

3.0 CURRENT AND FORECASTED AVIATION ACTIVITY

This section documents the development of the aviation activity forecast for Birchwood Airport and describes the purpose of a forecast and the methods used to gather and analyze the data considered. The results of previous forecasts are summarized and compared to the findings of this forecast.

The purpose of an aviation activity forecast is to:

1. Establish the current operational demands of the airport.
2. Evaluate historical airport uses and trends that affect aviation activity at the airport.
3. Forecast future operational demands based on the current demand and historical trends.

Terminology

In aviation activity forecasting, the most critical metric used is aircraft operations. The total number of operations is studied based on the type of operation and the type of aircraft employed. Therefore, it is necessary to use the term consistently while developing the forecast. The following terminology defines the different types of airport operations discussed in this report:

Operations: The FAA guidance regarding what constitutes an operation is defined differently in the FAA Advisory Circulars (ACs), as follows:

- AC 150/5070-6B, Airport Master Plans, provides guidance for airport master planning, including demand-capacity analysis, and defines an aircraft operation as the landing, take-off, or touch-and-go procedure (FAA, 2015).
- AC 150/5000-17, Critical Aircraft and Regular Use Determination, states that only local and itinerant take-offs and landings qualify as operations for the determination of critical aircraft and regular use. The critical aircraft is the most demanding aircraft that regularly use the airport. The threshold to determine regular use is 500 annual operations. For the determination of design requirements on the airfield, touch-and-go operations and operations by federal government agencies are expressly excluded from operational counts (FAA, 2017b). In this forecast, the term aircraft operation matches the FAA definition in AC 150/5000-17 and refers only to the take-off or landing of a local or itinerant aircraft.

Touch-and-Go Operations: An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway.

- Training Operations: Most training operations, are touch-and-go operations, and not included in the operations count per AC 150/5000-17. The training operations are identified separately in the baseline forecast and are considered when evaluating airfield demand.

Itinerant Operations: These are operations to or from an airport using aircraft based at a different airport. For these visitors, transient parking is provided to allow pilots to park their aircraft at the airport for a short duration.

Local Operations: These are operations to or from an airport using aircraft based at that airport. For this report, pilots with an address in the MOA or the nearby Palmer and Wasilla communities are assumed to be based at Birchwood Airport. This method generates a slightly higher proportion

of Local Operations compared to a cross-reference between operational identifiers and based aircraft registrations. Based aircraft records only include active registrations, in which airport sponsors have reported Birchwood as their home base, which would exclude some local operations.

Air Carrier Operations: Air carrier operations are scheduled passenger or cargo operations provided by a certificated air carrier. Air carriers are required to report all their operations to the U.S. Department of Transportation’s (DOT) Bureau of Transportation Statistics (BTS) – Office of Airline Statistics monthly (U.S. DOT, 2007).

Air Taxi Operations: Air taxi operations are on-demand charter operations provided by a certified air carrier. Air taxi operators voluntarily report operational information through the Airport Activity Survey annually (FAA, 2021a).

3.1 Prior Forecasts

When preparing an aviation activity forecast, the FAA requires that Terminal Area Forecast (TAF), previous forecasts, and state or local aviation system plan forecasts be considered (FAA, 2015). For the Birchwood Airport, relevant data from the 2005 Draft Birchwood Airport Master (2005 Master Plan), the 2011 AASP forecast, and the FAA’s TAF forecast were considered and compared to the 2020 baseline data developed in this report. A discussion and comparison to each forecast follows:

3.1.1 2005 Draft Birchwood Airport Master Plan

The forecast covered a planning period from 2000 to 2020 and is shown in Table 11. This forecast was based on field observations collected by the FAA Air Traffic Division in 2000 and HDR in 2001.

In 2000, the FAA responded to a request for an air traffic control tower at Birchwood Airport by performing an air traffic count survey. The survey took place over 10 days, spread out between May 23 and September 1. The survey recorded 1,662 operations spread over 75 hours during the 10 days. The FAA did not differentiate between take-offs, landings, and training operations.

In 2001, HDR, Inc. performed an air traffic count survey over eight days between July 5 and September 4. This survey separated training operations from take-offs and landings. In all, 557 operations were observed over 41 hours during the course of eight days. Of the operations observed, 224 (40%) were training operations. The operations and training operations were used to develop an hourly average volume of operations and training operations. A yearly average was calculated by multiplying the hourly average by the number of annual daylight hours between civil twilight. Therefore, the 2005 Draft Master Plan included both operations and training related touch-and-go operations to develop the yearly baseline aviation activity estimate. The 2005 Draft Master Plan also assumed that one-third of the baseline traffic was local and two-thirds were itinerant. Military operations were determined based on the Airport Master Record showing “<1%” military operations.

The 2005 Draft Master Plan projected moderate growth forecast scenario that corresponded with the annual average population growth for the region of 1.2% per year in the 15 years before the 2001 base year. A summary of the 2005 Draft Master Plan is included in Table 11.

The 2005 Draft Master Plan found no air carriers were operating or anticipated to start operating at the airport and did not forecast any enplanements. Actual operation counts from the BTS were not available for Birchwood Airport, which confirmed that no reporting air carriers were providing scheduled service at the airport during that time.

The existing and ultimate critical aircraft for each runway was identified for the planning period. For Runway 02L/20R (then called 01L/29R), the current and ultimate critical aircraft was determined to be a B-II to accommodate a fleet mix of small aircraft, including Piper Navajo (B-I), Piper Aztec (B-I), and Beechcraft M18 (A-II). For Runway 02R/20L, the critical aircraft was identified as A-I based on a fleet mix of tundra tire or ski-equipped aircraft such as Piper PA-12 and Piper PA-18.

Table 11: 2005 Draft Birchwood Airport Master Plan

Aircraft Operations Forecast				
	Base Year Estimate		Projected	
	2000	2005	2010	2020
Air Carrier	0	0	0	0
Air Taxi	2,200	2,346	2,494	2,785
General Aviation	83,808	89,378	94,949	106,888
Military	100	107	113	127
Total Operations	86,108	91,831	97,554	109,000
Based Aircraft	435	491	509	560

In summary, the 2005 Draft Master Plan used data sets for observed airport activity to establish the base year level of operations. One of the data sets used (data collected in 2000) included training related touch-and-go operations, which resulted in a higher level of operations assumed in the base year. Current FAA guidance does not allow touch-and-go training operations to be used in critical aircraft determination. Therefore, the 2005 base year and forecasted operations cannot be used as an accurate comparison to the 2020 aviation counts gathered for this forecast.

3.1.2 2011 Alaska Aviation System Plan Forecast

The AASP is a planning document that establishes the vision for Alaska’s aviation network by addressing aviation infrastructure and policy needs. The AASP identifies airport improvements needed and establishes funding priorities. The AASP includes documents on the condition of the aviation system with photos, maps, and data and is continuously updated as planning, design, and construction projects are completed.

The AASP includes a statewide aviation activity forecast published in 2011, which consists of a high-level forecast for Birchwood Airport. The AASP forecast is based on the historical FAA data for hours flown and based aircraft in Alaska compared to the rest of the United States. The AASP forecast then uses the correlation between hours flown and based aircraft to estimate operations

for Alaska as a whole. Next, specific data for Birchwood Airport is derived from the number of based aircraft at the airport, which is derived from the FAA Airport Master Record data (5010).

The 2011 final AASP forecast reported that there is no reliable year-by-year record of based aircraft by borough or census area. Therefore, the number of based aircraft in each borough was assumed to increase with the population forecast for that borough/census area.

The 2011 AASP forecast includes forecasts for 2008-2030 for enplanements, operations, and based aircraft. The Cessna 185 was identified as the most common aircraft in Alaska based on registration records; it was therefore assumed to be the critical aircraft at airports that do not have commercial service.

Birchwood Airport lacks commercial service, so the Cessna 185 (A-I [utility]) was identified as the study period’s existing and ultimate critical aircraft. The AASP forecasted activity specific to Birchwood Airport is summarized in Table 12.

Table 12: 2011 AASP Forecast for Birchwood Airport

Aircraft Operations Forecast				
	Base Year Estimate	Projected		
	2000	2005	2010	2020
Air Carrier	0	0	0	0
Air Taxi	0	0	0	0
General Aviation	36,525	36,043	38,330	46,047
Military	0	0	0	0
Total Operations	36,525	36,043	38,330	46,047
Based Aircraft	307	316	330	367

Birchwood Airport was not one of the airports studied in detail when the AASP forecast was prepared for the State of Alaska, and no local counts were performed at Birchwood Airport for the AASP. The method used to establish base-level estimates in the AASP relied on statistical information for the State of Alaska and applied that information to Birchwood Airport based on the number of based aircraft reported in the 5010 Master Record. The information used for this forecast is based on recently observed operation levels at Birchwood Airport and provides more accurate and detailed information than what is available in the AASP.

3.1.3 2019 FAA Terminal Area Forecast

The FAA maintains TAF for non-hub airports using modeling based on the number of based aircraft present at the airport (FAA, 2019a). The TAF is the official FAA forecast of aviation activity for active U.S. airports in the NPAIS, including Birchwood Airport. The TAF is updated frequently based on historical traffic information. Birchwood Airport is a non-towered airport, so no direct traffic records are available from Air Traffic Control. With the lack of specific reported information, the TAF for Non-Primary Airports, such as Birchwood, is developed by applying a 0% growth rate for the duration of the study period from the baseline operation data obtained from the 5010 Master Record. The May 20, 2021, 5010 Master Record estimates 70,188 operations annually for Birchwood (FAA, 2021b).

The quality of the TAF forecast depends on the quality of the estimated aviation activity data entered into the Master Record. Without knowing the source of the operational data entered into the Master Record in 2011 and knowing that the TAF does not consider local economic trends, the TAF is not a sufficient forecasting tool for Birchwood Airport.

3.2 Air Traffic Forecast

The goal of an aviation activity forecast is to use observed trends at the airport to project the estimated baseline year operations forward to the end of the study period. The forecasted aviation activity is also used to determine the ultimate critical aircraft. In cases where the critical aircraft is expected to change, it is also important to estimate the timing of the change, as this may trigger the need to modify airport facilities, such as runways, taxiways, and aprons.

This aviation forecast will be used to 1) compare demand as it changes over time with the capacity of airport facilities and 2) identify the time or activity levels when new or expanded facilities are needed.

The baseline for the forecast was developed through the evaluation of air carrier reporting, recorded instrument flight plans, operational counts, and interviews with air carriers and airport users. The methods used for this forecast are further discussed in the forecast methodology section below.

3.2.1 Operational Traffic Counts

On July 21, 2020, DOT&PF installed an automatic air traffic counter at the combined airport maintenance building and fire station, which is located on airport property. Data was collected on the counter using a General Audio Recording Device (G.A.R.D.) – an activity counting tool produced by Invisible Intelligence, LLC. The automated counter collected and recorded radio transmissions and operations through radar surveillance based on active aircraft transponders.

The G.A.R.D. software can generate reports for hourly, monthly, and yearly airport traffic for a designated reporting period. The software cross-references transponders with the FAA’s Automatic Dependent Surveillance-Broadcast (ADS-B) registry to identify the particular make and model of the aircraft recorded. Aircraft without ADS-B transponders are assigned unique “S” codes when entering the radar surveillance area. No make or model information is available for aircraft recorded with “S” codes, and the aircraft information is represented as “unknown” on the traffic counter reports. Based on interviews with airport users, aircraft without transponders are typically small aircraft. Therefore, all “unknown” aircraft are represented as A-I (utility) aircraft for the purposes of this forecast.

The DOT&PF recorded aviation activity data on the airport for two recording periods. The first recording period lasted 27 days between July 21 and August 16, 2020. The second recording period lasted 31 days between September 2 and October 2, 2020.

The G.A.R.D. automated counting system logs triggering events. In the case of the G.A.R.D. system, radio transmission events are logged when the transmission occurs within a pre-set range from the airport. Each event is logged together with the location and ADS-B transponder code or S-Code. This method allows for the identification of aircraft make and model of all transponder-

equipped aircraft. Training operations are identified by measuring the time between operations for each distinct aircraft. When the same aircraft has multiple operations only separated by under 10 minutes, it is assumed by Invisible Intelligence, LLC that the pilot is practicing touch-and-go operations.

Roughly 80% of the recorded aviation activity was related to training related touch-and-go operations. Table 13 outlines the recorded training operations. While this information was not included in the operations count to determine the critical aircraft per AC 150/5000-17, it was considered when evaluating airfield demand.

The G.A.R.D automated counter recorded 1,330 operations over 27 days at Birchwood Airport from July 21 to August 16, 2020. The G.A.R.D recorded 618 operations during a separate reporting period spanning 31 days from September 2 to October 2. The activity count periods and results are summarized in Table 14.

Table 13: 2020 Touch-and-Go Training Activity Counts

G.A.R.D. Counts		
	<u>G.A.R.D. Count 1</u>	<u>G.A.R.D. Count 2</u>
Dates	7/21/20 - 8/16/20	9/2/20 - 10/2/20
Number of Days	27	19
Recorded Touch-and-Go Operations	5,875	2,341
Average Ops/Day	218	140

Table 14: 2020 Activity Counts

G.A.R.D. Counts		
	<u>G.A.R.D. Count 1</u>	<u>G.A.R.D. Count 2</u>
Dates	7/21/20 - 8/16/20	9/2/20 - 10/2/20
Number of Days	27	19
Recorded Operations	1,330	618
Average Ops/Day	49.5	32.5

An annual projection of yearly operations was developed by assuming that the two distinct reporting periods represent typical aviation activity levels in the summer months and winter months, respectively. Summer operations were assumed to occur during the 99 days between Memorial Day and Labor Day. Winter operations were assumed to occur during the 266 days between Labor Day and Memorial Day. Assuming 49.5 operations per day during the summer and 32.5 operations per day during the winter results in an annual average of 13,545 operations a year (Table 15).

Table 15: Estimated 2020 Operations

Summer vs Winter Activity			
	Summer Activity	Winter Activity	Yearly Activity
Assumed Duration	5/25/20 - 9/7/20	9/7/20 - 5/31/21	
Average Ops/Day	49.5	32.5	
Average Training Ops/Day	218	120	
Number of Days Assumed	99	266	
Extrapolated Subtotal Operations	4,900	8,645	
Extrapolated Subtotal Training Operations	21,582	31,920	
Estimated Annual Ops			13,545
Estimated Annual Training Ops			53,502

The G.A.R.D collected data was sorted based on the location of the owner’s residence to determine the ratio of local versus itinerant operations at Birchwood Airport. This information is reflected in Table 16.

Table 16: Operations by Aircraft Owner’s Address

G.A.R.D. Counts		
	G.A.R.D. Count 1	G.A.R.D. Count 2
Dates	7/21/20 - 8/16/20	9/2/20 - 10/2/20
Number of Operations	1,330	618
MOA and MSB Address	490	284
CAP	313	39
Other State	256	62
Unknown	271	233
Percent Local Operations	60.4%	52.3%

The amount of local and itinerant information presented above considers that the CAP uses local aircraft. These aircraft are not registered locally but are used by the local chapter and based at Birchwood Airport while on rotation to the local chapter.

Based on the information shown in Table 16, local GA operations are assumed to be between 50% and 60% of Birchwood Airport’s estimated operations.

Ski Operations

Additional G.A.R.D data was collected in March and April 2023 to estimate the number of aircraft that utilize Runway 02R/20L, which provided baseline numbers for ski operations. The G.A.R.D automated counter recorded 5,175 operations at Birchwood Airport from March 8 to April 31, 2023. The transponder data from the same time reflected that approximately 32.82% of the operations occurred on the ski runway, with the remainder taking place on the main paved runway. This operational distribution likely reflects a lower than actual utilization of the ski runway because the majority of the planes that utilize the ski runway are small, cub-style aircraft that are not typically transponder equipped. Conservatively applying the 31.82% distribution to the total operations results shows that approximately 1,035 ski operations occurred on Runway 02R/20L during the study period.

As stated above, 80% of the operations at the Birchwood Airport are training related touch-and-gos and not eligible to be counted for regular use. Therefore, only 20% of the 1,035 ski operations counted are assumed to be eligible operations. This is likely a conservative assumption considering ski-plane pilots do not tend to perform training operations on runways at the same frequency as normal summertime traffic. Ski pilots tend to be more experienced, while much of the normal summer touch-and-go traffic at Birchwood Airport is performed by student pilots and flight schools. However, conservatively applying the 20% factor to the 1,035 total ski plane operations results in 329 eligible ski operations during the reporting period—or 6.2 ski operations per day.

Assuming that local ski pilots are generally twice as likely to fly during the peak months of March and April as they are during the rest of the ski flying season of November through February, an average of 6.2 ski operations per day occurred during March and April, and an average of 3.1 ski operations occurred per day during November through February. This resulted in 329 ski operations from November through February and 391 ski operations in March and April, for a total estimate of 721 annual ski operations on Runway 02R/20L.

3.2.2 Scheduled Service/Air Taxi/Charter Traffic

Scheduled airport activity data is collected in the BTS’s “T-100 Domestic air carriers” database. All certificated air carriers that offer scheduled service are required to submit a report to BTS each month. FAA includes this information in the Air Carrier Activity Information System (ACAIS). On-demand-only operators are not required to submit monthly reports and, thereby, are not fully represented in the database. Birchwood Airport is not included in the “T-100 Domestic air carriers” database, indicating no scheduled passenger and cargo services operate at the airport. This lack of scheduled passenger and cargo operations at the airport was confirmed through interviews with the Airport Manager and airport users.

The FAA collects data for air taxi operations through the FAA “Airport Activity Survey of Air Taxi/Commercial Operators” (FAA, 2019b). This survey is completed annually voluntarily, and the results are contained in the ACAIS. Birchwood air taxi enplanements recorded in the ACAIS show that there were between 140 to 450 air taxi enplanements annually from 2003 to 2012. These enplanements were likely related to guided hunting and fishing trips operated by airport user Dennis Harm. Mr. Harm stated that he stopped flying for guide operations around 2012, and no enplanements were reported at Birchwood between 2013 and 2018. A total of six enplanements were reported in 2019, and zero enplanements were reported in 2020 (FAA, 2020d).

In 2022, there were five Part 135 operators that occupied lease lots and/or tie-downs on Birchwood Airport, including: Denali Flying Service, Nick’s Air Service, 70 Degrees North, Alaska Air Services, and Precision Plus. The team interviewed the owner of 70 Degree North, Precision Plus, and Nick’s Air Service to discuss how the Part 135 operators based at Birchwood currently use the airport. With the exception of Nick’s Air Service, it was reported that Part 135 operators generally use their hangars and tie-downs for aircraft storage and maintenance and do not operate out of Birchwood for passenger service. Nick’s Air Services operates a Piper PA-18 Super Cub and a Cessna 185 and offers sightseeing, bear viewing, and air taxi services.

Additionally, non-based operators, Lake Clark Air Services and Lake and Peninsula Airlines (Lake and Pen) were interviewed about how the Birchwood Airport is utilized by commercial operators

that are not located at the airport. Both operators are based at nearby Merrill Field Airport and operate scheduled and unscheduled flights to rural Alaska. The results of the interviews are as follows:

- Lake Clark Air stated that they fly into the Birchwood Airport between 12 and 20 times a year with their fleet (including, but not limited to Beechcraft 100 [King Air], Beechcraft-99 [Commuter], Beechcraft 36 [Bonanza], Piper PA-31 [Chieftain] and Cessna 207 [Skywagon]). This happens when ground fog at Merrill Field causes visibility to fall below minimums in the Anchorage Bowl but generally does not affect Birchwood. Lake Clark stated that this generally happens on returning flights when passengers are departing the aircraft and, therefore, does not include enplanements. Lake Clark also emphasized the need to maintain the existing runway length and width to ensure access for the larger commercial aircraft.
- Lake and Pen stated they primarily use the Birchwood Airport as an alternative when they cannot land at Merrill Field or AIA due to weather. Before upgrading their fleet (from VFR to IFR), Lake and Pen used the Birchwood Airport as an alternative airstrip with a similar frequency to Lake Clark Air. Between 2018 and 2022, with the upgrade to IFR, they estimated that they used Birchwood four to five times total, primarily with VFR Piper PA-18 Super Cubs. Lake and Pen stated that they direct any of their IFR-equipped aircraft to AIA when Merrill Field is not available due to weather.

Therefore, the six total enplanements reported on FAA “Airport Activity Survey of Air Taxi/Commercial Operators” for the baseline forecast (FAA, 2020d) is considered a low representation of recent air taxi activity. The addition of Nick’s Flying Services on the airport likely resulted in more enplanements, but the change is not significant enough to impact the master planning process.

3.2.3 Military and Other Air Traffic

Military Operations

In interviews, airport users indicated that there are currently no military operations at Birchwood Airport, which is also supported by the ownership information for the aircraft that was recorded by the G.A.R.D. There are no military operations in the recorded aviation activity data.

There were 16 operations the dataset by aircraft owned by the U.S. Department of Interior, Office of Aviation Services. Two aircraft were used in these operations, a Cub Crafters CC18-180 and a Cessna U206. FAA policy prohibits the inclusion of operations with military or federally-owned aircraft in critical aircraft determination (FAA, 2019b). These operations are considered federal/military operations in this forecast and are not included in the operational statistics under the respective category.

Helicopter Operations

Based on interviews, helicopter traffic at Birchwood Airport mainly consists of operations with helicopters based at other airports. The data from G.A.R.D. identified 18 operations during the recorded periods. The amount of helicopter operations does not rise to the level of critical aircraft.

The dataset also includes one helicopter operation with a Eurocopter AS 350 owned by the State of Alaska. As state agencies are not excluded from funding eligibility, this operation is included in the operational statistics in the forecast below.

Balloon Activity

The data from G.A.R.D. identified one operation by a balloon. Based on interviews, this operation appears to be an anomaly, and there is no balloon activity reported by airport users or DOT&PF M&O staff. Balloon operations are not included in the aviation activity forecast.

Glider Operations

Glider operators from CAP and the AMSA were interviewed during the development of this master plan. CAP operates the following three gliders based at Birchwood:

- LET L-23 Super Blaník (53-foot wingspan)
- Schweizer SGS 2-33 (51-foot wingspan)
- ASK 21(55.75-foot wingspan)

CAP stated that 2019 was a representative year for glider activity, with a total of 248 glider operations. CAP also stated that there are three additional privately owned gliders on the airfield that have occasional operations.

The AMSA is based out of the Wasilla Municipal Airport and was unable to provide records for how many glider operations they conduct each year out of Birchwood. However, AMSA stated that they would prefer to relocate their base of operations to Birchwood for two reasons:

- Proximity: Most of their members and anticipated member growth are Anchorage-based. It is a much shorter drive from Anchorage to Birchwood than to their current base in Wasilla.
- Meteorology: The proximity of the Birchwood Airport to the Chugach Mountains makes for a superior location for access to updrafts and lifts used by gliders.

To date, AMSA has been unable to locate suitable permanent or temporary tie-down space at Birchwood Airport. If tie-down space were available, the AMSA stated they would relocate their tow plane, training glider, and club single seat glider to the airport. Further, club members presently have two additional personal single seat gliders that would be also be moved and two more that are in the process of being restored for future use. Relocation of AMSR aircraft could result in as many as six additional gliders based at the Birchwood Airport in the future. Therefore, glider pilots represent a significant and unique airport user group that needs to be considered when planning future airport developments.

3.2.4 Based Aircraft and Fleet Mix

The airport Master Record shows that there are currently 308 aircraft based at the airport (FAA, 2021b). There are 119 leasable tie-downs on the GA aprons at the airport. The DOT&PF's Statewide Aviation Leasing Office records indicate that all of the existing GA tie-downs are regularly leased during the summer months. The DOT&PF Leasing also stated that there is existing demand for an additional approximately 20 additional tie-down spaces. A count of aircraft visible

in 2020 aerial photography shows 237 occupied tie-downs on the GA aprons and private lease lots. The visual count does not account for aircraft located inside hangars. A count of hangar doors on the airport buildings indicates as many as 136 hangar units. There could be as many as 373 based aircraft at Birchwood Airport, assuming one aircraft per hangar door. However, getting an accurate count would require access to all hangars and interviews with all tenants, which is beyond the scope of this study. Therefore, the current 5010 Master Record is considered to be the best source of data available for aircraft based at Birchwood Airport, and 308 based aircraft was used as the baseline for the forecast.

The aircraft fleet in this forecast was developed from the mix of aircraft reported by the G.A.R.D automated counter during the two periods of observation in the summer and fall of 2020 and confirmed with a series of interviews with airport users, tenants, and business owners. Training operations have not been included in the fleet mix data. The G.A.R.D fleet mix data is shown in Table 17 below.

Table 17: Aircraft Mix at Birchwood Airport 2020

G.A.R.D. Counts		
	G.A.R.D. Count 1	G.A.R.D. Count 2
Dates	7/21/20 - 8/16/20	9/2/20 - 10/2/20
Number of Operations	1,330	618
A-I	1,309	603
A-II	0	6
B-I	3	4
C-I	1	0
C-II	4	0
Helicopter	13	5
Military/Federal (A-I)	14	2

3.2.5 Forecast Methodology

There are several methodologies and techniques for forecasting aviation activity at an airport. These methodologies are described in an FAA document titled Forecasting Aviation Activity by Airport (FAA, 2001). The chosen methodology for this forecast is trend analysis and extrapolation.

The forecast methodology approved by the DOT&PF and the FAA in November 2020 consisted of comparing actual operation counts collected by the DOT&PF with the forecasted aviation activity reported in the 2005 Draft Airport Master Plan and the 2011 AASP to see if a correlation or regression analysis could be established. However, after comparing the 2005 Draft Master Plan, the 2011 AASP Forecast for Birchwood, and the aviation activity recorded by the DOT&PF in 2020, it was determined that there is no direct correlation between the two previous forecasts and the currently recorded data.

The lack of correlation between the data from the previous forecasts and the 2020 data is likely due to the varying methodologies used to establish the baseline forecasts. There is no clear correlation between the data points, and therefore, a regression analysis is unlikely to produce reliable data that can be used to forecast aviation activity at Birchwood Airport for the study period. This conclusion matches the conclusions from the 2005 Draft Master Plan and the 2011 AASP

forecasts, which also found that there is not a sufficient amount of historical aviation operation data available at Birchwood Airport to generate a regression analysis for a reliable forecast.

Likewise, using trends with based aircraft to establish a regression analysis at Birchwood Airport will also not produce an accurate trend line for future forecasting. The airport has been reported at maximum capacity for tie-down lease space since the conclusion of the 2005 Draft Master Plan, and the number of based aircraft has been limited by the tie-down and lease space available.

Therefore, the forecasting methodology based on historical population trends used in both the 2005 Draft Master Plan and the AASP remains the best indicator for future aircraft activity at Birchwood Airport at this time.

The majority of airport users at Birchwood Airport reside in the MOA or the MSB, as determined by a review of airport leases and G.A.R.D. recorded activity data. Therefore, DOLWD records of historical population and forecasted population, economic, and local aviation trends for the MOA and the MSB were used to project the 2020 baseline operations at Birchwood Airport.

3.2.6 Area Population and Economic Trends

A socioeconomic profile, prepared by Northern Economics in November 2020, relates GA and commercial aviation activity to the economic and demographic trends in the study area. According to the DOLWD, the population in the MOA – which includes Chugiak – and the population in the MSB are expected to continue increasing over the next decade as the number of births and in-migration exceeds the number of deaths and out-migration. The population and economic trends in the study area are discussed in Section 6.0.

Local economic conditions for the 20-year planning horizon are forecasted to remain much as they are today. According to airport users, the fleet serving the airport is unlikely to change. The DOLWD population forecast predicts population in the region will continue to increase at a rate of 0.6% between 2019 and 2045. Table 18 provides the DOLWD population forecasts for MOA and MSB (Northern Economics, 2021).

Table 18: DOLWD Population Forecast for MOA and MSB

	Population Forecasts					
	2020 - 2025	2025 – 2030	2030 - 2035	2035 - 2040	2040 - 2045	2020 - 2045
MOA	0.5%	0.3%	0.2%	0.1%	0.1%	0.2%
MSB	1.9%	1.6%	1.5%	1.3%	1.1%	1.5%
Study Area	0.9%	0.7%	0.6%	0.5%	0.4%	0.6%

3.2.6.1 Population

The rate of population growth in the MOA and MSB is anticipated to have a direct relationship with the level of aviation activity at the airport. Historical and forecasted population trends for the MOA and MSB are discussed in Section 2.4.

3.2.6.2 Economic Activity

The local Chugiak economy is tied closely to the economic conditions and opportunities within the MOA and MSB, especially the communities of Anchorage, Palmer, and Wasilla. The Chugiak

area is a residential area with little commercial or industrial activity. The economic trends in and around the vicinity are discussed in Section 2.4.

No new economic drivers have been identified for the Chugiak area, and the economic growth is anticipated to align with population growth for the study period.

3.2.7 Based Aircraft

The forecast for based aircraft assumes that the unmet need for tie-downs and lease lots will be satisfied over the next 10 years. This forecast considers an overall trend for based aircraft that matches the population trends shown for the 20-year planning horizon in Table 18. However, assuming additional apron areas are developed in the near term to satisfy the unmet demand, an additional 20 aircraft are added to the year five based aircraft forecast, above the overall growth trend projected. Also, assuming additional lease space will be available in approximately 10 years and that the majority of lease lots will be developed for single hangar use, an additional 25 aircraft are added to the year 10 based aircraft forecast, above the growth projected, to satisfy unmet lease lot demand.

3.2.8 Trend Line Development

Low, moderate, and high growth rates for air traffic at Birchwood Airport follow the trend lines developed by Northern Economics (Northern Economics, 2021). The low rate represents 32.4% of the baseline projection. The baseline projection aligns with the average combined growth rate for both the MOA and MSB. The high growth rate is scaled to 133.5% of the baseline projection.

There are no air carriers currently offering scheduled passenger operations from Birchwood Airport. Interviews conducted with airport tenants indicated only occasional air taxi operations occur. Since the variations are irregular from year to year, no change from the baseline enplanements is forecasted.

Table 19 presents the low, moderate, and high growth rates developed for Birchwood Airport air traffic forecasts for the study period (Northern Economics, 2021).

Table 19: Annual Growth Rates for Birchwood Airport 2020 - 2045

Years	Annual Growth Rate (Percent)		
	Low	Base	High
2020 - 2025	0.28%	0.86%	1.14%
2025 - 2030	0.22%	0.67%	0.89%
2030 - 2035	0.18%	0.57%	0.76%
2035 - 2040	0.16%	0.48%	0.64%
2040 - 2045	0.13%	0.39%	0.53%

Table 20 provides a forecast for Birchwood Airport. Note that the counts presented in the table do not include training operations.

Table 20: Air Traffic Forecast Birchwood Airport 2020 - 2040

	Air Traffic by Type				
	2020	2025	2030	2035	2040
Enplanements					
Low Forecast	6	6	6	6	6
Moderate Forecast	6	6	6	6	6
High Forecast	6	6	6	6	6
Based Aircraft					
Low Forecast	308	332	361	364	367
Moderate Forecast	308	341	378	389	398
High Forecast	308	346	387	402	415
Local GA Operations					
Low Forecast	8,056	8,165	8,249	8,323	8,386
Moderate Forecast	8,056	8,408	8,693	8,944	9,161
High Forecast	8,056	8,526	8,912	9,256	9,556
Itinerant GA Operations					
Low Forecast	5,489	5,563	5,621	5,670	5,713
Moderate Forecast	5,489	5,728	5,925	6,088	6,230
High Forecast	5,489	5,806	6,067	6,300	6,507
Helicopter Operations					
Low Forecast	118	120	121	122	123
Moderate Forecast	118	123	127	131	134
High Forecast	118	125	131	136	140
Operations - Total					
Low Forecast	13,545	13,728	13,870	13,993	14,099
Moderate Forecast	13,545	14,136	14,618	15,032	15,391
High Forecast	13,545	14,332	14,979	15,556	16,063

Note: Italicized text is used to indicate forecasted aviation activity.

Based on projections from a base forecast scenario, operations will reach 15,391 operations annually by 2040. Enplanements are not anticipated to change at Birchwood Airport.

3.2.9 Critical Aircraft

Aircraft with a MTOW of less than 12,500 pounds, an AAC of A, and an Aircraft Design Group (ADG) of I – that is A-I (utility) – make up 97-98% of operations at Birchwood Airport and are the only classification of aircraft with more than 500 operations annually. The A-I critical aircraft is the same for Runway 02L/20R and Runway 02R/20L. However, 2023 G.A.R.D counts estimated there are more than 500 annual ski operations on Runway 02R/20L, and the critical aircraft for that runway should be considered to be ski-equipped. Three aircraft models –Cessna 172, Cessna 180, and Cessna 182 – were projected to have more than 500 annual operations each based on 2020 interpolated recorded aviation data. These aircraft are A-I aircraft with MTOW of less than 12,500 pounds (utility). Therefore, based on the recorded operations and forecasted activity, A-I (utility) aircraft constitute both the existing and ultimate critical aircraft at Birchwood Airport.

Existing Critical Aircraft: A-I (utility)

Ultimate Critical Aircraft: A-I (utility)

The Approach and Departure Reference Codes (APRC/DPRC) for a runway are a measure of the largest aircraft that can operate on the runway while maintaining safety for aircraft simultaneously taxing on a parallel taxiway (FAA, 2014). Based on visibility minima and separation between the runway centerline and the parallel taxiways, the existing APRC is B/I(S)/4,000, and the ultimate APRC is B/II/4000. The existing DPRC is B/I, and the ultimate DPRC is B/II.