

# Aviation Forecast

## Dillingham Airport Master Plan Update

Project No. CFAPT00353/ AIP 3-02-0078-017-2018

Prepared for:



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**List of Acronyms**

AAC	Aircraft Approach Category
AC	Advisory Circular
ACCS	Anchorage Cargo and Cold Storage
ADG	Airplane Design Group
ADOLWD	Alaska Department of Labor and Workforce Development
ALP	Airport Layout Plan
AMP	Airport Master Plan
ARC	Airport Reference Code
ATO	Air Traffic Organization
CFR	Code of Federal Regulations
DLG	Dillingham Airport
FAA	Federal Aviation Administration
FSS	Flight Service Station
GA	General Aviation
RSA	Runway Safety Area
TAF	Terminal Area Forecast

## Introduction

Dillingham Airport (DLG) is located at the far north end of Nushagak Bay in northern Bristol Bay, at the confluence of the Wood and Nushagak Rivers. It lies two nautical miles west of the City of Dillingham, 327 miles southwest of Anchorage, and is a 6-hour flight from Seattle. The airport elevation, which is defined as the highest point on the runway, is 82 feet at Mean Sea Level. See Figure 1. Project Location and Vicinity Map.

The Alaska Department of Transportation & Public Facilities (DOT&PF) is conducting an aviation forecast to support updates of the Dillingham Airport Master Plan (AMP) and the Airport Layout Plan (ALP). A Runway Safety Area (RSA) Practicability Study is also being conducted as part of the AMP update, which this aviation forecast will advise. The previous AMP was completed in 2005 and no longer serves as an effective guide for airport improvements. The updated AMP and accompanying ALP will provide a plan for capital improvements, maintenance, and operations of DLG over the next 15-20 years. It will provide recommendations that allow DLG to continue to serve the City of Dillingham as well as its surrounding communities into the future.

Aviation demand forecasts provide a basis for determining the type, size, and timing of airport facility requirements. The following information is evaluated and presented:

- Historical aviation activity
- Factors affecting future aviation activity influences
- Socioeconomic projections
- Operations forecasts
- Peak demands
- Airport Reference Code

### Results Summary

The results of the forecasting efforts indicate a reasonable likelihood that DLG's critical aircraft will be the Lockheed L-100 by 2040, with an Aircraft Approach Category (AAC) of C and an Airplane Design Group (ADG) of IV.

This would be a change from DLG's current critical aircraft, the Boeing 737-700, with an AAC of C and an ADG of III. This result will be discussed later in the report.

**Table 1: Current and Ultimate Critical Aircraft**

Current Critical Aircraft	Current Airport Reference Code	Ultimate Critical Aircraft	Ultimate Airport Reference Code
Boeing 737-700	C-III	Lockheed L-100	C-IV

Historical data used in this forecast generally go through the end of 2019. This ensures consistency and accounts for the lack of full calendar-year data for 2020. Additionally, COVID-19 has significantly affected passenger data in 2020, which could problematically affect forecasts, given that COVID-19 impacts to passenger counts are expected to be more significant in the near-term. Until additional data regarding long-term impacts becomes available, COVID-19 impacts will be discussed but not forecasted.

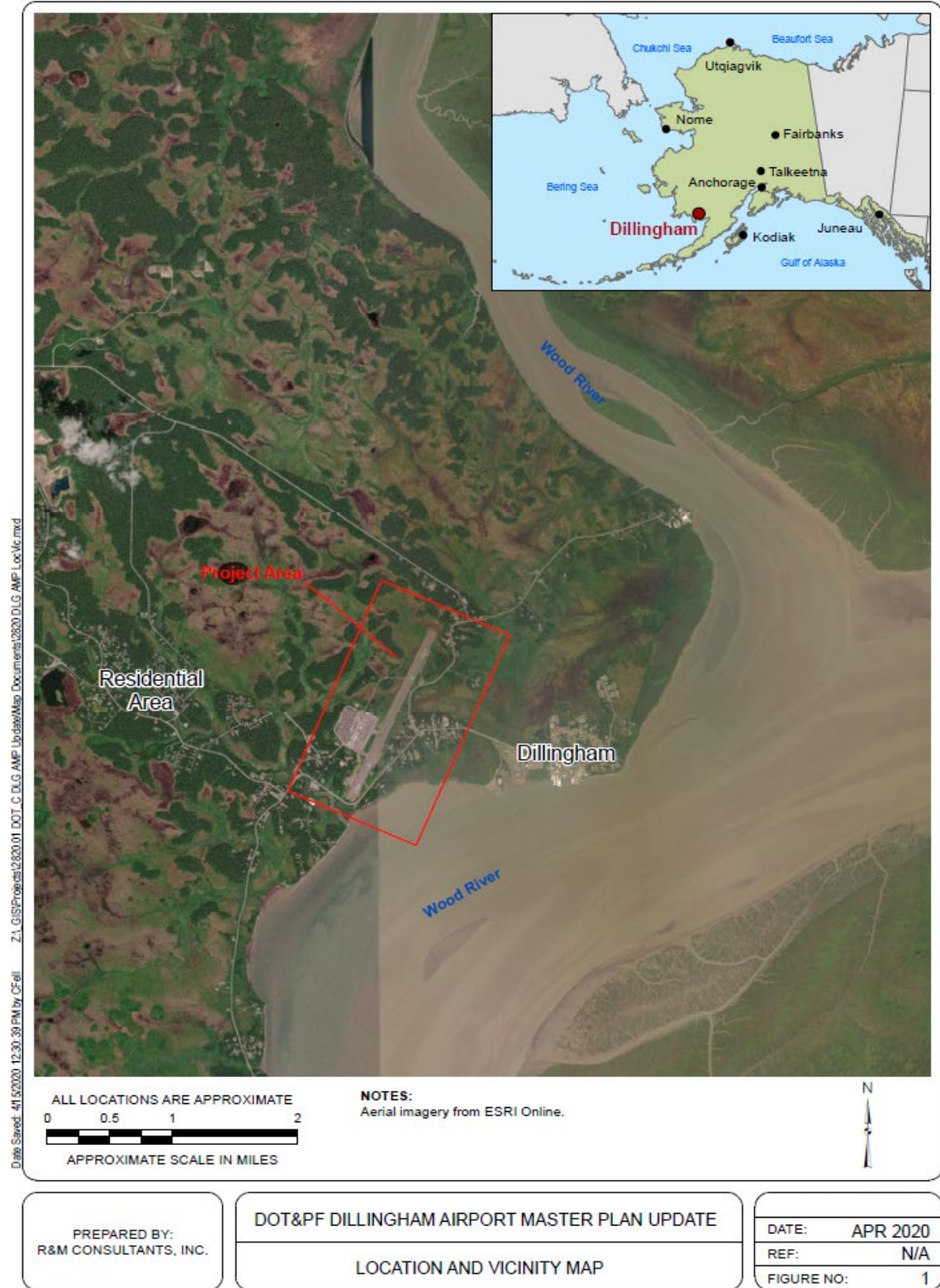


Figure 1: Location and Vicinity Map; Project No. CFAPT00353

## Community Profile

Dillingham has a highly integrated population of non-Natives and Alaska Natives. Historically, the area around Dillingham was inhabited by both Yup'ik and Athabascans, became a trade center when Russians erected the Alexandrovski Redoubt Post in 1818. Local Native groups and Natives from the Kuskokwim Region, the Alaska Peninsula, and Cook Inlet mixed together as they came to visit or live at the post. The community was known as Nushagak by 1837, when a Russian Orthodox mission was established. In 1884, the first salmon cannery in the Bristol Bay region was constructed by Arctic Packing Co., east of the site of modern-day Dillingham. Ten more canneries were established within the next seventeen years. The Dillingham town site was first surveyed in 1947. The city was incorporated in 1963 and is a 1<sup>st</sup> class city.<sup>1</sup>

The outstanding commercial fishing opportunities in the Bristol Bay area are the economic lifeblood of the region.

Dillingham is the economic, transportation, and public service center for western Bristol Bay. Commercial fishing, fish processing, cold storage, and support of the fishing industry are the primary economic activities, producing half of the world's sockeye salmon supply each summer. In 2018, the region saw a harvest of 152 million pounds of sockeye. After processing, this harvest was valued at \$688 million. The city's role as the regional center for government and services helps to stabilize seasonal employment. Many residents depend on subsistence activities, and some trap of beaver, otter, mink, lynx, and fox for supplemental cash income. Salmon, grayling, pike, moose, caribou, and berries are locally harvested.

## Airport Background and Current Conditions

DLG was originally built in the 1950s and consisted of a 3,750-foot-long gravel runway and access road. Through the 1960s and 1970s, additional land was acquired. The runway was also lengthened, and aprons, facilities, roads, and utilities were added. The runway was paved in 1988. The original apron and flight service station (FSS) building on the east side of the runway were replaced and relocated to the existing location on the west side of the runway (see Figure 2. Project Area Map).

An AMP was completed in 1985, with implementation including expansion of the main apron and construction of the gravel-surfaced general aviation apron on the west side of the airport. An updated AMP was completed in 2005. Significant capital improvements since the 2005 AMP include construction of a chemical storage building (2009), east apron and taxiway project (2010), RSA expansion project (2012), and a runway rehabilitation project (2017-2018).

DLG is located on 620 acres owned by the Alaska DOT&PF and managed by Central Region. DOT&PF leases land to air carriers and aviation-related businesses, which have made tenant improvements such as to buildings, utilities, and parking areas.

The FAA classifies DLG within the National Airport System as a non-hub, primary commercial service airport, which is regulated under 14 CFR (Code of Federal Regulations) Part 139. A commercial service airport is a publicly-owned airport that receives scheduled passenger service and has at least 2,500 passenger boardings each year. Commercial service airports, like DLG, that enplane more than 10,000

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<sup>1</sup> Alaska Community Database Online (Accessed March 2020).



annual passengers are primary airports. An airport is defined as an air traffic hub if it enplanes at least 0.05% of the passengers in the nation; if under 0.05%, the airport is non-hub.

Dillingham is classified as a regional airport by the Alaska Aviation System Plan Phase II. A regional airport supports regional economies by connecting communities to statewide and interstate markets.

DLG has one paved runway used for all aircraft operations, designated 1-19. Runway 1-19 is 6,400 ft. x 150 ft. of grooved asphalt with a Pavement Condition Index of 99.33, as indicated in the November 2019 Pavement Inspection Report. DLG has two aprons for aircraft parking, the main apron and the general aviation (GA) apron. Runway 1-19 is accessible from the main apron by taxiways A and B. Taxiway C provides access from the GA apron to the main apron. There is not a full-length parallel taxiway at DLG, making it necessary for airplanes to taxi the length of the runway before taking off Runway 19 and after landing on Runway 1 (see Figure 2. Project Area Map).

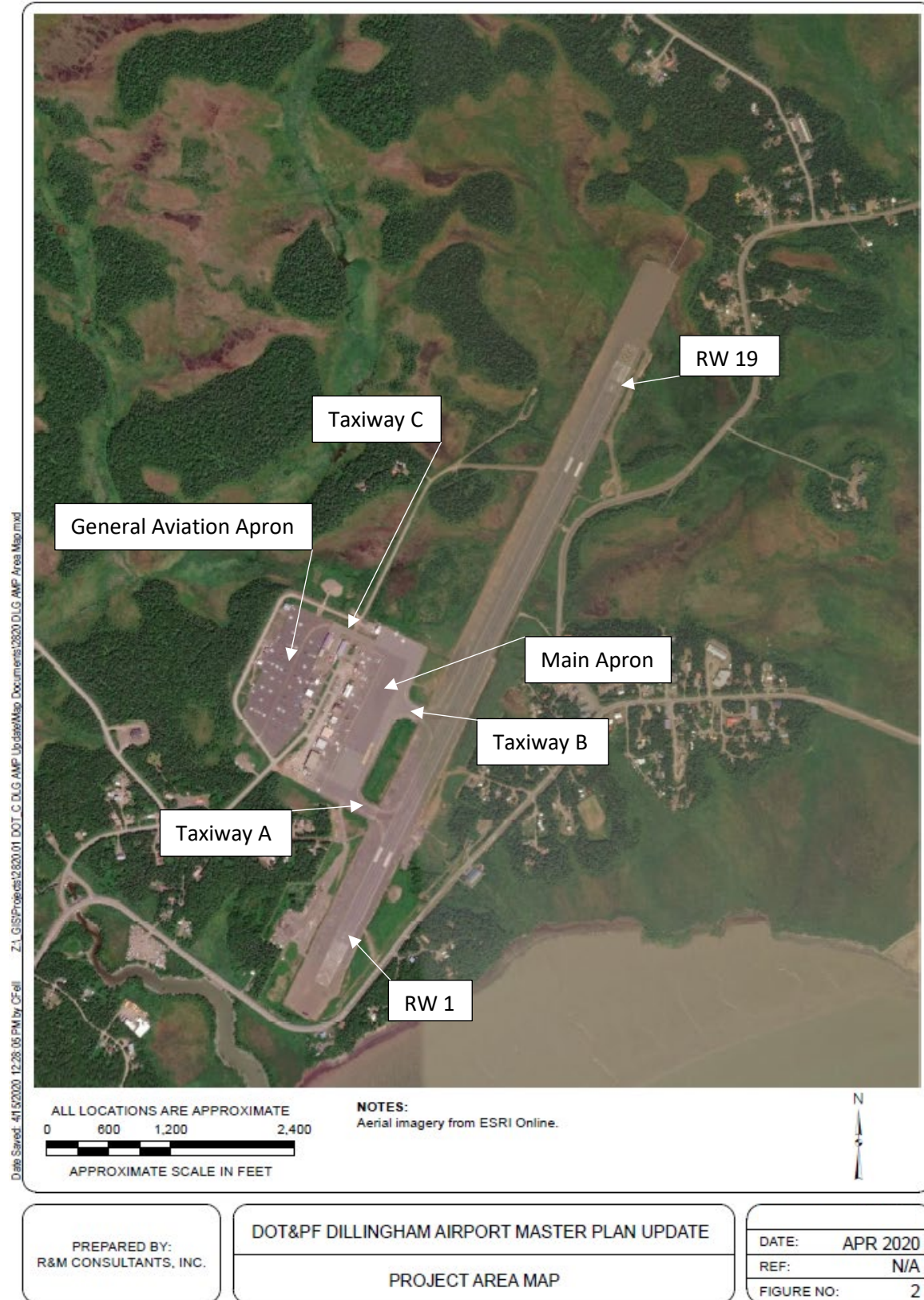


Figure 2: Project Area Map; Project No. CFAPT00353

## Demographic Characteristics

DLG largely serves residents in the Dillingham Census Area and the wider regions of Bristol Bay Borough and Lake and Peninsula Borough.

Ten communities are in the Dillingham Census Area, totaling 4,887 residents in 2019 (see Table 1). The population has been stable in recent years, fluctuating between approximately 4,850 and 5,060 residents since the 2010 census. The largest community is Dillingham (population: 2,327), followed by Togiak (873), Manokotak (483), New Stuyahok (476), and Aleknagik (208). The remaining communities have populations under 200.

Current populations in Bristol Bay Borough are about 15% lower than the peak in 2011 (see Table 1). Out of the three communities, the largest is Naknek (488), followed by King Salmon (301) and South Naknek (80).

The Lake and Peninsula Borough has also seen relatively stable population levels over the past decade (See Table 1). The largest of the 18 communities is Port Alsworth (226), followed by Newhalen (211), and Levelok (157).

**Table 2: Population Counts, Dillingham Census Area, Bristol Bay Borough, and Lake and Peninsula Borough, 2010-2019<sup>2</sup>**

Year	Dillingham Census Area	Bristol Bay Borough	Lake and Peninsula Borough
2010	4,847	997	1,631
2011	4,935	1,023	1,677
2012	4,978	983	1,679
2013	5,025	933	1,700
2014	5,063	943	1,687
2015	5,008	887	1,676
2016	4,958	875	1,642
2017	4,925	892	1,724
2018	5,007	877	1,658
2019	4,887	869	1,622

Population in the Dillingham Census Area has trended higher since the 1970s (see Table 2). Current population levels are slightly lower than the peak observed in 2014 at 5,063 residents (see Table 1).

After formation of the Bristol Bay Borough in 1962 (the state’s first borough), the 1970 census recorded 1,147 residents. A population of 1,410 residents in 1990 represented the peak; by 2010, the population had fallen by 29% (see Table 2).

The population in the Lake and Peninsula Borough peaked in 2000 at 1,823 residents before declining approximately 11% to 1,631 in 2010 (see Table 2).

<sup>2</sup> Alaska Department of Labor and Workforce Development, accessed 4/8/2020.

**Table 3: Population Counts, Dillingham Census Area, Bristol Bay Borough, and Lake and Peninsula Borough, by 1960-2010 Census Year<sup>3</sup>**

Census Year	Dillingham Census Area	Bristol Bay Borough	Lake and Peninsula Borough
<b>1970</b>	3,892	1,147	n/a
<b>1980</b>	3,232	1,094	1,384
<b>1990</b>	4,012	1,410	1,668
<b>2000</b>	4,922	1,258	1,823
<b>2010</b>	4,847	997	1,631

Most residents of Dillingham Census Area and Lake and Peninsula Borough identify as American Indian/Alaska Native alone or in combination with other, followed by White alone or in combination with other races. In Bristol Bay Borough, White residents alone or in combination with other races make up the majority of the population.

**Table 4: Population Proportions by Race: Dillingham Census Area, Bristol Bay Borough, and Lake and Peninsula Borough<sup>4</sup>**

Race	Dillingham Census Area	Bristol Bay Borough	Lake and Peninsula Borough
<b>American Indian/Alaska Native</b>	72.1%	32.7%	67.3%
<b>White</b>	17.6%	56.3%	22.8%
<b>Black</b>	1.3%	0.4%	0.7%
<b>Asian</b>	1.5%	0.3%	2.5%
<b>Native Hawaiian and Other Pacific Islander</b>	0.1%	0.2%	0.4%
<b>Two or more races</b>	6.7%	9.1%	6.2%

**Table 5: Population Under 15, 65 and Older: Dillingham Census Area, Bristol Bay Borough, and Lake and Peninsula Borough<sup>5</sup>**

Age	Dillingham Census Area	Bristol Bay Borough	Lake and Peninsula Borough
<b>Under 15</b>	26.1%	18.1%	21.9%
<b>65 and Older</b>	8.7%	9.6%	7.9%

Males make up most of the population in Dillingham Census Area, Bristol Bay Borough, and Lake and Peninsula Borough (see Table 5).

<sup>3</sup> Alaska Department of Labor and Workforce Development, accessed 4/10/2020. Note: Prior to borough formation, census data is limited.

<sup>4</sup> American Community Survey, 2014-2018 (5-year estimates).

<sup>5</sup> Ibid.

**Table 6: Population by Sex: Dillingham Census Area, Bristol Bay Borough, and Lake and Peninsula Borough<sup>6</sup>**

Sex	Dillingham Census Area	Bristol Bay Borough	Lake and Peninsula Borough
Male	51.7%	59.1%	51.6%
Female	48.3%	40.9%	48.4%

**Table 7: Median Annual Household Income and Poverty: Dillingham Census Area, Bristol Bay Borough, and Lake and Peninsula Borough<sup>7</sup>**

Category	Dillingham Census Area	Bristol Bay Borough	Lake and Peninsula Borough
Median Annual Household Income	\$58,750	\$84,688	\$46,406
Persons Living Below Poverty Level (% of Total Population)	17.2%	5.8%	15.9%

## Geographic Characteristics

The City of Dillingham is located on the northwest shoreline where the Wood River meets the Nushagak River at the far north end of Nushagak Bay in northern Bristol Bay. The city encompasses 33.6 sq. miles of land and 2.1 sq. miles of water. Dillingham is the transportation, economic, and public service hub for the Bristol Bay region and can only be reached by air or sea, making the airport and port vitally important for the livelihoods of Dillingham-area residents. Adjacent communities, including New Stuyahok, King Salmon, Togiak, Koliganek, Ekwok, and Manokotak regularly rely on Dillingham and DLG for meeting transportation and other public service needs. Dillingham’s economy relies heavily on the commercial fishing industry and use of its ports and airport for the export of salmon and seafood from Bristol Bay.

The US Army Corps of Engineers has mapped classified wetlands around and within DLG property, including freshwater forested/shrub wetlands and freshwater emergent wetlands. This is consistent with much of the land within the City of Dillingham, with mapped wetlands prevalent north and east of the airport. Squaw Creek runs southwest of the airport property and drains into the Nushagak River to the south.

DLG is located near the junction of Dillingham’s three major roads: Kakanak Road, Wood River Road, and Aleknagik Lake Road (see Figure 2). Kakanak Road crosses airport property south and southeast of the runway, and a portion of Wood River Road enters airport property southeast of the runway and north of Kakanak Road. These road corridors contain the majority of Dillingham’s residential development. The airport property is surrounded by substantial residential development on all sides except the northeast.

<sup>6</sup> American Community Survey, 2014-2018 (5-year estimates).

<sup>7</sup> American Community Survey, 2014-2018 (5-year estimates), Alaska Department of Labor and Workforce Development, accessed 4/10/2020.

## Economic Characteristics

The City of Dillingham is the largest community in the Dillingham Census Area. The city is the center of economic, transportation, government, public services, and social support infrastructure in the area.

Dillingham Census Area had an annual average of 2,600 jobs in 2018. Employment in Bristol Bay Borough totaled 1,314 jobs, with 1,004 jobs in Lake and Peninsula Borough.<sup>8</sup> The economic base of the region is highly seasonal and predominantly driven by the harvest and processing of Bristol Bay salmon. Employment balloons in the summer, often ten times more than in the winter. Other summer seasonal employment includes construction and mineral exploration.

The public sector is a key employer for the region, accounting for about 29% of employment in Dillingham Census Area, 17% in Bristol Bay Borough, and 44% in Lake and Peninsula Borough. Local government is the largest component of the region's public sector, followed by state and federal employment. Public sector employment includes local school districts.

Educational and health services is another key employment sector in Bristol Bay Borough and Lake and Peninsula Borough and contributes nearly a quarter of total employment in Dillingham Census Area. More specific counts were unavailable to support confidentiality (see Table 7 below). Employment in this sector includes a variety of outpatient, nursing and residential care, and social assistance organizations. Kakanak Hospital in Dillingham (operated by the Bristol Bay Area Health Corporation) supports the most employment in this sector.

Retail businesses serve residents year-round, with many operating seasonally to support the busy summer months. Of the three regions, retail employment in Dillingham Census Area is the highest, at 201 jobs (see Table 7).

The region's leisure and hospitality sector is composed primarily of accommodations, restaurants, and bars. In addition to businesses located in hub communities of Dillingham or King Salmon, the sector includes employment at high-end sport fishing lodges.

A variety of other sectors contribute to employment in the region, including professional and business services, transportation and warehousing, financial activities, and information.

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<sup>8</sup> These employment figures do not include self-employed, such as fishermen.



**Table 8: Employment by Sector in Dillingham Census Area, Bristol Bay Borough, and Lake and Peninsula Borough, 2018<sup>9</sup>**

	Dillingham Census Area	Bristol Bay Borough	Lake and Peninsula Borough
Educational and Health Services	628	*	*
Local Government	620	158	394
Retail	201	*	30
Leisure and Hospitality	92	120	123
State Government	85	24	6
Transportation and Warehousing	74	85	118
Federal Government	44	46	44
Professional and Business Services	29	28	10
Construction	*	*	38
Other	1,455	853	241
<b>Total Employment</b>	<b>3,228</b>	<b>1,314</b>	<b>1,004</b>

COVID-19 impacts on Alaska economy are expected to be considerable, including estimates that:

- By the end the fourth quarter of 2020, Alaska’s employment will be 92% of what it was in 2019, up from a low of 86% in April.
- In 2021, average annual employment will be 95% of 2019 levels, then increase to 96% in 2022.
- Summer employment will remain lower through 2022, with May-August employment averaging 93% of 2019 summer employment levels.

The forecast of pandemic impacts recognizes that sectors closely tied to tourism, oil and gas, and resident consumer spending are suffering the most total job losses. Airlines around the country have struggled to fill seats due to decreased travel associated with the pandemic. In the Dillingham region, Ravn Airgroup’s early April bankruptcy filing, somewhat related to COVID-19 impacts, had major impacts on air travel between Anchorage and Dillingham. This decreased travel caused Ravn to lay off all its employees and ground all planes. While Alaska Airlines eventually started a few flights per week from Anchorage to Dillingham in May, many residents and regional employers (including commercial fishermen, seafood workers, and others) were forced to schedule flights with smaller regional carriers operating twin engine aircraft. These seats were limited and ticket prices were high. Eventually, Alaska Airlines offered a daily flight, yet planned to return to a few flights each week once the summer travel rush slowed.

These pandemic-related travel disruptions have caused major hardships for all wanting to travel in and out of the Dillingham region. One common story, as told by a Dillingham-based commercial fisherman, is having to charter a flight this summer to bring in her crew members at \$1,000 per person. Many sport

<sup>9</sup> Alaska Department of Labor and Workforce Development, accessed 4/8/2020; \* indicates withheld data.

fishing lodges chose not to open this summer. Many of their scheduled clients preferred not to travel and those who may have been interested could not be accommodated given the unpredictable nature of scheduled flights in and out of Dillingham. To illustrate, a local lodge owner is hoping additional air carriers will operate between Anchorage and Dillingham next summer, stating, “It will be tough to operate on one flight per day.” There are concerns for important patient and other business travel, as longer stays in Anchorage will be necessary due to lack of seat availability to return to the Dillingham region in a timely manner.

### Commercial Fishing Activity

Most of the residential commercial permit holders and processing facilities in the Airport study area are located in the Dillingham Census Area. The Dillingham Census Area has three onshore fish processing facilities and several floating facilities east of Dillingham, in Nushagak Bay. There are several more facilities near Togiak and in different locations within Bristol Bay Borough and Lake and Peninsula Borough.

- Dillingham Census Area: resident commercial permit holders have fluctuated slightly between 2012 and 2019 (high of 621 in 2012 and a low of 595 in 2015). Active permits (number of permit holders who fished) ranged between 407 (2016) and 419 (2014).
- Bristol Bay Borough: resident commercial permit holder levels are stable (fluctuating between 148 and 157) between 2012 and 2018; active permits ranged from 126 (2017) and 142 (2014).
- Lake and Peninsula Borough: the number of resident commercial permit holders has fallen from 140 in 2012 to 121 in 2018; active permits also fell from 114 in 2012 to 72 in 2018<sup>10</sup>.

### Aviation Activity

The following sections present a review of past aviation activity, forecast methodology, and discussion of the factors that could affect future aviation activity at DLG. Forecasts for passengers, cargo, based aircraft, air taxi operations, general aviation operations, military aircraft operations, and the Airport Reference Code are presented.

The base year (year at which the most recent actual data was available) for forecasting is 2019. Forecasts were prepared for three future milestones: short term (2025), intermediate term (2030), and long term (2040).

### General Aviation and Military Operations

The FAA publishes a forecast of aviation activity for U.S. airports called the Terminal Area Forecast (TAF). The TAF dataset for DLG shows that 10,986 general aviation operations and 11 military operations occurred in 2019; however, some caution should be exercised in use of these data. The primary purpose of the TAF is to establish and predict budget and manning levels for the Air Traffic Organization (ATO), which is primarily related to towered airports. Forecasts are less detailed at airports with fewer than 100,000 annual enplanements, and DLG is a non-towered airport with fewer than 100,000 enplanements. Additionally, the general aviation and military operation counts have remained the same

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<sup>10</sup> Commercial Fisheries Entry Commission, accessed 4/10/2020.



since 2007 and are held constant in future years. As such, the TAF will not be useful for forecasting these two types of operations.

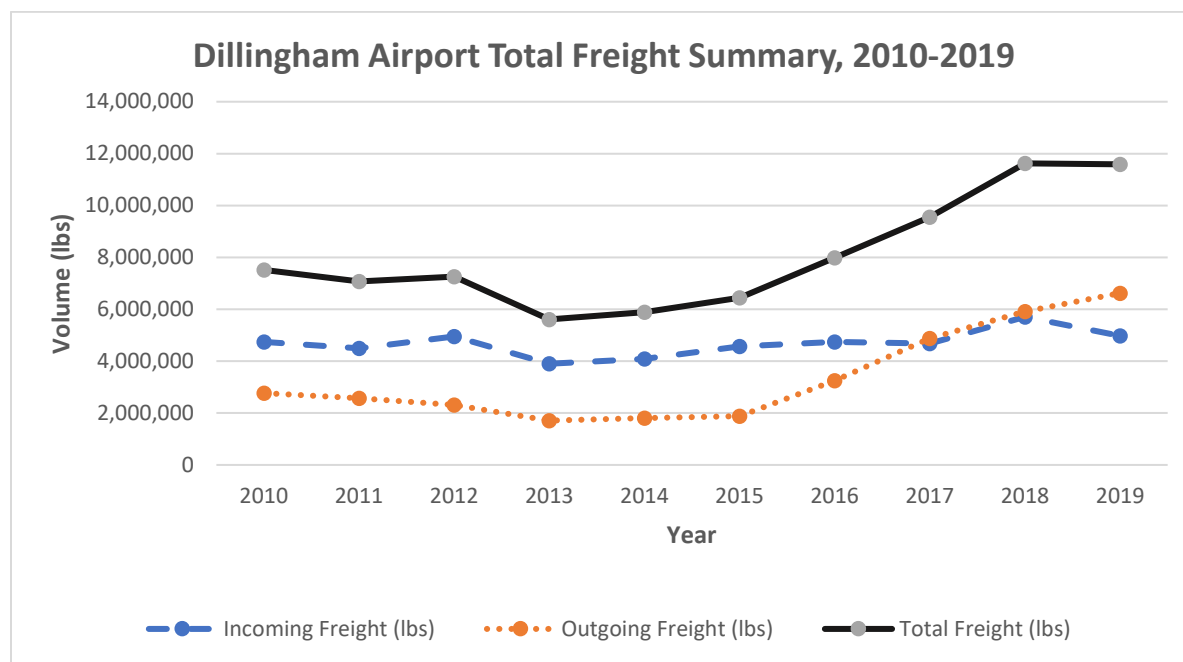
### Air Cargo

This section discusses historic freight and mail volumes at DLG. Table 8 and Figure 3 show reported freight volumes at DLG from 2010 to 2019.

**Table 9: DLG Total Freight Summary, 2010-2019<sup>11</sup>**

Year	Incoming Freight (lbs)	Outgoing Freight (lbs)	Total Freight (lbs)	Annual Growth Rate (Total Freight)
2010	4,745,483	2,767,641	7,513,124	-1.16%
2011	4,493,532	2,575,301	7,068,833	-5.91%
2012	4,956,858	2,305,322	7,262,180	2.74%
2013	3,900,444	1,708,634	5,609,078	-22.76%
2014	4,083,998	1,806,429	5,890,427	5.02%
2015	4,563,703	1,875,775	6,439,478	9.32%
2016	4,737,613	3,249,587	7,987,200	24.03%
2017	4,674,299	4,873,522	9,547,821	19.54%
2018	5,705,768	5,917,863	11,623,631	21.74%
2019	4,971,298	6,621,529	11,592,827	-0.27%

**Figure 3: DLG Total Freight Summary, 2010-2019<sup>12</sup>**



<sup>11</sup> Bureau of Transportation Statistics: T-100 Domestic Segment, 2010-2019.

<sup>12</sup> Ibid.

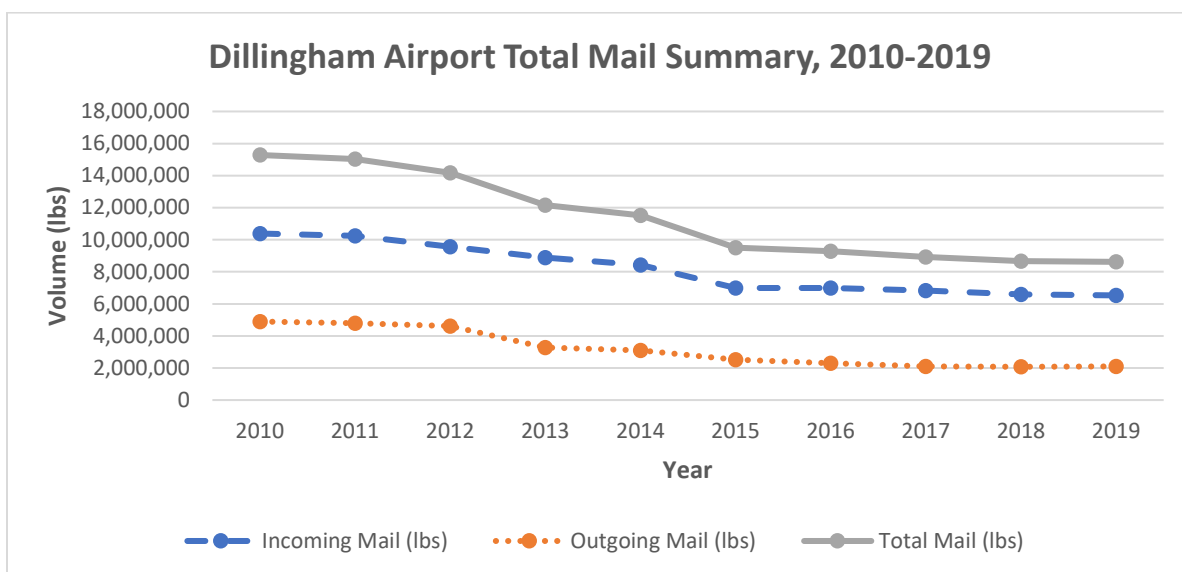
Following a period of weak or negative reported growth rates for freight volumes from 2010 to 2013, volumes increased significantly afterward, with the period between 2016 and 2018 showing the largest total volume increases. The primary explanatory factor for the decline earlier in the decade is the Great Recession that followed the 2008 Financial Crisis.

Additionally, while incoming freight volumes were higher than outgoing volumes between 2010 and 2016, outgoing freight volumes overtook incoming volumes between 2017 and 2019. This will be discussed further in the forecasting section. Table 9 and Figure 4 show reported mail volumes at DLG from 2010 to 2019.

**Table 10: DLG Total Mail Summary, 2010-2019<sup>13</sup>**

Year	Incoming Mail (lbs)	Outgoing Mail (lbs)	Total Mail (lbs)	Annual Growth Rate (Total Mail)
2010	10,386,140	4,897,602	15,283,742	
2011	10,247,455	4,788,984	15,036,439	-1.62%
2012	9,566,878	4,613,736	14,180,614	-5.69%
2013	8,882,915	3,283,851	12,166,766	-14.20%
2014	8,417,643	3,095,770	11,513,413	-5.37%
2015	6,980,673	2,520,837	9,501,510	-17.47%
2016	6,995,187	2,296,618	9,291,805	-2.21%
2017	6,829,089	2,091,092	8,920,181	-4.00%
2018	6,596,812	2,076,023	8,672,835	-2.77%
2019	6,528,939	2,091,860	8,620,799	-0.60%

**Figure 4: DLG Total Mail Summary, 2010-2019<sup>14</sup>**



<sup>13</sup> Bureau of Transportation Statistics: T-100 Domestic Segment, 2010-2019.

<sup>14</sup> Ibid.

Reported mail volumes have continued to decrease annually from the period between 2010 to 2018, with 2015 and 2017 experiencing the largest annual decreases (-14.20% and -17.47% respectively).

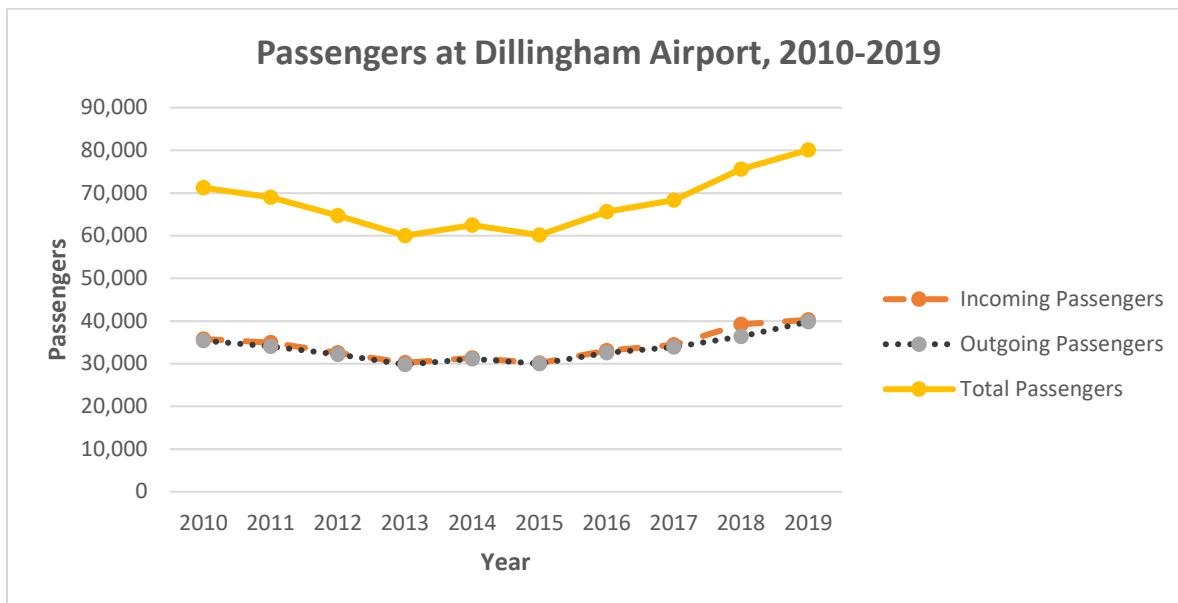
### Passenger Volumes

This section discusses the historical passenger volumes at DLG reported by T-100 filers. Table 10 and Figure 5 show reported commercial passenger levels at DLG from 2010 to 2019. Reliability of this data source is affected by the fact that passenger activity is not consistently reported by all air carriers; passenger volumes may be higher than are reported in the T-100 dataset.

Table 11: Passenger Levels at DLG, 2010-2019<sup>15</sup>

Year	Incoming Passengers	Outgoing Passengers	Total Passengers	Annual Growth Rate (Total Passengers)
2010	35,788	35,419	71,207	
2011	34,936	34,078	69,014	-3.08%
2012	32,549	32,195	64,744	-6.19%
2013	30,223	29,784	60,007	-7.32%
2014	31,314	31,142	62,456	4.08%
2015	30,147	30,003	60,150	-3.69%
2016	33,076	32,568	65,644	9.13%
2017	34,396	33,931	68,327	4.09%
2018	39,223	36,345	75,568	10.60%
2019	40,277	39,822	80,099	6.00%

Figure 5: Total Passengers at DLG, 2010-2019<sup>16</sup>



<sup>15</sup> Bureau of Transportation Statistics: T-100 Domestic Segment, 2010-2019.

<sup>16</sup> Ibid.

Following a period of declining reported passenger activity from 2010 to 2013 and 2014 to 2015, the total reported passengers have continued to increase for the period between 2015 and 2019, with the most significant annual growth in 2018 (10.60%).

### Factors Affecting Activity

Interviews were conducted with air carriers that either lease airport land at DLG or conduct operations at DLG. The data collected from interviews inform the aviation activity forecasts.

26 air carriers that conduct passenger, freight, and/or mail operations at DLG were contacted, of which 20 responded. They provided complete information to questions regarding recent or anticipated fleet changes for DLG operations, frequency of operations at DLG during the day and at night, preliminary comments about a potential runway shift to address Runway Safety Area (RSA) requirements, and contact information for future public and stakeholder involvement efforts.

Analysis of interview data yielded insight regarding key factors that have affected aviation activity and helped inform either the aviation activity forecasts or discussion of the results:

- COVID-19 had a significant negative impact on carriers that relied on providing passenger service because communities across the state were “hunkering down” to reduce the spread of the virus.
- There was generally less of an impact from COVID-19 for freight carriers. Some freight carriers even mentioned becoming busier after COVID-related restrictions were imposed.
- Northern Air Cargo is one of the largest cargo carriers in the state. The company revealed that they were considering switching to Boeing 737-800s for future DLG operations. This aircraft is more demanding than DLG’s current critical aircraft (Boeing 737-700), and one of the forecasting scenarios accounts for this possibility. Northern Air Cargo reported five to six flights per week to DLG in the summer, with two per day the first two weeks in July, and four per week in the winter.
- Lynden Air Cargo uses the Lockheed L-100 for its DLG operations, with 2-3 flights per week in June and July, and only a few charters out of fishing season.
- Everts Air Cargo uses MD-80s, and occasionally DC-6s, for its DLG operations, with 3 flights per week in the summer and two per week out of season.

See Appendix A for the full Air Carrier Interview Summary.

### Aircraft Operations

The 2019 DLG T-100 Domestic Segment dataset (from the Bureau of Transportation Statistics Air Carrier Statistics database) was used to determine base-year aircraft operations at DLG. The T-100 dataset for DLG provided departure and arrival information for each month in 2019, including the specific air carrier, aircraft, number of passengers and seat capacity, pounds of freight, and pounds of mail.

The interviews conducted with air carriers supplement T-100 data with valuable qualitative data to illuminate potential future airport design needs. The T-100 database was preferred for quantitative analysis due to (1) the monthly reporting by certificated U.S. air carriers, (2) the availability of more granular operations data than could be gleaned from interviews, and (3) the fact that Ravn Alaska was filing for bankruptcy during the interview period—liquidating assets and cutting personnel. Ravn

Alaska’s bankruptcy also affected its subsidiaries that have conducted operations at DLG, including Peninsula Airways (d/b/a PenAir). These factors affected the availability of data that could be collected from interviews and would significantly affect the reliability of aviation activity forecasts.

Aircraft operations were categorized by aircraft make and model, Aircraft Approach Category (AAC), and Airplane Design Group (ADG). The AAC and ADG are used to classify aircraft.<sup>17</sup> Knowing an airport’s critical aircraft is essential for determining its Airport Reference Code (ARC), which affects DLG’s design criteria.

**Table 12: Aircraft Approach Category (AAC)<sup>18</sup>**

AAC	Approach Speed
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

**Table 13: Airplane Design Group (ADG)<sup>19</sup>**

Group #	Tail Height (ft)	Wingspan (ft)
I	< 20’	< 49’
II	20’ - < 30’	49’ - < 79’
III	30’ - < 45’	79’ - < 118’
IV	45’ - < 60’	118’ - < 171’
V	60’ - < 66’	171’ - < 214’
VI	66’ - < 80’	214’ - < 262’

Table 14 summarizes DLG aircraft operations in 2019 by aircraft make and model, AAC, and ADG, as reported in the T-100 database.

<sup>17</sup> An airport’s critical aircraft refers to the most demanding aircraft that conducts at least 500 annual operations at the airport.

<sup>18</sup> FAA Advisory Circular 150/5300-13A, Airport Design.

<sup>19</sup> Ibid.

**Table 14: Annual DLG Operations by Aircraft, AAC, and ADG (2019)<sup>20</sup>**

<b>AAC - ADG</b>	<b>Aircraft</b>	<b>Annual Operations</b>
<b>A-I</b>	Beech Baron (55 Series)	10
	Beech Bonanza 35A/C/D/E/G/H/J/K/S/V/36A	12
	Cessna C206/207/209/210 Stationair	4664
	Gipps Aero Ga8 Airvan	2
	Piper PA-31 (Navajo)/T-1020	470
	Piper PA-32 (Cherokee 6)	837
<b>A-I Subtotal</b>		<b>5995</b>
<b>A-II</b>	Casa/Nurtanio C212 Aviocar	2
	Cessna 208 Caravan	2280
	Pilatus PC-12	156
<b>A-II Subtotal</b>		<b>2438</b>
<b>B-II</b>	Beech 1900 A/B/C/D	1399
<b>B-II Subtotal</b>		<b>1399</b>
<b>B-III</b>	Bombardier BD-700 Global Express	2
	Dassault Falcon 7X	2
	De Havilland DHC8-100 Dash-8	759
	McDonnell Douglas DC-6A	28
	Saab 2000	1212
<b>B-III Subtotal</b>		<b>2003</b>
<b>C-II</b>	Saab-Fairchild 340/A	8
	Saab-Fairchild 340/B	20
<b>C-II Subtotal</b>		<b>28</b>
<b>C-III</b>	Boeing 737-100/200	15
	Boeing 737-300	175
	Boeing 737-400	88
	Boeing 737-700/700LR/Max 7	264
	McDonnell Douglas DC-9-30	78
	McDonnell Douglas DC9 Super 80/MD81/82/83/88	199
<b>C-III Subtotal</b>		<b>819</b>
<b>C-IV</b>	Lockheed L100-30/L-382E	168
<b>C-IV Subtotal</b>		<b>168</b>
<b>Total</b>		<b>12850</b>

The current critical aircraft at DLG is ARC C-III. While C-IV aircraft operations occur at DLG, they do not meet 500 annual operations.

<sup>20</sup> Bureau of Transportation Statistics: T-100 Domestic Segment, 2019.

## Factors Affecting Operations

There are many factors that can affect future aircraft operations at DLG, potentially resulting in a change in critical aircraft. Factors include:

- Freight and passenger fee costs
- Fuel costs
- Changes in fleet mix
- Demographic changes
- Socioeconomic changes
- Capital projects to address FAA requirements or increase operational efficiency

## Forecast Scenarios

FAA AC 150/5070-6B, Airport Master Plans, allows several methodologies and techniques for forecasting aviation activity at DLG. Regression analysis was used, applying population and fishing industry data.

First, population data were analyzed. Population projections were prepared targeting the DLG study area. This study area includes the Dillingham Census Area, Bristol Bay Borough, and Lake and Peninsula Borough. Low-growth, base-growth, and high-growth population projections were made using local population projections prepared by the Alaska Department of Labor and Workforce Development (ADOLWD) and McKinley Research Group calculations (See Table 15).

**Table 15: Alaska Statewide and Local Area Population Annual Average Growth Rate Projections, 2020 to 2040 (Percent Change)<sup>21</sup>**

Location	2020-2025	2025-2030	2030-2035	2035-2040
Dillingham Census Area	0.1%	0.1%	0.2%	0.3%
Bristol Bay Borough	-0.5%	-0.8%	-0.4%	-0.4%
Lake and Peninsula Borough	0.4%	0.3%	0.3%	0.3%
Dillingham Airport study area <sup>22</sup>	0.09%	0.04%	0.15%	0.22%
Anchorage	0.4%	0.3%	0.2%	0.1%
Statewide	0.6%	0.5%	0.4%	0.3%

See Appendix B: *Dillingham Airport study area Population Trends and Projections* for additional discussion of population projection methodology.

Applying the population projections to base-year (2019) aviation activity, four forecast scenarios were considered for three future milestones: short term (2025), intermediate term (2030), and long term (2040). Forecast scenarios using population projections are the Low Growth Scenario, Base Growth Scenario, High Growth Scenario, and Air Cargo Fleet Change Scenario.

<sup>21</sup> Alaska Department of Labor and Workforce Development.

<sup>22</sup> McKinley Research Group calculations.

The last (fifth) scenario is called the “Fresh Sockeye Growth Scenario.” This scenario combines the annual growth rate of Dillingham to Anchorage airfreight volumes and the average annual growth rate of Bristol Bay fresh fish production for the same period, applying the hybrid rate to a specific aircraft classification, discussed later. Trend analysis is also used to compare fishing industry data with the various aspects of DLG operations. This fifth scenario specifically considers the largest economic factor impacting operations (specifically cargo) at DLG, where the other four scenarios are based on population projections as previous DLG AMPS have been.

Additional assumptions made when preparing the forecasts include:

- Ravn Alaska’s bankruptcy will not affect demand levels for passenger, freight, and mail service to/from DLG.
- The remaining air carriers will be able to replace the operations formerly provided by Ravn Alaska and its subsidiaries to/from DLG.
- To account for annual operations growth between 2019 and 2020, the growth rate projections for 2020-2025 were used; negating concern regarding anomalies in operations due to temporary COVID-19 impacts.

### Low Growth Scenario

The low growth scenario applies the growth rates from the Bristol Bay Borough population projection to the 2019 DLG aircraft operation counts. This scenario assumes that DLG study area’s projected growth between 2019 and 2040 will be similar to the projected rates of change for the Bristol Bay Borough (see Bristol Bay Borough in Table 15 above).

**Table 16: 2019 to 2040 DLG Aircraft Operations Forecast: Low Growth Scenario**

AAC-ADG	Annual Operations (2025)	Annual Operations (2030)	Annual Operations (2040)
A-I	5,817	5,588	5,369
A-II	2,366	2,273	2,183
B-II	1,358	1,304	1,253
B-III	1,944	1,867	1,794
C-II	27	26	25
C-III	795	763	733
C-IV	163	157	150
<b>Total</b>	<b>12,469</b>	<b>11,978</b>	<b>11,508</b>



### Base Growth Scenario

The base growth scenario applies the growth rates from the DLG study area population projection to the 2019 DLG aircraft operation counts. This scenario assumes that DLG study area’s projected growth between 2019 and 2040 will be similar to the weighted average for the three study area sub-regions’ projected rates of change (Dillingham Census Area, Bristol Bay Borough, and Lake and Peninsula Borough; see Dillingham Airport study area in Table 15 above).

**Table 17: 2019-2040 DLG Aircraft Operations Forecast: Base Growth Scenario**

AAC-ADG	Annual Operations (2025)	Annual Operations (2030)	Annual Operations (2040)
A-I	6,027	6,040	6,152
A-II	2,451	2,456	2,502
B-II	1,407	1,409	1,436
B-III	2,014	2,018	2,056
C-II	28	28	29
C-III	823	825	840
C-IV	169	169	172
<b>Total</b>	<b>12,920</b>	<b>12,945</b>	<b>13,187</b>

### High Growth Scenario

This scenario applies the growth rates from the Dillingham Census Area population projection to the 2019 DLG aircraft operation counts. This scenario assumes the study area’s projected growth between 2019 and 2040 will be similar to the projected rates of change for the Dillingham Census Area (see Dillingham Census Area in Table 15 above).

**Table 18: 2019-2040 DLG Aircraft Operations Forecast: High Growth Scenario**

AAC-ADG	Annual Operations (2025)	Annual Operations (2030)	Annual Operations (2040)
A-I	6,031	6,061	6,215
A-II	2,453	2,465	2,527
B-II	1,407	1,414	1,450
B-III	2,015	2,025	2,076
C-II	28	28	29
C-III	824	828	849
C-IV	169	170	174
<b>Total</b>	<b>12,927</b>	<b>12,992</b>	<b>13,321</b>

### Air Cargo Fleet Change Scenario

In this scenario, Northern Air Cargo goes forward with the fleet change it is considering and uses only Boeing 737-800s for DLG operations, instead of the series 100, 200, 300, and 400 aircraft it used in 2019. This scenario was considered because, during interviews with air carriers, Northern Air Cargo was the only carrier planning a fleet change to an aircraft more demanding than the current critical aircraft.

For all DLG operations conducted by Northern Air Cargo in the base year (2019), the aircraft used is replaced with the Boeing 737-800 for projected years 2020-2040. The growth rates from the high growth scenario were applied to the three future milestones.<sup>23</sup> The reason for testing this scenario was to learn whether the 737-800—categorized as a D-III aircraft—would exceed 500 annual operations by 2040, since D-III aircraft are more demanding than DLG’s current critical aircraft, which is the Boeing 737-700 (C-III). The following table shows the fleet Northern Air Cargo used for its 2019 DLG operations.

**Table 19: Northern Air Cargo Fleet, DLG Operations (2019)**

Aircraft	AAC-ADG	Annual Operations
Boeing 737-100/200	C-III	15
Boeing 737-300	C-III	175
Boeing 737-400	C-III	78
<b>Total</b>		<b>268</b>

This scenario assumes a fleet change taking place in 2020, which would alter the total number of C-III and D-III aircraft operations at DLG in 2020 (move 268 operations from the C-III category to D-III). Operations in the remaining ARC categories would continue to grow at their expected rates:

**Table 20: Northern Air Cargo Fleet Change Effect on DLG Operations, by ARC Category**

AAC-ADG	Annual Operations (2019)	Annual Operations (2020)
C-III	819	551
D-III	0	268

<sup>23</sup> During the interviews with air carriers, only Northern Air Cargo mentioned a potential fleet change to aircraft that are more demanding than DLG’s current critical aircraft.

**Table 21: 2019-2040 DLG Aircraft Operations Forecast: Air Cargo Fleet Change Scenario**

AAC-ADG	Annual Operations (2025)	Annual Operations (2030)	Annual Operations (2040)
A-I	6,031	6,061	6,215
A-II	2,453	2,465	2,527
B-II	1,407	1,414	1,450
B-III	2,015	2,025	2,076
C-II	28	28	29
C-III	554	557	571
C-IV	169	170	174
D-III	269	271	278
<b>Total</b>	<b>12,926</b>	<b>12,991</b>	<b>13,320</b>

Following a fleet change by Northern Air Cargo, D-III operations are not projected to meet 500 annual operations by 2040.

### Comparison with Federal Aviation Administration Forecast

The most recent TAF predicts a slow but steady increase in operations at DLG through 2040. Air carrier operations are predicted to increase between 0.523% and 0.594% annually through 2040. Air taxi and commuter operations are expected to increase 0.976% to 1.006% annually through 2040. The growth rates in the TAF fall within the growth rates used for the base growth and high growth scenarios, based on population projections.

### Fresh Sockeye Growth Scenario

While population is certainly a factor affecting aviation activity at DLG, analysis of the operations data indicated that population changes in the DLG study area from 2010-2019 did not adequately correlate with changes in certain aircraft operations counts. Because of the significant role of the fishing sector in the local economy, it was hypothesized that local fish processing data would have a stronger correlation with DLG operations for certain aircraft or carriers associated with freight movement.

After further analysis, fish processing data were narrowed to Bristol Bay fresh sockeye, excluding other processing types for Bristol Bay sockeye. This is because fresh sockeye generally needs to be flown to its destination to avoid spoilage. Alternatively, canned, frozen, and other processing types are typically barged out of Dillingham due to the longer time table.

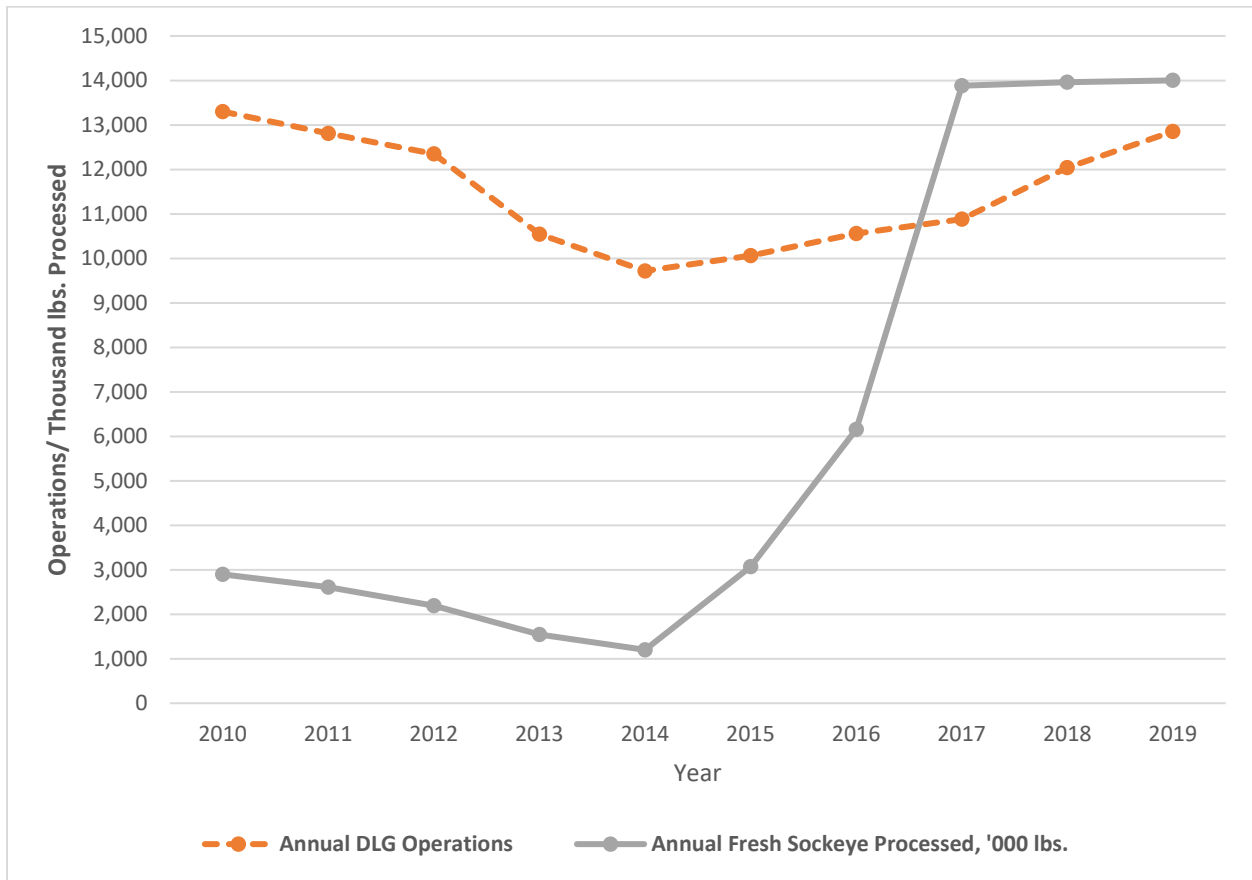
This scenario will demonstrate the following:

1. Changes in fresh sockeye processing volumes significantly affect DLG cargo volumes.
2. Changes in DLG cargo volumes from increased fresh sockeye processing affect C-IV aircraft operations.
3. Significant, long-term growth in regional fresh sockeye processing is expected.
4. Sockeye processing growth is reasonably likely to change the ARC at DLG to C-IV by 2040.

**Changes in Fresh Sockeye Processing Volumes Significantly Affect DLG Cargo Volumes.**

The annual volume of Bristol Bay fresh sockeye processed has dramatically increased—almost 12X—from just over 1.2 million lbs. in 2014 to 14 million lbs. in 2019. While production of Bristol Bay fresh sockeye has been steady around 14 million pounds annually since 2017, the volume being flown out of Dillingham has been noticeably increasing. In 2017, DLG handled approximately 25% of the total Bristol Bay fresh sockeye volume, rising to 30% in 2018, and 37% in 2019. See Figure 6 for Bristol Bay fresh sockeye volumes and Figure 7 for cargo volumes from DLG to Anchorage.

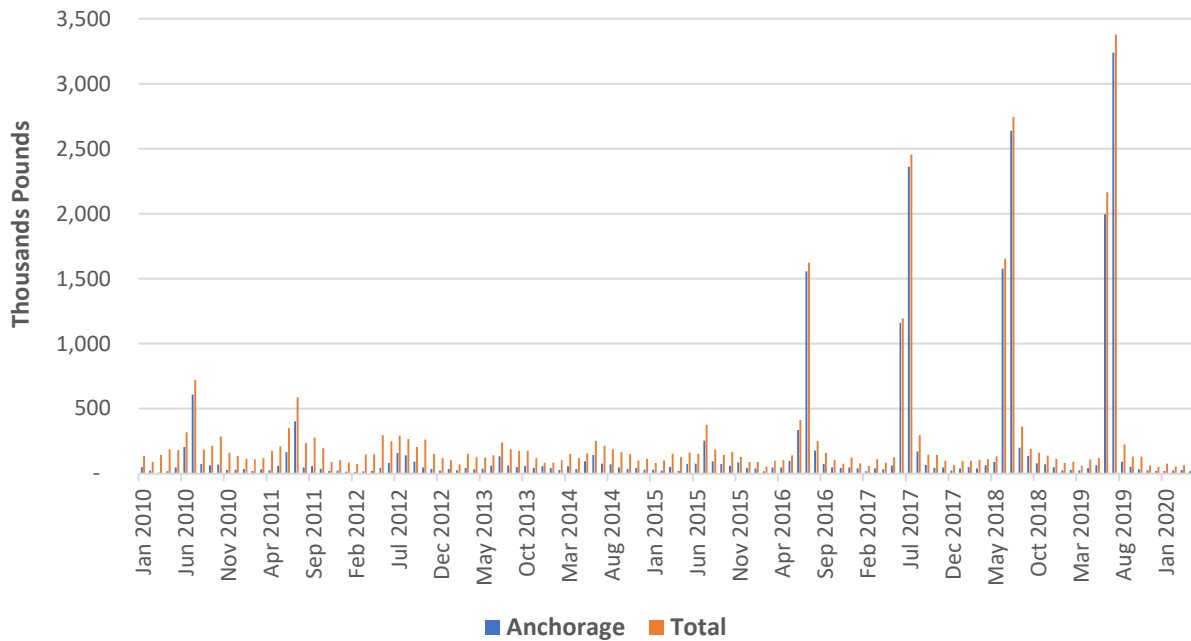
**Figure 6: Annual Bristol Bay Fresh Sockeye Processed, thousand lbs. vs. Annual DLG Operations<sup>24</sup>**



During the 2019 salmon fishing season (June to August), almost 2,700 tons of cargo were shipped from Dillingham to Anchorage (or 92% of all cargo departing from Dillingham). Approximately 160 tons were shipped in the other nine months combined.

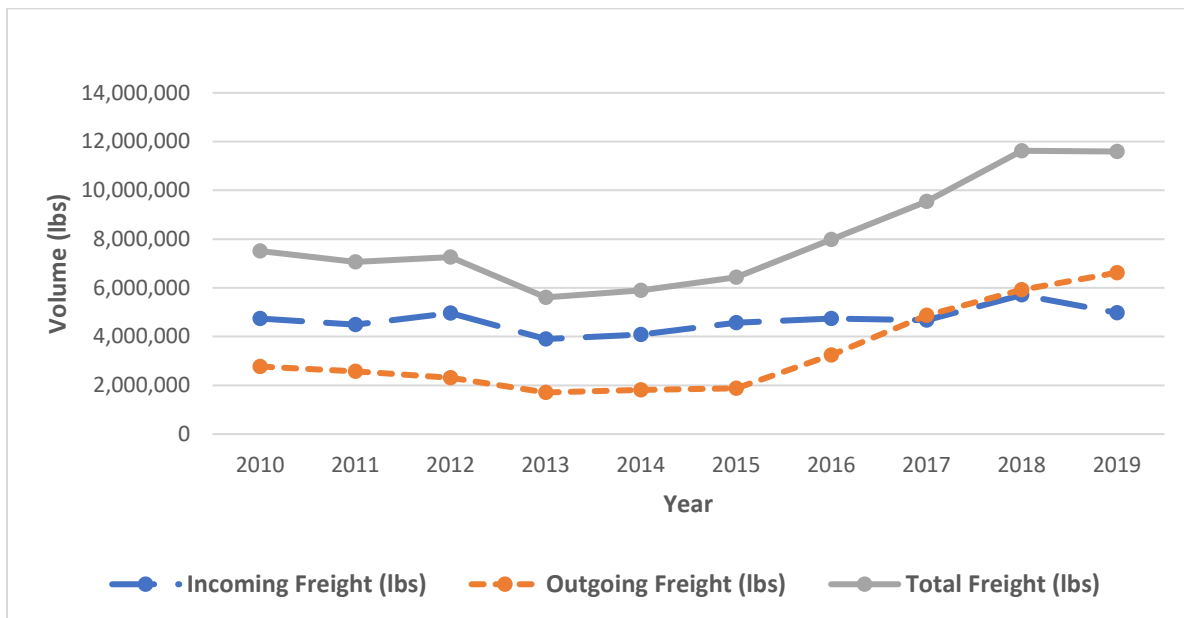
<sup>24</sup> BTS T-100 and ADFG COAR Data, [https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareabristolbay.salmon\\_sockeye\\_coar](https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareabristolbay.salmon_sockeye_coar).

Figure 7: Seasonal Air Cargo from Dillingham to Anchorage, thousand lbs., 2010-2020<sup>25</sup>



Note that cargo volumes from Anchorage to DLG remained relatively constant while outgoing cargo from DLG continues to rise, further evidence of fresh sockeye’s effect on outgoing cargo volumes. See Figure 8.

Figure 8: Dillingham Airport Historical Annual Freight Volumes, 2010-2019<sup>26</sup>



<sup>25</sup> BTS T-100

<sup>26</sup> Ibid.

Many external forces converged in 2017 to provide an opportunity for shore-based Bristol Bay processors to aggressively increase the volume of product shipped to fresh fish markets. Prior to 2017, fresh sockeye was primarily sourced from Cook Inlet and Copper River. Both areas saw low returns in 2017 while Bristol Bay saw the first in a string of large returns, opening the door for Bristol Bay to fill the void in the fresh sockeye market.

Processors in Naknek and Dillingham have the advantage of access to airports with air freight service. One interviewee stated for their operation, “Bristol Bay is now the primary source of fresh sockeye salmon in July,” a market shift that began in 2017<sup>27</sup>. Additionally, the geography of the Nushagak fishing district and Dillingham’s shore-based processing plants allows for quick deliveries of high-quality and high-value sockeye to the fresh market. Major processors OBI and Peter Pan Seafoods both have plans for increasing fresh sockeye production from their Bristol Bay plants.

### **Changes in DLG Cargo Volumes from Increased Fresh Sockeye Processing Affect C-IV Aircraft Operations.**

In 2019, most of the fresh sockeye flown out of Dillingham was on chartered Lynden Air Cargo flights. This is significant, because Lynden uses the Lockheed L-100—a C-IV aircraft—for its operations to and from DLG. With variable market share each year, Alaska Airlines, Northern Air Cargo, and Everts Air have also carried significant volumes of fish over the past four years, but they do not currently use aircraft with an ARC higher than C-III.

Air shipment of fresh sockeye occurs in an extremely concentrated period starting in June and peaking in July. Little fresh fish is shipped outside the June and July harvest season.

Like air cargo volumes spikes, air passenger travel from Dillingham to Anchorage is highly seasonal. June is the peak month for Anchorage passengers arriving in Dillingham, largely associated with the start of the seafood harvest and processing season. In June 2019, Anchorage passengers represented 86% of Dillingham arrivals. During summer peaks in July and August, Anchorage travelers represent over 81% of all passengers departing DLG.

Note that growth in the fresh sockeye market had less of an effect on passenger growth. Accordingly, this scenario will only apply Bristol Bay fresh sockeye processing growth to Lynden Air Cargo operations, excluding operations by other carriers.

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<sup>27</sup> Interview by McKinley Research Group, November 2020.

Figure 9: Air Passengers from Dillingham to Anchorage, Number of Passengers, 2010-2020<sup>28</sup>

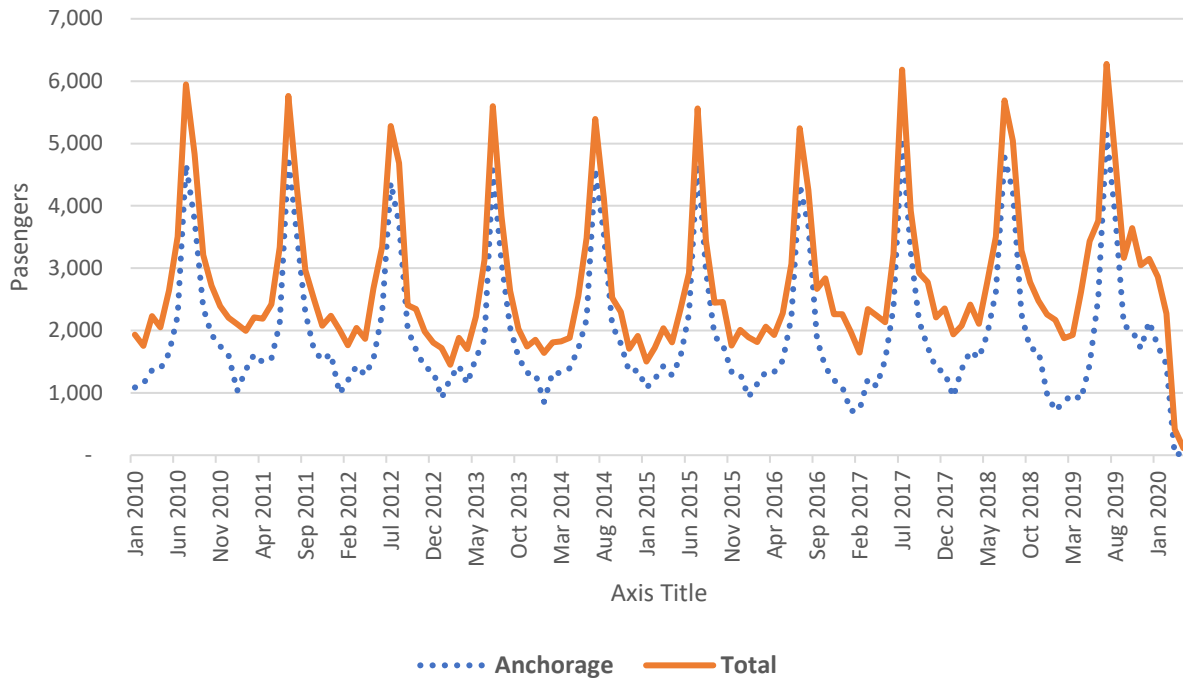
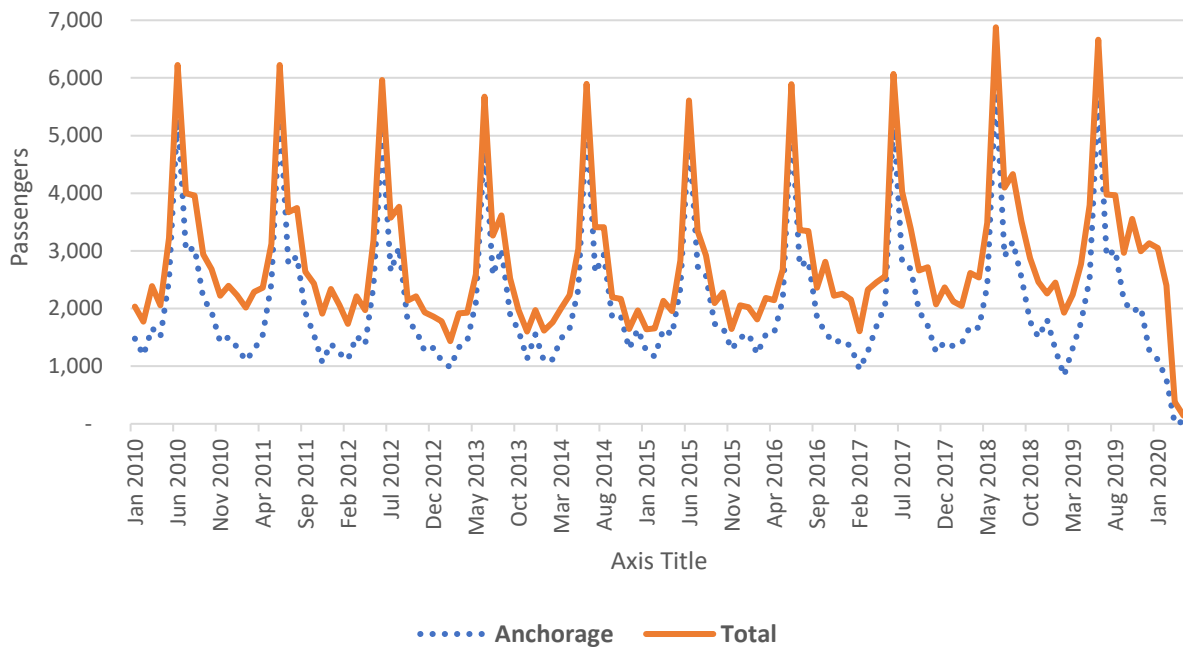


Figure 10: Air Passengers from Anchorage to Dillingham, Number of Passengers, 2010-2020<sup>29</sup>



<sup>28</sup> BTS T-100.

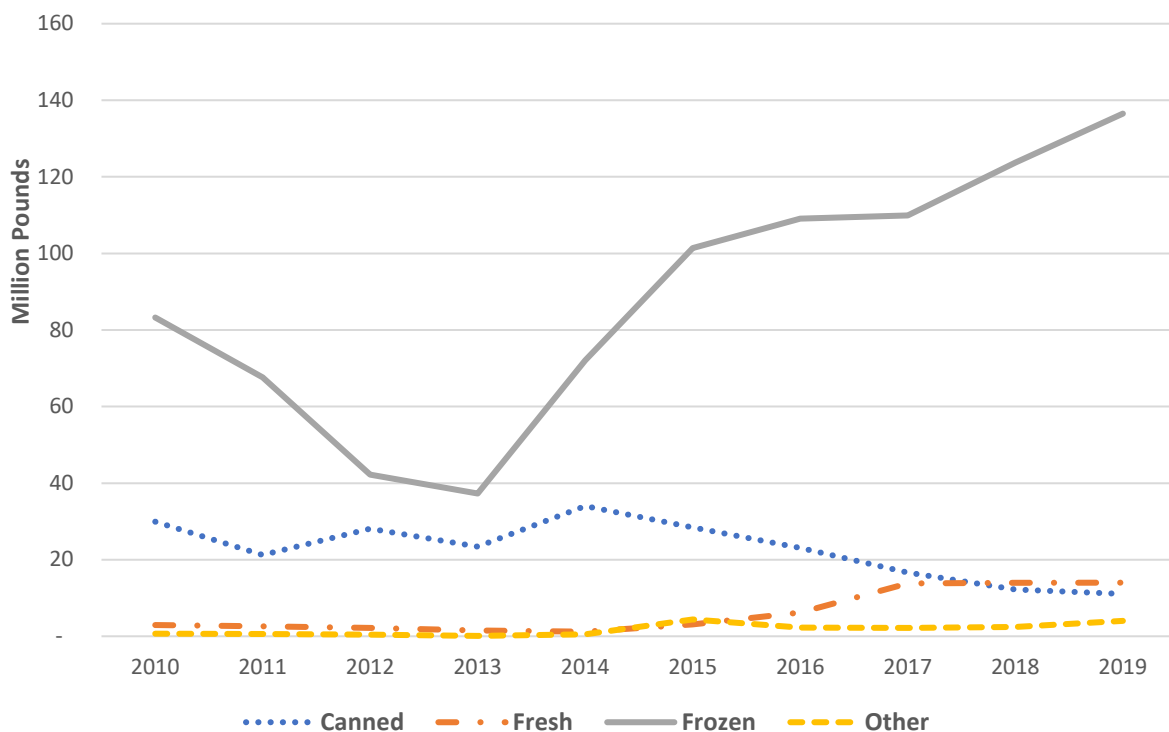
<sup>29</sup> Ibid.

**Significant, Long-Term Growth in Regional Fresh Sockeye Processing is Expected.**

In general, fresh sockeye markets have been strong and look to continue to grow into the future. Both Peter Pan Seafoods and OBI Seafoods have shifted aspects of their operations to capitalize on the fresh sockeye market and the opportunity provided by proximity to DLG.

There is unconstrained potential supply of fresh salmon from Bristol Bay, since fresh fish accounted for only 9% of production in 2019, with most sold as a frozen product (Figure 11). Market demand and infrastructure development (in Dillingham and Anchorage) will likely drive growth in production and shipments.

**Figure 11: Bristol Bay Sockeye, by Processing Type, Million lbs., 2010-2019<sup>30</sup>**



**Sockeye Processing Growth is Reasonably Likely to Change the ARC at DLG to C-IV by 2040.**

An important caveat to this section is that it is not possible to predict with certainty the volume of fresh fish that will be flown out of Dillingham in the future, given uncertainty about the strength of competitive sockeye runs elsewhere in Alaska; however, available data indicates that continued growth is likely, that that growth could result in DLG’s ARC increasing to C-IV by 2040.

Additionally, the timing of development of the Anchorage Cargo and Cold Storage (ACCS) facility may also be a factor. ACCS is expected to facilitate movement of fresh Alaska fish to domestic and overseas markets, and would further improve capacity to receive increasing volumes of fresh sockeye from DLG.

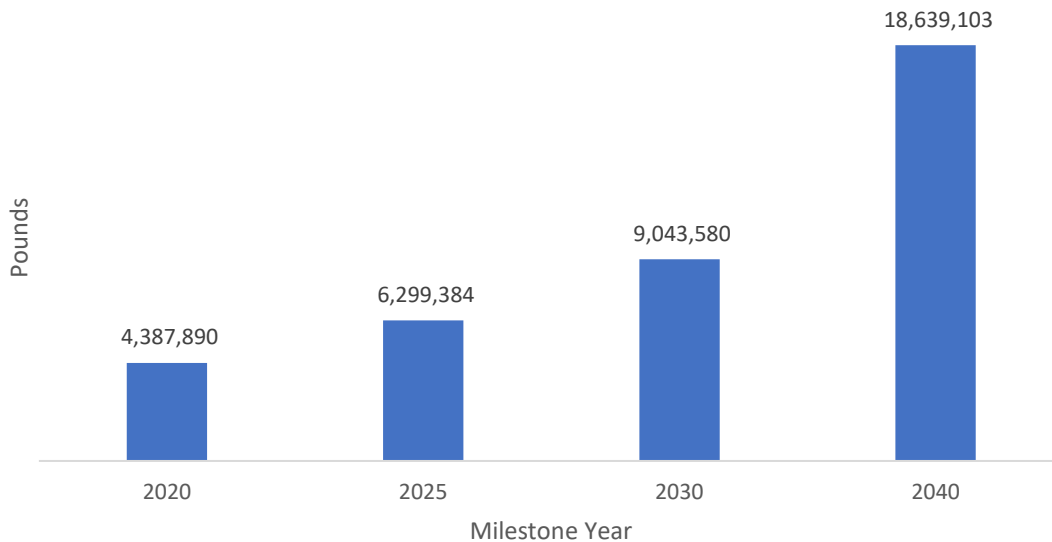
<sup>30</sup> ADFG COAR Data,  
[https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareabristolbay.salmon\\_sockeye\\_coar](https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareabristolbay.salmon_sockeye_coar).



A reasonable forecast can be developed by blending the annual growth rate of Dillingham to Anchorage airfreight volumes in June and July for the 2017 to 2019 period (14.1%) and the average annual growth rate of Bristol Bay fresh fish production overall for the same period (0.4%). This produces an annual average growth rate of 7.25%.

While representing substantial growth when compounded over a 20-year period, it is reasonable given the abundance of supply, increasing consumer appreciation for fresh fish from Bristol Bay, processor interest in shifting to production of more (and higher-value) fresh fish, and supporting infrastructure development that is likely to occur in the relatively near-term. Reflecting an annual growth rate in fresh fish shipments of 7.25%, Figure 12 provides projected total annual airfreight poundage moving from Dillingham to Anchorage in 2025, 2030, and 2040.

**Figure 12: Projected Annual Airfreight from Dillingham to Anchorage, Pounds, 2020, 2025, 2030, and 2040**



As projected above, fresh fish would account for 12% of total Bristol Bay production by 2030 and about 18% of production by 2040. In 2019, Alaska produced and sold 60 million pounds of fresh salmon, including 29 million pounds of fresh sockeye. Holding production from all other areas constant, the projected Bristol Bay increase by 2030 (about 4.7 million additional pounds) would represent an overall increase in Alaska fresh salmon production of about 8%, and by 2040 (about 14.3 million additional pounds) about 24%. Statewide fresh sockeye production would rise by about 16% and about 49% in 2030 and 2040, respectively.

Based on the assumption that all the increase in airfreight illustrated in the preceding figure is fresh fish (4.7 million additional pounds by 2030 and 14.3 million additional pounds by 2040), and the assumption that fish is shipped over a six-week period in June and July, daily outbound fresh salmon airfreight would average about 111,000 pounds/day in 2030 and about 340,000 pounds/day by 2040.

At an average of 45,000 pounds per flight, approximately two to three additional flights per day (averaged over six weeks) would be required. By 2040, seven to eight additional flights per day would be

needed. This could mean 504 DLG operations with C-IV aircraft by 2040 (projecting from 2019 operations).

## Critical Aircraft

Critical Aircraft determinations and aviation forecasts should be determined through analysis of the most relevant indicators. Therefore, low, base, and high growth scenarios calculated using population projections may be used to forecast operations growth for aircraft with ARCs other than C-IV. C-IV aircraft operations projections should use the growth rate provided in the Fresh Sockeye Growth scenario.

Given that Lynden Air Cargo performed 168 operations at DLG with a Lockheed L-100 in 2019, an additional 8 operations per day during the six-week period would mean 504 annual flights with a C-IV aircraft by 2040. If this occurs, the Lockheed L-100 would become the new critical aircraft.

This result only considers Lynden's forecasted growth—it is possible that other carriers will similarly upgrade their fleet to more demanding aircraft to accommodate the increasing freight volumes.

Additionally, while the pending Northern Air Cargo fleet change to the 737-800 for DLG operations would not result in D-III aircraft exceeding 500 operations by 2040, the combination of this and the increase in C-IV aircraft operations may have important pavement implications at DLG.

Considering these factors, DLG's current critical aircraft classification is C-III, and the forecasted critical aircraft classification is C-IV by 2040.

## Appendices

Appendix A. Air Carrier Interview Summary

Appendix B. Dillingham Airport Study Area Population Trends and Projections

# Appendix A

## Air Carrier Interview Summary

# Air Carrier Interview Summary

## Dillingham Airport Master Plan Update

Project No. CFAPT00353/ AIP 3-02-0078-017-2018

Prepared for:



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## Introduction

R&M Consultants, Inc. (R&M) is providing consulting services for the Alaska Department of Transportation and Public Facilities (DOT&PF) to update the Dillingham Airport Master Plan (DLG AMP). The DLG AMP will include a new Runway Safety Area (RSA) practicability study, updated forecasting, and an Airport Layout Plan brought up to current design standards.

The following is a summary of the aircraft operations data collected from phone and email interviews with air carriers that conduct operations at Dillingham Airport. These data will be used to inform (1) the Aviation Activity Forecast and (2) Conditions and Needs Assessment report for the AMP.

## Methodology

R&M called and/or emailed 26 air carriers that conduct passenger, freight, and/or mail operations at Dillingham Airport (DLG) to inform them of the AMP update and collect data. 20 carriers responded with complete information to the following questions:

1. Do you have any new aircraft or discontinued aircraft you are operating since September of last year at the Dillingham airport? In the future, do you foresee adding additional aircraft to or discontinuing aircraft from your fleet at the airport?
2. How many flights per day do you operate and which aircraft?
3. How many flights at night do you operate and which aircraft?
4. As part of the master plan project, we are analyzing changes in airport layout design, including shifting the runway to the west by 150 feet and extending the runway safety areas on the ends. Do you have any comments about a runway shift?
5. We plan on doing public involvement for this project this summer or later this year, depending on the COVID-19 restriction status. What is the best way to notify you of public meetings?

Table 1 provides a summary of the answers received from carriers. Blacked-out cells are from the carriers R&M did not receive responses from.

Table 1: Air Carrier Interview Summary

Air Carrier	DLG Location?	Q1: New or Discontinued Aircraft? Plans to Add or Discontinue Aircraft?	Q2: Flight Frequency? Which Aircraft?	Q3: Night Flight Frequency? Which Aircraft?	Q4: Runway Shift Comments?
Adventist World Aviation	Yes	Likely relocating away from DLG. Currently only using DLG for storage.	N/A	N/A	No
Alaska Airlines, Inc.	Yes	No	1/day; Boeing 737-700	N/A	No
Alaska Central Express (ACE Air Cargo)	No	N/A	2/day, 6 days/week on average. 4-5/day on busiest days; Beechcraft 1900C	Winter: 6/week; Beechcraft 1900C	They did the same thing in Aniak, spent millions of dollars and ended up shortening the runway.
Alaska Island Air	Yes	No	2-3/day; Piper Cherokee	N/A	Does not think a shift is cost effective. Would rather see a taxiway for Runway 19 with apron extension for operators to lease.
Alaska Pride Air	Yes	N/A	N/A	N/A	No
Antler Aviation	Yes	None added or discontinued. Hoping to add a Navajo.	Pre-COVID: 40/week; Currently: 10/week; Piper Cherokee 6	Winter: 5/year; Piper Cherokee 6	Ridiculous to move the runway. It works well. If it's a matter of getting federal funding then that's ok, but if it's just to comply with standards, it's not worth the cost.
Bay Air, Inc.	Yes	Sold the Maule; no plans to add new aircraft	June 1 to 3 <sup>rd</sup> week of September: 6-8/day, 6 days/week; Beaver	N/A	No
Bristol Bay Air Services, Inc.	Yes	No	2/day; Cessna 207 and Cessna 182	Occasional; Cessna 207 and Cessna 182	Look at moving the runway northwest of Dillingham (total relocation). Violent storms come from the southeast.

Coupchiak Aviation	No	N/A	Pre-COVID: 4-5/week; Currently: Musketeer; Piper PA-32 300	Winter: 10-12/year	It would be nice to shift. During storms, there is 60-70% crosswind.
Denaina Air Taxi	No	N/A	Pre-COVID: 1-2/month; Currently: 2-3/week since Ravn started liquidating assets, likely to decrease with AK Airlines resuming service to DLG; Navajo; King Air 200	N/A	No
Everts Air Cargo (Tatonduk Flying Service)	No	N/A	2/week; 3/week in the summer; primarily MD-80, occasionally DC-6	Winter: 5/year; MD-80	No
Grant Aviation	Yes	No	Pre-COVID: 10/day scheduled, 2/day unscheduled Currently: 3/day scheduled, 3/day unscheduled; Cessna 208B and Cessna 207	Winter: 3-5/night; Cessna 208B and Cessna 207	If there's a shift, the taxiway needs to be able to handle 737s. Wouldn't want to change the lease lot—this has been a problem at other airports that did something similar.
Guardian Flight	No				
Iliamna Air Taxi	No	N/A	Summer: 20/month; Winter: 2-3/month; Pilatus PC-12, Cessna 207, Beechcraft Bonanza A36, Baron B358	Occasional (same aircraft)	No
Island Air Service	No	N/A	10/year; Cherokee 6, Britten-Norman Islander, Cessna 208 Caravan	N/A	No
Katmai Air	No				
Lynden Air Cargo Airlines	No	N/A	June & July: 2-3/week Off season: 0-10/year	N/A	No
Maritime Helicopters, Inc.	No	N/A	5-10/year; various helicopters	N/A	No



Mulchatna Air	Yes	No	Pre-COVID: 1-3/day; Cessna 207	N/A	A shift could make enough space for a cross strip
Northern Air Cargo, Inc.	No	Looking to switch to 737-800s in the future for DLG operations	Winter: 4/week; Summer: 5-6/week; 1 <sup>st</sup> 2 weeks in July: 2/day; 737-300s and 737-400s	Winter: 2-3/week; 737-300s and 737-400s	Doesn't seem cost effective. Aniak was a mess—would have been better to buy the houses. Don't narrow or shorten the runway. MD-80s have stiffer braking actions which require longer runways.
Paklook Air, Inc d/b/a/ Airlift Alaska d/b/a/ Yute Commuter Service	No	N/A	3-4/month; Piper Lance	N/A	No
Shannon's Air Taxi	Yes	Recently added a Caravan. Would like to purchase a second Caravan if COVID doesn't hurt business too much.	4/day; Cessna 207	N/A	Figured they would do it eventually. You would have to move the localizer.
Starflite, Inc.	Yes				
Tanana Air Service (Bidzy Ta Hot Aana, Inc.)	No				
Tucker Aviation	Yes				
Van Air	Yes	Hoping to add a Beechcraft A36 or PA-32-301 (highly likely pre-COVID, now just moderately likely)	Pre-COVID: 15/week; Currently: 5-8/week; PA-32-301	1/week	Could be a waste of money. Will they look at paving the west ramp? It needs work.

## Conclusions

It was apparent that COVID-19 had a significant negative impact on carriers that relied on providing passenger service. A notable example was Ravn Alaska, which filed for bankruptcy in the wake of the pandemic (including subsidiary PenAir).

For freight carriers, there was generally less of an impact. Some freight carriers even mentioned becoming busier during COVID-related restrictions.

Regarding air carriers adding or discontinuing aircraft from their fleet, special attention should be paid to Northern Air Cargo, which stated that it is considering switching to Boeing 737-800s in the future for DLG operations. This aircraft is more demanding (Airport Reference Code D-III) than DLG's current design aircraft (Airport Reference Code C-III), and this information should be considered when making aircraft operations forecasts.

When asked about a possible runway shift, many carriers did not have comments; however, the two primary comments expressed were (1) doubt that a runway shift would be cost-effective and (2) concern over potentially reducing runway dimensions.

Appendix B  
Dillingham Airport Study Area  
Population Trends and Projections

# Dillingham Airport Study Area Population Trends and Projections

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## Factors Affecting Population Trends

This analysis provides population projections for the Dillingham Airport Study Area, including Dillingham Census Area, Bristol Bay Borough, and Lake & Peninsula Borough. This methodology differs from a forecast, which would account for specific reasonably foreseeable economic and other factors that may have potential to affect population change.

While it is beyond the scope of this analysis to quantify the potential impact of the full range of forces that may affect population growth in the Dillingham Airport Study Area over the next 20 years, it is useful to briefly note some of the key drivers of potential population change. These include the following:

- **Economic conditions in Alaska** – including factors such as oil prices and related government revenues, gas line development, and other events in the oil and gas industry (responsible for about a quarter of Alaska’s economy). In general, at a statewide level, increases in economic activity are accompanied by increases in population. Conversely, if economic activity contracts, population growth tends to slow or decline.
- **Local employment opportunities** – To the extent the local economy grows (or declines) in response to local events, related or unrelated to statewide or national economic trends, Dillingham Airport Study Area’s population could be affected.
- **Salmon resource abundance and values** – The single largest driver of economic activity is the Bristol Bay sockeye fishery. Changes in environmental or market conditions could have temporary or long-term effects on the economy and population.
- **The condition of the U.S. economy** – Changes in the U.S. economy typically have an inverse effect in Alaska. A weakening U.S. (Lower 48) economy can cause in-migration to Alaska, as the unemployed come to Alaska seeking work. Conversely, strong growth in the U.S. economy can lead to out-migration from Alaska.
- **Cost of living** – As the study region’s cost of living increases (typically associated with rising fuel prices), some people may choose to leave to live in other communities with lower housing prices, utility costs, and better opportunities for employment.
- **Natural growth and other demographic trends** – Changes in birth and death rates, aging of the population, and other demographic forces may also affect local population trends.
- **COVID-19** – The long-term effects of COVID-19 on local and regional populations are uncertain. It appears unlikely that Alaska’s mortality rates will be altered; however, migration is uncertain. In the short-term, a pandemic means fewer people will move both into and out of Alaska, but the biggest shift

will be amongst summer migrant workers (such as those serving in the seafood processing and visitor industry sectors), who are largely nonresidents.

Statewide and local population projections prepared by the Alaska Department of Labor and Workforce Development (ADOLWD) can be used as the basis for Dillingham Airport Study Area-specific projections.

ADOLWD periodically prepares long-term population forecasts for Alaska overall and for local areas. The most recent projections, published in April 2020, indicate slow growth (0.5% annually) over the next 20 years for the state overall.<sup>1</sup> Between 2020 and 2040, Anchorage is expected to have a 0.3% annual growth rate (see Table 1). Within the Dillingham Airport Study Area, Bristol Bay Borough’s population is expected to decline 0.5% annually on average between 2020 and 2040; Dillingham Census Area’s and Lake & Peninsula Borough’s populations are expected to increase slowly, at 0.2% and 0.3%, respectively.

ADOLWD projections indicate essentially no significant population growth can be expected in the study area. This is consistent with long-term historical trends in the area, which actually reflect a downward trend. The combined population of Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough in 2000 was 8,003, about 8% above the most recent (2019) population estimate or 7,375. The study area’s population in 2005, 15 years ago, was 7,617.

**Table 1. Alaska Statewide and Local Area Population Annual Average Growth Rate Projections, 2020 to 2040 (Percent Change)**

Location	2020-2025	2025-2030	2030-2035	2035-2040	2020-2040
Dillingham Census Area	0.1	0.1	0.2	0.3	0.2
Bristol Bay Borough	-0.5	-0.8	-0.4	-0.4	-0.5
Lake & Peninsula Borough	0.4	0.3	0.3	0.3	0.3
Anchorage	0.4	0.3	0.2	0.1	0.3
<b>Statewide</b>	<b>0.6</b>	<b>0.5</b>	<b>0.4</b>	<b>0.3</b>	<b>0.5</b>

Source: Alaska Department of Labor and Workforce Development

ADOLWD uses a “cohort component” methodology, separating the population of each gender into age groups and aging them forward in time, then adding projected births and in-migrants and subtracting projected deaths and out-migrants. ADOLWD assigns each borough/census area its own unique mortality, fertility, and migration rates “based on recent data and knowledge of the specific populations.” Again, these projections do not consider particular events that might affect the economy (such as COVID-19, Alaska’s current state government budget deficits or low oil prices in general).

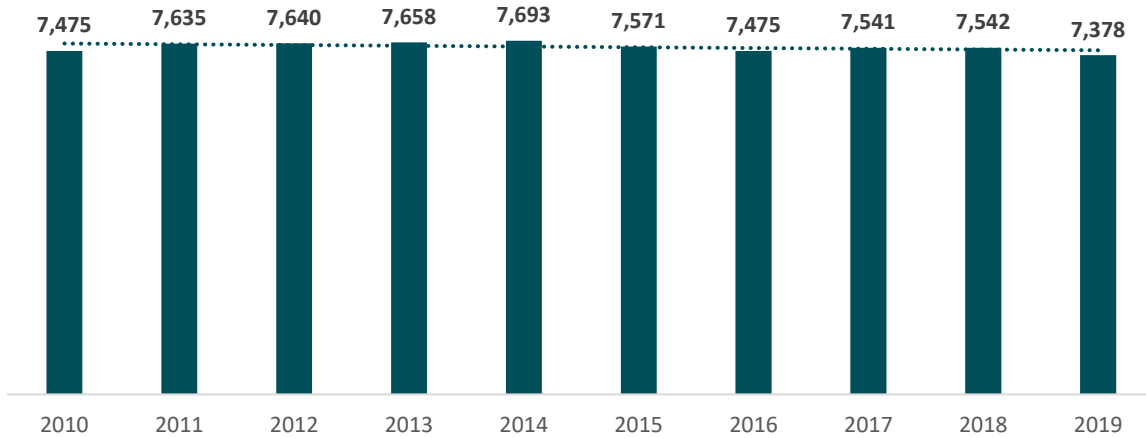
## Population Trends

In 2019, the Dillingham Airport Study Area population totaled 7,378. Overall, the region has seen an average annual population decline of 0.1% from 2010 to 2019. Within the study area, over the past decade, Bristol Bay Borough has had an annual average decline of 1.5%; Lake & Peninsula Borough population has also declined, by an annual average rate of 0.1%. While very slight, Dillingham Census Area has experienced growth, at an

<sup>1</sup> <https://laborstats.alaska.gov/trends/may20art4.pdf>

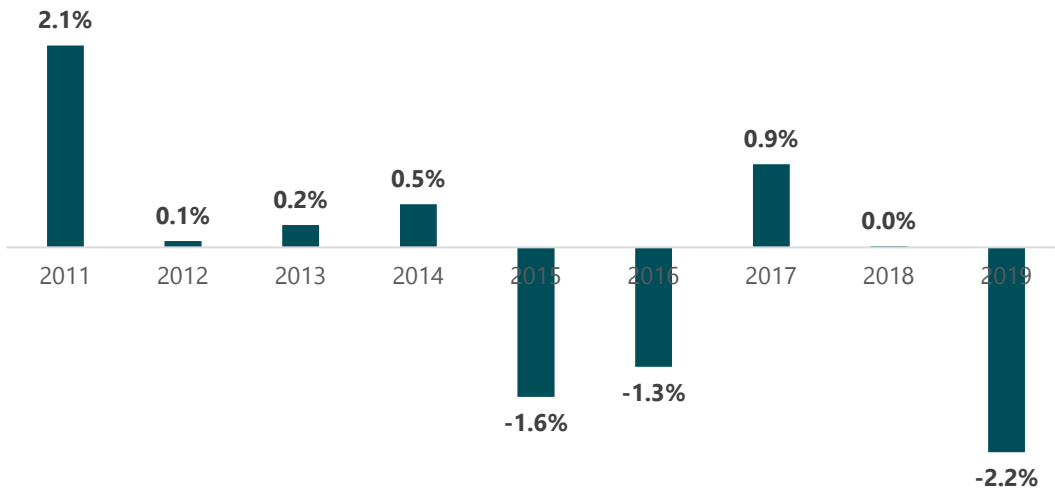
annual average rate of 0.1%. Dillingham Census Area represents about two-thirds (66%) of the Dillingham Airport Study Area.

**Figure 1. Dillingham Airport Study Area Population Trend, 2010-2019**



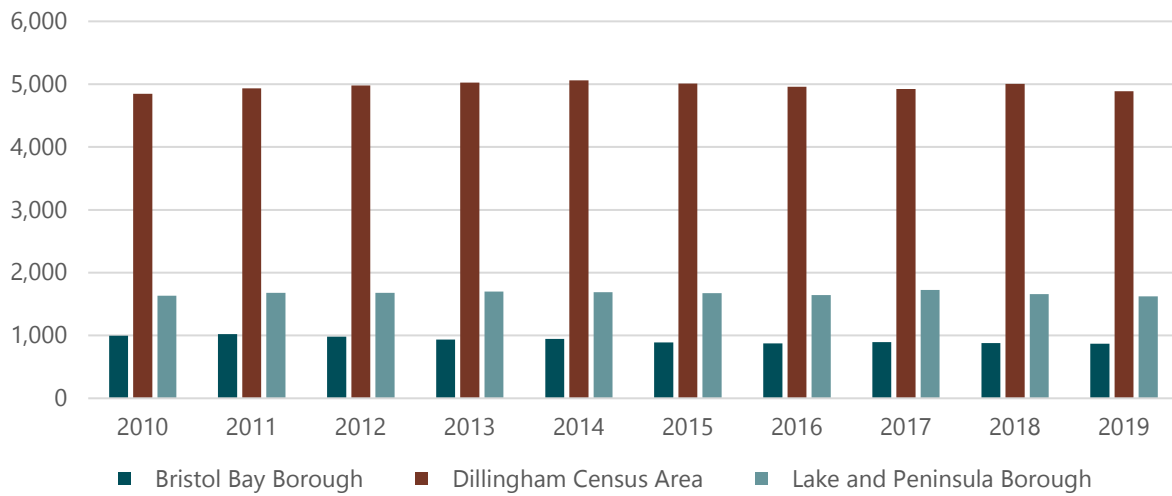
Note: Includes Bristol Bay Borough, Dillingham Census Area, and Lake & Peninsula Borough population estimates.  
Source: Alaska Department of Labor and Workforce Development

**Figure 2. Annual Dillingham Airport Study Area Population Growth Rate, 2010-2019**



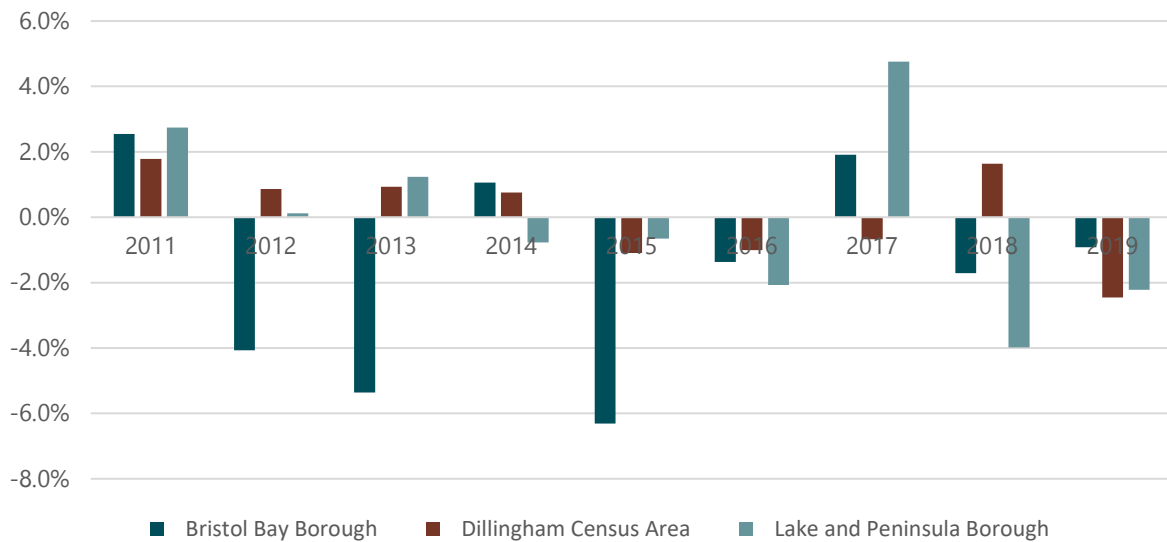
Source: Alaska Department of Labor and Workforce Development

**Figure 3. Bristol Bay Borough, Dillingham Census Area, and Lake & Peninsula Borough Population Trends, 2010-2019**



Source: Alaska Department of Labor and Workforce Development

**Figure 4. Annual Bristol Bay Borough, Dillingham Census Area, and Lake & Peninsula Borough Population Rates of Change, 2010-2019**



Source: Alaska Department of Labor and Workforce Development

## Population Projections

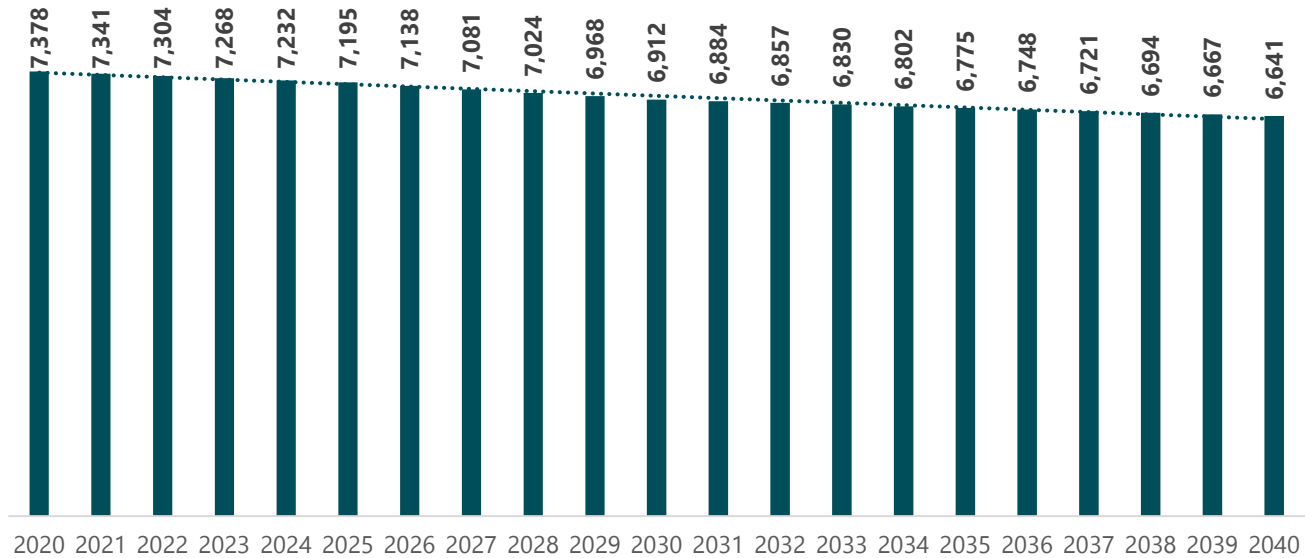
For purposes of this study, three growth scenarios have been defined, including low-case, base-case, and high-case projections. These projections are described, below.

### Low Growth Scenario

The Low Growth Scenario assumes the Dillingham Airport Study Area’s projected growth between 2020 and 2040 will be similar to average rate of change for Bristol Bay Borough over the past 10 years (2010-2019). Over that period the study area’s population declined an average annual rate of 1.5%. Under this scenario, the study

area’s population would decrease by 737 persons between 2020 and 2040 for an overall decline of 10.0% during that time period.

**Figure 5. Low Growth Scenario, Projected Annual Average Growth Rates, Dillingham Airport Study Area, 2020-2040**



Source: McDowell Group calculations

### Base Growth Scenario

The State Demographer’s projection for the study area is used as the Base Growth Scenario. The growth rate is a weighted average for the three subregions (Dillingham Census Area, Bristol Bay Borough, and Lake & Peninsula Borough) as projected by the ADOLWD. Under this scenario, it is estimated that the Dillingham Airport Study Area’s population will grow by 185 persons between 2020 and 2040, or 2.5% growth overall.

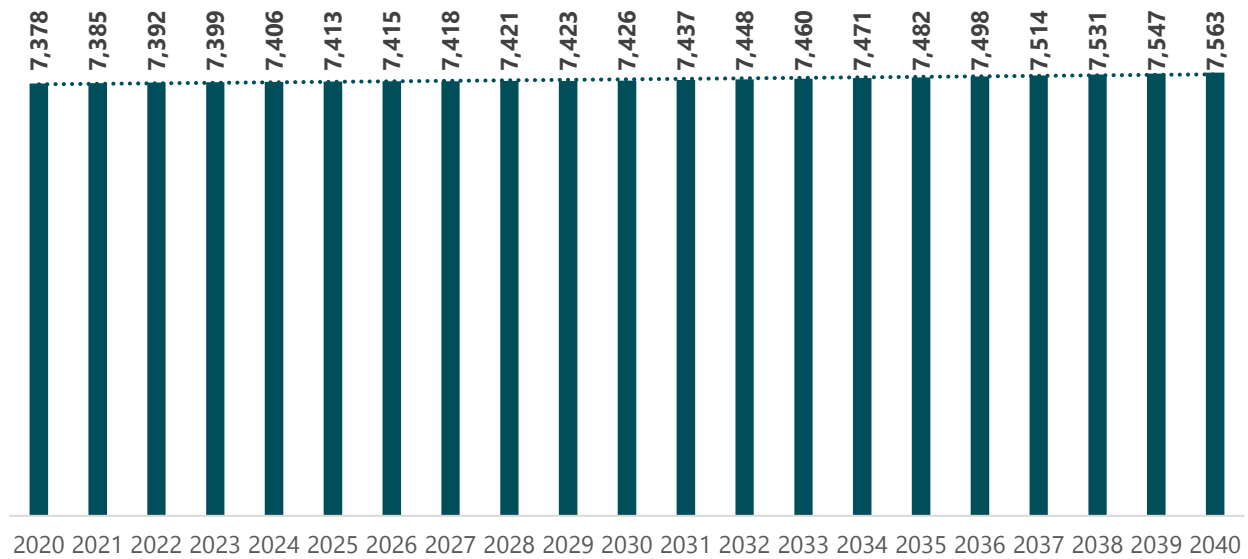
**Table 2. Base Growth Scenario, Projected Annual Average Growth Rates, Dillingham Airport Study Area, 2020-2040, 5-year Increments (Percent Change)**

Years	Annual Growth Rate
2020-2025	0.09
2025-2030	0.04
2030-2035	0.15
2035-2040	0.22

Source: McDowell Group calculations.



**Figure 6. Base Growth Scenario, Projected Annual Average Growth Rates, Dillingham Airport Study Area, 2020-2040**



Source: McDowell Group calculations.

### High Growth Scenario

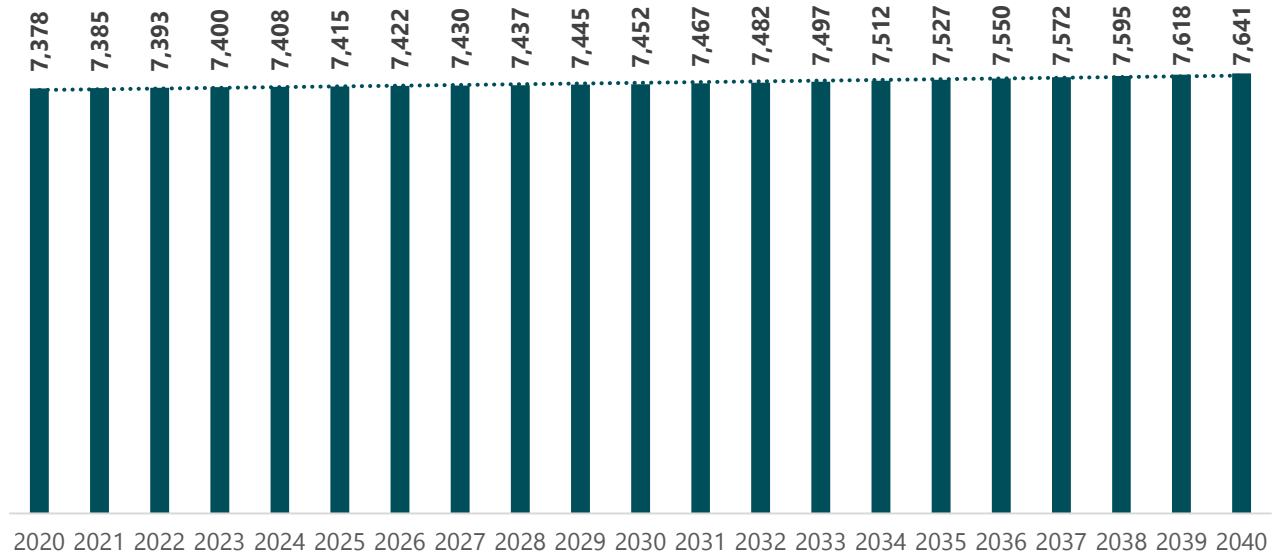
The High Growth Scenario assumes the Dillingham Airport Study Area matches average growth rate projected for the Dillingham Census Area as projected by ADOLWD (see Table 1). Under this scenario, it is estimated that the Dillingham Airport Study Area’s population will grow by 263 persons between 2020 and 2040, for overall growth of 3.6% over the 20-year period.

**Table 3. High Growth Scenario, Projected Annual Average Growth Rates, Dillingham Airport Study Area, 2020-2040, 5-year Increments (Percent Change)**

Years	Annual Growth Rate
2020-2025	0.1
2025-2030	0.1
2030-2035	0.2
2035-2040	0.3

Source: McDowell Group calculations.

**Figure 7. High Growth Scenario, Projected Annual Average Growth Rates, Dillingham Airport Study Area, 2020-2040**



Source: McDowell Group calculations.

## In Summary

**Table 4. Low, Base, and High Growth Scenarios, Projected Population, Dillingham Airport Study Area, 2020, 2025, 2030, 2040**

Years	Low Growth Scenario	Base Growth Scenario	High Growth Scenario
2020 (base year)	7,378	7,378	7,378
2025 (5-year)	7,195	7,413	7,415
2030 (10-year)	6,912	7,426	7,452
2040 (20-year)	6,641	7,563	7,641

Source: McDowell Group calculations.