

B – Forecasts of Aviation Activity



Introduction.

The importance of assessing future trends relating to airport utilization and operational activity levels is especially significant in the preparation of an Airport Terminal Area Plan. Therefore, the focus of these updated aviation activity projections will be to document and support the future planning recommendations of the Ketchikan International Airport (KTN or Airport) Terminal Area.

The previous KTN Airport Master Plan was completed in 2003 and this forecast element will include a comprehensive update of those previous forecasts in consideration of current industry trends.

Forecast Methodology

Aviation forecasts are time-based projections that are prepared to offer a reasonable expectation of future airport activity based on past trends and future demand. The relationship between current activity and forecast demand is an indicator as to the type and timing of future airport infrastructure, equipment, and service needs, as well as funding resource allocation. The baseline year of the forecast is 2018, using calendar year data that is projected for a 20-year planning period through 2038, identified in 5-year increments, and segmented into three planning phases: 1) 'near-term' (2019-2023), 2) 'mid-term' (2024-2028) and, 3) 'long-term' (2029-2038).

Data from the past eleven years (2008 to 2018) is used as the basis of analysis of historical trends, which includes periods of economic expansion and contraction that help forecasts account for various economic conditions and provides a perspective on the effects of economic change on aviation activity.

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The forecast techniques apply FAA-accepted statistical methods that are quantified using statistical means, including time-series trend, regression, comparative analysis, and market share. This forecast approach is also consistent with FAA Advisory Circular 150/5070-6B, Airport Master Plans guidance and procedural requirements.

Table B1 describes the various data sources that were compiled for reference in the preparation of this chapter.

TABLE B1: Description of Data Sources

Source	Description
FAA Traffic Flow Management System Counts Data (TFMSC)	The TFMSC includes data collected from flight plans. These operations are categorized by aircraft type and can be used to identify trends in the KTN fleet mix. The advantage of the TFMSC data is its degree of detail and insight into the itinerant aircraft users at KTN. A disadvantage of TFMSC data is that it does not include local operations or operations that did not file a flight plan. As such, the utility of TFMSC data is limited to larger aircraft, including scheduled commercial passenger/air cargo, charter operations, and the general aviation users that operate the larger aircraft fleet.
FAA Terminal Area Forecasts (TAF)	The FAA TAF, published in February 2019, provides historical records and forecasts for passenger enplanements, aircraft operations and based aircraft at KTN. These forecasts serve as a comparison for forecasts prepared as part of this planning effort and provide historical information on aircraft activity.
FAA Aerospace Forecast	The Aerospace Forecast 2019-2039 is a national-level forecast of aviation activity. The Aerospace Forecast helps guide local forecasts by serving as a point of comparison between local trends and national trends.
U.S. Department of Transportation (USDOT) T-100 Database	Scheduled, charter passenger, and air cargo airlines fill out the T-100 form monthly. The T-100 database is an online repository of the data recorded on the forms, such as number of passengers, number of seats available, freight transported, aircraft used, and departures performed. The T-100 data documents the operations of passenger and air cargo airlines.

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Source	Description
Socioeconomic Data	Socioeconomic data is provided by data vendor Woods & Poole Inc. (W&P). W&P provides data for gap years in the U.S. Census. Ketchikan, Alaska, is within the Ketchikan Gateway Borough that consists of the cities of Ketchikan, Saxman, and Loring. The Ketchikan Gateway Borough comprises the Ketchikan, AK Micropolitan Statistical Area (MSA). Socioeconomic data referenced in this chapter is primarily sourced from the W&P dataset for Ketchikan Gateway Borough. The dataset provides 11 main data categories with records from 1969 to 2018 and forecast through 2050. Data categories considered include population, employment, earnings and income, and Gross Regional Product (GRP).
Stakeholder Interviews	The Consultant conducted interviews with stakeholders during site visits. Interviews included terminal and airfield tenants, Transportation Security Administration (TSA), and the Fixed Based Operator (FBO). Airlines interviewed were Alaska Airlines and Island Air.
Air Carrier Activity Information System (ACAIS) Database	The ACAIS database includes revenue passenger boardings (i.e., enplanements) and all air cargo data that is reported to the FAA by U.S. scheduled and nonscheduled certificated air carriers, commuter air carriers, and small certificated air carriers, including Foreign flag air carriers. The ACAIS database is collected for a full calendar year and supports the FAA's Airport Improvement Program (AIP) apportionment formula calculations.
Alaska Airport System Plan (AASP)	The mission of the State of Alaska Department of Transportation & Public Facilities (DOT&PF) is to provide for the safe and efficient movement of people and goods across the state as well as delivery of essential services through the development, maintenance, operation, and management of Alaska's airport system. To assist with this mission the Alaska Aviation System Plan (AASP) sets the vision for the Alaska aviation network by addressing Alaska's aviation infrastructure and policy needs.

Source: Documents & Data Compiled by Mead & Hunt, August 2019.

Overview of the Airport Market Area

The Airport Market Area is defined as the geographic region served by Ketchikan International Airport (KTN). Most of the commercial air service demand is focused on the Ketchikan Gateway Borough, consisting of 6,654 square miles, which is also defined as the Ketchikan, AK MSA¹. For the purpose of this TAP, this will be considered the market area for the Airport. This area is presented in **Figure B1**, entitled Airport Market Area.

FIGURE B1: Airport Market Area (Ketchikan Gateway Borough)



Sources: Google Maps and Mead & Hunt, 2019.

¹ The Office of Management and Budget defines Micropolitan Statistical Area (MSA) as a labor market area centered on an urban area with a population of at least 10,000 but fewer than 50,000 people.

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KTN, which is classified as a “Regional” airport in the Alaska Airport System Plan (AASP), is owned by the Alaska DOT&PF and provides a variety of air transportation services and facilities for the Alaska Southcoast region market area. These include scheduled commercial passenger and air cargo service, passenger terminal building, instrument approach capabilities, jet capable runway, local weather station, aircraft storage facilities, seaplane haul-out ramp, and various airport support and maintenance facilities (e.g., ARFF, SRE, and maintenance).

There are also two public use DOT&PF-owned seaplane bases located within the Airport Market Area: Peninsula Point Pullout Seaplane Base and Ketchikan Harbor Seaplane Base. Other seaplane bases located in the vicinity (not owned by the DOT&PF) include Loring Seaplane Base and Murphys Pullout Seaplane Base. These adjacent seaplane facilities can influence the general aviation service market within the area, but it is assumed that KTN will continue to primarily serve the air transportation needs for both commercial service and the larger general aviation users within the region.

Market Area Socioeconomic Trends and Forecasts

The socioeconomic characteristics of an Airport Market Area are often collected during the airport planning process to document the historic and projected growth within the geographic area served by an airport. This information is then typically used as one tool to forecast aviation demand. The types of socioeconomic data that are presented include population, employment, per capita personal income, Gross Regional Product (GRP), and tourism. A summary of historic and projected socioeconomic trends for the KTN Airport Market Area, also known as the MSA, is presented below.

Population

For 2018, the Ketchikan Gateway Borough represented 18.9 percent of the Southeast Economic Region’s² population, ranking second behind the Borough of Juneau. In addition, the Southeast Region has a higher concentration of older Alaskans, age 65 and older, with the Ketchikan Gateway Borough recording 15 percent for this segment.

According to Woods & Poole data, population within the Ketchikan Gateway Borough grew at a compound average growth rate (CAGR) of 0.42 percent between 2008 and 2018. The major driver of population growth comes from natural increases and not in-migration. Population has fluctuated only slightly throughout this period, consisting of years with both minor positive and negative change. For 2018, the estimated population of the Airport Market Area was 13,919.

The Airport Market Area population is projected to grow at a Compound Annual Growth Rate (CAGR) of 0.58 percent per year between 2018 and 2038. By 2038, the Ketchikan Gateway Borough is expected to have a population of 15,616, an increase of 1,697 people over current levels. For comparison, the population growth of the State of Alaska and the U.S. overall is expected to outpace the Airport Market

² The Southeast Economic Region is represented by ten boroughs/cities/census areas: Haines, Hoonah-Angoon, Juneau, Ketchikan, Petersburg, Prince of Whales-Hyder, Sitka, Skagway Wrangell, and Yakutat.

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Area, experiencing CAGRs of 1.02 and 0.88 percent, respectively, between 2018 and 2038. (Woods & Poole Economics 2018).

Table B2 shows historical and forecasted population data for the Ketchikan Gateway Borough from 2008 to 2038.

TABLE B2: Ketchikan MSA Population (2008-2038)

Calendar Year	Population	Percent Change
2008	13,352	---
2013	13,850	3.7%
2018	13,919	0.5%
2023	14,380	3.3%
2028	14,836	3.2%
2033	15,260	2.9%
2038	15,616	2.3%
Historic CAGR (2008-2018)	0.4%	---
Projected CAGR (2018-2038)	0.6%	---

CAGR: Compound Annual Growth Rate

Source: Woods and Poole, 2018

Employment

According to Woods and Poole data, employment in the Airport Market Area grew at a CAGR of 0.52 percent between 2008 and 2018. In 2018, 10,643 people were employed in the Area. Projections indicate a positive employment growth rate of 1.09 percent annually through 2038.

Statistical data for unemployment in the Airport Market Area was derived from the Bureau of Labor Statistics. The unemployment rate (non-seasonally adjusted) for the Airport Market Area in 2018 was 6.0 percent, but recently peaked at 8.7 percent in 2010. Given the seasonal nature of the local economy that is influenced by the tourism and fishing industries, it is important to note the significant variation in the unemployment rate that is experienced throughout the year.

Table B3 presents the total employment and employment per capita for the Airport Market Area. The employment rate has steadily increased between 2008 to 2018 as the MSA population has grown and is reflected in the projected growth of the employment per capita for the 20-year planning period. This is indicative of the region's economic diversity and resilience.

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TABLE B3: Ketchikan MSA Employment (2008-2038)

Calendar Year	Total Employment	Percent Change	Employment per Capita
2008	10,107	---	1.08
2013	10,374	2.6%	1.10
2018	10,643	2.6%	1.16
2023	11,302	6.2%	1.29
2028	11,966	5.9%	1.40
2033	12,610	5.4%	1.46
2038	13,214	4.8%	1.47
Compound Annual Growth Rates (CAGR)			
Historic 2008-2018	0.52%	N/A	0.72%
Projected 2018-2038	1.09%	N/A	1.19%

Employment per Capita: Employed/Total Working Population.

Sources: Woods & Poole, 2018

Industry Mix

According to industry employment data compiled by the *Alaska Department of Labor and Workforce Development*, the employment projections for the State of Alaska and the Airport Market Area by industry between 2016 and 2026 will be led by:

- **Education and Health Services @ 13.4% compared to 12.8% for the Airport Market Area**
- **Leisure and Hospitality @ 9.2% compared to 11.1% for the Airport Market Area**
- **Service-Providing (Includes 4% growth in Air Transportation) @ 5.6% compared to 24.9% for the Airport Market Area**
- **Goods-Producing (Includes 24.4% growth in Agriculture, Forestry, Fishing, & Hunting) @ 2.5% compared to 1.0%³ for the Airport Market Area**

Below is an example of Ketchikan’s unique exposure to each of these industries:

- **Location of PeaceHealth Ketchikan Medical Center (Level IV Trauma Center)**
- **First port for most cruise ships visiting Alaska (recorded 1,073,923 visitors in 2018)**
- **KTN is a regional hub for air transportation jobs (both commercial passenger service and air cargo)**
- **Commercial fishing continues to be an economic mainstay of the local economy (proclaimed as the “The Salmon Capital of the World”).**

³ Employment data on local fish harvesting is not accurately reflected in statistics due to reporting requirements for self-employed.

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As shown in **Figure B2**, state and local government, mining/construction/manufacturing, utilities/wholesale/retail trade, education and health care, accommodation and food services, and transportation and warehousing were the leading industries within the Airport Market Area in 2018, accounting for just over 54 percent of the jobs. Employment within state and local government positions accounted for most of the jobs in the Airport Market Area at almost 17 percent.

Tables B4 and **B5** show the top industries by employment and sales both historically (2008-2018) and projected (2023-2038). State and local government employment will remain dominant. State and local government employment includes many professions such as public schools, police and fire departments, and all state public junior colleges, colleges, and universities. According to Woods and Poole projections, employment in the health care industry will surpass retail trade beginning in 2023.

FIGURE B2: Airport Market Area Employment by Industry (2018)



Source: Woods and Poole, 2018.

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TABLE B4: Ketchikan MSA Top 5 Industries by Employment and Sales (2008-2018)

Top 5 Industries by Employment								
Rank	2008		2013			2018		
	Industry	Jobs	Industry	Jobs	Δ	Industry	Jobs	Δ
1	State + Local Gov't	1,771	State + Local Gov't	1,795	1.36%	State + Local Gov't	1,757	-2.12%
2	Retail Trade	1,338	Retail Trade	1,163	-13.08%	Retail Trade	1,224	5.25%
3	Health Care	854	Health Care	1,078	26.23%	Health Care	1,096	1.67%
4	Accommodation and Food Services	817	Accommodation and Food Services	783	-4.16%	Accommodation and Food Services	961	22.73%
5	Transportation and Warehousing	747	Transportation and Warehousing	775	3.75%	Transportation and Warehousing	740	-4.52%

Top 5 Industries by Retail Sales								
Rank	2008		2013			2018		
	Industry	Sales (\$M)	Industry	Sales (\$M)	Δ	Industry	Sales (\$M)	Δ
1	Food + Bev Retail	\$60.303	Food + Bev Retail	\$65.862	9.22%	Food + Bev Retail	\$68.886	4.59%
2	General Merchandise	\$54.226	General Merchandise	\$48.348	-10.8%	General Merchandise	\$49.414	2.20%
3	Motor Vehicles and Parts	\$29.593	Clothing + Clothing Accessories	\$38.886	34.23%	Clothing + Clothing Accessories	\$39.707	2.11%
4	Clothing + Clothing Accessories	\$28.97	Restaurants	\$22.599	---	Restaurants	\$26.861	18.86%
5	Building Materials + Garden Equip.	\$22.526	Motor Vehicles + Parts	\$17.911	-39.5%	Non-store Retailers	\$24.934	---

Source: Woods and Poole, 2018.

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TABLE B5: Ketchikan MSA Top 5 Industries by Employment and Sales (2023-2038)

Top 5 Industries by Employment								
Rank	2023		2028			2038		
	Industry	Jobs	Industry	Jobs	Δ	Industry	Jobs	Δ
1	State + Local Gov't	1,944	State + Local Gov't	2,131	9.62%	State + Local Gov't	2,512	17.88%
2	Health Care	1,256	Health Care	1,432	14.01%	Health Care	1,749	22.14%
3	Retail Trade	1,252	Retail Trade	1,276	1.92%	Retail Trade	1,324	3.76%
4	Accommodation and Food Services	974	Accommodation and Food Services	983	.92%	Accommodation and Food Services	988	.5%
5	Transportation and Warehousing	767	Transportation and Warehousing	801	4.43%	Transportation and Warehousing	873	8.99%
Top 5 Industries by Retail Sales								
Rank	2023		2028			2038		
	Industry	Sales (\$M)	Industry	Sales (\$M)	Δ	Industry	Sales (\$M)	Δ
1	Food + Bev Retail	\$69.098	Food + Bev Retail	\$69.444	.5%	Food + Bev Retail	\$69.215	-.33%
2	General Merchandise	\$55.486	General Merchandise	\$60.236	8.56%	General Merchandise	\$68.359	13.48%
3	Clothing + Clothing Accessories	\$41.746	Clothing + Clothing Accessories	\$43.993	5.38%	Clothing + Clothing Accessories	\$48.01	9.14%
4	Restaurants	\$28.708	Non-store Retailers	\$31.585	11.89%	Non-store Retailers	\$38.567	22.10%
5	Non-store Retailers ¹	\$28.228	Restaurants	\$30.603	6.60%	Restaurants	\$34.579	13.01%

Source: Woods and Poole, 2018.

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Gross Regional Product (GRP)

GRP is defined as the value of goods and services produced in the MSA and serves as an index for the health of the overall economy. GRP grows as the economy increases and more valuable goods are produced. Growth in GRP will likely coincide with growth in airport passenger and cargo activity. Woods & Poole projections indicate the GRP will grow at a higher rate than the MSA population. This can be explained by the increasing production of high value goods and services and the continued growth of tourism for the region. The historical and projected GRP for the Ketchikan MSA is presented in **Table B6**.

TABLE B6: Ketchikan MSA Gross Regional Product (2008-2038)

Calendar Year	GRP (\$M)	Percent Change	GRP (\$M) per Capita
2008	\$700.661	---	\$.052
2013	\$736.523	5.1%	\$.053
2018	\$753.857	2.4%	\$.054
2023	\$825.533	9.5%	\$.057
2028	\$897.969	8.8%	\$.061
2033	\$972.023	8.3%	\$.064
2038	\$1045.649	7.6%	\$.067
Compound Annual Growth Rates			
2008-2018	0.73%	N/A	0.38%
2018-2038	1.65%	N/A	1.08%

GRP per capita: GRP/Total Population.

Sources: Woods & Poole, 2018

Income

Per capita personal income steadily grew from 2008 to 2018 and is projected to double in growth from 2018 to 2038. Historically, the personal income per capita within the Ketchikan Gateway Borough MSA has been higher than the personal income per capita of the U.S. and the State of Alaska. Future projections indicate the Airport Market Area will continue its trend of remaining higher than the nation and state. The 2018 personal income per capita for the U.S. and Alaska were \$52,920 and \$59,242, respectively. As seen in **Table B7**, the personal income per capita for the Airport Market Area is \$66,318. The MSA is projected to grow at a CAGR of 4.82 percent between 2018 and 2038, surpassing the U.S. (4.73 percent) and Alaska (4.53 percent) growth rates.

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TABLE B7: Ketchikan MSA Personal Income per Capita (2008-2038)

Calendar Year	Personal Income per Capita (\$)	Percent Change (%)
2008	\$51,971	---
2013	\$57,344	10.34
2018	\$66,318	15.65
2023	\$80,754	21.77
2028	\$102,548	26.99
2033	\$131,995	28.72
2038	\$170,207	28.95
CAGR (2008-2018)	2.47%	---
CAGR (2018-2038)	4.83%	---

CAGR: Compound Annual Growth Rate

Source: Woods & Poole, 2018.

Tourism Trends

According to information compiled from the Tourism section of the June 2019 *Alaska Aviation System Plan*, “Alaska provides some of the most unique tourism experiences in the United States” with Southeast Alaska recording the highest number of tourist-related visitors within the State due to the cruise ship industry. Juneau and Ketchikan are two of the primary stops for cruise ships in Southeast Alaska and there were 1,073,923 cruise ship passengers recorded for Ketchikan in 2018. In addition, aviation provides a key role in support of tourism within Southeast Alaska, with visitors accessing KTN directly or via cruise ships, and then utilizing smaller air taxi or charter aircraft to access remote areas for specific tourist-related activities (e.g., wildlife viewing, hunting, fishing, backpacking, etc.). In 2018, there were three air taxi operators at KTN providing year-round scheduled passenger service, with one additional operator scheduling service during the summer months (June – August).

Outdoor recreation tourism is the largest economic driver in the State of Alaska, and it is largely focused on activities related to fishing and wildlife viewing. Within Alaska, tourism accounts for more than \$3.2 billion dollars in annual spending related to outdoor trips, and about one in every ten jobs is tied to trip-related outdoor recreation.⁴ Given the nature of Alaska’s tourism focused economy, travel indicators generally exceed the national average growth rate. Nationwide travel indicators for 2018 showed a 1.9 percent increase in annual domestic travel, which is modest in comparison to the 5.2 percent increase in Alaska’s summer visitor volume.⁵

⁴ The University of Alaska Center for Economic Development. *Economic Development in Alaska, Outdoor Recreation Impacts and Opportunities* (March, 2019), 3. Accessed October 4, 2019. Retrieved from Alaska Travel Industry Association, Research Materials: <https://www.alaskatia.org/Research/OutdoorRecreationImpactsandOpportunities%202019.pdf>

⁵ McDowell Group. *Alaska Visitor Volume Report 2018* (2019), 7. Accessed October 4, 2019. Retrieved from Alaska Travel Industry Association, Research Materials: https://www.alaskatia.org/Research/Visitor%20Volume%20Summer%202018%20Report%202_15_19.pdf

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While cruise ship passengers represent the largest category of summer visitors to Ketchikan, the air market category has grown faster than the cruise ship category. The 2018 Ketchikan Summer Visitor Profile and Economic Impact Analysis notes that out of state summer visitors arriving by air was 32,200 in 2012 and rose to 44,500 in 2017, which represents a 38% increase in this five-year span.⁶ This rate of growth is more than three times that of cruise ship visitors, which only rose by 12 percent during the same period. Passenger traffic at KTN has continued to grow; between 2017 and 2018, summer domestic air passenger traffic at KTN grew by 2.6 percent.⁷

KTN plays an important role in connecting visitors in the air market travel category to fishing lodges and other outdoor recreation activities within the Southeast region during the summer months. The 2018 Ketchikan Summer Visitor profile study estimates that 50 percent of all air travel visitors arriving during the summer months are traveling for vacation/pleasure, 33 percent are visiting friends/relatives, and 17 percent are traveling for business-related reasons.⁸ Among summer visitors to Ketchikan who arrived by air, fishing was the top recreational activity, accounting for participation by approximately 43 percent of those visitors, followed by hiking at 24 percent participation and wildlife viewing at 21 percent.⁹

96 percent of summer visitors traveling by air are domestic travelers, with the majority (73 percent) of those visitors originating from the Western United States.¹⁰ Approximately 33 percent of travelers originate from Washington, followed by California at 13 percent, and Oregon at 6 percent.¹¹

Aviation Activity Profile

The aviation activity profile provides context for historical trends in airport activity and documents the recent changes that have occurred at the Airport. The profile serves as a baseline for the updated forecasts prepared for this planning effort and includes information on commercial passenger and air cargo airline service, general aviation, and military aviation activity.

KTN does not have an Air Traffic Control Tower (ATCT), but commercial airline operations are reported to the U.S. Department of Transportation (USDOT) and ultimately reflected on the

⁶ McDowell Group, *Ketchikan Summer Visitor Profile and Economic Impact Analysis* (2018), 1. Accessed October 4, 2019. Retrieved from Alaska Travel Industry Association Research Materials Website: https://www.alaskatia.org/Research/kvb-visitor-profile-and-impacts-6_10_18.pdf

⁷ McDowell Group, *Alaska Visitor Volume Report, Summer 2018* (2018), 4. Accessed October 4, 2019. Retrieved from Alaska Travel Industry Association Research Materials Website: https://www.alaskatia.org/Research/Visitor%20Volume%20Summer%202018%20Report%20_15_19.pdf

⁸ McDowell Group, *Ketchikan Summer Visitor Profile and Economic Impact Analysis* (2018), 10. Accessed October 4, 2019. Retrieved from Alaska Travel Industry Association Research Materials Website: https://www.alaskatia.org/Research/kvb-visitor-profile-and-impacts-6_10_18.pdf

⁹ *Ibid*, 2.

¹⁰ McDowell Group, *Ketchikan Summer Visitor Profile and Economic Impact Analysis* (2018), 25. Accessed October 4, 2019. Retrieved from Alaska Travel Industry Association Research Materials Website: https://www.alaskatia.org/Research/kvb-visitor-profile-and-impacts-6_10_18.pdf

¹¹ McDowell Group, *Ketchikan Summer Visitor Profile and Economic Impact Analysis* (2018), 25. Accessed October 4, 2019. Retrieved from Alaska Travel Industry Association Research Materials Website: https://www.alaskatia.org/Research/kvb-visitor-profile-and-impacts-6_10_18.pdf

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TAF for KTN. USDOT does not record general aviation operations, thus these local and itinerant operations are estimated on the TAF. The TFMSC does include some data for itinerant general aviation operations that file Instrument Flight Rules (IFR) flight plans but exclude those that do not.

Airline Service

Airline service encompasses scheduled passenger flights, air cargo flights, and non-scheduled charter flights. The following sections describe the airline profile, opportunities for additional air service, passenger enplanements, commercial operations, and air cargo service at KTN.

AIRLINE PROFILE. **Figure B3** identifies the current mainline air carriers and destinations that operate from KTN. These include Alaska Airlines, which provides year-round scheduled service with Boeing 737 aircraft and increased service during the summer season (June – August), and Delta Air Lines, which provides seasonal summer service only with the Embraer 175 and Canadair CRJ 900 regional jets.

KTN also accommodates scheduled service by air taxi airlines (i.e., Island Air Express). These smaller carriers operate a variety of aircraft having nine seats or less and include both fixed wing and floatplane type aircraft. See **Table B8** for details on cities served an aircraft equipage for the KTN scheduled commercial passenger airline service.

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FIGURE B3: KTN Mainline Air Carrier Passenger Service



Sources: Google Maps, and Mead & Hunt, 2019.

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TABLE B8: KTN Scheduled Commercial Passenger Service

Arlne	City Destination (Airport Identifier)	Primary Aircraft (Seats)
Year-Round Service		
Alaska Airlines – AS (Air Carrier)	Juneau, AK (JNU)	Boeing 737-700 & 800 (124-159 Seats)
Alaska Airlines – AS (Air Carrier)	Seattle, WA (SEA)	Boeing 737-800 & 900 (159-178 Seats)
Alaska Airlines – AS (Air Carrier)	Sitka, AK (SIT)	Boeing 737-700 & 800 (124-159 Seats)
Alaska Airlines – AS (Air Carrier)	Wrangell, AK (WRG)	Boeing 737-700 & 800 (124-159 Seats)
Island Air Express - I4 (Air Taxi/Commuter)	Juneau, AK (JNU)	Pilatus PC -12 (6 - 8 Seats)
Island Air Express - I4 (Air Taxi/Commuter)	Klawock, AK (KLW)	Cessna C208B (6 - 8 Seats)
Island Air Express - I4 (Air Taxi/Commuter)	Petersburg, AK (PSG)	Cessna C208B (9± Seats)
Seasonal Service 1		
Alaska Airlines – AS (Air Carrier)	Seattle, WA (SEA)	Boeing 737-800 & 900 (159-178 Seats)
Delta Air Lines - DL (Air Carrier)	Seattle, WA (SEA)	EMB 175 & CRJ 900 (76 Seats) ²

Source: USDOT BTS T-100 Data (Obtained August 2019).

¹ KTN seasonal service period: June through first week of September.

² The Delta seasonal service was provided by regional affiliate SkyWest Airlines.

AIR CARGO PROFILE. The scheduled air cargo service at KTN is provided by a combination of Alaska Airlines transporting freight and mail both in the belly compartments of their air carrier passenger aircraft and in dedicated air carrier cargo aircraft (B737-700 freighters), and Alaska Central Express (ACE) operating a fleet of Beech 1900 twin-engine turboprop aircraft. In addition to the daily scheduled passenger flights, the dedicated Alaska Airlines cargo flights are operated twice a day, five days per week, with single flights two days per week. ACE operates a single daily cargo flight six days per week. In addition, air cargo is distributed by the various air taxi/commuter carriers (e.g., Island Air Express) that provide scheduled passenger service to the rural communities and villages in the vicinity of KTN.

Passenger Enplanements and Airline Operations

The FAA TAF defines a passenger enplanement as a passenger who boards a scheduled commercial or chartered aircraft with more than nine seats for turboprops (or any number of seats for jet aircraft). The aircraft must be operating under Title 14 Code of Federal Regulations (CFR) Part 121 that applies to air carriers and commercial operators. Passenger enplanements include revenue and non-revenue passengers who paid taxes and passenger facility charges (PFC) for their carriage. Passenger enplanements do not include pilots, flight attendants, and any other members of the airline crew.

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TABLE B9: TAF Airline Classification System

TAF Airline Classification System		
Classification	Air Carrier	Air Taxi
Enplanements	Operated by a mainline carrier	Operated by a regional carrier
Operations	60 or more seats	59 or fewer seats

Passenger enplanements are categorized as air carrier or air taxi/commuter based on the type of carrier that is operating the route. For example, passengers on a Delta Air Lines A320 flown by Delta pilots would be categorized as air carrier enplanements, whereas passengers on a smaller regional jets operated by SkyWest pilots would be categorized as air taxi enplanements. Airline operations are categorized based on aircraft seating capacity. See **Table B9** above for the current airline classification system for enplanements and operations reflected in the TAF.

Enplanements from 2008 to 2018 are shown in **Table B10**. Both air carrier and air taxi/commuter service enplanements at KTN have increased since 2008, reflecting a gain of just under 25,000 and a CAGR of 2.1 percent.

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TABLE B10: KTN Passenger Enplanements

Year	Air Carrier	Air Taxi/Commuter	Total	% Change
2008	105,640	3,874	109,514	N/A
2009	94,981	3,039	98,020	-10.5%
2010	95,671	3,051	98,722	0.7%
2011	99,391	2,798	102,189	3.5%
2012	100,444	2,870	103,314	1.1%
2013	104,639	2,834	107,473	4.0%
2014	105,254	10,203	115,457	7.4%
2015	110,338	13,506	123,844	7.3%
2016	113,084	13,656	126,740	2.3%
2017	115,572	15,108	130,680	3.1%
2018	118,643	15,716	134,359	2.8%
CAGR	1.2%	15.0%	2.1%	N/A

CAGR: Compound Annual Growth Rate

Source: 2018 TAF

Table B11 shows the airline activity levels during the 12-month seasonal periods, broken out by hour, day, week, month, and annual timelines. KTN airline flight activity fluctuates through the year, with summer months experiencing the greatest number of flights. The highest operational and enplanement period occurs during the summer months of June, July, and August, during which Alaska Airlines increases their number of daily flights from 6 to 9 and Delta provides their seasonal single flight daily service.

It should also be noted the Airport's two existing peak-hour flights are a derivative of the year-round "Milk Run" flights (i.e., Flight #'s 64 & 67) that are scheduled in the late afternoon, between 4:40 and 5:35 pm. However, with only two designated narrow-body aircraft parking positions at the terminal building, there are times when the scheduled 4:15 pm Alaska Airlines cargo flight may occupy one of the terminal gate parking positions needed by one of the Alaska air carrier passenger aircraft.

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TABLE B.11: KTN Seasonal Airline Activity Levels (2018)

12-Month Seasonal Period (Month Span)	Arrival and Departure Flights/Operations					
	Peak Hour Arrivals	Peak Hour Departures	Daily Operations	Weekly Operations	Monthly Operations	Seasonal Operations
Spring Season (Mar - May)	2.0	3.0	18	133	532	1,596
Summer Season (June - Aug)	3.0	2.0	26	187	748	2,244
Fall Season (Sep - Oct)	2.0	3.0	18	132	528	1,584
Winter Season (Nov - Feb)	2.0	3.0	18	128	512	1,530

Note: Data reflects 12-Months of 2018 flight schedules.

Source: KTN Airport Flight Schedule Data and USDOT BTS T-100 Data.

Air Cargo

KTN scheduled air cargo data was compiled from information maintained in the U.S. DOT T-100 database and is presented in **Table B12**. As can be noted, air cargo operations have declined at KTN since 2008 at a 3.4 percent CAGR, due primarily to the consolidation of carriers that has occurred within the industry. However, total annual cargo weight handled, which includes both enplaned and deplaned freight and mail, has remained relatively consistent on an annual basis (in the 9,000- to 10,000-ton range) despite a 10-year low of 7,723 tons being recorded in 2013. This compares to similar fluctuations that have been recorded in the U.S. domestic air cargo market over the same period but resulted in a 1.5 percent CAGR for air cargo handled.

As presented in **Table B13**, Alaska Airlines has maintained its role as the leader in total air cargo (both enplaned and deplaned) carried at KTN since 2008, with 95.4 percent of air freight handled in 2018. Alaska Central Express handled the balance of air cargo (i.e., 4.5 percent) for 2018. For the air mail category, Alaska Airlines handled 77.3 percent of the mail, compared to 22.7 percent for Alaska Central Express. Also, as can be expected, most of the air cargo carried by Alaska Airlines (92.2 percent of the freight and 94.1 percent of the mail) was carried by their B737-700 freighter aircraft.

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TABLE B12: Historic KTN Air Cargo Airline Operations and Activity

Year	KTN				U.S. Domestic Market	
	Operations ¹	Total Cargo (Tons)	% Change Operations	% Change Cargo	Revenue Ton Miles (Millions)	% Change
2008	3,570	11,023	N/A	N/A	12,261	---
2009	3,231	10,137	-9.5%	-8.0%	10,275	-16.2%
2010	3,293	10,381	1.9%	2.4%	11,243	9.4%
2011	3,302	10,106	0.3%	-2.6%	10,601	-5.7%
2012	2,997	10,215	-9.2%	1.1%	10,886	2.7%
2013	2,449	7,723	-18.3%	-24.4%	10,996	1.0%
2014	2,733	8,079	11.6%	4.6%	11,226	2.1%
2015	2,877	9,072	5.3%	12.3%	11,636	3.7%
2016	2,943	8,482	2.3%	-6.5%	11,998	3.1%
2017	2,577	8,844	-12.4%	4.3%	13,062	8.9%
2018	2,515	10,007	-2.4%	13.1%	14,182	8.6%
CAGR	-3.4%	-1.0%	N/A	N/A	1.5%	N/A

CAGR: Compound Annual Growth Rate

Source: USDOT BTS T-100 Data and 2019 FAA Aerospace Forecast.

¹Does not include operations by the scheduled air taxi/commuter passenger carriers that also transport mail and freight.

TABLE B13: KTN Air Cargo Operations, Freight, & Mail Breakdown (2018)

Cargo Carrier	Operations	Freight (Tons)	% Freight	Mail (Tons)	% Mail
Alaska Airlines Inc.	1,249	4,144	95.4%	4,379	77.3%
Alaska Central Express	1,264	196.9	4.5	1,285	22.7%
SkyLink Express Inc.	2	2.3	0.1%	---	---
Total	2,515	4,344	100%	5,663	100%

Source: Source: U.S.DOT T-100.

Military Aircraft Operations

KTN does not have any based military aircraft and experiences only limited itinerant training operations, primarily fixed-wing aircraft (e.g., Beech 200 Super King Air, Lockheed C130 Hercules, Boeing FA-18 Hornet, etc.), from various locations in Alaska and the Pacific Northwest. According to itinerant military operations compiled from the 2018 TFMSC, there were only 76 military operations recorded, which is less than the 135 operations that were documented in the TAF.

Military activity is driven by the needs of the U.S. Department of Defense rather than by economic forces. Therefore, for planning purposes, military operations are projected to remain limited at KTN.

General Aviation

General aviation aircraft operations are defined as all civil aviation aircraft activity excluding air carriers and commercial aircraft. For low activity airports that do not have an Airport Traffic Control Tower (ATCT), annual general aviation operations are typically estimated by local airport staff and documented by the FAA in the TAF. Given the relatively low number of general aviation operations that have been recorded for KTN in TAF since 2008, the FAA's 2018 Traffic Flow Management System Counts (TFMSC) for general aviation were compiled and are presented for comparison to the historic TAF in **Table B14**. Since TFMSC data is collected from flight plans, these operations are categorized by aircraft type and can provide insights into the itinerant aircraft users at KTN. However, the TFMSC data does not include local operations or operations that did not file a flight plan, and thus the information on general aviation activity is typically skewed toward users that operate larger and more sophisticated aircraft.

As can be noted, it appears that general aviation aircraft operations have historically been under-reported at KTN, with just under 2,400 operations being recorded for 2018. However, these increased itinerant general aviation operation counts would still only represent about 17 percent of the total operations for KTN in 2018.

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TABLE B14: KTN Local & Itinerant General Aviation Operations

Year	Local	Itinerant	TAF Total	TFMSC Total ¹
2008	410	575	985	1,993
2009	410	575	985	1,799
2010	410	575	985	2,243
2011	410	575	745	2,753
2012	350	395	745	3,514
2013	350	395	745	3,378
2014	350	395	745	2,495
2015	350	395	745	1,896
2016	350	395	745	1,788
2017	350	395	745	1,905
2018 ¹	350	395	745	2,375

Source: KTN 2018 TAF for 2008-2017

¹ General aviation operations compiled from FAA's TFMSC database for KTN.

General Aviation Based Aircraft

The FAA categorizes based aircraft by engine type with the main categories being Single-Engine Piston (SEP), Multi-Engine Piston (MEP), Jet aircraft with turbine engines (includes turboprops and turbojets), Helicopters, and Other which includes experimental sport, glider, and ultralight aircraft. **Table B15** shows the based aircraft records from 2008 to 2018. As of 2018, 60 percent of based aircraft at KTN are categorized as SEP, including one MEP aircraft and one business jet.

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TABLE B15: KTN Based Aircraft

Fiscal Year	SEP	MEP	Jet	Helicopter	Other	Total	% Change
2008	10	1	0	2	0	13	N/A
2009	10	1	0	2	0	13	0.0%
2010	10	1	0	2	0	13	0.0%
2011	10	1	0	2	0	13	0.0%
2012	3	1	1	0	0	5	-61.5%
2013	3	1	1	0	0	5	0.0%
2014	3	1	1	0	0	5	0.0%
2015	3	1	1	0	0	5	0.0%
2016	3	1	1	0	0	5	0.0%
2017	3	1	1	0	0	5	0.0%
2018	3	1	1	0	0	5	0.0%
CAGR	-12.5%	0.0%	N/A	N/A	0.0%	-10.1%	N/A

CAGR: Compound Annual Growth Rate

Source: 2018 TAF

Forecast Resources and Trends

As noted in the *Forecast Methodology* section of this chapter, aviation forecast data for this planning effort has been sourced from various FAA published databases and studies, USDOT airline T-100 reporting forms, and industry publications. A brief description of these FAA publications is presented in the following text.

FAA Aerospace Forecasts

The *FAA Aerospace Forecasts (Fiscal Years 2019 to 2039)* provides aviation industry projections by aeronautical sector. The FAA prepares this document annually to identify the 20-year demands on the nationwide airport and airspace system. This FAA data is used to substantiate forecasting relationships, including recent airline industry trends, the direction of future passenger demand, and challenges to providing services.

FAA Terminal Area Forecast (TAF)

The FAA Terminal Area Forecast (TAF) serves as the official FAA record of aviation activity for airports in the *FAA National Plan of Integrated Airport Systems (NPIAS)*. The TAF, which is developed annually based on the fiscal year from October to September, includes forecasts for airline enplaned passengers, aircraft operations, and based aircraft. The TAF typically lags one to two years in

FAA Terminal Area Forecasts (TAF): *The official FAA record of historical and projected airport activity, as prepared annually by the FAA for all airports in the National Plan of Integrated Airport Systems (NPIAS).*

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reporting current activity levels, therefore the TAF may not always accurately reflect the snapshot of current activity, nor take into account key airport factors or locally driven forecast events. The TAF used for this forecast was published in February 2019. **Table B16** summarizes the current TAF projections compiled for KTN.

TABLE B16: KTN TAF Summary

Fiscal Year	2018	2023	2028	2033	2038	CAGR
Enplanements	134,359	143,022	154,863	168,934	184,981	1.6%
Operations	12,678	13,460	14,141	14,925	15,804	1.1%
Air Carrier	6,078	6,391	6,941	7,584	8,465	1.6%
Air Taxi	5,720	6,189	6,320	6,461	6,646	0.7%
Itinerant GA	395	395	395	395	395	0.0%
Itinerant Military	135	135	135	135	135	0.0%
Local GA	350	350	350	350	350	0.0%
Local Military	0	0	0	0	0	0.0%
Based Aircraft	5	5	5	5	5	0.0%
Single Engine Piston	3	3	3	3	3	0.0%
Jet	1	1	1	1	1	0.0%
Multi Engine Piston	1	1	1	1	1	0.0%
Helicopter	0	0	0	0	0	0.0%
Other	0	0	0	0	0	N/A

CAGR: Compound Annual Growth Rate

Other: Light sport aircraft, gliders, experimental aircraft, ultralights

Source: FAA TAF, 2019.

KTN TAF ENPLANEMENT BASELINE (2018): The FAA TAF reports 134,359 passenger enplanements for 2018, but this a forecasted value due to the FAA TAF reporting lag. For comparison, FAA’s Air Carrier Activity Information System (ACAIS) reports 135,389 passenger enplanements for 2018 based on actual monthly airline reporting records, therefore, 135,389 will be used as the 2018 baseline for forecasting passenger enplanements.

KTN TAF FORECASTS (2018-2038): The 20-year FAA TAF enplanements are projected to increase a total of 50,622 passengers, from 134,359 in 2018 to 184,981 in 2038, which is an average annual change of 2,531, a 37.7 percent overall growth, and a 1.6 percent CAGR. The FAA TAF forecast is consistent with the historical KTN mean of 2,259 additional passengers per year.

Airline Industry Trends

The *FAA Aerospace Forecasts* provides an assessment of the airline sector. As reported by the FAA, the airline industry is being shaped by four distinct trends: (1) selective capacity expansion; (2) steady

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growth of seats per aircraft, whether through up-gauging or reconfiguring existing aircraft; (3) increasing competitive pressure due to ultra-low-cost carrier expansion; and (4) increasing price discrimination¹² through ancillary revenues and revenue management systems.

Fundamentally, aviation passenger demand is being driven by economic factors. However, the strength of the U.S. economy in recent years, supported by positive financial conditions and a strong labor market, is beginning to slow but still expected to support aviation passenger growth through the planning period. Since 2007, the mainline carrier group has increased capacity by 14.8 percent while carrying 17.8 percent more passengers, due to increasing the seats per aircraft flown (e.g., aircraft up-gauging). In addition, the domestic boarding load factor (BLF) for 2018 returned to 84.7 percent, matching the historic high first reached in 2016, and is projected to rise and peak at over 86 percent in the future.

Quantified by available aircraft seat miles and revenue passengers, the domestic mainline enplanement growth is forecast to increase at 4.6 percent in 2019, then slow to 1.6 percent annually over the remaining forecast period. Both labor and fuel costs will continue to be significant factors governing future U.S. carrier airline industry growth.

KTN Airline Markets and Destinations

Potential Airline Service Events and Market Changes

KTN airline service is expected to continue to expand in response to growing service area passenger demands, emerging markets, and an evolving airline industry. It is expected that KTN Airport Staff will continue to explore new service prospects, including new air carriers, added flight frequency, new destinations, and possible new aircraft types. It is recognized that the introduction of added flight frequency and/or new service destinations would have a significant impact on the KTN airline passenger demand forecasts, and this additional service demand would likely be driven by increased seasonal growth in tourism.

Top KTN Passenger Markets/Destinations

Table B17 lists the top KTN origin and destination (O&D) airline markets. Of the top twenty markets, six are currently served, including Sitka, Seattle, Wrangell, Juneau, Klawock, and Petersburg. These six markets compromise nearly 63 percent of the total passengers and 61 percent of the KTN airfare revenue.

¹²Simply defined as the business strategy of selling largely similar products to different customers at different prices.

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TABLE B17: KTN Top 20 Origin & Destination Airline Markets

Rank	Airport	Passengers Per Day	Total Annual Passengers	Percent of Passengers	Revenues	Percent of Revenues
1	Sitka, AK	99.6	36,354	20.9%	\$4,442,092	18.27%
2	Seattle, WA	84.0	30,660	17.7%	\$6,042,988	24.86%
3	Wrangell, AK	63.6	23,214	13.4%	\$2,329,198	9.58%
4	Anchorage, AK	40.5	14,783	8.5%	\$3,743,296	20.51%
5	Juneau, AK	34.0	12,410	7.2%	\$1,695,745	6.98%
6	Portland, OR	12.9	4,709	2.7%	\$1,025,976	4.22%
7	Klawock, AK	11.1	4,052	2.3%	\$146,386	0.60%
8	Salt Lake City, UT	7.3	2,665	1.5%	\$565,996	2.33%
9	Phoenix, AZ (PHX)	5.7	2,081	1.2%	\$581,848	2.39%
10	Las Vegas, NV	5.1	1,862	1.1%	\$429,842	1.77%
11	Sacramento, CA	4.8	1,752	1.0%	\$421,470	1.73%
12	Los Angeles, CA	4.7	1,716	1.0%	\$448,500	1.84%
13	Petersburg, AK	4.5	1,643	1.0%	\$152,327	0.63%
14	Denver, CO	4.5	1,643	0.9%	\$505,178	2.08%
15	Spokane, WA	4.0	1,460	0.8%	\$284,544	1.17%
16	Boise, ID	3.8	1,387	0.8%	\$295,512	1.22%
17	San Diego, CA	3.6	1,314	0.8%	\$381,740	1.57%
18	Minneapolis, MN	3.2	1,168	0.7%	\$341,014	1.40%
19	Fairbanks, AK	2.9	1,059	0.6%	\$217,242	0.89%
20	San Francisco, CA	2.8	1,022	0.6%	\$258,243	1.06%
Top 20	---	403	146,949	84.7%	\$24,309,139	N/A
Top 5	---	322	117,421	67.7%	\$18,253,319	N/A

Source: KTN Air Service Market Research Report/August 2019 prepared by Mead & Hunt, 2019.

Top KTN Air Service Prospects

According to information compiled for the 2019 KTN Air Service Market Research Report, future expansion of passenger air service to existing and new market destinations is a reasonable forecast prospect. The opportunity for additional flight frequency and service to a new market destination could represent a significant forecast service event, and the potential for additional passenger enplanements. A summary of the potential KTN airline service events that could occur within the 20-year airline forecast planning horizon are presented in the following text.

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INCUMBENT AIRLINES. There are two Part 121 carriers, Alaska Airlines and Delta Air Lines, that provide passenger service to KTN. Alaska Airlines is the largest carrier operating at KTN, and currently represents 79.9 percent of the seats at the Airport. With nonstop service to Juneau, Seattle, Sitka and Wrangell, Alaska Airlines serves most of their markets in the region with year-round service. Anchorage is the largest market without nonstop service from KTN; however, the current daily passenger demand would not support nonstop service on mainline aircraft to Anchorage. If Alaska Airlines were to begin operating regional aircraft to Anchorage such as the ERJ-175, then direct service from KTN would be a possibility.

Alaska Airlines also has seasonal service opportunities with the ERJ-175 regional jet to either the San Francisco Bay Area or Los Angeles Basin. While both markets are not large enough today, they could likely support less-than-daily, seasonal service with growth in demand to a destination market like KTN. In addition, Portland, as the second largest hub for Alaska Airlines, is another market that could potentially be served with regional jet aircraft on a daily or less-than-daily basis during the summer months.

Delta provides summer seasonal nonstop service to their Seattle hub with 76-seat ERJ-175 and CRJ 900 regional jet aircraft. This service operates each year from June to the first week of September and represents just 1.7 percent of the seats at the Airport. The market has historically performed at a very high load factor (e.g., 74 percent for 2018) and could be a potential market for an additional roundtrip or larger mainline-sized aircraft. With Delta being in the market, potential new opportunities for seasonal, less-than-daily service could include any of their hub markets, particularly Minneapolis, Salt Lake City or Los Angeles. Minneapolis would open-up significantly more connecting opportunities for KTN than what is available at Seattle.

POTENTIAL AIRLINES. The 2019 KTN Air Service Market Research Report also reviewed potential air service opportunities from airlines that do not currently serve the KTN market. The airlines that were examined included: American Airlines, Frontier Airlines, JetBlue Airways, Southwest Airlines, Spirit Airlines, Sun Country Airlines and United Airlines. From this analysis, Sun Country Airlines and United Airlines were identified as the current best airline prospects for new air carrier service at KTN.

Sun Country Airlines operates as an ULCC, typically with less-than-daily service between major cities or leisure destinations. With their service in Portland, Minneapolis and Los Angeles, they could be a potential option for service at KTN with less-than-daily, seasonal service, concentrating during the summer on inbound traffic to Ketchikan and during the winter on outbound traffic from Ketchikan to a destination like Las Vegas.

United Airlines is a strong airline on the West Coast, with its dual hubs at San Francisco and Los Angeles. This strength could be an opportunity for service for KTN on a seasonal or less-than-daily basis on larger regional jets like the ERJ-175. If United served KTN to one of its West Coast hubs, then additional service long-term to either Chicago-O'Hare or Denver is a potential for KTN.

Projections of Aviation Demand

This section presents the projections of aviation demand at KTN for the 20-year planning period using various forecast methodologies for consideration. A preferred method is selected for each forecast and the resulting projections are then compared with the FAA TAF projections. Following FAA approval, these forecasts will be utilized to determine the projected future airside and landside facility requirements at KTN.

Passenger Enplanement Forecasts

Forecasts of passenger enplanements serve as the foundation for other commercial service activity projections, and thus provide a basis for determining future requirements for terminal area facilities integral to the accommodation of passengers. The preparation of the KTN passenger enplanement forecast included a review of historical trends and evaluation of multi-variable regression methods to project passenger enplanements. The three methodologies (i.e., scenarios) selected for projecting passenger enplanements at KTN are summarized below and shown in **Table B18** and **Figure B4**. In addition, a straight-line Trend Analysis and the TAF projections are included for comparison.

SCENARIO 1: MULTI-VARIABLE REGRESSION ANALYSES. The regression model tested variables that highly correlated (greater than 0.9) with KTN passenger enplanements over the past ten years. These included the U.S. Gross Domestic Product (GDP), U.S. Commercial Passengers, and MSA Income per Capita. A combination of these individual variables was then evaluated, and the results of the multi-variable regression analyses are presented in **Table B18**. This methodology generated what is determined to be the “High” enplanement forecast scenario for this study, with enplanements increasing at a CAGR of 2.7 percent.

TABLE B18: KTN Enplanement Correlation and Multi-Variable Regression Analyses

Variable	Correlation Coefficient	Adjusted R Squared Value
U.S. Gross Domestic Product (GDP) ¹	0.97	---
U.S. Commercial Passengers ²	0.95	---
MSA Income per Capita ¹	0.91	---
Combined (Multi-Variable Analyses)	---	0.957

Sources: ¹ Woods & Poole 2018, ² FAA Aerospace Forecasts

Scenario 1 “High” Enplanement Forecast Summary:

- **20-Year Change (2019 to 2038): 135,389 to 231,300 Enplanements**
- **20-Year Range: +95,911 Passengers**
- **20-Year Average Annual Change: +4,796 Passengers**
- **20-Year CAGR Change: 2.7 percent**

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Scenario 1 “High” Enplanement Forecast Factors:

- **Based on expanded flight frequencies and potential new destination**
- **Reflects continuance of positive regional and national economic improvements (post 2008 recession recovery)**
- **Consistent with mainline and regional airline industry passenger growth projected by FAA**
- **Includes expansion of local industry in response to increasing tourism-related visitors**

SCENARIO 2: AVERAGE MARKET SHARE OF U.S. DOMESTIC ENPLANEMENTS. The *FAA Aerospace Forecast Fiscal Years 2019-2039* projects that U.S. enplanements will grow at an average annual rate of 1.6 percent through 2039. Between 2008 and 2018, the Airport’s average share of total U.S. enplanements was 0.015 percent. This scenario assumes that KTN will maintain this average share through the forecast period. This methodology generated what is determined to be the “low-range” enplanement forecast scenario for this study, with enplanements increasing at a CAGR of 1.5 percent.

Scenario 2 “Low” Enplanement Forecast Summary:

- **20-Year Change (2019 to 2038): 135,389 to 183,100 Enplanements**
- **20-Year Range: +47,711 Passengers**
- **20-Year Average Annual Change: +2,386 Passengers**
- **20-Year CAGR Change: 1.5 percent**

Scenario 2 “Low” Enplanement Forecast Factors:

- **Based on general maintenance of the seasonal flight frequency**
- **Reflects limited positive regional and national economic improvements (post 2008 recession recovery)**
- **Consistent with mainline and regional airline industry passenger growth projected by FAA**
- **Includes a stagnated expansion of local industry in response to less than expected tourism-related visitors**

SCENARIO 3: SINGLE VARIABLE REGRESSION ANALYSES. As a variation of the Scenario 1 projections, this regression model tested a single variable for the MSA Income per Capita (see in **Table B17** above). This methodology generated what is determined to be the “Medium” enplanement forecast scenario for this study, with enplanements increasing at a CAGR of 2.1 percent.

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Scenario 3 “Medium” Enplanement Forecast Summary:

- **20-Year Change (2019 to 2038): 135,389 to 206,200 Enplanements**
- **20-Year Range: +70,811 Passengers**
- **20-Year Average Annual Change: +3,541 Passengers**
- **20-Year CAGR Change: 2.1 percent**

Scenario 3 “Medium” Enplanement Forecast Factors:

- **Based on expanded flight frequencies**
- **Reflects moderate, steady regional and national economic improvements (post 2008 recession recovery)**
- **Continued steady growth in tourism within the Airport Market Area**
- **Consistent with mainline and regional airline industry passenger growth projected by FAA**
- **Includes a positive expansion of local industry in response to a steady continuation of tourism-related visitors**

Table B19 and **Figure B4** below presents a summary of the various passenger enplanement forecast scenarios for this study.

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TABLE B19: KTN Passenger Enplanement Projections

Year	Scenario 1: Multi-Variable Regression Analyses (High)	Scenario 2: Average Market Share of U.S. Enplanements (Low)	Scenario 3: Single Variable Regression Analyses (Medium)	Trend Analysis	Terminal Area Forecasts (TAF)
2018	135,389 ¹	135,389 ¹	135,389 ¹	135,389 ¹	134,359 ²
2023	160,900	142,900	151,900	151,495	143,022
2028	180,800	152,300	172,300	170,164	154,863
2033	205,000	166,900	189,800	188,833	168,934
2038	231,300	183,100	206,200	207,502	184,981
CAGR 2018-2038	2.7%	1.5%	2.1%	2.2%	1.6%
2023 Variation from TAF	12.5%	-0.1%	6.2%	5.9%	---
2028 Variation from TAF	16.7%	-1.7%	11.3%	9.9%	---
2033 Variation from TAF	21.3%	-1.2%	12.4%	11.8%	---

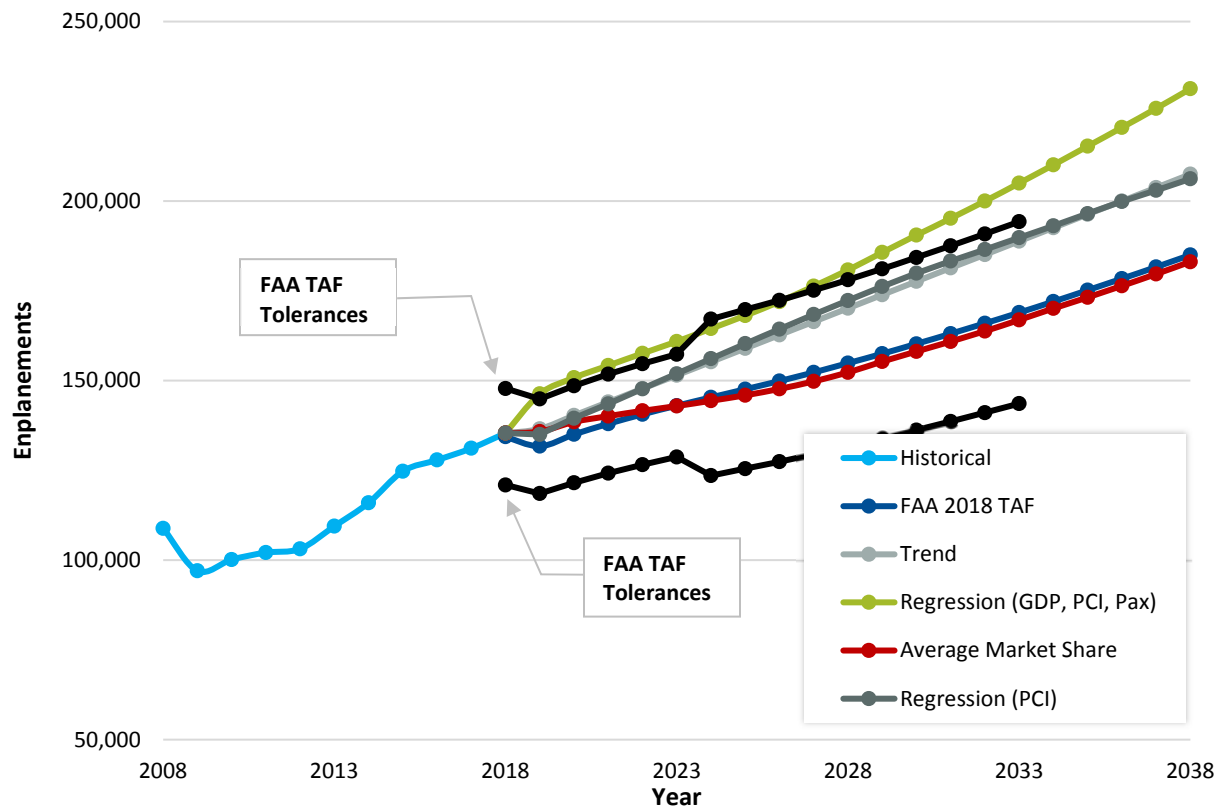
Source: FAA ACAIS, TAF, and Mead & Hunt projections.

Notes: ¹ The 2018 ACAIS data reflects actual calendar year KTN enplanement counts.

² The 2018 TAF data reflects forecast fiscal year (October 2017- September 2018 enplanement counts).

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FIGURE B4: KTN Passenger Enplanement Projections



Source: Mead & Hunt

PREFERRED ENPLANEMENT FORECAST METHODOLOGY. The previous section presented enplanement projections from several analytical sources. From these sources, preferred potential future enplanement activity can be established. It is expected that enplanement activity at KTN will fluctuate over the next 20 years; however, Scenario 3 (reflecting a single variable regression analysis for the MSA Income per Capita) has been selected as the preferred enplanement forecast scenario.

This scenario proposes that the Airport’s passenger enplanements will increase at a CAGR of 2.1 percent through the 20-year planning period. This growth rate, which is also consistent with the Trend Analysis, is just slightly lower than the Scenario 1- Multi-Variable Regression methodology and slightly higher than the Scenario 2 – Average Market Share methodology and TAF projections. Scenario 3 also reflects the potential demand for expanded flight frequencies in response to continued steady growth in tourism within the region.

Commercial Service Aircraft Operations

The level of commercial service operations needed at KTN is a derivative function of the aircraft types utilized to accommodate the commercial service enplanement projections presented above. Therefore, when developing the commercial service operations projections, it is critical to know the existing airline fleet mix at the airport and understand how it could change in the future in response to increasing passenger demand. In addition, one of Alaska Airlines' long-time operational models for providing commercial passenger and air cargo service within the state has been the successful "Milk Run" flights. The Milk Run refers to a scheduled (multi-stop) commercial service flight with narrow-body jets to several Alaska communities that would not be able to generate enough daily passengers on an individual basis to support service with these larger aircraft. For example, Alaska Flight #65 begins as a morning departure from Seattle with stops in Ketchikan, Wrangell, Petersburg, and Juneau before finishing in Anchorage.

As noted below in **Table B20**, KTN currently accommodates four of the daily/year-round Alaska Airline Milk Run flights, which are supplemented in the summer season with additional direct flights to Seattle by both Alaska Airlines and Delta. The narrow-body jet departure operations conducted by Alaska Airlines have remained relatively consistent at KTN (at just over 2,300) for the past five years. As for the Air Taxi operators, aircraft departures have fluctuated over the same period, in conjunction with minor changes in the seating capacity of these smaller aircraft. However, as noted previously, air taxi enplanements at KTN have increase 15 percent annually since 2008 and are expected to continue to increase over the 20-year planning period.

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TABLE B20: Historical KTN Commercial Service Aircraft Operations and Boarding Load Factors

	2014	2015	2016	2017	2018
Air Carrier					
Narrow Body Jet Departures	2,356	2,365	2,357	2,314	2,300
Regional Jet Departures	0	114	104	85	88
Average Seats Per Departure	131.1	132.3	134.7	137.3	135.3
Enplanements	105,745	115,461	118,534	120,636	124,640
Through Passengers	96,987	92,166	87,836	95,202	91,723
Total Onboard Passengers	202,732	207,627	206,370	215,838	216,363
Boarding Load Factor (BLF)	65.6%	63.3%	62.3%	65.5%	67.0%
Air Taxi					
Aircraft Departures	3,442	2,184	1,733	1,902	2,860
Average Seats Per Departure	8	9	9	9	7
Enplanements	10,203	9,286	9,347	10,508	10,749
Boarding Load Factor (BLF)	37.6%	48.5%	59.4%	61.0%	53.7%
Total Operations	11,596	9,326	8,388	8,602	10,496

Sources: Total commercial service operations, operations by equipment percentages and average seats per departure - USDOT BTS T-100 Data, Enplanements- ACAIS.

Table B21 summarizes the forecast for airline operational activity based on the preferred Scenario 3 “Medium” enplanement forecast scenario, including annual aircraft operations, seat capacity, and passenger loads. The airline operational forecasts incorporate projected changes in aircraft seat capacity, passenger load factors, and increased daily departures resulting from additional flight frequencies and/or potential new destination service, which are consistent with FAA airline industry benchmarks. Based on these assumptions, commercial service aircraft operations are projected to reach 13,270 by 2038, resulting in a CAGR of 1.2 percent. Despite the increased flights by the 76-seat EMB 175 and/or CRJ 900 regional jets, the average seats per departure is anticipated to increase over the forecast period due to Alaska Airlines’ up-gauging of the Boeing 737 narrow body jets (e.g., replacing a 124-seat B737-700 aircraft with a 159-seat B737-800 or a 178-seat B737-900). The BLF¹³ is also projected to grow as airlines try to keep capacity aligned with demand and add service selectively and cautiously. In addition, air taxi operators handled approximately 7.9 percent of the annual enplanements that were recorded at KTN in 2018, and this percentage split is projected to be maintained through the planning period for this study.

¹³ BLF refers to the total percentage of airline seats that are occupied by a passenger compared to the total number of seats that are available on the aircraft.

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TABLE B21: KTN Commercial Service Aircraft Operation Projections

	2018	2023	2028	2033	2038
Air Carrier					
Narrow Body Jet Departures	2,300	2,300	2,352	2,352	2,716
Regional Jet Departures	88	88	151	176	265
Average Seats Per Departure	135.3	135.3	155.3	154.3	155.0
Enplanements	124,640	139,840	158,621	174,731	189,829
Through Passengers	91,723	102,909	116,729	128,585	139,696
Total Onboard Passengers	216,363	242,749	275,350	303,316	329,525
Boarding Load Factor (BLF)	67.0%	75.1%	70.8%	77.7%	71.3%
Air Taxi					
Aircraft Departures	2,860	3,161	3,502	3,588	3,654
Average Seats Per Departure	7	7	7	8	8
Enplanements	10,749	12,060	13,679	15,069	16,371
Boarding Load Factor (BLF)	53.7%	54.5%	55.8%	56.0%	56.0%
Total Operations	10,496	11,098	12,010	12,232	13,270

Sources: 2018 total commercial service operations, operations by equipment percentages and average seats per departure - USDOT BTS T-100, 2018 enplanements- ACAIS, Forecasts by Mead & Hunt.

Air Cargo (Freight/Mail) and Operations

Alaska Airlines began dedicated air cargo service with converted B737-700 freighters in late 2017 in conjunction with the phase-out of their aging B737-400 combi fleet. The B737-700 freighters offer a maximum payload of 42,000 pounds, which is an increase of 10,000 pounds more than the B737-400 combi. Alaska Airlines also schedules the dedicated freighters similar to the passenger-only Milk Run flights, with stops at KTN, Sitka, and Juneau between Seattle and Anchorage.

In 2018, 2,515 air cargo operations were performed at KTN, which were generally split equally between Alaska Airlines and Alaska Central Express. This equates to 6.9 daily operations by all-cargo carriers. However, due to Alaska Airlines' operation of the B737-700 freighter aircraft and the belly freight cargo capacity of their passenger aircraft, they transported 95.4 percent of freight and 77.3 percent of the mail that is handled at KTN. The balance of the air cargo freight and mail is transported by Alaska Central Express operating the Beech 1900 turboprop aircraft.

In recent years, e-commerce (currently led by Amazon) has been a significant driver of the air cargo market. According to Boeing's *World Air Cargo Forecast 2018-2037*, Amazon accounts for almost half of the e-commerce industry within the U.S. As shown in the **Table B22**, annual operations by all-cargo carriers are projected to remain steady for the first half of the planning period with additional weekly

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flights being added incrementally in 2028 and again in 2038, reflecting a CAGR of 1.1 percent. This compares to a projected CAGR of 2.3 percent for North America air cargo traffic also identified in Boeing’s *World Air Cargo Forecast 2018-2037*.

TABLE B22: KTN Air Cargo Operation Projections

Year	Air Carrier	Air Taxi	Total Air Cargo Operations
2018	1,249	1,266	2,515
2023	1,249	1,266	2,515
2028	1,457	1,474	2,931
2033	1,457	1,474	2,931
2038	1,561	1,578	3,139
CAGR 2018-2038	1.1%	1.1%	1.1%

Source: USDOT BTS T-100 Data (Obtained August 2019) & Mead & Hunt Projections.

Air cargo data by type (air freight/mail) is reported by commercial carriers (both airlines and all-cargo companies) to the USDOT BTS. Although KTN experienced an overall decline of 9.2 percent in air cargo handled since 2008, it has grown at a CAGR of 5.5 percent since 2014. Due to the projected continued growth of e-commerce, which represents an ever-increasing share of the air cargo market, the volume of air freight/mail at the Airport is projected to continue to grow at a CAGR of 1.0 percent. As shown in **Table B23**, total air cargo at the Airport is projected to reach over 12,000 tons by 2038. This rate of growth is conservative compared to Boeing’s *World Air Cargo Forecast 2018-2037*, which predicts U.S. air cargo to grow at a CAGR of 2.3 percent through the same 20-year forecast period.

TABLE B23: Air Cargo (Freight/Mail) Projections - In Tons

Year	Freight	Mail	Total
2018	4,344	5,663	10,007
2023	4,566	5,952	10,517
2028	4,798	6,255	11,054
2033	4,798	6,575	11,618
2038	5,301	6,910	12,210
CAGR 2018-2038	1.0%	1.0%	1.0%

Source: USDOT BTS T-100 Data (Obtained August 2019) & Mead & Hunt Projections.

Military Aircraft Operations

As noted in a previous section, existing military operational activity at KTN is very limited, with less than one hundred operations being recorded at the Airport in 2018. This activity was represented primarily by a variety of fixed-wing aircraft performing itinerant training operations from various locations in

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Alaska and the Pacific Northwest but did also include some helicopter operations. As presented in **Table B24**, this military activity is projected to remain consistent near 2018 levels, with KTN continuing to accommodate infrequent military training operations throughout the forecast period.

TABLE B24: KTN Military Operation Projections

Year	Itinerant	Local	Total Military Operations
2018	76	0	76
2023	100	0	100
2028	100	0	100
2033	100	0	100
2038	100	0	100
CAGR 2018-2038	0.0%	0.0%	0.0%

Source: USDOT BTS T-100 Data (Obtained August 2019) & Mead & Hunt Projections.

General Aviation Aircraft Operations and Based Aircraft

As noted in a previous section, a review of general aviation operations from FAA’s TFMSC database indicates that itinerant general aviation aircraft activity at KTN has historically been under-reported by the TAF from between 78 percent to 89 percent annually. In addition, 71.4 percent of the annual itinerant activity for 2018 (i.e., 1,704 operations) were recorded by business jets and turboprops, with the balance being represented by various piston aircraft operations.

Analysis of KTN’s 2008-2018 TFMSC general aviation operations data indicates that the 2018 total represents the approximate 10-year average itinerant operations count reported by the TAF. This average of 2,400 operations will be carried forward as the forecast subtotal for itinerant operations through the planning period. Also, since the TFMSC data does not provide operational data for local general aviation activity, the existing TAF estimate of 350 local operations will be projected through the planning period. A summary of the forecast general aviation aircraft operations is presented below in **Table B25**.

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TABLE B25: KTN General Aviation Operation Projections

Year	Itinerant	Local	Total
Historic			
2008	1,993 ¹	410 ²	2,403
2009	1,799 ¹	410 ²	2,209
2010	2,243 ¹	410 ²	2,653
2011	2,753 ¹	410 ²	3,163
2012	3,514 ¹	350 ²	3,864
2013	3,378 ¹	350 ²	3,728
2014	2,495 ¹	350 ²	2,845
2015	1,896 ¹	350 ²	2,246
2016	1,788 ¹	350 ²	2,138
2017	1,905 ¹	350 ²	2,255
2018	2,375 ¹	350 ²	2,725
Projected			
2023	2,400	350	2,750
2028	2,400	350	2,750
2033	2,400	350	2,750
2038	2,400	350	2,750
CAGR 2018-2038	0.0%	0.0%	0.0%

Source: TFMSC & TAF Data (Obtained August 2019) & Mead & Hunt Projections.

¹ FAA TFMSC.

² FAA TAF.

Consistent with the limited number of local general aviation operations that have historically been recorded at KTN, the general aviation-based aircraft counts have also been relatively low. Based on the TAF data, based aircraft totals have ranged from a high of 13 in 2008 through 2011 to a low of 5 between 2012 and 2018. For the purposes of this planning effort, which is focused on the Terminal Area Plan, the existing counts of general aviation-based aircraft will be carried forward through the planning period. A summary of the forecast general aviation aircraft breakdown is presented below in **Table B26**.

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TABLE B26: KTN Based Aircraft Projections

	2018 ¹	2023	2028	2033	2038	CAGR 2018-38
Based Aircraft	5	5	5	5	5	0.0%
Single-Engine	3	3	3	3	3	0.0%
Multi-Engine	1	1	1	1	1	0.0%
Jet	1	1	1	1	1	0.0%
Helicopter	0	0	0	0	0	---
Other	0	0	0	0	0	---

Source: ¹ FAA TAF and Mead & Hunt projections.

Operations Forecast by Aircraft Type

With the total number of aircraft operations projected for each category of user, the next step in the forecasting process involves the individual and collective use of the Airport by various aircraft types. The aircraft types expected to use the Airport assist in determining the amount and type of facilities needed to meet the future aviation demand.

Table B27 depicts the approximate level of use by aircraft types that are projected to use the Airport through the planning period. As a percentage of projected increasing total operations, commercial service passenger aircraft operations are expected to increase from 66.4 percent in 2018 to 68.9 percent in 2038, air cargo operations are projected to increase from 15.9 percent to 16.3 percent, and general aviation aircraft operations are projected to decrease from 17.2 percent to 14.3 percent, while military aircraft operations are projected to remain flat for the planning period.

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TABLE B27: Summary of Operations Forecast by Aircraft Type, 2018-2038

Operation by Type	2018	2023	2028	2033	2038
Commercial Service ¹	10,496	11,098	12,010	12,232	13,270
Narrow Body Jets	4,600	4,600	4,704	4,704	5,432
66+ Seat Regional Jets	176	176	302	352	530
Air Taxi	5,720	6,322	7,004	7,176	7,308
Air Cargo ¹	2,515	2,515	2,931	2,931	3,139
Narrow Body Jet	1,249	1,249	1,457	1,457	1,561
Turboprop	1,266	1,266	1,474	1,474	1,578
General Aviation	2,725	2,750	2,750	2,750	2,750
Single Engine Piston	516	520	520	520	520
Multi-Engine Piston	505	520	520	520	520
Turboprop	754	760	760	760	760
Business Jet	950	950	950	950	950
Helicopter	0	0	0	0	0
Military ¹	76	100	100	100	100
Total	15,812	16,463	17,791	18,013	19,259

Source: Mead & Hunt.

¹ Actual

In the commercial service category, the percentage distribution of narrow body jet, 66+ Seat Regional jet, and air taxi operations are projected to remain relatively consistent through the planning period. Regarding general aviation operations, it is forecast that the Airport will continue to experience a significant amount of business jet and turboprop operations relative to other aircraft types. This is the result of a higher percentage of use of the Airport by itinerant aircraft operators and limited use for training and pleasure flying.

Peak Period Forecasts

Peak period forecasts are prepared to estimate when certain airport facilities such as the passenger terminal, will be at their busiest. They are utilized to evaluate the Level-of-Service (LOS) provided by both airside and landside facilities (e.g., runway/taxiway systems and passenger terminal buildings) and to assist in the rightsizing of future development projects. As with most development, airport improvements are not typically designed for the busiest hour of the busiest day of the year because such a design would lead to over-building. Instead, peak period forecasts will often identify a busy period throughout the year (e.g., the average day of the peak month) from which to further analyze. Forecasters use historical records to project future peaking; therefore, it is essential that peak forecasts be reevaluated if a change in user or aircraft type occurs. **Table B28** presents a breakdown of the peak period passenger and aircraft operations forecasts generated for this study.

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TABLE B28: Peak Period Forecasts

Category	Period	Factor	2018	2023	2028	2033	2038
Enplanements and Deplanements	Annual	100%	227,112	254,809	289,029	318,385	345,896
	Peak Month	13.0%	29,321	32,700	37,100	40,900	44,400
	Peak Day	3%	980	1,090	1,240	1,360	1,480
	Peak Hour – Enplanements ¹	23%	230	250	290	310	340
	Peak Hour – Deplanements ¹	23%	230	260	290	320	350
Total Passengers	Annual	100%	457,502	513,295	582,230	641,366	696,784
	Peak Month	12.9%	58,926	66,100	75,000	82,600	89,700
	Peak Day	3%	1,960	2,200	2,500	2,750	2,990
	Peak Hour ¹	15%	280	320	360	400	430
Aircraft Operations	Annual	100%	15,812	16,463	17,791	18,013	19,259
	Peak Month	12%	1,800	1,880	2,030	2,050	2,200
	Peak Day	3%	60	60	70	70	70
	Peak Hour	18%	11 ²	11 ²	13 ³	13 ³	13 ³

¹ Peak hour forecasts adjusted to reflect average load factor, depicted in **Table B20**.

² Total includes four Alaska Airline passenger operations (two flights), one Island Air Express passenger operation (one departure or arrival), and one Alaska Airline cargo operation (one departure).

³ Total includes four Alaska Airline passenger operations (two flights), one Island Air Express passenger operation (one departure or arrival), two Delta Air Line passenger operations (one flight), and one Alaska Airline cargo operation (one departure).

Peak Enplanements/Deplanements/Passengers: Month: FAA T-100 Database. Day and Hour: Airline Schedules.

Peak Aircraft Operations: Peak Month and Day: USDOT BTS T-100 Data. Day and Hour: Airline Schedules.

Peak enplanement and deplanement passenger forecasts are driven by growth in total passenger numbers, resulting from a combination of airlines transitioning from smaller to larger aircraft (e.g., aircraft up-gauging) and/or the provision of additional flights (e.g., adding summer season flights). T-100 data and airline schedules show that KTN experiences peak passenger numbers during the summer months of June through August. This coincides with Alaska’s peak summer tourist season, during which time both Alaska Airlines and Delta Air Lines add seasonal flights from Seattle. Daily peaks for both enplaned and deplaned passengers occur in the afternoon (between 4:40 p.m. and 5:35 p.m.) and coincide with the daily peak in commercial passenger operations occurring currently.

Future peaking analysis assumes that peak percentages, shown in **Table B28**, will remain the same into the future; however, the total number of peak passengers will steadily increase due to projected increases in aircraft seating capacities.

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Critical Aircraft

The critical aircraft is the most demanding type or group of aircraft having more than 500 annual non touch-and-go operations at an airport. For this analysis at KTN, operations data by aircraft type was compiled from a combination of the T-100 data and the Alaska Airline’s schedule. This data for the top seven ranked aircraft at KTN is presented below in **Table B29**.

TABLE B29: Existing Critical Aircraft (2018)

Rank	Aircraft	Role	Operations	ARC
1	Boeing 737-700	Passenger and Air Cargo Airline	4,161	C-III
2	Cessna C208B	Air Taxi	3,834	A-II
3	Boeing 737-800	Passenger Airline	1,520	D-III
4	Beech 1900 A/B/C/D	Air Cargo Airline	1,266	B-II
5	Pilatus PC-12	Air Taxi	836	A-II
6	Embraer ERJ-175 & CRJ 900	Passenger Airline	176	C-III
7	Boeing 737-900	Passenger Airline	168	D-III

Source: T-100 data and airline schedule

As can be noted, existing commercial passenger service of narrow-body jets establishes the existing critical aircraft at KTN. With 1,688 operations of the Boeing 737-800 and 737-900 aircraft being recorded in 2018, the existing Airport Reference Code (ARC) is confirmed to be defined by Aircraft Approach Category (AAC) D and an Airplane Design Group (ADG) III (i.e., ARC D-III).

The exact composition of the future fleet is unknown. However, it is projected that KTN’s commercial passenger service will continue to be represented predominantly with various models of ARC C-III and D-III narrow-body jets, maintaining similar physical characteristics throughout the planning period. **Table B30** presents the projected future operations by the air carrier fleet, distinguished by aircraft seating capacity.

TABLE B30: Future Air Carrier Operations by Aircraft Type

Seating Capacity	Typical Aircraft	ARC	2023	2028	2033	2038
60-76	Embraer ERJ-175 & CRJ 900	C-III	176	302	352	530
100-124	Boeing 737-700	C-III	4,161	2,913	1,457	1,561
125-150	Boeing 737-800	D-III	1,520	3,080	4,536	3,808
> 150	Boeing 737-900	D-III	168	168	168	1,624

Source: Mead & Hunt analysis, 2019.

Forecast Summary

The aviation activity forecast summary information is presented in Tables B30 and B31. Highlights of the forecasts are presented below.

- **Passenger enplanement growth is expected to continue, driven primarily by the increasing local and national economies and the steady growth of tourism within the region.**
- **Current annual average load factors for the airlines are slightly below the industry average at KTN, which means that a portion of the projected enplanement growth can be absorbed by current aircraft operation levels and/or future aircraft up-gauging. However, some additional flights are projected to be needed to serve additional routes and/or increased frequencies during the latter years of the planning period.**
- **The average number of seats per departure will continue to increase as airlines transition (i.e., up-gauge) to larger aircraft. Therefore, commercial aircraft operations will likely remain steady until the latter years of the planning period as the total number of seats increase. The smaller air taxi aircraft (less than 9 seats) will continue to serve the smaller communities within the market area and likely increase operations in response to continued expansion of the tourism industry.**
- **Air cargo volume and aircraft operations are projected to increase slightly through the planning period in response to the continued expansion of the e-commerce industry.**
- **Both military and general aviation operations are projected to remain steady, with no known factors to support increasing growth rates.**
- **The overall number of based aircraft at KTN is expected to remain flat, with no known factors to support increasing growth rates.**
- **The future critical aircraft at KTN will continue to be represented by the existing Alaska Airlines narrow-body jet fleet that provide commercial passenger service to the facility. Both the Boeing 737-800 and 900 series aircraft are categorized in accordance with the ARC D-III design standards.**

In accordance with language specified in Aviation Forecast Guidance APP-400, local aviation forecasts are approved by regional airports division offices or airports district offices (ADOs). Local forecasts that are consistent with the FAA's Terminal Area Forecast (i.e., the local forecast differs by less than 10 percent in the first five years, differs by less than 15 percent in the remaining forecast periods, and does not affect the timing or scale of an airport project) do not need to be coordinated with APP-400 and APO-110. Local forecasts that are not consistent with the TAF, but which do not affect the timing or scale of an airport project and do not impact the analysis of a National Environmental Policy Act (NEPA) document or Benefit Cost Analysis (BCA), may be accepted (not approved) for information purposes by the regional office/ADO without APP/APO coordination. As noted on **Table B31** and **Table B32** below, the forecasts for passenger enplanements and commercial operations are within the specified TAF thresholds for acceptance. However, due to a combination of the TAF under-reporting itinerant general

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aviation and commercial operations for 2018, which was confirmed by the FAA’s TFMSC and the USDOT T-100 databases, the specified TAF threshold cannot be met for total operations. Since the differential in total operations for the 2018 base year would not affect the timing or scale of an airport project and would not impact the analysis of a National Environmental Policy Act (NEPA) document or Benefit Cost Analysis (BCA), the FAA regional office may be able to approve the KTN total operations forecast without additional coordination.

TABLE B31: Summary of Airport & TAF Forecast Comparison, 2018-2033

Category	Year	Airport Forecasts	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2018	135,389	134,359	0.8%
Base yr. + 5yrs.	2023	151,900	143,022	6.2%
Base yr. + 10yrs.	2028	172,300	154,863	11.3%
Base yr. + 15yrs.	2033	189,800	168,934	12.4%
Commercial Operations				
Base yr.	2018	13,011 ¹	11,798	10.3%
Base yr. + 5yrs.	2023	13,613	12,580	8.2%
Base yr. + 10yrs.	2028	14,941	13,261	12.7%
Base yr. + 15yrs.	2033	15,163	14,045	8.0%
Total Operations				
Base yr.	2018	15,812 ²	12,678	24.7%
Base yr. + 5yrs.	2023	16,463	13,460	22.3%
Base yr. + 10yrs.	2028	17,791	14,141	25.8%
Base yr. + 15yrs.	2033	18,013	14,925	20.7%

Source: Mead & Hunt, Inc.

Note: TAF data is based on the U.S. Government fiscal year basis (October through September)

¹The Airport Forecast 2018 Base Year data reflects actual calendar year operation counts for commercial passenger and air cargo flights.

²The Airport Forecast 2018 Base Year data also reflects actual calendar year operation counts for itinerant general aviation from FAA TFMSC data.

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TABLE B32: TAF Summary of Airport Planning Forecasts

	Average Annual Compound Growth Rates								
	Base Yr. (2018)	Base Yr. +1yr. (2019)	Base Yr. +5yrs. (2023)	Base Yr. +10yrs. (2028)	Base Yr. +15yr. (2033)	Base yr. to +1 (2018)	Base yr. to +5 (2023)	Base yr. to +10 (2028)	Base yr. to +15 (2033)
Passenger Enplanements¹	135,389	138,691	151,900	172,300	189,800	2.4%	2.3%	2.4%	2.3%
Operations									
Air Carrier (Passenger)	4,776	4,776	4,776	5,006	5,006	0.00%	0.00%	0.47%	0.38%
Air Carrier (Air Cargo)	1,249	1,249	1,249	1,457	1,457	0.00%	1.6%	1.55%	1.03%
Commuter (Passenger)	5,720	5,720	6,322	7,004	7,176	2.02%	2.02%	2.05%	1.52%
Commuter (Air Cargo)	1,266	1,266	1,266	1,474	1,474	0.00%	0.00%	1.53%	1.02%
Total Commercial Operations	13,011	13,011	13,613	14,941	15,163	0.00%	0.91%	1.39%	1.03%
General Aviation	2,725	2,730	2,750	2,750	2,750	0.18%	0.18%	0.09%	0.06%
Military	76	81	100	100	100	6.32%	5.64%	2.78%	1.85%
Total Operations	15,812	15,942	16,463	17,791	18,013	0.82%	0.81%	1.19%	0.87%
Local	0	0	0	0	0	---	---	---	---
Itinerant	15,473	15,601	16,113	17,441	17,663	0.82%	0.81%	1.19%	0.87%
Instrument Operations¹	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Peak Hour Operations	11	10.8	10.8	12.6	12.6	0.00%	0.00%	1.55%	1.03%
Cargo/Mail (enplaned + deplaned tons)	10,007	10,109	10,517	11,054	11,618	1.02%	1.00%	1.00%	1.00%

Source: Mead & Hunt, Inc.

¹ No data on instrument operations available.

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TABLE B32: TAF Summary of Airport Planning Forecasts (Continued)

	Average Annual Compound Growth Rates								
	Base Yr. (2018)	Base Yr. +1yr. (2019)	Base Yr. +5yrs. (2023)	Base Yr. +10yrs. (2028)	Base Yr. +15yr. (2033)	Base yr. to +1 (2015)	Base yr. to +5 (2019)	Base yr. to +10 (2024)	Base yr. to +15 (2029)
Based Aircraft									
Single Engine (Nonjet)	3	3	3	3	3	0.0%	0.0%	0.0%	0.0%
Multi-Engine (Nonjet)	1	1	1	1	1	0.0%	0.0%	0.0%	0.0%
Jet Engine	1	1	1	1	1	0.0%	0.0%	0.0%	0.0%
Helicopter	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Other	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Total	5	5	5	5	5	0.0%	0.0%	0.0%	0.0%
Average Aircraft Seat Size (seats)	135.3	135.3	135.3	155.3	154.5	---	---	---	---
Average boarding load factor	67.0	68.6	75.1	70.8	77.7	---	---	---	---
GA operations per based aircraft	545	546	550	550	550	---	---	---	---

Source: USDOT BTS T-100, TFMSC, TAF, & ACAIS Data (Obtained August 2019) & Mead & Hunt Projections.

¹ Includes enplanements on both air carrier and commuter airlines.