately higher growth rate is more reasonable.
3. With the fleet mix evolving to include a high portion of turboprops and business jets, more itinerant operations can be anticipated.

Local General Aviation Operations Forecast

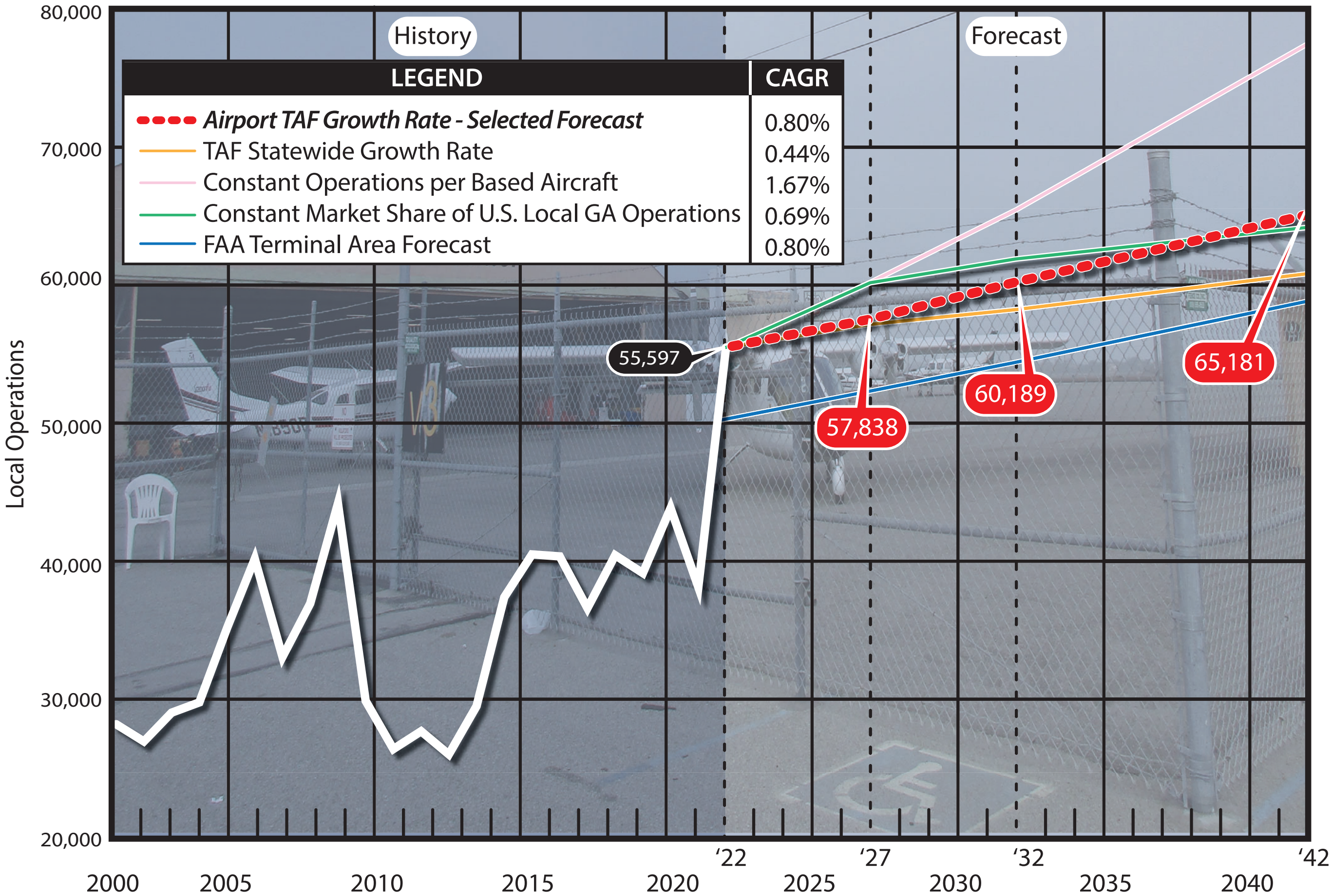
Local general aviation operations are generally touch-and-go training operations. Most local operations are conducted by operators of smaller piston aircraft. Aircraft maintenance providers will also perform local operations as well, so some local operations will be in larger turboprops and business jets. In 2022, there were 55,579 local operations at the airport. This was the highest level in the last 20+ years. Five local general aviation operations forecasts have been developed which are shown on **Exhibit 2E.**

The first considers the statewide TAF annual growth rate which is 0.44 percent. By applying this growth rate to the base year and extending it into the future plan years a forecast results. This forecast shows 60,680 local operations by 2042.

The second local general aviation operations forecast assumes that the current level of local operations per based aircraft remains constant in future years. In 2022, there were 463 local general aviation operations per based aircraft. This forecast results in an annual growth rate of 1.67 percent and 77,347 operations by 2042.

The third general aviation operations forecast considers the airport maintaining its market share of national local general aviation operations. In 2022, the airport accounted for 0.405 percent of national local general aviation operations. By applying this percent to the base year total for local general aviation operations, a long-term forecast of 63,820 local general aviation operations for OXR in 2042 results.

The fourth local general aviation operations forecast applies the 0.80 percent growth rate identified in the FAA TAF for the airport. By applying this growth rate, the long-term forecast is for 65,181 local general aviation operations. This forecast is the selected forecast for use in this study. This forecast was selected because it represents modest and reasonable growth and it falls within the planning envelope created by the five forecasts.



Year	OXR Local GA Operations	U.S. Local GA Operations[1]	Market Share	OXR Based Aircraft	Local GA Operations per Based Aircraft
2017	36,750	11,732,324	0.313%	141	261
2022	55,579	13,731,399	0.405%	120	463
TAF[2] Statewide Growth Rate (CAGR = 0.44%)					
2027	56,813	14,950,786	0.380%	130	437
2032	58,073	15,214,104	0.382%	141	412
2042	60,680	15,767,539	0.385%	167	363
Constant Operations per Based Aircraft (CAGR = 1.67%)					
2027	60,211	14,950,786	0.403%	130	463
2032	65,305	15,214,104	0.429%	141	463
2042	77,347	15,767,539	0.491%	167	463
Constant Market Share of U.S. Local GA Operations (CAGR 0.69%)					
2027	60,515	14,950,786	0.405%	130	465
2032	61,580	15,214,104	0.405%	141	437
2042	63,820	15,767,539	0.405%	167	382
Airport TAF[2] Growth Rate (CAGR = 0.80%) - SELECTED					
2027	57,838	14,950,786	0.387%	130	445
2032	60,189	15,214,104	0.396%	141	427
2042	65,181	15,767,539	0.413%	167	390

[1] FAA Aerospace Forecasts - Fiscal Years 2022-2042

[2] TAF published in Feb. 2023

Air Taxi Operations Forecast

Air taxi operations are those with the authority to provide "on-demand" or "for-hire" transportation of persons or property via aircraft with fewer than 60 passenger seats. Air taxi are a broad range of operations, including some smaller commercial service aircraft, some charter aircraft, air cargo aircraft, many fractional ownership aircraft, and air ambulance services.

Two forecasts of overall air taxi growth are presented on **Exhibit 2F**. The first considers the airport maintaining a constant market share of total U.S. air taxi operations as projected by FAA. This results in a very modest growth for the airport. In fact, this 20-year air taxi forecast results in fewer air taxi operations in 2042 than there were in 2021; therefore, this forecast seems low, and a second forecast is considered.

The second air taxi operations forecast considers the airport to capture an increasing percent of national air taxi operations. Currently, OXR accounts for 0.074 percent of national air taxi operations. By the long-term planning horizon, this forecast considers OXR to account for 0.095 percent of national air taxi operations. This results in a long-term forecast of 6,618 air taxi operations. This forecast would also capture the potential rise in AAM/eVTOL operations. This forecast is the selected forecast for air taxi operations at OXR.

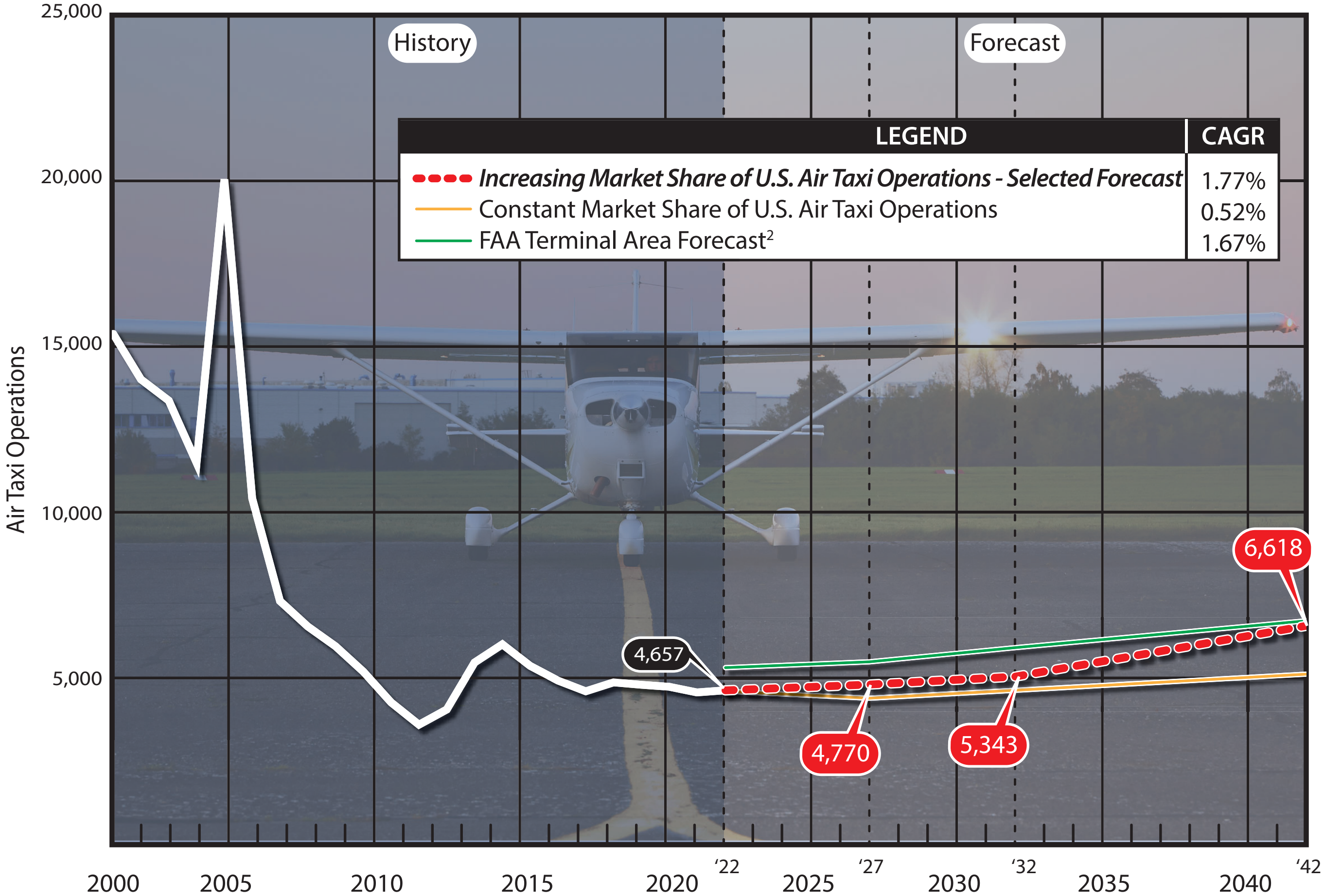
The primary reason this forecast is selected for this study is that private charter aircraft is a growth segment in aviation. Oxnard Airport can reasonably be expected to attract more activity in this segment due to location and the instrument approach capability of the airport. In addition, the national air taxi forecast includes commercial aircraft with fewer than 60 seats, a segment that is decreasing; therefore, the growth area within air taxi is charter and fractional operations.

Military Operations Forecast

Military aircraft can and do utilize civilian airports across the country. There is an inherent challenge to forecasting military operations, as recognized by FAA, because the military's mission can and does change quickly. As a result, FAA will include a placeholder figure in their TAF for airports. At OXR, 221 itinerant military operations are the placeholder for each year in the future. Local military operations have a placeholder of 42 operations for each year in the future. For this forecasting effort, the itinerant and local military operations will be maintained at the TAF constant rates.

Total Operations Forecast Summary

Table 2L presents the total operations forecast. The airport experiences a mix of operation types, including general aviation, air taxi, and military. Multiple forecasts for each of these operational categories were developed which created a planning envelope that represents the feasible range. Based on local conditions and the judgement of the forecast analyst, a single forecast was selected for each category. Combined, total operations are forecast to increase from 87,871 in 2022 to 110,173 in 2042 for an annual growth rate of 0.87 percent.



Year	OXR Air Taxi Operations	U.S. Air Taxi Operations[1]	OXR Market Share
2017	4,629	7,179,651	0.064%
2022	4,659	6,284,713	0.074%
Constant Market Share of U.S. Air Taxi Operations (CAGR 0.52%)			
2027	4,420	5,962,583	0.074%
2032	4,660	6,285,528	0.074%
2042	5,165	6,966,613	0.074%
Increasing Market Share of U.S. Air Taxi Operations (CAGR 1.77%) - SELECTED			
2027	4,770	5,962,583	0.080%
2032	5,343	6,285,528	0.085%
2042	6,618	6,966,613	0.095%

[1]FAA Aerospace Forecasts - Fiscal Years 2022-2042

[2]TAF published in Feb. 2023

TABLE 2L | Total Operations Forecast

Year	LOCAL OPERATIONS			ITINERANT OPERATIONS				Grand Total
	General Aviation	Military	Total Local	General Aviation	Air Taxi	Military	Total Itinerant	
2022	55,579	56	55,635	27,385	4,659	192	32,236	**87,871**
2027	57,838	42	57,880	29,667	4,770	221	34,658	**92,538**
2032	60,189	42	60,231	32,177	5,343	221	37,741	**97,972**
2042	65,181	42	65,223	38,111	6,618	221	44,950	**110,173**
CAGR	0.80%	NA	0.80%	1.67%	1.77%	0.71%	1.68%	**1.14%**

CAGR = Compound Annual Growth Rate

PEAKING CHARACTERISTICS

Many aspects of facility planning relate to levels of peaking activity – times when an airport is busiest. For example, the appropriate size of terminal facilities can be estimated by determining the number of people that could reasonably be expected to use the facility at a given time. The following planning definitions apply to the peak periods:

- **Peak Month** – The calendar month when peak aircraft operations occur.
- **Design Day** – The average day in the peak month.
- **Design Hour** – The peak hour within the design day.

Operations counts from the control tower were utilized in this analysis. In 2022, the busiest month was March when there were 9,496 operations which is 10.81 percent of annual operations. This percentage was then carried forward to the forecast years to estimate future peak months. The design day is not an actual peak day. Instead, it is the average day within the peak month. The design hour was determined by analyzing the busiest day of each week of the peak month and averaging the four busiest hours. These projections can be viewed in **Table 2M.**

TABLE 2M | Peak Period Forecast

Year	2022	2027	2032	2042
Annual Operations	87,871	92,538	97,972	110,173
Peak Month	9,496	9,994	10,581	11,899
Design Day	306	323	342	384
Design Hour	72	76	80	90

Source: Coffman Associates analysis.

OPERATIONS BY FLEET MIX

Developing an understanding of the operational fleet mix, including the approximate volume of operations by aircraft type, is an important input in determining future facility needs. The baseline operations mix is derived from an examination of FAA's Traffic Flow Management System Count (TFMSC) database, which captures operations by those that file a flight plan. The FAA indicates this database captures approximately 95 percent of operations by jets and turboprops, which tend to file flight plans at a high rate. Total operations by jets and turboprops are summarized in **Table 2N**. In 2022, there were 1,116 jet operations and 1,408 turboprop operations.

TABLE 2N | Historical Jet and Turboprop Operations

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Jets	1,104	1,254	1,056	944	1,010	1,366	1,238	1,060	1,024	1,116
TP	1,532	1,690	1,536	1,754	1,854	1,808	1,676	1,288	1,296	1,408
Total	**2,636**	**2,944**	**2,592**	**2,698**	**2,864**	**3,174**	**2,914**	**2,348**	**2,320**	**2,524**
*December 2021 - November 2022										

Source: FAA Traffic Flow Management System Count database. Data normalized by aircraft type by year.

Utilizing the TFMSC data for jets and turboprops, we can accurately establish a baseline operations number. Because FBO's perform maintenance, repair, and overhaul of jet engines, a portion of the operations are local in nature to account for test flights. Future jet and turboprop operations are based on national trends with both aircraft types having higher utilization rates and representing a larger percentage of overall operations. Jet operations are forecast to increase 10.96 percent annually and turboprops at 2.05 percent annually.

The operations estimate for helicopters and multi-engine piston aircraft are based on typical counts in comparison to the number of these aircraft based at the airport. Helicopter operations are estimated at 300 annually per based helicopter and multi-engine piston are estimated at 200 annual operations per based aircraft. All remaining operations are assigned to single engine piston operations.

Table 2P presents the fleet mix operations forecast for OXR. Piston aircraft are anticipated to continue to represent most operations but are forecast to decline as a percent of the whole over time. Multi-engine piston operations are also forecast to decline as a percent of the whole over time. Growth areas are in turbine engines (turboprops and business jets) and helicopters.

TABLE 2P | Fleet Mix Operations Forecast

	EXISTING		FORECAST					
Aircraft Type	**2022**	**Percent**	**2027**	**Percent**	**2032**	**Percent**	**2042**	**Percent**
Local Operations								
Single Engine Piston	54,835	98.56%	57,000	98.48%	59,271	98.41%	64,043	98.19%
Multi-Engine Piston	200	0.36%	200	0.35%	200	0.33%	200	0.31%
Turboprop	100	0.18%	120	0.21%	140	0.23%	200	0.31%
Jet	100	0.18%	120	0.21%	140	0.23%	200	0.31%
Helicopter	400	0.72%	440	0.76%	480	0.80%	580	0.89%
Total Local	**55,635**	**100.00%**	**57,880**	**100.00%**	**60,231**	**100.00%**	**65,223**	**100.00%**
Itinerant Operations								
Single Engine Piston	24,312	75.42%	22,872	65.99%	21,559	57.12%	21,086	46.91%
Multi-Engine Piston	2,800	8.69%	2,800	8.08%	2,600	6.89%	2,600	5.78%
Turboprop	1,308	4.06%	1,640	4.73%	2,148	5.69%	2,968	6.60%
Jet	1,016	3.15%	3,786	10.92%	7,114	18.85%	12,076	26.87%
Helicopter	2,800	8.69%	3,560	10.27%	4,320	11.45%	6,220	13.84%
Total Itinerant	**32,236**	**100.00%**	**34,658**	**100.00%**	**37,741**	**100.00%**	**44,950**	**100.00%**
Total Operations	**87,871**		**92,538**		**97,972**		**110,173**	

Source: FAA TFMSC database; Coffman Associates analysis

FORECAST SUMMARY

This study has outlined the various activity levels that might reasonably be anticipated over the planning period. **Exhibit 2G** presents a summary of the aviation forecasts prepared in this study. The base year for these forecasts is 2022, with a 20-year planning horizon to 2042. The primary aviation demand indicators are based aircraft and operations.

Based aircraft are forecast to increase from 120 in 2022 to 167 by 2042, for a CAGR of 1.67 percent. Total operations are forecast to increase from 87,871 in 2022 to 110,173 by 2042, which is a CAGR of 1.14 percent. Several forecasts for each aviation demand indicator were developed to create a range of reasonable forecasts (i.e., a planning envelope) from which a single forecast was selected for use in determining facility needs.

Projections of aviation demand will be influenced by unforeseen factors and events in the future therefore, future demand will not likely follow the exact projection line, but over time, forecasts of aviation demand tend to fall within the planning envelope. The need for additional facilities will be based upon these forecasts; however, if demand does not materialize as projected, then implementation of facility construction can be slowed. Likewise, if demand exceeds these forecasts, then implementation of facility construction can be accelerated.

FORECAST COMPARISON TO THE TAF

The FAA reviews the aviation demand forecasts developed in aviation planning studies and compares them to the *Terminal Area Forecast* (TAF) for the airport. The forecasts are considered consistent with the TAF if they meet the following criteria:

- Forecasts differ by less than 10 percent in the 5-year forecast period, and 15 percent in the 10-year forecast period, or
- Forecasts do not affect the timing or scale of an airport project, or
- Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.5, *Formulation of the National Plan of Integrated Airport Systems* (NPIAS) and *Airports Capital Improvement Plan* (ACIP).

If the forecasts exceed these parameters, they may be sent to FAA headquarters in Washington, D.C., for further review. **Table 2Q** presents the direct comparison of the planning forecast with the TAF published in March 2022. The forecasts are not expected to affect the timing or scale of any major airport projects, and the role of the airport as a general aviation facility is not expected to change. For total operations, this forecast is within the tolerance range in the five year and 10-year forecast. For based aircraft the forecast is within TAF tolerance; however, it should be noted that the base year starting point is different as the TAF identifies 130 and this forecast identified 120, which was sourced from www.basedaircraft.com.

It is recommended that the FAA updated the TAF to the forecast numbers from this study.

	2022	2027	2032	2042
ANNUAL OPERATIONS				
Itinerant				
Air Taxi	4,659	4,770	5,343	6,618
General Aviation	27,385	29,667	32,177	38,111
Military	192	221	221	221
Total Itinerant Operations	***32,236***	***34,658***	***37,741***	***44,950***
Local				
General Aviation	55,579	57,838	60,189	65,181
Military	56	42	42	42
Total Local Operations	***55,635***	***57,880***	***60,231***	***65,223***
Total Annual Operations	***87,871***	***92,538***	***97,972***	***110,173***
Annual Instrument Approaches	***4,835***	***5,199***	***5,661***	***6,743***
BASED AIRCRAFT				
Single Engine	87	88	89	96
Multi-Engine Piston	15	15	14	14
Turboprop	8	10	13	18
Jet	2	7	13	22
Helicopter	8	10	12	17
Total Based Aircraft	***120***	***130***	***141***	***167***
PEAKING				
Annual Operations	87,871	92,583	97,972	110,173
Peak Month	9,496	9,994	10,581	11,899
Design Day	306	323	342	384
Design Hour	72	76	80	90

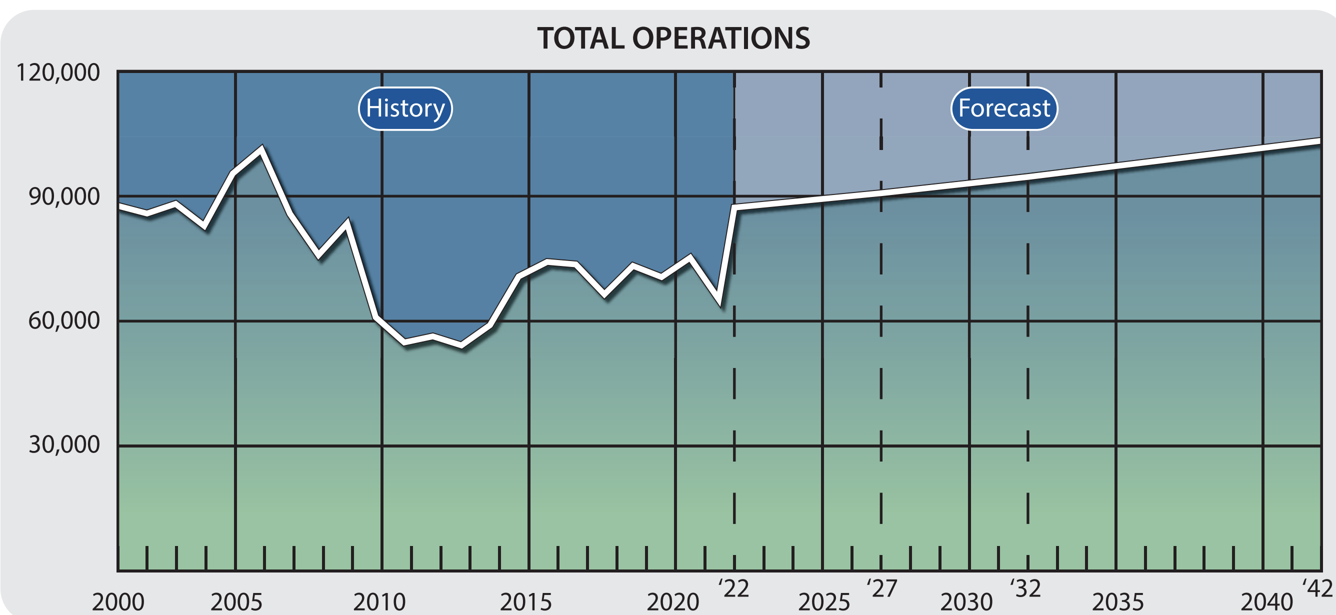


Exhibit 2G
FORECAST SUMMARY

TABLE 2Q | Forecast Comparison to the Terminal Area Forecast

	BASE YEAR 2022	FORECAST			
		2027	2032	2042	CAGR 2022-2042
Total Operations					
Airport Forecast	87,871	92,538	97,972	110,173	1.14%
2022 FAA TAF[1]	79,774	85,780	88,249	93,530	0.80%
% Difference	**9.66%**	**7.58%**	**10.44%**	**16.34%**	
Based Aircraft					
Airport Forecast	120	130	141	167	1.67%
2022 FAA TAF[1]	130	136	141	151	0.75%
% Difference	**8.00%**	**4.51%**	**0.00%**	**10.06%**	

[1]TAF published Feb. 2023
CAGR - Compound Annual Growth Rate

AIRCRAFT/AIRPORT/RUNWAY CLASSIFICATION

The FAA has established several aircraft classification systems that group aircraft types based on their performance (approach speed in landing configuration) and design characteristics (wingspan and landing gear configuration). These classification systems are used to determine the appropriate airport design standards for specific airport elements, such as runways, taxiways, taxilanes, and aprons.

AIRCRAFT CLASSIFICATION

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using, or are expected to use, an airport. The critical design aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft type or a composite aircraft representing a collection of aircraft with similar characteristics. The design aircraft is classified by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). FAA AC 150/5300-13A, *Airport Design*, describes the following airplane classification systems, the parameters of which are presented on **Exhibit 2H.**

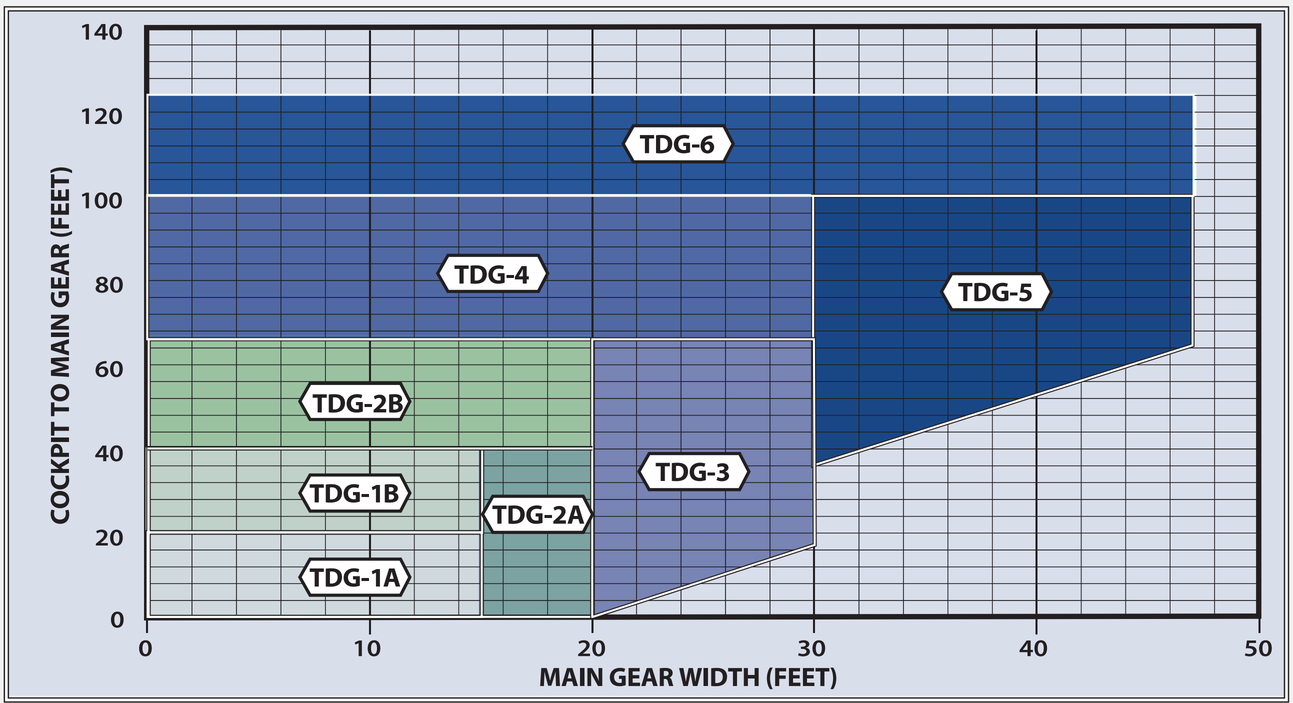
Aircraft Approach Category (AAC): A grouping of aircraft based on a reference landing speed (V_{REF}), if specified, or if V_{REF} is not specified, 1.3 times stall speed (V_{SO}) at the maximum certificated landing weight. V_{REF}, V_{SO}, and the maximum certificated landing weight are those values established for the aircraft by the certification authority of the country of registry.

The AAC generally refers to the approach speed of an aircraft in landing configuration. The higher the approach speed, the more restrictive the applicable design standards. The AAC, depicted by a letter A through E, is the aircraft approach category and relates to aircraft approach speed (operational characteristics). The AAC generally applies to runways and runway-related facilities, such as runway width, runway safety area (RSA), runway object free area (ROFA), runway protection zone (RPZ), and separation standards.

AIRCRAFT APPROACH CATEGORY (AAC)		
Category	**Approach Speed**	
A	less than 91 knots	
B	91 knots or more but less than 121 knots	
C	121 knots or more but less than 141 knots	
D	141 knots or more but less than 166 knots	
E	166 knots or more	
	AIRPLANE DESIGN GROUP (ADG)	
Group #	**Tail Height (ft)**	**Wingspan (ft)**
I	<20	<49
II	20≤30	49≤79
III	30≤45	79≤118
IV	45≤60	118≤171
V	60≤66	171≤214
VI	66≤80	214≤262
	VISIBILITY MINIMUMS	
RVR* (ft)	**Flight Visibility Category (statute miles)**	
VIS	3-mile or greater visibility minimums	
5,000	Not lower than 1-mile	
4,000	Lower than 1-mile but not lower than ¾-mile	
2,400	Lower than ¾-mile but not lower than ½-mile	
1,600	Lower than ½-mile but not lower than ¼-mile	
1,200	Lower than ¼-mile	

***RVR**: Runway Visual Range

TAXIWAY DESIGN GROUP (TDG)



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

Exhibit 2H
AICRAFT CLASSIFICATION PARAMETERS

Airplane Design Group (ADG): The ADG, depicted by a Roman numeral I through VI, is a classification of aircraft which relates to aircraft wingspan or tail height (physical characteristics). When the aircraft wingspan and tail height fall in different groups, the higher group is used. The ADG influences design standards for taxiway safety area (TSA), taxiway object free area (TOFA), taxilane object free area, apron wingtip clearance, and various separation distances.

Taxiway Design Group (TDG): A classification of airplanes based on outer-to-outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance. The TDG relates to the undercarriage dimensions of the design aircraft. The TDG is classified by an alphanumeric system: 1A, 1B, 2, 3, 4, 5, 6, and 7. The taxiway design elements determined by the application of the TDG include the taxiway width, taxiway edge safety margin, taxiway shoulder width, taxiway fillet dimensions, and, in some cases, the separation distance between parallel taxiways/taxilanes. Other taxiway elements, such as the taxiway safety area (TSA), taxiway/taxilane object free area (TOFA), taxiway/taxilane separation to parallel taxiway/taxilanes or fixed or movable objects, and taxiway/taxilane wingtip clearances are determined solely based on the wingspan (ADG) of the design aircraft utilizing those surfaces. It is appropriate for taxiways to be planned and built to different TDG standards based on expected use.

Exhibit 2J summarizes the classification of the most common aircraft in operation today. Generally, recreational and business piston and turboprop aircraft will fall in AAC A and B, and ADG I and II. Business jets typically fall in ACC B and C, while the larger commercial aircraft will fall in AAC C and D.

AIRPORT AND RUNWAY CLASSIFICATIONS

Airport and runway classifications, along with the aircraft classifications defined previously, are used to determine the appropriate FAA design standards to which the airfield facilities are to be designed and built.

Runway Design Code (RDC): A code signifying the design standards to which the runway is to be built. The RDC is based upon planned development and has no operational component.

The AAC, ADG, and runway visual range (RVR) are combined to form the RDC of a runway. The RDC provides the information needed to determine certain design standards that apply. The first component, depicted by a letter, is the AAC and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristics), whichever is most restrictive. The third component relates to the available instrument approach visibility minimums expressed by RVR values in feet of 1,200 (⅛-mile), 1,600 (¼-mile), 2,400 (½-mile), 4,000 (¾-mile), and 5,000 (1-mile). The RVR values approximate standard visibility minimums for instrument approaches to the runways. The third component reads "VIS" for runways designed for visual approach use only.

Approach Reference Code (APRC): A code signifying the current operational capabilities of a runway and associated parallel taxiway regarding landing operations. Like the RDC, the APRC is composed of the same three components: the AAC, ADG, and RVR. The APRC describes the current operational capabilities of a runway under meteorological conditions where no special operating procedures are necessary, as opposed to the RDC, which is based upon planned development with no operational component. The APRC for a runway is established based upon the minimum runway-to-taxiway centerline separation.

A-I

Aircraft	TDG
Beech Baron 55	1A
Beech Bonanza	**1A**
Cessna 150, 172	1A
Eclipse 500	1A
Piper Archer, Seneca	1A

B-I

Aircraft	TDG
Beech Baron 58	**1A**
Beech King Air 90	1A
Cessna 421	1A
Cessna Citation CJ1 (525)	1A
Cessna Citation 1 (500)	2A
Embraer Phenom 100	1B

A/B-II *12,500 lbs. or less*

Aircraft	TDG
Beech Super King Air 200	**2A**
Cessna 441 Conquest	1A
Cessna Citation CJ2 (525A)	2A
Pilatus PC-12	1A

B-II *over 12,500 lbs.*

Aircraft	TDG
Beech Super King Air 350	2A
Cessna Citation CJ3 (525B), V (560)	2A
Cessna Citation Bravo (550)	1A
Cessna Citation CJ4 (525C)	**1B**
Cessna Citation Latitude/Longitude	1B
Embraer Phenom 300	1B
Falcon 10, 20, 50	1B
Falcon 900, 2000	2A
Hawker 800, 800XP, 850XP, 4000	1B
Pilatus PC-24	1B

A/B-III

Aircraft	TDG
Bombardier Dash 8	3
Bombardier Global 5000, 6000, 7000, 8000	**2B**
Falcon 6X, 7X, 8X	2B

Note: Aircraft pictured is identified in bold type.

C/D-I

Aircraft	TDG
Lear 25, 31, 45, 55, **60**	**1B**
Learjet 35, 36 (D-I)	1B

C/D-II

Aircraft	TDG
Challenger 600/604/800/850	1B
Cessna Citation VII, X+	1B
Embraer Legacy 450/500	1B
Gulfstream IV, 350, 450 (D-II)	2A
Gulfstream G200/G280	1B
Lear 70, 75	1B
CRJ 700	2B
ERJ 175, 195	3
CRJ 900	2B

C/D-III *less than 150,000 lbs.*

Aircraft	TDG
Gulfstream V	2A
Gulfstream G500, 550, 600, **650 (D-III)**	**2B**

C/D-III *over 150,000 lbs.*

Aircraft	TDG
Airbus A319-100, 200	3
Boeing 737 -800, 900, BBJ2 (D-III)	3
MD-83, 88 (D-III)	4

C/D-IV

Aircraft	TDG
Airbus A300-100, 200, 600	5
Boeing 757-200	4
Boeing 767-300, 400	5
MD-11	6

D-V

Aircraft	TDG
Airbus A330-200, 300	5
Airbus A340-500, 600	6
Boeing 747-100 - 400	5
Boeing 777-300	6
Boeing 787-8, 9	5

Exhibit 2J
AIRCRAFT REFERENCE CODES

Departure Reference Code (DPRC): A code signifying the current operational capabilities of a runway and associated parallel taxiway regarding takeoff operations. The DPRC represents those aircraft that can take off from a runway while any aircraft are present on adjacent taxiways, under meteorological conditions with no special operating conditions. The DPRC is like the APRC, but is composed of two components, AAC and ADG. A runway may have more than one DPRC depending on the parallel taxiway separation distance.

Airport Reference Code (ARC)**:** An airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely at an airport. The current ARC for OXR is B-II.

CRITICAL AIRCRAFT

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using, or are expected to use, an airport. The critical aircraft is used to define the design parameters for an airport. The critical aircraft may be a single aircraft or a composite aircraft representing a collection of aircraft classified by three parameters: AAC, ADG, and TDG.

The first consideration is the safe operation of aircraft likely to use an airport. Any operation of an aircraft that exceeds design criteria of an airport may result in a lesser safety margin; however, it is not the usual practice to base the airport design on an aircraft that uses the airport infrequently.

The critical aircraft is defined as 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, excluding touch-and-go operations. Planning for future aircraft use is of importance since the design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure that short-term development does not preclude the reasonable long-range potential needs of the airport.

According to FAA AC 150/5300-13A, *Airport Design*, "Airport designs based only on existing aircraft can severely limit the ability to expand the airport to meet future requirements for larger, more demanding aircraft. Airport designs that are based on large aircraft never likely to be served by the airport are not economical." Selection of the current and future critical aircraft must be realistic in nature and supported by current data and realistic projections.

CURRENT CRITICAL AIRCRAFT

There are three elements for classifying the airport design aircraft. The three elements are the AAC, ADG, and the TDG. The AAC and ADG are examined first, followed by the TDG.

The primary source of operations data is the FAA's TFMSC database, which captures an operation when a pilot files a flight plan and/or when flights are detected by the National Airspace System, usually via radar. It includes documentation of commercial traffic (air carrier and air taxi), general aviation, and military aircraft. Due to factors, such as incomplete flight plans, limited radar coverage, and VFR operations, TFMSC data does not account for all aircraft activity at an airport by a given aircraft type; however, the TFMSC does provide an accurate reflection of IFR activity. Operators of high-performance aircraft, such as turboprops and jets, tend to file flight plans at a high rate. **Exhibit 2K** presents the last 10 years of TFMSC data for the airport.

Aircraft Approach Category (AAC) and Airplane Design Group (ADG)

Exhibit 2K includes a summary table of the turboprop and business jets operations as classified by the AAC. As can be seen, over the last 10 years, operations by aircraft in AAC have exceeded the 500 operations threshold. Operations by aircraft in C, D, and E have not exceeded 500 annual operations either individually or combined; therefore, the appropriate current AAC is B.

Operations by aircraft in ADG II have consistently been above the 500 operations threshold. There are only a few operations by aircraft in ADG III and IV. A current ADG of II is supported for the airport.

Taxiway Design Group (TDG)

The TDG is the third component of the airport design aircraft determination. The TDG is primarily based on the main gear wheel width. Medium and large business jets, as well as turboprops, tend to have the greatest wheel widths. **Exhibit 2K** presents turboprop and business jet operations as classified by TDG as sourced from the TFMSC. TDG 2A operations have exceeded 500 annual operations every year for the last 10 years. Operations in TDG 2B or higher have not reached more than 74 in any given year; therefore, TDG 2A is the current TDG classification.

FUTURE CRITICAL AIRCRAFT

It is not unusual for an airport to transition from one critical aircraft to another. **Table 2R** presents the forecast operational fleet mix for jets and turboprops by AAC and ADG. In 2022, there were 2,524 turboprop and jet operations, of which eight percent (208) were by aircraft in AAC C and six percent (148) were in AAC D. The total operations fleet mix forecast was previously presented on **Table 2P**. Operations by turboprops and jets in ACC C and D are forecast to maintain at their current percentage of the whole (8 percent for ACC C and 6 percent for ACC D). Since activity by these types of aircraft is projected to grow over the next 20 years, the total number of operations in AAC C and D is also projected to grow. By the intermediate planning horizon, AAC C and D operations exceed 500 individually.

TABLE 2R | Jet and Turboprop Operations Forecast by Design Category

	HISTORICAL JET & TURBOPROP OPERATIONS[1]		FORECAST JET & TURBOPROP OPERATIONS[1]			FORECAST MIX PERCENT		
Design Categories	2022	Percent	Short Term	Inter. Term	Long Term	Short Term %	Inter. Term %	Long Term %
AAC A	422	17%	907	1,527	2,471	16%	16%	16%
AAC B	1,746	69%	3,966	6,679	10,811	70%	70%	70%
AAC C	208	8%	453	763	1,236	8%	8%	8%
AAC D	148	6%	340	573	927	6%	6%	6%
Total	**2,524**	**100%**	**5,666**	**9,542**	**15,444**	**100%**	**100%**	**100%**
ADG I	442	18%	1,020	1,527	2,162	18%	16%	14%
ADG II	2,012	80%	4,363	7,347	11,892	77%	77%	77%
ADG III	70	2%	283	668	1,390	5%	7%	9%
Total	**2,524**	**100%**	**5,666**	**9,542**	**15,444**	**100%**	**100%**	**100%**

AAC: Aircraft Approach Category; ADG: Airplane Design Group
[1]Traffic Flow Management System Count (TFMSC) - FAA activity database.

Over the next 20-years, the number of operations by aircraft in ADG III is projected to exceed 500 annual operations. These aircraft include the Gulfstream 500, 650,750, and Embraer 175; therefore, the airport should plan for a transition to a critical aircraft in the D-III designation.

The future TDG is planned to transition to TDG 2B from the current 2A.

Airport Design Aircraft Summary

The analysis presented examined each of the three elements for classifying the airport critical aircraft. The three elements are the aircraft approach category, airplane design group, and the taxiway design group. The current airplane approach category is "B." The current airplane design group is "II." The current TDG is "2A." **Therefore, the current airport design aircraft is classified as B-II-2A.** This classification is best represented by a range of Cessna Citation business jets such as the CJ2, CJ3, 550, and 560.

The future airport design aircraft is planned to be D-III-2B. A representative aircraft would be the Gulfstream 600.

RUNWAY DESIGN CODE

The RDC relates to specific FAA design standards that should be met in relation to a runway. The RDC takes into consideration the AAC, ADG, and the RVR. In most cases, the critical aircraft will also be the RDC for the primary runway.

Runway 7-25 is 5,953 feet long, 100 feet wide, and has instrument approach visibility minimums of not lower than 1-mile. Based on current activity, the current RDC is **B-II-5000**.

ARC	Aircraft	TDG	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*	TP/J
A-I	LNP4 - Lancair Propjet four-seat	1A	0	0	0	0	0	0	0	0	0	2	T
	B36T - Allison 36 Turbine Bonanza	1A	4	4	4	0	0	4	2	4	2	2	T
	EA50 - Eclipse 500	1A	24	42	28	32	28	8	20	18	52	52	J
	KODI - Quest Kodiak	1A	4	12	10	2	0	2	2	0	0	2	T
	P46T - Piper Malibu Meridian	1A	76	26	16	24	26	52	52	28	24	18	T
	SF50 - Cirrus Vision SF50	1A	0	0	0	0	2	0	0	6	16	38	J
	EVOT - Lancair Evolution Turbine	1A	0	0	2	6	0	2	2	0	0	4	T
	EPIC - Dynasty	1A	22	24	16	74	42	78	38	30	100	62	T
	PC7 - Pilatus PC-7	1A	4	2	0	2	0	0	10	6	4	2	T
	TBM7 - Socata TBM-7	1A	38	26	16	76	84	76	74	68	68	20	T
	TBM8 - Socata TBM-850	1A	32	28	20	26	52	14	32	4	42	10	T
	TBM9 - Socata TBM	1A	0	2	4	8	18	12	24	16	48	10	T
	TMB8 - SOCATA TBM 700	1A	0	0	0	0	0	0	0	0	2	0	T
	Total		204	166	116	250	252	248	256	180	358	222	
A-II	C208 - Cessna 208 Caravan	1A	40	4	10	8	8	10	6	8	2	4	T
	DH6 - De Havilland Canada DHC-6 Twin Otter	1A	0	0	0	0	0	0	0	0	2	0	T
	DHC6 - DeHavilland Twin Otter	1A	0	0	0	0	2	0	0	0	0	4	T
	PC12 - Pilatus PC-12	1A	42	236	230	320	510	394	188	142	112	192	T
	C12 - CS2 C212 CASA/IPTN 212 Aviocar	1A	0	0	2	2	0	0	0	0	0	0	T
	Total		82	240	242	330	520	404	194	150	116	200	
B-I	BE40 - Raytheon/Beech Beechjet 400/T-1	1A	48	50	40	26	14	20	10	12	10	20	J
	BE90 - Beech King Air 90	1A	2	0	0	0	0	0	2	0	0	0	T
	BE9L - Beech King Air 90	1A	44	72	66	80	90	92	102	72	92	26	T
	C25M - Cessna Citation M2	1A	0	0	0	4	4	6	12	26	18	4	J
	C425 - Cessna 425 Corsair	1A	4	16	0	2	2	2	0	2	0	2	J
	C510 - Cessna Citation Mustang	1A	42	30	14	12	6	36	28	22	12	10	J
	C525 - Cessna CitationJet/CJ1	1A	68	122	72	42	46	60	52	18	16	14	J
	MU2 - Mitsubishi Marquise/Solitaire	1A	10	14	24	26	32	36	20	18	8	26	T
	PRM1 - Raytheon Premier 1/390 Premier 1	1A	4	10	4	4	28	42	32	20	24	12	J
	DA10 - Dassault Falcon/Mystère 10	1B	0	0	2	0	0	0	0	0	0	0	J
	E50P - Embraer Phenom 100	1B	24	44	30	36	42	20	16	8	6	16	J
	FA10 - Dassault Falcon/Mystère 10	1B	2	0	2	0	2	2	0	2	0	0	J
	H25C - BAe/Raytheon HS 125-1000/Hawker 1000	1B	0	2	0	0	4	0	2	0	0	0	J
	L39 - Aero L-139 Albatross	1B	0	0	0	0	0	0	0	0	0	2	J
	AC80 - Aero Commander Turbo 680	1A	0	2	0	0	4	0	0	0	2	0	T
	C500 - Cessna 500/Citation I	2A	0	6	4	0	2	2	0	0	2	0	J
	C501 - Cessna I/SP	2A	0	4	6	6	0	0	2	0	2	2	J
	P180 - Piaggio P-180 Avanti	2A	6	0	8	2	6	0	8	4	0	4	T
	PA42 - Cheyenne III/IV; Piper Aircraft	2A	2	0	0	0	2	0	0	0	0	0	T
	PAY1 - Piper Cheyenne 1	2A	4	0	0	2	0	0	4	0	0	0	T
	PAY2 - Piper Cheyenne 2	2A	0	4	6	4	4	0	8	2	0	2	T
	PAY3 - Piper PA-42-720 Cheyenne 3	2A	0	0	0	0	0	0	0	10	10	4	T
	PAYE - Cheyenne	2A	0	0	2	0	0	0	0	0	0	0	T
	BE10 - Beech King Air 100 A/B	1A	2	6	2	2	6	6	0	4	0	0	T
	HDJT - HONDA HA-420 HondaJet	1A	0	0	0	0	4	16	10	0	6	0	J
	SBR1 - North American Rockwell Sabre 40/60	1A	14	2	0	2	0	0	0	0	0	0	J
	Total		276	384	282	250	298	340	308	220	208	144	
B-II	C700 - Cessna Citation Longitude	1B	0	0	0	0	0	0	4	4	6	12	J
	PC24 - Pilatus PC-24	1B	0	0	0	0	0	0	0	0	2	4	T
	BE9T - Beech F90 King Air	1A	4	6	4	4	10	4	2	2	2	0	T
	C441 - Cessna Conquest	1A	6	16	4	2	0	2	6	6	0	0	T
	C25C - Cessna Citation CJ4	1B	2	0	8	6	4	8	26	18	10	10	J

ARC	Aircraft	TDG	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*	TP/J
B-II	C56X - Cessna Excel/XLS	1B	66	60	40	42	46	106	138	32	50	82	J
	C680 - Cessna Citation Sovereign	1B	50	54	56	22	32	16	34	16	30	22	J
	C68A - Cessna Citation Latitude	1B	0	0	0	0	4	16	20	10	40	30	J
	C750 - Cessna Citation X	1B	34	26	34	22	16	58	32	14	30	20	J
	CL30 - Bombardier (Canadair) Challenger 300	1B	30	26	44	46	48	50	26	26	22	22	J
	CL35 - Bombardier Challenger 300	1B	0	0	2	10	24	16	26	20	34	58	J
	E55P - Embraer Phenom 300	1B	16	36	20	28	50	46	66	36	70	56	J
	FA20 - Dassault Falcon/Mystère 20	1B	10	10	14	8	2	0	0	0	0	0	J
	FA50 - Dassault Falcon/Mystère 50	1B	8	12	14	6	6	6	10	16	10	8	J
	HA4T - Hawker 4000	1B	0	0	0	8	4	8	6	0	2	0	J
	AC69 - Jet Prop /Gulfstream	2A	2	0	0	0	0	0	0	0	0	0	T
	AC90 - Gulfstream Commander	2A	10	4	2	2	0	4	0	2	4	2	T
	B190 - Beech 1900/C-12J	2A	126	116	68	158	74	12	24	430	376	488	T
	B350 - Beech Super King Air 350	2A	80	88	108	106	74	138	140	66	134	294	T
	BE20 - Beech 200 Super King	2A	410	360	344	378	276	302	316	176	160	180	T
	BE30 - Raytheon 300 Super King Air	2A	96	100	136	52	82	78	96	124	86	4	T
	C25A - Cessna Citation CJ2	2A	64	74	66	20	94	158	158	142	96	108	J
	C25B - Cessna Citation CJ3	2A	40	98	32	28	30	56	52	62	54	66	J
	C550 - Cessna Citation II/Bravo	2A	38	26	24	20	6	20	40	20	16	16	J
	C551 - Cessna Citation II/SP	2A	0	0	0	2	0	0	2	0	0	2	J
	C55B - Cessna Citation Bravo	2A	0	0	0	0	0	0	2	0	0	4	J
	C560 - Cessna Citation V/Ultra/Encore	2A	58	92	46	38	26	24	16	54	44	18	J
	CITA - 525A Citation CJ2	2A	0	0	2	0	0	0	0	0	0	0	J
	F2TH - Dassault Falcon 2000	2A	16	12	14	18	20	12	8	8	6	26	J
	F900 - Dassault Falcon 900	2A	76	72	50	90	62	56	26	14	10	12	J
	E120 - Embraer Brasilia EMB 120	3	4	0	4	8	0	0	8	8	0	0	T
	D328 - Dornier 328 Series	1B	0	0	2	0	0	0	0	6	0	0	T
	J328 - Fairchild Dornier 328 Jet	1B	0	2	0	2	0	0	0	0	0	2	J
	SW3 - Fairchild Swearingen SA-226T/TB Merlin 3	1B	2	46	10	12	42	32	42	14	6	36	T
	SW4 - Swearingen Merlin 4/4A Metro2	1B	458	484	414	364	408	452	462	36	0	6	T
	Total		1,706	1,820	1,562	1,502	1,440	1,680	1,788	1,362	1,300	1,588	
B-III	FA7X - Dassault Falcon F7X	2A	0	4	2	0	2	6	2	6	4	2	J
	GL5T - Bombardier BD-700 Global 5000	2B	0	2	2	0	8	12	6	2	2	2	J
	GLEX - Bombardier BD-700 Global Express	2B	2	2	2	4	4	8	4	18	26	10	J
	DH8C - Dash 8/DHC8-300	3	0	0	0	0	0	0	0	0	2	0	T
	C2 - Grumman C-2 Greyhound	3	0	0	0	4	0	0	0	0	4	0	T
	E2 - Grumman TE-2 Hawkeye	5	0	0	2	0	0	2	0	0	0	0	T
	FA8X - Dassault Falcon 8X	1B	0	0	0	0	0	4	0	4	0	0	J
	Total		2	8	8	8	14	32	12	30	38	14	
C-I	LJ25 - Bombardier Learjet 25	1B	0	0	0	0	0	2	0	0	0	0	J
	LJ31 - Bombardier Learjet 31/A/B	1B	12	10	8	6	8	8	8	4	0	10	J
	LJ40 - Learjet 40; Gates Learjet	1B	2	2	4	6	2	8	4	2	8	10	J
	LJ45 - Bombardier Learjet 45	1B	14	30	82	88	60	54	10	12	12	20	J
	LJ55 - Bombardier Learjet 55	1B	10	8	8	10	4	0	0	0	0	0	J
	LJ60 - Bombardier Learjet 60	1B	38	38	24	30	22	42	32	20	12	12	J
	LR40 - Bombardier Learjet 40	1B	0	0	0	0	2	0	0	0	0	0	J
	LR45 - Learjet 45	1B	0	0	0	0	2	0	0	0	0	0	J
	LR60 - Bombardier Learjet 60	1B	0	0	2	0	0	0	0	0	0	0	J
	WW24 - IAI 1124 Westwind	1B	6	0	2	4	2	0	6	0	0	2	J
	Total		82	88	130	144	102	114	60	38	32	54	

Exhibit 2K
TURBOPROP AND JET OPERATIONS

ARC	Aircraft	TDG	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*	TP/J
C-II	ASTR - IAI Astra 1125	1B	38	4	0	4	4	0	0	4	0	2	J
	C650 - Cessna III/VI/VII	1B	18	10	4	8	2	2	12	0	2	0	J
	CL60 - Bombardier Challenger 600/601/604	1B	40	40	42	48	40	52	38	20	24	48	J
	E545 - Embraer EMB-545 Legacy 450	1B	0	0	0	0	8	4	4	4	16	20	J
	E550 - Embraer Legacy 500	1B	0	0	0	2	12	28	94	110	76	4	J
	G150 - Gulfstream G150	1B	4	4	4	0	8	58	0	6	0	2	J
	G159 - Gulfstream Aerospace G 159/VC-4	1B	2	4	0	2	0	0	0	0	0	0	J
	G280 - Gulfstream G280	1B	0	0	26	18	20	24	24	16	34	58	J
	H25B - BAe HS 125/700-800/Hawker 800	1B	52	56	44	20	28	18	26	34	18	14	J
	LJ70 - Learjet 70	1B	0	0	0	0	0	2	0	0	6	0	J
	LJ75 - Learjet 75	1B	0	0	4	8	8	8	4	10	2	4	J
	E135 - Embraer ERJ 135/140/Legacy	2B	2	0	4	0	4	0	0	4	0	0	J
	E35L - Embraer 135 LR	2B	0	0	0	2	4	2	0	0	2	2	J
	GLF3 - Gulfstream III/G300	2A	2	6	2	0	4	0	0	0	0	0	J
	Total		158	124	130	112	142	198	202	208	180	154	
C-III	C27J - Alenia C-27J Spartan	1B	0	0	0	0	2	4	4	0	2	0	T
	E75L - Embraer 175	3	0	0	0	0	2	0	0	0	0	0	J
	Total		0	0	0	0	4	4	4	0	2	0	
C-IV	C130 - Lockheed 130 Hercules	1B	2	8	0	0	0	0	2	2	0	0	T
	C17 - Boeing Globemaster 3	5	0	0	0	0	0	2	0	0	0	0	J
	Total		2	8	0	0	0	2	2	2	0	0	
D-I	L35 - Learjet 35	1B	0	0	2	2	0	0	0	0	0	0	J
	LJ35 - Bombardier Learjet 35/36	1B	24	18	28	22	18	18	28	60	18	22	J
	T38 - Northrop T-38 Talon	1A	0	0	0	2	0	0	0	0	0	0	J
	Total		24	18	30	26	18	18	28	60	18	22	
D-II	GALX - IAI 1126 Galaxy/Gulfstream G200	1B	14	8	14	16	6	6	4	4	4	8	J
	GL20 - Gulfstream 2	1B	0	4	0	0	0	0	0	0	0	0	J
	GLF2 - Gulfstream II/G200	1B	4	0	0	0	0	0	0	0	0	0	J
	G4 - Gulfstream IV	2A	0	0	0	0	0	0	2	0	0	0	J
	GLF4 - Gulfstream IV/G400	2A	62	56	48	50	52	84	34	44	46	62	J
	Total		80	68	62	66	58	90	40	48	50	70	
D-III	GA6C - G-7 Gulfstream G600	2B	0	0	0	0	0	0	0	4	4	6	J
	GLF5 - Gulfstream V/G500	2B	18	20	26	10	8	34	18	30	6	12	J
	GLF6 - Gulfstream	2B	0	0	4	0	8	10	2	16	8	38	J
	Total		18	20	30	10	16	44	20	50	18	56	
E-I	F16 - Lockheed F-16 Fighting Falcon	1A	2	0	0	0	0	0	0	0	0	0	J
	Total		2	0	0	0	0	0	0	0	0	0	

TAXIWAY DESIGN GROUP

TDG	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
1A	536	752	588	788	1,018	974	726	532	664	536
1B	982	1,046	990	906	992	1,178	1,210	570	552	622
2A	1,092	1,122	970	976	816	952	940	1,164	1,050	1,296
2B	22	24	38	16	36	66	30	74	48	70
3	4	0	4	12	2	0	8	8	6	0
4,5,6	0	0	2	0	0	4	0	0	0	0
TOTAL	2,636	2,944	2,592	2,698	2,864	3,174	2,914	2,348	2,320	2,524

AIRPORT REFERENCE CODE (ARC) SUMMARY

ARC	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
A-I	204	166	116	250	252	248	256	180	358	222
A-II	82	240	242	330	520	404	194	150	116	200
B-I	276	384	282	250	298	340	308	220	208	144
B-II	1,706	1,820	1,562	1,502	1,440	1,680	1,788	1,362	1,300	1,588
B-III	2	8	8	8	14	32	12	30	38	14
C-I	82	88	130	144	102	114	60	38	32	54
C-II	158	124	130	112	142	198	202	208	180	154
C-III	0	0	0	0	4	4	4	0	2	0
C-IV	2	8	0	0	0	2	2	2	0	0
D-I	24	18	30	26	18	18	28	60	18	22
D-II	80	68	62	66	58	90	40	48	50	70
D-III	18	20	30	10	16	44	20	50	18	56
E-I	2	0	0	0	0	0	0	0	0	0
TOTAL	2,636	2,944	2,592	2,698	2,864	3,174	2,914	2,348	2,320	2,524

APPROACH CATEGORY (AAC)

AAC	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
A	286	406	358	580	772	652	450	330	474	422
B	1,984	2,212	1,852	1,760	1,752	2,052	2,108	1,612	1,546	1,746
C	242	220	260	256	248	318	268	248	214	208
D	122	106	122	102	92	152	88	158	86	148
E	2	0	0	0	0	0	0	0	0	0
TOTAL	2,636	2,944	2,592	2,698	2,864	3,174	2,914	2,348	2,320	2,524

AIRPLANE DESIGN GROUP (ADG)

ADG	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
I	588	656	558	670	670	720	652	498	616	442
II	2,026	2,252	1,996	2,010	2,160	2,372	2,224	1,768	1,646	2,012
III	20	28	38	18	34	80	36	80	58	70
IV	2	8	0	0	0	2	2	2	0	0
TOTAL	2,636	2,944	2,592	2,698	2,864	3,174	2,914	2,348	2,320	2,524

JETS AND TURBOPROPS

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Jets	1,104	1,254	1,056	944	1,010	1,366	1,238	1,060	1,024	1,116
TP	1,532	1,690	1,536	1,754	1,854	1,808	1,676	1,288	1,296	1,408
TOTAL	2,636	2,944	2,592	2,698	2,864	3,174	2,914	2,348	2,320	2,524

Source: TFMSC 1/1/2013 thru 11/30/2022 - Data normalized annually
Note: 2022 data from 12/1/2021 thru 11/30/2022

ARC - Airport Reference Code **TP/J** - Turboprop/Jet
TDG - Taxiway Design Group

Exhibit 2K
TURBOPROP AND JET OPERATIONS

The critical aircraft may transition to AAC D and ADG III in the future. The current FAA approved ALP plans for visibility minimums of ¾-mile, therefore, the future RDC for Runway 7-25 is **D-III-4000**.

APPROACH AND DEPARTURE REFERENCE CODES

The approach and departure reference codes (APRC and DPRC) describe the current operational capabilities of each runway and the adjacent parallel taxiways, where no special operating procedures are necessary. Essentially, the APRC and DPRC describe the current conditions at an airport in runway classification terms when considering the parallel taxiway. Runway 7-25 is served by full-length parallel Taxiway F, which is 365 feet from the runway centerline. This taxiway is planned to be reconstructed in the near future and have a separation distance of 400 feet. The runway/taxiway system meets the standards associated with the current and future APRC and DPRC.

CRITICAL AIRCRAFT SUMMARY

Table 2S summarizes the airport and runway classification for OXR. The current critical aircraft is defined by those aircraft in B-II-2A, and the future critical aircraft is D-III-2B. The current RDC for Runway 7-25 is B-II-5000, and the future RDC is D-III-4000.

TABLE 2S | Existing/Ultimate Runway Design Characteristics

	Critical Aircraft	Runway Design Code	Approach Reference Code	Departure Reference Code
Current	B-II-2A	B-II-5000	B/III/4000 D/II/4000	B/III D/II
Future	D-III-2B	D-III-4000	D/IV/4000 D/V/4000	D/IV D/V

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

SUMMARY

This forecasting effort has outlined the various activity levels that might reasonably be anticipated over the planning period, as well as the critical aircraft for the airport. Based aircraft are forecast to increase from 120 in 2022 to 167 by 2042, for an annual growth rate of 1.67 percent. Total operations are forecast to increase from 87,871 in 2022 to 110,173 by 2042, which is also an annual growth rate of 1.14 percent.

The critical aircraft for the airport was determined by examining the FAA TFMSC database of flight plans. The current critical aircraft is described as B-II-2A and is best represented small and medium sized business jets. The future critical aircraft is described as D-III-2B and is best represented by a large business jets.