2.0 INVENTORY OF EXISTING CONDITIONS

HDL Engineering Consultants, LLC (HDL) conducted an onsite inspection of Birchwood Airport on June 23, 2020 (Appendix A). The focus of the inspection was to inventory and assess the condition of existing airport facilities. As part of the inventory, interviews were conducted with DOT&PF's Maintenance and Operations (M&O), DOT&PF's Statewide Aviation Leasing office, tie-down holders, leaseholders, hangar associations, CAP, the Alaska Mountain Soaring Association (AMSA) glider club, and based and non-based commercial operators.

2.1 Airport and Regional Overview

2.1.1 Regional Setting

The Birchwood Airport is in the Chugiak-Eagle River area, which includes the communities of Eagle River, Eagle River Valley, South Fork, Chugiak, Birchwood, Peters Creek, and Eklutna. The airport resides within the boundaries of the MOA and is 20 miles north of the Anchorage Bowl. Anchorage is the urban, economic, and transportation hub of the state and includes an international airport, as well as several smaller airports that serve commercial and private users.

Special Use Airspace Restricted Area R-2203, associated with U.S. Joint Base Elmendorf-Richardson (JBER), is located to the west of Birchwood Airport.

2.1.2 Community Overview

Birchwood is a neighborhood in the Chugiak-Eagle River area, primarily serving as a bedroom community to Anchorage. Historically, the Tanaina inhabited this land, which the Eklutna Tribe now represents. Eklutna, Inc., a Native corporation organized under the Alaska Native Claims Settlement Act of 1971, is the largest private landowner in Anchorage and owns much of the land adjacent to the airport.

Like many places in Alaska, the Anchorage and Chugiak-Eagle River areas have a robust flying community. However, the Birchwood Airport provides a unique service to pilots as an airport that primarily caters to general aviation and has airspace that is not controlled by Air Traffic Control under Visual Flight Rules (VFR) flight conditions. That, coupled with the low cost for users, offers pilots a convenience not found at other airports in the region. Users report it is a popular location for new and learning pilots due to the ease of access.

2.1.3 Land Ownership and Current/Future Adjacent Land Uses

The area surrounding the Birchwood Airport includes lands owned by a combination of MOA (west), Alaska Railroad Corporation (ARRC) (southeast), and private lands (Figure 2). The largest private landowners bordering the airport include Eklutna, Inc. (northeast and southwest) and Izaak Walton League, which houses the Birchwood Recreation and Shooting Park (BRSP) (northwest).

Municipality of Anchorage

The Ted R. Smith Tactical Training Facility for law enforcement is located on about 34 acres of land owned by the MOA. The training facility is located south of the BRSP and between Birchwood Airport and Cook Inlet.

Alaska Railroad Corporation

The ARRC owns two parcels of land next to the airport, primarily to the east. One is an approximate 14 acre vacant parcel, and the other is a 160-acre parcel that includes the railway. In addition to rail use, ARRC stores equipment, materials, and freight on the property. ARRC representatives said they have little interaction with the Birchwood Airport and do not currently have plans for development that would impact airport users. When interviewed in 2020, an ARRC representative said that the long-term plan is to increase access to the railyard and increase storage.

Eklutna, Inc.

As of 2023, Eklutna, Inc. owns 660 acres to the south and 40 acres to the north of the airport. When interviewed for the AMP in the fall of 2020, Eklutna, Inc. representatives reported their short- and long-term land use goals are to be "good land stewards" and "provide the most benefit to their shareholders as possible." Overall, Eklutna, Inc. representatives see the airport as a community asset and support land uses and related activities that benefit airport functions. In an August 24, 2023 letter to DOT&PF, Eklutna, Inc. clarified its position by stating that "At this time, Eklutna, Inc. has no plans to sell any of the property adjoining the airport. Although it may have been communicated that Eklutna's position in the past was to sell this land, we would prefer evaluating development of our adjacent parcels through efforts by our development and construction divisions. While some measure of real estate transactions may need to occur during airport expansion, we strongly feel we should have the opportunity to develop our land rather than cede it to a public entity." Additionally, a significant portion of the 660 acres owned by Eklutna, Inc. is protected from future development through a conservation easement. Only 134.5 acres of the 660 acres owned by Eklutna, Inc. southwest of the Airport is developable land. See below for additional information and map of the Fire Creek Estuary Conservation Easement (CE) (Figure 2).

Great Land Trust Held Conservation Easement on Eklutna, Inc. Lands

The Great Land Trust (GLT) holds the Fire Creek Estuary CE, located on Eklutna, Inc. lands (Figure 2). The CE is a legal agreement between the owner (Eklutna, Inc.) and the holder (GLT); the easement was recorded on August 31, 2012 (2012-049638-0, Anchorage Recording District). As holder of the CE, GLT holds a real estate interest in the Eklutna, Inc. Fire Creek Estuary property that runs with the land, is governed by real estate law, and defined by state statutes and Internal Revenue Service code. The CE retires all development rights for the property in perpetuity and prohibits the conveyance of any interest in the property to a third party that would reduce or negatively impact the CE or conservation purposes/values of the property. The property's conservation purposes/values are defined by Internal Revenue Code and apply to the entirety of the property. Any negative impact on any portion of the property's conservation purposes/values is considered a negative impact on the CE as a whole and is, therefore, in violation of the CE.

Birchwood Inert Waste Monofill

The Birchwood Inert Waste Monofill is located northwest of the airport and is owned and operated by the Izaak Walton League. The Monofill is used for the disposal of construction and demolition debris. The permit is "active" but expires on February 3, 2025. BRSP representatives stated that it is no longer being filled with debris.

Birchwood Recreation and Shooting Park

Land belonging to the Izaak Walton League borders the airport to the northwest and houses the BSRP. The park sits on about 87 acres of land between the Birchwood Airport and Cook Inlet. The park has about 3,200 members with varying daily usage. Overall, there is little conflict, if any, between park and airport users. The park entrance is directly across from the airport, so there is concern that any expansion of the airport could impact the ability for park users to enter and exit the property. Park leadership plans to expand the shooting range but does not have significant plans to change land uses in or around the park boundaries. Any expansion is planned within the current footprint of the park. Planned projects include constructing a path, boardwalk and foot bridges that would allow shooting from the perimeter toward the center of the BRSP area; construction of two paved access roads that will allow year-round use of BRSP facilities; and construction of berms in key locations to allow use of specific areas for fast growing two-gun and three-gun events.

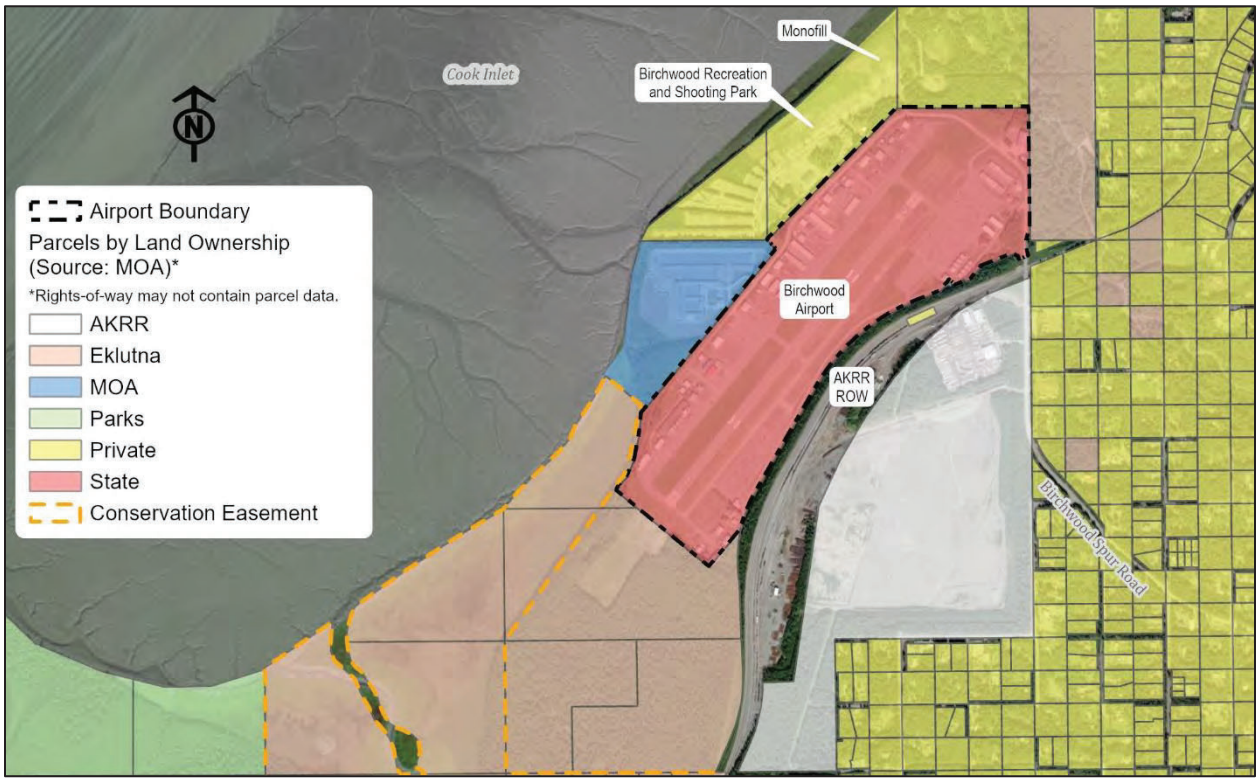


Figure 2: Land Ownership Adjacent to Birchwood Airport

2.1.4 Area Land Use Plan Goals and Zoning

Chugiak-Eagle River 2027 Long-Range Transportation Plan (2007)

The Chugach Mountain Bike Riders (CMBR), a Chugach-based non-profit, is spearheading an effort to develop the northern extension of the Coastal Trail, a 12-foot-wide multiuse soft-surface trail from Eagle River to Eklutna. The project is identified as one of 50 "Transportation Enhancement Recommendations" in the Chugiak-Eagle River 2027 Long-Range Transportation Plan (2007). The proposed trail runs from Beach Lake and continues up the coast and would span Fire Creek to Birchwood Spur via a connection along the airport. The CMBR has identified a preferred route located along the western side of the airport with a desired 50' trail easement to allow for trail development.

Chugiak-Eagle River Comprehensive Plan (updated 2006)

The 1993 Chugiak-Eagle River Comprehensive Plan (updated in 2006) applies to the Birchwood Airport and adjacent lands and recommends that land immediately surrounding the Birchwood Airport continue to be used as low-density residential and industrial areas or parks (Figure 3). The 2006 update similarly does not propose changes in use to the airport land or adjacent land and lists residential, industrial, and park development as priorities. The 2006 update predicts that Chugiak-Eagle River will continue to primarily have large-lot, single-family residential housing in the outlying areas, with some smaller subdivisions and multi-family housing in the central Eagle River area.

The 2006 update states that Eklutna, Inc.'s land in northern Chugiak-Eagle River includes the largest amount of suitable undeveloped land. In 2009, the Anchorage Assembly adopted a site-specific land use plan as part of the Chugiak-Eagle River Comprehensive Plan, the Chugiak-Eagle River Site Specific Land Use Plan. This site-specific plan (updated in 2018) largely focuses on the area of Carol Creek, about 12 miles southeast of the Birchwood Airport by road.

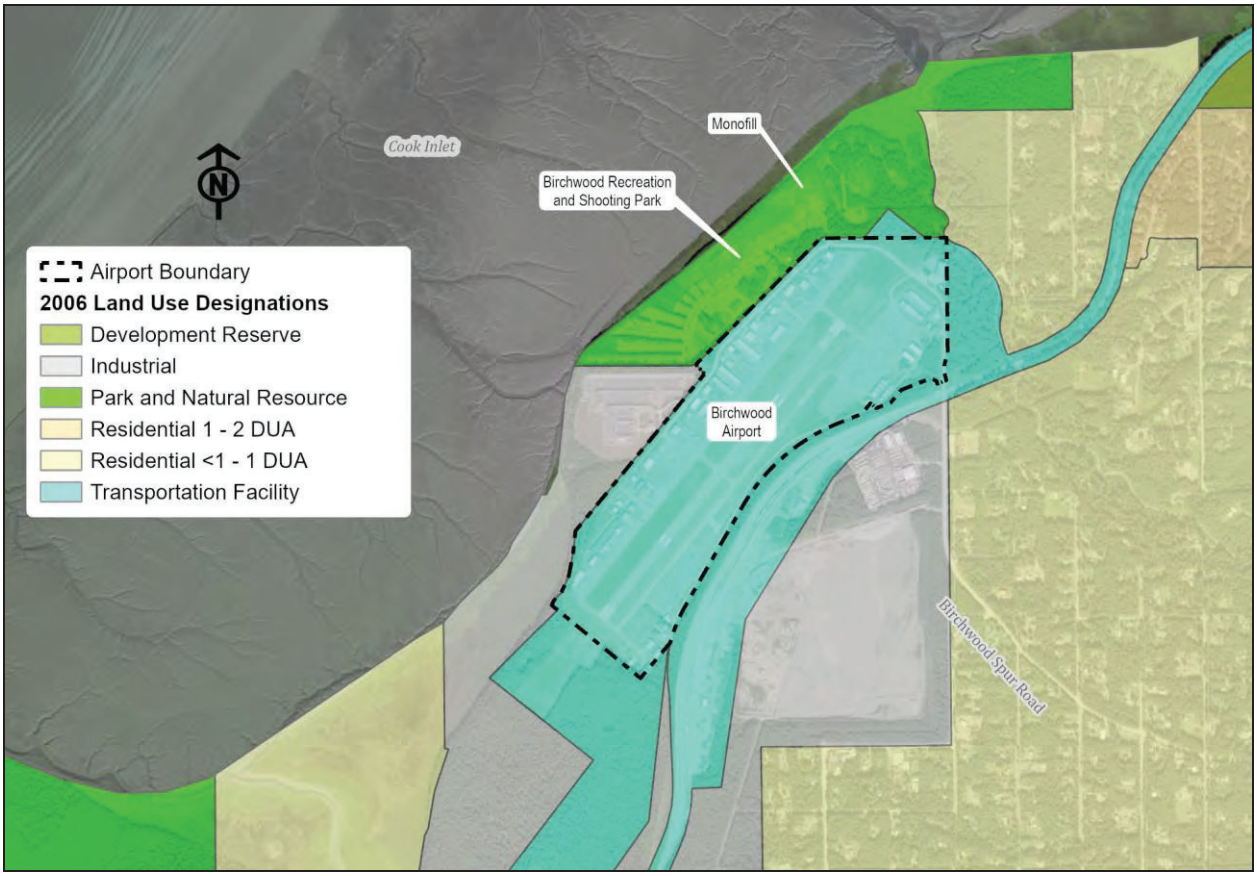


Figure 3: 2006 Chugiak Eagle River Comprehensive Plan Future Land Use

Municipality of Anchorage Title 21 Land Use Code

The MOA has an area-specific land use code in Title 21. Chapter 10 of Title 21 pertains explicitly to the Chugiak-Eagle River area (Figure 4). Below is a brief description of the relevant zoning as it pertains to the airport and potentially developable land south of the airport, owned by Eklutna, Inc., followed by broad descriptions of allowable use by zoning designation.

Through Title 21, the Birchwood Airport is zoned as "light industrial," which allows for public and private light and general manufacturing, processing, service, storage, wholesale, and distribution operations along with other uses that support and/or are compatible with industrial uses. Title 21 Chapter 21.10 states that "all development in the airport district shall be governed by a State of Alaska master plan."

An approximately 65-acre tract of land bordering the southern end of the airport is owned by Eklutna, Inc. and zoned as a combination of "Light Industrial" and "Rural Residential." Tracts further south are owned by Eklutna, Inc. and zoned for "Rural Residential." Within a 1-mile radius of the airport, there is land zoned for "Heavy Industrial," "Light Industrial," "Public Lands and Institutions," "Transition," and "Rural Residential."

Eklutna, Inc.'s land zoned "Light Industrial" would allow for airport expansion. The remainder of Eklutna, Inc.'s land in that area is zoned as "Rural Residential" (low-density residential) and would require rezoning before it could be developed for airport use. If Eklutna, Inc. were to consider a

land transfer or if development were proposed on that land, the Eklutna Tribe would assess those lands for cultural and archaeological assets prior to any development taking place.

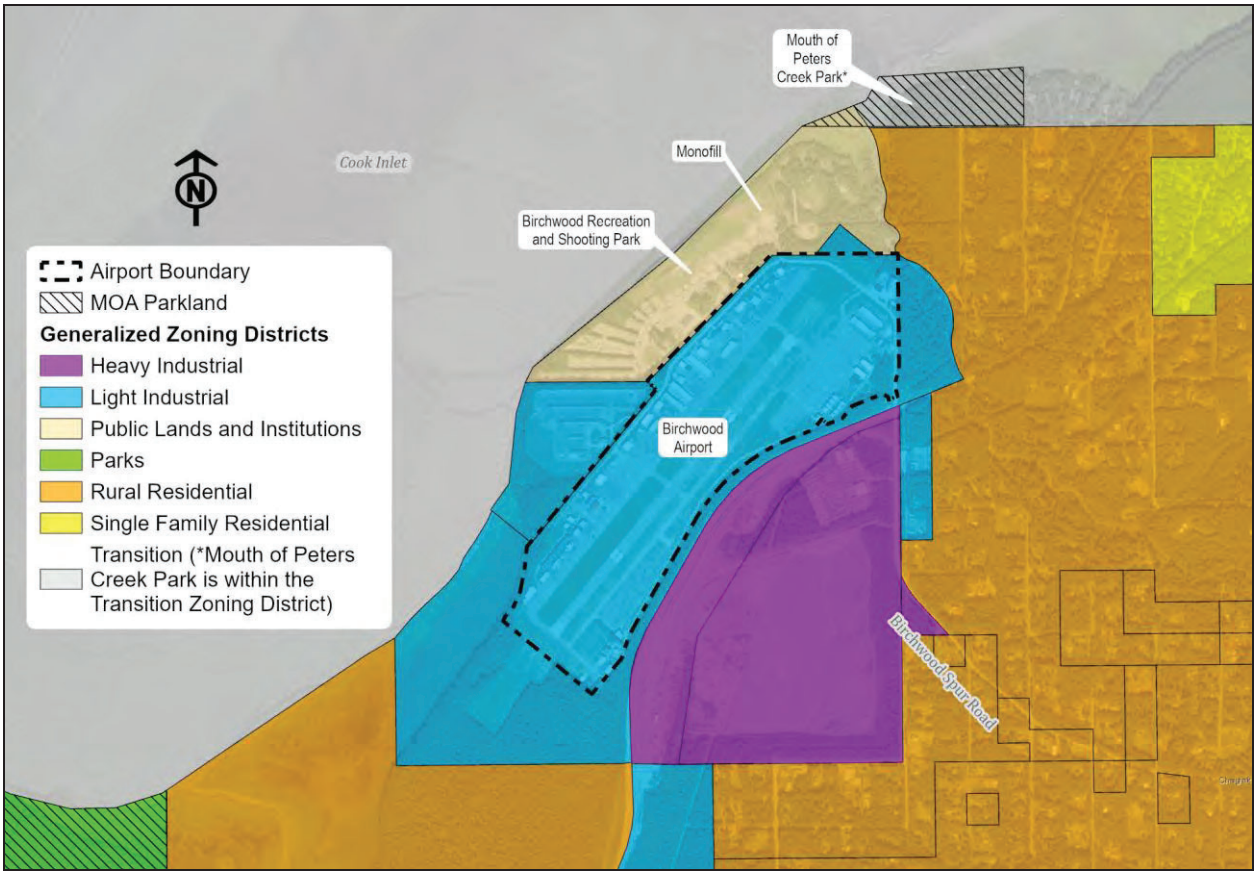


Figure 4: Municipality of Anchorage Zoning

There are three parcels of land designated as heavy industrial within a 1-mile radius of the Birchwood Airport, which are ARRC railway or are adjacent to the railway. Heavy industrial land use allows for public and private heavy manufacturing, warehousing and distribution, equipment and materials storage, vehicle and equipment repair, major freight terminals, waste and salvage, resource extraction and processing, and other related uses. Some commercial uses, which support or are compatible with industrial uses, are also permitted or conditionally allowed. Non-industrial uses are more limited than in other districts to prevent land use and traffic conflicts, retain a preserve of activities that are supportive of industrial establishments, and maintain and protect the supply of industrial lands within the municipality.

The Izaak Walton League Recreational Facility, containing the BSRP, abuts Cook Inlet and is zoned as Public Lands and Institutions. The Izaak Walton League is a national conservation organization. Public Lands and Institutions lands are designated for "major public and quasi-public civic, administrative, and institutional uses and activities."

The Cook Inlet shoreline northwest of the Birchwood Airport is zoned as Transition. The transition district, developed in the 1960s as the unrestricted district (U), was originally intended for areas that were not expected to be developed in the immediate future, and as development patterns occurred, were intended to be rezoned to more restrictive zoning classifications.

While low-density residential land surrounds the light and heavy industrial land around the Birchwood Airport on three sides, nearly all residential land is at least 1 mile from the airport footprint. Low-density residential is intended for those areas where natural physical features and environmental factors such as slopes, alpine and forest vegetation, soils, slope stability, and geologic hazards require unique and creative design for development.

Finally, the MOA has a stream protection setback ordinance in Anchorage Municipal Charter (AMC) 21.07.020. The stream setback for Peters Creek is 50 feet. The setback is measured from the ordinary high-water mark. As noted in Section 2.3, Environmental Resources, Peters Creek is also in a FEMA Mapped Floodplain, potentially necessitating a flood hazard permit for any proposed development in that area.

2.1.5 Existing Avigation Easements

There are four existing avigation easements located off airport property that allow DOT&PF to enter onto the grantor's property to clear obstructions to air navigation. The easements are depicted on Figure 18 and are described below:

- 8.04 acres located on Eklutna Inc. land south of the Runway 02L threshold, within the Runway 02L Runway Protection Zone (RPZ). This easement was reportedly granted to DOT&PF by Eklutna Inc. at no cost.
- 0.26 acres located on Izaak Walton League land north of the Runway 20R threshold, northeast of the Runway 20R RPZ.
- 2.15 acres located on Izaak Walton League land north of the Runway 20R threshold, which makes up the northeastern corner of the Runway 20R RPZ and the remainder of the RPZ that is not on airport property.
- 22.7 acres encompassing a parcel owned by the Municipality of Anchorage at the mouth of Peters Creek, approximately 2,000 feet northeast of the Runway 20R threshold. This easement is not contiguous with other easements or the airport property.

2.1.6 Emergency Use

Chugiak and Eagle River are located on the Alaska Highway System and are accessible via the Glenn Highway. There are significant bridge crossings on the Glenn Highway over the Matanuska and Knik Rivers north of Chugiak and over Eagle River south of the City of Eagle River.

Conversations with the Airport Manager and air taxi operators in the spring of 2023 indicated that residents and pilots considered Birchwood an emergency and/or alternative airstrip. In the case a large earthquake damages the Glenn Highway bridges, the airport can be used to provide access for emergency services to the Chugiak/Eagle River area. It is also considered an alternative airfield to Merrill Field by recreational and commercial operators, and Ted Stevens Anchorage International Airport (AIA) by some commercial operators when poor conditions at Merrill Field or AIA prohibit VFR operations.

2.1.7 Future Airport Expansion Opportunities

Opportunities to expand the airport footprint through potential land acquisitions are limited due to geographic and logistical constraints:

- Expansion to the east is highly unlikely, as it would require moving the existing railroad tracks owned and operated by ARRC. ARRC strongly opposed any expansion of airport lands in this area as it would unfavorably impact their operations.
- The land owned by the Izaak Walton Recreation League is zoned as "Public Lands and Institutions." However, given the small size and proximity to the ocean, it is an unlikely candidate for expansion.
- Expansion to the north is challenging. Peters Creek runs just past the airport's northern border. Further, the tract of land to the northeast is zoned as "residential."
- The best potential area for expansion is the land south of the airport, the approximate 660 acres owned by Eklutna, Inc., which includes a single tract of nearly 65 acres. If that land was acquired, it would provide an area for hangar and lease lot development and the potential for even further expansion to the south. As noted previously, Eklutna, Inc. is not in favor of selling its land but has expressed interest in developing its land to support future airport growth.

In summary, given the physical constraints and existing and intended future land use for areas adjacent to the airport, there are limited options to expand the current airport footprint. However, there are potential opportunities to support airport-related businesses and services within the existing footprint and on adjacent lands.

2.2 Description of Existing Facilities

2.2.1 History and Capital Improvements

The main runway at the Birchwood Airport was originally constructed in the 1940s as a backup airfield for the United States Army base, Fort Richardson, located approximately 12 miles southwest of the airport (Koehler, 2020). After being converted to civilian use in 1949 (FAA, 2020a), the runway was paved in 1972 and runway edge lights were installed (DOT&PF, 2020a). The following is a summary of the major development at the airport from 1977 through the present day. In some cases, these improvements were funded solely by the State of Alaska. In others, a large majority of the funding was provided through the FAA AIP, supplemented by matching funds from the State.

Year 1977: Parallel taxiways and associated connecting taxiways were constructed on the east and west sides of the runway. The Northeast and West Aprons were constructed as paved aprons, and the Southeast Apron was constructed with gravel surfacing. At the time, these aprons were identified as the West, East, and South Aprons, respectively. In addition, Birchwood Spur Road was paved to provide access to the west side of the airport (DOT&PF, 2020a).

Year 1979: The Snow Removal Equipment Building (SREB) was constructed using a grant from the State of Alaska. The grant included provisions to reserve two bays within the building for use by the Chugiak Volunteer Fire Department to store and maintain fire engines (Koehler, 2020) (DOT&PF, 2020a).

Year 1990: The Southeast Apron was paved and the Northeast Apron was expanded. Mandatory signs were added at the hold positions on all connecting taxiways. The Southeast Apron Road was paved, and a sand storage building was constructed adjacent to the SREB (DOT&PF, 2020a).

Year 2005 - 2006: A project was completed to replace the airfield lighting system. Runway edge lights and taxiway edge lights were replaced for Taxiways A, B, C, D, E, and G. Runway 01R/19L (currently Runway 023R/20L) was established on the center portion of Taxiway A, including pavement markings and threshold and runway edge markers. Edge markers were also installed on the southern portion of Taxiway A. Mandatory airfield signs were updated to include location signs. The project also included new constant current regulators and radio controls for the airfield lighting system (DOT&PF, 2020a). The DOT&PF also acquired a hydrostatic loader-mounted snow blower to perform snow removal.

Year 2013: Runway 02L/20R was resurfaced, and new runway markings were applied to the 20L threshold. The runway designations were revised from 01L/19R and 01R/19L to 02L/20R to 02R/20L (DOT&PF, 2020a).

Year 2019: Pavement was rehabilitated on the Taxiways B, C, D, E, and G and the Northeast and Southeast Aprons, and Transient Aprons. The project included the removal of pavement and base course material and replaced it with foamed asphalt-treated base course and 2 inches of asphalt pavement. The project also included the installation of new tie-downs on the rehabilitated aprons (DOT&PF, 2018).

Table 1 includes a list of FAA AIP grants for airport improvements at the Birchwood Airport since the initiation of the AIP in 1982.

Table 1: AIP Grants Accepted for the Birchwood Airport

Federal Fiscal Year	Grant #	Description	Amount
1987	3-02-0034-001-1987	Rehabilitate Apron, Acquire Land for Development, Improve SREB, Improve Access Road, Construct Apron	$ 986,385
2001	3-02-0034-002-2002	Conduct Master Plan Study, Phase 1	$ 220,196
2002	3-02-0034-003-2002	Conduct Master Plan Study, Phase 2	$ 185,718
2004	3-02-0034-004-2004	Install Runway Lighting 1L/19R	$ 767,093
2006	3-02-0200-055-2006	Acquire Snow Removal Equipment - Hydrostatic loader-mounted snow blower	$ 215,568
2006	3-02-0200-056-2006	Rehabilitate Runway 01L/19R (Maintenance)	$ 6,327
2007	3-02-0000-008-2007	Conduct Environmental Study Conduct Archaeological Survey for G2G and complete EA	$ 47,500
2008	3-02-0200-066-2008	Rehabilitate Runway 01L/19R (Maintenance)	$ 134,700
2009	3-02-0034-005-2009	Conduct Airport Master Plan Study	$ 151,080
2012	3-02-0034-006-2012	Rehabilitate Runway 01L/19R	$ 1,366,134
2012	3-02-0200-084-2012	Remove Obstructions	$ 220,196
2012	3-02-0200-087-2012	Rehabilitate Runway 01L/19R - Surface Preservation Maintenance	$ 71,400
2018	3-02-0034-007-2018	Rehabilitate Paved Portion of 02R/20L, TWs B, C, D, E, and G, NE and SE Aprons	$ 5,751,877
2018	3-02-0200-122-2018	Rehabilitate Runway 02R/20L- Apply Marking and Crack Seal to Runway 20L, and, incidentally, TWs and Apron	$ 73,342
2019	3-02-0200-124-2019	Various Obstruction Removal: Brush Cutting and Tree Removal in 2L RPZ, 20R RPZ, 20R Approach Surface and from fence line.	$ 986,385

Source: DOT&PF, 2020a

2.2.2 Pavement Condition

The DOT&PF performs Pavement Condition Index (PCI) studies of all paved airfield surfaces every three years. The last pavement condition study for Birchwood Airport was completed in 2021. The 2021 PCI values recorded for Runway 02L/20R and the paved taxiways are discussed in their respective sections below. In general, the following ranges apply:

- PCI of less than 70 indicates a need for corrective maintenance or pavement rehabilitation, such as patching and crack sealing
- PCI of less than 60 indicates a need for rehabilitation, such as resurfacing
- PCI of less than 40 is an indicator of the need for reconstruction

Birchwood Airport is due for an updated pavement condition report in the latter part of 2024.

2.2.3 Airfield

2.2.3.1 Runways

The existing airfield configuration consists of two runways: paved Runway 02L/20R and gravel Runway 02R/20L. The existing runway, Runway Safety Area (RSA), Object Free Area (OFA), Obstacle Free Zone (OFZ) dimensions, and other related information are summarized in Table 2.

Table 2: Existing Runway Conditions

	Runway 02L	Runway 20R	Runway 02R	Runway 20L
Visibility Minimums	Visual	Visual	Visual	Visual
Type	Visual	Visual	Visual	Visual
Category	Utility[1]	Utility[1]	Utility[1]	Utility[2]
Runway Design Group	B-II (utility)	B-II (utility)	A-I (utility)	A-I (utility)
Runway Length	4,012	4,012	1,802	1,802
Runway Width	100	100	50	50
Runway Shoulder Width	10	10	10	10
Runway Surface	Paved	Paved	1,200' Gravel/600' Paved[2]	1,200' Gravel/600' Paved[2]
Allowable Crosswind	13 kt	13 kt	10.5 kt	10.5 kt
Runway Safety Area				
- Length beyond departure end	240 [3]	240 [3]	240	240
- Length prior to threshold	240 [3]	240 [3]	240	240
- Width	150	150	120	120
Runway Object Free Area				
- Length beyond departure end	240 [3]	200 [3]	240	240
- Length prior to threshold	200 [3]	240 [3]	240	240
- Width	500	500	250	250
Runway Obstacle Free Zone				
- Length prior to threshold	200	200	200	200
- Width	250	250	120	120
Approach Runway Protection Zone				
- Length	1,000	1,000	1,000	1,000
- Inner width	250	250	250	250
- Outer width	450	450	450	450
- Area (acres)	8.035	8.035	8.035	8.035
Departure Runway Protection Zone				

	Runway 02L	Runway 20R	Runway 02R	Runway 20L
- Length	1,000	1,000	1,000	1,000
- Inner width	250	250	250	250
- Outer width	450	450	450	450
- Area (acres)	8.035	8.035	8.035	8.035
Runway Separation to:				
- Hold Position	125	125	125	125
- Parallel Runway	200 [4]	200 [4]	200 [4]	200 [4]
- Parallel Taxiway	200/300 [5]	200/300 [5]	N/A	N/A
- Aircraft Parking	330/380 [6]	330/380 [6]	125	125

[1] Utility runways are intended for use by aircraft less than 12,500 pounds gross weight (14 Code of Federal Regulations [CFR] Part 77, 2010).
[2] The northern 600 feet of Runway 02R/20L is surfaced with asphalt pavement, while the southern 1,200 feet is surfaced with gravel.
[3] The length of the RSA and OFA prior to the Runway 20R threshold is 240 feet. The length of the RSA and OFA prior to the Runway 02L threshold is 240 and 200 feet, respectively. The standard length for both the RSA and OFA prior to the threshold of a B-II runway is 300 feet. An existing fence crosses both the RSA and the OFA 200 feet prior to the threshold. This fence is an obstruction.
[4] The necessary separation between parallel runways during VFR conditions is 700 feet for simultaneous operations (FAA, 2014).
[5] The separation listed refers to 200 feet from the runway centerline to Taxiway A and 300 feet to Taxiway B.
[6] The separation listed refers to 330 feet to the Northeast and Southeast Aprons and 380 feet to parking on the west side of the runway.

Runway 02L/20R

Runway 02L/20R is a visual runway that measures 4,012 feet by 100 feet (Figures 5 and 6). The runway is classified as a utility runway and designed to accommodate Approach Category B and Design Group II aircraft. The runway surface was paved in 2013 and is in good condition. Runway pavement markings are worn (Figure 5). Results of the 2021 pavement condition study indicate that Runway 02L/20R received a PCI of 81, indicating that the runway only requires routine maintenance. The runway has non-precision pavement markings with runway threshold markings, runway designation markings, runway centerline, and runway edge markings.

The separation between paved Runway 02L/20R and gravel Runway 02R/20L is 200 feet, which does not meet FAA requirements for simultaneous operations. The required separation is 700 feet for simultaneous operations during VFR conditions (FAA, 2014).

Figure 5: Runway 20R

The runway has medium-intensity edge lights that were installed in 2005. The lights are operational and in fair condition but are near the end of their useful life.

Runway 02R/20L

Runway 02R/20L is a visual, gravel/ski utility runway designed to accommodate Approach Category A and Design Group I aircraft (Figure 6). The runway is classified as a utility runway and is frequently used by ultra-light aircraft and aircraft equipped with tundra tires in the summer and ski-equipped aircraft in the winter. The runway measures 1,802 feet by 50 feet. The southern 1,200-foot portion of the runway is surfaced with gravel and is in fair condition. The northern 600-foot portion of the runway is paved. The pavement in this area was replaced in 2019 and is in good condition. The runway is equipped with retro-reflective edge markers in fair condition. The paved portion of the runway is marked with visual runway markings, including the threshold bar, runway designator, runway centerline, and runway edge markings. Without runway edge lights, the runway is only available during VFR conditions, which limits the operations on this runway, especially during the dark winter months.

Figure 6: Runway 20L

02L/20R Runway Safety Areas

RSAs are specifically graded to allow a deviation from the runway surface without significant damage to the aircraft and risk of injury to the pilot and passengers. Both longitudinal and transverse grades are defined by FAA. The RSA should provide a suitable safety margin in case of over-shoots, underruns, and excursions adjacent to the runway. The RSA is required to be graded to minimum safe grades, be load bearing under dry conditions, and free of non-essential and non-frangible objects.

The RSA for Runway 02L/20R is 150 feet wide and starts 240 feet prior to the thresholds of Runway 02L and 20R. The standard length for both the RSA prior to the threshold of a B-II runway is 300 feet. The airport property line is located approximately 200 feet prior to the 02L threshold, and the RSA extends onto the neighboring property owned by Eklutna, Inc. (Figure 7). The Avigation and Hazard easement for the RPZ permits the passage of aircraft above the property and gives the airport the right to remove all objects protruding into the airspace together with the right to prohibit future obstructions or interference in the airspace. A non-frangible 5-foot perimeter fence is installed along the property line. Both airport users and M&O have indicated that they have safety concerns with the location of the fence in the RSA (Koehler, 2020).

Figure 7: Runway 02L Runway Safety Area

02R/20L RSA

The RSA for Runway 02R/20L is 120 feet wide and extends 240 feet onto Taxiway A beyond both runway ends.

Pilots expressed concerns with the maintenance of the RSAs for both runways. The main concern is that the RSAs and other grass infield areas contain alders and other small trees that are cut using "brushing" techniques. This method leaves 2-3 inches of the stems from the small trees protruding from the ground, which have the potential to puncture the tires of aircraft that deviate from the runway. Users requested that DOT&PF remove the brush from the RSAs and infield areas, reseed the areas with grass, and regularly mow and maintain the grass to provide a smooth, level area for aircraft to access in case of emergency. Glider operators, in particular, requested that the RSAs and infield areas be cleared of all unnecessary equipment and be better maintained in case glider pilots need to land unexpectedly in the infields. The glider operators stated that this is an important safety concern because a glider is committed to landing on short final and needs a safe area to do so if the planned runway becomes unavailable.

Runway Protection Zones

The RPZs for Runways 02L/20R and 02R/20L are outlined in Table 2. The RPZs for both runways have an inner width of 250 feet, an outer width of 450 feet, and a length of 1,000 feet. These RPZ dimensions are suitable for runways with an Aircraft Approach Category (AAC) of A and B and a maximum take-off weight (MTOW) of less than 12,000 pounds (utility).

The purpose of RPZs is to protect people and property on the ground from aircraft operations during final approach and initial take-off. The FAA requires that airport sponsors reserve the right to control the height of objects in the RPZ to ensure safety on the ground and in the air. FAA prefers that airport sponsors secure that right by fee simple ownership of the land inside the RPZ. When that is not possible, an avigation easement is acceptable.

The RPZ for the approach to Runway 02L is located on property owned by Eklutna, Inc. The DOT&PF has secured an Avigation and Hazard easement from Eklutna, Inc. to perform air hazard mitigation within the RPZ. Under the terms of the easement, trees can be cleared from the RPZ to remove obstructions.

A 2.15-acre portion of the RPZ for the approach to Runway 20R is located on property owned by the Izaak Walton Recreation League. The DOT&PF has secured an Avigation and Hazard easement from this private party.

The DOT&PF would elect to purchase the land within the existing easements and RPZs that fall outside of airport property if the respective owners ever decided to sell.

The RPZs for Runway 02R/20L fall in their entirety on airport property.

Runway Object Free Areas and Obstacle Free Zones

The OFA and OFZ for Runways 02L/20R and 02R/20L are outlined in Table 2. The OFA is an area on the ground, centered on the runway centerline. This area must remain free of all objects that are non-essential for air navigation and ground movement of aircraft. The OFZ is the volume of airspace located from the ground to 150 feet above ground level (AGL), within the dimension shown in Table 2. This area must remain free of non-essential objects, taxiing and parked aircraft, and other penetrations, except for frangible navigation aids, which have locations fixed by function.

The OFAs and OFZs for Runways 02L/20R and 02R/20L appear to be clear of non-frangible objects, with the exception of the perimeter fence south of Runway 02L/20R. The fence is non-frangible, approximately 5 feet tall and is located on the property line approximately 200 feet from the 02L threshold. Also, the presence of inline Taxiway A prior to the thresholds of Runway 02R/20L also makes it possible that taxiing aircraft could penetrate Runway 02R/20L OFA and OFZ.

2.2.3.2 Taxiways

Taxiway A

Parallel Taxiway A is located to the north and south and directly in line with Runway 02R/20L. A 1,802-foot-long section in the middle of Taxiway A was converted to Runway 02R/20L in 2005 (Figure 8). The northern 745-foot portion of the taxiway is paved. This paved section is equipped with MITL in fair and operable condition. A 240-foot segment of the paved section constitutes the RSA for Runway 20L, which was repaved in 2019 and is in good condition. At the time of the 2021 DOT&PF pavement inspection, the remainder of Taxiway A pavement (not within the Runway 20L RSA) was assigned a PCI of 27, indicating that it needs to be replaced. However, because the taxiway is in line with Runway 02L/20R, it is not eligible for improvement using FAA funds and was not rehabilitated as part of the 2019 project.

The south 1,360 feet of Taxiway A is in line with the approach to Runway 02R. This segment of the taxiway is surfaced with gravel and is in fair condition. The gravel taxiway area is delineated with edge marker cones.

During the inspection, it was noted that pilots approaching 02R regularly landed on Taxiway A prior to the threshold. The inline gravel taxiway creates a confusing sight picture for landing aircraft where the threshold and available landing area are not sufficiently defined on approach. As a result, aircraft landing on the taxiway presents an unsafe condition to both landing and taxiing aircraft and reduces available safety area and obstacle separation for aircraft on approach to Runway 02R.

Also, the separation between Runway 02L/20R and Taxiway A does not meet the required separation distance between the runway and parallel taxiway. The runway and taxiway are 200 feet apart. However, the FAA requirement for separation is 240 feet (FAA, 2014).

Figure 8: Taxiway A and Runway 20L

Taxiway B

Taxiway B is a full-length parallel taxiway that was repaved in 2019. The taxiway pavement and markings are in good condition. The West and Transient Aprons abut Taxiway B for its full length. MITL is installed on the east side of Taxiway B.

Connecting Taxiways

Taxiways C, D, E, and G connect the parallel taxiways to Runway 02L/20R. The taxiway dimensions are summarized in Table 3.The section of these taxiways located within the Runway 02L/20R RSA was rehabilitated when the runway was repaved in 2013. The remainder of the taxiways were repaved during the 2019 improvements. These taxiways have MITL and hold signs installed at all hold line locations. Taxiway E connects gravel Runway 02R/20L to Runway 02L/20R and is gravel. This taxiway is equipped with retroreflective edge markers.

Airport users expressed a need for a new connecting taxiway from Taxiway B to Runway 02L/20R, approximately halfway between existing connecting Taxiways E and G. A future taxiway, Taxiway F, is shown on the 2016 Ultimate ALP in this location.

2.2.3.4 Aprons and Aircraft Parking

Birchwood Airport has three primary aprons for based aircraft: the Northeast, Southeast, and the West Aprons. A Transient Apron also provides short-term tie-downs available to transient pilots. Apron sizes and the public tie-down spaces that are available on each are summarized in Table 3.

Table 3: Public Use Aprons and Tie-Down Spaces

	Size (SF)	Total Tie-Downs Available
Transient	31,640	7
Southeast Apron	192,075	39
Northeast Apron	390,080	80
West Apron	151,248	-

The Northeast Apron measures 424 feet by 920 feet and provides eighty 25-foot by 20-foot tie-downs for lease. A second set of wing tip anchors are installed at each tie-down space to accommodate larger aircraft. Taxilane access to hangar leases is provided north and east from the apron. The apron was rehabilitated and repaved in 2019 and the pavement is in good condition.

The Southeast Apron varies in width between 150 and 233 feet over its 1,000-foot length and provides thirty-nine 25-foot by 20-foot tie-downs for lease (Figure 9). The apron is primarily used by tenants with aircraft using "tundra tires" and skis that rely on Runway 02R/20L for their operations. The apron was rehabilitated and repaved in 2019 and the pavement is in good condition. Both the Northeast and Southeast Aprons have floodlights installed on light poles along the edge of the apron to illuminate the tie-down areas.

Figure 9: Southeast Apron

The paved portion of the West Apron measures 48 feet by 3,151 feet and consists of the area between Taxiway B and lease parcels on the west side of the airport. This apron is not used for aircraft parking. The southern 1,400-foot portion of the apron is surfaced with gravel in fair condition. The paved portion of the apron was reconstructed and paved in 2019, and the pavement is in good condition. Airport users have expressed the desire to pave the gravel portion of this apron to reduce foreign object debris on the adjacent taxiways.

The Transient Apron is located mid-field on the west side of Runway 02L/20R, with direct access to the pilots' lounge/flight planning station. A pay box for tie-down fees is located in the pilots' lounge. The collection of fees is based on the honor system. The apron measures 140 feet by 226 feet. Seven 25-foot by 20-foot tie-downs are provided for transient pilots. The apron was rehabilitated and repaved in 2019 and the pavement is in good condition.

All aprons currently serve A-I (utility) aircraft and are not designed to B-II aircraft standards. Airport users have expressed the need for additional large aircraft parking spaces to accommodate a limited number of glider and B-II aircraft. Users also expressed the desire for airport electrical outlets ("head bolt heaters") at GA tie-downs.

2.2.3.5 Lights, Markings, and Signage

Visual and Approach Aids

Runway 02L/20R has medium-intensity edge lights (MIRL) that are operational and in fair condition. The existing light fixtures were installed in 2005, are of incandescent bulb type, and extend 30 inches above the ground. During the inspection, DOT&PF M&O noted that the constant current regulator is overloaded and expressed their preference to switch to Light Emitting Diode (LED) style fixtures. The existing L-282 constant current regulators are single-phase. There are two regulators in use and one spare. The regulator labeled "Spare" was energized during the field investigation, but the regulator labeled "Runway" was not.

The electrical equipment building is located directly north of the north end of the West Apron. The space between the building and the nearest lease lot is limited. Access to the building is often blocked by the tenant's regular use of their lease lot.

Runway 20R is equipped with visual approach slope indicator (VASI), owned and maintained by DOT&PF. There are no approach aids on Runway 02L and some users have expressed a desire to install a new VASI or precision approach path indicator (PAPI) on that end of the runway.

There are no lighting or approach aids located on Runway 02R/20L.

Birchwood Airport's rotating beacon is installed on a 51-foot mast that was erected in 1977 (Figure 10). The overall height of the mast and beacon is approximately 62 feet. The mast and beacon are in good operational condition but should be maintained or replaced as needed in the future. The beacon allows pilots to identify Birchwood Airport during hours outside civil twilight by the green and white light emitting from the beacon. The beacon is located approximately 1,300 feet down Runway 20R and approximately 716 feet to the west between Birchwood Spur Road and the rifle range.

Figure 10: Rotating Beacon

A lighted wind cone with segmented circle markers is installed in the infield area between Runway 02L/20R and Taxiway B and between connecting Taxiways C and D (Figure 11). The wind cone was replaced in 2005 and is operational and in fair condition. The segmented circle markers are in good condition and were replaced during the 2013 Runway 02L/20R rehabilitation project. The segmented circle includes traffic pattern indicators directing circling traffic to the northwest of the field.

Figure 11: Segmented Circle and Lighted Wind Cone

An unlit, unofficial, supplemental wind cone is installed east of Runway 02R/20L. The wind cone is erected and maintained by local pilots and is not an official airport visual aid. The wind cone is installed on a moveable foundation and is in poor condition (Figure 12).

Figure 12: Supplemental Wind Cone

Signage

Mandatory and location signs are installed at Runway 02L/20R hold positions. The signs were installed in 2005 and are operational and in good condition.

Markings

Pavement markings on all runways, taxiways, and aprons are standard, with the exception of Runway 02L/20R, which is a visual runway but is marked as a non-precision approach runway. Runway markings on Runway 02L/20R were applied during reconstruction in 2013 and are worn and faded. Taxiway markings on the old portions of Taxiway A pavement are also worn and faded. Markings on other taxiways and aprons that were replaced after the pavement rehabilitation in 2019 and are in good condition.

2.2.4 Airspace

The airspace at Birchwood Airport is classified as Class E controlled airspace, shown in Figure 13 (FAA, 2020b), with a floor of 1,200 feet AGL and a ceiling of 18,000 feet AGL. Class G uncontrolled airspace is present below the Class E airspace from ground level to 1,200 feet. Class A controlled airspace is present above 18,000 feet. Birchwood Airport is located east of the controlled Class C and Class E Anchorage airspace and east of the Special Use Airspace Restricted Area R-2203B for U.S. JBER Air Force operations. To the north of Birchwood Airport is the Class

E controlled airspace for the Big Lake Airport, Wasilla Municipal Airport, and Palmer Municipal Airport. The Class E airspace at these neighboring airports has a floor of 700 feet.

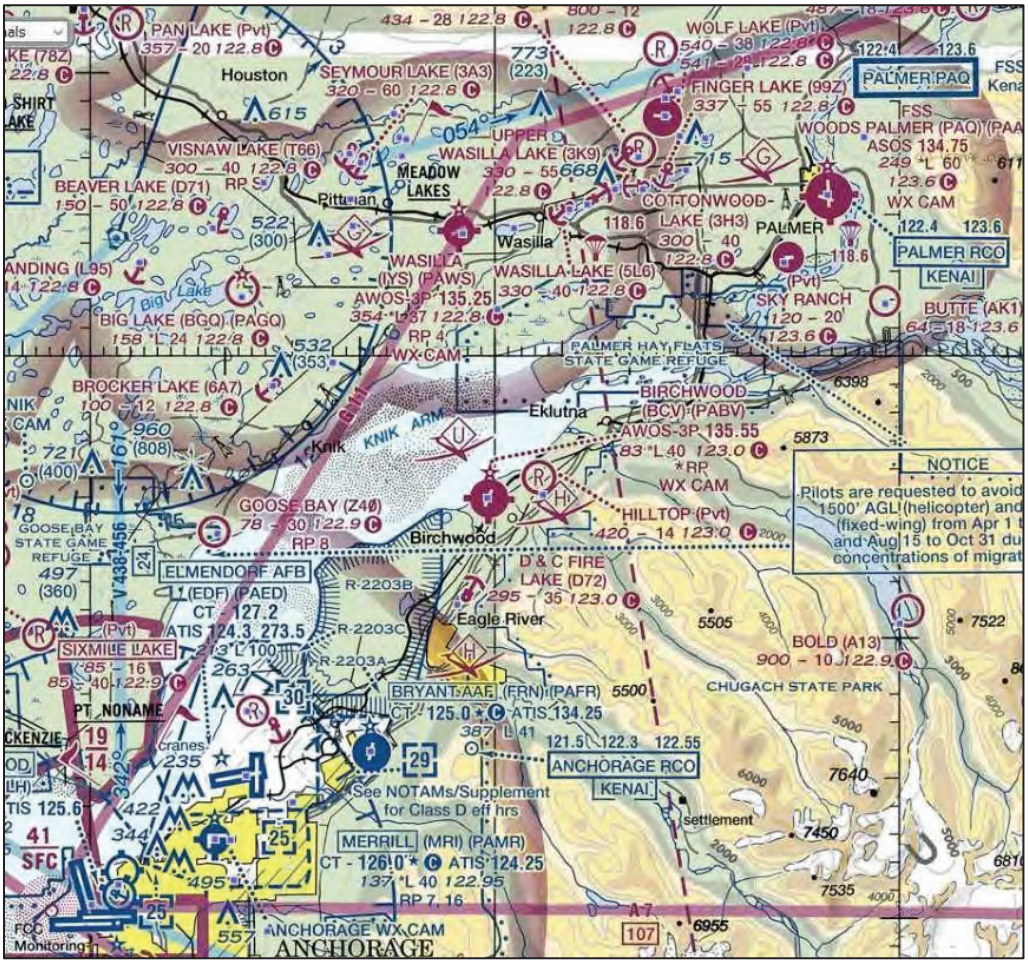


Figure 13: Birchwood Airspace Sectional Chart

Pilots operating under VFR in Class E airspace do not need to communicate with air traffic control and are required to have a minimum of 3 miles of visibility and must stay at least 500 feet below, 2,000 feet laterally, or 1,000 feet above cloud formations. If weather conditions prohibit VFR operations, pilots who are instrument equipped and rated may still operate in the airspace under Instrument Flight Rules (IFR). IFR pilots must file an IFR flight plan and be in communication with Air Traffic Control.

The Special Use Airspace Restricted Area R-2203B for JBER is in close proximity to the south end of Birchwood Airport. The airspace prevents extended approaches to Runway 02L. Pilots interviewed expressed the desire to adjust the limits of the restricted area to provide more available airspace south of the airport for approaches.

2.2.4.1 Air Traffic Patterns

Air traffic at the airport is not controlled by Air Traffic Control. Instead, pilots voluntarily report their position on a common traffic advisory frequency of 123.00 megahertz (FAA, 2020a). Fixed-wing aircraft use a rectangular pattern over the Knik Arm. The regular pattern utilizes right traffic

(aircraft turns to the right) for Runways 20L and 20R; left traffic (aircraft turns to the left) for Runways 02L and 02R (Figure 14). Ultralight aircraft use a rectangular pattern that turns to the southeast (toward the mountains) from all runways (FAA, 2020a).

The normal pattern altitude for fixed-wing aircraft is 800 to 1,000 feet above the airport elevation.

Helicopter traffic is less structured than fixed-wing traffic patterns and tends to fly direct to and from landing areas in this uncontrolled environment. The FAA Alaska Chart Supplement directs helicopters to avoid the GA and ultralight traffic pattern at the airport, and helicopters generally fly straight in from the east. No changes to helicopter traffic are proposed.

As shown in Figure 14, the training grounds for U.S. JBER are located south of Birchwood Airport. The airspace above the training grounds is a restricted area, R-2203B, to exclude all aircraft that are not participating in the military exercises. The restriction extends from ground level to 11,000 feet altitude mean sea level (FAA, 2020b). The restricted area is located 1.7 miles to the south of the airport, with the closest point approximately 1.5 miles measured radially from the Runway 02L threshold. The restriction is in effect between 0500 and 2400, Mondays through Fridays, and pilots can verify if the restricted area is in use by the military by contacting Anchorage Approach Control. Most pilots choose to avoid restricted airspace.

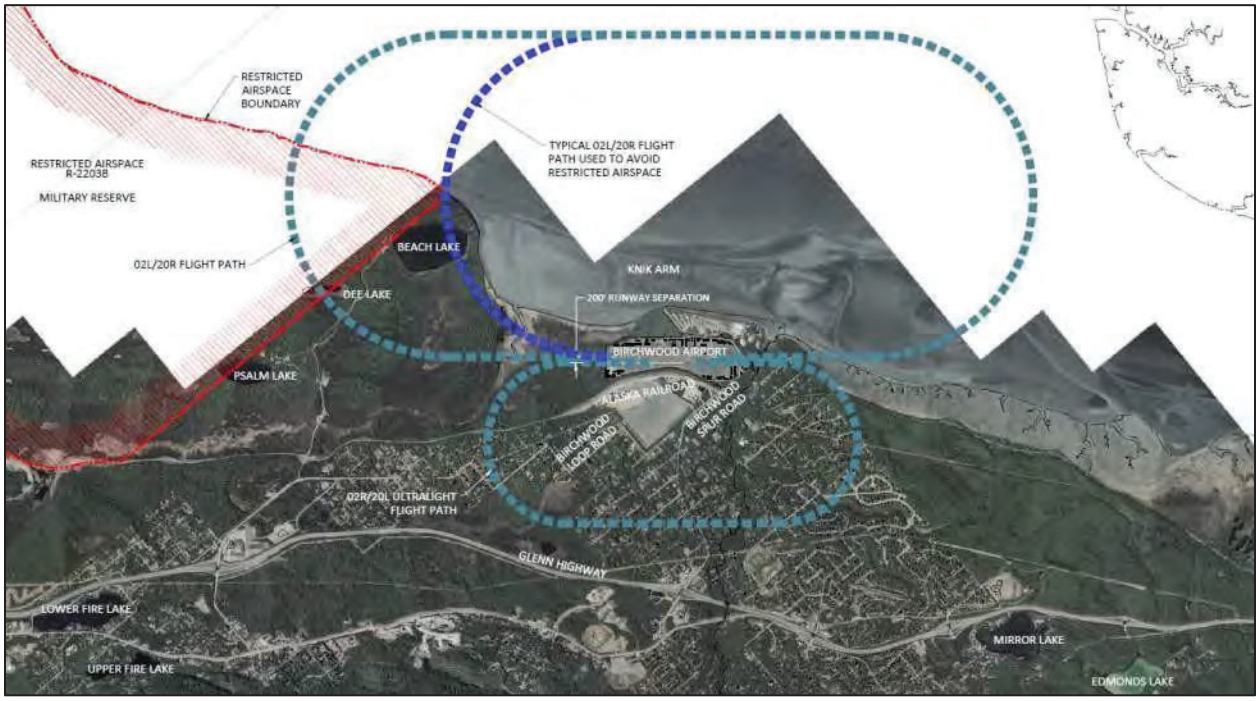


Figure 14: Traffic Patterns for Birchwood Airport

During interviews and public comment, users reported the following safety issues related to the existing use and traffic patterns at the Birchwood Airport:

- Pilots occasionally operate at the airport without broadcasting their intentions on the radio.
- Simultaneous operations have been witnessed on both runways.
- The similar designation between Runway 02L/20R and 02R/20L is confusing to some pilots, leading to inaccuracies when broadcasting their intentions for take-off or landing.

2.2.4.2 Approach and Departure Procedures

Birchwood Airport has no published instrument approach procedures. However, during interviews and public comment, a small number of users expressed the desire for DOT&PF to investigate the feasibility of establishing a published instrument approach to Runway 02L/20R.

2.2.4.3 Airspace: Part 77 Surfaces and Obstructions

The airspace for an airport is regulated by the FAA with regard to airport airspace (14 Part 77, 2010), threshold siting (FAA, 2014) (FAA, 2020c), and terminal instrument procedures (FAA, 2018). These regulations establish imaginary airspace surfaces and standards for determining obstructions to air navigation. The geometry and slopes of imaginary surfaces are governed by the airport category (Utility or Other than Utility), the type of instrument approach procedures planned, and visibility minimums. Utility runways are intended for use by aircraft with a gross weight of less than 12,500 pounds (14 CFR Part 77, 2010). All runways at the Birchwood Airport are currently visual utility runways. Table 4 summarizes existing airspace surfaces for the airport.

Table 4: Existing Part 77 and Threshold Siting Surfaces

	Runway 02L	Runway 20R	Runway 02R	Runway 20L
	(Visual, Utility[8])	(Visual, Utility[8])	(Visual, Utility[8])	(Visual, Utility[8])
Primary Surface	250' wide centered on runway to 200' off runway end	250' wide centered on runway to 200' off runway end	250' wide centered on runway to 200' off runway end	250' wide centered on runway to 200' off runway end
Approach Surface	5,000' at 20:1 from Primary Surface, width: 250'-1,250'	5,000' at 20:1 from Primary Surface, width: 250'-1,250'	5,000' at 20:1 from Primary Surface, width: 250'-1,250'	5,000' at 20:1 from Primary Surface, width: 250'-1,250'
Transitional Surface	7:1 from Primary and Approach Surfaces	7:1 from Primary and Approach Surfaces	7:1 from Primary and Approach Surfaces	7:1 from Primary and Approach Surfaces
Horizontal Surface	5,000' arc, 150' above airport elevation	5,000' arc, 150' above airport elevation	5,000' arc, 150' above airport elevation	5,000' arc, 150' above airport elevation
Conical Surface	4,000' at 20:1 outward from horizontal	4,000' at 20:1 outward from horizontal	4,000' at 20:1 outward from horizontal	4,000' at 20:1 outward from horizontal
Departure Surface	N/A[9]	N/A[9]	N/A[9]	N/A[9]

[8] Utility runways are intended for use by aircraft less than 12,500 pounds gross weight

[9] Runway departure threshold siting applies to runways used for instrument operations. Birchwood Airport has no published procedures.

Airspace obstructions identified during the 2020 aeronautical survey are noted below:

Runway 02L/20R

Trees penetrate the 20:1 Part 77 approach surface of Runway 02L by as much as 19 feet between approximately 629 and 1,512 feet prior to the threshold. Similarly, trees penetrate the 7:1 transitional surface on either side of the Runway 02L approach. The most severe penetration is by 47.7 feet, which occurs 678 feet prior to the threshold and 425 feet south of the centerline.

Approximately 11 trees also penetrate the 20:1 Part 77 approach surface of Runway 20R. These penetrations occur between 969 feet and 1,604 feet prior to the threshold, with airspace obstructions varying between 0.7 and 13.6 feet. There is one tree located 956 feet prior to the

threshold and 230 north of the centerline that penetrates the transitional surface by approximately 4 feet. There are several trees located south of the 20R approach surface in this area that penetrate the transitional surface by as much as 10 feet.

Trees located in the green belt between the airport property boundary and the railroad tracks, located on ARRC property south of the airport, penetrate the Runway 02L/20R transitional surface by as much as 36 feet. There are no penetrations to the transitional surface north of the runway.

Runway 02R/20L

Similar obstructions are present in the 20:1 approach surface of gravel Runway 02R and transitional surface south of the runway, as noted above for Runway 02L. The penetrations to the approach are caused by trees and vary between 19.3 feet and 6.8 feet of obstruction height. The obstructions within the transitional surface south of the runway are caused by trees and fencing located on the airport property boundary and adjacent property. The trees in this area penetrate the transitional surface of the gravel strip by as much as 60 feet. Also, a 15-foot-tall vehicle traveling on the Southeast Apron Road penetrates the primary and transitional surfaces of Runway 02R/20L by as much as 14.4 feet.

There are no penetrations to the transitional surface north of the runway or to the Runway 20L approach surface.

2.2.4.4 Navigation Aids

There are no navigational aids located at Birchwood Airport. If required, pilots rely on vectoring from nearby navigational aids. These include the very high-frequency omnidirectional ranges (VORs) at Big Lake and AIA and the Campbell Lake Non-Directional Beacon (NDB).

The airport is equipped with a Type III-B automated weather observation system (AWOS) located on the west side of the airfield, adjacent to the transient apron (Figure 15). It provides certified weather reporting for the airport. The AWOS is owned by FAA and maintained by the National Weather Service. The AWOS is reporting data and is in good condition.

The AWOS is located in very close proximity to the Transient Apron and CAP lease lot and presents a possible obstruction to taxiing aircraft. The AWOS is also located within 500 feet of nearby hangars, which does not meet FAA siting criteria for wind sensors (FAA, 2017a). These siting criteria include restrictions on obstructions such as vegetation and buildings that should be at least 15 feet lower than the wind sensor within a 500-foot radius of the sensor.

Figure 15: Automated Weather Observation System

2.2.5 Landside

2.2.5.1 Lease Lots and Buildings

The tenants at Birchwood Airport include a mixture of private airport users with individual tie-down or hangar leases; hangar associations; and aeronautical businesses such as aircraft parts and maintenance and commercial operator maintenance and storage facilities.

The Pilots Lounge is owned by DOT&PF and located on the edge of the Transient Apron. The DOT&PF does not maintain the building, and day-to-day cleaning and maintenance is performed by volunteers from the local Airport Association. The building construction was originally funded by a legislative grant in the early 1980s. The septic system recently failed and was reconstructed by DOT&PF in 2021.

The Birchwood Airport includes 67 lease lots. The FAA and DOT&PF occupy five of these lease lots for airport services. As of July 2022, all lease lots were occupied. Each lease lot has access to telephone, electric power, and natural gas.

As of July 2020, 119 tie-downs were available for use at the airport, all of which were occupied. The DOT&PF permits tie-downs but does not track subleasing of tie-downs. Currently, the tie-downs do not include electrical outlets, though pilots requested this amenity in interviews.

Vehicle parking at the airport relies on lease lots, aprons, and tie-downs due to the absence of designated public parking areas.

2.2.5.2 Terminal, Fixed Based Operations, and Fuel Facilities

Birchwood Airport has one fueling station. C2 Aviation, located on Lot 9, Block 500, provides a self-serve fueling station for 100LL. Jet fuel is not available. No inadequacies with the existing fuel service were identified during the site inspection.

2.2.5.3 Surface Access and Parking

Birchwood Airport is accessed from Birchwood Spur Road and Southeast Apron Road. Birchwood Spur Road was paved in 1977 and provides access to the west side of the airport. This road also provides access to adjacent residential areas, BSRP, an inert waste mono-fill, and the Ted R. Smith Tactical Training Facility for Law Enforcement. The road is maintained by DOT&PF highway maintenance crews. The road pavement is in poor condition and in need of resurfacing. However, due to the shared use, rehabilitation of the road is not eligible for FAA AIP grant funding.

The Southeast Apron Road was paved in 1990 and provides access to tie-downs and hangars on both the Northeast and Southeast Aprons.

Users expressed the need for a designated vehicle parking area with portable restroom facilities at the Northeast and Southeast Aprons. Because the Southeast Apron is used by ski-equipped aircraft and purposely not plowed in the winter, cars and trucks traveling or parking on the apron create ruts in tie-down areas and taxilanes. Pilots currently park their vehicles along the apron perimeter.

Internal vehicle circulation was a noted concern from airport users. Vehicles routinely travel through the CAP lease lot and Transient Apron to access aircraft, businesses, and hangars on the west side of the airport. Also, vehicles routinely travel on the taxiways and cross the runways or RSAs to travel from one side of the airport to the other. This creates a safety issue within the movement area. Users have expressed a desire to establish an access road around the south end of the airport to mitigate vehicle movement across the runways.

2.2.5.4 Utilities

Electrical service to Birchwood Airport is provided by Matanuska Electric Association, with the main feed being supplied overhead from a distribution pole east of the airport, adjacent to the ARRC right-of-way (ROW). The overhead electrical line transitions underground once it crosses ARRC ROW and reaches airport property. The primary underground line extends around the perimeter of the airport, creating a loop feed. Junction boxes are located at multiple lease lot lines, with service extended to the individual lease lots from the junction boxes.

Telecommunication service to the airport is provided by Matanuska Telephone Association. There are two main feeds that service the airport: one feed consists of copper and fiber optic cable (FO) and extends underground along Birchwood Spur Road; the second extends from north of the airport connecting at a manhole/cabinet just west of the ARRC ROW. From the manhole, FO and copper extend around the north end of the airport, with FO vaults and pedestals placed at multiple lease lot lines to provide service to the lots. The FO extends around the south end of the airport property, terminating near the southeast corner. The copper facilities extend through the lease lots along the west side before terminating and then extend from the manhole/cabinet site along the east side to the southeast end, where it terminates.

Natural Gas service is provided by the ENSTAR Natural Gas Company, with the main feed extending along Birchwood Spur Road in the form of a 4-inch diameter main. After crossing ARRC ROW, the 4-inch main transitions to a 2-inch diameter line, which loops around the airport and provides service to lease lots.

Commercial water and sewer are not available at the airport. Onsite wells and septic facilities are utilized for water and wastewater disposal and are permitted through the MOA Development Services Division.

2.2.5.5 Fencing and Security

A 7-foot perimeter fence is installed around the entire airfield. The fence is overgrown with vegetation and in need of maintenance and repair.

There are eight general-use gates (1, 2, 12, 18, 19, A, B, C) and 14 personal-use gates (3-11 and 13-17) located in the perimeter fence line. Airport access roads are equipped with access gates to separate landside transportation from the airfield. However, these gates are not currently used to restrict access to the field. Most gates are in poor condition and left in the open position. Users reported an increase in non-airport-related traffic and theft at the airport in recent years. However, airport users generally preferred that the gates remain open and are not in favor of locked gates with an access control system.

Moose and other wildlife are occasionally seen inside the airport fence. Some airport users interviewed suggested that one-way (outgoing only) moose gates be installed along the fence lines in the heavily wooded areas so that moose trapped inside the fence can find their own way out.

2.2.5.6 Solid Waste Recycling Options

Municipal solid waste collection is not available at the airport and leaseholders make their own arrangements for the collection and disposal of solid waste and hazardous materials. There are no reports of any issues with the disposal of solid waste and hazardous materials at the airport.

2.2.5.7 Maintenance

Maintenance at the Birchwood Airport is provided by the State of Alaska. During the summer, there is no dedicated airport maintenance personnel onsite. One DOT&PF employee is assigned to provide full-time airport maintenance in the winter. The DOT&PF maintenance personnel plows and maintains the paved surfaces and unpaved safety areas and performs routine maintenance on the airport property.

The DOT&PF maintenance building and SREB are located across the Birchwood Spur Road, to the north of the Northeast Apron. This facility is used to store and maintain state maintenance and snow removal equipment. The facility is shared with the Chugiak Fire Department for storage of equipment used to support airport rescue and firefighting activities. A sand storage building is located to the south of the maintenance building.

Maintenance vehicles include one front-end loader with a plow attachment, one snow blower, and one grader (Koehler, 2020). The DOT&PF intends to acquire a loader and a snow blower using AIP funding.

2.3 Environmental Resource Considerations

The following section has been developed in accordance with the FAA's AC 150/5070-6B, *Airport Master Plans*, which states that airport master plans do not typically require National Environmental Policy Act (NEPA) process. The master planning process involves identification of sensitive environmental resources in the vicinity of the airport and environmental considerations associated with future development proposed as part of the design alternatives. For the purpose of this environmental overview, reference to the Birchwood Airport includes the area within the airport property boundary, while reference to "the vicinity" is defined as the area within the airport property boundary as well as the Birchwood Community Council boundary (Figure 16).

The evaluation of potential environmental impacts has been carried out to the level necessary to compare how each alternative may involve sensitive environmental resources. Research of existing online databases and readily available information was conducted on September 15, 2020 (unless otherwise noted) to identify environmental resource categories that are present on or in the vicinity of the airport. Future development of the airport will require a more detailed impact analysis per the FAA's NEPA guidance. FAA Orders 1050.1F and 5050.4B outline the FAA's environmental review requirements.

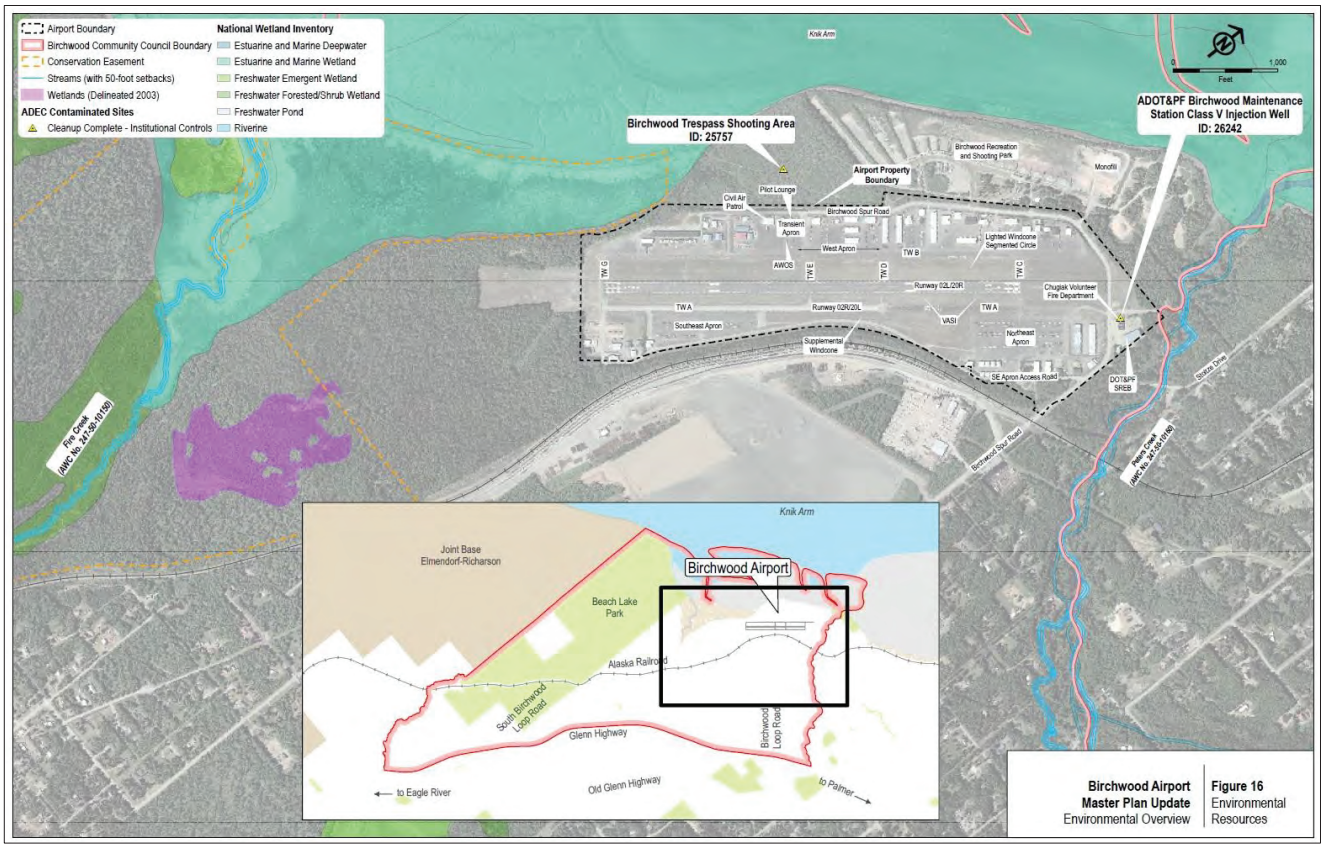


Figure 16: Environmental Resource Review Area

2.3.1 Historic Properties, Archeological, and Culture Resources

The Tanaina, a group of Native American Indians, originally inhabited the area several hundred years ago. They are current represented by the Eklutna Tribe, many of who live in the village of Eklutna at the northern end of the Chugiak-Eagle River area. These people lived by subsistence and moved from place to place seasonally for hunting and gathering food. Most settlements were located on the western side of Cook Inlet or on the Kenai Peninsula. A small group of Tanaina inhabited the eastern side of the Knik Arm. Traditional lifestyles for the Tanaina began to change around the turn of the 19th century as a result of traders and prospectors.

The federal government and the construction of the Alaska Railroad have principally defined the modern history of the Birchwood area. Subsequent developments included the Glenn Highway. Settlements patters were influenced through the federal government's homesteading programs; the development of two military installations (Fort Richardson and Elmendorf Air Force Base); and further local development of transportation, communication, and land management facilities in the area. As a result of the Alaska Native Interest Lands Conservation Act, Eklutna, Inc. is the largest landholder in the area.

In 2017, a Categorical Exclusion (CATEX) for the proposed Birchwood Airport Apron and Taxiway Reconstruction project was completed. The DOT&PF conducted a search of the Alaska Heritage Resource Survey files on July 11, 2017, to identify properties of historical significance within the airport property boundary. At that time the research was conducted there were no historic or cultural resources listed (or eligible for listing) on the National Register of Historic Places (NRHP) located within the airport property boundary. The Native Village of Eklutna provided historic knowledge of known significant and sensitive cultural resources located in the vicinity of the airport. All future development associated with the proposed alternatives described in the master plan update will require tribal consultation with the intent to locate and identify these resources prior to any ground disturbing activities. Because of the sensitive nature of the cultural resources, their identified locations have been omitted from the mapping presented in this plan. Comments and information supplied by Native Village of Eklutna is on file with the DOT&PF and the FAA.

FAA's NEPA guidance requires analysis of impacts associated with future airport development on historical, architectural, and archaeological, and cultural resources. In addition future development of the airport will also require review under Section 106 of the National Historic Preservation Act (NHPA). Consultation efforts associated with Section 106 of the NHPA require coordinating with Tribes, the State Historic Preservation Office (SHPO), and others in regard to with tribes and other Stakeholders under Section 106 of the NHPA will be required. If impacts to historical, architectural, archaeological, and cultural resources are anticipated, the FAA will work with tribes and other appropriate stakeholders to avoid adverse effect to identified resources or define mitigation measures.

2.3.2 Department of Transportation Act Section 4(f) and 6(f) Resources

Section 4(f) of the Department of Transportation Act states that FAA cannot approve the use of publicly-owned wildlife refuges, parks and recreation areas, or historical sites eligible for the

NRHP unless there is no feasible and prudent alternative to using the land and the project includes all possible measures to minimize harm to the property.

On September 15, 2020, a review of the following resources did not identify properties protected under Section 4(f), as defined by FAA Order 1050.1F, located in the vicinity of the airport:

- U.S. Fish and Wildlife Service (USFWS) website
- U.S. National Park Service (NPS) website
- Alaska Department of Fish and Game (ADF&G) list of state game refuges, sanctuaries, critical habitat areas, and special areas
- Alaska Department of Natural Resources (ADNR) Division of Parks and Recreation website
- MOA Department of Parks and Recreation website
- U.S. Forest Service (USFS) website

2.3.3 Biological Resources

Biological resources are valued for their intrinsic, aesthetic, economic, and recreational qualities and include fish, wildlife, plants, and their respective habitats. On September 15, 2020, the resource categories in the following section were reviewed for their presence on or within the vicinity of the airport.

2.3.3.1 Anadromous Fish Streams and Essential Fish Habitat

According to the ADF&G online Anadromous Waters Catalog (AWC), there are two anadromous water bodies in the vicinity of the airport, Peters Creek (AWC #247-50- 10160) and Fire Creek (AWC #247-50-10150). Both creeks provide spawning and rearing habitat for Coho salmon. Pink salmon and Chinook salmon are also present in both creeks. Proposed work around streams will require the incorporation of ADF&G's requirement that a riparian buffer zone of 25 feet be maintained to protect anadromous habitat. In addition, the MOA's stream protection setback (AMC 21.07.010) of 50 feet from the ordinary high water mark will apply to any future ground disturbance surrounding the streams.

Anadromous waterbodies are considered essential fish habitat (EFH). Both waterbodies flow to the title flats of Knik Arm. Knik Arm is classified as EFH for all life stages of Chinook, Pink, Sockeye, Chum, and Coho salmon. Under the Magnuson-Stevens Fisher Conservation and Management Act, the FAA is required to consult with the National Marine Fisheries Service regarding impacts to EFH.

2.3.3.2 Migratory Birds and Eagles' Nests

The Migratory Bird Treaty Act of 1918, as amended (16 USC 703-711), as well as the Bald and Golden Eagle Protection Acts (16 USC 668-668d) and Executive Order 13186, requires all federal agencies to avoid, to the extent possible, the "take" of migratory birds and bald and golden eagle, eggs, feathers, or nests.

Review of the USFWS Information for Planning and Consultation online portal identified a diversity of migratory bird species in the vicinity of the airport that may travel through the area. Vegetation clearing associated with the project is expected to follow USFWS recommended time

periods for avoiding clearing in Southcentral Alaska (May 1 – July 15), except as allowed by state, federal, and local laws. Suitable eagle nesting habitat exists in the general project vicinity.

2.3.3.3 Threatened and Endangered Species

The Cook Inlet beluga whale is listed as an endangered species under the Endangered Species Act and is protected under the Marine Mammal Protection Act. Consultation with the National Marine Fisheries Service (NMFS) will be required for all future airport development that could have a direct or indirect impact to the Cook Inlet beluga whale or it designated critical habitat (see Section 2.3.5).

There are no other threatened or endangered species protected by the USFWS or NMFS in the vicinity of the airport per the Anchorage Fish and Wildlife Field Office Letter to Agency Representatives regarding Section 7 Consultations in Anchorage and the Matanuska-Susitna Area (November 1, 2012). The USFWS Endangered, Threatened, Proposed, Candidate, and Delisted Species in Alaska list (2013) did not identify any candidate species in the vicinity of the airport.

2.3.3.4 National Marine Sanctuaries

No national marine sanctuaries are present in the waters surrounding the State of Alaska based on a review of the National Oceanic and Atmospheric Administration's National Marine Sanctuaries online database.

2.3.3.5 State Refuges, National Wildlife Refuges, Critical Habitat Areas and Sanctuaries

The NMFS has designated critical habitat for the Cook Inlet beluga whale. The designated area includes upper Cook Inlet (including Knik and Turnagain Arms). Knik Arm is adjacent to the northwest corner of the airport property boundary. Any impacts associated with direct or indirect involvement of critical habitat area due to the development of airport alternatives will require Section 7 consultation with NMFS under the Endangered Species Act.

Review of the ADF&G online listing of state of Alaska refuges and sanctuaries indicated none of the resources are located in the vicinity of the airport. According to the USFWS online initial project scoping tool there are no national wildlife refuges are present within the vicinity of the airport.

2.3.3.6 Wetlands and Other Waters of the U.S.

In 2003, a wetland delineation and preliminary jurisdictional determination were completed for the Birchwood Airport Master Plan Environmental Assessment (DOT&PF Project 54741). Using aerial imagery and field observations, seasonally saturated forested and scrub/shrub emergent wetlands were identified on the southwestern edge of the airport property.

Future airport development will be required to ensure that impacts to aquatic resources are avoided and minimized to the maximum extent practicable in the design and review process. The U. S. Army Corps of Engineers (USACE) Regulatory Offices administer two laws that may apply to proposed construction work:

- Section 10 of the Rivers and Harbors Act of 1899 (33 United States Code 403) requires that a Department of the Army permit be obtained for certain structures or work in or affecting navigable waters of the U.S. prior to conducting the work. Navigable waters

include those waters subject to the ebb and flow of the tide and waters that are presently used, or have been used in the past, or may be susceptible for use to transport in interstate or foreign commerce.

- Section 404 of the Clean Water Act (33 United States Code 1344) requires that a Department of the Army permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands, prior to conducting the work. Waters of the U.S. may include certain rivers, streams, lakes, ponds, and adjacent wetlands.

2.3.3.7 Wilderness Areas

No wilderness areas are located in the vicinity of the airport based on review of Wilderness Connect (via wilderness.net). The nearest designated wilderness area is the Kenai Wilderness Area, located approximately 40 air miles southwest of the airport. Wilderness Connect is a clearinghouse that was formed in 1996 and is provided by the federal interagency National Wilderness Steering Committee and Wilderness Policy Council. The clearinghouse compiles information from the Bureau of Land Management, USFWS, USFS, and NPS.

2.3.4 Air Quality

According to the Alaska Department of Environmental Conservation's (ADEC) Air Non-point Mobile Source website the Birchwood Airport is not in an air quality non-attainment or maintenance area for National Ambient Air Quality Standards.

2.3.5 Floodplain and Regulatory Floodway

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps #020050070D and #02000050086D indicate that FEMA-mapped floodplains are present on airport property and are associated with Peters Creek. A flood hazard permit from the MOA will be required for future airport development involving development within the floodplain boundary.

2.3.6 Farmland

Farmlands are defined as those agricultural areas considered important and protected by federal, state, and local regulations. Important farmlands include all pasturelands, croplands, and forests considered to be prime, unique, or of statewide or local importance. Currently, there are no designated prime or unique farmlands, or farmlands of statewide importance in Alaska. However, the Fairbanks Soil and Water Conservation District and the Matanuska-Susitna Borough (MSB) have adopted criteria for Farmlands of Local Importance for lands within their jurisdictional boundaries. The Birchwood Airport is located within the MOA and is, therefore, outside the areas that have adopted criteria for Farmlands of Local Importance.

2.3.7 State Parks, National Parks, National Forests, and Wild and Scenic Rivers

There are no national parks, monuments, preserves, national forests, or wild and scenic rivers located in the vicinity of the airport according to NPS and USFS online databases.

Review of ADNR's Division of Parks and Outdoor Recreation website indicates that there are no state parks or recreation areas are located in the vicinity of the airport.

2.3.8 Hazardous Waste

ADEC's Contaminated Sites Mapper shows one active contaminated site in the vicinity of the airport: The Birchwood Trespass Shooting Area. An additional site, the DOT&PF Birchwood Maintenance Station Class V Injection Well, is classified as "cleanup complete: institutional controls".

2.3.9 Navigable Waters

Navigable waters under the USACE jurisdiction are not located within, or in close proximity, to the airport (USACE, 2020).

2.3.10 Noise

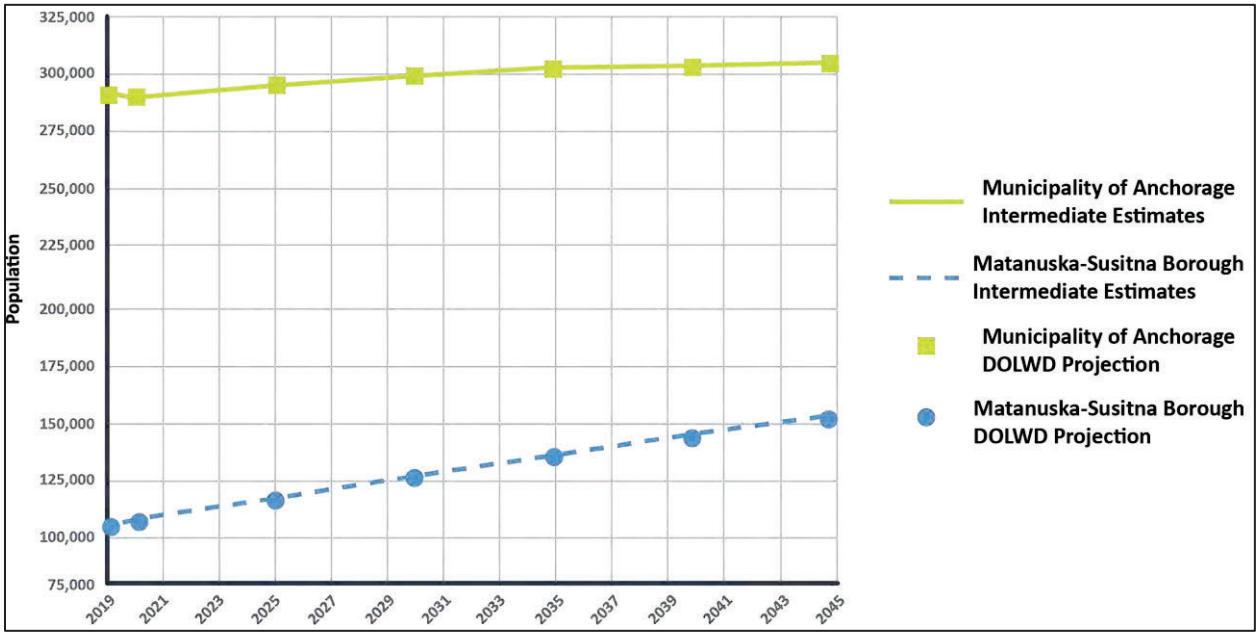
Per the FAA Environmental Desk Reference for Airport Actions (2020), a noise analysis may be required for actions involving a new airport location, a new runway, a major runway extension, or runway strengthening; or when annual operations exceed 90,000 propeller operations or 700 jet operations. Future project development at the airport will be assessed to determine if a noise analysis is required.

2.4 Socioeconomic Evaluation

Northern Economics completed a Socioeconomic Evaluation in November 2020 to provide a socioeconomic profile of the study area, which includes the MSB and the MOA, with emphasis on the Chugiak/Birchwood/Eagle River area, when applicable. The socioeconomic profile describes current conditions and forecasts for the study area's population, economy, and key industries, such as aviation, tourism, and oil and gas production.

2.4.1 Population Profile of the Birchwood Area

Users of Birchwood Airport are primarily residents of the MOA and MSB. The Alaska Department of Labor and Workforce Development (DOLWD) constructs population projections in five-year increments for each borough in the State of Alaska. The 2019 estimated population and projections for 2020–2045 are shown in Graph 1, with lines to represent linear interpolation between the projections. In total, the residents of the MOA and MSB make up 54% of the state's population of 731,000.



Graph 1: Population Projects, 2020 - 2045

Source: DOWLD (2020a) and analysis by Northern Economics

In 2019, the MOA had 291,845 residents. That number was expected to decrease in 2020 but increase in each following year up to a high of 305,393 in 2045. This represents a growth of approximately 5% from 2019 to 2045 or an increase of 13,548 people. The rate of growth is expected to slow over time and then plateau.

The rate of growth is much higher in the MSB than in the MOA, but the MSB has fewer residents (106,438 residents in 2019). The population of the MSB is expected to grow by nearly 44% from 2019 to 2045, an increase of 46,648 residents. In fact, the MSB has the highest projected rate of growth of any borough or census area in Alaska. Much of the growth has historically been driven by migration from the MOA to the MSB. The MSB shows resiliency in employment and population with the ability to defy statewide trends; however, recent analysis shows that the MSB's rate of population growth and the rate of migration from the MOA to the MSB are both declining (Fried and Howell, 2020).

Since 2010, the total population of the MOA has not changed much, but Birchwood is one place within the MOA where the population has grown. The population of Birchwood has increased by about 200 residents, or at a rate of about 0.5%, since 2010 (Fried and Howell, 2020). Eagle River has historically grown faster than Anchorage, but any changes are generally driven by activity at U.S. JBER. Many residents (both civilian and active-duty service members) work on base but live off base, contributing to the demand for goods, services, and residential property in the Eagle River area. The Eagle River area also has the highest percentage of veterans in the MOA because many U.S. JBER military and Air Force employees choose to retire in the area (Fried and Howell, 2020).

Recently, there has been relatively little growth at U.S. JBER, so it is uncertain whether the overall growth trend will continue for the Eagle River area (Fried and Howell, 2020). Eklutna has the greatest potential for growth based on land availability and would have potential to help absorb population growth in the MOA.

2.4.2 Economic Activity

2.4.2.1 Employment

In 2019, the MOA had a labor force of 146,948, which is 50.4% of the total population. From 2010 to 2019, the unemployment rate in the MOA ranged from a maximum of 6.6% in 2010 to a low of 5.0% in 2015 (Table 5). A statewide recession has already contributed to the loss of about 6,000 jobs in the MOA since 2015, but the recent pandemic and ensuing global economic conditions have caused the loss of an additional 11,000 jobs in the MOA, for a total loss of 17,000 since 2015 (Popp, 2020). Forecasts show that the recovery will likely take more than three years to achieve pre-recession employment levels, and in 2023, the MOA will still have 4,400 fewer jobs than it did at the end of 2015.

Table 5: Study Region Labor Force and Unemployment Rate

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Labor Force										
MOA	157,923	159,007	158,380	158,402	158,075	156,755	155,274	153,108	149,431	146,948
MSB	42,315	43,369	43,757	43,925	44,887	46,183	47,351	48,125	47,728	46,901
Unemployment Rate (%)										
MOA	6.6	5.9	5.4	5.2	5.2	5.0	5.5	5.8	5.4	5.1
MSB	9.4	9.2	8.7	8.3	8.1	7.7	8.2	8.2	7.4	6.9

The labor force of the MSB was 46,901 in 2019, which is 44.1% of the total population. The unemployment rate was higher in the MSB than in the MOA every year from 2010 to 2019, with a maximum of 9.4% in 2010. The data shows a downward trend, reaching a minimum unemployment rate of 6.9% in 2019, and unemployment in the MSB appears to be converging with the rate in the MOA. The unemployment rate of the MSB will also have seasonal fluctuations related to summer tourism that are not visible in the annual data presented in Table 5 (Popp, 2020).

2.4.2.2 Occupations

The DOLWD compiles data on workers in each of Alaska's boroughs to provide insight into the most common occupations. The top five occupations in the combined MOA/MSB area in 2016 were retail salespersons (8,326 workers), cashiers (3,519), office and administrative support workers (3,401), registered nurses (3,310), and personal care aides (3,179) (DOLWD, 2020b). Most jobs in both the MSB and the Eagle River area are based on providing services to locals, while many residents are commuting to Anchorage for higher-paying jobs (Fried and Howell, 2020). Notable exceptions are the oil and gas industry, where many workers commute to Alaska's North Slope, and the MSB's important agriculture industry that produces goods locally.

2.4.3 Economic Trends

Two key industries of interest for the study area are the oil and gas industry and tourism, especially fly-out fishing. Table 6 shows the average employment by place of work for the MOA and MSB for North American Industry Classification System (NAICS) sectors related to the tourism industry, and the highlighted rows show specific sectors that are closely linked economically to tourism. In the MOA, there are nearly 3,300 workers in the air transportation industry and 337

workers specifically in scenic sightseeing. In the MSB, there are 162 workers in the air transportation sector, but the number of workers in the scenic and sightseeing sector is not reported.

The Eagle River area is a residential service hub and also a commuter base, which has unique implications for the local economy. For example, because commuters are away at work, restaurants in Eagle River have historically struggled due to the lack of lunch demand, which is important for a restaurant's overall financial performance (Popp, 2020). The Chugiak/Birchwood/Eagle River area is widely regarded as a suburb or neighborhood of the Anchorage Bowl.

Table 6: Travel and Tourism Industry Employment by Place of Work

		Average Employment	
NAICS Code	NAICS Sector	MOA	MSB
480000	**Transportation and Warehousing**	**10,496**	**856**
481000	Air Transportation	3,293	162
483000	Water Transportation	321	*
484000	Truck Transportation	1,331	114
485000	Transit and Ground Passenger	566	319
486000	Pipeline	*	None
487000	Scenic and Sightseeing	337	*
488000	Support Activities	1,660	109
491000	Postal Service	*	33
492000	Couriers and Messengers	2,216	45
493000	Warehousing and Storage	408	*
900000	**Leisure and Hospitality**	**17,661**	**3,061**
710000	Arts, Entertainment, and Recreation	2,403	420
711000	Performing Arts	383	*
712000	Museums, Zoos, Parks, etc.	233	*
713000	Amusement, Gambling, Recreation	1,787	319
720000	Accommodation and Food Services	15,528	2,641
721000	Accommodation	3,546	632
722000	Food Services and Drinking Places	11,712	2,009

Note: An "*" indicates employment data is withheld to protect the confidentially of businesses.
Source: DOWLD, 2020c

2.4.3.1 General Aviation

General aviation drives demand for Birchwood Airport but there are also a number of industries that are important to the leaseholders and users of the airport, as well as to residents and businesses in the study region. The following sections discuss GA demand as well as those industries on which stakeholders placed importance: tourism, manufacturing, industrial land development, oil and gas, and mining.

Birchwood Airport is viewed as a positive asset and is highly valued by the community. Businesses on and near the airport support the aviation community by providing basic goods and services like airplane parts manufacturing, maintenance, repairs, and fueling. Stakeholders feel that the airport is being used for the right purpose but that there are significant opportunities for improvement in

management, leasing practices, land development, and revenue generation (Eklutna, Inc., 2020 and Rogers, 2020).

2.4.3.2 Tourism

Economic activity related to tourism is reflected in the leisure and hospitality industries, especially in accommodations and food services. However, there are few of these businesses in the immediate vicinity of the airport. The overall outlook for tourism in Alaska is positive despite the dip in visitors to the state that occurred due to health mandates and travel restrictions (Fried and Howell, 2020).

An owner of an overnight lodge in Birchwood was aware of some hunting guides using Birchwood Airport as a departure point for fly-out hunting trips (Rogers, 2020). Most of the bigger operators in this industry sector operate out of Lake Hood using floatplanes, which allow clients to reach remote lodges in scenic destinations. While amphibious floatplanes could land at Birchwood Airport as well as remote lakes, it is not clear if this is ideal for hunting guides or operators. It might be possible to expand tourism at Birchwood Airport to include flightseeing and more fly-out hunting and fishing trips, but it would rely on developing niche tourism opportunities (Popp, 2020).

2.4.3.3 Manufacturing and Industrial Land Development

Spenard Builders Supply currently operates a truss and window manufacturing facility on land leased from ARRC adjacent to the airport, which utilizes the railroad connection to transport large truss structures into Anchorage and the MSB. Some developers have looked at vacant land near the airport as potential areas for expansion to support other manufacturing businesses, but none were pursued. Attracting investment dollars could help to boost the local economy, but the cost of labor in Alaska is prohibitive, and the demand for products is often outside Alaska (Popp, 2020).

Another concern when considering manufacturing industries is the cost of energy for space heating and/or electricity. Birchwood Airport has a natural gas connection, which is a strong selling point for business development because natural gas is the least expensive energy source in the area (Popp, 2020). Boutique or niche manufacturing with in-state demand, especially to support GA purposes, is already present in Birchwood and is also the most likely to succeed in the future.

2.4.3.4 Oil and Gas

Most oil industry jobs are located on Alaska's North Slope, but the workers live in other parts of Alaska or other states. For example, the MSB has no oil and gas production, but it is the third largest supplier of oil and gas workers behind Anchorage and the Kenai Peninsula (DOLWD, 2020d). This group of North Slope-commuting workers is equivalent to 6% of the MSB residents and collectively earned more in payroll than any other industry in 2018. Table 7 shows Alaska resident oil industry workers by their place of residence for the MOA and the MSB. In 2018, there were 3,218 oil industry workers living in the MOA and 1,789 workers living in the MSB. The table also shows that wages earned by workers totaled more than $500 million in 2018.

Table 7: Direct Alaska Resident Oil Industry Jobs by Place of Residence

Area	Resident Workers	Total Wages to Residents ($)
MOA	3,218	508,449,652
MSB	1,789	192,747,065
All Other	2,559	260,521,101

Source: DOWLD, 2020d

Birchwood Airport currently does not serve as a transportation hub to serve oil and gas operations in the region. There are oil and gas operations that are technically accessible from Birchwood Airport; however, it seems more likely that companies would use an airport that either is closer to the job site or has better intermodal connections (such as AIA). Many oil and gas producers also transport their own workers. Hilcorp, for example, owns 15 of the 16 platforms in Cook Inlet and has its own fleet of aircraft and facilities (Moriarty, 2020). Most other North Slope producers already have travel partnerships or agreements in place, so it is unlikely that operations would shift to Birchwood. There might be some opportunity to support North Slope operations by developing industrial properties near the railroad in Birchwood as staging or manufacturing areas for equipment; however, no such projects are currently in development (Popp, 2020). This opportunity would need to be further explored to determine the true feasibility.

2.4.3.5 Mining

Alaska is becoming nationally and internationally competitive in the mining industry, with several notable projects, including Donlin Gold, the Ambler Mining District, and the Pebble Mine, receiving national media attention. This industry has a positive outlook, and growth should be expected in the future; however, it is uncertain how much of this employment would come from the MOA or MSB. The MSB provides a disproportionately large number of workers for remote camp jobs in Alaska, so it is possible that these workers could contribute to remote mining projects around the state (Fried and Howell, 2020).

2.5 Airport Financial Assessment

Analyzing operating costs and their driving factors provides an initial assessment of Birchwood Airport's financial condition. The information in this section is compiled from the DOT&PF, other component reports of this Birchwood Airport Master Plan Update, and the financial statements and published aviation forecasts of comparable airports. Information from these sources is available on an annual basis and does not include shorter periods of time, which limits analysis of maintenance costs to an annual basis.

The information about Birchwood Airport includes only a portion of the income and expense data related to rural airport operations for DOT&PF. It does not reflect federal funds received for capital or maintenance grants; federal funds received from the Air Carrier Compliance program; the state's share of capital and maintenance project grants; managerial expenses by Commissioner, Deputy Commissioner, Statewide Aviation staff; nor administrative costs incurred by Division of Administrative Services (Budget, Finance, IT, appeals functions), Statewide Aviation Leasing, ROW, Planning, Design and Engineering Services, and Construction.

Through fiscal year (FY) 2017, it does not reflect expenses for the rural airport facilities component building costs such as repairs, electricity and heating fuel, or other utilities for buildings, but it

does include M&O costs such as personnel; utilities; and fuel for equipment, runway lights, and some buildings such as heated storage. For FY 2018–2020, it does include both M&O and facility costs such as personnel; utilities; and fuel for equipment, runway lights, building repairs, electricity, and heating (DOT&PF 2021).

2.5.1 Airport Revenues and Expenditures

For the years studied, the Birchwood Airport has had an operating profit. Table 8 compares revenues and expenses associated with the airport for fiscal year (FY) 2015–2022.

Table 8: Revenues, Expenses, and Operating Profits, $, FY 2015-2022

Fiscal Year	Revenue	Expenses	Operating Profit
2015	208,165.98	66,793.98	141,372.00
2016	201,024.25	57,423.97	143,600.28
2017	200,555.79	134,124.85	66,430.94
2018	243,716.10	99,907.24	143,808.86
2019	258,990.50	97,672.78	161,317.72
2020	273,832.14	147,209.04	126,623.10
2021	292,437.38	155,373.86	137,063.52
2022	280,021.52	145,309.75	134,711.77

Source: DOT&PF, 2023b

Birchwood Airport generates revenues from several sources. In order of greatest to least, revenues in FY 2020 came from land use (70% of total revenue), assigned aircraft tie-downs and transient parking (25%), application and process fees (3%), fuel dispensing permits (2%), and interest and late fees (<1%). Revenues have grown rapidly from FY 2017 to FY 2021, increasing 45.8% over that period. The increase has largely been driven by land use revenues. Table 9 provides total revenues for FY 2015-2016 and detailed revenues for FY 2017–2022.

Table 9: Revenue Detail, $, FY 2015-2022

Fiscal Year	Assigned Aircraft Tie-Down/Transient Parking	Fuel Dispensing Permit	Interest/Late Fees	Application /Process Fee	Land Use	Total Revenue
2015	A detailed breakdown of revenue is not available					208,165.98
2016	A detailed breakdown of revenue is not available					201,024.25
2017	50,937.19	2,895.35	260.73	1,050.00	145,412.52	200,555.79
2018	68,718.00	4,721.14	243.28	4,225.00	165,808.68	243,716.10
2019	68,756.16	10,982.53	396.59	3,775.00	175,080.22	258,990.50
2020	68,723.00	5,137.15	212.52	8,025.00	191,734.47	273,832.14
2021	69,876.00	4,271.48	164.79	2,250.00	215,875.11	292,437.38
2022	70,912.66	5,225.40	150.16	250.00	203,483.30	280,021.52

Source: DOT&PF, 2023b

Birchwood Airport generates expenses from several sources. Historically, expenses included categories such as personal services, services, and commodities, in that order of magnitude. While personal services have been the largest category of spending at the airport, they constitute a smaller share than other airports because Birchwood Airport is unmanned. In FY 2020, the new categories

of facilities and capital outlay costs accounted for 70% of expenses. Personal services (19% of the total), services (7%), and commodities (4%) costs were all lower than has been typical for the airport in recent years.

Expenses at Birchwood Airport are shown in Table 10. Facilities costs are included for FY 2018–2022, causing an increase in the baseline expenses at the airport relative to prior years. In FY 2020, additional capital outlay and facilities expenses resulted in higher total expenses for a year in which expenses would have otherwise been lower due to less spending in other categories.

Table 10: Expense Detail, $, FY 2015-2022

Fiscal Year	Personal Services	Services	Commodities	Capital Outlay	Facilities	Total Expense
2015	24,630.88	6,289.18	35,873.92			66,793.98
2016	26,887.86	5,296.41	25,239.70			57,423.97
2017	74,387.00	51,310.18	8,427.67			134,124.85
2018	45,629.06	42,344.99	11,933.19			99,907.24
2019	42,339.96	46,883.01	8,389.81			97,672.78
2020	27,708.92	10,715.40	5,429.71	25,207.05	78,147.96	147,209.04
2021	6,105.04	29,961.91	4,941.12		114,365.79	155,373.86
2022	38,432.89	10,285.67	11,851.12		84,740.07	145,309.75

Source: DOT&PF, 2023b

Other than seasonal variations in the type and amount of operating expenses required for airport operations (e.g., heating and snow removal costs during the winter), insufficient information is available to determine daily or quarterly variations in the operating costs at the airport at this time.