3.0 AVIATION ACTIVITY FORECAST

This chapter discusses the findings and methodologies used to project aviation demand at Priest River Municipal Airport. The forecasts developed in the airport master plan provide a framework to guide the analysis for future development needs and alternatives. It should be recognized that there are always short and long-term fluctuations in an airport's activity due to a variety of factors that cannot be anticipated.

Projections of aviation activity for Priest River Municipal Airport were prepared for the 20-year planning horizon including the near-term (2014-2019), mid-term (2020-2024), and long-term (2025-2034) timeframes. These projections are generally unconstrained and assume the airport will be able to develop the various facilities necessary to accommodate based aircraft and future operations. The projections of aviation demand developed for Priest River Municipal Airport are documented in the following sections:

- Historic Aviation Activity
- Trends/Issues Influencing Future Growth
- Projections of Aviation Demand
  - Forecasting Methodologies
  - Based Aircraft Projections
  - Aircraft Local Operations Projections
  - Aircraft Itinerant Operations Projections
  - Aircraft Total Operations Projections
- Peaking Characteristics
- Critical Aircraft
- Summary

3.1 HISTORIC AVIATION ACTIVITY

Historic activity data for the airport provides the baseline from which future activity can be projected. Historic aviation activity and aviation activity projections at the airport are based on FAA 5010 Master Records and available FAA Terminal Area Forecasts (FAA TAF) data.

While historic trends are not always reflective of future periods, historic data does provide insight into how local, regional, and national demographic and aviation-related trends may be tied to the Airport.

Aviation activity is measured in operations were an operation is defined as either a takeoff or a landing. Historic aircraft operations data for Priest River Municipal Airport are summarized in **Table 3-1**.

TABLE 3-1 HISTORIC AIRCRAFT OPERATIONS AND BASED AIRCRAFT

	Itinerant Operations				Local Operations			TOTAL ALL OPS	Based Aircraft
Year	Air Taxi	General Aviation	Military	Total	General Aviation	Military	Total		
2004	0	7,320	0	**7,320**	1,857	0	**1,857**	**9,177**	**19**
2005	0	7,520	0	**7,520**	1,926	0	**1,926**	**9,446**	**19**
2006	0	7,688	0	**7,688**	1,981	0	**1,981**	**9,669**	**16**
2007	0	7,859	0	**7,859**	2,037	0	**2,037**	**9,896**	**16**
2008	0	7,978	0	**7,978**	2,074	0	**2,074**	**10,052**	**13**
2009	0	8,066	0	**8,066**	2,097	0	**2,097**	**10,163**	**14**
2010	0	8,154	0	**8,154**	2,120	0	**2,120**	**10,274**	**13**
2011	0	6,400	0	**6,400**	1,600	0	**1,600**	**8,000**	**12**
2012	0	6,400	0	**6,400**	1,600	0	**1,600**	**8,000**	**16**
2013	0	6,470	0	**6,470**	1,618	0	**1,618**	**8,088**	**16**
2014	0	6,540	0	**6,540**	1,636	0	**1,636**	**8,176**	**16**

Source: FAA 5010 Master Records, FAA TAF and Airport Records

- Total Operations: As shown, according the FAA TAF and FAA 5010 records, total annual operations have slightly declined over the last 10 years, down 11% overall or a compound annual growth rate (CAGR) of -1.1% between 2004 and 2014. This decline in general aviation activity at Priest River Municipal Airport is consistent with national trends.

- Air Taxi Operations: There were no air taxi operations at Priest River Municipal Airport over the last 20 years.

- General Aviation Operations: Total general aviation operations (both local and itinerant) have slightly declined over the last 10 years. Operations peaked in 2010 at 10,274 annual operations. In 2011, general aviation operations dropped to 8,000 per year and have remained unchanged since 2011. This decline is not unique to Priest River Municipal Airport and is reflective of the decline in general aviation activity across the nation due to economic weakness during the recession coupled with high fuel prices.

- Military Operations: Although, airport management and users of the airport report minimal amount of military helicopter traffic throughout the year, the FAA TAF indicates no military operations at Priest River Municipal Airport since 1990.

- Based Aircraft: The number of aircraft based at Priest River Municipal Airport has slightly declined over the last 20 years. In 2014, 16 aircraft, all single-engine aircraft and including two ultra-light, were based at the airport.

3.2 TRENDS/ISSUES WITH THE POTENTIAL TO INFLUENCE FUTURE AIRPORT GROWTH

There are several factors that may influence aviation activity which are independent of airport activity. It is worthwhile to review outside influences to determine how they may impact future growth. These factors include regional demographics and outlook, national aviation trends, and local factors.

3.2.1 REGIONAL DEMOGRAPHICS

Socioeconomic characteristics are collected during the airport planning process and examined to derive an understanding of the dynamics of historic and projected growth within the geographic area served by an airport. This information is then typically used as one tool to forecast aviation demand. The types of socioeconomic data that are presented include population, employment, and per capita personal income.

The Airport is located in Bonner County, which counts two main public airports: Sandpoint Airport and Priest River Municipal Airport. Priest River Municipal Airport mostly serves the towns of Priest River and Newport, WA located at the border of Bonner County. Sandpoint Airport serves the towns of Sandpoint, Kootenai, Ponderay and Dover. A summary of historic and projected socioeconomic trends for Bonner County is presented below.

Population

The population in Bonner County is on an upward trend since 1969. Between 1980 and 2008, the population increased at a Compound Annual Growth Rate (CAGR) of 1.88% from 24,301 to 40,966, fueled by recreational opportunities and quality of life. However, from 2003 to 2013, the County's population grew only 6 percent, while that of Idaho grew 18 percent and the U.S population grew 9 percent. Since 2008, the population remained unchanged at approximately 40,800. Bonner County also has hundreds of summer residents.

Sandpoint is the county seat and the largest city of the County with a population of 7,577 in 2013. Priest River is the largest city west of Sandpoint and has a population of 1,720 residents. (Source: U.S. Census Bureau and Idaho Department of Labor)

Employment

According to the Idaho Department of Labor, Bonner County has successfully been able to expand and diversify its economy. The manufacturing jobs rose 27 percent from 1,486 in 2000 to 1,880 in 2010. However, the County sawmills have suffered from low prices and the Priest River area has lost more than 650 jobs in sawmills and logging since 2006.

The civilian labor force in Bonner County increased from 18,460 in 2003, with an unemployment rate of 7.3 percent to 19,040 in 2013, with an unemployment rate of 8.6 percent. In May 2014, the unemployment rate was 6.5 percent, slightly higher than the U.S unemployment rate of 6.3 percent and the State of Idaho unemployment rate of 4.9 percent.

The unemployment rate peaked in 2010 at 6.2 percent and has been slowly declining over the last three years. In 2012, the unemployment rate in Bonner County was 4.7 percent; comparatively, the unemployment rates for Idaho and the U.S. were 7.3 percent and 8.1 percent, respectively.

Employment in northern Idaho (Bonner, Benewah, Boundary, Kootenai and Shoshone counties) is projected to grow at a CAGR of 1.56 percent between 2010 and 2020. (Source: Idaho Regional Economic Analysis Project, U.S. Bureau of Economic Analysis, Idaho Department of Labor)

Per Capita Income

In 2012, the per capita personal income (PCPI) of Bonner County was $33,749. The PCPI has grown over the last 22 years (1990 - 2012) with a CAGR of 4.30 percent. The PCPI growth for Bonner County has outpaced that of Idaho (3.57 percent CAGR) and of the U.S. (3.72 percent CAGR). However, the level of the PCPI in Bonner County remains lower than that of Idaho and the United States (respectively $34,481 and $43,735 in 2012).

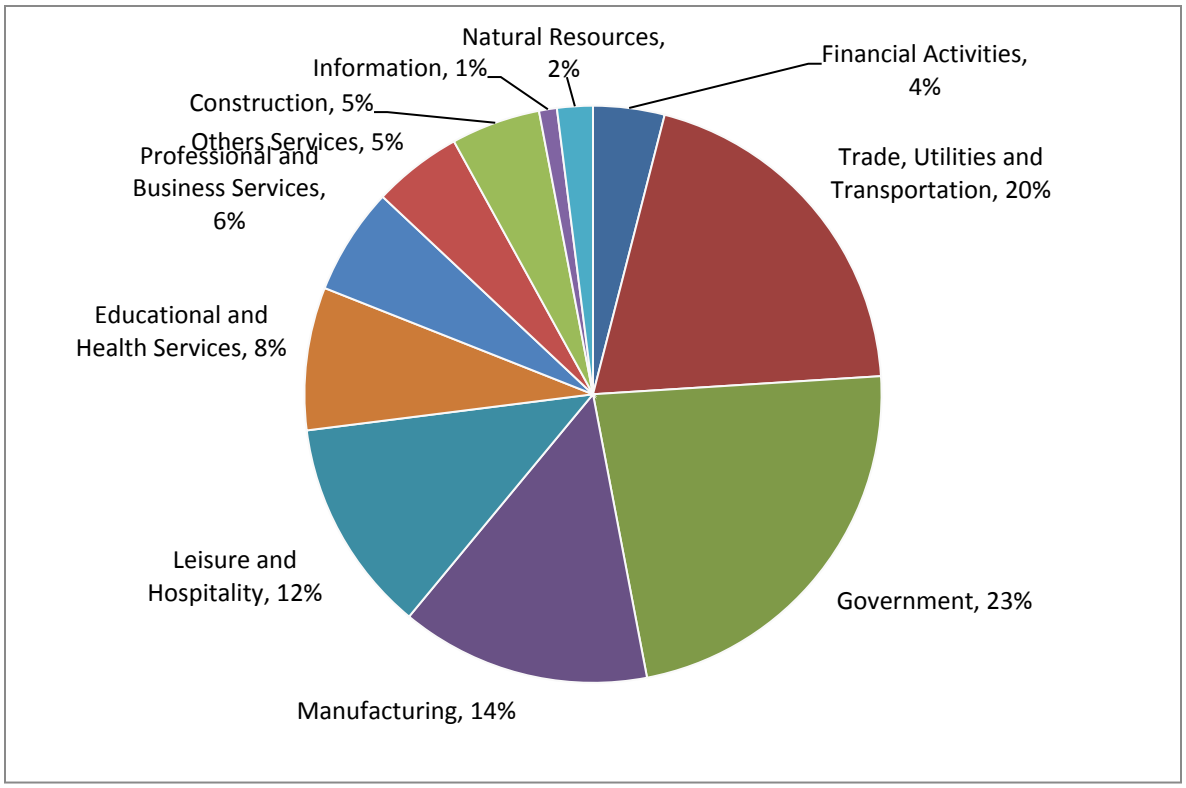
The Median Household Income was $29,583 in Priest River and $41,379 in Bonner County in 2012. (Source: Idaho Regional Economic Analysis Project, U.S. Bureau of Economic Analysis, U.S. Census Bureau – American Fact Finder)

Industry Mix

The largest nonfarm industries in Bonner County are Government, Trade, Utilities and Transportation and Manufacturing. According to the Idaho Department of Labor, manufacturing jobs rose 27 percent between 2000 and 2010, while they fell 26 percent statewide. The main contributor to this expansion were Litehouse salad dressings, Quest Aircraft, Unicep Packaging plastic applicators, Thorne Research's nutritional supplements, Cygnus machining, Diedrich's coffee-roasting machines and Encoder Products electronics. Quest Aircraft is headquartered in Sandpoint and is the manufacturer of the Kodiak, a 10-seat single engine turboprop airplane. The company is currently located at the Sandpoint Airport.

Figure 3-1 displays the repartition of the nonfarm payroll jobs in Bonner County in 2012: 20 percent of the nonfarm payroll jobs in the County were in the trade, utilities, and transportation industries, while the government sector accounted for 23 percent, manufacturing accounted for 14 percent and leisure and hospitality jobs accounted for 12 percent.

FIGURE 3-1 – NONFARM PAYROLL JOBS



Source: T-O Engineers, Inc., Idaho Department of Labor

The tourism sector in Bonner County is an important part of the local economy both in winter and summer. The development of Schweitzer Mountain Resort and its expansions since 1990 have boosted winter employment at local motels, restaurants and stores. In addition, Sandpoint's reputation for recreational activities as well as for the arts has contributed to tourism growth.

However, as previously mentioned, the sawmill industry, which is the county's mainstay, have been suffering and the Priest River area has lost numerous sawmill and logging jobs. (Source: Idaho Department of Labor)

Newport and Pend Oreille County, Washington

The city of Newport, WA is located on the Washington/Idaho border, just west of the Pend Oreille River, approximately 7 miles from the City of Priest River. Newport is the County seat of Pend Oreille County and developments in the eastern portions of Pend Oreille County may have potential impacts on demand at Priest River Municipal Airport.

The population in Newport was 2,116 in 2013 and the median household income was $28,265 in 2012. In Pend Oreille County, the population was 13,150 in 2013 and the median household income was $37,582 in 2012.

Pend Oreille County is a very rural county and highly depends on resources extraction, specifically gold, lead and zinc mining as well as timber and cement manufacturing. Pend Oreille County experiences high unemployment rate and low labor force participation compared to the State of Washington.

Two major employment sectors in Pend Oreille County are manufacturing and government. Further, the Ponderay Newsprint Company, a paper manufacturer, is also a major employer in Pend Oreille County.

The average unemployment rate in 2013 was 11.2 percent and 11.6 percent in 2012, which is one of the highest unemployment rates in the state of Washington. The drop in the unemployment rate was due to decreases in the labor force, not because of increases in jobs. (Source: United States Census Bureau – American Fact Finder, Employment Security Department – Washington State)

3.2.2 NATIONAL AVIATION TRENDS

Historic and anticipated trends related to general aviation will be important considerations in developing forecasts of demand for Priest River Municipal Airport. National trends can provide insight into the potential future of aviation activity and anticipated facility needs. The aviation industry has experienced significant changes over the last 30 years. This section will briefly discuss the tendencies and factors that have influenced those trends in the U.S.

National General Aviation Industry Trends

At the national level, fluctuating trends regarding general aviation usage and economic upturns/downturns resulting from the nation's business cycle have impacted general aviation demand. Slow economic recovery and economic uncertainties will continue to impact demand for general aviation at many airports throughout the U.S., including Priest River Municipal Airport, over the next several years.

- General Aviation Fleet Changes: While single-engine piston aircraft still account for the majority (61%) of the U.S. general aviation aircraft fleet in 2013, the national historic trends indicate that multi-engine turboprop and business jet fleets grew at a faster rate than the single-engine piston fleet. The most active growth in the fleet size has been in turbine aircraft and rotorcraft. According to the *FAA General Aviation and Air Taxi Activity Survey*s, as a result of the recent recession, the U.S. general aviation aircraft fleet has declined 4.7% from 231,606 aircraft in 2007 to an estimated 202,875 in 2013. General aviation industry began to show signs of recovery in 2012 and 2013, especially with strong growth in turbine aircraft (both rotorcraft and turbo jet) deliveries.

- Active Pilots: There were over 599,000 active pilots in the United States at the end of 2013. An active pilot is a person with a pilot certificate and a valid medical certificate. There was a -0.3% CAGR in pilot population between 2000 and 2013. Recreational and private pilot certificates accounted for the largest declines.

- General Aviation Operations: According to FAA air traffic activity, between 2000 and 2013, general aviation operations experienced a -3.3% CAGR. In 2013, there were approximately 25.8 million general aviation operations at 514 towered airports, 55% of which were itinerant operations. General aviation operations at combined FAA and contract towers were down 1.2% between 2012 and 2013.

National Projections of Demand

On an annual basis, the FAA publishes aerospace forecasts that summarize anticipated trends in all components of aviation activity. Each published forecast revisits previous aerospace forecasts and updates them after examining the previous year's trends in aviation and economic activity. Many factors are considered in the FAA's development of aerospace forecasts, some of the most important of which are U.S. and international economic forecast and anticipated trends in fuel costs. The recent projections found in *FAA Aerospace Forecast Fiscal Years 2014-2034* are summarized below.

- During the five year period between 2013 and 2018, U.S. economic growth is projected to grow at a CAGR of 2.9%. For the remaining years of the forecast period, real Gross Domestic Product (GDP) growth is assumed to slow to around 2.4% annually.

- The FAA estimates that the U.S. general aviation aircraft fleet will grow from an estimated 203,000 aircraft in 2013 to 225,700 aircraft in 2034. This is equal to a CAGR of 0.5%. Most of this growth is driven by turbo jet, turboprop, and turbine rotorcraft markets, while the number of piston aircraft is expected to slightly decrease.

- Strong growth is anticipated in the turbine aircraft (turboprop and jets) fleet, estimated to grow at a CAGR of 2.4% between 2013 and 2034.

- General aviation hours flown will increase at a CAGR of 1.4% between 2013 and 2034.

- It is anticipated that general aviation aircraft operations will grow at a CAGR of 0.5% through 2034.

3.2.3 LOCAL FACTORS AFFECTING DEMAND

There are other factors, unique to Priest River Municipal Airport, which have the potential to impact the forecasts developed in this chapter.

Proximity to Competing Airports

The proximity to competing airports is one of the key determinants of the demand and size of an airport's service or catchment area. For comparative purposes, only the airports equipped with a paved runway have been included hereafter; two airports with a turf/gravel runway are also located in close proximity to Priest River Municipal Airports: Priest Lake USFS Airport and Cavanaugh Bay Airport, respectively at 26 and 23 miles.

Sandpoint Airport is also located in Bonner County, approximately 17 miles northeast of Priest River Municipal Airport. However, beside Sandpoint Airport, there are few airports in northern Idaho and eastern Washington that are within close proximity of Priest River Municipal Airport, mainly due to mountainous terrain.

As depicted with **Figure 3-2**, the only other public-use airport located within a 20 miles radius of Priest River Municipal Airport is Sandpoint Airport. There are two other airports located within a 30 miles radius: Deer Park Airport in Washington and Coeur d'Alene Airport in Idaho.

As noted in **Table 3-2**, all except one of the neighboring or competing airports have runway length that exceed that presently available at Priest River Municipal Airport. When total based aircraft among all of the general aviation airports in the area are considered, there are presently 607 general aviation aircraft based in the area, most of them based at Coeur d'Alene, Deer Park, WA and Sandpoint.

FIGURE 3-2: AREA AIRPORTS

TABLE 3-2 AREA AIRPORTS SUMMARY

Airport	Runway Length*	Based Aircraft**	Annual Operations	Distance from Priest River Municipal Airport
Priest River Municipal	2,983 feet	16	8,000	-
Sandpoint	5,501 feet	79	30,100	17.8 miles
Deer Park (WA)	6,100 feet	94	36,540	28.5 miles
Coeur d'Alene	7,400 feet	252	123,048	29.1 miles
Sand Canyon	3,446 feet	17	11,000	39.4 miles
Ione Municipal (WA)	4,059 feet	3	2,700	42.6 miles
Boundary County	4,002 feet	57	18,925	46.5 miles
Troy (MT)	3,570 feet	0	700	50.5 miles
Colville Municipal (WA)	2,695 feet	35	7,550	51.1 miles
Spokane International (WA)	11,002 feet	54	67,131	54.5 miles
	TOTAL	***607***	***305,694***	

*Longest Runway if the airport is equipped with several runways

** Includes Fixed wing aircraft (Single-engine, multi-engine and jet), Helicopters, Gliders and Ultra-Light

Source: FAA 5010 Master Records and T-O Engineers Inc.

Local Business and Tourism Usage

There are several areas of economic growth in Bonner County that have the potential to increase the usage of Priest River Municipal Airport.

According to the ITD Individual Airport Summary, completed in 2009, two area businesses depend on the airport: Northland Aviation and Aerocet Floats. However, Northland Aviation was dissolved in 2009 and no longer operates a business in Priest River. Further, the airport manager and users of the airport advise that Quest Kodiak occasionally uses the airport.

The tourism industry is also an important component of Bonner County. It has experienced significant growth in the past and may continue to experience growth in the future. The development of the nearby Schweitzer Mountain Resort, as well as the reputation of Bonner County for its scenic landscapes, recreational and outdoors activities certainly contributes to increase the tourism in the area.

Although the proximity with Sandpoint Airport and the absence of fuel at Priest River Municipal Airport are limiting factors, the increased tourism in Bonner County and the Priest Lake area has the potential to in turn increase the use of Priest River Municipal Airport. Priest Lake is a popular tourist destination, especially during the summer months and the airport is used by both tourists and second-home owners, mostly with single engine aircraft.

The Priest River Museum and Timber Education Center provide history and activities relating to the timber industry and, historical economic foundation of the Priest River area. In addition, local festivals in the Priest River and Priest Lake Area, such as the Priest River Timber Days and Priest Lake Huckfest in July, have the potential to attract tourists and increase the use of the airport.

Aerial Firefighting & Life Flight/Medical Related Activity

In 2014, the Idaho Department of Lands (IDL) advised there were no IDL or United States Forest Service (USFS) aerial firefighting activities conducted out of Priest River Municipal Airport. Due to the proximity with Sandpoint Airport, there is limited need for aerial firefighting activities at Priest River Municipal Airport. Both fixed-wing (Single Engine Air Tanker) and helicopter activities by the USFS are conducted out of the Panhandle Heli-tac base at Sandpoint Airport.

However, the Airport Board advised the Priest River Municipal Airport was used by single-engine firefighting aircraft during the summer 2015, and that firefighting aircraft occasionally used the airport during this fire season. The magnitude of use is dictated by the severity of the fire season and the proximity of the fire to the airport.

Although there is limited used by Life Flight fixed-wing aircraft, the airport is regularly used by Life Flight helicopters, and the ability of the airport to support and accommodate Life Flight helicopters and fixed-wind operations is viewed as critical to the overall health and well-being of the community.

Further, airport management and users of the airport report minimal amount of military helicopter traffic throughout the year.

Summary of local factors

The use of the airport for tourism, recreational flight, business, occasional firefighting, and Life Flight operations is considered to be an important function of the airport over the planning horizon. It is not anticipated that the various aircraft associated with these activities will approach the threshold to consider changes to the identified critical aircraft at the airport and the existing runway length may limit the type of aircraft that can use the airport without weight or fuel restrictions. Recommended facilities and strategies to address potential impacts are considered in later chapters of this report.

3.3 PROJECTIONS OF DEMAND

While the Priest River Municipal Airport has experienced a decline in its number of based aircraft and operations since the events of September 11, 2001 and the recent economic recession; it is considered to be unlikely that this pattern will continue over the forecasted period. The airport will most likely experience moderate growth over the next 20-year forecast period, the rate of that growth will be somewhat comparable to others in the region, but somewhat dependent on the future facilities and services provided at the airport.

Projections of aviation demand at Priest River Municipal Airport for the 20-year planning period are presented here using various methodologies. The results of these different methodologies are compared and a preferred projection of each is selected.

The following assumptions were made in developing the projections of aviation demand at Priest River Municipal Airport:

- The national and local economies will continue to grow through the overall forecast period.
- Economic disturbances may cause year-to-year traffic variations, but the long term projections will likely be realized.
- Aviation at Priest River Municipal Airport will generally reflect the national aviation industry. The FAA projects growth in all aspects of aviation.

- Airport facilities will keep pace with and meet the demand for aviation use and a lack of facilities will not limit the number of based aircraft to be accommodated in the future.

3.3.1 FORECASTING METHODOLOGIES

Several forecasting techniques were used to project future aviation demand at Priest River Municipal Airport. There are two basic approaches to forecasting: top-down or bottom-up. The top-down approach forecasts aviation demand for the nation or for a region and allocates portions of the total demand to geographic areas, based on historical shares or assumed growth rate. The bottom-up approach consists in forecasting aviation demand for an airport using data for a specific geographic area.

When forecasting aviation demand, it is assumed there is a relationship between historical events and conditions, and that this relationship will continue into the future. The following methods were used to predict future activity levels at Priest River Municipal Airport.

Market Share

This method of forecasting is a relatively easy method to use and the required data is often available in the FAA's Terminal Area Forecast (TAF). It assumes a top-down relationship between national, regional and local forecasts and considers that local forecasts are a percentage (market share) of regional or national forecasts. Historical market shares are calculated for a given time period (often a 5- or 10-year period) and used as a basis for projecting future market shares.

Regression Analysis - Trend Analysis

A regression analysis is a type of econometrics analysis, and uses mathematical and statistical tools. The value being estimated or forecasted (here aviation activity) is called the dependent variable, while the value used to prepare the forecast is called the independent variable. A simple regression analysis uses one independent variable, while multiple regression analyses use two or more independent variables.

A regression equation is computed with historical values and is used to project future values. It is possible to use socioeconomic data as independent variables, such as population, per capita income, or employment. It is also possible to use time as the independent variable to perform a Trend Analysis. This method is a basic technique, which can capture economic growth and recession.

Compound Annual Growth Rate

The Compound Annual Growth Rate (CAGR) can be defined as the year-over-year growth rate. It is an imaginary number that describes the rate at which a data series would have grown if it had grown at a steady rate.

It is computed with the following formula:

$$CAGR = -1 + \left(\frac{Ending\ Value}{Beginning\ Value}\right)^{\left(\frac{1}{number\ of\ years}\right)}$$

It is possible to forecast future values based on the CAGR of a data series, assuming that the rate will remain the same in the future. As with every forecasting method uncertainties remain.

Summary

These different methodologies can be used in an infinite number of ways, with several distinct variables. Regression analyses can be used with population, employment, personal per capita income, or even a combination of the three as the independent variable. Market share can be computed using a five-year average or a ten-year average and data from the state or from a FAA region. In addition, predictions with the CAGR can be computed using the historic rate for the last 10 years, or the historic rate for the last 20 years, as well as the projected employment growth or the historic Per Capita Personal Income (PCPI) growth.

The following methodologies and variables were used to predict the number of based aircraft and operations at Priest River Municipal Airport.

- Linear Regression
  - With Employment as the independent variable
  - Trend Analysis
- CAGR
  - Historic Growth (Last 10 years)
  - Historic Growth (Last 20 years)
  - Projected Employment Growth
  - Historic PCPI growth
- Market Share
  - Northwest Mountain Region (5-year average)
  - Northwest Mountain Region (10-year average)
  - State of Idaho (5-year average)
  - State of Idaho (10-year average)

Not all these methodologies yielded coherent or reasonable results. In addition, some methodologies, in particular the market shares yielded similar or very close results. Therefore, not all the methodologies used during the initial analysis will be presented in the subsequent

sections of this report; based on the consultant's professional opinion only the methods leading to coherent and reasonable results will be described in details hereafter.

3.3.2 BASED AIRCRAFT

Based aircraft are those aircraft that are permanently stored at an airport. Estimating the number and type of aircraft expected to be based at Priest River Municipal Airport over the next 20 years is crucial to evaluate the need for future facility and infrastructure requirements.

As discussed in the Inventory chapter, the airport's most recent FAA 5010 (09/18/2014) and the FAA National Based Aircraft Inventory Program identify 16 total aircraft based at Priest River Municipal Airport: 14 single-engine and 2 ultra-light. Sixteen based aircraft will be used as the base year (2014) based aircraft number from which projections are developed.

Based aircraft at Priest River Municipal Airport were projected using the methodologies previously described. A summary of the methodologies yielding coherent and reasonable results is below and shown in **Table 3-3** and **Figure 3-3**.

- Scenario 1: Historic Based Aircraft Growth. This scenario projects based aircraft to increase at an average annual rate of growth of 0.32%, equal to the historic CAGR in based aircraft at Priest River Municipal Airport between 1994 and 2014.

- Scenario 2: Projected Employment Growth. This scenario projects based aircraft to increase at an average annual rate of growth of 1.56%, equal to the projected employment growth developed for northern Idaho, as part of the Idaho Regional Economic Analysis Project.

- Scenario 3: 10-year average Market Share of Northwest Mountain Region Based Aircraft. During the last ten years, Priest River Municipal Airport's share of Northwest Mountain (NWM) Region's based aircraft fleet as reported in the FAA's Terminal Area Forecasts, was on average 0.0065%. This scenario assumes that Priest River Municipal Airport will maintain this share of the NWM Region Based Aircraft and that the NWM Region Based Aircraft will grow as predicted in the FAA's Terminal Area Forecasts. The annual growth rate for this scenario is 0.95%.

- Scenario 4: 10-year average Market Share of Idaho Based Aircraft. During the last ten years, Priest River Municipal Airport's share of Idaho's based aircraft fleet as reported in the FAA's Terminal Area Forecasts, was on average 0.56%. This scenario assumes that Priest River Municipal Airport will maintain this share of the State of Idaho Based Aircraft and that the Idaho Based Aircraft will grow as predicted in the FAA's Terminal Area Forecasts. The annual growth rate for this scenario is 1.29%.

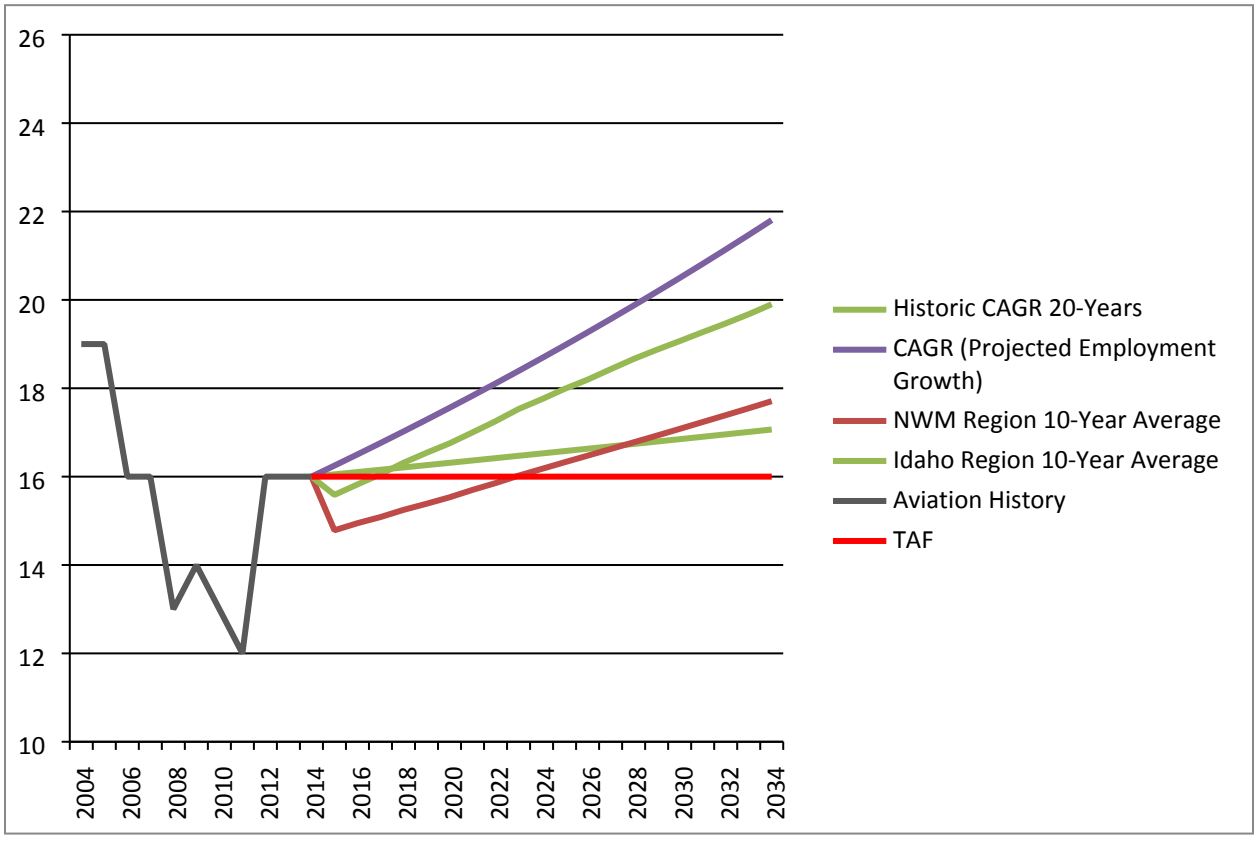
The results of these forecasting methodologies were compared and are listed and depicted in **Table 3-3 and Figure 3-3**. The FAA TAF notes that 16 aircraft were based at the airport and maintains this number through the planning period. This scenario was not considered as the traffic and number of based aircraft in north Idaho is experiencing significant growth.

TABLE 3-3 – BASED AIRCRAFT PROJECTIONS

Year	Scenario 1 Historic Based Aircraft Growth	Scenario 2 Projected Employment Growth	Scenario 3 NWM Region Market Share	Scenario 4 Idaho Market Share	FAA Terminal Area Forecast (TAF)
2014	16	16	16	16	16
2019	16	17	16	17	16
2024	17	19	16	18	16
2034	17	22	18	20	16
CAGR (2015-2034)	**0.32%**	**1.56%**	**0.95%**	**1.29%**	**0%**
2019 Variation from TAF	**1.62%**	**8.05%**	**-3.84%**	**3.37%**	**-**
2024 Variation from TAF	**3.28%**	**16.74%**	**1.09%**	**10.94%**	**-**
2034 Variation from TAF	**6.67%**	**36.29%**	**10.68%**	**24.38%**	**-**

Source: T-O Engineers, Inc.

FIGURE 3-3 – BASED AIRCRAFT PROJECTIONS



Source: T-O Engineers, Inc.

The results of the four scenarios examined in this analysis were compared to the FAA's Terminal Area Forecast (TAF) for Priest River Municipal Airport.

The four scenarios predict a growth in the number of based aircraft and all the scenarios are higher than the TAF at the end of the planning period. Scenario 2 (Projected Employment growth) was chosen as the preferred based aircraft projection, with a CAGR of 1.56%. Based on this methodology, by the end of the forecast period, 22 based aircraft are projected at Priest River Municipal Airport. This is 36.29% more than the TAF projections of based aircraft at the end of the planning period. During the first 5 years of the planning period (2014-2019), the maximum variation from the TAF projections is 8.05%; during the following 5 years of the planning period (2020-2024) the maximum variation from the TAF projections is 16.74%.

The projected employment growth as noted by the State of Idaho points to new jobs and business growth around Priest River Municipal Airport which can correlate to additional based aircraft at the airport. It was considered that six additional based aircraft at the end of the planning period was not unrealistic given the growth experienced in north Idaho. Based on this correlation as well as the consultant's professional opinion, the Projected Employment Growth Rate methodology (Scenario 2) is the preferred forecast for based aircraft.

Fleet Mix

Total based aircraft projected for the airport over the planning period using the preferred based aircraft projection were allocated to four aircraft categories – single-engine, multi-engine and jet, helicopter, and other – to develop a projection of the airport's based aircraft fleet mix through the planning period. The fleet mix projections developed for Priest River Municipal Airport were developed based on the fleet mix percentages exhibited at the airport and in the *FAA Aerospace Forecast, Fiscal Years 2014-2034* projection of active general aviation aircraft.

The preferred based aircraft fleet mix projections are shown in **Table 3-4**. Turbine aircraft are anticipated to grow at the national level through the forecast period. However, existing facilities constraints and limitations may hinder the growth in multi-engine at Priest River Municipal Airport. Based on the anticipated national growth, current facilities constraints and the consultant's professional opinion two small multi-engine aircraft are estimated to be based at Priest River Municipal Airport by 2034.

Further, two ultra-light aircraft are currently based at the airport. Based on the anticipated national growth in Experimental, Sport Aircraft and Other Aircraft through the planning period, four aircraft classified as "Other" are expected to be based at the airport at the end of the planning period. The "Other" category includes the ultra-light aircraft currently based at the airport as well as experimental and sport aircraft. There is potential for additional ultra-light aircraft based at Priest River Municipal Airport.

TABLE 3-4 – PROJECTED BASED AIRCRAFT FLEET MIX

Aircraft Type	2014	2019	2024	2034	CAGR 2014-34
Single-Engine	14	14	15	16	0.67%
Multi-Engine	0	0	1	2	-
Helicopter	0	0	0	0	-
Other*	2	3	3	4	3.53%
Total	**16**	**17**	**19**	**22**	**1.56%**

*Includes Ultra-Light, Experimental, Sport Aircraft and Other aircraft

Source: T-O Engineers, Inc.

3.3.3 AIRCRAFT OPERATIONS

Aircraft operations are divided into two types: local and itinerant. Local operations are classified as operations by aircraft, which:

- Operate in the local traffic pattern or within sight of the airport, or
- Are known to be departing for or arriving from flights in local practice areas within a 20-mile radius of the airport, or
- Execute simulated approaches or low passes at the airport.

Itinerant operations are defined as:

- All other operations other than local.

The current ratio of local to itinerant general aviation is 20 percent local and 80 percent itinerant.

Different factors impact the number of operations at an airport including but not limited to, the total based aircraft, area demographics, activity and policies of neighboring airports, and national trends. These factors were examined and projections were developed for the local operations, itinerant operations as well as for the total number of operations.

Local Operations

A summary of the methodologies used to develop the aircraft local operations are below and shown in **Table 3-5** and **Figure 3-4.**

- Scenario 1: Historic Local Operations Growth. This scenario projects local operations to increase at an average annual rate of growth of 0.78%, equal to the historic CAGR in local operations at Priest River Municipal Airport between 1994 and 2014.

- Scenario 2: Projected Employment Growth. This scenario projects local operations to increase at an average annual rate of growth of 1.56%, equal to the projected employment growth developed for northern Idaho, as part of the Idaho Regional Economic Analysis Project.

- Scenario 3: 5-year average Market Share of Northwest Mountain Region Local Operations. During the last five years, Priest River Municipal Airport's share of Northwest Mountain (NWM) Region's local operations as reported in the FAA's Terminal Area Forecasts, was on average 0.044%. This scenario assumes that Priest River Municipal Airport will maintain this share of the NWM Region local operations and that the NWM Region local operations will grow as predicted in the FAA's Terminal Area Forecasts. The annual growth rate for this scenario is 0.84%.

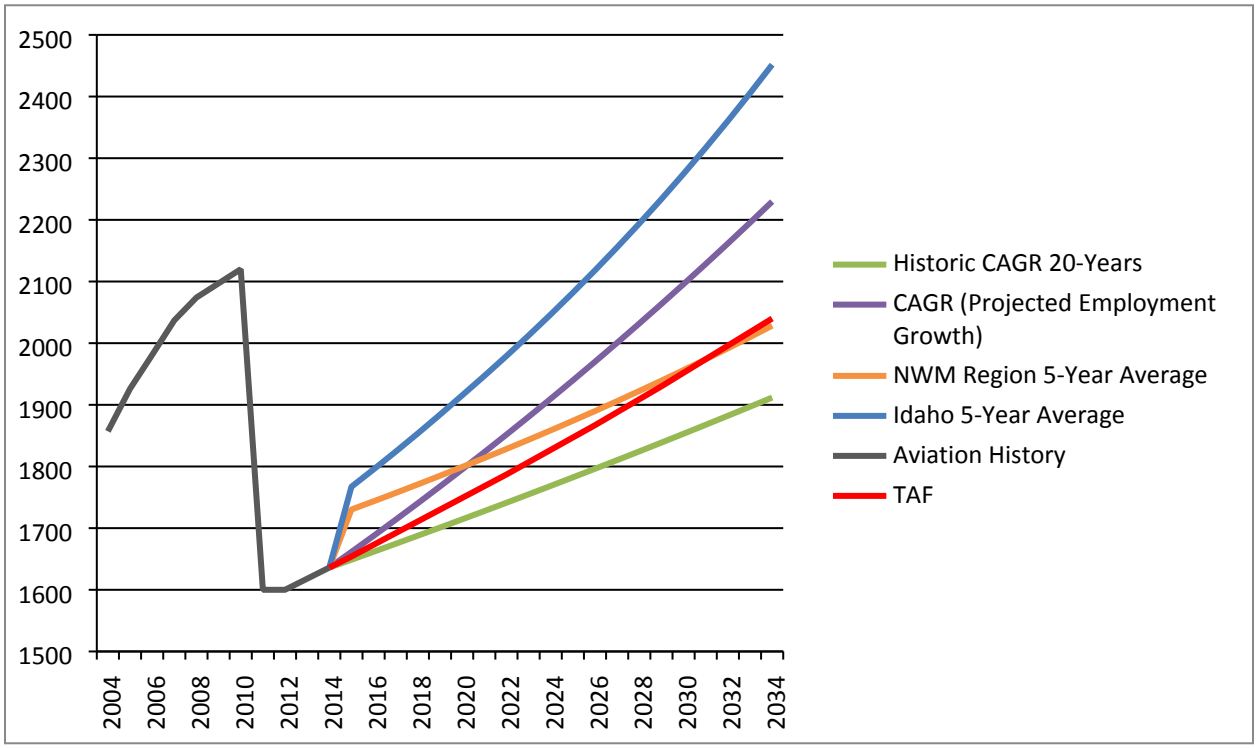
- Scenario 4: 5-year average Market Share of Idaho Local Operations. During the last five years, Priest River Municipal Airport's share of Idaho's local operations as reported in the FAA's Terminal Area Forecasts, was on average 0.43%. This scenario assumes that Priest River Municipal Airport will maintain this share of the State of Idaho Local Operations and that the Idaho Local Operations will grow as predicted in the FAA's Terminal Area Forecasts. The annual growth rate for this scenario is 1.73%.

TABLE 3-5 – GENERAL AVIATION LOCAL OPERATIONS PROJECTIONS

Year	Scenario 1 Historic Local Operations Growth	Scenario 2 Projected Employment Growth	Scenario 3 NWM Region Market Share	Scenario 4 Idaho Market Share	FAA Terminal Area Forecast (TAF)
2014	1,636	1,636	1,636	1,636	1,636
2019	1,701	1,768	1,785	2,101	1,730
2024	1,769	1,910	1,859	2,282	1,807
2034	1,912	2,230	2,028	2,734	2,040
CAGR (2015-2034)	**0.78%**	**1.56%**	**0.84%**	**1.73%**	**1.11%**
2019 Variation from TAF	**-1.68%**	**2.18%**	**3.18%**	**8.91%**	**-**
2024 Variation from TAF	**-3.20%**	**4.54%**	**1.73%**	**12.02%**	**-**
2034 Variation from TAF	**-6.29%**	**9.30%**	**-0.57%**	**20.18%**	**-**

Source: T-O Engineers, Inc.

FIGURE 3-4 – GENERAL AVIATION LOCAL OPERATIONS PROJECTIONS



Source: T-O Engineers, Inc.

The results of the four scenarios examined in this analysis were compared to the FAA's TAF for Priest River Municipal Airport. All the scenarios are higher than the TAF except for Scenario 1 (Historic Local Operations Growth). The four scenarios predict a growth in the number of local operations. Scenario 1 (Historic growth rate) is the less aggressive with 1,912 local operations forecasted at the end of the planning period, while Scenario 4 (Idaho Market Share) is the most aggressive with 2,734 local operations at the end of the planning period.

Scenario 2 (Projected Employment Growth) was chosen as the preferred general aviation local operations projection, with a CAGR of 1.56%. Based on this methodology, 2,230 local operations are projected at Priest River Municipal Airport, by the end of the forecast period. This is 9.3% more than the TAF projections of local operations. This scenario is considered to be reasonable without being overly aggressive. It is higher than Scenario 1 (Historic Local Operations Growth), but lower than Scenario 4 (Idaho Market Share).

Aviation demand is considered to be a derived demand; one that depends upon the level of business and leisure activity in the economy. The projected employment growth as noted by the State of Idaho points to new jobs and business growth around Priest River, which can correlate to anticipated increased future usage of the airport. Based on this correlation as well as the consultant's professional opinion, the Projected Employment Growth rate methodology (Scenario 2) is the preferred forecast for general aviation local operations.

Itinerant Operations

A summary of the methodologies used to develop the aircraft itinerant operations are below and shown in **Table 3-6** and **Figure 3-5.**

- Scenario 1: Historic Itinerant Operations Growth. This scenario projects itinerant operations to increase at an average annual rate of growth of 0.43%, equal to the historic CAGR in itinerant operations at Priest River Municipal Airport between 1994 and 2014.

- Scenario 2: Projected Employment Growth. This scenario projects itinerant operations to increase at an average annual rate of growth of 1.56%, equal to the projected employment growth developed for northern Idaho, as part of the Idaho Regional Economic Analysis Project.

- Scenario 3: 10-year average Market Share of Northwest Mountain Region Local Operations. During the last ten years, Priest River Municipal Airport's share of Northwest Mountain (NWM) Region's itinerant operations as reported in the FAA's Terminal Area Forecasts, was on average 0.17%. This scenario assumes that Priest River Municipal Airport will maintain this share of the NWM Region itinerant operations and that the NWM Region itinerant operations will grow as predicted in the FAA's Terminal Area Forecasts. The annual growth rate for this scenario is 1.05%.

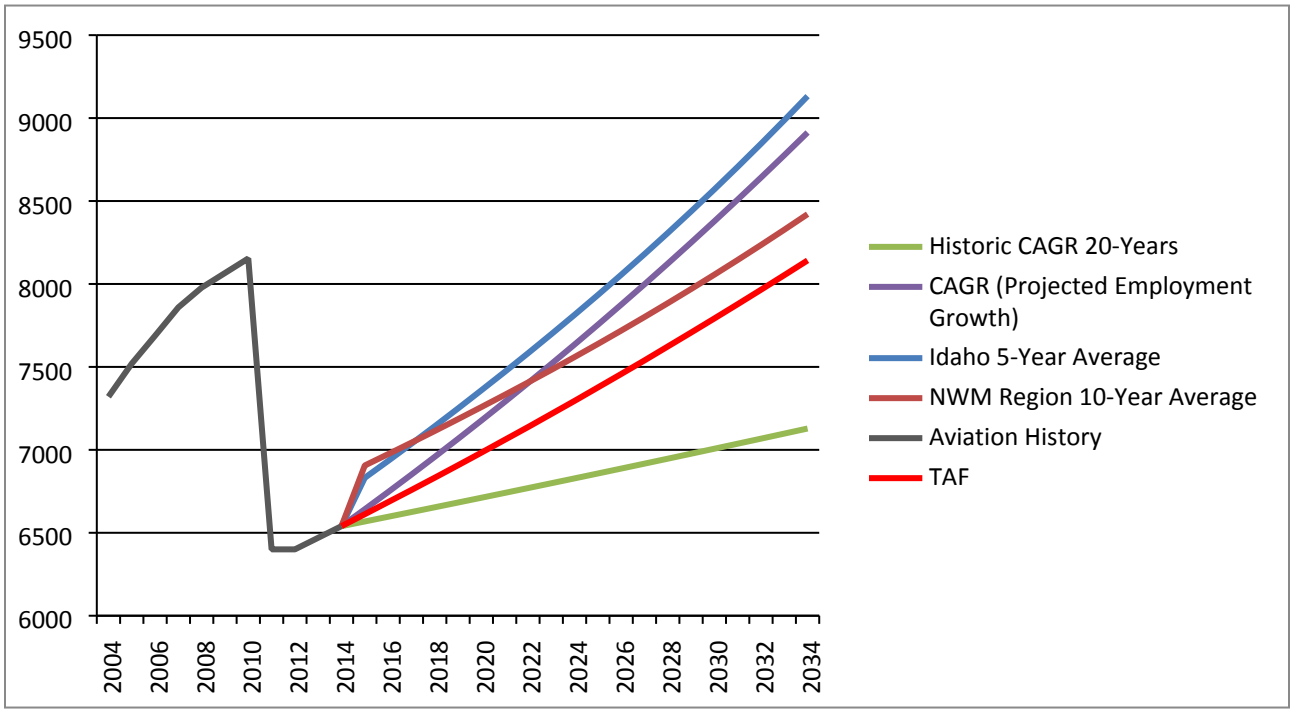
- Scenario 4: 5-year average Market Share of Idaho Local Operations. During the last five years, Priest River Municipal Airport's share of Idaho's itinerant operations as reported in the FAA's Terminal Area Forecasts, was on average 1.34%. This scenario assumes that Priest River Municipal Airport will maintain this share of the State of Idaho itinerant operations and that the Idaho itinerant operations will grow as predicted in the FAA's Terminal Area Forecasts. The annual growth rate for this scenario is 1.54%.

TABLE 3-6 – GENERAL AVIATION ITINERANT OPERATIONS PROJECTIONS

Year	Scenario 1 Historic Itinerant Operations Growth	Scenario 2 Projected Employment Growth	Scenario 3 NWM Region Market Share	Scenario 4 Idaho Market Share	FAA Terminal Area Forecast (TAF)
2014	6,540	6,540	6,540	6,540	6,540
2019	6,682	7,066	7,185	7,250	6,907
2024	6,828	7,635	7,559	7,814	7,216
2034	7,129	8,913	8,421	9,132	8,142
CAGR (2015-2034)	**0.43%**	**1.56%**	**1.05%**	**1.54%**	**1.10%**
2019 Variation from TAF	**-3.25%**	**2.31%**	**4.03%**	**4.96%**	**-**
2024 Variation from TAF	**-6.4%**	**4.66%**	**3.62%**	**7.11%**	**-**
2034 Variation from TAF	**-12.45%**	**9.47%**	**3.42%**	**12.16%**	**-**

Source: T-O Engineers, Inc.

FIGURE 3-5 – GENERAL AVIATION ITINERANT OPERATIONS PROJECTIONS



Source: T-O Engineers, Inc.

The results of the four scenarios examined in this analysis were compared to the FAA's TAF for Priest River Municipal Airport. All the scenarios are higher than the TAF except for Scenario 1 (Historic Itinerant Operations Growth). The four scenarios predict a growth in the number of itinerant operations. Scenario 1 (Historic growth rate) is the less aggressive with 7,129 itinerant operations forecasted at the end of the planning period, while Scenario 4 (Idaho Market Share) is the most aggressive with 9,132 itinerant operations at the end of the planning period.

Scenario 2 (Projected Employment growth) was chosen as the preferred general aviation itinerant operations projection, with a CAGR of 1.56%. Based on this methodology, by the end of the forecast period, 8,913 itinerant operations are projected at Priest River Municipal Airport. This is 9.47% more than the TAF projections of itinerant operations at the end of the planning period. This scenario is considered to be reasonable without being overly aggressive. It is higher than Scenario 1 (Historic Itinerant Operations Growth), but lower than Scenario 4 (Idaho Market Share).

As previously mentioned, aviation demand is considered to be a derived demand and depends upon the level of business and leisure activity in the economy. The projected employment growth as noted by the State of Idaho points to new jobs and business growth around Priest River, which can correlate to anticipated increased future usage of the airport especially for business and tourism. Based on this correlation as well as the consultant's professional opinion, the Projected Employment Growth rate methodology (Scenario 2) is the preferred forecast for general aviation itinerant operations.

Total Operations

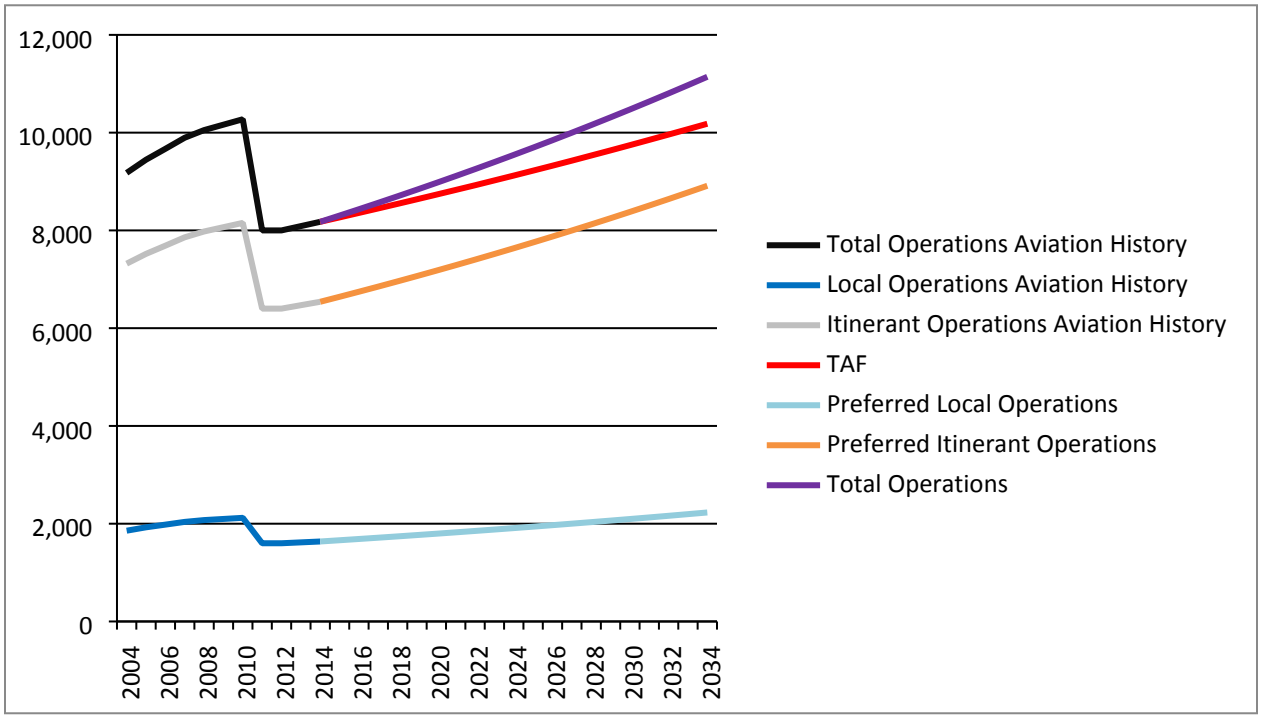
Total aircraft operations projections were derived by combining the local and itinerant operations preferred forecasts. The total aircraft operations were also compared to the FAA TAF, as shown in **Table 3-7** and **Figure 3-6.**

TABLE 3-7 – GENERAL AVIATION TOTAL OPERATIONS PROJECTIONS

Year	Local Operations Preferred Forecast	Itinerant Operations Preferred Forecast	Total Operations Projections	FAA Terminal Area Forecast (TAF)
2014	1,636	6,540	8,176	8,176
2019	1,768	7,066	8,834	8,637
2024	1,910	7,635	9,545	9,122
2034	2,230	8,913	11,143	10,182
CAGR (2015-2034)	**1.56%**	**1.56%**	**1.56%**	**1.10%**
2019 Variation from TAF	**2.18%**	**2.31%**	**2.28%**	**-**
2024 Variation from TAF	**4.54%**	**4.66%**	**4.64%**	**-**
2034 Variation from TAF	**9.30%**	**9.47%**	**9.44%**	**-**

Source: T-O Engineers, Inc.

FIGURE 3-6 – GENERAL AVIATION TOTAL OPERATIONS PROJECTIONS



Source: T-O Engineers, Inc.

This methodology results in an annual growth rate of 1.56%, which is slightly higher than the TAF's annual growth rate of 1.10%. Based on this methodology, 11,143 general aviation operations are projected to occur at Priest River Municipal Airport, by the end of the forecast period. This is 9.44% more than the adjusted TAF projections of total operations in 2034.

The preferred general aviation operations projection for Priest River Municipal Airport is carried forward in the master planning process and is used to examine future airport facility needs.

3.3.4 PEAKING ANALYSIS

Another primary consideration for facility planning at airports relates to peak hour, also referred to as design level activity. This operational characteristic is decisive because some facilities should be sized to accommodate the peaks in activity, for example, the aircraft apron or terminal areas.

In calculating the number of general aviation operations occurring during the peak hour, it was assumed that the peak day was 20 percent higher than the average day and that the peak hour was 20 percent of the peak day operations. **Table 3-8** presents peak factors for the 20-year planning period.

TABLE 3-8 – OPERATIONS FORECASTS – PEAKING FACTORS

Year	Total Annual Operations	Average Daily Total	Peak Day	Peak Hour
2014	8,176	22	27	5
2019	8,834	24	29	6
2024	9,545	26	31	6
2034	11,143	31	37	7

Source: T-O Engineers, Inc.

3.3.5 ANNUAL INSTRUMENT APPROACH OPERATIONS

Forecasts of annual instrument approaches are used by the FAA in evaluating an airport's requirements for navigational aid facilities. The FAA defines an instrument approach as an approach to an airport with the intent to land an aircraft in accordance with an instrument flight rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

Currently, Priest River Municipal Airport does not have an instrument approach. Analysis on the ability of the airport to obtain approach capabilities over the 20 year planning horizon is included in later chapters. Because no instrument approaches currently exist, no forecast has been developed for annual instrument approaches.

3.3.6 CRITICAL AIRCRAFT

The development of airport facilities is impacted by both the demand for those facilities and the type of aircraft that are expected to make use of those facilities. Generally, airport infrastructure components are designed to accommodate the most demanding aircraft which will utilize the facilities on a regular basis, also referred to as the critical aircraft. The factors used to determine an airport's critical aircraft are the approach speed and wing span of the most demanding class of aircraft anticipated to perform at least 500 annual operations at the airport during the 20 year planning period.

The existing ARC for Priest River Municipal Airport is B-I Small. Common aircraft using the airport today include single-engine aircraft with occasional use by small multi-engine aircraft. Based on available operating data at the airport and discussions with airport management, it appears single-engine aircraft 12,500 lbs or less (small aircraft) are the primary aircraft type operating at the airport.

Small multi-engine aircraft do utilize the airport occasionally throughout the year. Based on the analysis completed as part of this forecasting effort, no solid data exists that would indicate increased demand of larger aircraft over the 500 annual operations threshold during the forecast period. Further the existing runway length is a limiting factor for regular use by large aircraft.

Based on information obtained by the consultant and conversations with users and airport management, the Cessna 182 was selected as the critical aircraft. Further, according to data in the FAA National Based Aircraft Inventory Program, five Cessna 182 are based at Priest River Municipal Airport. **Table 3-9** summarizes the characteristics of the selected critical aircraft.

TABLE 3-9 – CHARACTERISTICS OF DESIGN AIRCRAFT

Approach Speed	64 knots
Wing Span	36.1 feet
Length	28.1 feet
Tail Height	9.2 feet
Maximum Take Off Weight	3,100 lbs

Source: FAA and airliners.net

Based on the analysis conducted in this forecasting effort, the fleet using the airport today will be similar in the future. Several existing constraints and development (to small aircraft standards) limit the ability of the airport to meet new and larger design standards. These constraints include the State Highway 57 as well as other roads, trees, power lines and buildings located in the immediate vicinity of the airport.

However, it is recommended that the traffic be monitored at Priest River Municipal Airport to evaluate the use by larger aircraft. Occasional use is acceptable, but regular use by larger aircraft could necessitate drastic change in the geometry of the airport and could shorten the life of the existing footprint of the airport.

3.3.7 FORECAST SUMMARY

It is anticipated that Priest River Municipal Airport will see some growth in all activity areas during the 20-year planning period. By 2034, approximately 11,143 general aviation operations are projected to occur and 22 aircraft are projected to be based at Priest River Municipal Airport. **Table 3-10** summarizes the projections in this chapter.

TABLE 3-10 – SUMMARY OF AVIATION ACTIVITY FORECASTS 2014-2034

Year	Local Operations Preferred Forecast	Itinerant Operations Preferred Forecast	Total Operations Projections	Based Aircraft
2014	1,636	6,540	8,176	16
2019	1,768	7,066	8,834	17
2024	1,910	7,635	9,545	19
2034	2,230	8,913	11,143	22
CAGR	**1.56%**	**1.56%**	**1.56%**	**1.56%**
2019 Variation from TAF	**2.18%**	**2.31%**	**2.28%**	**8.05%**
2024 Variation from TAF	**4.54%**	**4.66%**	**4.64%**	**16.74%**
2034 Variation from TAF	**9.30%**	**9.47%**	**9.44%**	**36.29%**

Source: T-O Engineers, Inc. and FAA Terminal Area Forecasts