Table 2-17: FAA historic data and TAF forecasts for State of Washington for selected data (selected five-year periods)

Year	Enplanements	Total Operations	Based Aircraft
1990	9,041,107	2,820,613	4,563
1995	13,231,273	3,208,215	4,790
2000	15,996,284	3,610,414	5,872
2005	16,374,531	3,427,252	6,631
2010	17,658,548	3,178,399	5,963
2015	22,178,136	2,935,112	5,554
2020*	28,005,492	3,060,949	6,087
2025*	31,430,084	3,235,020	6,439
2030*	35,210,770	3,427,528	6,771
2035*	39,291,134	3,637,193	7,125
2040*	43,760,924	3,867,483	7,516
2045*	48,718,672	4,122,093	7,963
Average Annual Growth	2.24%	1.2%	1.08%

Source: FAA TAF
*Data is TAF forecasted data

airport given local factors, such as flight schools or charter operations, however, as a gross estimate, it is useful to consider these forecasts in relation to local factors at ORS.

2.4.2.2 FAA Washington State TAF

The FAA TAF presents the same categories of forecast data for each of the individual states. See Table 2-17 above. The FAA TAF predicts for the State of Washington an average annual growth rate of 2.24% for enplanements, 1.20% for total operations and 1.08% for based aircraft over the next 25 years. As previously mentioned, these statistics are used to help identify trends and augment individual forecasts.

2.4.2.3 Washington State Aviation System Plan

Washington State completed its latest aviation system plan update in 2017 (WASASP). This update is the latest iteration of the continuing 20-year plan to assist the State, FAA and individual airports in understanding the influences affecting aviation within the state and to help individual airports and the State make appropriate plans for the future. The WASASP report is characteristic of other FAA funded state system planning studies and is organized similarly to individual airport system plans. These similarities are because state system plans are also conducted under the same FAA Master Planning guidance as individual airport master plans, found in FAA Advisory Circular 150/5070-6B. The WASASP provides forecasts for each of the airports. As with national forecasts the state forecasts for individual airports are more general than are

Figure 2-5: New Washington State Aviation System Plan Airport Classification System

Classification	Primary Activities	Factors to Classify Airports
Major	• Commercial service • Aircraft or aerospace manufacturing	• ARC C-III or greater • Primary Activity: commercial service and/or aerospace manufacturing/MRO • Population over 40,000
Regional	• Corporate GA and travel business	• ARC B-II or greater • Primary Activity: corporate GA and travel business • Population over 30,000
Community	• GA-personal transportation/business and recreational • Pilot training	• Not metro or regional • Paved primary runway surface • 15 or more based aircraft
Local	• GA-personal transportation/recreational • Pilot training • Agriculture	• Not metro or regional • Paved primary runway surface • Less than 15 based aircraft
General Use	• GA-personal transportation/recreational, including backcountry	• Unpaved primary runway surface (including all seaplane bases)

Source: WASASP (2017)

those developed in specific airport master plans. The WASASP defines the three pillars of the Washington Aviation System as air cargo, commercial uses and general aviation, and ORS embodies each of those three pillars.

As part of the new WASASP, the State of Washington has developed its own airport classification system to better describe the airport's contribution to the state airport system **Figure 2-5** depicts the new WASASP airport classifications.

As part of the new classification system, ORS has been designated as a "Community" Airport. A full description of this new classification is:

"A Community airport provides a facility for larger scale general aviation activities that are important to aviation, such as business and personal transportation, recreation, and pilot training. There may be fewer corporate flights for business activities than a Regional airport, but they will still be active at this type of airport. The typical aircraft serving these activities are ARC A-I (small) to B-II. A Community airport serves a population range of 5,000 to 1.8 million. Community airports have paved runways and should have a minimum of 15 based aircraft to be included in this classification."

ORS meets the definition of the "Community" airport, including its expectation of the type of aircraft served, quite well.

Of particular interest to ORS were the forecasts developed as part of the latest WASASP. The overall average and classified annual growth rates forecast by the WASASP for the 20-year period and relevant to ORS forecasts are summarized as:

- GA aircraft operations statewide: **0.9%**
  - Community Classified Airports: **1.3%**
- Air Carrier / Air Taxi Commuter aircraft operations statewide: **2.0%**
- Enplanements statewide: **3.1%**
  - Based Aircraft statewide: **1.1%**
- Community Classified Airports: **1.8%**

These numbers are similar to most of the other FAA TAF based forecasts and provide further credence to the projected activity of the aviation industry in Washington as a whole. Also as part of the WASASP, some individual airport information was also presented in terms of 20-year projection trends. **Table 2-18** shows the historic reported and forecast projections attributed to ORS for scheduled passenger operations from the WASASP.

Table 2-18: Projected Air Carrier / Air Taxi / Commuter aircraft operations as per WASASP (2017)

Year	Scheduled Passenger Operations
2014	3,439
2019	3,566
2024	3,715
2034	4,087

Source: WASASP (2017)

The figures reported in the WASASP do not match current reported analysis or trends at ORS. Reported scheduled passenger aircraft operations are already substantially higher than reported by the WASASP. This anomaly is due to the different databases used and time periods in which the data is presented. It is not uncommon for information of this type in a statewide plan to be collected from consolidated databases rather than being specific to an individual airport. The information is not meant to be entirely conclusive for each individual airport, and is used more to show trends for the entire state.

2.4.2 National Trends and Forecasts

2.4.2.1 FAA Aerospace Forecast

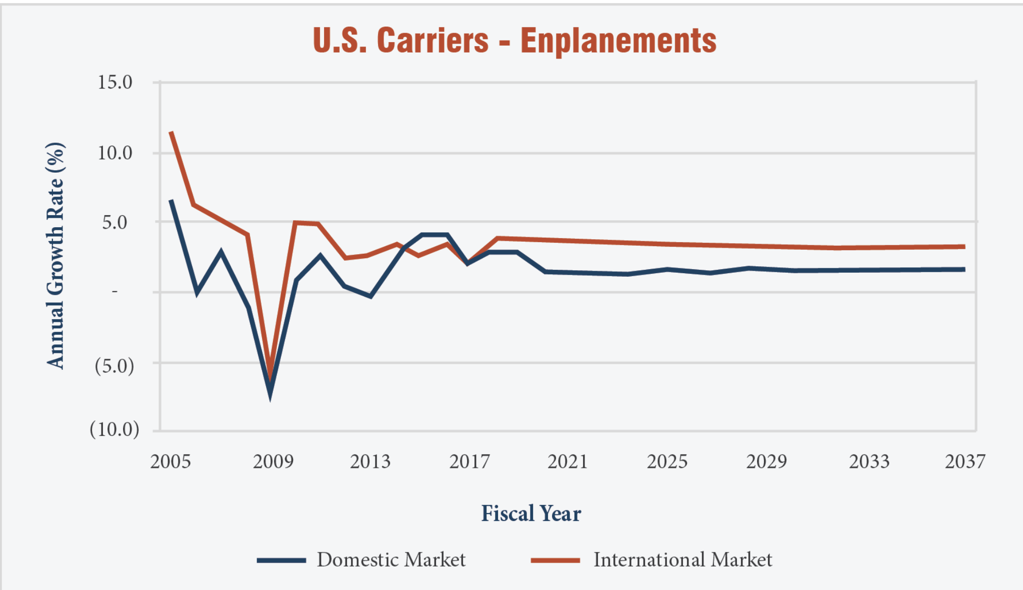
An important part of developing trends for statistical purposes is analyzing relevant issues from a national perspective, and then applying them, as warranted, to the regional and local perspective. One of the most reliable and important tools for this purpose is the information collected and analyzed by the FAA as part of its FAA Aerospace Forecast (2017–2037), and the NPIAS driven FAA TAF reports.

The latest FAA Aerospace Forecast report states that the U.S. is in its seventh year of recovery from a significant recession that affected the industry tremendously. The aviation industry is currently doing well overall and recent events have seemed to heighten airline competition. The boom and bust cycles that characterized much of the aviation business since deregulation 40 years ago have been replaced by an industry that is closely tied to the healthy economy, and for the most part, the report states that the US economy is showing very good signs of long-term strength. The FAA is forecasting US domestic carrier passenger growth to average 1.9% per year over the next 20 years. (See **Figure 2-6**) The sharp decline in oil prices in 2015 and 2016 was a boost for the overall growth of the industry, which is still in effect. The FAA is forecasting oil to be supplied at appx $50 per barrel in 2018 and perhaps exceed $100 per barrel in 2026 and perhaps be over $132 per barrel by 2037.

Although there are some significant changes continuing, the report states that the long-term outlook for GA is stable and has room for optimism. In 2016, deliveries of GA aircraft continued their decline, with a drop of -2.1% in turboprop deliveries, a decline of -7.4%

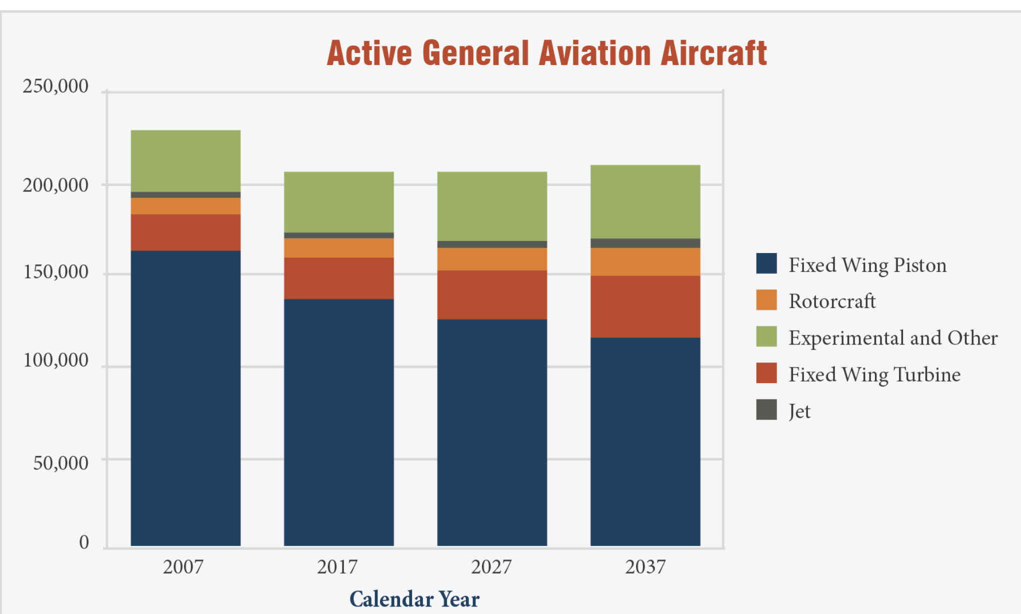
in deliveries of single-engine piston aircraft, and a sharp decline of -23.2% in multi-engine piston aircraft, however, business jet deliveries continued to increase by 1.8%. The FAA predicts an average annual increase in the GA fleet of 0.1% per year for the next 20 years, with the largest gains being made in the rotorcraft sector, and continuing declines in the fixed wing fleet over the same period. See **Figure 2-7.**

Figure 2-6: FAA forecast US enplanements



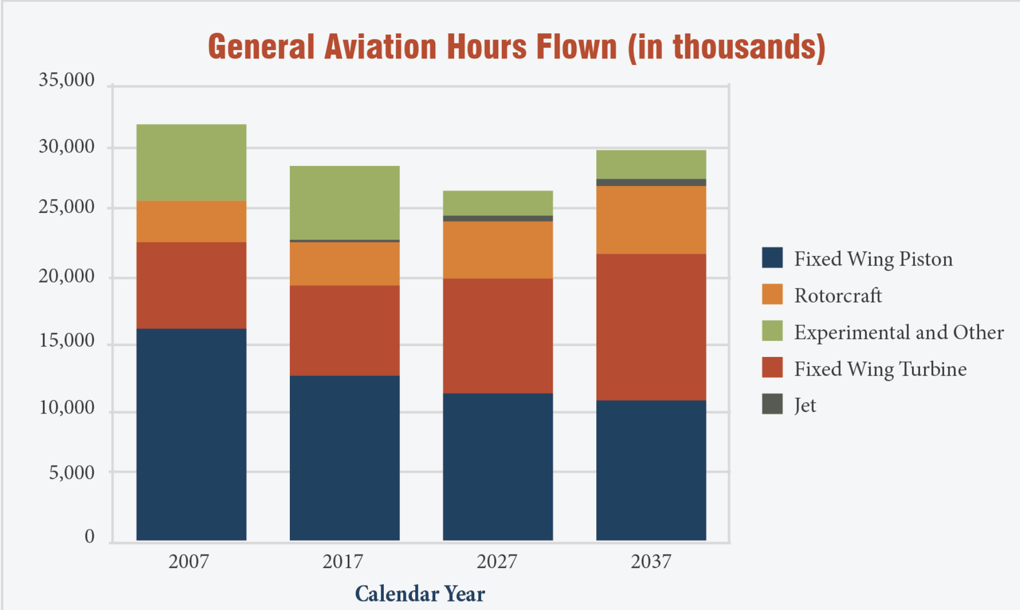
Source: FAA Aerospace Forecast

Figure 2-7: FAA forecasts for general aviation fleet



Source: FAA Aerospace Forecast

Figure 2-8: FAA forecasts for GA hours flown



The number of GA hours flown is expected to increase an average of 0.9% per year over the forecast period, with a 2.3% growth in the turbine hours, a 2.0% increase in rotorcraft hours, and a 3.0% increase in jet hours, but with a 0.8% decline in in fixed wing piston hours. The regional and business jet market continues to be robust, and shows no signs of slowing. See **Figure 2-8**.

2.4.2.2 FAA National Terminal Area Forecast Summary

The FAA's official forecast for ORS, and for all other airports as well, is provided by the annual FAA TAF (Terminal Area Forecast). FAA TAF information has been utilized in several ways in previous sections of this forecast chapter. The FAA TAF is used in conjunction with the FAA's National Plan of Integrated Airport Systems (NPIAS) to determine an airport's forecasted number of aircraft operations, based aircraft, enplanements and other information, especially if no other data is available. The FAA TAF and the associated annual summary report provide forecasts for multiple levels, from nationwide to region and down to the individual airport level. The types of operations that the TAF forecasts for individual airports depends upon the complexity of the airport, with large commercial service airports having more complete data, and smaller GA airports having less. For ORS, the TAF includes forecasts of enplanements, aircraft operations and based aircraft, with each broken down into standard subset categories. The forecasts for individual airports are made from a national rather than a local perspective. The entire current FAA TAF for ORS can be found in **Appendix XX**.

The latest FAA TAF forecasts some interesting data for the US as a whole. For the near term, itinerant GA operations are predicted to increase by 0.2% and local GA operations by 0.3%. Total enplanements at all airports are expected to increase by 4.3%. For the longer term, trends favor a national average annual growth rates for air carriers by 2.6%, a dip in air taxi/commuter traffic by -1.1%, an increase in itinerant GA operations of 0.3% and growth of local GA operations at 0.4%. There is also a 0.78% increase forecasted for based aircraft nationally over the same period. A summary of some selected individual historic and forecast national statistics provided within the latest FAA TAF over selected 5-year periods can be seen in **Table 2-19**.

Table 2-19: FAA TAF Report - National trends and forecasts for selected years

Year	Passenger Enplanements	Itinerant Operations		Local Operations	Based Aircraft
1990	35,267,097	10,899,797	37,856,386	39,597,910	162,130
1995	53,086,501	13,244,148	38,692,933	38,432,590	157,731
2000	75,336,095	14,252,839	43,829,370	43,173,651	179,675
2005	147,094,064	15,537,944	40,248,225	40,842,565	197,155
2010	159,812,158	12,132,948	34,401,873	36,767,751	165,441
2015	154,157,631	10,505,427	32,401,573	35,880,959	163,973
2020*	161,102,944	9,047,757	32,450,259	36,472,297	179,487
2025*	176,944,397	8,055,931	32,997,398	37,130,522	186,859
2030*	192,880,962	8,368,051	33,586,458	37,837,913	194,021
2035*	209,583,076	8,703,656	34,222,076	38,601,331	201,459
2040*	227,402,065	9,060,573	34,911,411	39,429,173	209,386
2045*	246,388,889	9,439,235	35,659,947	40,328,657	217,754

Source: FAA TAF

2.4.3 Other Relevant Influences on Trends & Forecasts

When forecasting future operations, enplanements and based aircraft at GA and small commercial service airports, it is important to examine other potential influences and desires that could affect overall development. Some of the items to consider may have unquantifiable metrics, while others may be quantifiable. It is incumbent upon the forecaster to not only use professional judgement when considering these variables, but to place a great degree of emphasis upon stakeholder opinions about the topics. Forecasting operations at larger, commercial airports can certainly be challenging due to their complexity and the sheer amount of data available, however, smaller GA airport forecasts can be equally as challenging because of the limited amount of reliable published data and because some variables can potentially have a large influence on the whole. This makes forecasting for GA airports much more dependent upon local input and forecaster discretion.

2.4.3.1 Ferry Operations

Washington State Ferries operates ferry service crossing the Puget Sound and its inland waterways. This marine highway carries commercial users, tourists, and daily commuters. Several vessels provide service between Anacortes and the San Juan Islands, with a stop at the Orcas Island Ferry Terminal (**Tables 2-21-2-22 and Figure 2-9**).

Historic ferry ridership between Anacortes and Orcas Island decreased from 2002 to 2009, but has since rebounded with 672,272 riders in 2017.

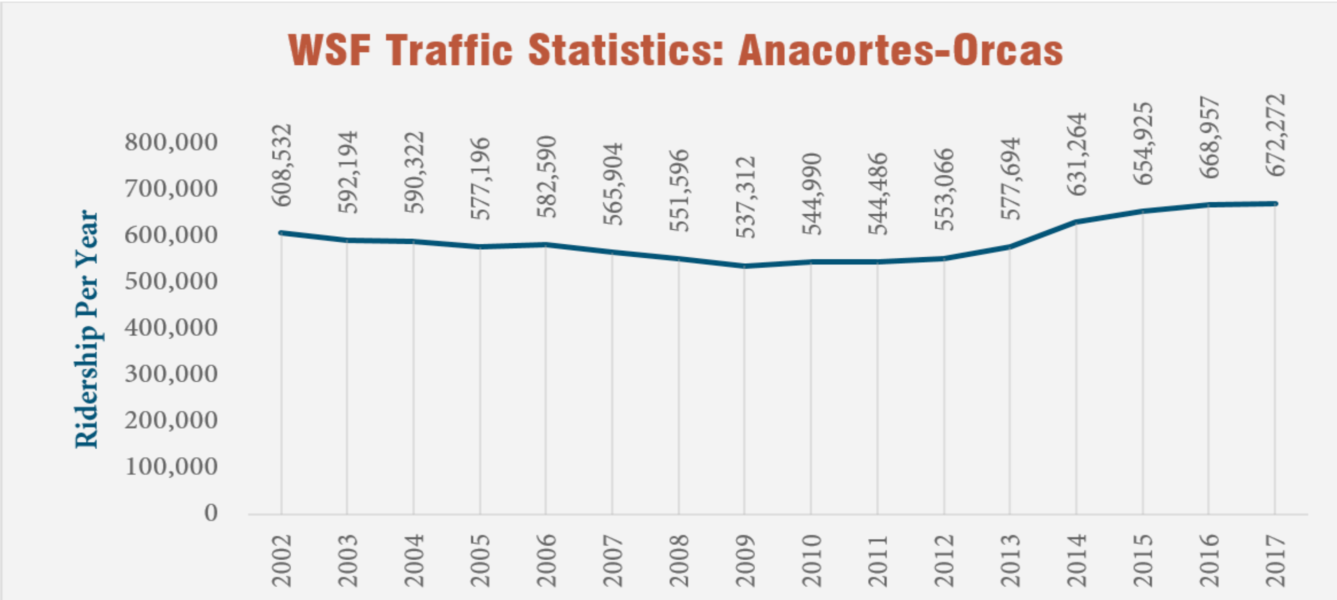
Round-trip fares on the Anacortes-Orcas route are assessed for passengers and vehicles.

Table 2-20: Representative Washington State Ferries Vessels Serving Orcas Island (2017)

Vessel Name	Vessel Class	Maximum Passengers	Maximum Vehicles
Chelan	Issaquah	1200	124
Hyak	Super	2000	144
Kittitas	Issaquah	1200	124
Samish	Olympic	1500	144
Yakima	Super	2000	144

Source: http://www.wsdot.com/ferries/vesselwatch, accessed April 2018. Vessels serving Orcas Island may vary.

Figure 2-9: WSF Traffic Statistics



Source: WSF Traffic Statistics Rider Segment Reports

Table 2-21: Washington State Ferries Traffic Statistics: Anacortes-Orcas

Year	Vehicles	Passengers			Total Riders	% Change from Previous Year
		Total	Vehicle	Foot		*(Total Riders)*
2002	288,558	319,974	250,840	69,134	608,532	0.0%
2003	276,728	315,466	243,356	72,110	592,194	-2.7%
2004	278,222	312,100	244,884	67,216	590,322	-0.3%
2005	276,274	300,922	238,362	62,560	577,196	-2.2%
2006	279,872	302,718	238,446	64,272	582,590	0.9%*
2007	274,224	291,680	210,500	81,180	565,904	-2.9%*
2008	265,236	286,360	224,090	62,270	551,596	-2.5%*
2009	260,254	277,058	214,306	62,752	537,312	-2.6%
2010	263,232	281,758	222,928	58,830	544,990	1.4%
2011	260,616	283,970	225,560	58,310	544,486	-0.1%
2012	264,174	288,892	230,244	58,648	553,066	1.6%
2013	275,104	302,590	238,730	63,860	577,694	4.5%
2014	289,400	341,864	262,310	79,554	631,264	9.3%*
2015	297,986	356,939	280,767	76,172	654,925	3.7%
2016	307,276	361,681	285,333	76,348	668,957	2.1%
2017	310,377	361,895	288,989	72,906	672,272	0.5%*

Source: WSF Traffic Statistics Rider Segment Reports January 1, 2002 through December 31, 2017.
*Calculated values. All other percentages drawn from WSF reports.

Table 2-22: Washinton State Ferries Passenger and Vehicle Fares: Anacortes-Orcas

Fare Type		Anacortes/Orcas *(Round-Trip)*
Passenger (in vehicle or walk on)	Regular Fare (Peak Season)	13.50
	Senior / Disability / Medicare (Peak Season)	6.70
	Youth (Peak Season)	6.70
	Wave2Go Multi-Ride Card (Peak Season)	88.65
Bicycle Surcharge	Passenger Fare Plus	2.00 (4.00)
Small Vehicle & Driver (under 14')	Regular Fare (Peak Season)	32.75 (44.15)
	Senior / Disability / Medicare (Peak Season)	25.95 (37.35)
	Wave2Go Multi-Ride Card (Peak Season)	123.15
Standard Vehicle & Driver (14' to under 22')	Regular Fare (Peak Season)	40.95 (55.20)
	Senior / Disability / Medicare (Peak Season)	34.15 (48.40)
	Wave2Go Multi-Ride Card (Peak Season)	153.90
Motorcycle & Driver, Stowage Fee	Regular Fare (Peak Season)	19.10 (25.70)
	Senior / Disability / Medicare (Peak Season)	12.30 (18.90)
	Wave2Go Multi-Ride Card (Peak Season)	143.90
Vehicle Length-Based Fares	22' to under 30', Under 7'2" High (Peak Season)	62.80 (84.65)
	22' to under 30', Over 7'2" High (Peak Season)	125.30 (169.00)
	30' to under 40' (Peak Season)	166.95 (225.25)
	40' to under 50' (Peak Season)	208.65 (281.50)
	50' to under 60' (Peak Season)	250.30 (337.75)
	60' to under 70' (Peak Season)	292.00 (394.05)
	70' to under 80' (Peak Season)	333.65 (450.30)
	80'+ (per additional foot) (Peak Season)	4.15 (4.65)

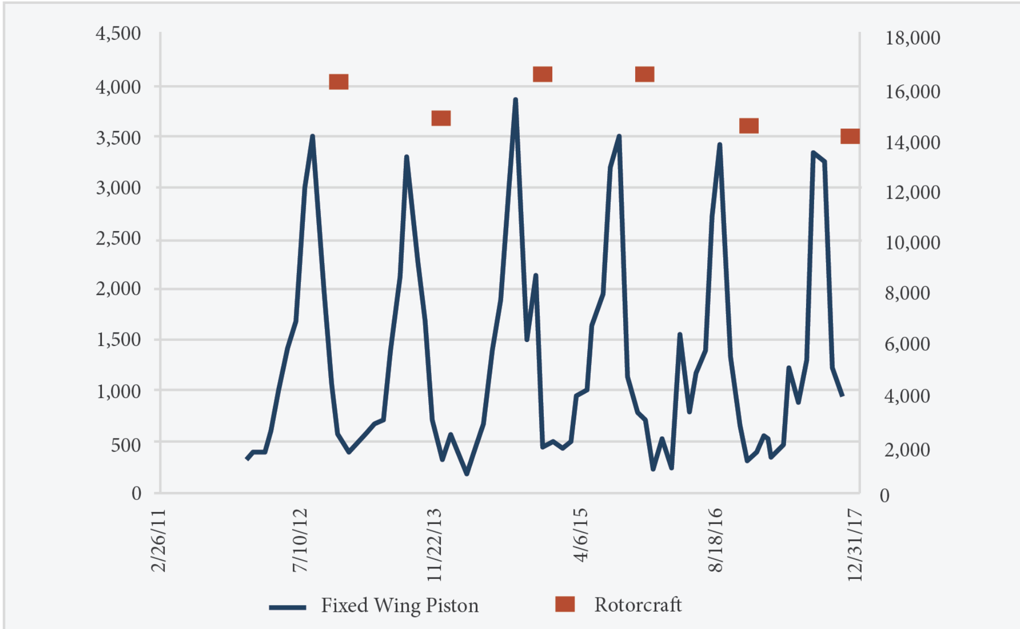
Source: WSF Passenger and Vehicle Fares, Effective October 1, 2017.

Regular passenger fares were $13.50 as of October 1, 2017, with discounts available for youth, senior, and disabled individuals. Vehicle fares are based on vehicle length, height, and width and range from $32.75 for a small vehicle and driver during the off season to $450.30 for a vehicle 70-80 feet in length during peak season.

2.4.3.2 Fuel Sales

Fuel sales are another metric that can help to determine historical trends in activity at an airport. Although sales can fluctuate over time, consumption of fuel can be an indicator of activity at an airport, especially for GA. Interpreting fuel sales information at ORS was only possible coupled with explanations from airport representatives. It is rare that commercial scheduled passenger aircraft purchase fuel at ORS. Most fuel sales at ORS are from transient and local GA aircraft. The fact that the aviation fuel must be transported to Orcas Island prior to final sale obviously increases the cost as compared to sales on the mainland. Fuel sales records over the time period available corroborate the observations by local users of somewhat static GA

Figure 2-10: Fuel sales records for ORS



Source: ORS Airport Management Records

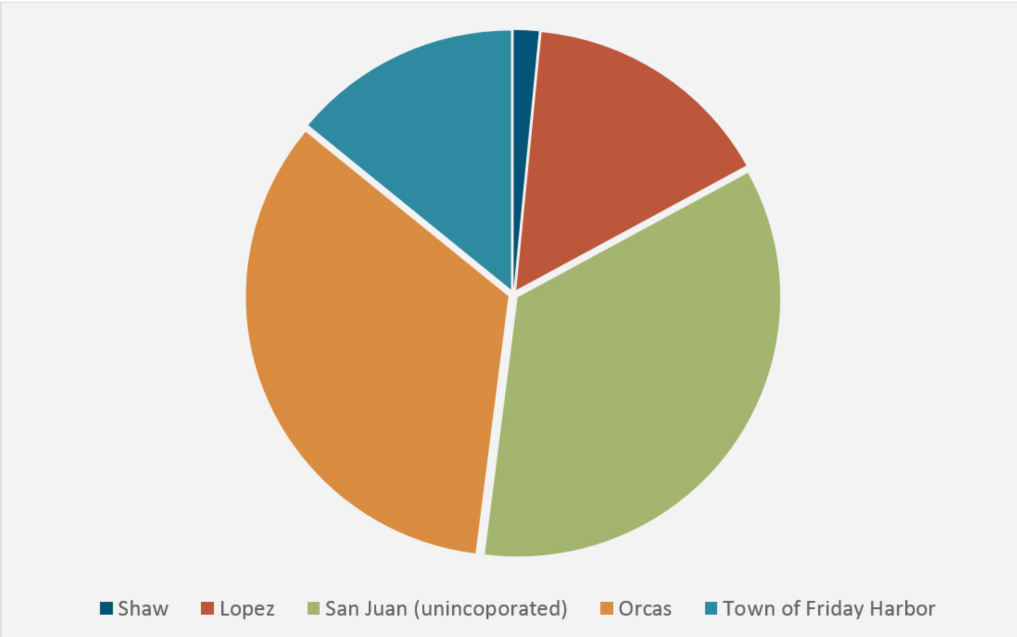
activity levels. **Figure 2-10** depicts the recorded fuel sales at ORS over several years. The obvious decline and rise of fuel sales over a year is clearly evident and highlights just how much activity and traffic there is during the tourist season. The consensus of stakeholders is that additional fuel sales to commercial carriers would be very beneficial, but not likely in the foreseeable future. Fuel sales data do not contribute to the activity forecasts but will be used in determining required fuel storage.

2.4.3.3 US Census and Demographic Information

The US census information relative to Eastsound and Orcas Island has been refined and augmented greatly by the State of Washington and San Juan County. The 2017 20-year comprehensive population projections developed by the Department of Community Development provide some valuable information regarding the population trends on Orcas Island. Orcas Island constitutes about 1/3 of the total County population (**Figure 2-11**). The island has been and is currently home to a disproportionately large number of second home owners and part-time residents, and this trend is continuing. This situation is well known to ORS airport representatives and stakeholders, and is evident in the types and numbers of local GA operations and scheduled passenger traffic.

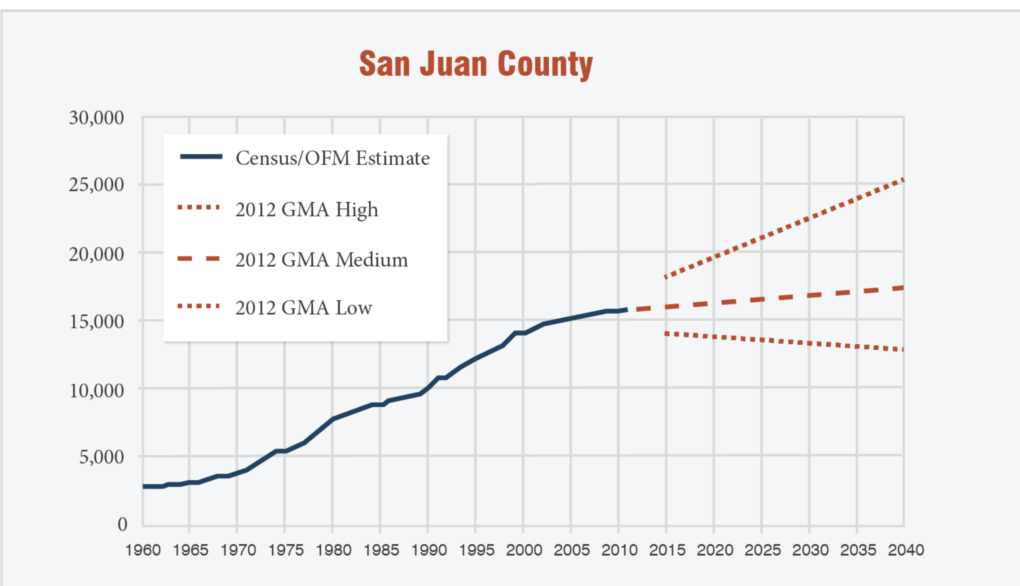
From 1990 to 2016, Orcas Island grew at a compound annual growth rate of nearly 2.04%. However, the rate of population growth has been declining and was approximately 0.55% from 2010 to 2016. This growth rate is based primarily on immigration as deaths continue to outpace birth rates in the County and on Orcas Island. The most reliable low-end estimates for population growth for Orcas Island show a decrease in population over time, however, more likely medium projections estimate modest growth for both Orcas Island and San Juan County through 2040. (See **Figure 2-12**). The total estimated Orcas Island population as of April 2016 was 5,395. Under medium prediction estimates, this number is expected to rise to approximately 5,768 by 2040.

Figure 2-11: San Juan County population distribution



Source: OFM GMA County Population Projection, Courtesy of San Juan County

Figure 2-12: San Juan County 20-year population estimates



Source: OFM GMA County Population Projection, Courtesy of San Juan County

2.5 ORS FORECASTS

2.5.1 Forecasting Methodology

FAA AC 150/5070-6B gives wide latitude in both the types and application of the methods that can be used when forecasting data in an airport master plan. The reason for this flexibility is to account for the large variances in the types and complexities of airports and the large number of variables that can influence the forecasts. Professional judgement must be employed in determining the best methodology for the application of forecasts. There are several types of methodologies that the FAA recognizes, including:

1) Regression analysis. This is a statistical technique that ties aviation demand (dependent variables), such as enplanements, to economic measures (independent variables), such as population and income. This type of analysis should be restricted to relatively simple models with independent variables for which reliable forecasts are available.

2) Trend analysis and extrapolation. This type of method relies on projecting historic trends into the future. In trend analysis, a simple equation can be used with time as the independent variable. It is one of the fundamental techniques used to analyze and forecast aviation activity. While it is frequently used as a back-up or expedient technique, it is highly valuable because it is relatively simple to apply. Sometimes trend analysis can be used as a reasonable method of projecting variables that would be very complicated (and costly) to project by other means. This is especially true for smaller, GA airports.

3) Market share analysis or ratio analysis. This technique assumes a top-down relationship between national, regional, and local forecasts. Local forecasts are a market share (percentage) of regional forecasts, which are a market share (percentage) of national forecasts. Historical market shares are calculated and used as a basis for projecting future market shares. This type of forecast is useful when the activity to be forecast has a constant share of a larger aggregate forecast.

4)Smoothing. A statistical technique applied to historical data, giving greater weight to the latest trend and conditions at the airport; it can be effective in generating short-term forecasts.

For ORS forecasts, a combination of Trend Analysis with Applied Smoothing augmented with Market Share Ratio and other demographic and stakeholder input data will be utilized. Current and historic data coupled with existing forecast data from external sources is used to create a trending average that is adjusted by recent trends (smoothing) to create a forecasted annual average growth rate. This methodology takes advantage of the known historical trends of the airport, the current operational and based aircraft data and other data influencing the region including national trends and data.

In determining the slope of a linear graph over time, several average and trend-adjusted average annual growth rates that were previously discussed in this chapter were considered as well as other national and specific information. Some of the specific annualized rates and the other relevant information used is summarized in **Table 2-23**. Individual rates that were predicted by the FAA TAF and compared to the developed forecasts are highlighted as well.

2.5.1.1 TAF Reconciliation

To further refine the FAA TAF forecasts, the FAA relies upon the airport master planning process. To ensure reasonableness and to create a baseline for master planning forecasts, the guidance provided for airport master planning in the FAA AC 150/5070-6B states that all airport master plan forecasts must be compared against the FAA's existing TAF for the airport. After comparisons are made, the forecasts are considered compatible and consistent with the FAA TAF for all classes of airports if the forecasts for total enplanements, based aircraft, and total operations meet the following criteria:

- Forecasts differ by less than 10 percent in the five-year forecast period
- Forecasts differ by less than 15 percent in the ten-year forecast period

If comparisons are not consistent with the FAA TAF, the reasons for the differences must be explained. It is not uncommon for there to be differences between the FAA TAF and airport master plan forecasts, especially for smaller uncontrolled commercial service and GA airports with limited current and historic data.

Table 2-23: Some specific Indicators considered for ORS forecasts, adjusted and augmented as described within the chapter

Level of Indicator	Specific Indicator	Source	Average Annual Rates
Based Aircraft Information			
Local	FAA Based Aircraft Stats (1984-2017)	FAA 5010 / TAF	3.91%
Local	FAA Based Aircraft Stats (2006-2016)	FAA 5010 / TAF	0.00%
Local	2008 Master Plan Based Aircraft Forecast	ORS MP 2008	1.30%
Local	FAA ORS Based Aircraft Forecasts (2017-2045)	FAA TAF	3.76%
Regional	FAA NWMR Forecasts (2017-2045)	FAA TAF	0.88%
Regional	FAA Washington State Forecasts (2017-2045)	FAA TAF	1.08%
Regional	WASASP Forecasts (all classes)	WASASP	1.10%
Regional	WASASP Forecasts (community class)	WASASP	1.80%
National	FAA National Forecasts (2017-2045)	FAA TAF	0.78%
General Aviation Aircraft Operations			
Local	FAA GA Operations Stats (1990-2015, local and itinerant)	FAA 5010/TAF	-0.67%
Local	2008 Master Plan GA Operations Forecast	ORS MP 2008	1.30%
Local	FAA ORS GA Operations Forecasts (2017-2045, local and itinerant)	FAA TAF	1.37%
Regional	FAA NWMR Forecasts (2017-2045 all operations)	FAA TAF	1.06%
Regional	FAA Washington State Forecasts (2017-2045 all operations)	FAA TAF	1.20%
Regional	WASASP Forecasts (all classes)	WASASP	0.90%
Regional	WASASP Forecasts (community class)	WASASP	1.30%
National	FAA National Forecasts (near term itinerant operations)	FAA TAF	0.20%
National	FAA National Forecasts (near term local GA operations)	FAA TAF	0.30%
National	FAA National Forecasts (long term itinerant operations)	FAA TAF	0.30%
National	FAA National Forecasts (long term local GA operations)	FAA TAF	0.40%
Scheduled Passenger Service Operations			
Local	FAA Air Carrier Operations Stats (1990-2015)	FAA 5010/TAF	-0.19%
Local	2008 Master Plan Air Carrier Operations Forecast	ORS MP 2008	3.10%
Local	ORS Reported Air Carrier Activity (1998-2017)	Port of Orcas	-2.51%
Local	ORS Reported Air Carrier Activity (1998-2017)	Port of Orcas	0.91%

Level of Indicator	Specific Indicator	Source	Average Annual Rates
Local	ORS Reported Air Carrier Activity (2013-2017)	Port of Orcas	11.21%
Local	FAA ORS Air Carrier Forecasts (2017-2045)	FAA TAF	0.98%
Regional	FAA NWMR Forecasts (2017-2045 all operations)	FAA TAF	1.06%
Regional	FAA Washington State Forecasts (2017-2045 all operations)	FAA TAF	1.20%
Regional	WASASP Forecasts (all classes)	WASASP	2.00%
National	FAA Aerospace Forecast All Passengers	FAA	1.9%
National	FAA National Commuter Traffic (2017-2045)	FAA TAF	-1.10%
Passenger Enplanements			
Local	FAA Passenger Enplanement Stats (1990-2015)	FAA 5010/TAF	-0.78%
Local	2008 Master Plan Passenger Enplanements Forecast	ORS MP 2008	3.10%
Local	ORS Reported Passenger Enplanements (1998-2017)	Port of Orcas	0.54%
Local	ORS Reported Passenger Enplanements (2005-2017)	Port of Orcas	6.14%
Local	ORS Reported Passenger Enplanements (2013-2017)	Port of Orcas	17.30%
Local	FAA ORS Pax Enplanements Forecasts (2017-2045)	FAA TAF	3.10%
Regional	FAA NWMR Forecasts (2017-2045)	FAA TAF	2.04%
Regional	FAA Washington State Forecasts (2017-2045 all operations)	FAA TAF	2.24%
Regional	WASASP Forecasts (community class)	WASASP	3.10%
National	FAA Aerospace Forecasts	FAA	1.90%
National	FAA National Forecasts (2017-2045)	FAA TAF	4.3%
Instrument Operations			
Local	FAA Instrument Operations Stats (2000-2017)	FAA TFMSC	11.16%
Local	FAA Instrument Operations Stats (2007-2017)	FAA TFMSC	15.06%
Local	FAA Instrument Operations Stats (2012-2017)	FAA TFMSC	7.44%

2.5.2 Forecast Tables

The following tables represent the forecasts as developed for the ORS airport master plan, with associated data and FAA TAF forecasts for reference. The tables depict the current baseline levels as well as the required forecasts for the short term (+5-years), mid-term (+10-years), and long term (+20-years) as required by the FAA. The complete year by year forecasts for all data elements can be found in **Appendix XX**.

Based Aircraft

Table 2-24: ORS Based Aircraft Forecasts

	Base Year 2017	Short Term Forecast 2022	Intermediate Term Forecast 2017	Long Term Forecast 2037
Single	60	63	66	73
Twin	1	1	1	1
Jet	0	0	0	0
Helicopter	0	0	0	0
Total Based Aircraft Forecast (+1.00%)	61	64	67	74
FAA TAF Based Aircraft forecast (+3.76%)	76	94	108	155
% Difference Between Forecast and TAF	20%	32%	38%	52%

Explanation of Forecast and TAF Differences

The current FAA TAF for ORS has a very robust average annual growth rate of based aircraft of 3.76% over the forecast period. A deeper analysis of the data, as previously explained in the relevant section of this chapter, shows the past numbers recorded for ORS to be quite unreliable for many of the years records were kept, especially in relation to the FAA Airport Master Records. More recent trends and available data suggest that based aircraft numbers have been relatively static at the facility, and a decrease over the last ten years. Further consideration of input from ORS representatives and interested stakeholders coupled with analysis of the available information such as GA activity, census data, and WASASP forecasts have influenced the forecast.

General Aviation and Schedued Commuter Operations

Table 2-25: ORS Aircraft Operations Forecasts

	Base Year 2017	Short Term Forecast 2022	Intermediate Term Forecast 2027	Long Term Forecast 2037
Interant Operations				
Air Carrier	0	0	0	0
Air Taxi/Commuter (+2.10%)	8,790	9,753	10,820	13,320
GA (+1.50%)	18,247	19,657	21,176	24,576
Military	100	100	100	100
Local Operations				
GA (+0.85%)	15,203	15,860	16,546	18,007
Military	0	0	0	0
Total Aircraft Operations Forecast	42,340	45,370	48,642	56,003
FAA TAF Forecast	42,309	44,991	47,892	54,425
% Difference Between Forecast and TAF	0.07%	0.84%	1.54%	2.82%

Explanation of Forecast and TAF Differences

There are no major discrepancies between the current FAA TAF for ORS and the forecast predictions.

Instrument Approach Procedures

Table 2-26: ORS Instrument Operations Forecasts

	Base Year 2017	Short Term Forecast 2022	Intermediate Term Forecast 2027	Long Term Forecast 2037
Instrument Operations (+7.50%)	2,482	3,563	5,115	10,543

Explanation of Forecast and TAF Differences

The current FAA TAF for ORS does not include any predictive analysis regarding total instrument operations at ORS.

Passenger Enplanements

Table 2-27: ORS Enplanement Forecasts

	Base Year 2017	Short Term Forecast 2022	Intermediate Term Forecast 2027	Long Term Forecast 2037
Air Carrier	0	0	0	0
Commuter (+2.80%)	9,180	10,642	12,337	16,580
Total Enplanements Forecast	9,180	10,642	12,337	15,580
FAA TAF Forecast	6,723	7,832	9,110	12,360
% Difference Between Forecast and TAF	36.5%	35.9%	35.4%	34.1%

Explanation of Forecast and TAF Differences

As described in more detail in the relevant section of this chapter, there have been some stark differences in the enplanements reported by the FAA and those reported by ORS using data provided by the carriers. Actual enplanements for 2017 are reported as 9,180. The TAF uses as its base (current year) forecast, 6,723 enplaned passengers. When the correct current year enplanements are applied to the TAF forecast growth rate, the forecasts are within the mandated maximum difference.

Very little of the difference between the actual and TAF base year counts can be ascribed to on-demand/unscheduled carriers or calendar/fiscal differences. Looking at the ACAIS record for 2017, on-demand/unscheduled carriers account for only about 2.5% of total enplanements. Also, if there is a growth trend, as there is at ORS, it wouldn't be surprising that calendar year data would be higher than fiscal year data, but probably nothing close to the 26% difference shown in the table except in extreme circumstances.

Capacity

Capacity of the facility to handle the onloading and offloading of scheduled service is currently adequate, but could certainly be enhanced. The forecasts predict moderate growth reflecting an increasing use of the existing passenger facilities. No changes in current service are forecast that would not be able to be met by future planning and development of additional or remodeled onloading and offloading facilities under normal FAA AIP development. In contrast to scheduled passenger facilities, cargo facilities currently utilized for onloading and offloading are very strained and have exceeded facility capacity for some time. Although cargo forecasts are not part of the required forecasts for this chapter, additional needs are evident, and are further discussed in the facility needs section. Capacity, or lack of it, does not impact the forecasts.

Image of Cessna 208B Grand Caravan

2.5.3 Critical Aircraft

ORS does not have an active control tower, or a method for recording all types and numbers of flights at the facility. Because of this, other reliable sources of information and methods of collecting relevant data are necessary to help in ascertaining critical aircraft information. In addition to gathering IFR flight records for the facility and examining fuel sales, interviews with airport representatives and stakeholders, government representatives and the master plan advisory committee were also utilized. Most importantly, the manager of the airport provided detailed information about the nature of flights in and out of the airport. Since there are many IFR flight operations in and out of ORS, the aircraft type reported with IFR flight information is very helpful in assisting with the critical aircraft determination.

The "Critical Aircraft" or "Design Aircraft" determination is an important aspect of an airport master plan as it potentially sets ultimate dimensional design requirements for an airport. This impacts items such as the distance between runways and taxiways and the size of certain other areas protecting the safety of aircraft operations and passengers. To facilitate application of design standards across the universe of aircraft types, the FAA groups aircraft into performance- and dimension-based categories. These different categories are primarily defined based on wingspan, tail heights, landing gear configuration and approach speeds. The process of examining the using and forecasted aircraft leads to the selection of a "Design Aircraft" and a "Runway Design Code" (RDG). That selection leads to the consideration of the facility requirements discussed in future chapters of the master plan.

- Aircraft Classification - The Design Aircraft classification is a composite of three parameters: The Aircraft Approach Category, the Airplane Design Group, and the Taxiway Design Group.
- Aircraft Approach Category – The Aircraft Approach Category (AAC) is based on the landing aircraft's approach speed. Most of the aircraft using ORS are in AAC Category A – approach speed less than 91 knots or AAC B – approach speed 91+ to 121 knots
- Airplane Design Group - Most of the aircraft using ORS are in either ADG I – Tail Height <20' and wingspan < 49', or ADG II – tail height 20' to <30' and wingspan 49' to <79'.
- Taxiway Design Group – TDG relates to the undercarriage dimensions of the using aircraft and sometimes determines taxiway width and/or runway-taxiway separation. Most of the aircraft using ORS are in the TDG-1A category.
- Runway Design Code (RDC) is a combination of the above factors plus a number representing the approach visibilities at the airport. For ORS the visibility minimums are "not less than 1 mile" and receive a code category 5000.

The Cessna Grand Caravan, an A-II category aircraft with an approach speed of less than 91 knots, by itself accounts for more than 500 operations at ORS. However, the Grand Caravan's minimum operating speed during icing conditions is 95 knots, and icing conditions are frequent at ORS. In addition, aircraft with approach speeds in the B category, such as the Beechcraft King Air 200, collectively conduct more than 500 operations at ORS annually, so the B category becomes critical.

Most of the aircraft operating at ORS are TDG-1A or lower, and aircraft higher than TDG-1A do not collectively exceed 500 annual operations. Thus, the airport Runway Design Category (RDC) for ORS is B-II-1A-5000. This RDC will be used in the facilities requirements chapter later in this master plan.

FORECAST SUMMARY

Table 2-28 summarizes the ORS forecast for total operations, total enplanements and total based aircraft over the next 20 years.

Table 2-28: ORS Summary

	Base Year 2017	Short Term Forecast 2022	Intermediate Term Forecast 2027	Long Term Forecast 2037	Forecasted Growth Percentage
Total Operations	42,340	45,370	48,642	56,003	1.4%
Total Enplanements	9,180	10,642	12,337	16,580	3.0%
Total Based Aircraft	61	64	67	74	1.00%