Chapter Three: AERONAUTICAL ACTIVITY FORECAST

La Grande / Union County Airport

Airport Master Plan Update

FINAL – March 2018

Introduction

Aviation demand forecasts help to determine the size and timing of needed airport improvements. This chapter indicates the types and levels of aviation activity expected at the La Grande / Union County Airport (Airport) during a 20-year forecast period. Projections of aviation activity for the Airport were prepared for the near-term (2019), mid-term (2024), and long-term (2034) timeframes. These projections are generally unconstrained and assume that Union County (County) will be able to develop the various facilities necessary to accommodate based aircraft and future operations.

The primary objective of a forecasting effort is to define the magnitude of change in aviation activity that can be expected over time. Because of the cyclical nature of the economy, it is virtually impossible to predict with certainty year-to-year fluctuations in activity, especially when looking 20 years into the future. However, trends can be identified and used to study long-term growth potential. While a single line is often used to express the anticipated growth, it is important to remember that actual growth may fluctuate above and below this line. **Forecasts serve only as guidelines, and planning must remain flexible to respond to unforeseen changes in aviation activity and resultant facility needs.**

Forecasts for the following aviation activity parameters as presented in this chapter:

- **Based Aircraft**, including fleet mix: The number and type of based aircraft help determine the future aircraft hangar, tiedown apron, and auto parking facility requirements.
- **Aircraft Operations**, including annual, peak, local vs. itinerant, and fleet mix: An operation is defined as either an aircraft landing or taking off (*i.e.*, an aircraft landing, then taking off counts as two operations). Aircraft operations forecasts help in analyzing runway capacity and determining runway, taxiway, and navigational aid requirements. The aircraft operations forecast provides some of the input for the computer modeling that estimates future aircraft noise exposure.
- **Critical Aircraft and Airport Reference Code**: The critical, or design, aircraft is derived from the operational fleet mix (aircraft types). The critical aircraft and its airport reference code determine many airfield design requirements, such as runway and taxiway size and strength, and safety clearances around aircraft movement areas.

Once the current level of activity was determined and documented, various forecasts were developed based on one or more of the following: national, state, and regional aviation and aircraft ownership trends; state and local population trends and forecasts; socioeconomic trends; and existing and potential local airport business plans for expansion at the Airport. Next a preferred forecast was selected, which may represent a combination of more than one of the developed forecasts.

The FAA is responsible for reviewing aviation forecasts that are submitted to the agency in conjunction with airport planning. The FAA reviews such forecasts with the objective of including them in its Terminal Area Forecasts (TAF) and the National Plan of Integrated Airport Systems (NPIAS). According to FAA Order 5090.3C, forecasts must be realistic, based on the latest available data, reflect the current conditions at the Airport, be supported by information in the study, and provide adequate justification for airport planning and development.

The forecasts presented in this chapter are consistent with the Airport's role as a Regional General Aviation Airport; they do not anticipate a major role change.

Data Sources

Several data sources and forecasting guidance that were used and reference throughout this chapter are described here.

FAA Terminal Area Forecasts (TAF)

The TAF is the official FAA forecast of aviation activity for US airports. It contains active airports in the NPIAS including FAA-towered airports, Federal contract-towered airports, nonfederal-towered airports, and non-towered airports. Forecasts are prepared for major users of the National Airspace System including air carrier, air taxi / commuter, general aviation, and military. The forecasts are prepared to meet the budget and planning needs of the FAA and provide information for use by state and local authorities, the aviation industry, and the public.

FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*

AC 150/5070-6B, *Airport Master Plans*, provides guidance for the preparation of airport master plans that range in size and function from small general aviation to large commercial service facilities. This AC contains the key guidance that explains the steps required for the development of a master plan, including the preparation of aviation activity forecasts and what elements should be forecast.

Airport Cooperative Research Program Report (ACRP): *Counting Aircraft Operations at Non-Towered Airports*

Prepared for the ACRP, a research branch of the Transportation Research Board of the National Academies, this 2007 report provides methodologies used across the country to estimate operations at airports without an air traffic control tower, such as the La Grande / Union County Airport.

ACRP Report: *Airport Aviation Activity Forecasting*

This document, also prepared by the ACRP and issued in 2007, discusses methods, including different forecast modeling, and practices for aviation activity forecasting. This report identifies ways to evaluate forecasts, particularly uncertainty and accuracy in forecasts. This ACRP report also identifies common aviation metrics, issues in data collection and preparation, and data sources.

Forecasting Aviation Activity by Airport

Witten by GRA, Inc. under contract to the FAA, this 2001 document provides guidance to individuals, as well as the FAA, when preparing airport activity forecasts and those who review the forecasts. Further, the FAA utilizes this guidance when developing the TAF.

FAA Aerospace Forecasts, Fiscal Years 2014-2034

The FAA annually prepares this document to explain the current economic and aviation outlook, as well as macro level forecasts of aviation activity and the US aircraft fleet. The Fiscal years 2014-2034 report was released in March of 2014.

General Aviation Statistical Databook & Industry Outlook

The General Aviation Manufacturers Association (GAMA) publishes this document on an annual basis. The document contains the association's industry outlook for the coming year, as well as data on the GA fleet and flight activity, the US pilot population, airports, safety, international data, and forecast information. The report also contains the year-end shipment and billings figures for GA divided into four different segments: business jets, turboprops, piston engine airplanes, and helicopters.

Federal and State Data Sources

Historical and forecast socioeconomic data for the State of Oregon and Union County was obtained from several sources including the US Census Bureau, the Bureau of Business and Economic Research, the US Bureau of Labor Statistics, and Portland State University.

Local Data Sources

Other sources of data, such as the Oregon Department of Aviation's *Oregon Aviation Plan* (2007), County Comprehensive Plans and economic development information for the county and region, were obtained and researched to understand local economic issues.

Current Trends Affecting Aviation

Research has shown that national, state, and local GA trends, as well as those socioeconomic conditions influence the aviation activity at any particular GA airport. This sections aims at assessing these current trends and their possible influence on activity at the Airport.

National Aviation Trends and Forecasts

The Airport is part of an air transportation system and, as such, is subject to national and regional aviation trends. This means that the Airport is directly affected by trends that impact these larger systems. As a GA Airport, La Grande / Union County is mostly affected by trends in the GA segment of the industry. GA refers to a wide range of flight activity and, by general definition, is all flight activity excluding commercial airline and military aircraft.

GA in the US peaked in the 1970s, and then experienced years of decline until growth returned in the 1990s. The growth in the 1990s was due not only to an expanding economy, but also to the General Aviation Revitalization Act (GARA) of 1994. GARA set an 18-year limit on the liability of GA aircraft and component manufacturers, spurring production of single engine piston aircraft. Single engine piston is the aircraft type that accounts for the majority of the nation's GA activity.

The business aviation portion of GA grew rapidly in the 1990s and into the first part of the 21st century. Airplanes used for business tend to be larger and faster than those limited to personal use, although business use of GA aircraft ranges from small, single engine aircraft rentals to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. Since 9/11, business aviation has benefited from airline service problems – the additional airline passenger and baggage security imposed and reductions in air service, particularly to smaller communities. Until 2008, business aviation grew rapidly as various chartering, leasing, time-sharing, fractional ownership, interchange agreements, partnerships, and management contracts emerged.

GA growth began to decline in 2008 and 2009, due primarily to the economic recession that began the end of 2007. Soaring fuel prices in mid-2008 only reinforced the decline. The recession dampened every aspect of GA – from flight training and aircraft production, to the number of pilots and the hours aircraft were flown.

GA aircraft types are widely varied, although the majority of GA aircraft are piston-powered, fixed-wing airplanes. The FAA tracks the national GA aircraft fleet mix and the number of hours flown by aircraft type – common indicators of change in the GA industry. **Table 3A** shows the FAA's forecast for active GA and air taxi aircraft. An active aircraft is one that has a current registration and was flown at least one hour during the calendar year. The source of historical numbers is the FAA General Aviation and Air Taxi Activity (and Avionics) Surveys. The FAA suggests that the timing and strength of a recovery in aviation demand remains highly uncertain as the operational environment continues to evolve, but that the long-term outlook remains favorable. Business aviation is predicted to show stronger than the personal and recreational aviation segments, as businesses consider factors such as possible commercial airline flight delays, safety, and security issues. The number of active GA and air taxi aircraft is projected to grow 0.5% annually over the next two decades. Annual growth rates vary by type of aircraft and the FAA projects that the more expensive and sophisticated turbine-powered fleet (including helicopters) will grow at an average of 2.6% annually over the next two decades; of that fleet, the turbine jets will see the strongest growth of 3.0% annually. In contrast, the piston-powered aircraft fleet is projected to decrease at -0.3% annually. The FAA cautions its forecasts depend on many unknown factors. Some of these factors include the national and world economies, US unemployment, price of oil, and national fiscal issues.

Table 3A. US Active General Aviation and Air Taxi Aircraft Forecast

		Average Annual Growth Rate			
Aircraft Type	2013 (Estimated)	2000-2013 Historical	2013-2014 Forecast	2013-2023 Forecast	2013-2034 Forecast
Total Piston Fixed Wing	137,965	-1.6%	-0.7%	-0.6%	-0.4%
Single Engine	*123,730*	*-1.4%*	*-0.8%*	*-0.6%*	*-0.4%*
Multi-engine	*14,235*	*-3.0%*	*-0.4%*	*-0.5%*	*-0.5%*
Total Turbine Fixed Wing	22,085	4.3%	0.6%	1.7%	2.4%
Turboprop	*10,195*	*4.5%*	*-0.3%*	*0.6%*	*1.6%*
Turbojet	*11,890*	*4.2%*	*1.4%*	*2.6%*	*3.0%*
Total Rotorcraft	10,385	2.9%	3.1%	3.0%	2.6%
Piston	*3,360*	*1.8%*	*2.1%*	*1.8%*	*1.7%*
Turbine	*7,025*	*3.5%*	*3.6%*	*3.5%*	*3.0%*
Experimental	25,305	1.7%	2.3%	1.6%	1.5%
Sport Aircraft	2,110	N/A	6.2%	5.0%	4.1%
Other	5,015	-2.2%	0.2%	0.2%	0.2%
Total GA	202,865	-0.5%	0.1%	0.3%	0.5%
National Piston Growth Rate	141,325	-1.6%	-0.7%	-0.5%	-0.3%
National Turbine Growth Rate	29,110	4.1%	1.3%	2.1%	2.6%

Source: FAA Aerospace Forecast 2014-2034, Table 28 (Mar 2014); 2013 figures are estimates.

As the active aircraft fleet grows, the number of GA hours flown is projected to increase at 1.4% per year, which is a more conservative growth rate than the 2.2% that the FAA projected just a couple years ago.

FAA annual growth rate projections vary for hours flown, from a declining rate of -0.6% for piston fixed-wing aircraft, to a high growth of 4.2% for jet aircraft. **Table 3B** presents the FAA's forecast for aircraft hours flown. Rotorcraft hours were relatively immune to the recession compared to other categories. Turbine fixed wing aircraft utilization was also less impacted from the GA decline related to the recession, when compared to other categories.

Table 3B. US Active General Aviation and Air Taxi Hours Flown Forecast

		Average Annual Growth Rate			
Aircraft Type	2013 (Estimated)	2000-2013 Historical	2013-2014 Forecast	2013-2023 Forecast	2013-2034 Forecast
Total Piston Fixed Wing	12,806,000	-3.9%	-2.2%	-1.4%	-0.6%
Single Engine	*11,050,000*	*-3.7%*	*-2.2%*	*-1.4%*	*-0.6%*
Multi-engine	*1,756,000*	*-5.0%*	*-2.4%*	*-1.3%*	*-0.5%*
Total Turbine Fixed Wing	6,146,000	2.0%	3.4%	3.2%	3.3%
Turboprop	*2,759,000*	*2.6%*	*0.9%*	*0.9%*	*1.8%*
Turbojet	*3,387,000*	*1.6%*	*5.4%*	*4.8%*	*4.2%*
Total Rotorcraft	3,473,000	3.6%	2.8%	3.1%	2.8%
Piston	*748,000*	*2.7%*	*2.3%*	*2.0%*	*1.8%*
Turbine	*2,725,000*	*3.9%*	*2.9%*	*3.4%*	*3.1%*
Experimental	1,191,000	-0.7%	3.9%	3.2%	2.6%
Sport Aircraft	180,000	N/A	7.0%	6.1%	5.1%
Other	181,000	-5.4%	0.7%	0.7%	0.7%
GA Total	23,978,000	-1.7%	0.3%	1.0%	1.4%
National Piston Growth Rate	13,554,000	-3.7%	-2.0%	-1.2%	-0.4%
National Turbine Growth Rate	8,872,000	2.5%	3.2%	3.3%	3.2%

Source: FAA Aerospace Forecast 2014-2034, Table 29 (Mar 2014); 2013 figures are estimates.

The above table illustrates the disproportionate relationship between active aircraft types and the number of hours flown by these aircraft types; single engine piston airplanes represent nearly 73% of the active fleet but fly less than 50% of the total hours flown, while higher performance, more expensive aircraft represent a smaller portion of the fleet and a much larger portion of the total number of hours flown.

Post-recession recovery of GA traffic has been slow – evident by the continuing decline and subsequent flat to slow growth in the industry. In 2014, cautious optimism is returning as total airplane shipments rose in 2013 and 2014. Additionally, GA airplane billings have steadily increased over the last two years. **Table 3C** summarizes the change between 2012 and 2014.

Table 3C. GA Airplane Shipments – Manufactured Worldwide

	2012	**2013**	**2014**
Total Piston Airplanes	908	933	1,129
Total Turboprop Airplanes	584	645	603
Business Jets	672	678	722
Total Airplane Shipments	2,164	2,256	2,454
Total Airplane Billings	$18.9 billion	$23.4 billion	$24.5 billion

Source: GAMA 2014 GA Statistical Databook & 2015 Industry Outlook.

GA flying is expected to show signs of gradual recovery – the most recent activity indicators are showing flat or modest growth. While GA operations at air traffic control towered airports showed a declining trend during the recession, GA operations for 2012 increased by 0.6%. The FAA estimates that the active general aviation aircraft fleet decreased by 1.2% in 2011, and then remain unchanged in 2012.

Promising technological developments such as NextGen, coupled with the economic recovery are expected to slow past declines and support positive growth trends. NextGen, short for Next Generation, is a national initiative that is anticipated to modernize aviation. NextGen is already being implemented by airlines and at large commercial service airports, through implementation of satellite-based air traffic management. The basic benefits of NextGen are increased airspace capacity (reduced congestion), enhanced safety, and economic benefits. The economic benefit could make doing business in GA airport communities more attractive as it will handle a wide range of aircraft types and eliminate the need for costly instrument landing equipment. The Wide Area Augmentation System (WAAS) available for the last decade augments GPS to provide more precise navigational guidance.

State and Local Aviation Trends

While broad industry trends influence aviation activity at individual airports, regional and local factors may have a greater influence. The primary source for discussion of state and local aviation trends is the Oregon Aviation Plan (OAP) completed in 2007, the FAA Terminal Area Forecast, and local aviation activity information and data.

The OAP describes the following trends that would fuel aviation demand:

- Continued migration into the state – new residents will depend on air transportation to maintain ties with family and friends.
- Continued increases in socioeconomic indicators, such as total employment, per capita income, and retail sales.

As of 2013, there were 97 public-use and over 360 private-use airports in the State of Oregon[1]. Of these, 96 airports were included in the state airport system in 2007. The airports in the system had an estimated 4,875 based aircraft in 2005. In comparison, the aircraft registry shows 7,641 aircraft registered in the State of Oregon as of February 2015, 66 of which are registered in Union County[2]. The OAP 2007 projected that based aircraft in the state would grow 1.23% yearly to 6,225 by 2030. For the same timeframe, GA operations were projected to grow from 1.62 million in 2005 to 2.22 million total operations – an estimated 1.58% annual growth rate, which is slightly above the based aircraft growth rate.

The OAP reports that the La Grande / Union County Airport had a total of 51 based aircraft and 18,278 operations in 2005 (the base year for data gathering). The OAP forecasts that the number of based aircraft will experience a compound annual growth rate (CAGR) of 1.27% to reach 66 based aircraft in 2025 and that the number of operations will also experience a CAGR of 1.27% to reach 23,534 operations in 2025.

[1] Oregon Department of Aviation Annual Report, July 1, 2012 through June 30, 2013.
[2] The number of aircraft registered can often differ from based aircraft counts, particularly if many of the aircraft are inactive, stored at private airfields, or spend the majority of time at airports outside the state.

In recognizing the importance of accurate based aircraft counts at each airport, the FAA has tasked GCR & Associates, Inc. with the responsibility of collecting based aircraft details as part of a National Based Aircraft Inventory Program. A website (www.basedaircraft.com) has been established to allow airport managers direct on-line entry of their based aircraft, which are then validated by the system. Through this Master Plan Update, Airport Management has collected based aircraft information and it has been entered into the system. As of February 2015, the database shows the Airport has 76 based aircraft, including 65 single engine, three multi-engine, and eight helicopters.

Fuel sales can be an indicator of aviation activity at an airport. **Table 3D** lists fuel sales from 2008 through 2014. Fuel sales have been variable and the split between AvGas and JetA fuel has shown signs of change in recent years, with AvGas gaining overall shares of fuel sold. This trend likely indicates slower firefighting years, as most firefighting aircraft are fueled with JetA, or the increase of fire operators trucking in fuel from offsite.

Table 3D. La Grande / Union County Airport Historical Fuel Sales (Gallons)

	2008		2009		2010		2011		2012		2013		2014	
	AvGas	*JetA*	*AvGas*	*JetA*	*AvGas*	*JetA*	*AvGas*	*JetA*	*AvGas*	*JetA*	*AvGas*	*JetA*	*AvGas*	*JetA*
January	1,208	6,621	875	6,925	614	7,164	754	4,257	785	2,087	596	1,350	1,053	2,594
February	1,135	5,650	942	6,400	776	3,353	945	3,906	1,072	3,482	1,419	871	820	2,614
March	1,891	11,117	1,110	6,724	1,620	4,763	867	7,306	514	1,882	1,554	1,849	1,719	2,711
April	2,323	8,361	2,436	7,872	2,241	6,701	1,788	7,342	1,986	4,019	1,781	3,451	2,545	4,738
May	2,782	9,718	4,220	10,237	2,833	10,753	1,860	10,186	2,675	9,484	1,936	4,132	2,671	3,765
June	4,317	10,255	4,529	7,907	5,317	8,067	2,489	2,968	2,212	3,857	2,343	3,520	4,744	3,212
July	3,309	11,445	5,969	20,251	7,842	9,692	2,543	5,342	2,953	6,171	5,680	12,086	19,157	36,173
August	16,667	15,558	15,948	30,854	5,235	10,755	5,016	8,433	29,999	22,477	16,965	26,602	28,399	39,160
September	5,115	10,270	4,818	13,934	5,937	9,509	6,494	10,478	11,103	17,995	3,034	6,926	3,573	9,237
October	3,228	9,171	1,701	9,873	2,873	6,939	1,866	3,673	1,688	6,371	2,079	4,487	2,393	3,568
November	1,133	8,897	1,469	8,443	1,284	5,324	542	1,933	934	3,075	1,674	6,790	1,341	3,372
December	610	6,066	899	8,443	508	7,205	1,516	3,170	684	1,101	641	2,389	504	2,651
12-Month Total	43,718	113,129	44,916	137,863	37,080	90,225	26,680	68,994	56,605	82,001	39,702	74,453	68,919	113,795
Percent of Total	28%	72%	25%	75%	29%	71%	28%	72%	41%	59%	35%	65%	38%	62%
Total Fuel Sold	**156,847**		**182,779**		**127,305**		**95,674**		**138,606**		**114,155**		**182,714**	

Source: Union County, 2015.

Regional Socioeconomic Trends and Forecasts

Aviation activity at an airport is usually tied closely to the local and regional economy. As population around the airport grows, airport activity grows. Aviation activity has also traditionally been linked to employment and income factors because of the discretionary nature of personal and business travel, as well as the recreational nature of some GA activity.

The Airport is located in Union County, and while a small portion of the 30-minute service area (presented in Chapter 1) extends beyond the County line into Baker County, only Union County data will be included in this analysis. It is assumed any aircraft use in this southern portion of the service area would utilize the Baker City Municipal Airport, due to geographical considerations. Additionally, this area is sparsely populated and would have a very limited impact to overall considerations for the La Grande / Union County Airport.

Table 3E presents historical and projected populations for Union County. This table also presents the average annual growth rates for population. Union County experienced a surge in population between 1970 and 1980. Since that time, population levels have been relatively constant. The projected population trend represents a mild growth rate.

Table 3E. Historical and Projected Populations for Union County, OR

	Year	Union County Population
Historical	1970	19,377
	1980	23,921
	1990	23,598
	2000	24,530
	2010	25,748
Projected	2020	28,216
	2030	30,530
	2040	32,572
	Year	**Average Annual Growth Rates**
Historical	1970-1980	2.13%
	1980-1990	-0.14%
	1990-2000	0.39%
	2000-2010	0.49%
Projected	2010-2020	0.92%
	2020-2030	0.79%
	2030-2040	0.65%

Sources: Historical Population Data – US Census Bureau; Projected Population Data – Office of Economic Analysis, Department of Administrative Services, State of Oregon.

Higher income usually correlates with increased GA activity; in comparison to the State of Oregon and the United States, Union County's per capita personal income is less in total dollars. However, the CAGR from 1990-2013 shows Union County's per capita personal income increasing at a slightly higher rate than the State of Oregon and tracking with the National growth rate, as shown in **Table 3F**.

Table 3F. Per Capita Personal Income History, Union County, Oregon, and the US

	1990	2000	2010	2013	Annual Growth 1990-2013
Union County	$16,450	$26,270	$33,860	$38,370	3.7%
State of Oregon	$17,780	$28,430	$35,350	$39,240	3.5%
United States	$19,290	$30,130	$39,550	$44,100	3.7%

Source: US Bureau of Economic Analysis, 2015 (2013 data estimates from March 2014).

Although Union County's personal per capita income is lower than the state average, the propensity for residents to own aircraft is higher than that statewide, per **Table 3G**. Typically, income is a good indicator of activity and aircraft ownership; however, it is possible that the remote geographic location of the region encourages increased rates of personal aircraft ownership

Table 3G. Comparison of Population and Aircraft Registration (2014), Oregon, and Union County

Area	Population	Registered Aircraft	Registered Aircraft per 1,000 Population
Union County	25,652	66	2.57
State of Oregon	3,928,068	7,641	1.95

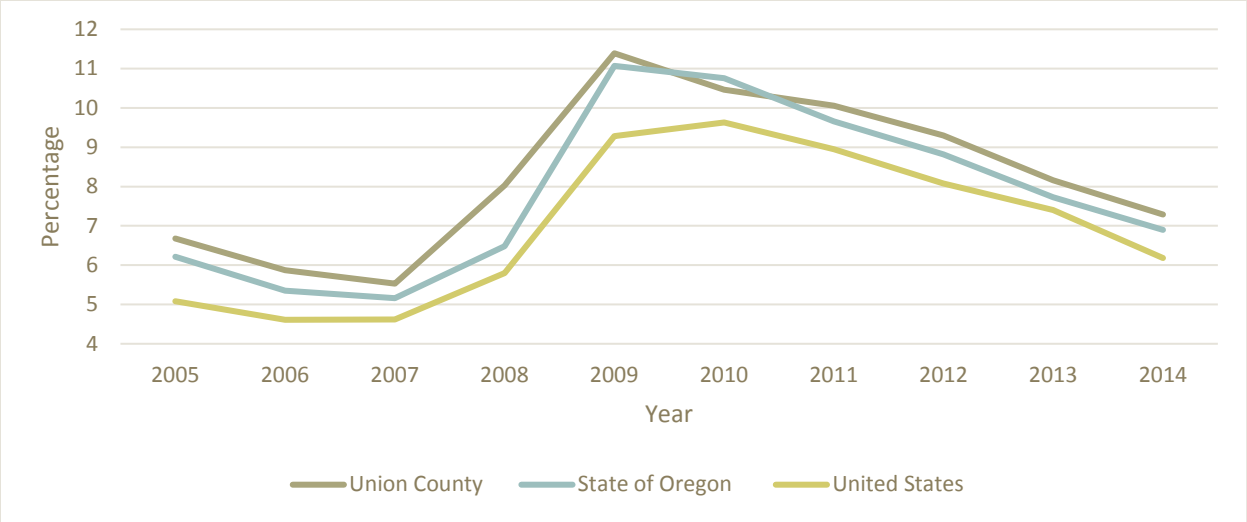
Source: Population estimate for 2014 from US Census Bureau, Registered Aircraft per FAA database, February 2014.

Exhibit 3A provides a visual comparison of the unemployment rates for Union County, the State of Oregon, and the United States from 2005 to 2014. Both Union County and the State of Oregon have a higher unemployment rate than the national rate. Union County's unemployment rate trends along the same highs and lows experienced statewide. For the last 20 years or so, Oregon has been moving from a resource-based economy to a more mixed manufacturing and marketing economy, with an emphasis on high technology. The high-tech sector has grown in the Portland metro area, while rural parts of the state have been less successful at changing to a new economy[3]. Union County reflects a typical trend of many small communities whose economic base has been shifting from the timber and natural resource industries.

Although some of the socioeconomic factors discussed above are unfavorable towards airport growth, there are several silver linings to focus on. Two examples of this are the Grande Ronde Hospital and the US Forest Service (USFS) presence on-Airport. The Hospital use of the Airport includes two helicopters provided by LifeFlight Network and stationed at the Airport year-round, as well as itinerant fixed-wing activity on an as-needed basis. The USFS provides an Interagency Air Tanker Base, as well as several other services that are essential partners to the local economy and resource management. The USFS's constant presence on-field provides the County with a consistent revenue source, all while preserving the vast forestlands that are vital to the County itself.

[3] Oregon Bluebook, http://bluebook.state.or.us/

Exhibit 3A. Unemployment Rates for Union County, Oregon, and the US



Source: US Bureau of Labor Statistics, 2015 (seasonally adjusted).

Based Aircraft Forecast

The number of aircraft based at the Airport is an important consideration when planning facilities. The based aircraft forecast will directly influence the type and number of aircraft storage facilities and apron tiedowns needed. Projections of based aircraft also provide one indication of the anticipated growth in flight activity expected to occur at the Airport.

The based aircraft forecast begins by presenting historical numbers of based aircraft. Then, various forecast models prepared for the Airport are analyzed and the preferred forecast for based aircraft and fleet mix through 2034 is presented.

Historical Based Aircraft Data

Table 3H indicates historical based aircraft numbers from 1990 through 2012, as reported in FAA's 2014 Terminal Area Forecast (TAF). The data show a slow increase in total based aircraft, up until year 2012 and no explanation for the drop is provided. While the TAF is valuable as the source for historical based aircraft numbers from which to discern trends, the numbers listed in recent years appear to be understated. Airport management reports – and entered into the Based Aircraft online registry – actual based aircraft number in 2014 is 76, which is the number this Master Plan assumes to be the most accurate. Of the based aircraft reported, 65 are single engine, three are multi-engine, and eight are helicopters.

Table 3H. Historical Based Aircraft at La Grande / Union County Airport

Year	Based Aircraft	Year	Based Aircraft
1990	42	**2002**	51
1991	42	**2003**	53
1992	40	**2004**	51
1993	40	**2005**	51
1994	40	**2006**	64
1995	40	**2007**	64
1996	40	**2008**	64
1997	40	**2009**	65
1998	40	**2010**	64
1999	40	**2011**	64
2000	40	**2012**	55
2001	40	**2014**[4]	76

Source: FAA Terminal Area Forecast, for data 1990-2012, issued February 2015. 2014 data provided by Union County.

Based Aircraft Forecast Through 2034

Seven different forecasting models were analyzed to provide a range of the possible numbers of based aircraft. The average annual growth rates for these seven models range from -0.30% to 2.60%, as shown in **Table 3I**.

Table 3I. Comparison of Based Aircraft Forecasts for La Grande / Union County Airport

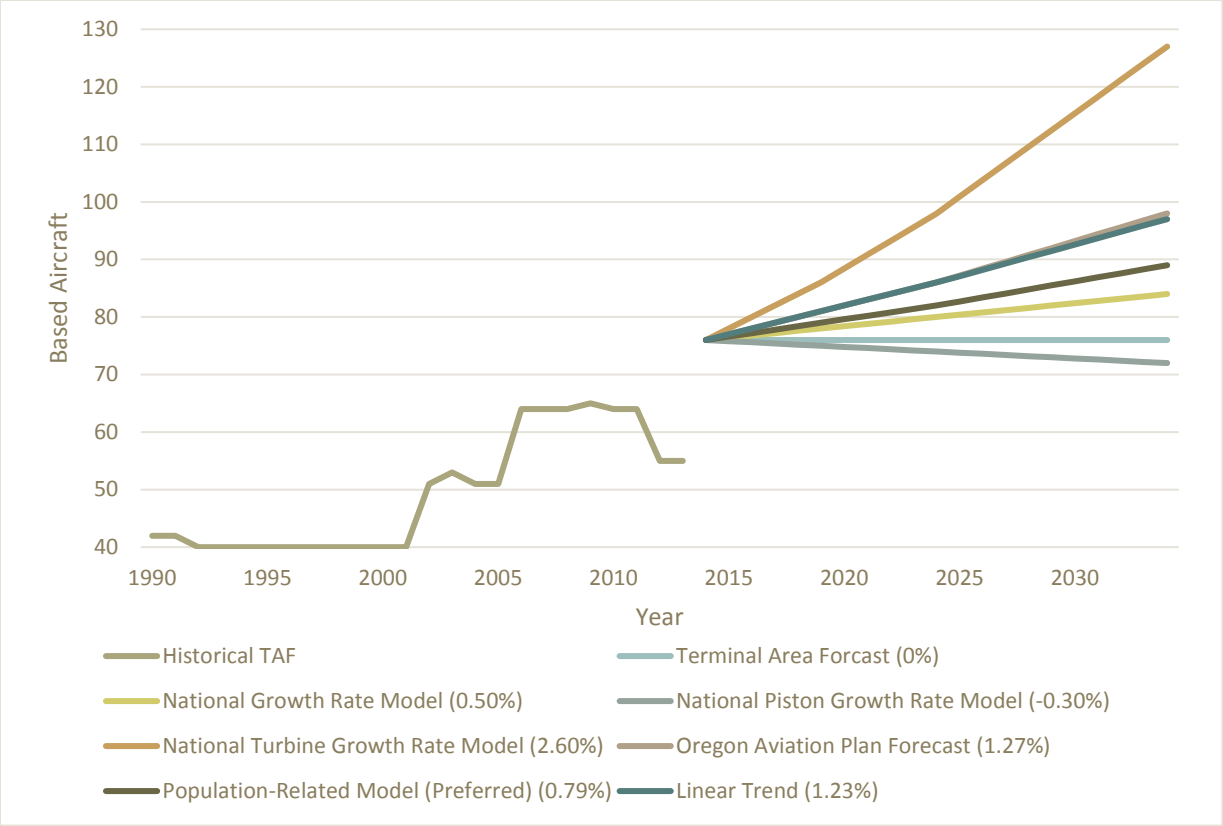
	2019	2024	2034	Average Annual Growth Rate
Terminal Area Forecast	76	76	76	0%
National Growth Rate Model	78	80	84	0.50%
National Piston Growth Rate Model	75	74	72	-0.30%
National Turbine Growth Rate Model	86	98	127	2.60%
Oregon Aviation Plan Forecast	81	86	98	1.27%
Population-Related Model	79	82	89	0.79%
Linear Trend	81	86	97	1.23%
Preferred Forecast	**79**	**82**	**89**	**0.79%**

Source: WHPacific, Inc., 2015.
Note: Base year was 2014 with 76 based aircraft, per airport management records.

The Preferred Forecast was chosen by selecting the Population-Related Model, which represents an annual average growth rate of 0.79%. Each forecast method is described and evaluated below, and the methodology for selecting the preferred alternative is given in the paragraphs that follows. **Exhibit 3B** graphically compares these forecasts. While the exhibit presents the forecasts as increasing year-by-year according to average growth rates, actual growth will occur in phases as facilities are constructed and made available for based aircraft.

[4] Data provided by Airport Management, February 2015.

Exhibit 3B. Graphic Comparison of Based Aircraft Forecasts for La Grande / Union County Airport



Source: WHPacific, Inc. 2015. Base year (2014) aircraft count is 76 based aircraft, per Airport Management.

Terminal Area Forecast (0%)

The FAA's TAF for the Airport, prepared in 2015, shows no change in based aircraft over the 20-year planning period. There is no reason to believe there will be no change in the based aircraft, considering the historical increase of based aircraft, which continued during the recent economic recession.

National Growth Rate Model (0.50%)

The FAA's projected growth rate for the national GA fleet is shown in Table 3A. It applies to a fleet mix that is mostly single engine piston, similar to that at the Airport. This model would show an increase of eight based aircraft at the Airport by 2034, for a total of 84 aircraft. One potential problem with this model is that local influences on the number of based aircraft at the Airport are not considered.

National Piston Growth Rate Model (-0.30%)

The majority of airplanes based at the Airport now and in the past have been piston-powered. It is reasonable to apply the same growth rate at the Airport as forecast for piston airplanes nationwide. However, this model does not take into consideration the expected influx of larger, turbine-powered aircraft into the Airport, as the national trends would indicate. This forecast model would decrease the total based aircraft to 72 by 2034.

National Turbine Growth Rate Model (2.60%)

Recent additional based aircraft at the Airport have been turbine powered, and nationally figures are trending towards an increase in turbine aircraft. However, the majority of the aircraft are still piston powered and the turbine growth rate model is aggressive when compared to other models. By applying the 2.60% CAGR at the Airport, based aircraft would increase by 51 to a total of 127 by 2034.

Oregon Aviation Plan Forecast (1.27%)

The forecast for the Airport in the Oregon Aviation Plan equates to 1.27% average annual growth. This forecast accounts for local socioeconomic factors; however, the national, state, and local economic climate has changed since the forecast was produced. Still, it reflects a slightly lower growth rate than airports statewide, which is consistent with the current economic indicators. This forecast would increase based aircraft to 98 by 2034.

Population-Related Model (0.79%)

The population of Union County is projected to grow at an annual rate of 0.79% from 2010 to 2040. An increase in population would indicate increases in based aircraft, as data shows current residents have a high propensity for aircraft ownership. Using this growth model, an additional 13 aircraft would base at the Airport for a total of 89 by 2034. The population-related model is the median growth rate of all those studied.

Linear Trend (1.23%)

The linear trend model projects a continuation of the historical trend into the future, using TAF based aircraft data from 1990 through 2012. Using this model assumes that the historical data is correct. Considering the data shows zero growth between 1992 through 2001, it seems likely there are errors – also the existing based aircraft does not reflect information provided by Airport Management. Using this trend, an additional 21 based aircraft would locate to the Airport for a total of 97 by 2034.

Preferred Based Aircraft Forecast (0.79% Average Annual Growth)

The Population-Related Model has been selected as the Preferred Forecast for the La Grande / Union County Airport. This model results in a based aircraft total of 89 by 2034, which is an increase of 13 aircraft over 2014.

The Preferred Forecast is mid-line of the forecasts and models studied. It is less aggressive than the National Turbine Growth Rate, the OAP Forecast, and the Linear Trend. These models were dismissed because they either weren't fully applicable to the conditions at the Airport, the forecast was prepared prior to the economic downturn, or the data's validity was susceptible, respectively. Alternatively, the remaining forecasts were too pessimistic when applying the local considerations and trends. A growth rate just below one percent is well-aligned with trends and industry expectation.

Based Aircraft Fleet Mix

The fleet mix of aircraft based at the Airport will likely change over the planning period, although single engine, piston-powered aircraft will still be predominant. **Table 3J** presents the based aircraft fleet mix forecast. The forecast includes a slight increase in the number of turboprop and turbojet aircraft, and helicopters in the future, which reflects the national trends shown in Table 3A. Additionally, the user

surveys distributed at the beginning of this planning process identified an itinerant Cessna Citation (C-560) user that plans to relocate to the Airport within the next five years. It is also likely that the USFS will be relocating up to two helicopter rappel crews, which would increase the helicopter presence at the Airport.

Table 3J. Preferred Based Aircraft Fleet Mix Forecast for La Grande / Union County Airport

Year	Single Engine	Multi-Engine (Piston & Turboprop)	Turbojet	Helicopter	Total
2014	65	3	0	8	76
2019	65	3	1	10	79
2024	67	3	1	11	82
2034	70	5	1	13	89

Source: WHPacific, Inc., 2015.

Aircraft Operations Forecast

This section begins with a review of historical trends in aircraft operations. Previous aircraft operations forecasts are reviewed and the preferred aircraft operations forecast is explained and presented. Other forecast information presented in this section includes operations fleet mix, local vs. itinerant operations, peak activity, and critical aircraft and Airport Reference Code.

Historical Aircraft Operations Data

Table 3K presents historical aircraft operations according to the FAA's TAF. Operations are divided into two basic categories: itinerant and local. Local operations are defined as touch-and-go, or training operations, as well as any other operations that stay within 20 miles of the Airport. All other operations are categorized as itinerant. Another distinction for aircraft operations at the Airport is that they occur in either GA, air taxi, or military aircraft. Air taxi aircraft operations refer primarily to passenger/cargo charter or air taxi, fractional jet operations, and air ambulance. Air taxi flights usually file under Instrument Flight Rules (IFR) flight plans; however, many air taxi flights are not counted as pilots sometimes file the IFR flight plans after takeoff or cancel them before landing. IFR records were consulted for this forecasting effort and it does appear that many IFR operations are not captured at the Airport due to this reason.

Table 3K. Historical and Current Aircraft Operations at the La Grande / Union County Airport

Year	Itinerant			Local	Total Airport Operations
	Air Taxi	GA	Military		
1990	1,000	17,000	100	11,000	29,100
1991	1,000	17,000	100	11,000	29,100
1992	1,000	6,500	100	1,800	9,400
1993	1,000	6,500	100	1,800	9,400
1994	1,000	6,500	100	1,800	9,400
1995	1,000	6,500	100	1,800	9,400
1996	0	9,600	0	6,400	16,000
1997	0	9,758	0	6,505	16,263
1998	0	9,924	0	6,616	16,540
1999	0	10,098	0	6,732	16,830
2000	0	10,272	0	6,848	17,120
2001	0	10,243	0	6,828	17,071
2002	0	10,424	0	6,949	17,373
2003	0	10,606	0	7,070	17,676
2004	0	10,786	0	7,189	17,975
2005	0	10,968	0	7,310	18,278
2006	0	11,130	0	7,418	18,548
2007	0	11,287	0	7,523	18,810
2008	0	11,454	0	7,634	19,088
2009	0	11,611	0	7,739	19,350
2010	2,500	9,000	500	4,000	16,000
2011	2,500	9,000	500	4,000	16,000
2012	2,500	9,000	500	4,000	16,000
2013	2,500	9,000	500	4,000	16,000
2014*	2,500	9,000	500	4,000	16,000

*Source: Terminal Area Forecasts, FAA (March 2014). *Base year data (2014) confirmed by Airport Management.*

Aircraft Operations Forecast Through 2034

The FAA Aerospace Forecast presented in Table 3B indicates that GA aircraft usage will increase. While the nationwide fleet is projected to grow 0.5% per year, hours flown are projected to grow 1.4% per year. For the piston fleet, however, the hours flown are expected to decrease by -0.4% annually – alternatively, the turbine fleet is expected to increase usage by 3.2% annually. Although the piston and turbine fleet forecasts diverge, the overall trend is that aircraft use will increase at a faster rate than the total number of aircraft. Therefore, it would be logical to ascertain that aircraft operations at any given airport will grow at a faster rate than based aircraft.

Table 3L presents the four forecasts analyzed for aircraft operations: Terminal Area Forecast, Operations per Based Aircraft, Oregon Aviation Plan Forecast, and National Growth Rate Model.

Table 3L. Comparison of Aircraft Operations Forecasts for La Grande / Union County Airport

	2019	2024	2034	Average Annual Growth Rate
Terminal Area Forecast	16,998	17,831	19,578	1.01%
Operations per Based Aircraft	25,043	25,994	28,213	0.79%
Oregon Aviation Plan Forecast	17,040	18,150	20,585	1.27%
National Growth Rate Model	17,150	18,385	21,110	1.40%
Preferred Forecast	**17,040**	**18,150**	**20,585**	**1.27%**

Source: WHPacific, Inc., 2015. Figures for TAF from FAA, 2015.

Terminal Area Forecast (1.01%)

The FAA's TAF projects an average annual growth of 1.01% through 2034. Given the low growth rate, this forecast is inconsistent with local conditions and national trends previously discussed.

Operations per Based Aircraft (0.79%)

According to TAF records[5], the Airport's historic operations and based aircraft numbers result in an average 317 operations per based aircraft. This operations per based aircraft ratio is higher than FAA planning guidance, and yields a significantly higher operations count than the other models presented. The FAA has recommended that rural GA airports with little itinerant traffic should have about 250 operations per based aircraft, while busier GA airports with more itinerant traffic should typically have about 350 operations per based aircraft. Considering the Airport's consistent Air Taxi and seasonal firefighting operations, it is possible to have a ratio higher than at a typical rural GA airport. However, if only using the 2014 estimate provided by Airport Management, the operations per based aircraft would be 211.

Regardless of the ratio used, the average annual growth rate would be the same as the based aircraft forecast and considering the overall trend of higher aircraft utilization it would be reasonable to expect a higher operations growth rate than 0.79%.

Oregon Aviation Plan (1.27%)

The OAP uses base data from 2005 to project 1.27% average annual growth in aircraft operations at the Airport. While this Plan was prepared prior to the economic recession, the growth in operations yields a 230 operations per based aircraft ratio which is expected for an airport similar to La Grande / Union County.

National Growth Rate Model (1.40%)

The existing fleet of aircraft is expected to have higher utilization for the duration of the planning period, which is why the National Growth Rate Model has the highest average annual growth rate of the selected forecasting models, at 1.40%. However, this model includes both piston and turbine aircraft and the majority of aircraft operations at the Airport are piston-powered, which has shown to be declining. For this reason, this model would likely overstate operations at the Airport.

[5] Excluding 1990-1991 as they appear to be erroneously high.

Preferred Operations Forecast (1.27%)

The Oregon Aviation Plan is the preferred aircraft operations forecast, calculated as 1.27% average annual growth. This growth rate equates to 230 operations per based aircraft over the duration of the planning period; this ratio is consistent with FAA guidance for rural airports. It also corresponds with the expectation of higher aircraft utilization.

Table 3M presents the breakdown of the preferred forecast for aircraft operations. The operation estimates represent a similar trending of the operations by category ratio as currently exists at the Airport.

Table 3M. Preferred Aircraft Operations Forecast for La Grande / Union County Airport

Year	Itinerant			Local	Total Airport Operations
	Air Taxi	GA	Military		
2014	2,500	9,000	500	4,000	16,000
2019	2,600	9,750	500	4,190	17,040
2024	2,800	10,500	500	4,350	18,150
2034	3,150	11,925	500	5,010	20,585

Source: WHPacific, Inc., 2015.

Operations Fleet Mix

The fleet mix for aircraft operations is not the same as the fleet mix for based aircraft, because of transient traffic. For example, there are few turbine-powered aircraft based at the Airport, but all of the firefighting tankers operating at the Interagency Air Tanker Base are turbine-powered. Some additional itinerant turbine-powered operations expected at the Airport would be freight aircraft and the fixed wind air ambulance.

The following **Table 3N** presents the estimated current (2014) and projected future operations fleet mix. In the future, it is projected that air taxi and GA aircraft using the Airport will include more turboprops, such as the King Air models, and even some turbojet aircraft such as the Cessna Citation. Firefighting operations – turbine fixed wing and helicopter – are harder to forecast as they are highly seasonal.

Table 3N. Preferred Aircraft Operations Fleet Mix Forecast for La Grande / Union County Airport

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Helicopter
2014	67%	5%	10%	3%	15%
2019	65%	5%	11%	3%	16%
2024	63%	5%	12%	4%	16%
2034	60%	5%	14%	5%	16%

Source: WHPacific, Inc., 2015.

Peak Demand Forecast

Airport activity fluctuates from month to month, day to day, and hour to hour; therefore, airfield and landside facilities are traditionally designed to accommodate reasonable peak levels of use. In reviewing fuel sales and discussing with Airport Management, the Airport is consistently busier in the summer than in the winter. According to the historical fuel sales reported in Table 3D, August is the busiest month, representing an average of 26% of the year's fuel sales – indicating increased sales for the larger

firefighting aircraft. Using this information, an assumption can be made that the peak month consists of approximately 20% of the annual operations total. The values for average day peak month and for the peak hour were then calculated using the methodology in FAA Advisory Circular 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*. Under this methodology, the average day peak month is derived by taking the number of operations calculated for the peak month and dividing that figure by the number of days in the peak month (31 days). Peak hour is assumed to be 15% of the day peak. **Table 3O** summarizes the peak operations forecast.

Table 3O. Peak Operations Forecast for La Grande / Union County Airport

	2014	2019	2024	2034
Annual Operations	16,000	17,040	18,150	20,585
Peak Month (20% Annual)	3,200	3,408	3,630	4,117
Design Day	103	110	117	133
Design Hour (15% of Peak Day)	15	16	18	20

Source: WHPacific, Inc., 2015.

Critical Aircraft, Runway Design and Airport Reference Codes

According to FAA criteria, a runway's design is based on the characteristics of the critical aircraft, which is the most demanding aircraft that uses the runway "regularly" or "substantially." The FAA defines regular or substantial use as at least 500 annual itinerant operations. The Runway Design Code (RDC) can vary for individual runways by providing standards to serve different design aircraft on different runways and taxiways. The RDC also includes a component for instrument approach visibility minimums, which will be discussed further in the Facility Requirements chapter. The largest RDC at an airport dictates the overall Airport Reference Code (ARC) for a particular airport.

The RDC and ARC is defined by the Aircraft Approach Category and the Airplane Design Group of the critical aircraft. The Aircraft Approach Category is determined by the approach speed, or 1.3 times the stall speed of the aircraft in its landing configuration at its maximum landing weight, and is represented by the letters A, B, C, D, and E. The Airplane Design Group is based on the aircraft's wingspan or tail height, and is defined by Roman numerals I, II, III, IV, V, and VI. **Table 3P** shows the RDC and ARC component definitions and typical aircraft that meet these definitions.

Table 3P. Runway Design and Airport Reference Code Components

Approach Category	Approach Speed	Typical Aircraft
A	Less than 91 knots	Cessna 150, 172, 206, Beech Bonanza
B	91 to 120 knots	King Air, Piper Navajo, Gulfstream I
C	121 to 140 knots	C-130 Hercules, Learjet, Challenger
D	141 to 165 knots	Boeing 747, Gulfstream V
Airplane Design Group	**Wingspan**	**Typical Aircraft**
I	Less than 49 feet	Cessna 150, 172, 206, Learjet
II	49 to 78 feet	King Air, Cessna Citation, Fairchild Metroliner
III	79 to 117 feet	Bae 146, P2V, DC-6, MD-87
IV	118 to 171 feet	C-130 Hercules, DC-10
Airplane Design Group	**Tail Height**	***(Airplane Design Group may be determined by tail height, if more demanding than wingspan)***
I	Less than 20 feet	
II	20 to 29 feet	
III	30 to 44 feet	

Source: FAA AC 150/5300-13A, Airport Design*. Note, Aircraft Approach Category E (166 knots or more) and Airplane Design Group V and VI (171 feet or more) are not shown.*

Runway 16-34 Critical Aircraft and Runway Design Code

The current RDC for Runway 16-34 is B-II (small), which indicates a critical aircraft similar to the Beech King Air and weighing less than 12,500 pounds at maximum takeoff weight (MTOW). During discussions at the second Planning Advisory Committee meeting it was mentioned that the Fairchild Metroliner, currently used by one of the freight companies operating into the Airport, may be a more appropriate critical aircraft for Runway 16-34. The Metroliner is an ARC B-II aircraft, with an MTOW 14,500 pounds[6]. Current estimations of activity report 360 annual landings into the Airport in this aircraft, for a total of 720 annual itinerant operations that exceeds the FAA's threshold for "regular" use. Additionally, that aircraft typically operates on Runway 16-34, due to crosswind conditions at the Airport. Therefore, **the Fairchild Metroliner is the appropriate critical aircraft for Runway 16-34, and it is recommended the ARC for that runway be upgraded to B-II.**

Runway 12-30 Critical Aircraft and Runway Design Code

The current RDC for Runway 12-30 is C-IV, represented by the C-130 Hercules critical aircraft. This Aircraft was used extensively during the time of the last Master Plan Update by the US Forest Service (USFS) for undertaking critical firefighting missions. Since that time, many changes have occurred in the USFS Large Air Tanker (LAT) fleet. The following discussion will address these changes and how they impact Runway 12-30, as LAT use is the most demanding operation occurring on that runway.

[6] Some models have an MTOW of 16,000 pounds.

The USFS has a large presence at the Airport and manages critical wildland fire suppression missions for the entire region of Northeast Oregon. It is important to note that although the LAT fleet is commonly referred to as the USFS LAT fleet, all LATs currently operating in the United States are owned and operated by private contractors. Furthermore, those operators pay into the Aviation Trust Fund by means of fuel taxation. Additionally, private contractors pay into the County's operating fund by purchasing fuel and paying landing fees, which as shown in Table 2E are a significant funding source. For example, the ten year annual average for landing fees collected from 2005-2014 was nearly $18,000, with some years in excess of $40,000. Not only do these aircraft operators provide an essential public safety service, they are a large economic contributor in the region.

The current LAT fleet is old, and many of the remaining LATs are facing retirement in the near-term future, according to USFS's *Large AirTanker Modernization Strategy* report issued in January 2012. As such, the agency is analyzing options for Next Generation LATs. **Table 3Q** presents the existing LAT fleet and their ARCs, indicating which are currently on contract for 2015, as well as those that have been dispatched to the Airport in 2013 and 2014.

Table 3Q. Next Generation LAT Fleet, Contracts Nationwide & Operations at La Grande /Union County

Aircraft Type	ARC	On Contract for 2015	Operated at LGD (2013/2014)
DC-6	B-III		
DC-7	B-IV		✓
P2V-5 and P2V-7	C-III	6	✓
BAe-146	C-III	1	✓
CV-580	C-III		✓
MD-87	C-III	2	✓
RJ 85	C-III	2	
MD-80	C-III		
C-130Q and C-130H	C-IV	2	
MAFFS (Modular Airborne Fire Fighting System) Military C-130[7]	C-IV	8	
DC-10	C-IV	1	

Source: USFS, Boise National Interagency Fire Center (2015), USFS Large Air Tanker Modernization Strategy *Report (2012), and Union County landing fee records.*

Other aircraft not listed in the above table, but mentioned in the *LAT Modernization Strategy* report, are the Boeing 737 (100 - 500 models) and the Bombardier Q400. Both of these aircraft are ARC C-III. At present, however, neither of these aircraft have undergone the required testing, evaluation, and application phase for tanker approval.

As mentioned previously, the Hercules C-130 was extensively used by the USFS until 2006 when the fleet's airworthiness came into question. In response to this aircraft's departure from the firefighting fleet, the

[7] Available on-call, as needed.

USFS has utilized the aircraft listed in Table 3Q. However, many of these – the P2V aircraft in particular – are facing retirement by the year 2020. In response, the USFS has concluded that the air tanker fleet needs to be replaced with newer, faster, and more cost-effective mix of Next Generation LATs. Part of that strategy is to bring the C-130 back into commission. Consequently, Congress authorized the National Defense Authorization Act of 2014 (approved December 2013), which gave approval to transfer seven C-130 aircraft from the Coast Guard to the US Air Force. The US Air Force has been tasked with converting these aircraft into tanker configuration, and at completion the C-130 LATs will be transferred to the USFS. Once brought on-line, these C-130s will be owned by the USFS but maintained and piloted by private contractors[8]. As of current press releases, all seven C-130s are expected to be operational by 2019 – just in time to replace the retiring P2V fleet.

The National Interagency Fire Center, *Wildland Fire Summary and Statistics*, (2014) reports there were more requests for LATs in 2014 than in any of the last 18 years, despite the 2014 acres burned average was well below the 10-year average. What all this information indicates, is that while the LAT fleet is undergoing transitions, it is clear the current fleet of LATs will continue to be highly utilized and any replacement aircraft will be of similar size and speed.

The average number of LAT operations at the Airport in 2013 and 2014 was 176, all of which were ARC C-III and B-IV. Despite being under the substantial use threshold of 500 itinerant operations, the FAA gives allowances for airports with unpredictable operations, such as firefighting. FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, pg 1, states "under unusual circumstances, adjustments may be made to the 500 total annual itinerant operations threshold after considering the circumstances of a particular airport." [9]

It is clear that the La Grande / Union County Airport serves a critical regional need for aerial firefighting. No other airports in the region are capable of replacing this facility, as it is the only USFS tanker base in Northeastern Oregon. When compared to other nearby airports (Baker and Pendleton, specifically), neither is equipped for the specialized fire suppression operations. While both airports have runways that may be able to accommodate the aircraft, they do not have proximity to fire personnel or the same proximity to multiple National Forests, as La Grande / Union County does. Additionally, Baker lacks the utilities and infrastructure needed to support those activities. Therefore, is it prudent for the FAA to consider these unusual circumstances, and allow for a critical aircraft that does not meet the standard 500 annual itinerant operations.

Given the data provided from the US Forest Service and recent Congressional action, it appears the most demanding aircraft that can be expected to operate at the Airport is the C-130 Hercules. Given firefighting

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[8] It is expected the private contractors will pay into the Aviation Trust Fund and County operations funds, just as current LATs do.

[9] During preparation of this Master Plan, data from 2015-16 was gathered to further address this issue. In 2015-16 a total of 487 operations occurred in fire suppression aircraft that were either ARC C-III or B-IV. Accordingly, the four-year (2013-16) average operations were 332 operations, as verified by USFS landing fee invoices. In those four years the County collected $75,260 in landing fees from those tankers.

operations are highly variable, it is impossible to estimate just how many operations are to be expected over the planning period. However, it is considered good practice to plan for accommodating this need, due to the importance of aerial firefighting operations for the region and its safety. Therefore, **it is recommended that the C-130 Hercules remain as the critical aircraft for a Runway 12-30 ARC of C-IV.**

Airport Reference Code

The most demanding (largest) RDC is recommended to be C-IV, which would also be representative of the Airport Reference Code to be used for various design standards.

Summary of Forecasts

The long-term growth of the Airport will be influenced by nation and regional trends outlined within this chapter. The elements of the aeronautical activity forecast for the Airport are summarized in **Table 3R**.

With this forecast data, the next step in the master planning process is to calculate the ability of existing facilities to meet the forecasted demand. Additionally, the next chapter will identify needed enhancements of airside and/or landside facilities to accommodate forecasted demand. It is important to note that the aviation industry tends to cycle through highs and lows. Actual growth may be more aggressive or passive at times over the planning period, so it is essential to identify opportunities beyond the based needs to the County can proactively accommodate unforeseen growth.

Table 3R. Summary of La Grande / Union County Airport Preferred Aeronautical Activity Forecasts

Forecast Element	2014	2019	2024	2034
Based Aircraft				
Single Engine Piston	65	65	67	70
Multi-engine (Piston & Turboprop)	3	3	3	5
Turbojet	0	1	1	1
Helicopter	8	10	11	13
Total	***76***	***79***	***82***	***89***
Aircraft Operations				
Air Taxi – Itinerant	2,500	2,600	2,800	3,150
GA – Itinerant	9,000	9,750	10,500	11,925
Military – Itinerant	500	500	500	500
GA – Local	4,000	4,190	4,350	5,010
Total	***16,000***	***17,040***	***18,150***	***20,585***
Operations Fleet Mix				
Single Engine Piston	10,720	11,077	11,434	12,351
Multi-engine (Piston & Turboprop)	2,400	2,726	3,086	3,911
Turbojet	480	511	726	1,029
Helicopter	2,400	2,726	2,904	3,294
Total	***16,000***	***17,040***	***18,150***	***20,585***
Peak Demand (Operations)				
Peak Month – August (20% annual)	3,200	3,408	3,630	4,117
Design Day	103	110	117	133
Design Hour (15% Peak Day)	15	16	18	20
Airport Reference Code – C-IV				
Runway 16-34 RDC	B-II, Fairchild Metroliner			
Runway 12-30 RDC	C-IV, C-130 Hercules			

Source: WHPacific, Inc. (2015).

FAA Approval of Forecasts

The FAA's NW Mountain Region Airports District Office reviewed the presented forecast. A copy of their correspondence, as well as the TAF Comparison Spreadsheet, is included as Appendix B. Briefly, their comments were (via email, 15 May 2015):

- **Based Aircraft**: The based aircraft numbers should match the verified numbers from the based aircraft website. We understand these are a work in progress, but they should match soon. *(The County is in the process of verifying the last three remaining aircraft, all others have been verified.)*
- **Aircraft Operations**: Confirm population growth rates.
- **Runway 16-34 Design Code**: We concur with the recommendation to change the Runway 16-34 critical aircraft to the Metroliner (ARC B-II).
- **Runway 12-30 Design Code and Airport Reference Code**: We do not concur with the recommendation for the Runway 12-30 critical aircraft being the C-130 (C-IV). Current firefighting operations are not shown to exceed the 500 operations level for regular and substantial use. A portion of these are projected to be replaced with C-130s but there is no information showing a

direct correlation to operations at La Grande nor an actual level of C-130 operations. However, it is obvious that an important user of the airport are the Large Air Tankers. Given the current use of LAT's with an ARC of C-III, this may be a more prudent ARC to use moving forward. Additionally, it would appear that no major airfield geometry changes would result with the ARC change from C-IV to C-III. This could always be reviewed if the operations at La Grande were to change dramatically.

The County, along with WHPacific, Inc., discussed FAA's comments – particularly in regards to the Runway 12-30 RDC – and has decided to keep C-IV for consideration throughout the Master Plan. This decision is based the following reasons:

- The dimensional standards for C-III and C-IV are the same, as acknowledged by the FAA, and regardless the County would be asking for a Modifications to FAA Design Standards (like on the previous Master Plan) for runway and taxiway widths.
- Although the existing C-130 fleet is limited, there is a definite effort on USFS's behalf to reinstate the aircraft.
- The County's vision is to maintain C-IV.

Rather than limiting discussion to C-III, this Master Plan will address both C-III and C-IV Design Standards in the following chapters, chiefly in Chapter 4, *Development Alternatives*, to present a quantitative evaluation of the advantages and disadvantages of each RDC.