

2 Aviation Forecast

2.1 OVERVIEW

In planning for the future growth of any airport, it is important to understand the context within which potential increases in aviation activity are likely to occur. Several indicators of aviation activity, including regional and local trends in general aviation, were used to develop an aviation activity forecast for Felts Field. The forecast period covers a 20-year period from 2017 to 2037, and the forecast elements include data at five-year intervals (2022, 2027, 2032, and 2037). In March 2020, the COVID-19 pandemic affected U.S. aviation demand and will have an impact on near-term demand forecasts contained herein; however, recovery is expected in the next three years and the long-term 20-year forecast should not be affected.

The aviation demand forecast's purpose is to provide one of the parameters for planning future aviation facilities. Aviation forecasting is not an "exact science," so experienced aviation judgment and practical considerations will influence the level of detail and effort required to establish reasonable forecasts and subsequent airport development decisions. This chapter includes a discussion of the national and local general aviation activity historical trends and projections. These trends provide a basis for the projections of aviation activity developed for Felts Field.

The air traffic activity at Felts Field largely comprises air taxi and general aviation activity. Therefore, the historical trends and projections focus specifically on this type of activity. While historical data is presented only from 2013 through 2017, additional data was analyzed to prepare the forecasts contained herein and in Appendix B, "Historical Data Tables and Figures."

The Great Recession began in December 2007 and lasted until June 2009. Recovery from the Great Recession was much slower than previous recessions and per the U.S. Federal Reserve Economic Data, many key economic indicators did not return to pre-Great Recession levels until late 2013 through mid-2014. For instance, real Gross Domestic Product (GDP) per capita and nonfarm employment did not return to pre-Great Recession levels until the fourth quarter of 2013 and May 2014, respectively. Aviation activity, which is closely tied to the economic performance of the United States, also did not return to pre-Great Recession levels until the same time. Therefore, any activity before 2013 does not accurately represent recent historical trends.

The forecasts were developed by analyzing recent general aviation trends in activity at Felts Field and nationally. Historical growth rates were analyzed and compared to forecast growth rates to ensure that the projections were reasonable. Trends in the national general aviation forecasts developed by the FAA were used to provide the underlying assumptions for the projections of general aviation activity and the other elements of the forecast contained herein. The FAA develops its estimates of such trends through conversations with various segments of the general aviation community.

2.2 NATIONAL ECONOMIC AND GENERAL AVIATION TRENDS

The FAA Aerospace Forecast, Fiscal Years 2017–2037 (FAA Forecasts)² includes a description of national factors that influence overall general aviation demand, including economic measures such as U.S. GDP and the Consumer Price Index (CPI). In addition to the economic factors, trends related to the purchase of general aviation aircraft specifically influence the outlook related to the overall general aviation activity in the U.S. These factors coupled with local general aviation trends were the basis for the forecasts developed for Felts Field.

Table 2-1 presents the historical and projected U.S. GDP and CPI. GDP is a measure of overall economic growth and CPI is a measure of economic inflation. As shown in the table, GDP increased at a compounded average annual growth rate of 2.2% from 2013 to 2017.

GDP is projected to increase at an average annual growth rate of 2.3% from 2017 to 2022. In the near term, year-over-year growth in GDP is forecast to accelerate as the U.S. administration puts its economic stimulus package in place.

Table 2-1 also presents CPI. CPI increased at an average annual growth rate of 1.3% from 2013 to 2017. CPI is projected to increase at an annual compounded growth rate of 2.5% from 2017 to 2022. These projected increases in CPI follow the same pattern as the projected increases in GDP; however, they lag several years with the largest year-over-year increase (2.5%) anticipated to occur from 2022 to 2023, compared to the largest year-over-year increases occurring in GDP from 2017 to 2018 and 2018 to 2019.

² This publication was released in March 2017. Fiscal year refers to the federal fiscal year, which begins October 1 and ends September 30 each year.

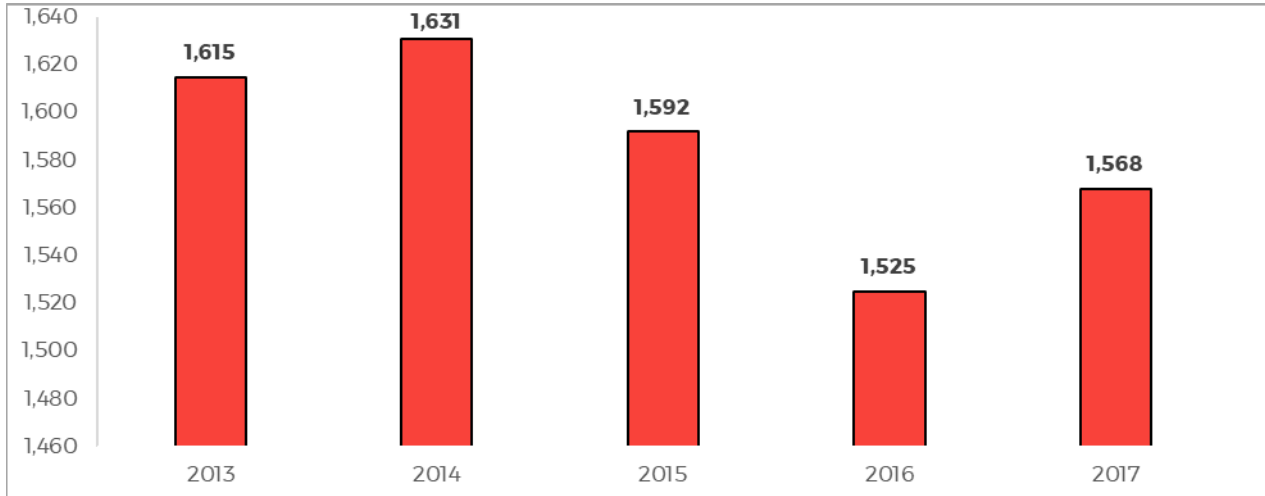
Table 2-1. Historical and Projected Gross Domestic Product and Consumer Price Index

Fiscal Year	Gross Domestic Product		Consumer Price Index	
	(Billions, 2009\$)	Percent Change	(1982-84=1.00)	Percent Change
2013	15,510	1.3%	2.322	1.6%
2014	15,884	2.4%	2.360	1.6%
2015	16,321	2.8%	2.368	0.3%
2016	16,581	1.6%	2.389	0.9%
2017	16,937	2.1%	2.446	2.4%
2018	17,365	2.5%	2.497	2.1%
2019	17,791	2.5%	2.556	2.4%
2020	18,163	2.1%	2.623	2.6%
2021	18,563	2.2%	2.694	2.7%
2022	18,960	2.1%	2.766	2.7%
2023	19,353	2.1%	2.843	2.8%
2024	19,730	1.9%	2.921	2.7%
2025	20,099	1.9%	3.001	2.7%
2026	20,454	1.8%	3.081	2.7%
2027	20,834	1.9%	3.161	2.6%
2028	21,262	2.0%	3.236	2.4%
2029	21,683	2.0%	3.313	2.4%
2030	22,114	2.0%	3.391	2.4%
2031	22,557	2.0%	3.473	2.4%
2032	23,002	2.0%	3.557	2.4%
2033	23,448	1.9%	3.643	2.4%
2034	23,927	2.0%	3.732	2.4%
2035	24,411	2.0%	3.822	2.4%
2036	24,901	2.0%	3.914	2.4%
2037	25,392	2.0%	4.008	2.4%
Compounded Average Annual Change				
2013-2017		2.2%		1.3%
2017-2022		2.3%		2.5%
2022-2037		2.0%		2.5%
2017-2037		2.0%		2.5%

Source: FAA Aerospace Forecast, Fiscal Years, 2017–2037; compiled by WSP USA

Figure 2-1 presents the historical general aviation aircraft shipments from 2013 to 2017, according to the General Aviation Manufacturers Association (GAMA).

Figure 2-1. Historical General Aviation Aircraft Shipments



Source: General Aviation Manufacturers Association

The FAA uses the economic forecasts and trends in general aviation aircraft deliveries to develop its forecast of active general aviation aircraft. General aviation aircraft are made up of piston aircraft, turbine (turboprops and jets) aircraft, and helicopters. The National Business Aviation Association defines these aircraft as follows:

- Piston aircraft have one or more piston-powered engines connected to the propeller(s), which provide thrust to move the aircraft on the ground and through the air. Piston-powered aircraft most commonly use 100 octane low-leaded fuel and fly at altitudes below 15,000 feet. Piston aircraft used for business typically fly relatively short missions of 300 to 400 miles, using small general aviation airports that are often without ATCTs.
- Turboprop aircraft have one or more gas-turbine engines connected to a gearbox that turns the propeller(s) to move the aircraft on the ground and through the air. Turboprop aircraft burn Jet A fuel, are frequently larger than piston aircraft, can carry more payload and passengers than their piston-powered counterparts and can typically fly higher than piston aircraft, at altitudes up to 35,000 feet. Turboprop aircraft are an attractive option for businesses that need to fly missions requiring 600 to 1,000 miles of travel between general aviation airports that often have runways too short to accommodate jets.
- Jet aircraft have one or more gas-turbine engines, which provide thrust to move the aircraft on the ground and through the air. Jet aircraft use Jet A fuel, often fly faster than turboprop aircraft, and can fly at higher altitudes than piston or turboprop aircraft. Depending on their capability, jet aircraft typically fly at altitudes below the airlines (20,000-25,000 feet) or above the airlines (above 40,000 feet). Jet aircraft are often faster than turboprop aircraft, making them attractive for businesspeople

who need to reach a destination in the shortest possible amount of time. General aviation jet aircraft typically use airports with runways greater than 4,200 feet.

- Helicopters (rotorcraft) are aircraft that are lifted and propelled by one or more horizontal rotors. Helicopters are powered either by a piston engine that uses 100-octane low-leaded fuel or a turbo-shaft engine that uses Jet A fuel. Turbo-shaft engines are a form of gas-turbine propulsion designed to produce shaft power rather than jet thrust. They are typically used for very short business aviation flights of less than 100 miles, and fly at altitudes of less than 1,000 feet. Helicopters can land at a variety of heliports and outlying airports.

FAA Form 5010-1 of the National Based Aircraft Inventory Program classifies both piston and turbine aircraft as either single-engine or multi-engine aircraft. In addition, this database has been updated to more accurately reflect active aircraft being utilized the United States.

Table 2-2 presents the number of historical and FAA projected general aviation aircraft fleet in the United States. As shown in the table, the total number of active piston aircraft has remained relatively stable, while the number of turbine aircraft has increased. The total number of piston and turbine aircraft has ranged from approximately 159,000 in 2013 to a high of approximately 164,300 in 2015. Since 2013, the number of piston and turbine aircraft has increased approximately 2.7%. Helicopters have increased from 2013 to 2017 at an average annual rate of 2.8%.

General aviation aircraft are projected to continue to decrease at an average annual rate of 0.2% from 2017 to 2037. Projected decreases for these aircraft is moderated by growth in turbine aircraft, which are projected to increase at an average annual rate of 2.0% during the projection period compared to 0.8% and 0.2% average annual decreases for piston aircraft and helicopters, respectively, during the same period.

Table 2-3 presents the historical and projected general aviation and military operations at FAA and contract ATCTs for the United States. As shown in the table, the number of general aviation and military operations has decreased slightly at an average annual rate of 0.3% from 2013 to 2017. General aviation and military operations are projected to have minimal increase of 0.3% from 2017 to 2018, which is continued throughout the remainder of the projection period, with an average annual growth rate of approximately 0.3% from 2017 to 2037. Military operations are projected to remain constant during the projection period, while general aviation operations are projected to increase at an average annual growth rate of 0.3% between 2017 and 2037. The modest increases in this type of activity during the projection period reflect the modest increases in turbine aircraft during the same period.

Table 2-2. Historical and Projected U.S. General Aviation Aircraft Fleet

Fiscal Year	Single-Engine Piston	Multi-Engine Piston	Total Piston	Percent Change	Turbine	Percent Change	Helicopter	Percent Change	Total	Percent Change
2013	124,398	13,257	137,655	-3.8%	21,256	-3.8%	9,765	-2.9%	168,676	-3.8%
2014	126,036	13,146	139,182	1.1%	22,139	4.2%	9,966	2.1%	171,287	1.5%
2015	127,887	13,254	141,141	1.4%	23,152	4.6%	10,506	5.4%	174,799	2.1%
2016	126,820	13,200	140,020	-0.8%	23,230	0.3%	10,700	1.8%	173,950	-0.5%
2017	125,760	13,155	138,915	-0.8%	23,385	0.7%	10,890	1.8%	173,190	-0.4%
2018	124,730	13,115	137,845	-0.8%	23,595	0.9%	11,075	1.7%	172,515	-0.4%
2019	123,705	13,080	136,785	-0.8%	23,870	1.2%	11,255	1.6%	171,910	-0.4%
2020	122,685	13,045	135,730	-0.8%	24,195	1.4%	11,435	1.6%	171,360	-0.3%
2021	121,645	13,005	134,650	-0.8%	24,555	1.5%	11,615	1.6%	170,820	-0.3%
2022	120,600	12,965	133,565	-0.8%	24,960	1.6%	11,800	1.6%	170,325	-0.3%
2023	119,540	12,915	132,455	-0.8%	25,395	1.7%	11,985	1.6%	169,835	-0.3%
2024	118,475	12,865	131,340	-0.8%	25,880	1.9%	12,175	1.6%	169,395	-0.3%
2025	117,410	12,820	130,230	-0.8%	26,385	2.0%	12,365	1.6%	168,980	-0.2%
2026	116,335	12,765	129,100	-0.9%	26,915	2.0%	12,560	1.6%	168,575	-0.2%
2027	115,245	12,705	127,950	-0.9%	27,500	2.2%	12,760	1.6%	168,210	-0.2%
2028	114,145	12,640	126,785	-0.9%	28,115	2.2%	12,960	1.6%	167,860	-0.2%
2029	113,065	12,575	125,640	-0.9%	28,745	2.2%	13,165	1.6%	167,550	-0.2%
2030	112,010	12,505	124,515	-0.9%	29,395	2.3%	13,375	1.6%	167,285	-0.2%
2031	110,990	12,430	123,420	-0.9%	30,060	2.3%	13,595	1.6%	167,075	-0.1%
2032	110,000	12,355	122,355	-0.9%	30,755	2.3%	13,820	1.7%	166,930	-0.1%
2033	109,035	12,280	121,315	-0.8%	31,455	2.3%	14,055	1.7%	166,825	-0.1%
2034	108,095	12,200	120,295	-0.8%	32,185	2.3%	14,295	1.7%	166,775	0.0%
2035	107,205	12,125	119,330	-0.8%	32,940	2.3%	14,545	1.7%	166,815	0.0%
2036	106,350	12,045	118,395	-0.8%	33,720	2.4%	14,800	1.8%	166,915	0.1%
2037	105,550	11,970	117,520	-0.7%	34,625	2.7%	15,065	1.8%	167,210	0.2%
Compounded Average Annual Change										
2013-2017				0.2%		2.4%		2.8%		0.7%
2017-2022				-0.8%		1.3%		1.6%		-0.3%
2022-2037				-0.8%		2.2%		1.6%		-0.1%
2017-2037				-0.8%		2.0%		1.6%		-0.2%

Source: FAA Aerospace Forecast, Fiscal Years, 2017–2037; compiled by WSP USA

Table 2-3. Historical and Projected U.S. General Aviation and Military Operations

Fiscal Year	General Aviation	Percent Change	Military	Percent Change	Total	Percent Change
2013	25,806,000	-1.2%	2,552,000	-1.0%	28,358,000	-1.2%
2014	25,654,000	-0.6%	2,515,000	-1.4%	28,169,000	-0.7%
2015	25,578,000	-0.3%	2,495,000	-0.8%	28,073,000	-0.3%
2016	25,536,000	-0.2%	2,462,000	-1.3%	27,998,000	-0.3%
2017	25,600,000	0.3%	2,464,000	0.1%	28,064,000	0.2%
2018	25,678,000	0.3%	2,464,000	0.0%	28,142,000	0.3%
2019	25,756,000	0.3%	2,464,000	0.0%	28,220,000	0.3%
2020	25,835,000	0.3%	2,464,000	0.0%	28,299,000	0.3%
2021	25,915,000	0.3%	2,464,000	0.0%	28,379,000	0.3%
2022	25,995,000	0.3%	2,464,000	0.0%	28,459,000	0.3%
2023	26,075,000	0.3%	2,464,000	0.0%	28,539,000	0.3%
2024	26,156,000	0.3%	2,464,000	0.0%	28,620,000	0.3%
2025	26,238,000	0.3%	2,464,000	0.0%	28,702,000	0.3%
2026	26,320,000	0.3%	2,464,000	0.0%	28,784,000	0.3%
2027	26,402,000	0.3%	2,464,000	0.0%	28,866,000	0.3%
2028	26,486,000	0.3%	2,464,000	0.0%	28,950,000	0.3%
2029	26,569,000	0.3%	2,464,000	0.0%	29,033,000	0.3%
2030	26,654,000	0.3%	2,464,000	0.0%	29,118,000	0.3%
2031	26,739,000	0.3%	2,464,000	0.0%	29,203,000	0.3%
2032	26,825,000	0.3%	2,464,000	0.0%	29,289,000	0.3%
2033	26,911,000	0.3%	2,464,000	0.0%	29,375,000	0.3%
2034	26,998,000	0.3%	2,464,000	0.0%	29,462,000	0.3%
2035	27,085,000	0.3%	2,464,000	0.0%	29,549,000	0.3%
2036	27,174,000	0.3%	2,464,000	0.0%	29,638,000	0.3%
2037	27,262,000	0.3%	2,464,000	0.0%	29,726,000	0.3%
Compounded Average Annual Change						
2013-2017		-0.2%		-0.9%		-0.3%
2017-2022		0.3%		0.0%		0.3%
2022-2037		0.3%		0.0%		0.3%
2017-2037		0.3%		0.0%		0.3%

Source: FAA Aerospace Forecast, Fiscal Years, 2017–2037; compiled by WSP USA

2.3 AVIATION DEMAND FORECAST

In an effort to quantify the anticipated level of aircraft activity for Felts Field, an aviation demand forecast was developed for the 20-year planning period (2017–2037). The forecast includes projections for aircraft operations, based aircraft and fleet mix at Felts Field. The primary methodology used to prepare this forecast was a market share analysis, which included a review of historical growth rates in aviation activity and a comparison of Felts Field’s aviation activity to the general aviation activity of Washington state and the nation. Comparisons of historical aviation activity by type were closely examined to prepare the aviation forecasts contained herein. Sections 2.3.1 and 2.3.2 provide additional details regarding the aviation activity forecasts.

2.3.1 Aircraft Operations

Table 2-4 presents historical aircraft operations by type of activity at Felts Field. As shown in the table, total aircraft operations have remained relatively constant since 2013. Itinerant aircraft operations have increased due to increases in both air taxi and general aviation aircraft operations, while local operations³ have decreased at an average annual rate of 1.3% from 2013 to 2017 and the share of local operations has decreased from 48% to 46% of total operations during the same period, with the lowest share (45%) in 2016 and the highest share (52%) in 2015. The average local operations share from 2013 to 2017 at Felts Field was approximately 48%, which compares to a local share of 40% for Washington state general aviation airports that are similar in size to Felts Field in terms of aircraft operations. **Figure 2-2** compares the historical share of local aircraft operations at Felts Field to similar general aviation airports in Washington state.

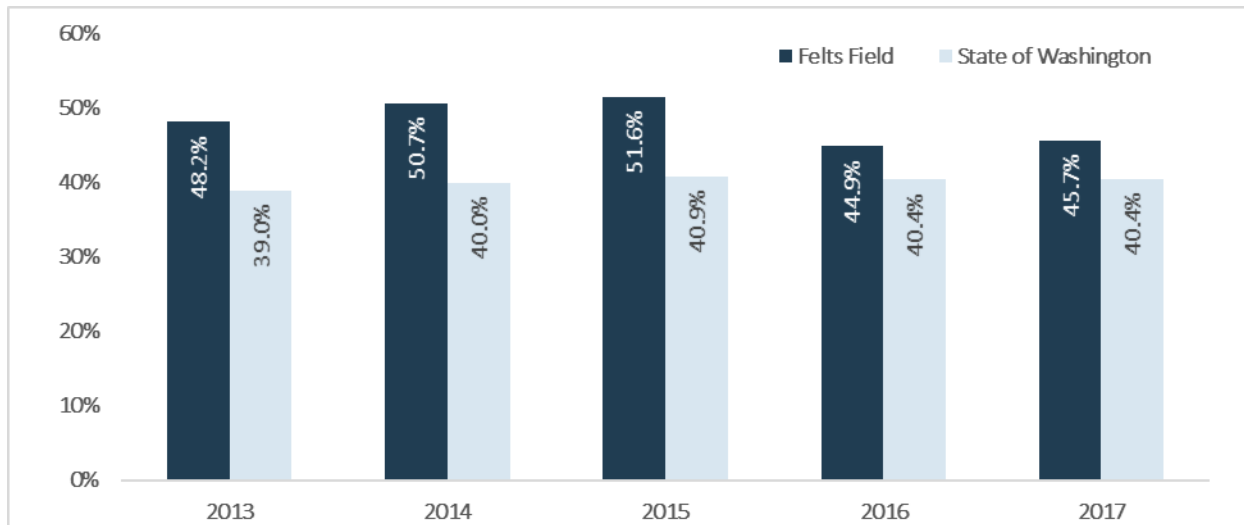
Table 2-4. Historical Felts Field Aircraft Operations by Type

Year	ITINERANT				LOCAL			TOTAL				Percent Change
	Air Taxi	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Air Taxi	General Aviation	Military	Total	
2013	3,438	23,164	53	26,658	24,697	76	24,773	3,438	47,861	129	51,428	-7.5%
2014	3,663	22,803	74	26,540	27,299	34	27,333	3,663	50,102	108	53,873	4.8%
2015	3,629	22,986	49	26,666	28,261	134	28,395	3,629	51,247	183	55,059	2.2%
2016	3,880	24,047	42	27,969	22,626	184	22,810	3,880	46,673	226	50,779	-7.8%
2017	3,927	23,918	42	27,887	23,293	184	23,477	3,927	47,211	226	51,364	1.2%
Compounded Average Annual Change												
2013-2017	3.4%	0.8%	-5.6%	1.1%	-1.5%	24.7%	-1.3%	3.4%	-0.3%	15.0%	0.0%	

Source: FAA Terminal Area Forecast; compiled by WSP USA

³ Itinerant aircraft operations are aircraft operations that arrive from outside the traffic pattern or depart the airport traffic pattern. Local aircraft operations represent aircraft operations that stay within the traffic pattern airspace (nonitinerant).

Figure 2-2. Comparison of Local Aircraft Operations Share



Source: WSP USA

AIR TAXI OPERATIONS

Table 2-5 compares Felts Field’s air taxi aircraft operations with all airports in Washington state and the United States from 2013 to 2017. Air taxi aircraft operations have increased in recent years from 2013 to 2017 at a compounded average annual growth rate of 3.4%, compared to average annual decreases of 1.4% and 3.4% for Washington state and the United States, respectively. As shown, Felts Field’s share of Washington state’s air taxi aircraft operations has varied, ranging from 1.7% (2013) to 2.1% (2017). Felts Field’s share of U.S. air taxi aircraft operations was also varied, ranging from a low of 0.030% in 2013 to a high of 0.039% in 2017. Felts Field’s share of Washington state’s air taxi aircraft operations was less varied than the share of U.S. air taxi operations, indicating a stronger relationship to local traffic over the traffic of the nation.

Table 2-5. Historical Felts Field, Washington State, and U.S. Air Taxi Aircraft Operations

Year	Felts Field	Percent Change	State of Washington	Percent Change	U.S.	Percent Change	Felts Field Share of State	Felts Field Share of U.S.
2013	3,438	-17.4%	201,062	-2.3%	11,482,054	-1.7%	1.7%	0.030%
2014	3,663	6.5%	188,781	-6.1%	11,045,862	-3.8%	1.9%	0.033%
2015	3,629	-0.9%	180,204	-4.5%	10,506,227	-4.9%	2.0%	0.035%
2016	3,880	6.9%	189,281	5.0%	10,183,394	-3.1%	2.0%	0.038%
2017	3,927	1.2%	189,974	0.4%	9,985,059	-1.9%	2.1%	0.039%
Compounded Average Annual Change								
2013-2017		3.4%		-1.4%		-3.4%		

Source: FAA Terminal Area Forecast; compiled by WSP USA

Because a market share methodology was used to develop this forecast, projections of air taxi operations were developed by applying a percentage to represent Felts Field’s share of Washington state and U.S. air taxi operations to the projected air taxi operations forecast by the FAA in its Terminal Area Forecast and weighting those shares based on the relationship to historical activity. Because the historical data indicates a stronger relationship to local traffic, projections of local traffic were considered more heavily than national traffic in the preparation of the activity forecasts. **Table 2-6** presents the projected operations at

Felts Field compared to that of state of Washington and the United States. As shown, the average annual growth rate in Felts Field’s air taxi aircraft operations is projected to be 1.8% from 2017 to 2022 and 2.0% from 2017 to 2037.

Table 2-6. Projected Felts Field, Washington State, and U.S. Air Taxi Aircraft Operations

Year	Felts Field	Percent Change	State of Washington	Percent Change	U.S.	Percent Change	Felts Field Share of State	Felts Field Share of U.S.
2017	3,927		189,974		9,985,059		2.1%	0.039%
2018	3,966	1.0%	192,373	1.3%	9,589,937	-3.96%	2.1%	0.041%
2019	4,044	2.0%	194,992	1.4%	9,139,055	-4.70%	2.1%	0.044%
2020	4,124	2.0%	197,945	1.5%	8,701,538	-4.79%	2.1%	0.047%
2021	4,205	2.0%	199,252	0.7%	8,300,167	-4.61%	2.1%	0.051%
2022	4,288	2.0%	200,750	0.8%	8,066,397	-2.82%	2.1%	0.053%
2023	4,374	2.0%	202,509	0.9%	8,053,033	-0.17%	2.2%	0.054%
2024	4,461	2.0%	204,348	0.9%	8,108,284	0.69%	2.2%	0.055%
2025	4,551	2.0%	206,213	0.9%	8,168,108	0.74%	2.2%	0.056%
2026	4,642	2.0%	208,114	0.9%	8,229,671	0.75%	2.2%	0.056%
2027	4,736	2.0%	210,044	0.9%	8,291,989	0.76%	2.3%	0.057%
2028	4,832	2.0%	212,011	0.9%	8,355,041	0.76%	2.3%	0.058%
2029	4,930	2.0%	214,011	0.9%	8,419,160	0.77%	2.3%	0.059%
2030	5,031	2.0%	216,042	0.9%	8,484,333	0.77%	2.3%	0.059%
2031	5,134	2.0%	218,108	1.0%	8,550,315	0.78%	2.4%	0.060%
2032	5,239	2.1%	220,207	1.0%	8,616,854	0.78%	2.4%	0.061%
2033	5,347	2.1%	222,341	1.0%	8,684,103	0.78%	2.4%	0.062%
2034	5,457	2.1%	224,516	1.0%	8,752,415	0.79%	2.4%	0.062%
2035	5,570	2.1%	226,725	1.0%	8,821,827	0.79%	2.5%	0.063%
2036	5,685	2.1%	228,968	1.0%	8,892,053	0.80%	2.5%	0.064%
2037	5,803	2.1%	231,255	1.0%	8,962,805	0.80%	2.5%	0.065%
Compounded Average Annual Change								
2017-2022		1.8%		1.1%		-4.2%		
2022-2037		2.0%		0.9%		0.7%		
2017-2037		2.0%		1.0%		-0.5%		

Source: WSP USA analysis; FAA Terminal Area Forecast; compiled by WSP USA

GENERAL AVIATION AIRCRAFT OPERATIONS

Table 2-7 compares Felts Field’s general aviation aircraft operations to state of Washington airports and the United States from 2013 to 2017. As shown, the Felts Field’s share of Washington state’s general aviation aircraft operations has ranged from 2.1% (2013, 2016, and 2017) to 2.3% (2015). Felts Field’s share of U.S. general aviation operations has ranged from a low of 0.068% in 2016 to a high of 0.075% in 2015. In recent years, Felts Field’s share of general aviation aircraft operations has been more consistent for Washington state than the U.S.

Projections of general aviation aircraft operations were determined by using Felts Field’s share of Washington state and U.S. general aviation applied to the projected aircraft operations forecast by the FAA contained in the TAF. Because the historical share of traffic indicated a stronger relationship to state of Washington traffic, projections of state of Washington aircraft operations were weighted more heavily than national traffic in the preparation of the activity forecasts. Table 2-8 presents the projected general aviation aircraft operations at Felts Field compared to that of state of Washington and the United States. As shown, the average annual growth rate in Felts Field’s combined general aviation operations are projected to be 0.6% from 2017 to 2037, compared to 1.0% and 0.4% for Washington state and the United States,

respectively. In the near term (2017 to 2022), the average annual growth rate is projected to be 0.6% for Felts Field, compared to 0.9% for Washington state and 0.3% for the U.S.

Table 2-7. Historical Felts Field, Washington State, and U.S. General Aviation Aircraft Operations

Year	Felts Field	Percent Change	State of Washington	Percent Change	U.S.	Percent Change	Felts Field Share of State	Felts Field Share of U.S.
2013	47,861	-6.8%	2,316,929	-3.3%	68,808,247	-1.1%	2.1%	0.070%
2014	50,102	4.7%	2,233,148	-3.6%	68,183,393	-0.9%	2.2%	0.073%
2015	51,247	2.3%	2,260,020	1.2%	68,334,308	0.2%	2.3%	0.075%
2016	46,673	-8.9%	2,265,719	0.3%	68,365,883	0.0%	2.1%	0.068%
2017	47,211	1.2%	2,285,628	0.9%	68,583,877	0.3%	2.1%	0.069%
Compounded Average Annual Change								
2013-2017		-0.3%		-0.3%		-0.1%		

Source: FAA Terminal Area Forecast; compiled by WSP USA

Table 2-8. Projected Felts Field, Washington State, and U.S. General Aviation Aircraft Operations

Year	Felts Field	Percent Change	State of Washington	Percent Change	U.S.	Percent Change	Felts Field Share of State	Felts Field Share of U.S.
2017	47,211		2,285,628		68,583,877		2.1%	0.07%
2018	48,257	2.2%	2,354,669	3.0%	68,817,281	0.34%	2.0%	0.07%
2019	48,945	1.4%	2,375,559	0.9%	69,054,567	0.34%	2.1%	0.07%
2020	49,640	1.4%	2,396,772	0.9%	69,295,434	0.35%	2.1%	0.07%
2021	50,343	1.4%	2,418,349	0.9%	69,538,767	0.35%	2.1%	0.07%
2022	51,052	1.4%	2,440,278	0.9%	69,785,784	0.36%	2.1%	0.07%
2023	51,768	1.4%	2,462,671	0.9%	70,036,290	0.36%	2.1%	0.07%
2024	52,491	1.4%	2,485,447	0.9%	70,289,814	0.36%	2.1%	0.07%
2025	53,221	1.4%	2,508,626	0.9%	70,547,121	0.37%	2.1%	0.08%
2026	53,958	1.4%	2,532,251	0.9%	70,808,445	0.37%	2.1%	0.08%
2027	54,702	1.4%	2,556,336	1.0%	71,073,776	0.37%	2.1%	0.08%
2028	55,453	1.4%	2,580,898	1.0%	71,343,239	0.38%	2.1%	0.08%
2029	56,211	1.4%	2,605,951	1.0%	71,617,045	0.38%	2.2%	0.08%
2030	56,975	1.4%	2,631,503	1.0%	71,894,674	0.39%	2.2%	0.08%
2031	57,746	1.4%	2,657,568	1.0%	72,176,758	0.39%	2.2%	0.08%
2032	58,523	1.3%	2,684,159	1.0%	72,463,364	0.40%	2.2%	0.08%
2033	59,307	1.3%	2,711,285	1.0%	72,754,689	0.40%	2.2%	0.08%
2034	60,097	1.3%	2,738,955	1.0%	73,050,916	0.41%	2.2%	0.08%
2035	60,894	1.3%	2,767,210	1.0%	73,352,038	0.41%	2.2%	0.08%
2036	61,696	1.3%	2,796,050	1.0%	73,658,147	0.42%	2.2%	0.08%
2037	62,505	1.3%	2,825,477	1.1%	73,969,316	0.42%	2.2%	0.08%
Compounded Average Annual Change								
2017-2022		1.6%		1.3%		0.3%		
2022-2037		1.4%		1.0%		0.4%		
2017-2037		1.4%		1.1%		0.4%		

Source: WSP USA analysis; FAA Terminal Area Forecast; compiled by WSP USA

MILITARY AIRCRAFT OPERATIONS

Table 2-9 presents a comparison of Felts Field’s military aircraft operations compared to state of Washington airports and the United States from 2008 to 2017. As shown, the Felts Field’s share of Washington state’s military aircraft operations has ranged from 0.2% (2013 and 2014) to 0.5% (2016 and 2017). Felts Field’s share of U.S. military operations has ranged from a low of 0.002% in 2014 to a high of 0.005% in 2016 and 2017. Historically, Felts Field’s military aircraft operations have more closely followed the growth rates of Washington state versus the U.S.

Table 2-9. Historical Felts Field, Washington State, and U.S. Military Aircraft Operations

Year	Felts Field	Percent Change	State of Washington	Percent Change	U.S.	Percent Change	Felts Field Share of State	Felts Field Share of U.S.
2013	129	46.6%	67,876	31.4%	4,734,411	-1.5%	0.2%	0.003%
2014	108	-16.3%	63,637	-6.2%	4,777,041	0.9%	0.2%	0.002%
2015	183	69.4%	50,478	-20.7%	4,819,729	0.9%	0.4%	0.004%
2016	226	23.5%	48,467	-4.0%	4,787,041	-0.7%	0.5%	0.005%
2017	226	0.0%	48,478	0.0%	4,789,098	0.0%	0.5%	0.005%
Compounded Average Annual Change								
2013-2017		15.0%		-8.1%		0.3%		

Source: FAA Terminal Area Forecast; compiled by WSP USA

Because there is no military aircraft based at Felts Field, military aircraft operations are projected to remain the same during the projection period. **Table 2-10** presents the projected military aircraft operations at Felts Field compared to that of state of Washington and the United States. As shown, the military aircraft operations are projected to remain constant during the projection period for Felts Field, Washington state, and the United States.

Table 2-10. Projected Felts Field, Washington State, and U.S. Military Aircraft Operations

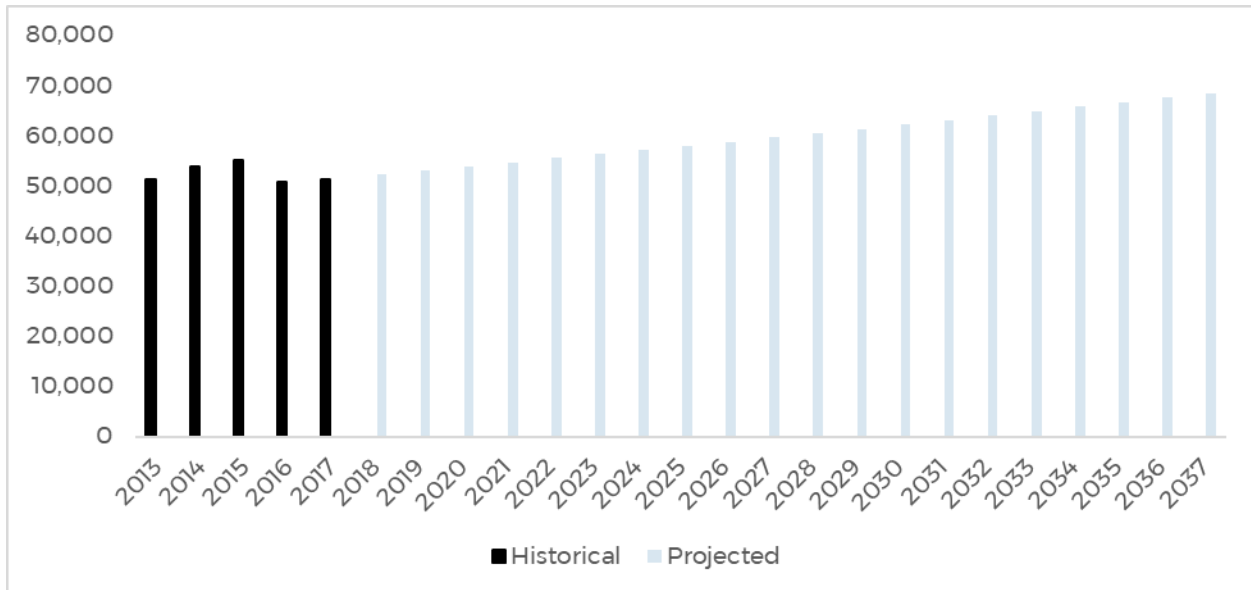
Year	Felts Field	Percent Change	State of Washington	Percent Change	U.S.	Percent Change	Felts Field Share of State	Felts Field Share of U.S.
2017	226		48,478		4,789,098		0.5%	0.00%
2018	226	0.000%	48,490	0.02%	4,789,308	0.00%	0.5%	0.00%
2019	226	0.000%	48,502	0.02%	4,789,526	0.00%	0.5%	0.00%
2020	226	0.000%	48,514	0.02%	4,789,738	0.00%	0.5%	0.00%
2021	226	0.000%	48,526	0.02%	4,789,958	0.00%	0.5%	0.00%
2022	226	0.000%	48,538	0.02%	4,790,181	0.00%	0.5%	0.00%
2023	226	0.000%	48,551	0.03%	4,790,406	0.00%	0.5%	0.00%
2024	226	0.000%	48,564	0.03%	4,790,637	0.00%	0.5%	0.00%
2025	226	0.000%	48,577	0.03%	4,790,871	0.00%	0.5%	0.00%
2026	226	0.000%	48,591	0.03%	4,791,113	0.01%	0.5%	0.00%
2027	226	0.000%	48,604	0.03%	4,791,356	0.01%	0.5%	0.00%
2028	226	0.000%	48,618	0.03%	4,791,605	0.01%	0.5%	0.00%
2029	226	0.000%	48,632	0.03%	4,791,857	0.01%	0.5%	0.00%
2030	226	0.000%	48,646	0.03%	4,792,112	0.01%	0.5%	0.00%
2031	226	0.000%	48,660	0.03%	4,792,371	0.01%	0.5%	0.00%
2032	226	0.000%	48,674	0.03%	4,792,635	0.01%	0.5%	0.00%
2033	226	0.000%	48,689	0.03%	4,792,903	0.01%	0.5%	0.00%
2034	226	0.000%	48,704	0.03%	4,793,175	0.01%	0.5%	0.00%
2035	226	0.000%	48,719	0.03%	4,793,451	0.01%	0.5%	0.00%
2036	226	0.000%	48,734	0.03%	4,793,733	0.01%	0.5%	0.00%
2037	226	0.000%	48,750	0.03%	4,794,016	0.01%	0.5%	0.00%
Compounded Average Annual Change								
2017-2022		0.0%		0.0%		0.0%		
2022-2037		0.0%		0.0%		0.0%		
2017-2037		0.0%		0.0%		0.0%		

Source: WSP USA analysis; FAA Terminal Area Forecast; compiled by WSP USA

AIRCRAFT OPERATIONS BY TYPE

The combination of each aircraft user type was combined and graphically depicted to illustrate the historical and projected total aircraft operations for Felts Field, as shown in **Figure 2-3**.

Figure 2-3. Historical and Projected Aircraft Operations



The FAA TAF provides projections for Felts Field’s activity by type of aircraft operation. The aircraft operations forecasts presented above were allocated using the same share as those in the FAA TAF, with the exception of general aviation aircraft operations. As presented, the forecast contains a split of general aviation activity between itinerant and local aircraft operations. The projected allocation between itinerant aircraft operations and local aircraft operations were adjusted from the allocation presented in the FAA TAF to account for the increase in local traffic by Moody Aviation, who conducts flight training at Felts Field. **Table 2-11** presents the operations forecast by type of operation. As shown, air taxi aircraft operations are projected to increase at an average annual growth rate of 2.0% during the projection period, with general aviation aircraft operations increasing at an average annual growth rates of 1.4%.

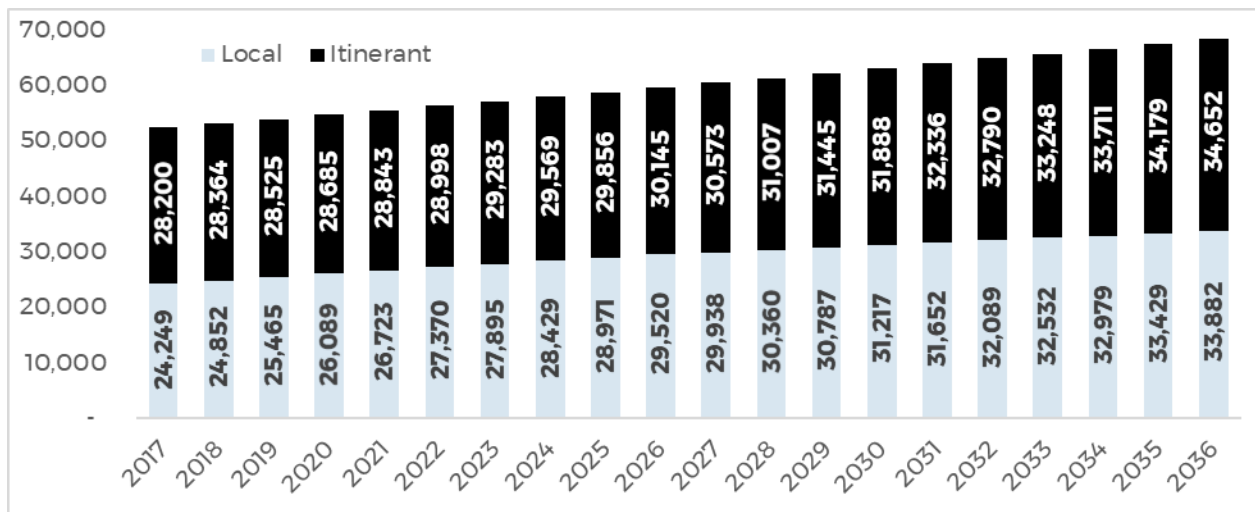
Table 2-11. Projected Felts Field Aircraft Operations by Type

Year	ITINERANT				LOCAL			TOTAL				Percent Change
	Air Taxi	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Air Taxi	General Aviation	Military	Total	
2017	3,927	23,918	42	27,887	23,293	184	23,477	3,927	47,211	226	51,364	
2018	3,966	24,192	42	28,200	24,065	184	24,249	3,966	48,257	226	52,450	2.1%
2019	4,044	24,278	42	28,364	24,668	184	24,852	4,044	48,945	226	53,216	1.5%
2020	4,124	24,360	42	28,525	25,281	184	25,465	4,124	49,640	226	53,990	1.5%
2021	4,205	24,438	42	28,685	25,905	184	26,089	4,205	50,343	226	54,774	1.5%
2022	4,288	24,512	42	28,843	26,539	184	26,723	4,288	51,052	226	55,566	1.4%
2023	4,374	24,582	42	28,998	27,186	184	27,370	4,374	51,768	226	56,368	1.4%
2024	4,461	24,780	42	29,283	27,711	184	27,895	4,461	52,491	226	57,178	1.4%
2025	4,551	24,976	42	29,569	28,245	184	28,429	4,551	53,221	226	57,998	1.4%
2026	4,642	25,172	42	29,856	28,787	184	28,971	4,642	53,958	226	58,827	1.4%
2027	4,736	25,367	42	30,145	29,336	184	29,520	4,736	54,702	226	59,664	1.4%
2028	4,832	25,699	42	30,573	29,754	184	29,938	4,832	55,453	226	60,511	1.4%
2029	4,930	26,034	42	31,007	30,176	184	30,360	4,930	56,211	226	61,367	1.4%
2030	5,031	26,372	42	31,445	30,603	184	30,787	5,031	56,975	226	62,232	1.4%
2031	5,134	26,713	42	31,888	31,033	184	31,217	5,134	57,746	226	63,105	1.4%
2032	5,239	27,055	42	32,336	31,468	184	31,652	5,239	58,523	226	63,988	1.4%
2033	5,347	27,401	42	32,790	31,905	184	32,089	5,347	59,307	226	64,880	1.4%
2034	5,457	27,749	42	33,248	32,348	184	32,532	5,457	60,097	226	65,780	1.4%
2035	5,570	28,099	42	33,711	32,795	184	32,979	5,570	60,894	226	66,689	1.4%
2036	5,685	28,452	42	34,179	33,245	184	33,429	5,685	61,696	226	67,608	1.4%
2037	5,803	28,807	42	34,652	33,698	184	33,882	5,803	62,505	226	68,534	1.4%
Average Annual Growth												
2017-2022	1.8%	0.5%	0.0%	0.7%	2.6%	0.0%	2.6%	1.8%	1.6%	0.0%	1.6%	
2022-2037	2.0%	1.1%	0.0%	1.2%	1.6%	0.0%	1.6%	2.0%	1.4%	0.0%	1.4%	
2017-2037	2.0%	0.9%	0.0%	1.1%	1.9%	0.0%	1.9%	2.0%	1.4%	0.0%	1.5%	

Source: WSP USA analysis

Figure 2-4 presents the allocation between itinerant and local aircraft operations during the projection period. As shown, the share of local aircraft operations is projected to increase slightly during the projection period from 46.2% in 2017 to 49.4% in 2037, with itinerant aircraft operations' share decreasing from 53.8% to 50.6% during the same period.

Figure 2-4. Projected Itinerant versus Local Aircraft Operations Share



2.3.2 Based Aircraft

As previously mentioned, the U.S. general aviation industry has experienced a marked decrease in aircraft shipments in the last 10 years. In addition, the FAA forecasts extremely modest growth in the number of based general aviation aircraft during the next 30 years. **Table 2-12** presents the historical based aircraft statistics for Felts Field, Washington state, and the United States. As shown in the table, the number of operations per based aircraft has ranged from 302 in 2017 to a high of 337 in 2014. This shift is partly due to more flight training and the opposite trend in the two data points, as aircraft operations have decreased in the last five years, based aircraft have increased. Aircraft operations (air taxi, general aviation, and military combined) have decreased for Washington state and the United States during the last five years, while based aircraft have remained relatively constant. Felts Field’s share of Washington state’s based aircraft has increased over the past five years, from a low of 2.8% in 2013 to 3.0% in 2015 through 2017.

Table 2-12. Historical Based Aircraft Felts Field, Washington State, and United States

Year	Felts Field			State of Washington			United States			Felts Field Share of State	Felts Field Share of U.S.
	Aircraft Operations	Based Aircraft	Ops per BA	Aircraft Operations	Based Aircraft	Ops per Based Aircraft	Aircraft Operations	Based Aircraft	Ops per Based Aircraft		
2013	51,428	160	321	2,585,867	5,651	458	85,024,712	166,953	509	2.8%	0.096%
2014	53,873	160	337	2,485,566	5,587	445	84,006,296	170,375	493	2.9%	0.094%
2015	55,059	168	328	2,490,702	5,554	448	83,660,264	163,994	510	3.0%	0.102%
2016	50,779	168	302	2,503,467	5,614	446	83,336,318	165,480	504	3.0%	0.102%
2017	51,364	168	306	2,524,080	5,672	445	83,358,034	166,822	500	3.0%	0.101%
Compounded Average Annual Change											
2013-2017	0.0%	1.2%	-1.2%	-0.6%	0.1%	-0.7%	-0.5%	0.0%	-0.5%		

Source: FAA Terminal Area Forecast (all data except Felts Field based aircraft for 2015 through 2016), FAA Form 5010-1 (Felts Field based aircraft 2015–2017); compiled by WSP USA

Table 2-13 presents historical and projected based aircraft for Felts Field, Washington state, and the United States. As shown, based aircraft at Felts Field were forecast using a ratio of aircraft operations to based aircraft, with Felts Field’s share of based aircraft for Washington state and the United States used as a check for reasonableness. The number of based aircraft at Felts Field is projected to increase from 168 in 2017 to 203 in 2037 or an average of nearly two aircraft each year. This increase results in Felts Field’s share of Washington state’s based aircraft ranging from 2.9% to 3.0%, which is consistent with recent trends of a consistent share. **Figure 2-5** graphically presents the historical based aircraft per aircraft operation and Felts Field’s based aircraft share of Washington state.

Table 2-13. Historical and Projected Based Aircraft: Felts Field, Washington State, and United States

Year	Felts Field			State of Washington			United States			Felts Field Share of State	Felts Field Share of U.S.
	Aircraft Operations	Based Aircraft	Aircraft Ops per BA	Aircraft Operations	Based Aircraft	Aircraft Ops per BA	Aircraft Operations	Based Aircraft	Aircraft Ops per BA		
2017	51,364	168	306	2,334,106	5,672	412	73,372,975	166,822	440	3.0%	0.10%
2018	52,450	171	307	2,354,669	5,736	411	73,606,589	168,247	437	3.0%	0.10%
2019	53,216	174	306	2,375,559	5,796	410	73,844,093	169,600	435	3.0%	0.10%
2020	53,990	177	305	2,396,772	5,867	409	74,085,172	170,947	433	3.0%	0.10%
2021	54,774	180	304	2,418,349	5,943	407	74,328,725	172,439	431	3.0%	0.10%
2022	55,566	183	304	2,440,278	6,005	406	74,575,965	173,903	429	3.0%	0.11%
2023	56,368	185	305	2,462,671	6,076	405	74,826,696	175,468	426	3.0%	0.11%
2024	57,178	187	306	2,485,447	6,144	405	75,080,451	176,880	424	3.0%	0.11%
2025	57,998	189	307	2,508,626	6,211	404	75,337,992	178,273	423	3.0%	0.11%
2026	58,827	191	308	2,532,251	6,275	404	75,599,558	179,660	421	3.0%	0.11%
2027	59,664	193	309	2,556,336	6,339	403	75,865,132	181,076	419	3.0%	0.11%
2028	60,511	194	312	2,580,898	6,406	403	76,134,844	182,484	417	3.0%	0.11%
2029	61,367	195	315	2,605,951	6,470	403	76,408,902	183,914	415	3.0%	0.11%
2030	62,232	196	318	2,631,503	6,538	402	76,686,786	185,377	414	3.0%	0.11%
2031	63,105	197	320	2,657,568	6,606	402	76,969,129	186,827	412	3.0%	0.11%
2032	63,988	198	323	2,684,159	6,674	402	77,255,999	188,280	410	3.0%	0.11%
2033	64,880	199	326	2,711,285	6,743	402	77,547,592	189,750	409	3.0%	0.10%
2034	65,780	200	329	2,738,955	6,815	402	77,844,091	191,242	407	2.9%	0.10%
2035	66,689	201	332	2,767,210	6,887	402	78,145,489	192,766	405	2.9%	0.10%
2036	67,608	202	335	2,796,050	6,961	402	78,451,880	194,294	404	2.9%	0.10%
2037	68,534	203	338	2,825,477	7,037	402	78,763,332	195,856	402	2.9%	0.10%
Average Annual Growth											
2017-2022	1.6%	1.7%	-0.1%	0.9%	1.1%	-0.3%	0.3%	0.8%	-0.5%		
2022-2037	1.4%	0.7%	0.7%	1.0%	1.1%	-0.1%	0.4%	0.8%	-0.4%		
2017-2037	1.5%	1.0%	0.5%	1.0%	1.1%	-0.1%	0.4%	0.8%	-0.4%		

Sources: WSP USA analysis; FAA Form 5010-1 (Felts Field based aircraft (2017)); FAA Terminal Area Forecast

Figure 2-5. Historical and Projected Felts Field Based Aircraft, Aircraft Operations per Based Aircraft, and Washington State Based Aircraft Share Aircraft Fleet Mix (Based and Operational)

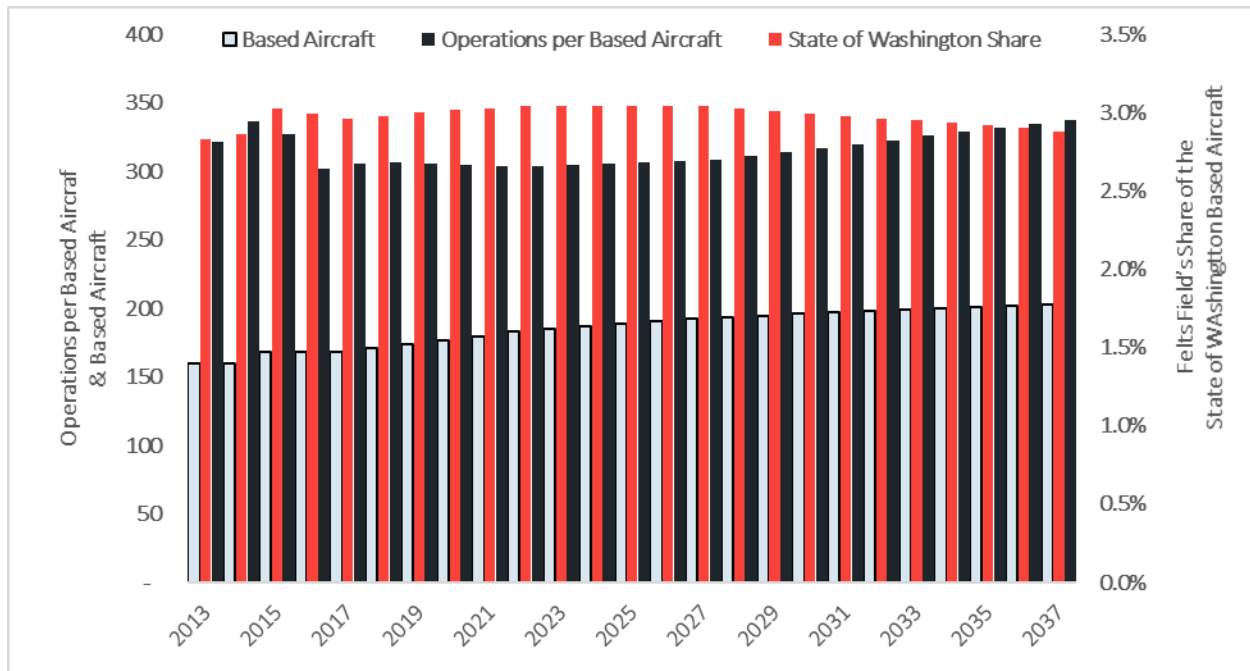


Table 2-14 compares the historical aircraft fleet mix for 2008 (the latest historical actual fleet mix data available) and FAA data for 2017. As shown, since 2008 there have been shifts in the fleet mix at Felts Field and in the United States. The distribution of single-engine and jet aircraft has declined at Felts Field, while the distribution of multi-engine and helicopters has increased. The distribution of single- and multi-engine aircraft has decreased for the United States since 2008, while the distribution of jet aircraft and helicopters has increased. The average number of aircraft operations per based aircraft has decreased from 444 to 292 based on the data available from the Form 5010-1 of the National Based Aircraft Inventory Program and the Terminal Area Forecast. Note that in 2008, the number of based aircraft could be overstated because records were not as accurate as they are currently.

Table 2-14. Historical Based Aircraft Fleet Mix

	2008 *				2017			
	Felts Field	% Distr	U.S.	% Distr	Felts Field	% Distr	U.S.	% Distr
Single Engine	304	88.1%	145,497	75.5%	143	85.1%	125,760	72.6%
Multi Engine	25	7.2%	17,515	9.1%	13	7.7%	13,155	7.6%
Turbine	3	0.9%	19,949	10.3%	0	0.0%	23,385	13.5%
Helicopter	13	3.8%	9,876	5.1%	12	7.1%	10,890	6.3%
TOTAL	345	100.0%	192,837	100.0%	168	100.0%	173,190	100.0%

Sources: FAA Forecast 2017–2037; Felts Field 2005 Master Plan Update; FAA Form 5010-1 data; compiled by WSP USA

* Counts were documented before the update of the National Based Aircraft Inventory System.

The projected aircraft fleet mix for Felts Field was estimated by comparing the trends of the FAA’s forecasted fleet mix to the total based aircraft forecasts for Felts Field. In general, the FAA forecast indicates decreases in the overall share of single-engine and multi-engine aircraft with increases in the share of jets and helicopters. These same trends were applied to determine the projected aircraft fleet mix (**Table 2-15**). As shown, the combined percentage distribution for single-engine and multi-engine aircraft is projected to decrease from 92.9% in 2017 to 71.9% in 2037. The percentage distribution of jet aircraft and helicopters is projected to increase from 7.1% in 2017 to 28.1% in 2037.

Table 2-15. Projected Felts Field Based Aircraft Fleet Mix

Year	Single Engine	Multi Engine	Turbine	Helicopter	Total
2017	143	13	-	12	168
2022	141	13	14	15	183
2027	138	13	24	18	193
2032	135	13	29	21	198
2037	133	13	32	25	203
Percentage Distribution					
2017	85.1%	7.7%	0.0%	7.1%	100.0%
2022	77.0%	7.1%	7.7%	8.2%	100.0%
2027	71.5%	6.7%	12.4%	9.3%	100.0%
2032	68.2%	6.6%	14.6%	10.6%	100.0%
2037	65.5%	6.4%	15.8%	12.3%	100.0%

Source: WSP USA analysis

The forecast distribution of aircraft for Felts Field was applied to the projected local operations and the FAA’s distribution of aircraft was applied to the itinerant operations to determine the distribution of operations by aircraft type during the projection period. While there were no jet aircraft based at Felts Field in 2017, recent development projects, including an FBO that can service jet aircraft, have resulted in more itinerant jet aircraft operations and as the forecast indicates, based jet aircraft are expected to grow. This reflects the growth in corporate jet aircraft nationally during the same time period. There are a number of facilities at Felts Field that accommodate jet aircraft. In addition, the airport is encouraging general aviation aircraft owners to locate their operations at Felts Field, including corporate jet aircraft. **Table 2-16** presents the projected operations distribution for the forecast period. As shown, the distribution of single-engine and multi-engine operations decrease from 92.1% in 2017 to 86.3% in 2037, while the distribution of jet and helicopter operations increase from 7.9% in 2017 to 13.7% in 2037.

Table 2-16. Projected Aircraft Operations Distribution

Year	Single Engine ¹	Multi Engine ¹	Jet ²	Helicopter	Total
2017	43,059	4,249	626	3,430	51,364
2022	45,138	5,125	1,028	4,189	55,481
2027	46,694	6,380	1,405	5,040	59,518
2032	48,021	7,893	1,706	6,034	63,654
2037	49,072	9,650	1,994	7,295	68,011
Percentage Distribution					
2017	83.8%	8.3%	1.2%	6.7%	100.0%
2022	81.4%	9.2%	1.9%	7.5%	100.0%
2027	78.5%	10.7%	2.4%	8.5%	100.0%
2032	75.4%	12.4%	2.7%	9.5%	100.0%
2037	72.2%	14.2%	2.9%	10.7%	100.0%

Source: WSP USA analysis

¹ Includes both piston and turbine aircraft

². Actual jet operations based on FAA Traffic Flow Management System Counts data

2.3.3 Critical Aircraft

The Critical Aircraft classification determines many of the design characteristics of an airport and applicable FAA development standards. To be classified as such, critical aircraft must be expected to perform more than 500 annual local and itinerant operations, excluding touch-and-go's, at Felts Field. The FAA uses the combined attributes of aircraft approach speed and wing span to establish design standards that are applied to the various facilities and physical separations on an airfield. Under the aviation demand forecasts, the critical aircraft listed by the FAA ARC will be recommended for Felts Field. During the facility requirements phase of the master plan update, ARC classifications may be applied to individual Felts Field facilities based on forecast demand levels and airport role determination.

The FAA-defined ARC comprises two descriptors: Aircraft Approach Category (Categories A through E) based on landing approach speed and Airplane Design Group (Design Groups I through VI) based on the wingspan dimension. Assigning an ARC to Felts Field, based on the physical and operating characteristics for critical aircraft, guides future planning by identifying appropriate standards for facility development (i.e., runway, taxiway, and apron dimensions and separations). Consequently, the ARC classification assigned to the airport facilities influences how these facilities are designed and developed. Faster and larger wingspan critical aircraft require larger design dimensions for the airport. Existing aircraft and those anticipated to operate at Felts Field in the 20-year planning time frame are included in the determination.

The fleet mix forecast presented previously anticipates turbine-powered jet-based aircraft to increase from 0% in 2017 to 15.8% by 2037. Jet aircraft operations at Felts Field are projected to increase from approximately 600 in 2017 to nearly 2,000 during the same timeframe. Given the primary role of these aircraft for corporate business travel, most of the jet aircraft activity should constitute itinerant operations. This level of activity easily exceeds the FAA definition of 500 itinerant operations to be classified as Critical Aircraft for Felts Field.

The 2005 master plan identified an ARC of D-II for Felts Field. Critical aircraft used to determine this ARC were based on a composite of the approach speed of the Lear 35 and wingspan of the Cessna Citation II. Observations from the 2010 Airport Layout Plan Update indicate that the critical aircraft remained appropriate for Felts Field at the time.

For this analysis, the FAA's Traffic Flow Management System Counts (TFMSC) data for Felts Field were used to analyze jet aircraft activity. A review of the TFMS data by jet aircraft indicates there were 626 jet aircraft operations recorded at Felts Field in 2017 and 378 through July 2018.

Table 2-17 presents the most demanding aircraft forecast to operate at Felts Field through the 2037 planning period. Identification of the critical aircraft is based on the guidance from FAA's Advisory Circular 150/5000-17, "Critical Aircraft and Regular Use Determination."

Table 2-17. Most Demanding Aircraft Through 2037

Aircraft Type	Aircraft Approach Category	Airplane Design Group	Taxiway Design Group	Actual 2017		Projected 2027		Projected 2037	
				Jet AC Ops	% Share	Jet AC Ops	% Share	Jet AC Ops	% Share
Cessna Citations	B	II	2	444	70.9%	843	60.0%	997	50.0%
Cessna Citations CJ2	B	I	1A	170	27.2%	351	25.0%	437	21.9%
Learjet 25	C	I	1B	6	1.0%	183	13.0%	500	25.1%
Eclipse 500	A	I	1A	6	1.0%	28	2.0%	60	3.0%
TOTAL				626	100.0%	1,405	100.0%	1,994	100.0%

Sources: FAA Advisory Circular 150/5000-17, *Critical Aircraft and Regular Use Determination*, June 2017; FAA's TFMSC data for Felts Field (2017); WSP USA analysis

No single jet aircraft type had over 500 operations in 2017; however, the larger wingspan Cessna Citation CJ3/CJ4, etc. represents the current most demanding aircraft at Felts Field with Runway Design Code (RDC) B-II.

The existing runway length limits the type of corporate jets that can operate at Felts Field. If the runway were slightly longer, aircraft insurance companies would insure larger corporate jets to operate at Felts Field. Aircraft such as the Lear 25/31/35 would operate at and potentially base at the airport if the runway was not a limiting factor. As **Table 2-17** illustrates, only six flights by Learjets were recorded in 2017. As of July 2018, four C-I jets (Hawker 800 and Lear 31) have flown to and from Felts Field.

The future critical aircraft was determined based on the current percentage of jet operations applied to the forecast jet operations. The percentage for larger RDC C-I jets was increased over the 20-year period to reach the minimum 500 annual operations. The justification for this is based on the current airport management's efforts to market Felts Field for business and corporate users, funding significant airport improvement projects, and the current demand for corporate jet hangars at Felts Field.

Thus, per the Critical Aircraft AC, the combination of the existing B-II jet wingspan and future C-I jet approach speed define the future C-II critical aircraft designation from which the Airport Layout Plan will be based.

- **Existing critical aircraft designation for Felts Field is RDC B-II** related to this existing group of aircraft:
 - Cessna Citations CJ3/4s
 - Cessna Citations II/Bravos
 - Cessna Citations V/Ultras
 - Cessna Citations Excels
 - Embraer Phenom 300
 - Dassault Falcon/Mystère 50
 - Cessna Citation Latitude
- **Future critical aircraft for Felts Field is RDC C-II** based on combination of existing RDC B-II wingspan jets and existing RDC C-I approach speed jets, growing to over 500 annual operations, occurring between 2027 and 2037 by jets types such as those listed below that currently operate at the airport:
 - Bombardier Learjet 25/31/35/36
 - Hawker 800

2.3.4 Peak Aircraft Operations

To plan for adequate handling of activity at an airport, a planning day incorporates the average day of the peak month. The peak-hour activity on that day is also a significant planning criterion. **Table 2-18** summarizes the instrument aircraft operations from the TFMSC data at Felts Field for 2016. As shown, October was the peak month for 2016, with a 9.7% share of total instrument aircraft operations. As shown in the table, the variance in the distribution of operations between the peak month and the month with the lowest traffic is approximately 2.7%. This variance is much lower than observations at other general aviation airports where peak months can be approximately 5% higher than the month with the lowest traffic. In addition, at facilities like Felts Field, it could also be expected to see the peak month occurring during the summer when the weather is better. This smoothness in the distribution of operations by month indicates a strong base of local traffic, as reflected in the split between local and itinerant activity.

Table 2-18. Felts Field Instrument Operations by Month (2016)

Month	Aircraft Operations	Percentage Distribution
January	436	7.0%
February	456	7.4%
March	527	8.5%
April	508	8.2%
May	488	7.9%
June	473	7.6%
July	532	8.6%
August	576	9.3%
September	508	8.2%
October	599	9.7%
November	582	9.4%
December	500	8.1%
TOTAL	6,185	100.0%

Sources: FAA TFMSC data; compiled by WSP USA

Assuming a month has 30.5 days results in the average day, peak-month estimates presented in **Table 2-19**. Average day peak-month activity increases from 200 operations per day in 2009 to 237 operations per day in 2029.

Table 2-19. Summary of Peak Activity

	2017	2022	2027	2032	2037
Annual Operations	51,364	55,566	59,664	63,988	68,534
Peak Month @ 9.7%	4,974	5,381	5,778	6,197	6,637
Average Day Peak Month	163	176	189	203	218
Arrivals					
Itinerant	41	44	48	51	55
Local	41	44	47	51	54
Departures					
Itinerant	41	44	48	51	55
Local	40	44	46	50	54
By Operation Type					
Air Taxi	12	14	15	17	18
General Aviation	150	162	173	186	199
Military	1	-	1	-	1
Total	163	176	189	203	218
By Aircraft Type					
Single Engine	135	133	133	136	141
Multi Engine	14	14	14	15	15
Jet	-	13	23	28	31
Helicopter	14	16	19	24	31
Total	163	176	189	203	218

Source: WSP USA analysis

2.4 FORECAST SUMMARY

Figure 2-6 presents the historical and projected aviation demand for based aircraft at Felts Field.

Figure 2-6. Projected Based Aircraft by Type

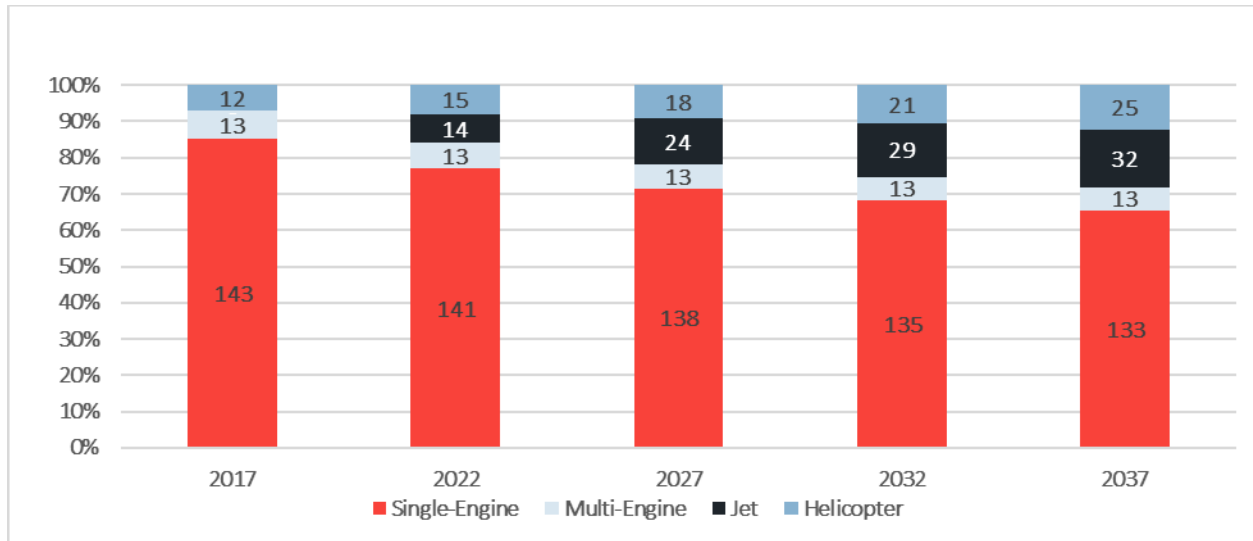


Table 2-20 presents the forecast, including operations, peak-day operations, and based aircraft for each of the five-year milestones of the forecast.

Table 2-20. Forecast Summary

	2017	2022	2027	2032	2037
Annual Operations	51,364	55,566	59,664	63,988	68,534
Average Day, Peak Month					
Aircraft Operations	163	176	189	203	218
Based Aircraft	168	183	193	198	203

Source: WSP USA analysis

Based on the forecasts presented in this chapter, the future of Felts Field is conservatively optimistic. The projected aviation demand for Felts Field indicates a steady annual increase in aircraft activity throughout the planning period. Chapter 3, “Facility Requirements,” translates the forecasts into the number and future of facilities necessary to support the anticipated demand.