FORECAST SUMMARY

The forecast chapter presents a 20-year vision of aviation activity at the Coeur d'Alene Airport (COE or "the Airport"). A summary of the forecasts is included as **Table 2-1** and detailed in the accompanying chapter. Forecasts guide the Airport's capital improvement program, pairing improvements with demand. Forecasts are an estimate of future activity levels and provide guidance that assists decision makers in making judgments for future airport development scenarios.

Kootenai County (or "the County") has experienced 15 percent population growth, 19 percent gross regional product growth, and 13 percent employment growth between 2007 and 2017. COE has seen an 11 percent increase in takeoffs and landings between 2007 and 2017, and the number of based aircraft, aircraft stored in hangars and on aprons, has grown by 41 percent during these 10 years. The forecasts indicate that this growth will continue, spurred on by community economic development and a growing population.

Table 2-1: Forecast Summary

Forecast Element	2007	CAGR	2017	2037	CAGR
Aircraft Operations	**79,846**	**0.8%**	**86,876**	**136,900**	**2.3%**
Itinerant Operations	46,526	2.6%	59,912	99,300	2.6%
Local Operations	33,320	-2.1%	26,964	37,600	1.7%
Based Aircraft	**186**	**3.5%**	**262**	**373**	1.8%
Single-Engine Piston	150	4.0%	221	308	1.7%
Jet & Turbo-Prop	9	2.9%	12	26	3.9%
Multi-Engine Piston	15	-0.7%	14	12	-0.9%
Helicopter	9	-1.2%	8	12	2.0%
Other	3	8.8%	7	15	3.9%

Single Engine Piston includes experimental and light sport aircraft. CAGR: Compound Annual Growth Rate
Sources: Operations: 2007 and 2017 calculated from IFR records, 2037 = Forecast
Based Aircraft: 2007 from TAF, 2017 from BasedAircraft.com, 2037 = Forecast

1. INTRODUCTION TO FORECASTS

Aviation activity forecasts evaluate future demand at the Airport. This chapter is organized into the following sections:

1. Introduction to the Forecasts
2. Community Profile
3. Aviation Activity Profile
4. General Aviation Forecasts
5. Peak Forecasts and Critical Aircraft
6. Forecast Summary and FAA Forecast Tables

The forecasts have a base year of 2017 and use the FAA Fiscal year (October to September). The forecast period is 20 years with reporting intervals of every five years. Preferred forecasts are compared with the FAA TAF.

Forecasts help determine if existing airport facilities have the capacity to handle future demand or if modifications are needed to meet future demand. Demand forecasts are prepared for aircraft operations, which are counts of landings and takeoffs, and based aircraft parked and stored at COE. The Airport does not have scheduled commercial passenger or cargo service, so these activity indicators are not included in the demand forecasts. The FAA Helena Airports District Office (ADO) will review forecasts for rationality and comparison to the FAA TAF. **Table 2-2** describes the data sources used in this chapter.

Table 2-2: Description of Data Sources

Source	Description
FAA TAF	The FAA TAF, published in January 2017, provides historical records and forecasts for aircraft operations and based aircraft at COE. These forecasts serve as a comparison for forecasts prepared as part of this planning effort and provide historical information on aircraft activity. The TAF is included as Attachment 1. A key element of these forecasts is verification of TAF operations estimates. TAF numbers may be inaccurate because they have not changed over the years. Thus, this forecast will reevaluate operations counts to verify the TAF numbers.
FAA Aerospace Forecast	The Aerospace Forecast 2017-2037 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. The Aerospace Forecast is used to estimate trends where specific data for COE is not available.
Table is continued on the next page.	

Table 2-2: Description of Data Sources (Continued)

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 used to identify trends in the COE fleet mix. The advantage of the TFMSC data is its degree of detail and its insights into the itinerant users of COE. A disadvantage of TFMSC data is 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 charter operators, and private business jets.
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. The W&P dataset considers the Coeur D'Alene Metropolitan Statistical Area (MSA) which is equivalent to the boundary of Kootenai County. The dataset provides 124 data categories with records from 1970 to 2016 and forecast through 2040. Data categories considered include population, employment, earnings and income, and gross regional product.
Stakeholder Interviews	The Consultant team sent a survey to pilots based at COE, and airport management solicited feedback from key tenants such as the U.S. Forest Service and Empire Aerospace. Forecasts were presented to an advisory committee made up of Stakeholders for feedback.
FlightWise	FlightWise is a third-party data provider that keeps records of instrument flight plans. FlightWise data supplemented TFMSC data, which did not have a complete set of FY2017 operations records when the forecast was prepared.
OPSNET	OPSNET (Operations Network) is the source of National Airspace System (NAS) air traffic operations and delay data. Provided information about IFR (instrument flight rules) and VFR (visual flight rules) operations. As COE does not have a ATCT, data from Felts Field (SFF) was utilized to determine ratio of IFR to VFR operations. SFF was chosen due to geographic proximity and similarity.
On-site Traffic Count	A member of the Consultant team spent seven consecutive days of 8 hour shifts on site. The shifts alternated between morning and afternoon observations to count operations at the Airport. The purpose of these counts was to fill in gaps in the TFMSC data.
FAA Radar Data	FAA provided IFR and VFR radar for fiscal year 2016. FAA reports that the IFR data is complete, and the VFR data is a sample.
Kootenai Metropolitan Planning Organization (KMPO)	A population estimate from the KMPO Metropolitan Transportation Plan 2010-2035 was compared to the Woods & Poole population data for the County and U.S Census population estimates. KMPO population estimates for 2007-2030 are higher than Woods & Poole estimates, and higher than the 2016 U.S. Census estimate for Kootenai County.

3. COMMUNITY PROFILE

The community profile describes the characteristics of the area served by COE. The Airport is located within the Coeur d'Alene Metropolitan Statistical Area (MSA) and serves Northern Idaho. Key socioeconomic indicators described in this section help tell the story behind why COE has experienced growth in the past decade, and socioeconomic projections will be used to forecast aviation activity. Analysis was done to determine whether there is any correlation between aviation activity and community socioeconomic indicators.

3.1 Population

The boundaries of the Coeur d'Alene MSA are coincident with those of Kootenai County. The County is the third most populous in Idaho. The largest city is Coeur d'Alene, which has 33 percent of the County's residents. County population grew at a compound annual growth rate (CAGR) of 1.4 percent between 2007 and 2017. Woods & Poole projections show County population growing at a 1.6 percent CAGR to a total population of over 210,000 by 2037. These projections were compared to the Kootenai Metropolitan Planning Organization's (KMPO) 2007-2030 population estimates provided in the 2010 Metropolitan Transportation Plan. The KMPO estimates are 23 percent higher than Woods & Poole in 2030; However, KMPO estimates are seven years old and the 2016 U.S. Census Population Estimate shows that Woods & Poole estimates are closer to the County's actual population for 2017.

Table 2-3 shows the population records from 2007 to 2017 and the Woods & Poole forecast through 2037.

Table 2-3: Kootenai County Population

Year	Woods & Poole	Percent Change	KMPO	Percent Change
2007	134,211	-	148,955	
2012	142,278	6.0%	165,505	11.1%
2017	**153,828**	**8.1%**	183,895	11.1%
2022	166,916	8.5%	204,327	11.1%
2027	180,922	8.4%	227,030	11.1%
2032	195,514	8.1%	246,163	8.4%
2037	210,472	7.7%	266,287	8.2%
CAGR ('07-'17)	1.4%	N/A	2.1%	N/A
CAGR ('17-'37)	1.6%	N/A	1.9%	N/A

CAGR = Compound Annual Growth Rate
U.S. Census 2016 Population Estimate 154311
Sources: Woods & Poole, KMPO Metropolitan Transportation Plan 2010-2035. KMPO projections beyond 2030 were extrapolated as part of this Master Plan.

3.2 Employment and Economic Development

Kootenai County has experienced economic growth since the end of the 2007-2009 recession with total employment increasing at CAGR of 1.4 percent from 2007 to 2017. Employment increased by 12.2 percent between 2007 and 2012. This jump within the five years is reflective of the growth in the region. Employment per capita within the County has remained stable with about 0.54 jobs per resident. Proximity to the employment center of Spokane is expected to have some impact on County employment numbers. Total employment and employment per capita are presented in **Table 2-4.**

Table 2-4: Kootenai County Employment

Year	Employment	Percent Change	Employment/Capita
2007	72,398		0.539
2012	74,014	2.2%	0.520
2017	**83,010**	**12.2%**	**0.540**
2022	90,816	9.4%	0.544
2027	98,674	8.7%	0.545
2032	106,341	7.8%	0.544
2037	114,058	7.3%	0.542
CAGR (2007-2017)	1.4%	N/A	0.0%
CAGR (2017-2037)	1.6%	N/A	0.0%

CAGR = Compound Annual Growth Rate
County Population included in **Table 2-3**
Source: Woods & Poole

Top industries by total employment in 2007 were retail trade (13 percent of total county employment), state and local government (12 percent), and construction (10 percent). By 2017, top industries were retail trade (14 percent), state and local government (13 percent), and healthcare (10 percent). The healthcare and accommodation industries have moved past the construction industry in terms of employment. This indicates diversification in the regional economy as well as increased tourism in the area. The Idaho Panhandle features mountains, lakes, and rivers that are attractive to outdoors enthusiasts.

Top industries by sales have consistently been Motor Vehicles, General Merchandise, and Gas Stations. The top five industries by sales has not changed in the past decade nor is it projected to change in the future. However, the Eating & Drinking Places industry is projected to surpass the Food & Beverage Retail industry by 2037. This consistency is an indication that the community needs will remain relatively constant and will grow with population increases.

Top industries by employment and sales are presented in **Table 2-5** and **Table -2-6.**

Table 2-5 Kootenai County Top 5 Industries by Employment and Sales 2007-2017

Top Industries by Employment								
Rank	2007		2012			2017		
	Industry	Jobs	Industry	Jobs	Δ	Industry	Jobs	Δ
1	Retail Trade	9,457	Retail Trade	10,135	7.2%	Retail Trade	11,421	12.7%
2	State and Local Government	8,803	State and Local Government	9,338	6.1%	State and Local Government	10,624	13.8%
3	Construction	7,094	Health Care	7,388	11.2%	Health Care	8,265	11.9%
4	Health Care	6,643	Accommodation & Food Service.	6,202	2.8%	Accommodation & Food Service	7,034	13.4%
5	Accommodation & Food Service.	6,031	Construction	5,269	-25.7%	Construction	6,125	16.2%
Top Industries by Retail Sales								
Rank	2007		2012			2017		
	Industry	Sales ($M)	Industry	Sales ($M)	Δ	Industry	Sales ($M)	Δ
1	Motor Vehicles	$531.88	Motor Vehicles	$559.12	5.1%	Motor Vehicles	$719.13	28.6%
2	General Merchandise	$388.99	General Merchandise	$459.30	18.1%	General Merchandise	$499.53	8.8%
3	Gas Stations	$266.59	Gas Stations	$373.26	40.0%	Gas Stations	$384.02	2.9%
4	Food & Bev. Retail	$249.34	Food & Bev. Retail	$278.32	11.6%	Food & Bev. Retail	$305.97	9.9%
5	Eating & Drinking Places	$179.43	Eating & Drinking Places	$210.97	17.6%	Eating & Drinking Places	$242.99	15.2%

Values in 2009 dollars Percentages represent percent of total employment/retail sales.
Source: Woods & Poole

Table 2-6 Kootenai County Top 5 Industries by Employment and Sales 2017-2037

Top Industries by Employment								
Rank	2017		2027			2037		
	Industry	Jobs	Industry	Jobs	Δ	Industry	Jobs	Δ
1	Retail Trade	11,421	Retail Trade	13,458	17.8%	Retail Trade	15,656	16.3%
2	State and Local Government	10,624	State and Local Government.	13,115	23.4%	State and Local Government.	15,488	18.1%
3	Health Care	8,265	Health Care	10,258	24.1%	Health Care	12,479	21.7%
4	Accommodation & Food Service	7,034	Accommodation & Food Service	8,611	22.4%	Accommodation & Food Service	10,058	16.8%
5	Construction	6,125	Construction	7,289	19.0%	Construction	7,939	8.9%
Top Industries by Retail Sales								
Rank	2017		2027			2037		
	Industry	Sales ($M)	Industry	Sales ($M)	Δ	Industry	Sales ($M)	Δ
1	Motor Vehicles	$719.13	Motor Vehicles	$896.16	24.6%	Motor Vehicles	$1,043.92	16.5%
2	General Merchandise	$499.53	General Merchandise	$638.88	27.9%	General Merchandise	$805.37	26.1%
3	Gas Stations	$384.02	Gas Stations	$470.78	22.6%	Gas Stations	$576.94	22.5%
4	Food & Beverage Retail	$305.97	Food & Beverage Retail	$351.17	14.8%	Eating & Drinking Places	$409.55	29.6%
5	Eating & Drinking Places	$242.99	Eating & Drinking Places	$316.11	30.1%	Food & Beverage Retail	$399.91	13.9%

Values in 2009 dollars Percentages represent percent of total employment/retail sales.
Source: Woods & Poole

3.3 Gross Regional Product

Gross regional product (GRP) is the value of goods and services produced in the County, and serves as a health index of the overall economy. GRP grows with the production of more goods, more valuable goods, and a combination of the two. GRP per capital decreased in 2012 due to the recession and population growth exceeding GRP growth; however, total GRP continued to grow during this time as the region continued to be productive. GRP increased by 18.2 percent between 2012 and 2017. This increase is reflective of the growth in the region. The Woods & Poole GRP projections show GRP increasing at a faster rate than the County population. This can be attributed to the increases in efficiency and growth in the health care and accommodation industries, which are predicted to grow faster than the retail trade industry in 2027 and 2037. Retail trade, healthcare, and accommodation industries, are all among the top 5 employers in the county, with retail trade employing the most people (**Table 2-5** and **Table 2-6**). As the health care industry provides high value per employee, it can generate more GRP growth per job than retail trade. **Table 2-7** shows the GRP of the County from 2007 to 2037.

Table 2-7 Kootenai County Gross Regional Product

Year	GRP ($M)	Δ	GRP/Capita
2007	$4,621		$34,000
2012	$4,651	0.6%	$33,000
2017	**$5,499**	**18.2%**	**$36,000**
2022	$6,279	14.2%	$38,000
2027	$7,115	13.3%	$39,000
2032	$7,991	12.3%	$41,000
2037	$8,926	11.7%	$42,000
CAGR (2007-2017)	1.8%	N/A	0.6%
CAGR (2017-2037)	2.5%	N/A	0.8%

CAGR = Compound Annual Growth Rate
Source: Woods & Poole

3.4 Catchment Areas and Regional Airports

An airport's "catchment area" is the geographic boundary from which it draws its users, and airport activity is primarily influenced by the movement of people and products to and from the catchment area. Catchment areas are defined by the types of services offered at an airport, proximity of competitor airports, and the tendency of the local population to use the airport. The Airport's catchment area is based on the proximity of surrounding airports, and is shown in **Exhibit 2-1**.

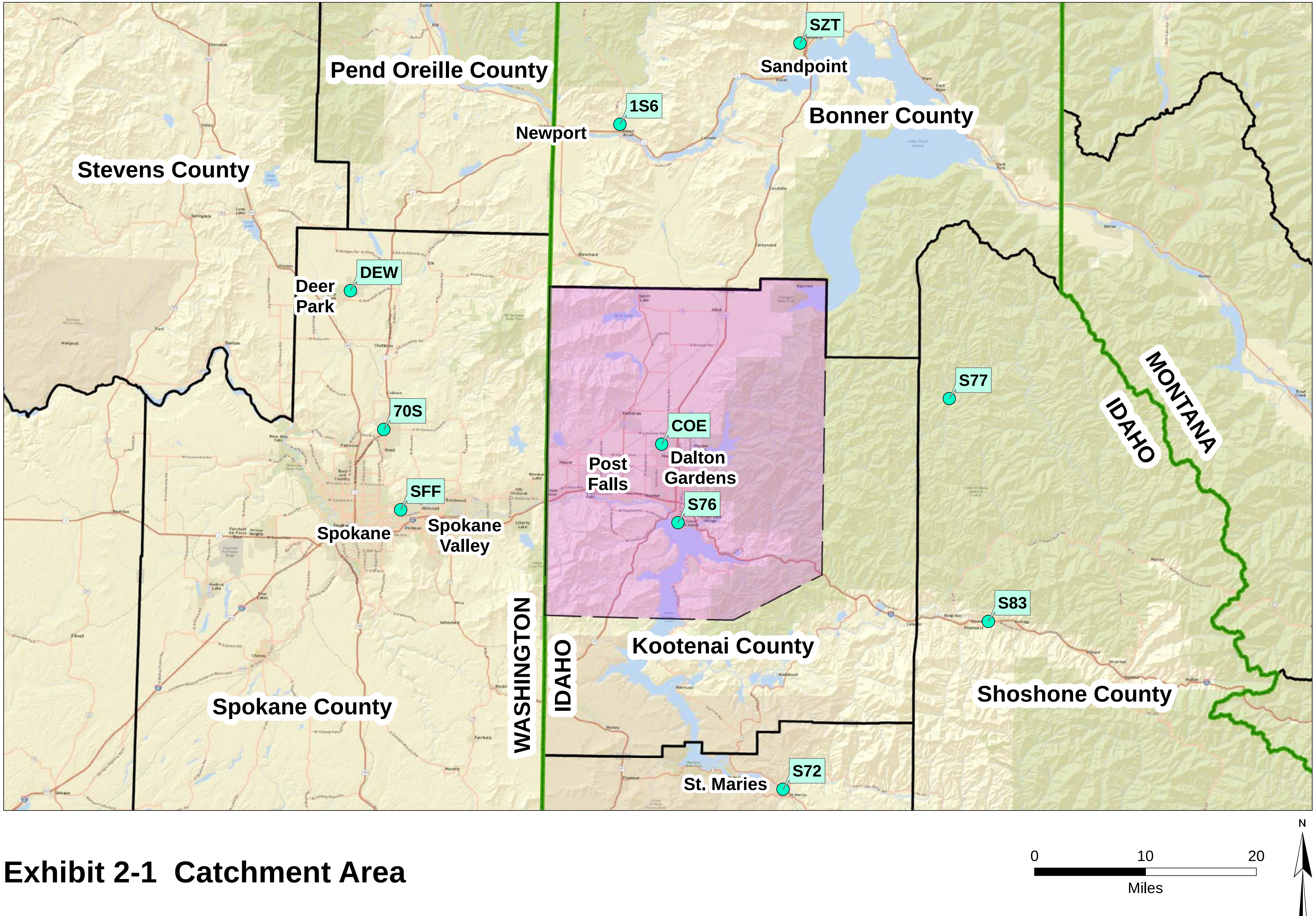


Exhibit 2-1 Catchment Area

COE is the only Airport with paved runways in the catchment area. Brooks Sea Plane Base (S76) is located 6 miles south of COE and has a water runway on the north shore of Lake Coeur D'Alene. As such, Brooks does not compete directly with Coeur d'Alene Airport for tenants or transient aircraft.

Other airports in proximity to the catchment area includes Spokane International (GEG), Mead Flying Service Airport (70S), Deer Park Airport (DEW), Priest River Municipal Airport (1S6), Sandpoint Airport (SZT), Magee Airport (S77), St Maries (S72), Spokane-Felts (SFF), and Shoshone County Airport (S83). Key facilities and primary markets of regional general aviation airports are summarized in **Table 2-8**.

Table 2-8: Regional General Aviation Airports

Airport	Characteristics			Primary Markets			
	Runway Length	IAP	Jet A	Large Jets	Small Jets	Turbo-Props	Piston
Priest River (1S6)	2,950'	No	No	No	No	Yes	Yes
Magee (S77)	2,200'	No	No	No	No	Yes	Yes
Shoshone County (S83)	5,316'	No	No	No	Yes	Yes	Yes
St Maries (S72)	3,354'	Non-Precision	No	No	No	Yes	Yes
Sandpoint (SZT)	5,501	Non-Precision	Yes	No	Yes	Yes	Yes
Spokane Felts (SFF)	4,499'	Precision	Yes	No	Yes	Yes	Yes
Spokane Int'l (GEG)	11,002	Precision	Yes	Yes	Yes	Yes	Yes
Coeur d'Alene (COE)	7,400	Precision	Yes	Yes	Yes	Yes	Yes

Source: FAA Airport Facilities Directory. Market determination based on instrumentation, runway length, and fuel availability.
IAP: Instrument Approach Procedure

Determination of a primary market does not suggest that a market that is not currently served will never use an airport. Rather, it reflects the presence of facilities at an airport that cater to the needs of a certain market. For example, piston aircraft are versatile in that they do not need Jet A fuel or a long runway, and due to their susceptibility to strong winds and turbulence, they tend not to be operated when visibility is particularly low due to stormy weather. For this reason, piston aircraft owners have fewer requirements for the airport where they base their aircraft than the business jet owners.

Business jets need a long runway to operate at their full payload, and owners generally need the aircraft available to fly regardless of the weather, so airport instrumentation is important. Large jets cannot use any of the other regional airports surrounding the COE catchment area except for GEG and SFF. Runway length at SZT and SFF limits the types of jets that can be served.

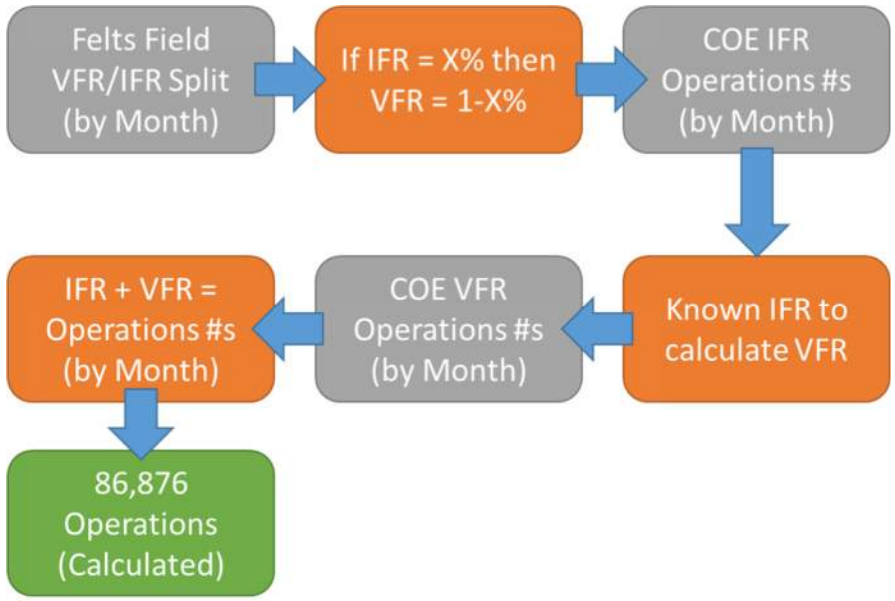
4. AVIATION ACTIVITY PROFILE

The aviation activity profile provides a baseline for the forecasts by showing trends in activity at the Airport and the context for any changes in aviation activity that have occurred. Sources of information include the FAA, Airport management, and Airport tenants. This section includes information on operations and based aircraft.

4.1 Operations Estimate

COE does not have a control tower; therefore, historical operations counts may be inaccurate. Thus, operations need to be adjusted to provide a baseline for the forecasts. Adjusted operation totals were calculated using a combination of FAA TFMSC and OPSNET data. Historical general aviation operations were estimated by using the process described below and shown in **Exhibit 2-2**: Operations estimates were checked against traffic counts collected in the field for concurrence.

Exhibit 2-2: Method for Estimating 2017 COE Operations



Source: Prepared by Mead & Hunt, Inc.

1. TFMSC operations data from 2007 to 2016 and Flightwise operations data for 2017 were used as a baseline for IFR operations. TFMSC do not include VFR data. TFMSC data for fiscal year 2017 was incomplete at the time of this forecast.
2. OPSNET from Spokane/Felts Field (SFF) ATCT data was used to determine the number of IFR and VFR operations for each year to calculate the ratio of IFR to VFR operations per month for each year. SFF data were used due to the Airport's geographic proximity to COE, the similar instrument flight procedures available, and the similar weather pattern.
3. Multiplying the IFR/VFR ratio to the TFMSC operations data provided the calculated number of IFR and VFR operations.
4. The sum of IFR and VFR operations is equal to the total annual operations.
5. Operations for 2007 to 2017 were calculated using this method and used instead of the TAF for the operations baseline.

4.2 General Aviation

Itinerant Operations

Itinerant operations are those that originate and terminate at different airports. Operators include student pilots performing cross country training flights, business travelers, and recreational pilots. Itinerant general aviation and air taxi operations made up 69 percent of overall operations at COE in 2017. Itinerant operations have increased at a 2.6 percent CAGR compared to a -2.8 percent CAGR for national itinerant operations. One reason behind COE's national trend reversal is that the region's GRP growth (1.6 percent CAGR) has outperformed the national GDP growth (1.4 percent CAGR) from 2007 to 2017, as discussed in section 3.3. Itinerant general aviation operations are shown in **Table 2-9**.

Table 2-9: Itinerant General Aviation Operations

Year	COE	% Change	U.S.A.	% Change
2007	46,526		18,575,000	-0.7%
2008	52,843	13.6%	17,493,000	-5.8%
2009	56,591	7.1%	15,571,000	-11.0%
2010	56,893	0.5%	14,864,000	-4.5%
2011	41,790	-26.5%	14,528,000	-2.3%
2012	47,842	14.5%	14,522,000	0.0%
2013	46,262	-3.3%	14,117,000	-2.8%
2014	47,586	2.9%	13,979,000	-1.0%
2015	48,083	1.0%	13,887,000	-0.7%
2016	43,605	-9.3%	13,904,000	0.1%
2017	59,912	37.4%	13,936,000	0.2%
CAGR	2.6%		-2.8%	

CAGR = Compound Annual Growth Rate.
Source: 2017 TAF, OPSNET, TFMSC

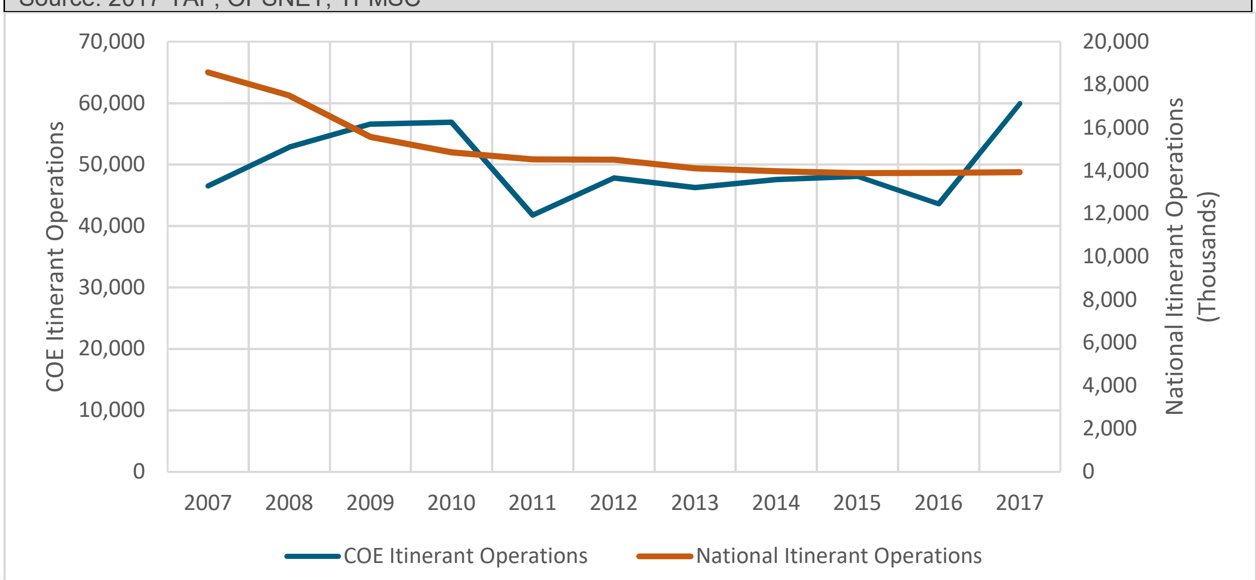


Table 2-10 shows itinerant operations at the Airport by type. Itinerant general aviation operations have declined since 2007; however, Air Taxi operations have grown. This increase in Air Taxi operations is due to the local economy growing with factors, such as income per capita and employment rates, increasing throughout the years. There are relatively few military operations at the Airport as there are no based military aircraft at COE. Military activity is performed as needed and is not driven by market forecasts like general aviation.

Table 2-10: COE Itinerant Operations by Type

Year	Air Taxi	Military	General Aviation	Total Itinerant
2007	65	1,019	45,442	46,526
2008	16,588	871	35,384	52,843
2009	17,765	933	37,894	56,591
2010	17,859	938	38,096	56,893
2011	13,118	689	27,983	41,790
2012	15,018	788	32,035	47,842
2013	14,522	762	30,977	46,262
2014	14,938	784	31,864	47,586
2015	15,094	792	32,196	48,083
2016	13,546	711	29,347	43,605
2017	18,418	967	40,527	59,912
CAGR	N/A	-0.5%	-1.1%	2.6%

CAGR = Compound Annual Growth Rate.
Source: 2017 TAF, OPSNET, TFMSC

Itinerant operations are expected to continue to grow with changes in the local and national economies. Unlike local operations, which are more sensitive to the performance of the local economy, itinerant operations can be impacted by economic contraction across the world. Many itinerant visitors come from other parts of the Country and economic contractions in their home areas could impact itinerant operations levels at COE.

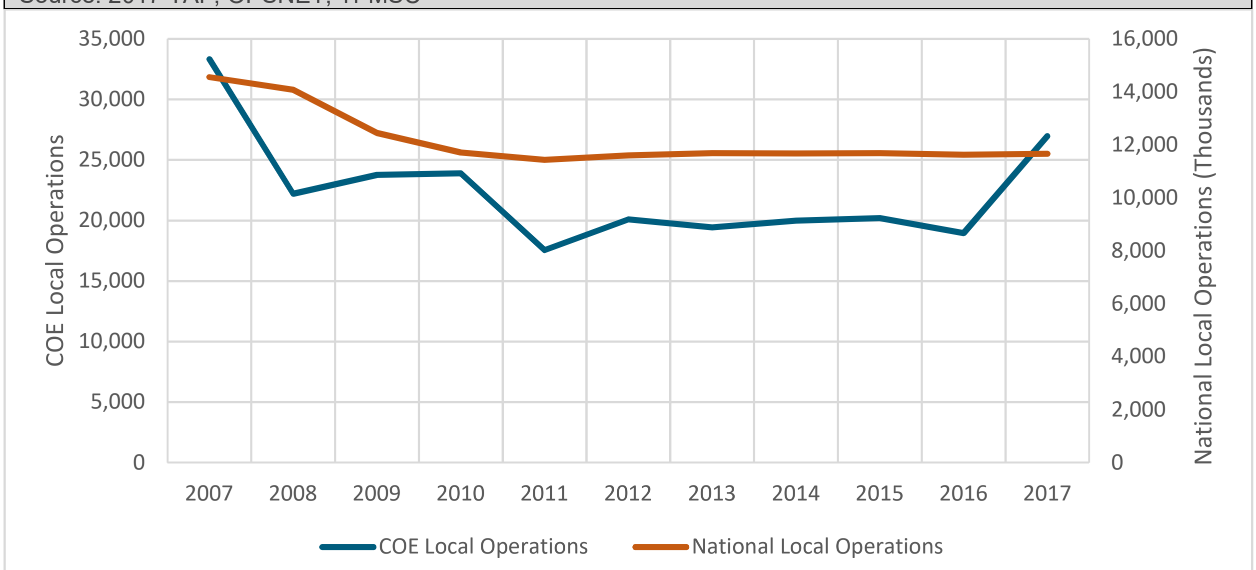
Local General Aviation Operations

Local general aviation operations are those that originate and terminate at the same airport and are generally performed by pilots that are practicing landings. Local operations can vary greatly based on the level of flight training at an airport and how active the resident GA community is. Local operations include touch-and-go landings where the aircraft lands, slows, then accelerates and takes off without leaving the runway. Touch-and-goes count as two operations. COE has two businesses that offer flight instruction but does not have a full-time flight school. Local general operations are shown in **Table 2-11.**

Table 2-11: Local General Aviation Operations

Year	COE	% Change	U.S.A.	% Change
2007	33,320	-	14,556,771	-22.2%
2008	22,199	-33.4%	14,081,157	-3.3%
2009	23,773	7.1%	12,447,957	-11.6%
2010	23,900	0.5%	11,716,274	-5.9%
2011	17,556	-26.5%	11,437,028	-2.4%
2012	20,098	14.5%	11,608,306	1.5%
2013	19,434	-3.3%	11,688,301	0.7%
2014	19,990	2.9%	11,675,040	-0.1%
2015	20,199	1.0%	11,691,338	0.1%
2016	18,961	-6.1%	11,632,078	-0.5%
2017	26,964	42.2%	11,664,410	0.3%
CAGR	-2.1%	N/A	-2.2%	N/A

CAGR = Compound Annual Growth Rate.
Source: 2017 TAF, OPSNET, TFMSC



Based Aircraft

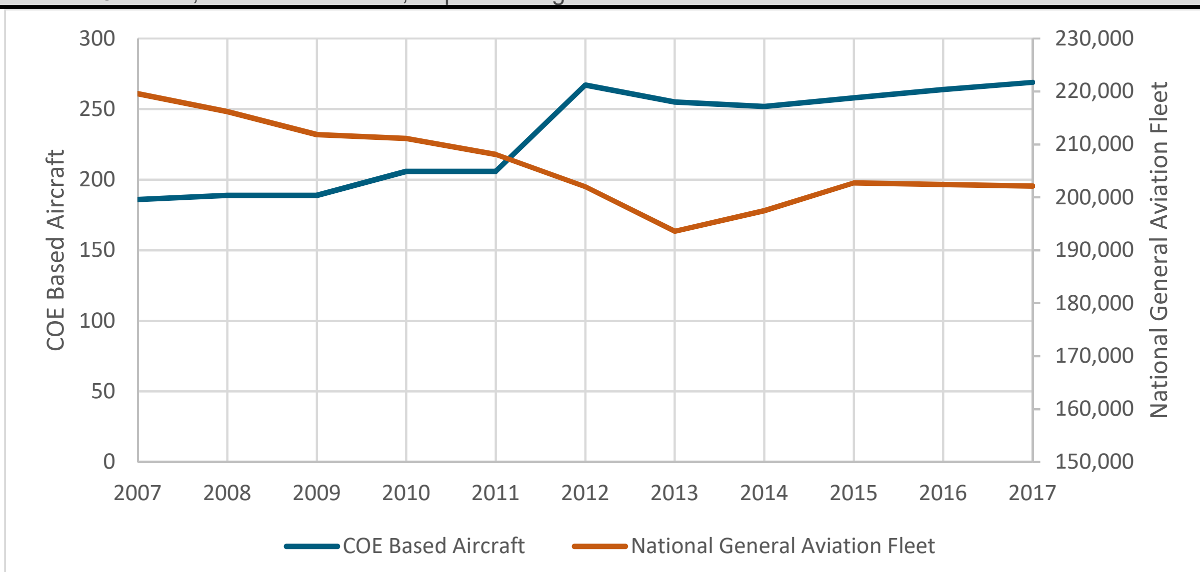
Terminology	
Single Engine Piston (SEP): SEP have one piston-powered engine. These aircraft are generally smaller and are often used for flight training and recreational flying. SEP may be used for regional business trips. Depending on weight and operator certification, these aircraft generally require only one pilot. Sub-categories within SEP include “experimental” and “sport.” - Experimental aircraft refer to kit airplanes that are built by users, or third-parties besides the original manufacturer. Experimental aircraft share many characteristics with SEP – the key differentiator is how and where the aircraft is assembled. - Sport aircraft are airplanes that have a specific weight and maximum speed in level flight. Sport aircraft require less training and a less strict medical certificate to pilot the aircraft. **Jet:** Jet aircraft are characterized for having a turbine engine instead of a piston engine. Jet aircraft range in size from small four-passenger business jets to the largest airliners. They can generally fly faster and at higher altitudes than SEP and MEP, making them better suited for business travel and emergency response. It is less common, but not unheard of, to see a jet used for recreational flying and flight instruction. Some smaller civilian jets can operate with a single pilot; however, most civilian jet aircraft require two.	**Turboprop:** Turboprop aircraft use gas turbine engines to drive a propeller. These aircraft tend to be slower than jets but are capable of using grass airfields. Turboprops are used as small commuter aircraft due to lower fuel and maintenance costs. **Multi-Engine Piston (MEP):** MEP have two or more engines and are typically larger than SEP. Multiple engines make the aircraft more capable, and require additional flight instruction beyond what is needed to operate an SEP. MEP are primarily used for flight training and business aviation. MEP may require two pilots, but many variants can be operated with one. **Helicopters:** Helicopters are characterized by having a rotor mounted above the cabin for lift and propulsion. Helicopters are commonly used for flight training, by law enforcement and emergency response, and by aerial businesses such as pipeline inspection, forestry, and aerial agriculture. Helicopters can be piston or turbine powered, and depending on the complexity of the model, can be operated by one pilot or two. **Other:** The category of “Other” includes experimental, sport, glider, and ultralight aircraft. These aircraft are used for recreational flying. - Gliders are unpowered aircraft that are towed into flight, and use thermal uplift to sustain altitude. - Ultralight aircraft weigh less than 155 pounds and do not require the pilot operating the aircraft to have a private pilot’s license or medical certificate.

Based aircraft are those that are stored at the Airport. Based aircraft numbers do not include visiting or itinerant aircraft. The FAA separates based aircraft into different categories based on an aircraft’s propulsion system, engine configuration, and weight. **Table 2-12** shows based aircraft records from 2007 to 2017.

Table 2-12: COE Based Aircraft Fleet

Year	Single	Multi	Jet	Helicopter	Other	Total	% Change
2007	150	15	9	9	3	186	-
2008	143	18	12	14	2	189	1.6%
2009	143	18	12	14	2	189	0.0%
2010	170	15	4	17	0	206	9.0%
2011	170	15	4	17	0	206	0.0%
2012	221	20	7	17	2	267	29.6%
2013	216	16	7	14	2	255	-4.5%
2014	213	16	7	14	2	252	-1.2%
2015	215	17	11	13	2	258	2.4%
2016	218	17	11	14	4	264	2.3%
2017	**221**	**14**	**12**	**8**	**7**	**262**	**-0.8%**
CAGR	4.0%	-0.7%	2.9%	-1.2%	8.8%	3.5%	

CAGR = Compound Annual Growth Rate.
Source: 2017 TAF, BasedAircraft.com, Airport Management



Single-Engine-Piston (SEP) are the most common aircraft based at COE, making up 84 percent of the fleet. Multi-Engine-Piston (MEP) and Jet each make up an additional five percent of the fleet, while helicopter and "others" make up the remaining six percent. Other aircraft include gliders and a balloon. There are four unmanned aerial vehicles (UAS or "drones") at COE, but these do not count as based aircraft and cannot use airport facilities.

The COE based fleet is made up of 90 percent aircraft reference code (ARC) A-I aircraft, five percent B-I aircraft, three percent helicopters, two percent C-II jets, and one percent B-II jets, turbo-props, and MEP. Based jets include a Gulfstream IV, two Hawker 800's, two Cessna Citations, and a Bombardier Challenger. ARC is defined in **Chapter 1**, and discussed in in **Section 6**.

5. GENERAL AVIATION FORECASTS

Forecasting Techniques

Forecasts look at historical trends and future opportunities to project future activity. This includes observing how market forces outside of aviation (discussed in **Section 3**) impact demand for air travel. The method of evaluating the relationship between variables for the purposes of establishing a relationship is called a correlation analysis.

A correlation analysis ignores units and orders of magnitude, and instead measures how closely the variables change in proportion to one another using percentages. This means that ten percent growth in an index with a starting level of 1,000 would show a perfectly positive correlation to a ten percent growth in an index with a starting level of 1,000,000,000. Correlation can also be negative, indicating that as one index grows, the other declines. Correlation is measured by the correlation coefficient (denoted as "*r*"), which ranges from -1 to +1. A score close to +/-1 suggest stronger positive/negative correlation, and a score closer to zero suggests that the two variables are not correlated.

Correlation shows potential interrelatedness between two variables; however, it cannot be the sole factor to determine that growth of one variable is caused by the other. Often, there are unrelated factors and additional variables that impact the growth in both variables. An example is a ten percent growth in the sale of luxury goods correlating to the ten percent growth in travel by private aircraft in a community. Purchasing luxury goods does not directly cause people to fly by private aircraft, nor vice versa – but the strong correlation suggests that a third factor may be causing both variables to grow (such as local growth in an industry with high paying jobs or an influx of high net worth individuals to a community for an event). For this reason, correlation is augmented by professional judgement. **Table 2-13** shows the results of the correlation analysis for the three activity indicators.

Table 2-13: COE Airport Activity Correlation Analysis

Rank	Itinerant Ops	*r*	Local Ops	*r*	Based Aircraft	*r*
1	Nat'l Loc GA Ops	0.37	Nat'l Loc GA Ops	0.62	MSA Income/Cap	0.90-
2	Nat'l Itn GA Ops	0.28	Nat'l ME Fleet	0.62	MSA Retail Sales	0.90
3	GA Fleet	0.23	Nat'l Itn GA Ops	0.58	Nat'l Jet Fleet	0.87
4	MSA GRP	0.14	GA Fleet	0.56	GDP	0.82
5	MSA Pop	0.12	Nat'l SE Fleet	0.33	MSA Population	0.82
Strong: $-0.75 \geq r \geq 0.75$			Medium: $-0.75 < r \leq -0.50$ or $0.50 \leq r < 0.75$			
Weak: $-0.50 < r \leq -0.25$ or $0.25 \leq r < 0.50$			None: $-0.25 < r < 0.25$			

Itinerant and local operations did not show strong correlation with any of the variables assessed. The number of based aircraft however, showed strong correlation with national and local indicators. The impact of this analysis on each activity measure is described later in this section.

5.1 Itinerant General Aviation Operations

Methods

Trends in itinerant general aviation are discussed in **Section 4.2**. Itinerant general aviation operations were found to have a weak positive correlation with all variables checked, and the closest three were national itinerant general aviation operations (r=0.28), national local general aviation operations (r=0.37), and the national general aviation fleet (r=0.23). The weak correlation is likely due to inaccurate historical records for COE. Due to the weak correlation, forecast methods based on regression analysis were not used. Forecasts for itinerant general aviation use the following methods:

- Application of the FAA Aerospace Forecast 2017-2037 growth rate for itinerant operations.
- Application of COE growth rate from the 2017 TAF for itinerant operations.
- Application of the historical 10-year growth rate for itinerant operations.

The forecasts are presented alongside the 2017 TAF for comparison purposed in **Table 2-14.**

Preferred and TAF Comparison

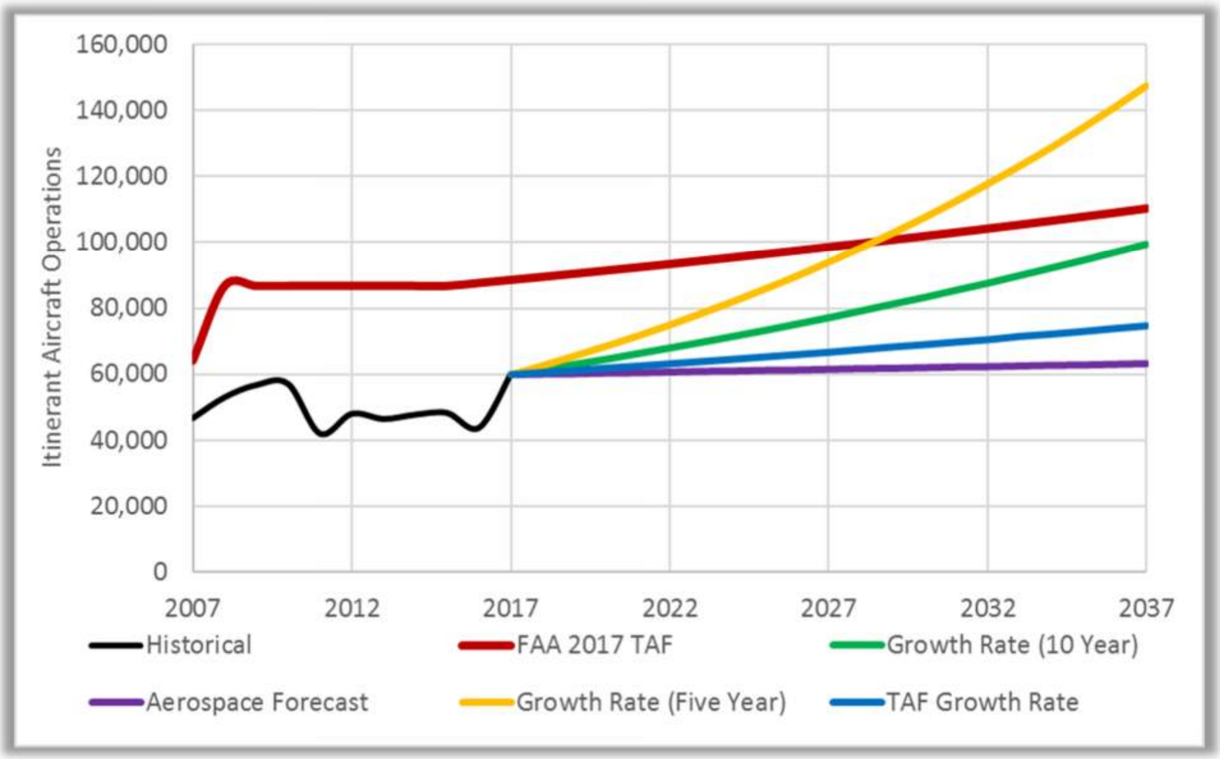
COE operations were not highly correlated with the national operations trends so there is need to look at the historical data. The preferred itinerant operations forecast uses the 10-year growth rate, which estimates that itinerant general aviation operations will grow at 2.6 percent CAGR. This growth rate exceeds the TAF projection of 1.1 percent CAGR; however, due to the adjustment in operations numbers, the TAF remains above the preferred forecast for the 20-year period.

The growth rate utilizing historical local trends is preferred over forecasts using national trends like the Aerospace Forecast and TAF growth rate. The 5-year growth rate was found to have 4.6 percent annual growth which is considered unsustainable over a 20-year period. Strong local economic growth, shown in **Section 3**, is expected to support continued general aviation growth at COE.

The preferred forecast is compared to the TAF in **Table 2-15.** The difference between the two forecasts lies in the operations adjustment that was done as part of this forecast. TAF numbers are too high and will need to be adjusted to reflect the findings of this study. The TAF uses a Top Down Model for airports of COE's size which does not take local factors into account. The TAF assumes market share based on an arbitrary variable and is based primarily on time series analysis; thus, if the base year is incorrect and the growth rate is assigned arbitrarily the TAF will become less accurate as time goes on.

Table 2-14: Itinerant Operations Forecast

Year	FAA 2017 TAF	Aerospace Forecast	TAF Growth Rate	Growth Rate (Five Year)	Growth Rate (10 Year)
2017	88,478	59,912	59,912	59,912	**59,912**
2022	93,310	60,700	63,200	75,000	**68,000**
2027	98,532	61,500	66,700	94,000	**77,200**
2032	104,175	62,300	70,500	117,700	**87,500**
2037	110,276	63,200	74,700	147,400	**99,300**
CAGR	1.1%	0.3%	1.1%	4.6%	**2.6%**



CAGR = Compound Average Growth Rate
Source: TAF Issued January 2017, Master Plan Forecasts

Table 2-15: Itinerant Operations Forecast – TAF Comparison

Year	FAA 2017 TAF	Preferred	Difference	
2017	88,478	59,912	-28,566	-32.3%
2022	93,310	68,000	-25,310	-27.1%
2027	98,532	77,200	-21,332	-21.6%
2032	104,175	87,500	-16,675	-16.0%
2037	110,276	99,300	-10,976	-10.0%
CAGR	1.1%	2.6%	N/A	N/A

CAGR = Compound Average Growth Rate
Source: TAF Issued January 2017

5.2 Local Operations

Methods

Local general aviation operations were found to have a relatively weak positive correlation with all variables checked. The top three were national itinerant operations (*r*=0.58), national local operations (*r*=0.62), and the national multi-engine fleet (*r*=0.62). Due to the weak correlation, forecast methods based on regression analysis were not used. Forecasts for local general aviation use the following methods:

- Application of the FAA Aerospace Forecast 2017-2037 growth rate for local operations.
- Application of the operations per based aircraft method.
- Application of the historical five and 10-year growth rates for local operations.

The FAA Aerospace Forecast and historical growth rate methods are simple linear growth rate formulas. The Operations per based aircraft method ties local activity to the number of aircraft based at COE. There has been an average of 101 local operations per based aircraft per year from 2007 to 2017, and this ratio is applied to the based aircraft forecast in **Section 5.3**. to calculate future operations. Forecasts are presented alongside the 2017 TAF for comparison purposed in **Table 2-16.**

Preferred and TAF Comparison

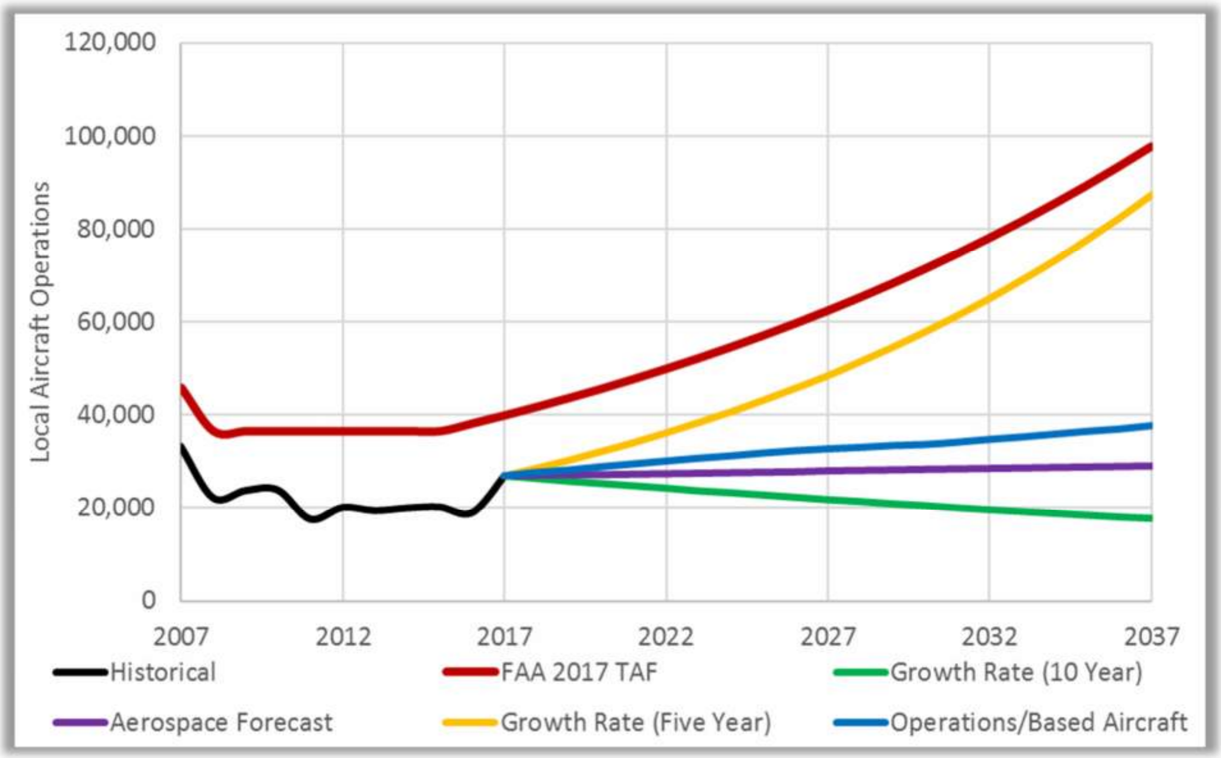
The preferred method uses the projected number of based aircraft and the ratio of operations per based aircraft calculated with 2017 TAF data. The forecast has a 1.7 percent CAGR through the 20-year period and projects 37,600 local operations in 2037. The five-year growth rate method has a CAGR of 6.1 percent which is not considered sustainable over a 20-year period. The 10-year growth rate method has a CAGR of -2.1 percent, which produces a decline in local operations over the next 20 years. The Aerospace Forecast method remains nearly flat, with a 0.4 percent CAGR over the forecast period.

The TAF forecasts strong local operation growth with a CAGR of 4.6 percent through 2037. This is due to the higher estimated historical number of operations compared to the calculated historical local operations discussed in **Section 4.2**, and projections that far exceed the national average (per the Aerospace Forecast method). TAF projections are unlikely to occur unless COE gets an institutional flight school. As of November 2017, there are no plans for such a facility at COE.

The preferred forecast is compared to the TAF in **Table 2-17.** The difference between the two forecasts lies in the operations adjustment that was done as part of this forecast. TAF numbers are too high and will need to be adjusted to reflect the findings of this study. The TAF growth rate is not considered realistic for COE.

Table 2-16: Local Operations Forecast

Year	FAA 2017 TAF	Ops / Based Aircraft	Aerospace Forecast	Growth Rate (5 Year)	Growth Rate (10 Year)
2017	39,820	**26,964**	26,964	26,964	26,964
2022	49,843	**30,100**	27,400	36,200	24,300
2027	62,386	**32,700**	28,000	48,500	21,800
2032	78,091	**34,700**	28,500	65,100	19,600
2037	97,757	**37,600**	29,000	87,400	17,700
CAGR	4.6%	**1.7%**	0.4%	6.1%	-2.1%



CAGR = Compound Average Growth Rate
Source: TAF Issued January 2017

Table 2-17: Local Operations Forecast – TAF Comparison

Year	FAA 2017 TAF	Operations / Based Aircraft	Difference	
2017	39,820	26,964	-12,856	-32.3%
2022	49,843	30,100	-19,743	-39.6%
2027	62,386	32,700	-29,686	-47.6%
2032	78,091	34,700	-43,391	-55.6%
2037	97,757	37,600	-60,157	-61.5%
CAGR	4.6%	1.7%	NA	NA

CAGR = Compound Average Growth Rate
Source: TAF Issued January 2017

5.3 Based Aircraft

Methods

Historical trends and composition of the based aircraft fleet at COE are discussed in **Section 4.2**. Unlike aircraft operations, based aircraft historically showed strong correlation with local socioeconomic indicators. The top five were MSA Retail Sales (*r*=0.90), MSA Income per Capita (*r*=0.90), the National Jet Fleet (*r*=0.89), U.S. Gross Domestic Product (*r*=0.82), and MSA Population (*r*=0.82) It is unlikely that any one of these indicators driving based aircraft on its own; however, each suggest that based aircraft growth at COE has performed in line with growth of the local and national economy, and in line with the sale of jet and turbo-prop aircraft.

Three methods are used to project the based aircraft fleet.

- Application of the FAA Aerospace Forecast 2017-2037 growth rate for each based aircraft type.
- Application of the historical 10-year growth rate for each based aircraft type.
- Application of a regression model based on MSA employment and income per capita.

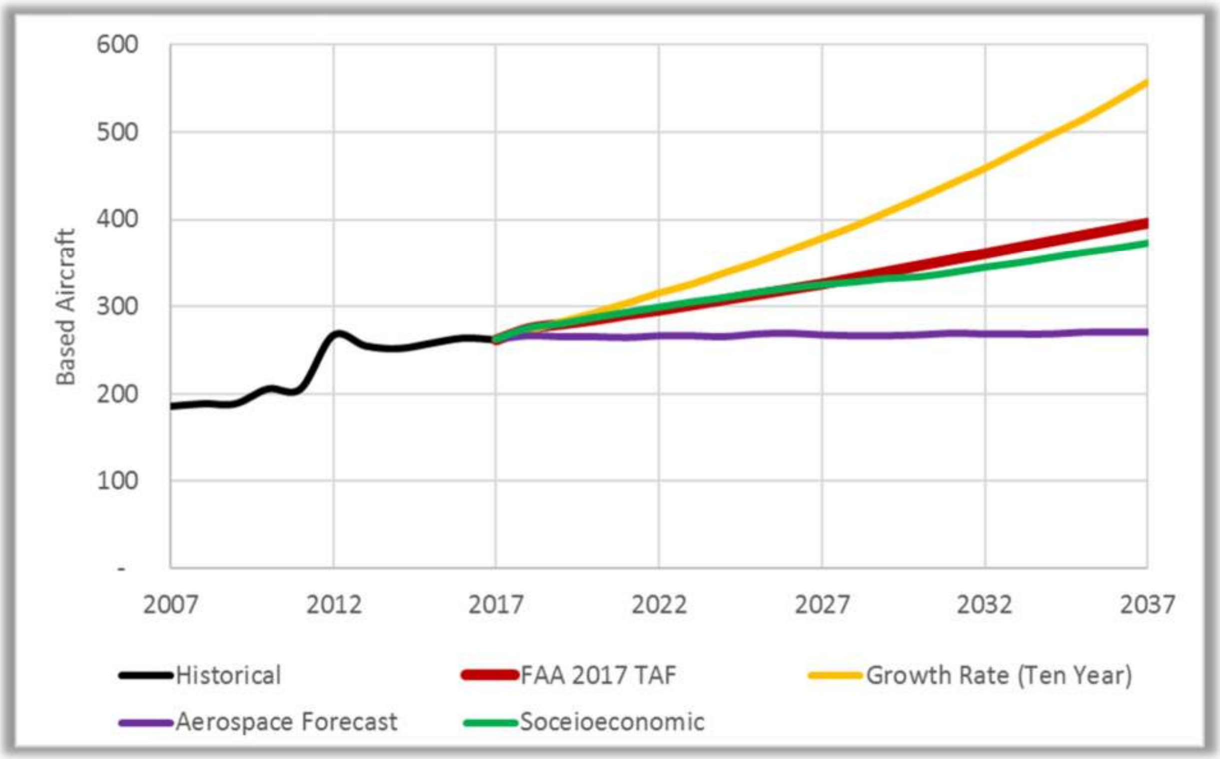
The regression model is based on the underlying logic that growth in based aircraft at COE relies on a strong local economy. The correlation analysis provides historical support and the forecast assumes that these relationships will continue. This method forecasts total based aircraft, and the future fleet is then determined by looking at expected growth rates for each sub-market (e.g. SEP, MEP, Jet, Helicopter, Other). The other two methods look at local (10-year growth rate) and national (Aerospace Forecast) methods that consider fluctuations within the different market segments of general aviation. Forecasts are presented alongside the 2017 TAF for comparison purposed in **Table 2-18.**

Preferred and TAF Comparison

The regression model is the preferred based aircraft forecast. This method produces a based aircraft forecast that is similar to TAF projections, and is in line with the correlation analysis done to identify potential demand drivers in the community. The Aerospace Forecast was not selected because SEP activity is projected to decline nationally, whereas this market has seen some growth at COE in recent years. The ten-year growth rate forecast projects that based aircraft will more than double in the next 20 years, which is not expected to happen given the general slowing of the industry, lack of available storage space at COE, and competition from nearby airports. The preferred forecast is compared to the TAF in **Table 2-19**

Table 2-18: Based Aircraft Forecasts

Year	FAA 2017 TAF	Growth Rate (Ten-Year)	Aerospace Forecast	Socioeconomic
2017	262	262	262	**262**
2022	296	315	266	**299**
2027	326	378	267	**325**
2032	361	458	268	**356**
2037	396	557	270	**373**
CAGR	2.1%	3.8%	0.2%	**1.8%**



CAGR = Compound Average Growth Rate
Source: TAF Issued January 2017

Table 2-19: Based Aircraft Forecasts – TAF Comparison

Year	FAA 2017 TAF	Socioeconomic	Difference	
2017	262[1]	262	0	0.0%
2022	296	299	3	1.0%
2027	326	325	-1	-0.3%
2032	361	356	-5	-1.4%
2037	396	373	-23	-5.8%
CAGR	2.1%	1.8%	NA	NA

1: TAF value for 2017 changed to reflect actual counts from Airport Management and BasedAircraft.com

Table 2-20 shows the breakdown of COE based aircraft growth rate by aircraft type. The standard SEP fleet is expected to decline as these aircraft are retired faster than they are replaced. Growth within this segment comes from the light sport and experimental aircraft types. Both sub-sets of the SEP market are already present at COE and there were nearly 50 experimental aircraft at COE in 2017.

Jet and Turbo-prop aircraft are expected to continue to grow in line with strong local economic growth. COE has property available for development of box hangars along the north side of Runway 6/24 which will be attractive to new jet operators based on proximity to the primary runway. A look at the regional airports shows that SFF has limited space for additional box hangars, GEG is too far away from Kootenai County, and the other airports lack the facilities needed to accommodate medium and large jets (e.g. an instrument approach, long runway, and Jet A fuel).

Table 2-20: Preferred Based Aircraft Forecast

Type	2017	2022	2027	2032	2037	CAGR
SEP	221	252	272	286	308	1.7%
**Standard*	*162*	*156*	*149*	*143*	*137*	*-0.8%*
**Light Sport*	*10*	*16*	*22*	*27*	*31*	*5.8%*
**Experimental*	*49*	*80*	*101*	*116*	*140*	*5.4%*
MEP	14	13	13	13	12	-0.8%
Business Jet	10	12	13	15	16	2.4%
Turbo-prop	2	4	6	8	10	8.4%
Helicopter	8	9	10	11	12	2.0%
Other	7	9	11	12	15	3.9%
Total	**262**	**299**	**325**	**345**	**373**	**1.8%**

An item of note is that based aircraft do not include contractors that work for the U.S. Forest Service, and they do not include the aircraft that are being worked on by Empire Aerospace. These aircraft are some of the largest types that use COE and have facility requirements that exceed many of the based aircraft except the business jets. Facility requirements analysis will address the needs of both the based and itinerant fleets.

6. PEAK FORECASTS AND CRITICAL AIRCRAFT

6.1 Peak Period Forecasts

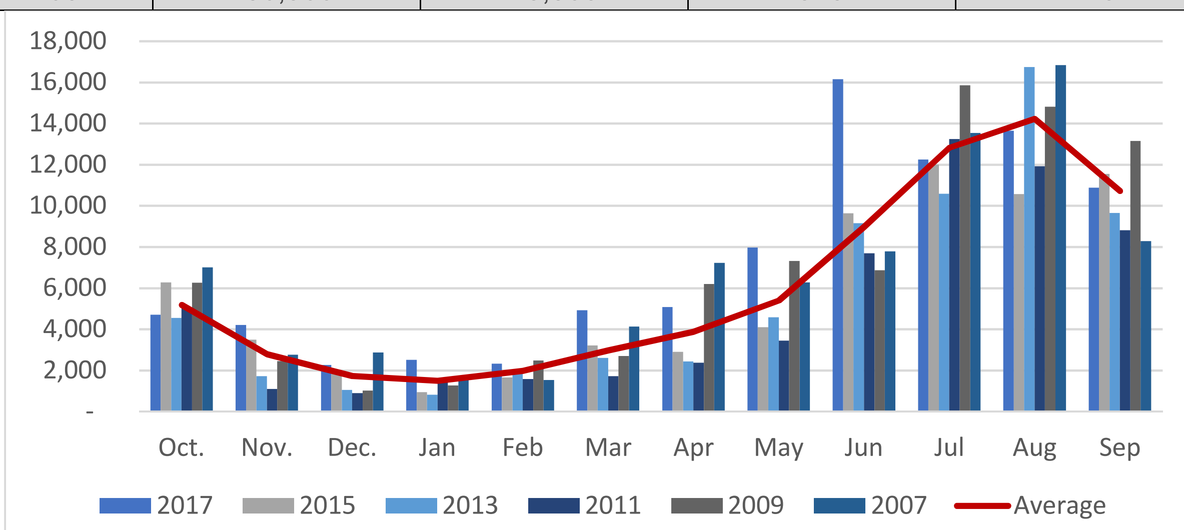
Peak forecasts estimate when airport facilities are busiest. Peak forecasts are used to assess level of service of airfield and terminal facilities and the scale of improvement projects. Improvement projects are not typically designed for the busiest moment of the year, but rather for busy periods that occur throughout the year. The forecast uses historical records to project future peaking and will need to be reevaluated if a change in user or aircraft type occurs.

Historically, July has been the peak month with some years having August see peak activities. In 2017 and 2016, June was the peak month with 18.6 percent and 19.5 percent of annual operations respectively. On average, peak months see 20.7 percent of total annual operations. Peak day is the average number of operations per day during the peak month. Peak hour is the busiest hour (as a percentage of peak day operations) based on on-site counts.

Table 2-21 presents peak operations forecasts.

Table 2-21: Peak Period Operations Forecasts

Year	Annual	Peak Month	Peak Day	Peak Hour
2017	86,876	17,964	583	75
2022	98,100	20,285	659	85
2027	109,800	22,704	737	95
2032	122,200	25,268	820	105
2037	136,900	28,308	919	118



Sources: TFMSC, FlightWise

6.2 Critical Aircraft

The critical aircraft is the most demanding type, or group of aircraft with similar characteristics, to operate more than 500 times per year at an airport. Critical aircraft are categorized by airport reference code (ARC), which is made up of the aircraft approach category (AAC) and aircraft design group (ADG), as defined in **Chapter 1.** The critical aircraft will be used to design and scale improvement projects and setbacks in subsequent chapters.

Counts of operations by aircraft type from TFMSC and surveys sent to key tenants Empire Aerospace and the U.S. Forest Service, are used to estimate operations by itinerant aircraft. Based aircraft records are used to estimate the distribution of local operations. Unlike itinerant operations, local operations are generally performed by smaller aircraft, so the only aircraft reference codes included in the analysis are A-I, A-II, B-I, and helicopters. Source data used in the itinerant operations estimates are shown in **Table 2-22**, and source data used in the local operations estimates are shown in **Table 2-23**.

Table 2-22: Itinerant Operations Records

Reference Code	2012	2013	2014	2015	2016	2017	Average
A-I	542	406	540	518	508	534	11.5%
A-II	180	164	232	268	350	386	5.8%
A-III	0	0	0	0	4	4	0.0%
B-I	1,004	954	926	758	756	778	19.0%
B-II	1,300	1,352	1,544	1,834	1,608	1,632	34.0%
B-III	186	164	156	148	148	146	3.5%
C-I	392	412	468	556	626	590	11.2%
C-II	324	284	254	298	390	374	7.1%
C-III	34[1]	24[1]	22[1]	930[1]	234[1]	334[1]	5.7%
C-IV	6	0	0	10	2	6	0.1%
D-I	46	18	34	46	34	54	0.9%
D-III	22	36	48	50	50	66	1.0%
H-H	6	2	38	6	16	2	0.3%
Total TFMSC Operations.	4,042	3,816	4,262	5,508	4,726	4,902	100.0%
Total Itn. Operations[2]	47,841	46,261	47,596	48,082	43,604	59,912	
TFMSC % of Total Itn. Operations	8.4%	8.2%	9.0%	11.5%	10.8%	8.2%	

1: U.S. Forest Service (USFS) did not provide counts for operations performed by civil contractors for 2012-2014. C-III operations for 2015-2017 include USFS civil contractor operations counts.
2: Total itinerant operations are estimated due to the absence of an airport traffic control tower at COE.
Sources: TFMSC for FAA Fiscal Years 2012 – 2017, Empire Airlines Survey, USFS Survey, Master Plan Itinerant Operations Estimates. Itn. = Itinerant

Table 2-23: 2017 Based Aircraft and Local Operation by ARC

Reference Code	Aircraft Count	% of Based	Performs Local Ops.?	Local Ops. Estimate	% of Local Ops.
A-I	236	90%	Yes	24,955	92%
B-I	12	5%	Yes	1,269	5%
B-II	3	1%	No	0	0%
C-II	4	1%	No	0	0%
Helicopter	7	3%	Yes	740	3%
Total	262	-	-	26,964	-

Sources: BasedAircraft.com, COE Airport Management. Ops. = Operations

Future operations by ARC are calculated differently depending on the type of aircraft. Aircraft with an ARC of B-II, and those with approach categories of C or greater and design groups of III or greater are expected to be well accounted for in the TFMSC records and user surveys. While some aircraft cancel flight plans prior to landing at COE and are thus missing from the TFMSC, it is expected that the order of magnitude presented by the TFMSC, combined with the user surveys, is generally accurate. Counts by type are included as **Attachment 1**.

Smaller aircraft types, (A-I, B-I, and B-II) are also accounted for in TFMSC but these aircraft often fly under VFR and are therefore not always included in TFMSC. Future operations by these ARCs are estimated by identifying the relative percentage of these aircraft types operations relative to total estimate operations less operations by larger aircraft. These smaller aircraft essentially make up the balance of remaining operations for COE. Total operations by ARC are shown in **Table 2-24.**

Table 2-24: Total Operations by ARC

ARC	2017	2022	2027	2032	2037	Average
A-I	74,930	84,582	94,578	105,102	117,628	86.1%
A-II	3,473	3,942	4,469	5,072	5,756	4.1%
A-III	17	19	21	24	28	0.0%
B-I	4,089	4,616	5,167	5,752	6,444	4.7%
B-II	1,700	1,929	2,188	2,483	2,818	2.0%
B-III	167	189	214	243	276	0.2%
C-I	600	681	772	876	994	0.7%
C-II	333	378	429	487	552	0.4%
C-III	267	303	343	389	442	0.3%
C-IV	10	11	13	15	18	0.0%
D-I	60	68	77	88	99	0.1%
D-III	70	79	90	102	116	0.1%
H-H	1,160	1,303	1,439	1,567	1,729	1.3%
Total	86,876	98,100	109,800	122,200	136,900	100%

Sources: Master Plan Operations Estimates, TFMSC, Based Aircraft Records

The most demanding AAC to exceed the substantial use threshold of 500 operations is C, with 1,210 operations in 2017 and 2,006 operations forecast in 2037. The most demanding ADG to exceed the substantial use threshold of 500 operations is III, with 521 operations in 2017 and 862 operations forecast in 2037. Therefore, the existing and future ARC for COE is C-III. There is no single C-III aircraft that exceeds the substantial use threshold, so a representative C-III aircraft is selected to be the critical aircraft. The most common C-III aircraft is the BAe-146, which is used by private contractors working for the U.S. Forest Service and operated 300 times in 2017. In busy fire seasons, such as 2015, the BAe-146 and similar large air tankers operated over 870 times.

Crosswind Runway 2/20 is not built to the same length and width as primary Runway 6-24. This runway typically serves smaller business jets, turbo-props, and piston aircraft; however, the Gulfstream G450 based at COE uses Runway 2/20 frequently. Given the existing dimensions and typical users of Runway 2/20, the runway should be designed to B-II standards. The most common demanding B-II aircraft to use the runway are the Cessna family of small- and medium-cabin business jets, such as the Citation V, Citation Excel, and Citation II. These jets had over 800 operations in 2017.

Runway 6/24 Critical Aircraft: BAe-146 (C-III)

Runway 2/20 Critical Aircraft: Cessna Citation V (B-II)

7. FORECAST SUMMARY AND FAA FORECAST TABLES

Aviation demand at COE will be driven by strong economic growth in Kootenai County. Forecasts for the County's population, gross product, and employment indicate that the next 20 years will experience growth of around two percent annually. COE is the premier general aviation airport in Northern Idaho and has the facilities needed to host a wide variety of business jets and turbo-props. The Airport's primary users, single engine piston aircraft, will continue to grow although the makeup of the fleet with change from one where standard aircraft are the most common to one where light sport and experimental aircraft make up a larger percentage.

The Airport will continue to provide employment through the surrounding businesses like Empire Aerospace, aircraft maintenance shops, and fixed base operators. Public safety will remain a critical role through use by the U.S. Forest Service during fire season. The highlights of the demand forecast are shown in **Table 2-25**, and FAA reporting forms are included as **Exhibit 2-3** and **Exhibit 2-4**.

Table 2-25: Forecast Summary

Forecast Element	2007	CAGR	2017	2037	CAGR
Aircraft Operations	**79,846**	**0.8%**	**86,876**	**136,900**	**2.3%**
Itinerant Operations	46,526	2.6%	59,912	99,300	2.6%
Local Operations	33,320	-2.1%	26,964	37,600	1.7%
Based Aircraft	**186**	**3.5%**	**262**	**373**	1.8%
Single-Engine Piston	150	4.0%	221	308	1.7%
Jet & Turbo-Prop	9	2.9%	12	26	3.9%
Multi-Engine Piston	15	-0.7%	14	12	-0.9%
Helicopter	9	-1.2%	8	12	2.0%
Other	3	8.8%	7	15	3.9%

Single Engine Piston includes experimental and light sport aircraft. CAGR: Compound Annual Growth Rate
Sources: Operations: 2007 and 2017 calculated from IFR records, 2037 = Forecast
Based Aircraft: 2007 from TAF, 2017 from BasedAircraft.com, 2037 = Forecast

The demand forecasts will be carried forward to **Chapter 3, Facility Requirements**. Here, the expected level of demand will be compared to the Airport's existing facilities and recommendations for facility improvements and modifications will be made.

Exhibit 2-3: Master Plan Forecast Comparison to TAF

AIRPORT NAME: Coeur d'Alene Airport	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2017	0	36	-100.0%
Base yr. + 5yrs.	2022	0	36	-100.0%
Base yr. + 10yrs.	2027	0	36	-100.0%
Base yr. + 15yrs.	2032	0	36	-100.0%
Commercial Operations				
Base yr.	2017	18,418	27,200	-32.3%
Base yr. + 5yrs.	2022	21,400	27,200	-21.3%
Base yr. + 10yrs.	2027	24,400	27,200	-10.3%
Base yr. + 15yrs.	2032	27,700	27,200	1.8%
Total Operations				
Base yr.	2017	86,876	128,298	-32.3%
Base yr. + 5yrs.	2022	98,100	143,153	-31.5%
Base yr. + 10yrs.	2027	109,800	160,918	-31.8%
Base yr. + 15yrs.	2032	122,200	182,266	-33.0%

NOTES: TAF data is on a U.S. Government fiscal year basis (October through September).
AF/TAF (% Difference) column has embedded formulas.

The Airport Forecast and the TAF differ substantially due to the revision of baseline operations numbers. A combination of TFMSC, OPSNET IFR/VFR splits, and on-site counts were used to better estimate aircraft operations at COE. The results were 32.3 percent lower than the TAF estimates for the base year. Commercial operations (on demand air taxi at COE) grow more quickly than TAF estimates; however, the TAF projects substantial growth (4.6 percent CAGR) for local operations.

Airport management and tenants do not expect local operations to grow at this rate without the presence of an institutional flight school. No plans for such as school exist as of Winter 2017; therefore, the Master Plan forecasts project a slower growth rate than the TAF.

An FAA HQ forecast review is not required as total operations is less than 200,000 and there are no projects that require an Environmental Impact Statement (EIS) or Benefit-Cost Analysis (BCA) for the Airport Improvement Program (AIP).

Exhibit 2-4: Master Plan Forecast in FAA Format

AIRPORT NAME: Coeur d'Alene Airport **Specify base year:** 2017

	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.	Average Annual Compound Growth Rates Base yr. to +1	Base yr. to +5	Base yr. to +10	Base yr. to +15
Passenger Enplanements									
Air Carrier (Not Present at COE)	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Commuter (No Scheduled Service at COE)	36	0	0	0	0	-100.0%	-100.0%	-100.0%	-100.0%
TOTAL	36	0	0	0	0	-100.0%	-100.0%	-100.0%	-100.0%
Operations									
Itinerant									
Air carrier (Not Present at COE)	0	0	0	0	0	N/A	N/A	N/A	N/A
Commuter/air taxi	18,418	19,300	21,400	24,400	27,700	4.8%	3.0%	2.9%	2.8%
Total Commercial Operations	18,418	19,300	21,400	24,400	27,700	4.8%	3.0%	2.9%	2.8%
General aviation	40,527	40,700	45,200	51,300	58,400	0.4%	2.2%	2.4%	2.5%
Military	967	1,400	1,400	1,400	1,400	44.8%	7.7%	3.8%	2.5%
Local									
General aviation	26,964	27,700	30,100	32,700	34,700	2.7%	2.2%	1.9%	1.7%
Military (Not Present at COE)	0	0	0	0	0	N/A	N/A	N/A	N/A
TOTAL OPERATIONS	86,876	89,100	98,100	109,800	122,200	2.6%	2.5%	2.4%	2.3%
Instrument Operations	7,639	7,835	8,626	9,655	10,745	2.6%	2.5%	2.4%	2.3%
Peak Hour Operations	75	77	85	95	105	2.7%	2.5%	2.4%	2.3%
Cargo/mail (enplaned+deplaned tons)	0	0	0	0	0	N/A	N/A	N/A	N/A
Based Aircraft									
Single Engine (Nonjet, inc. LSA & Exp.)	221	231	252	272	286	4.5%	2.7%	2.1%	1.7%
Multi Engine (Nonjet)	14	13	13	13	13	-7.1%	-1.5%	-0.7%	-0.5%
Jet Engine & Turbo Prop	12	14	16	19	23	16.7%	5.9%	4.7%	4.4%
Helicopter	8	9	9	10	11	12.5%	2.4%	2.3%	2.1%
Other	7	8	9	11	12	14.3%	5.2%	4.6%	3.7%
TOTAL	262	275	299	325	345	5.0%	2.7%	2.2%	1.9%

LSA = Light Sport Aircraft. Exp. = Experimental Aircraft

B. Operational Factors

	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.
Average aircraft size (seats)					
Air carrier (Not present at COE)	0.0	0.0	0.0	0.0	0.0
Commuter (Not present at COE)	0.0	0.0	0.0	0.0	0.0
Average enplaning load factor					
Air carrier (Not present at COE)	0.0%	0.0%	0.0%	0.0%	0.0%
Commuter (Not present at COE)	0.0%	0.0%	0.0%	0.0%	0.0%
GA operations per based aircraft	258	249	252	258	270