Oregon currently has a total of 11 Category II airports, which includes one public-use heliport (Portland Downtown Heliport). The distribution of Category II airports throughout Oregon is a reflection of the state's physical geography, population centers, and the underlying market conditions required to support the full range of GA activity common to this type of airport.

More than half (6 of 11) of Oregon's Category II airports are located within 30 nautical miles of Aurora State Airport. The concentration of Category II airports in the Portland Metro area is consistent with the region's overall population and economic characteristics.

FAA Forecasting Process

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

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

Key Activity Elements

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

- Aircraft fleet mix;
- Peak activity;
- Distribution of local and itinerant operations; and
- Determination of the design aircraft (also referred to as the critical aircraft).

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

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

FLIGHT TRAINING

Flight schools are not required by FAA to report annual aircraft operations by airport. Although the ATCT aircraft operations counts do not distinguish between flight training activity and other air traffic operating in the vicinity of the Airport, Aurora ATCT staff were consulted to approximate the portion of local operations that are associated with flight training. In addition to the two locally based flight schools (with about 20 fleet aircraft combined), the Aurora ATCT manager indicates that aircraft from Hillsboro, Troutdale, and Twin Oaks airports operate at the Airport daily.

The Aurora ATCT manager confirms that 40 to 45% of the total aircraft operations at Aurora State Airport are related to flight training, noting that "Aurora State is so dynamic in its day-to-day operations and highly dependent upon the weather. This percentage may be higher in the summer months." It was also confirmed by the ATCT manager that most local operations at the Airport are flight training, and virtually all of those are runway related movements (touch and go, stop and go landings, etc.). The activity mix is consistent with historical ATCT operations counts and is reflected in the 2021 baseline operations total.

FIXED BASE OPERATORS (FBO)

Aurora State Airport currently has two full service fixed base operators (Atlantic Aviation and Willamette Aviation Services) offering fuel, aircraft hangar and parking space, and aircraft maintenance services for a full range of general aviation and business aviation users. The current level of service reflects the Airport's ability to support the local based aircraft fleet and attract transient aircraft, including business aviation users in a highly competitive market.

CHANGES IN DATA SOURCES AND METHODOLOGY

Several improvements in data sources, verification and methodology have occurred since 2012. The changes provide a more accurate definition of airport activity than presented previously. These changes, described below and previously in Chapter 2, are incorporated into the 2021 airport activity data that is the baseline for new 20-year aviation activity forecasts.

The updated data provides a more accurate picture of current activity at Aurora State Airport, and therefore the ability to develop more reliable long-term aviation activity forecasts. However, it is important to recognize that the recent improvements in data accuracy reduces the ability to draw definitive conclusions when comparing to previously-reported estimates or forecasts. As a result, it is recommended that the new aviation activity forecasts be reviewed using consistent data sources and the assumptions defined in each forecast model, rather than a comparison to previous forecasts.

BASED AIRCRAFT COUNTING METHODOLOGY

The FAA's method of monitoring an airport's based aircraft fleet has improved in recent years. Airport owners are now required by FAA to regularly update their locally-based aircraft totals through verification and submittal of validated counts through the FAA National Based Aircraft Inventory Program (www.basedaircraft.com). The coordinated reporting eliminates duplicated (aircraft counted at more than one airport) and inactive aircraft. The regular reporting also allows more opportunities to review and validate aircraft. Inactive aircraft can be added to an airport's validated count when reactivated in the FAA's system.

In late 2021, the ODAV State Airport Manager reviewed the based aircraft count for Aurora State Airport, previously updated in 2018. The evaluation was completed in consultation with the FAA Seattle Airports District Office in December 2021, and resulted in a new validated count of 281 based aircraft. The previous count was 349 based aircraft 2018. The reduction in the Airport's based aircraft total reflects a more precise verification of aircraft and removal of previously-counted aircraft located at two private heliports adjacent to Aurora State Airport.

Page: 3-10

Author: Timothy A House Subject: Highlight Date: 2/15/2023 2:40:34 PM -08'00'
Why weren't the flight schools contacted directly to get first hand ops information?

How long have the flight schools been in business? As mentioned above, local ops have increased significantly in the last 5 years, but Avgas fuel sales have declined.

Other than stating that the airport has two flight schools, there is no other information provided that would inform the basis for any future airport activity estimates.

Author: Timothy A House Subject: Sticky Note Date: 2/15/2023 2:41:24 PM -08'00'
CWE Response:
The composition of flight training at the Airport includes two locally based flight schools and schools located at other nearby airports. Since flight schools are not required by FAA to report annual aircraft operations by airport, data are not readily available. Although the ATCT aircraft operations counts do not distinguish between flight training activity and other air traffic operating in the vicinity of the Airport, ATCT staff were consulted to verify (through observation) the portion of aircraft operations that are associated with flight training.

The Aurora ATCT manager confirms that 40 to 45% of the total aircraft operations at Aurora State Airport are related to flight training, noting that "Aurora State is so dynamic in its day-to-day operations and highly dependent upon the weather. This percentage may be higher in the summer months." The Aurora ATCT manager also confirmed the OPSNET historical growth in local operations accurately reflects increased flight training activity. It was confirmed that most local operations at the Airport are flight training runway-related movements (touch and go, stop, and go landings, etc.). It was also confirmed that operations related to local area flight training (e.g., to/from VFR practice areas) are counted as itinerant operations since they exit the Class D airspace. The ATCT manager indicated that the rate of growth in local operations experienced at Aurora State Airport in recent years is not sustainable due to a variety of factors that are not formally quantified.

The activity mix is consistent with historical ATCT operations counts and is reflected in the 2021 baseline operations total. In addition to the two locally based flight schools (with about 20 fleet aircraft combined), the Aurora ATCT manager indicates that aircraft from Hillsboro, Troutdale, and Twin Oaks airports account for significant local operations. The aircraft not locally based do not regularly purchase fuel at the Airport since their home airports are located nearby.

A reduction in small non-flight training piston aircraft at the Airport attributed to the change to Class D airspace (ATCT) and the demolition of several T-hangars that were replaced with large corporate hangars is also consistent with historical AVGAS consumption. The increase in locally based piston flight training observed by the ATCT manager may have partially offset a deeper decline in AVGAS consumption attributed to changes in piston aircraft fleet size.

We will combine paragraph 3 with paragraph 1 to better describe the nature of flight training at the Airport.

Proposed Revised Text included in document.

Author: Michael Lawrance Subject: Sticky Note Date: 4/13/2023 12:42:34 PM
This response did not answer the question. There is still no information provided on the two flight schools and their operations. No discussion on their past growth nor their future plans for growth. With local ops being a significant driver of total airport activity, this information should be provided.

Author: msteele Subject: Sticky Note Date: 6/15/2023 2:22:37 PM
Added additional text describing conversations with flight schools personnel, what is known about their recent histories, and future plans.

Author: Timothy A House Subject: Highlight Date: 2/15/2023 11:54:02 AM -08'00'
HQ: While it's good that the BA numbers have been updated to more accurately reflect existing conditions, this section is silent on historically reported numbers. Without a discussion of historic based aircraft, there is no way to determine whether any of the BA forecast scenarios are reasonable.

Author: Michael Lawrance Subject: Sticky Note Date: 4/13/2023 12:48:02 PM
Comment not addressed.

Author: msteele Subject: Sticky Note Date: 8/25/2023 4:39:30 PM
We have added a section presenting and discussing the historic BasedAircraft.com counts provided by FAA.

The 2022 validated based aircraft count included the following adjustments to the previous inventory:

- Added new aircraft not previously entered (or assigned to the Airport) in the database;
- Removed aircraft that could not be physically verified on site;
- Removed aircraft that were also reported by other airports and could not be verified on site for 6+ months per year;
- Removed aircraft without current FAA registrations or airworthiness certificates; and
- Removed aircraft (21 helicopters) located at the nearby Columbia Helicopters Heliport (FAA Identifier: OR68) and the HTS Aurora Heliport (FAA Identifier: OR24).

Based on FAA facility criteria, it was determined that the two private heliports operate independently from Aurora State Airport since their aircraft do not require access to the runway-taxiway facilities. Historically, these aircraft have been included in previous airport master plan forecasts and data sets. Based on current FAA guidance, the off-airport aircraft at OR68 and OR24 are not be reflected in baseline data or new airport master plan forecasts for Aurora State Airport. In addition to the adjustment in based aircraft numbers, the Airport's ATCT aircraft operation counts were adjusted to reflect the separation of on- and off-airport activity. Additional information on ATCT operations adjustments is provided later in this chapter.

The current split between aircraft located on airport property and on adjacent privately-owned property with TTF access agreements was verified in the updated validated count. Both on-airport and TTF aircraft are included in the Airport's current and historical FAA validated counts since they all rely on the runway-taxiway system for their flight operations. It is noted that the FAA does not normally consider TTF aircraft as "based aircraft" at the airports they access and utilize. However, due to the fact that the TTF at Aurora State Airport do not have to cross a fence to enter the airfield and that the TTF facilities are seamlessly integrated with the Airport, the FAA has in this one instance, approved the TTF aircraft at Aurora State Airport has based aircraft. As noted earlier, helicopters located at the two private heliports adjacent to the Airport are not "TTF aircraft" and they are not included in current based aircraft counts for the Airport. This accounting is consistent with current FAA guidance, and it is a change from the previous FAA-accepted counting methodology used at the Airport. Prior to this airport master plan, these (non-TTF) helicopters were included in based aircraft counts for Aurora State Airport.

The new validated based aircraft count for the Airport was approved and accepted by FAA in January 2022. The FAA requires the January 2022 validated count (281) to serve as the common baseline for all based aircraft forecast models in the Airport Master Plan. Other existing FAA data sources reporting based aircraft (5010-1 Airport Record Form, Terminal Area Forecast, etc.) will be updated for consistency with the current validated count.

TABLE 3-5: BASED AIRCRAFT AND FLEET MIX

Aircraft Type	On-Airport	TTF	Total
Single Engine	45	175	220
Multi Engine	1	14	15
Jet	3	33	36
Helicopter	1	9	10
Total	**50**	**231**	**281**

Source: National Based Aircraft Inventory – January 2022

The January 2022 validated based aircraft count for Aurora State Airport is summarized in **Table 3-5**. The summary includes a breakdown of aircraft by types, consistent with FAA da[illegible]orting. Additional information on aircraft types and categories is provided on the following page. The FAA National Based Aircraft Inventory Program report (January 2022) for the Airport is provided in **Appendix 7**.

Page: 3-11

Author: Timothy A House Subject: Highlight Date: 2/15/2023 11:55:00 AM -08'00'
HQ: This methodology should to be applied to previous BA estimates, and the updated historic numbers (see attached Excel spreadsheet from basedaircraft.com) need to be presented here.

Author: Michael Lawrance Subject: Sticky Note Date: 4/13/2023 12:51:58 PM
Comment not addressed.

Validated numbers for the last 11 years provided separately. Those historic numbers (minus the adjustments to the helicopter counts) needs to be provided here.

Author: msteele Subject: Sticky Note Date: 6/15/2023 2:40:38 PM
The historic validated counts were received from FAA on 5/4/2023. These data and adjustments to the data are now presented and discussed in the next section.

Author: Timothy A House Subject: Highlight Date: 2/15/2023 2:46:00 PM -08'00'
ML: This is the case with any airport with TTF operations and is not the reason for including TTF as based aircraft.

It needs to be clearly stated here that FAA does not normally consider TTF aircraft "based" at the airport. However, due to the fact that the TTF aircraft at UAO do not have to cross a fence to enter the airfield, and that the TTF facilities (hangars, taxiways/taxilanes) are seamlessly integrated with the airport, the FAA in this one instance has approved the TTF aircraft to be considered based aircraft.

Author: Timothy A House Subject: Sticky Note Date: 2/15/2023 2:46:18 PM -08'00'
CWE Response:
We will add the clarification to the paragraph.

Proposed Revised included in the document.

Author: Michael Lawrance Subject: Highlight Date: 4/19/2023 1:41:17 PM
Update this table to reflect historic based AC numbers from validated spreadsheet (provided separately).

CWE has stated that historic counts are unreliable. This section needs to explain how the TTF operation works. How has the airport historically gathered BA numbers from the TTF operators? Are the land owners that built/rent the hangars required to provide info on their tenants? Were the land owners consulted to get historic records?

Author: msteele Subject: Sticky Note Date: 8/15/2023 3:29:28 PM
This table presents the validated based aircraft counts approved by FAA as our base numbers for this project. The count was finalized at the [illegible]2021. The historic counts provided by FAA reflect the based aircraft numbers as reported on basedaircraft.com on January 1 of each [illegible]ear. [illegible]e difference between the numbers in our approved 2021 base numbers and the 2021 historic numbers provided by FAA are [illegible]e they reflect different points of time in the year. Additional text describing the historic based aircraft numbers provided by FAA and the above described timing difference has been added to the working paper.

Single-Engine Piston (SEP) and Turboprop (SETP)
SEP aircraft have one piston-powered engine. SETP aircraft have one turbine powered engine used to drive the aircraft's propeller. Both or these types of aircraft are generally smaller and often used for flight training and recreational flying but may be used for municipal business trips. SETP aircraft are also commonly used by air ambulance (medevac) and air cargo service providers. Depending on weight and operator certification, these aircraft generally require only one pilot. Single-engine piston and turboprop aircraft are included in the "Single Engine" category on the FAA 5010-1 Airport Master Record Form and the FAA National Based Aircraft Inventory Program.

Multi-Engine Piston (MEP) and Turboprop (METP)
MEP/METP aircraft have two or more engines and are typically larger than SEP/SETP aircraft. Multiple engines make the aircraft more capable and require additional flight instruction beyond what is needed to operate an SEP/SETP aircraft. MEP aircraft are primarily used for personal travel, flight training, and business aviation. METP aircraft are used extensively in business aviation. Most MEP/METP aircraft may be operated with one pilot, but some larger aircraft may require two pilots. MEP/METP aircraft are included in the "Multi Engine" category on the FAA 5010-1 Airport Master Record Form and the FAA National Based Aircraft Inventory Program.

Jets
Jet aircraft have one or more turbofan/turbojet engines instead of a piston or turboprop engine. These aircraft range in size from small, four-passenger business jets to the largest airliners. They can generally fly faster and at higher altitudes than piston and turboprop aircraft, providing service capabilities (range, speed) comparable to commercial airliners. Some civilian jets are certified for single-pilot operation, although the majority of jet models require two pilots.

Helicopter
Helicopters have one or more rotors mounted above the cabin for lift and propulsion. Helicopters are commonly used for aerial firefighting, law enforcement, emergency response, medical evacuation (MEDVAC), flight training, and aerial inspection (pipeline, forestry, aerial agriculture, etc.). Helicopters may be piston- or turbine-powered, and depending on the complexity of the model, can be operated by one pilot or two.

Other
Some aircraft that are included in the categories noted above may further categorized by FAA based on their design category or type certificate.

- Experimental aircraft refer to kit airplanes built by users or third parties other than the original manufacturer. Experimental aircraft share many characteristics with SEP aircraft; the key differentiator is how and where the aircraft is assembled. These aircraft are commonly included in the "Single Engine" category in FAA airport records (5010, Based Aircraft Inventory), rather than "Other."
- Sport aircraft (also referred to as Light Sport Aircraft, or LSA) are airplanes that have a specific weight and maximum speed in level flight. Sport aircraft require less training and a less strict medical certificate to pilot the aircraft. These aircraft are listed in the "Single Engine" category in FAA 5010 airport records.
- Gliders are unpowered aircraft that are towed into flight and use thermal uplift to sustain altitude. Powered gliders are equipped with engines and are capable of takeoff without the aid of tow plane. These aircraft are listed in the "Gliders" category in FAA 5010 airport records.
- Ultralight aircraft weigh less than 155 pounds and do not require the pilot operating the aircraft to have a private pilot's license or medical certificate. These aircraft are listed in the "Ultralights" category in FAA 5010 airport records.

Source: Century West Engineering, FAA and industry terminology.

ANNUAL AIRCRAFT OPERATIONS

The addition of an ATCT at Aurora State Airport in October 2015 provides actual counts of aircraft takeoffs and landings during the 13 hours (0700 to 2000 hours) of daily operation. Overall aircraft operations data presented in the last Airport Master Plan were estimated and supplemented with limited instrument flight plan data. The ability to accurately estimate aircraft operations is greatly improved with actual data accounting for the majority of flight activity.

As described in Chapter 2, the 2021 baseline aircraft operations total was developed using actual air traffic control tower counts, with two specific adjustments. First, an adjustment was made to account for aircraft activity occurring during non-ATCT operating hours (2000 to 0700). Based on methods described in Chapter 2, off-hours IFR activity was estimated to account for 14% of annual operations, and off-hours and supplemented with activity was estimated to be 5% of annual operations. Combined, total estimated off-hours operations accounted for 6.4% of 2021 activity.

Page: 3-12

Author: Timothy A House Subject: Highlight Date: 2/15/2023 11:56:38 AM -08'00'
HQ: small aircraft per certification under Part 23; rather than smaller.

Author: Michael Lawrance Subject: Sticky Note Date: 4/13/2023 12:53:21 PM
ment not addressed.

Author: msteele Subject: Sticky Note Date: 8/15/2023 3:30:01 PM
Changed text as suggested

Author: Timothy A House Subject: Highlight Date: 2/15/2023 2:47:49 PM -08'00'
KD: True for SEP but not SETP. SETP has significant use in business; PC12 is the most commonly used aircraft (by ops) for aeromedical in the NAS, for example.

Author: Timothy A House Subject: Sticky Note Date: 2/15/2023 2:47:34 PM -08'00'
CWE Response:
We will update after "municipal business trips": *"SETP aircraft are also commonly used by air ambulance (medevac) and air cargo service providers."*

Table 3-9 summarizes the current Woods & Poole Economics forecast gross regional product (GRP) for Marion and Clackamas County for the 2021-2041 period that corresponds to the Airport Master Plan. GRP measures the market value of all goods and services produced in the defined region. As indicated in the data, strong GRP growth is forecast over the long term, with a similar slowing near the end of the forecast horizon.

TABLE 3-9: FORECAST GROSS REGIONAL PRODUCT

	2021	2026	2031	2036	2041
Marion County (millions)	$16,761	$18,397	$20,107	$21,874	$23,688
Percent Change	-	9.76%	9.29%	8.79%	8.29%
					CAGR: 1.7%
Clackamas County (millions)	$21,172	$23,348	$25,652	$28,067	$30,590
Percent Change	-	10.28%	9.87%	9.42%	8.99%
					CAGR 1.9%

Source: Woods & Poole Economics, Inc. Washington, D.C. Copyright 2021. Woods & Poole does not guarantee the accuracy of this data. The use of this data and the conclusion drawn from it are solely the responsibility of Century West Engineering, Inc.

Current Aviation Activity

Current based aircraft and annual aircraft operations data for use in developing new aviation activity forecasts are presented in **Tables 3-10 and 3-11**. The 2021 baseline totals will be applied to all 2021-2041 airport master plan forecast models.

TABLE 3-10: BASELINE BASED AIRCRAFT (JANUARY 2022)

Aircraft Type	On-Airport	TTF	Total
Single Engine	45	175	220
Multi Engine	1	14	15
Jet	3	33	36
Helicopter	1	9	10
Total	**50**	**231**	**281**

Source: National Based Aircraft Inventory – January 2022

TABLE 3-11: BASELINE AIRCRAFT OPERATIONS (2021)

	2021
Itinerant	
Air Taxi	2,006
General Aviation	36,390
Military	79
Subtotal	**38,475**
Local	
General Aviation	37,488
Military	65
Subtotal	**37,553**
Total	**76,028**

Source: Century West Engineering developed using FAA OPSNET Data

Page: 3-17

Author: Michael Lawrance Subject: Highlight Date: 4/13/2023 1:21:07 PM
Per the data from the site, the 1/1/22 validated number was 267.

Since we provided annual based aircraft counts for the past 10 years, update the document to reflect those numbers.

Author: msteele Subject: Sticky Note Date: 8/25/2023 4:34:32 PM
Per correspondence with ADO staff (email from Ben Mello on 1/12/2022) the FAA officially accepted the 2021 base numbers for based aircraft are as presented in Table 3-10. These numbers are the result of a comprehensive and detailed manual count of aircraft by ODAV management that was validated by FAA on 1/12/2022.

We have added a discussion of the historic National Based Aircraft Inventory data provided by FAA HQ on 5/4/2023 reflecting the January 1 totals in a new section following the "Based Aircraft Counting Methodology" section earlier in this chapter. The new dataset has been used to develop trend models as the timing of the annual totals does not impact the overall trends. However, as the historic counts provided represent an arbitrary point in time and do not reflect the detailed inventory completed by ODAV, we decline to change the base numbers to match.

Page: 3-21

TABLE 3-13: FORECAST BASED AIRCRAFT FLEET MIX

	CAGR	2021	2026	2031	2036	2041
Single Engine*	0.9%	216	229	240	250	259
Multi Engine Piston	0.0%	6	6	6	6	6
Turbo Prop	1.1%	13	14	15	15	16
Jet	2.3%	36	40	45	50	56
Helicopter	1.4%	10	11	11	12	13
Total Based Aircraft	**1.1%**	**281**	**300**	**317**	**333**	**350**

Source: Century West Engineering
*Includes Experimental/LSA

AIRCRAFT OPERATIONS

Eleven aircraft operations forecasts were developed based on a variety of models. The average annual growth rates for the models ranged from 0.5% to 3.6%. Five of the models were discarded after review; the remaining models are presented in **Table 3-14** and depicted in **Figure 3-5**. These forecast models are applied to the 2021 aircraft operations baseline data presented earlier in the chapter.

Historical Tower Counts Trend – This model uses the full six years (2016-2021) of adjusted ATCT airport operations data available to establish a best-fit linear trend line for the period. The model assumes steady linear growth year-over-year. Itinerant and local splits were based on 2021 operations counts. The model is limited by the short period from which to develop meaningful trend and operational events experienced during the COVID-19 pandemic (e.g., decreased business travel by corporations and increased flight training activity) may be disproportionately reflected in the resulting trend projection. The model results in an average annual growth rate of 3.6%.

The Historical Tower Counts Trend model was not selected as the recommended aircraft operations forecast, primarily due to the comparatively short period of ATCT data available to develop the projection. Also, as indicated by FAA at the beginning of the COVID-19 pandemic: *"Federal Aviation Administration (FAA) forecast approval will be based in reference to the data and methodologies used and the conclusions at the time the document was prepared. However, consideration must still be given to the significant impacts of COVID-19 on aviation activity. As a result, there is lower than normal confidence in future growth projections."*

Hybrid TFMSC Itinerant/FAA National Aerospace Forecast GA Local Operations Model – An earlier iteration of this model began with a 20-year (2001-2021) trend of TFMSC instrument flight plan data for the Airport. It is intended to establish a projected growth rate for the period. Itinerant and local splits were based on 2021 operations counts. Operational impacts experienced during the COVID-19 pandemic appear to dampen the overall trend. This early iteration yielded a reasonable correlation between the historical data to the derived trend line (R-squared = 0.72). The model results in an average annual growth rate of 2.4%.

However, while the TFMSC 20-year trend is a good indicator of itinerant activity, local operations are not captured in the TFMSC data. Based on this consideration, the model should be augmented to account for local activity, which includes predominantly airport traffic pattern activity conducted in visual flight rules (VFR) conditions.

Normally at a towered airport such as Aurora State Airport, a trend analysis of historical ATCT local operations would provide a reasonable indication of future growth potential. However, two unique factors significantly limit the ability to generate reliable airport-specific trend analyses for this forecast:

1. Limited Data Range. The limited number of years of ATCT operations (2016-forward) provides a reliable indication of individual year historical activity but does not provide a sufficient span of time needed to define reliable trends to build future activity projections. This is highlighted within the overall ATCT data, where local operations have experienced several significant upward and downward fluctuations during this period.

2. COVID-19. The FAA recognizes that the COVID-19 pandemic and the ongoing post-COVID recovery have created significant forecast uncertainty throughout the U.S. civil aviation system that reduces the level of confidence normally associated with airport master plan forecasting. The impacts of COVID-19 on activity at

Author: Timothy A House Subject: Highlight Date: 2/15/2023 12:36:42 PM -08'00'
ML: Six years of data is not sufficient to develop a 20-year projection.

Author: msteele Subject: Sticky Note Date: 8/18/2023 4:57:37 PM
This model has been discarded and the discussion has been moved to the discarded models appendix.

Author: Timothy A House Subject: Highlight Date: 2/15/2023 12:37:53 PM -08'00'
ML: Specifically, what operations events. And if the results are "disproportionately reflected" in the results, then why was this scenario chosen as one of the preferred?

Author: Timothy A House Subject: Sticky Note Date: 2/15/2023 12:38:05 PM -08'00'
CWE Response:
This model (Historical Tower Counts Trend) was not selected as the recommended aircraft operations forecast, primarily due to the comparatively short period of ATCT data available to develop the projection. Also, as indicated by FAA at the beginning of the COVID-19 pandemic "Federal Aviation Administration (FAA) forecast approval will be based in reference to the data and methodologies used and the conclusions at the time the document was prepared. However, consideration must still be given to the significant impacts of COVID-19 on aviation activity. As a result, there is lower than normal confidence in future growth projections."

Author: Timothy A House Subject: Highlight Date: 2/15/2023 12:48:46 PM -08'00'
ML: This scenario relies on limited data set (IFR ops) to project long-term total ops. No supporting data has been given to show the 20-year historical relationship between IFR and total ops. How can this be determined reasonable without that data?

Author: Michael Lawrance Subject: Sticky Note Date: 4/17/2023 11:37:49 AM
Comment not addressed.

Author: msteele Subject: Sticky Note Date: 8/25/2023 4:17:23 PM
This model has been discarded and the discussion has been moved to the discarded models appendix.

Author: Timothy A House Subject: Highlight Date: 2/15/2023 12:42:55 PM -08'00'
Show [illegible]s and inputs used.

Author: Michael Lawrance Subject: Sticky Note Date: 4/13/2023 5:17:50 PM
Comment not addressed.

Author: Michael Lawrance Subject: Sticky Note Date: 4/17/2023 12:59:42 PM
Additionally, how many regressions were performed and what variable data sets were used?

Author: msteele Subject: Sticky Note Date: 8/25/2023 4:17:11 PM
This model has been discarded and the discussion has been moved to the discarded models appendix.

Design Aircraft

The design aircraft (or critical aircraft) represents the most demanding aircraft, or family of aircraft with similar characteristics, using an airport on a regular basis and determines the appropriate AAC/ADG and airport design standards for airport development.

The existing and future design aircraft identified in the aviation activity forecasts corresponds to Aircraft Approach Category C and Airplane Design Group II.

- 2021 TFMSC data indicates that Aircraft Approach Category C and D operations exceeded the minimum of 500 annual operations required for Design Aircraft designation. While neither approach category alone reached the operations threshold, collectively they exceed the threshold and represent the most demanding family of high performance jet aircraft.
- Airplane Design Group II or larger aircraft operations also exceeded the 500 operations threshold required for Design Aircraft designation.
- AAC and ADG are independently justified through current activity levels, and the AAC/ADG C-II designation most accurately represents this segment of aircraft activity.
- Specific facility requirements, such as runway length requirements will be derived from the composite of Approach Category C and D jet aircraft reflected in FAA runway length planning tables.

Bombardier Challenger 601

Page: 3-27

Author: Timothy A House Subject: Highlight Date: 2/15/2023 1:12:43 PM -08'00'
KD: With similar characteristics

Author: Timothy A House Subject: Sticky Note Date: 2/15/2023 1:12:34 PM -08'00'
CWE Response:
We will change "…family of aircraft…" to "…aircraft with similar characteristics…"

Author: Michael Lawrance Subject: Highlight Date: 4/17/2023 1:54:43 PM
Table needs to be included with the raw data.

Author: msteele Subject: Sticky Note Date: 8/25/2023 4:15:11 PM
Added additional text and a table detailing the identification of C-II critical aircraft based on normalized TFMSC data.

Author: Timothy A House Subject: Sticky Note Date: 2/15/2023 1:13:36 PM -08'00'
AC 150/5325-4B Chapter 3 runway length tables are not correlated to C and D aircraft, pe se. Moreover, this forecast does not breakout the aircraft types needed to assess the 75% and 25%, including regular use in each, or the city pair data needed to assess 60% vs 90% payloads.

Author: Timothy A House Subject: Sticky Note Date: 2/15/2023 1:15:10 PM -08'00'
CWE Response:
We will provide an additional table to break out jet aircraft operations (including the critical aircraft) in the recommended forecast by operational categories that correspond to the AC 150/5325-4B Chapter 3 runway length tables.
**Table to be added when revised preferred operations forecast is finalized.

Author: Timothy A House Subject: Sticky Note Date: 4/17/2023 1:55:48 PM
KD: With the runway length calculations, there are departure obstacles requiring minimum climb gradients on both runway ends. Work with AJV to identify the obstacles then assess mitigation options.

AC 150/5325-4B chapter 3 assumes a no obstacle environment; if obstacles cannot be mitigated, the AC charts may not be valid.

Author: Timothy A House Subject: Sticky Note Date: 2/15/2023 1:16:03 PM -08'00'
CWE Response:
Noted. This assessment will be included the facility requirements chapter evaluation of runway length.

Operational Peaks

Activity peaking is evaluated to identify potential capacity related issues that may need to be addressed through facility improvements or operational changes. The Peak Month represents the month of the year with the greatest number of aircraft operations (takeoffs and landings). The Peak Month for most general aviation airports occurs during the summer when weather conditions and daylight are optimal. This also coincides with the busiest time of year for flight training and recreational flying. A review of FAA OPSNET ATCT operations counts identified July as the Peak Month in 2021, which accounted for 11.4% of annual operations.

The Design Day is a calculated metric that is representative of an average day in the peak month, which is calculated by dividing the total peak month operations by 30.5. The peak activity period in the Design Day is the Design Hour. For planning purposes, the Design Hour operations are estimated to account for 20% of Design Day operations.

Also of interest is the Peak Day. The Peak Day represents the busiest day that the airport experiences in a year. The Peak Day may or may not fall within the Peak Month. A review of the OPSNET Peak Day report identified June 16 as the Peak Day in 2021.

The operational peaks for each forecast year are summarized in **Table 3-20**. This level of peaking is consistent with the mix of airport traffic and is expected to remain relatively unchanged during the planning period. These measures of activity are considered in the facility requirements analyses when calculating runway/taxiway capacity and transient aircraft parking requirements.

TABLE 3-20: PEAK OPERATIONS

	2021	2026	2031	2036	2041
Annual Operations	**76,028**	**79,354**	**82,825**	**86,449**	**90,230**
Peak Month Operations*†	8,699	9,080	9,477	9,891	10,324
Design Day Operations (Average Day in Peak Month)	285	298	311	324	338
Peak Day Operations*††	459	479	500	522	545
Design Hour Operations (Assumed 20% of Design Day)	57	60	62	65	68

Source: Century West Engineering
* Adjusted OPSNET Data
† 2021 Peak Month identified as July
†† 2021 Peak Day identified as June 16

Design Aircraft

The design aircraft (or critical aircraft) represents the most demanding aircraft, or family of aircraft with similar characteristics, using an airport on a regular basis and determines the appropriate AAC/ADG and airport design standards for airport development. It is widely understood that the most demanding aircraft operating at Aurora State Airport are Jets. FAA AC 150/5000-17, Critical Aircraft and Regular Use Determination states that counts of jet operations provided by TFMSC data, once normalized as described previously, are considered representative of the total operations of this aircraft type which nearly always operates on IFR flight plans.

As noted in Chapter 2 - Existing Conditions Analysis, TFMSC data shows that an existing critical aircraft with an AAC of C and an ADG of II (herein referred to as C-II) is justified based on the 500 annual operations requirement. While operations by C-II aircraft specifically do not reach the threshold, there are more than 500 annual operations by AAC C aircraft and ADG II aircraft which meets the requirement.

To determine the future critical aircraft, the 2021 TFMSC operations by all AAC C and D aircraft, and all ADG II and II aircraft were projected forward across the 20-year planning period based on 20-year historical trends derived from TFMSC data. According to these projections, operations by C-II aircraft will remain below the 500 operations threshold through the planning period. However, similarly to the existing critical aircraft, there are sufficient operations separately by AAC C and ADG II aircraft to justify a future critical aircraft with an AAC of C and ADG of II (C-II). Sufficient operations by AAC C or ADG III aircraft are not anticipated to occur in the 20-year term. **Table 3-21** summarizes projected operations by AAC and ADG.