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5. Aviation Activity Forecasts

This chapter discusses the background, assumptions, and methodologies used to project future aviation demand at North Perry Airport (HWO). It is important to recognize that there can be short-term fluctuations in an airport's activity due to a variety of factors that are, at best, difficult to be anticipated. The aviation industry is, as of the time of this analysis (Spring 2016), presently experiencing the influence of just such an event in the form of the precipitous drop in the price of oil and the corresponding drop in aviation fuel costs. The forecasts developed in this document are intended to consider the routine ebb and flow in activity levels while projecting what the long-term trend of activity is most likely to be. In so doing these projections provide a meaningful framework to guide analysis for future Airport development needs and alternatives.

The projections of aviation demand developed for HWO are documented in the following sections:

- Historical and Current Aviation Activity
- Socioeconomic Factors
- Local and Regional Aviation Trends
- National Aviation Trends
- Based Aircraft Forecasts
- Aircraft Operations Forecasts
- Peaking Characteristics and Peak Operations Projections
- Critical Aircraft
- Forecast Summary
- FAA Forecast Review and Approval

This forecast analysis includes methodologies that consider historical aviation trends at the Airport and throughout the nation. Local historical data were collected from FAA Terminal Area Forecast (TAF) records, Air Traffic Activity System (ATADS), Traffic Flow Management System Counts (TFMSC), Airport tower records, 5010 Airport Master Records, and the Florida Department of Transportation (FDOT) Florida Aviation Database (FAD) and FDOT planning analyses. In addition, socioeconomic data for the Miami-Fort Lauderdale Metropolitan Statistical Area (MSA) have been examined to track local trends and conditions that can impact general aviation demand levels. Projections of aviation activity for the Airport were prepared for near-term (2020), mid-term (2025), and long-term (2035) timeframes.

It is important to note that the forecasts developed for this document incorporate the existing conditions at HWO and its surrounding area. This includes not only local socioeconomic factors, but physical ones as well. These factors include potential limitations on the ability to significantly expand airfield facilities, interrelationship with other nearby airports, airspace considerations, and other factors including the existing limitation of operational activity to aircraft of 12,500 lbs. or less certificated maximum takeoff weight (MTOW). This limitation is particularly pertinent in the definition of based aircraft and fleet mix projections.

5.1 Historical and Current Aviation Activity

At general aviation airports such as HWO, there are two primary indicators of activity; based aircraft and aircraft operations. A based aircraft is generally defined as an aircraft that is permanently stored at an airport. In the case of Florida airports, consideration is often given to counting aircraft as based that spend the majority of the year at an airport given the high number of seasonal residents that reside in

Florida for 6 or more months a year. An aircraft operation represents either a take-off or landing conducted by an aircraft and as a result a takeoff and a landing such as those that occur with flight training "touch and go" practice counts as two operations.

Historical based aircraft and operations data for HWO provides the baseline for the consideration of projections of future activity at the Airport. While historical trends are not always reflective of future periods, historical data does provide insight into how local, regional, and national demographic and past events has contributed to aviation-related trends nationally and at a specific airport. It is also important to point out that historical data typically reflects the available facilities at the Airport. For example, HWO is configured with four runways, all of similar dimensions, and have takeoff weight restrictions of 12,500 lbs. Despite being a busy general aviation facility, the airfield configuration and weight limitations restrict the size and type of aircraft that can operate at the Airport. As these conditions are anticipated to remain constant throughout the 20-year planning horizon, these factors will continue to drive the types of aircraft that will be able to operate at HWO as well as limiting the potential for significant business jet operations into and out of HWO as the vast majority of these exceed the weight limitation.

The following sections summarize overall historical aviation-related activity at HWO in terms of aircraft operations and the number of based aircraft at the Airport. In general, within the aircraft sectors served by HWO, the airport has experienced similar historical trends in activity as has been seen nationwide. Specifically, this has equated to a gradual decline in the number of based aircraft at the Airport since 2000 and significant fluctuation in aircraft operations stemming from fallout from the events of September 11, 2001, gradual recovery in the mid-2000's, economic recession of 2008-2010 and subsequent effects through 2012, and a recovery between 2012 and 2015. Recently, this recovery has been accelerated by the reduction in fuel prices which has contributed to a strong up-tick in aircraft operations and will continue to exert a positive influence on operations as long as the price of oil is artificially depressed by world market and political events. It is not assumed, however, that the current trend of low oil prices will remain in play over the longer term considered in this analysis.

These and other conditions were considered in the process of developing forecasts for HWO's future activity. In order to establish the historical perspective, previous activity data were compiled from several sources including ATADS, control tower counts, TFMSC, 5010 Airport Master Records, and FAA TAF records. Information from the Florida Department of Transportation (FDOT) was also utilized where applicable.

Based Aircraft

Several sources of information related to existing and historical based aircraft information were consulted. This data is provided by the FAA, FDOT, and by the Airport itself. The FAA TAF is the official FAA forecast of aviation activity for U.S. airports. It contains historic data and projections for active airports in the National Plan of Integrated Airport Systems (NPIAS) including FAA towered airports, Federal contract towered airports, non-federal towered airports, and non-towered airports. According to the January 2016 TAF, there were 255 based aircraft at HWO. FDOT maintains an inventory of based aircraft and operations for general aviation airports throughout the State. The most recent inventory, updated in 2014, identified 349 based aircraft in 2014 and estimated 353 based aircraft in 2015.

Senior management staff from HWO conducted a count of based aircraft, inventorying occupants of all T-hangars and leased tie-down positions using a listing of aircraft N-numbers to validate occupancy, FBO aircraft, aircraft operated by commercial operators notable among these being two banner tow operators having multiple aircraft, along with aircraft owned and operated by other airport tenants. Based on this recent inventory, a total of 398 aircraft were identified as being based aircraft at HWO in

2015/2016 (complete listing provided in **Appendix B**. The National Based Aircraft Inventory Program reports based aircraft directly from an airport. For HWO, the last update to this database was in 2010, when the Airport reported 245 based aircraft.

In recent years as other nearby GA airports and their Fixed Base Operators have focused their efforts on serving the growing corporate aviation market and the array of medium and larger business jets that are typical of that market, light GA operators and specifically those in the under 12,500 lb. class began relocating. Opa Locka (OPF) for example is one such nearby facility where the focus on the upper end GA market has led to operators of light aircraft moving, and HWO has been the beneficiary of this trend. This shifting is likely not to have been picked up in the FAA database.

Table 5-1 presents historical based aircraft at HWO referencing FAA TAF, FDOT, and Airport-reported totals. For Airport-reported based aircraft, years 2011 through 2014 are extrapolated since data were available in 2010 and 2015. Also shown is the annual compounded annual growth rate (CAGR). It should be noted that CAGR calculates a constant rate of change over a given time period. It dampens the effect of volatility during periods that experience significant change, and is essentially a “smoothed” annual growth rate.

Table 5-1: Historical HWO Based Aircraft

Year	FAA TAF	FDOT	Airport Reported Based Aircraft
2005	325	325	
2006	328	302	
2007	325	302	
2008	257	302	
2009	228	325	
2010	247	325	245
2011	247	351	276
2012	252	322	306
2013	253	345	337
2014	258	349	367
2015	258	353	398
CAGR			
2005-2015	-2.28%	0.83%	N/A

Sources: FAA TAF January 2016. FDOT Dept. of Aviation Forecasts.
Prepared: March 2016

Based on discussion with the FAA in May of 2016, it appears that the based aircraft database which is an online data site, had not been being consistently updated with annual changes in the number of based aircraft at HWO. As such, a significant component of the disparity between the TAF based aircraft values and the counts performed by BCAD appear to be a result of having not updated that database over the past several years. Because of the significant difference in the number of based aircraft reported by the TAF compared with data from FDOT airport inspections and databases and actual Airport survey data, the TAF estimates were not deemed as a reliable base from which to project future based aircraft at the Airport. Although FDOT regularly updates its inventory of based aircraft at the

State's general aviation airports, the database was last updated in 2014 or approximately two years old. As such, it is estimated that based aircraft figures reported by the Airport reflect the most accurate inventory: this data will be utilized in the development of forecasts throughout the remainder of this document.

Aircraft Operations

Annual aircraft operations represent the number of takeoffs and landings occurring at the Airport during a calendar year. Historical operations data include operations conducted by both based aircraft as well as operations conducted by itinerant aircraft stored at other airports arriving at the Airport for a variety of reasons including business, recreation, or flight training purposes.

Historical aircraft operations data for HWO are summarized in **Table 5-2**. Data have been obtained from the ATADS database. Although historical data are also available from the FAA TAF and FDOT, the ATADS database reports annual calendar year operations data from control towers. It is interesting to note, that similar to the FAA's based aircraft numbers the ATADS data for 2015 is, in this case slightly lower than actual counts from the HWO ATCT. Based on year end 2015 ATCT counts the total count for 2015 was 172,387 operations. As shown, the ebb and flow of operational activity is clearly evident of the past 10-year period listed in the table. Total aircraft operations have fluctuated significantly between 2005 and 2015 with the variance between the 2007 10 year high and 2010 10-year low being just under 61,900 annual operations. If one goes back even farther this same pattern of fluctuation remains evident. It is due to this pattern that aviation forecasts look to longer term patterns and not short term demand spurts or retrenchment. Despite the fluctuating patter there has been an overall increase of approximately 2.2 percent annually during that timeframe noted in **Table 5-2**.

Table 5-2: Historical HWO Aircraft Operations

Year	Itinerant Operations				Local Operations		Total
	Air Carrier	Air Taxi	GA	Military	Civil	Military	
2005	1	6	51,261	19	86,358	22	137,667
2006	0	4	57,580	24	106,549	221	164,378
2007	0	0	61,442	66	120,608	74	182,190
2008	1	5	59,931	56	109,946	138	170,077
2009	0	50	57,173	336	104,536	790	162,885
2010	4	92	47,880	49	72,029	268	120,322
2011	7	457	50,170	51	85,037	382	136,104
2012	0	93	47,711	10	79,801	33	127,648
2013	1	224	50,126	33	91,949	66	142,399
2014	0	230	52,503	33	102,944	66	155,776
2015	0	210	58,653	23	112,600	64	171,550
CAGR 2005-2015	-100.00%	42.7%	1.4%	1.9%	2.7%	11.3%	2.2%

Sources: ATADS Database, January 2016. Prepared: March 2016

5.2 Socioeconomic Factors

Depending on the role of an airport and the population base that it serves, the socioeconomic profile of the local community can often influence existing and future aviation-related activity. In general terms, the North Perry Airport is situated in Broward County in the west-central portion of the Miami-Fort Lauderdale metropolitan area, which is the largest and fastest growing region in Florida. Because of its hospitable weather, numerous beaches, and multi-modal regional and international transportation hubs, the Miami-Fort Lauderdale area receives significant business and tourist related commercial and general aviation activity. Although it is difficult to determine the socioeconomic profile of visitors, there is a significant amount of data available to identify the demographics of the local populace. Where applicable, these data can be used in the planning process to relate future aviation activity levels at the Airport to local and regional socioeconomic trends.

For the purposes of this document, local socioeconomic data that will be analyzed have been obtained from Woods and Poole, an independent firm that specializes in long-term county and metropolitan area economic and demographic projections. The geographical area that is examined is defined as the Miami-Fort Lauderdale Metropolitan Statistical Area (MSA), which includes cities in the Miami Metropolitan area in Miami-Dade County, Broward County, and Palm Beach County. This analysis examines historical trends and future projections of the MSA's population, employment, and per capita income. Several sources of data were used for this section. Data provided in this section were provided by Woods and Poole Economics, Inc., and the U.S. Census Bureau's American FactFinder.

Table 5-3: summarizes the population trends of the Miami MSA, the State of Florida, and the United States, with the compound annual growth rates (CAGR) indicated for each of the areas.

Table 5-3: Comparison of Historical Population Growth (U.S., FL, and Miami MSA)

Year	Miami MSA	Florida	United States
2000	5,026,000	15,982,378	282,162,000
2008	5,455,000	18,251,243	304,094,000
2009	5,505,000	18,423,878	306,772,000
2010	5,582,000	18,852,220	309,326,000
2011	5,688,000	19,107,900	311,583,000
2012	5,763,000	19,355,257	313,874,000
2013	5,828,000	19,600,311	316,129,000
2014	5,895,000	19,893,297	318,699,000
2015	5,965,000	20,271,272	321,449,000
CAGR 2000-2015	1.15%	1.60%	0.87%

Sources: Woods and Poole, and U.S. Census, American FactFinder.
Prepared: March 2016

As shown in **Table 5-3**: , both the Miami-Fort Lauderdale MSA and the State of Florida have increased in population at a higher rate than the U.S. as a whole between 2000 and 2015.

In addition to population, there are other demographic factors that impact demand for general aviation in a particular region. The regional economy can also significantly impact aviation demand. Regional economic trends are summarized in this analysis through an examination of employment and earnings data. **Table 5-4** presents historical employment and total earnings data for the Miami-Fort Lauderdale MSA, and the State of Florida as a whole. It should be noted that total earnings data obtained from Woods and Poole is reported in constant dollars (year 2009) to adjust for inflation over time.

Table 5-4: Historical Miami and State of Florida Employment and Earnings

Year	Miami-Fort Lauderdale MSA		Florida	
	Employment (in thousands)	Total Earnings (in millions)	Employment (in thousands)	Total Earnings (in millions)
2000	2,771	127,788	8,841,600	381,937
2008	3,259	152,844	10,304,800	461,271
2009	3,134	145,021	9,840,250	440,520
2010	3,142	144,185	9,780,200	440,948
2011	3,255	145,433	9,927,836	451,764
2012	3,341	150,774	10,075,472	462,580
2013	3,419	155,370	10,223,108	473,396
2014	3,483	159,277	10,370,744	484,212
2015	3,547	163,403	10,518,380	495,027
CAGR 2000-2015	1.66%	1.65%	1.16%	1.74%

Source: Woods and Poole Economics, Inc.
Note: Data available for years 200, 2008-2010, 2015, intermediate years are extrapolated.
Prepared: March 2016

As shown in **Table 5-4**, employment growth and total earnings for the Miami-Fort Lauderdale MSA and the State of Florida have increased significantly since 2000. The 1.66 percent employment growth from 2000 to 2015 for the Miami-Fort Lauderdale area and 1.16 percent growth for the State as a whole during that timeframe outpaces the population growth rate identified in **Table 5-3**. Total earnings, which is defined as the sum of wages and salaries, proprietors' income, and other labor income has also increased between 2000 and 2015.

Per capita personal income (PCPI) is another way to measure the economic growth of an area. PCPI is a composite measure of market potential and indicates the general ability of persons to purchase products and services. **Table 5-5** provides a summary of historical PCPI figures for the Miami-Fort Lauderdale MSA, the State of Florida, and the U.S. It should be noted that PCPI data obtained from Woods and Poole is reported in constant dollars (year 2009) to adjust for inflation over time.

Table 5-5: Historical Miami MSA and State of Florida per Capita Personal Income

Year	Miami MSA	Florida	U.S.
	Per Capita Personal Income ($ 2009)	Per Capita Personal Income ($ 2009)	Per Capita Personal Income ($ 2009)
2000	$38,583	$35,580	$36,794
2008	$44,505	$40,241	$40,921
2009	$40,482	$38,967	$38,637
2010	$40,874	$39,129	$39,492
2011	$41,676	$39,363	$40,646
2012	$42,253	$39,596	$41,674
2013	$42,277	$39,830	$41,707
2014	$42,897	$40,063	$42,365
2015	$43,542	$40,297	$43,021
CAGR 2000-2015	0.81%	0.83%	1.05%

Source: Woods and Poole Economics, Inc.
Note: Data available for years 200, 2008-2010, 2015, intermediate years are extrapolated.
Prepared: March 2016

As shown in **Table 5-5**, the per capita income of the U.S. as a whole increased at a higher rate between 2000 and 2015 than both the Miami-Fort Lauderdale MSA and the State of Florida, however, in 2015 the Miami-Fort Lauderdale region had higher average incomes than Florida and the U.S. as a whole.

Socioeconomic Trends - Summary

Based on the data presented in this section, the following assumptions can be made regarding the socioeconomic profile of the area that surrounds HWO:

- The Miami-Fort Lauderdale MSA has increased by nearly 1 million residents since 2000, and in the last 5 years, the area is growing by nearly 70,000 new residents annually. Based on data provided by Woods and Poole, this trend is anticipated to continue.
- Employment in the Miami-Fort Lauderdale MSA is increasing faster than the State of Florida, and is outpacing population growth indicating that the economy is strong and able to accommodate future population growth.
- Total earnings for the Miami-Fort Lauderdale MSA is increasing at an annual rate of 1.65 percent and per capita income is higher than the State of Florida and the U.S. as a whole. These trends are anticipated to continue and serve as another indication that the local economy of the Miami MSA is anticipated to be strong throughout the projection period.

5.3 Local and Regional Aviation Trends

The State of Florida has 110 public-use airports that are designated for general aviation use. All airports, even busy commercial service airports, accommodate general aviation activity. The State is unique in that it experiences a proportionately higher level of general aviation activity due to its hospitable climate and terrain, significant tourism industry, and availability of flight training facilities. This section identifies trends in aviation specific to Florida, the Miami-Fort Lauderdale Metropolitan areas, and the areas proximate to North Perry Airport itself.

The Florida Aviation System Plan (FASP) was updated in 2012 and identifies trends in aviation and socioeconomic factors that impact Florida's airports. The FASP notes that population and employment are anticipated to increase in all regions of the State. The three largest regions are the East Central, West Central, and Southeast Metropolitan, the last of which includes Miami and the North Perry Airport. These three regions account for roughly one-third of Florida's total population, and are also the regions projected to gain the largest number of additional residents in future years. According to the FASP, the Southeast Metropolitan Region more than doubled in population during the last three decades, exceeding 5 million residents in the 2010 census, and is expected to grow to 7.3 million residents by 2035.

As it pertains to trends in aviation for Florida's airports, the FASP identifies the following sectors as specific areas of focus:

- Changing Industry/Technology
  - NextGen, new TSA security objectives at general aviation airports
- Flight Restrictions
  - TSA Temporary Flight Restrictions, particularly in busy metropolitan areas
  - National Air Tour Safety Standards/Restricted Military and North-South airspace corridors
- Changing Demand/User Needs
  - Fractional Ownership, specifically for business jets (of very limited importance to HWO)
  - Fluctuation of fuel costs
  - Fixed Base Operator insurance increases
- Funding
  - Airport Improvement Program (AIP) Funding and FAA Reauthorization and Reform Act
  - Shortfall in federal benefits for general aviation airports

In order to address these and other areas of focus, FDOT (through its Joint Automated Capital Improvement Plan) process has incorporated a system that matches airport service categories to future development needs. Historical and short-term future State funding for Florida airports is identified in **Table 5-6**.

Table 5-6: Florida State Aviation Funding

Category	Historical			Projected		
	2013	2014	2015	2016	2017	5-YR Total
Aviation Safety	$9,239,138	$13,957,267	$10,632,267	$15,026,042	$14,842,446	$63,697,628
Aviation Security	$5,110,107	$7,137,475	$3,823,139	$5,270,096	$8,465,791	$29,806,608
Aviation Capacity	$95,972,454	$64,304,293	$75,968,933	$72,756,032	$58,757,344	$367,759,056
Aviation Preservation	$23,580,645	$31,161,576	$30,077,737	$31,947,158	$35,863,205	$152,630,321
Aviation Environmental Project	$1,108,140		$1,023,020	$640,000	$1,260,000	$4,031,160
Aviation Revenue/ Operational Improvement	$29,951,339	$20,019,288	$21,024,098	$18,873,221	$23,965,340	$63,697,628
Total	$164,961,823	136,580,367	$142,549,194	$144,512,549	$143,154,126	$731,758,059

Source: Florida Aviation System Plan Updated 2012. Prepared: March 2016

In 2014, FDOT conducted a Statewide Aviation Economic Impact Study Update that identified direct and indirect economic impacts of individual airports in Florida. Although the Study did not identify specific trends in aviation, it is beneficial to understand the economic importance of an Airport. According to the Study, it was estimated that the North Perry Airport accounted for over 900 jobs with a total payroll of $33.5 million and a total economic output (direct and indirect impacts) of over $83 million. This places HWO as the 20th ranked airport in terms of employment and 21st in terms of total economic output in the State of Florida.

5.4 National Aviation Trends

The preparation of forecasts of aviation-related demand requires a general understanding of recent and anticipated national trends in the aviation industry. National trends provide insight for the development of aviation activity projections for the Airport. Some trends in the aviation industry will undoubtedly have a greater impact on HWO than others.

There are 19,360 public and private airport facilities located throughout the United States, as reported by the FAA; 3,331 of these airports are included in the FAA's National Plan of Integrated Airport Systems (NPIAS), indicating that they are eligible for federal funding assistance. HWO is identified as a Regional general aviation airport in the NPIAS, which is defined by the FAA as an airport that, "Supports regional economies by connecting communities to regional and national markets. These airports have high levels of activity with some jets and multiengine propeller aircraft. These airports average about 90 total based aircraft, including 3 jets." General aviation airports comprise 85 percent of the airports listed in the NPIAS.

Since all of the activity at the Airport is associated with general aviation, this section focuses on historical and anticipated trends in the U.S. general aviation industry. General aviation aircraft are defined as all aircraft not flown by commercial airlines or the military.

General Aviation Activity Trends

The aircraft production and general aviation industries have experienced significant changes in recent years. At the national level, fluctuating levels of general aviation usage caused by economic upturns/downturns resulting from the nation's business cycle have all impacted general aviation demand.

Each year, the General Aviation Manufacturers Association publishes its General Aviation Statistical Databook and Industry Outlook. The 2015 publication identifies trends in the general aviation industry through 2015, historical aviation-related activity data through 2014, and forecasts of aviation activity through 2035. According to GAMA, the number of active aircraft in the U.S. general aviation fleet, the number of annual general aviation hours flown, general aviation AvGAS consumption, and total general aviation fuel consumption have all declined in recent years (see **Table 5-7**). Following the events of September 11, 2001, general aviation activity nationwide was negatively impacted. Rising fuel costs and economic volatility further accelerated this decline from 2008 through 2014. It should be noted however, that 2015 estimates for all of these categories except for the number of aircraft in the U.S. fleet show slight increases, indicating that that activity has stabilized and currently appears to be returning to a slow, steady growth in the future. This stabilization has been aided by the inordinate drop in the prices of fuel over the past year.

Table 5-7 also shows forecasts of future aviation activity. As shown, with the exception of AvGas consumption, general aviation activity is projected to see moderate annual growth through 2035. The primary reason for the lag in AvGas consumption is that the majority of growth in the general aviation industry is projected to be experienced by jet and corporate type aircraft. GAMA projects an annual decline of -0.6 percent in the number of piston aircraft between 2014 and 2035 (139,182 to 120,945) compared to an increase of 2.9 percent in the number of business jets (12,362 to 20,815).

Table 5-7: U.S. General Aviation Activity Data

Certificate Type	Historical					Projected				
	2000	2010	2012	2013	2014	2015	2020	2030	2035	Average Growth 2014-2035
Active U.S. GA Aircraft	217,534	223,370	209,034	199,927	204,408	198,780	199,410	206,680	214,260	0.4%
U.S. GA Hours Flown (in Thousands)	29,960	24,802	24,403	22,876	23,271	23,566	24,355	27,869	30,626	1.4%
U.S. AvGAS Consumption Gal. (in Millions)	322.8	220.7	212.3	197.3	196.6	198.3	189.9	188.4	193.8	-0.1%
Total U.S. Aviation Fuel Consumption Gal. (in Millions)	1,304.8	1,655.6	1,754.7	1,456.9	1,566.6	1,605.8	1,811.1	2,288.0	2,500.2	2.3%

*Note: Year 2015 data are estimated, no data for 2011 are available.
Source: 2015 General Aviation Statistical Databook & 2016 Industry Outlook   Prepared: March 2016

Another resource that was consulted to identify national general aviation trends was the FAA's Aerospace Forecast 2016-2036. This publication identifies historical economic and aviation-related trends and data, as well as forecasts of U.S. aviation activity. The Forecast notes that despite slow economic growth in the U.S. and globally, 2015 showed signs of recovery in the aviation industry. "The general aviation market showed continuing improvements in single engine piston and business jet segments, while declines in turboprop and multi-engine piston segments translated into a downturn in shipments. Overall deliveries were down by 3.1 percent in calendar year 2015; even though U.S. billings increased 2.4 percent to $12.0 billion. General aviation activity at FAA and contract tower airports recorded a 0.3 percent decline in 2015 as itinerant activity fell 0.7 percent, more than offsetting a 0.1 percent increase in local operations."

The FAA also projects a slight long-term decrease in AvGAS consumption, but moderate increases in total aircraft fuel consumption, general aviation hours flown, and the number of aircraft in the general aviation fleet. Overall, the FAA identifies moderate, long-term growth in general aviation operations through 2013 (see **Table 5-8**). As shown, the number of general aviation operations at FAA and contract towers is anticipated to increase from 25,578,000 in 2015 to 27,416,000 in 2035, which reflects 0.36 percent annual growth.

According to the FAA, "The long-term outlook for general aviation is favorable, led primarily by gains in turbine aircraft activity". The active general aviation fleet is forecast to increase 0.2 percent a year between 2015 and 2036, equating to an absolute increase in the fleet of about 7,000 units. While steady growth in both GDP and corporate profits results in continued growth of the turbine and rotorcraft fleets, the largest segment of the fleet – fixed wing piston aircraft continues to shrink over the forecast. Although fleet growth is minimal, the number of general aviation hours flown is projected to increase an average of 1.2 percent per year through 2036, as growth in turbine, rotorcraft, and experimental hours more than offset a decline in fixed wing piston hours.

Table 5-8: General Aviation Operations at FAA and Contract Tower Facilities

Historical	Total U.S. ATCT GA Operations
2001	37,626,000
2008	31,574,000
2009	28,019,000
2010	26,580,000
2011	25,965,000
2012	26,130,000
2013	25,806,000
2014	25,654,000
2015 (est.)	25,578,000
Projected	
2020	26,026,000
2025	26,473,000
2035	27,416,000
Average Annual Growth	
2015-2035	0.36%

Source: FAA Aerospace Forecasts 2016-2036.
Prepared March 2016

Pilot Certificates

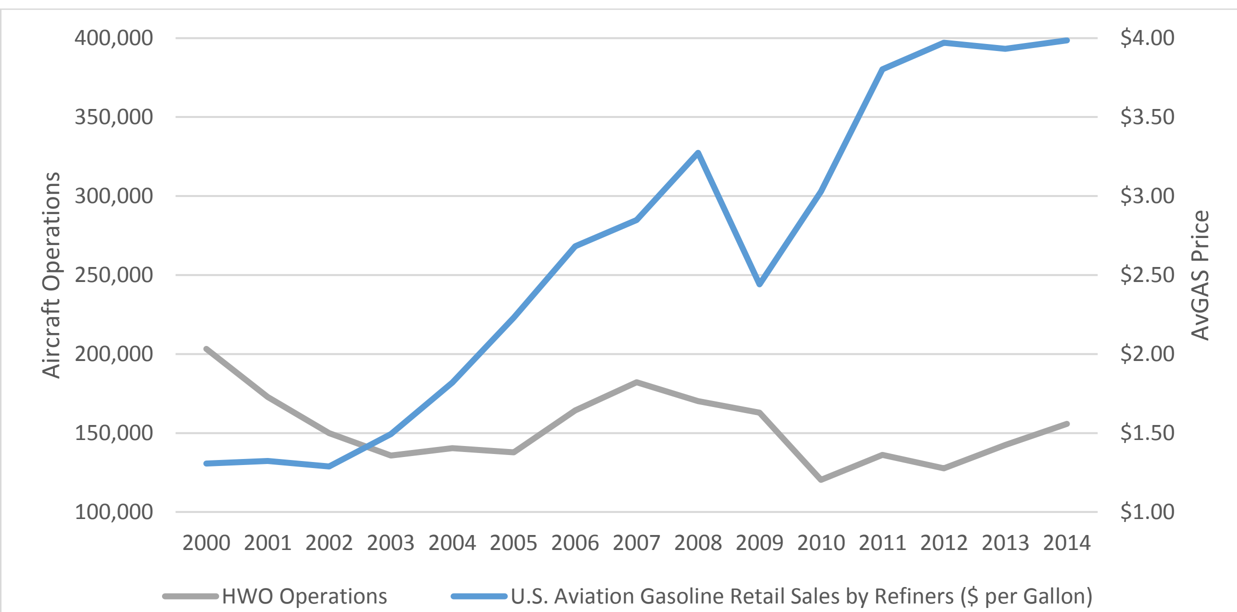
Another national trend in aviation that is anticipated to impact activity is the regulatory change that affects the number of student pilot certificates. In 2010, the FAA increased the duration of validity for pilot certificates under the age of 40 from 36 months to 60 months. Since this change, the number of student pilot licenses has increased from 119,119 in 2010 to an estimated 122,729 in 2015. According to the FAA Terminal Aerospace Forecasts 2016-2036, the number of student pilot certificates is anticipated to reach 131,800 by 2036.

Fuel Costs

One of the most significant elements that affects aviation activity is the impact of fuel costs as they pertain to aircraft operations and hours flown. Although one of the Fixed Base Operators at HWO offers jet fuel, the majority of aircraft that operate at the Airport are piston-powered and use AvGAS. The U.S. Energy Information Administration tracks historical prices of all liquid petroleum prices sold in the United States, including AvGAS. **Figure 5-1** shows a comparison of annual aircraft operations conducted at HWO to the average price of AvGAS in the corresponding year. It should be noted that fuel price information for 2015 and data specific to the State of Florida are not made public in order to protect individual companies that produce AvGAS.

As shown, annual operations at the Airport declined significantly between 2000 and 2003, while the cost of fuel remained relatively flat. Between 2012 and 2014, the average price of AvGAS remained relatively flat while aircraft operations at HWO have increased approximately 22 percent, indicating that economic recovery is occurring at the Airport. Although the price of jet fuel has decreased significantly in the past year, the price of AvGAS has declined only slightly. According to AirNav.com, at the time this document was published, the average price of self-serve AvGAS at HWO was approximately $3.88, while aircraft operations at the Airport increased over 10 percent from 2014. This would suggest that HWO may not face a significant shock in the future once the current oversupply of petroleum products due to inordinately low priced oil moderates.

Figure 5-1: AvGas Fuel Prices vs. HWO Aircraft Operations



Source: U.S. Energy Information Administration, ATADS.

Business Use of Aviation

One other aspect of general aviation that could be considered a “trend” is business use of aviation. Business-related aviation is often thought to pertain specifically to corporate jets or turbo props. However, multi-engine piston and even single engine piston aircraft are often used for regional business travel, particularly in areas with high populations and limited or congested transportation connectivity outlets.

Business use of aviation is very important at HWO and in the nation as a whole. For the purposes of this document, the terms business and corporate aircraft are used interchangeably, as they both refer to aircraft used to support a business enterprise; though, as defined by the FAA, they each have their own distinct definition. The FAA defines business use as:

> “Any use of an aircraft (not for compensation or hire) by an individual for transportation required by the business in which the individual is engaged.”

The FAA defines corporate transportation as:

> “Any use of an aircraft by a corporation, company or other organization (not for compensation or hire) for the purposes of transporting its employees and/or property, and employing professional pilots for the operation of the aircraft.”

The FAA estimated in their 2015-2019 Report to Congress that business aircraft usage comprises 8.7 percent of all aviation activity. An additional 9.7 percent of the nation’s general aviation activity is considered corporate. These figures represent a general decline nationally in the use of business/corporate aviation between 2008 and 2012 when they totaled 9.6 percent and 11.9 percent, respectively.

Increased personnel productivity is one of the most important benefits of using business aircraft. Companies flying general aviation aircraft for business control scheduling capabilities. Itineraries can be changed as needed, and aircraft can fly to destinations not served by scheduled airlines.

Business aircraft usage provides the following:

- Employee time savings
- Increased enroute productivity
- Minimized time away from home
- Enhanced industrial security
- Enhanced personal safety
- Management control over scheduling

Many of the nation's employers that use general aviation aircraft are members of the National Business Aircraft Association (NBAA). The NBAA’s *Business Aviation Fact Book 2014* shows that nationwide business aviation contributes $150 billion to the U.S. economic output. The NBAA Fact Book also indicates that only three percent of business aircraft are flown by Fortune 500 companies; the remaining 97 percent are operated by a large spectrum of companies and organizations of various sizes. This indicates that the use of business aviation is not exclusive to large companies, and has practicable applications for many different types of businesses.

Business use of general aviation aircraft ranges from small, single-engine aircraft rentals to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. General aviation aircraft use allows employers to transport personnel and air cargo efficiently. Businesses often use general aviation aircraft to link multiple office locations and reach existing and potential customers. Business aircraft use by smaller companies has escalated as various chartering, leasing, time-sharing, interchange agreements, partnerships, and management contracts have emerged. As it pertains to HWO, business use of aviation is primarily relegated to single-engine and multi-engine piston aircraft.

FAA Forecasts

The FAA publishes forecasts on an annual basis that summarize anticipated trends in most components of general aviation activity. Each published forecast revisits previous activity forecasts and updates them after examining the previous year's trends in aviation and economic activity. Many factors are considered in the FAA's development of forecasts, including U.S. and international economic trends and projected fuel costs. FAA forecasts provide detailed analyses of historical and forecasted aviation trends and provide a general framework for anticipated future levels of regional and national aviation activity.

Examples of measures of national general aviation activity that are monitored and forecast by the FAA on an annual basis in the FAA Aerospace Forecasts include active pilots, active hours flown, and active aircraft fleet. Historical and projected activity in each of these categories is examined in the following sections. The data presented is based on the most recent available information, contained in *FAA Aerospace Forecasts, Fiscal Years 2016- 2036.*

Active Pilots

Active pilots are defined by the FAA as those persons with a pilot certificate and a valid medical certificate. **Table 5-9** summarizes historical and projected U.S. active pilots by certificate type. As shown, the FAA projects a slight increase in the total number of pilots through the projection period from 590,039 in 2015 to 597,575 in 2035. Pilot certificate categories that are forecast to experience the most significant increases include Students, Sport Pilot, Airline Transport, and Rotorcraft, while Recreational and Private certificates are projected to decrease through 2035.

Active Hours Flown

Aircraft hours flown is another statistic used by the FAA to measure and project general aviation activity. Hours flown is a valuable measure because it captures a number of activity-related data including aircraft utilization, frequency of use, and duration of use. Total hours flown in general aviation aircraft have declined from 2001 to 2015 by an annual rate of approximately 1.1 percent, as shown in **Table 5-10**.

Table 5-10 also shows that the FAA projects total active hours flown in the U.S. to increase from approximately 23.2 million in 2015 to 29.1 million in 2035, which reflects an annual growth rate of approximately 1.2 percent. Piston-powered aircraft hours flown are anticipated to decrease slightly through 2035 while increases in hours flown are projected in turbo prop, jet, rotorcraft, experimental, and sport aircraft categories.

Active Aircraft Fleet

The FAA tracks the number of active general aviation aircraft in the U.S. fleet annually. Active aircraft are those aircraft currently registered and flying at least one hour during the year. **Table 5-11** summarizes the historical active U.S. general aviation fleet as well as FAA projections of future active aircraft, by aircraft type.

Active general aviation aircraft decreased slightly between 2001 and 2015 although there was significant growth in the number of turboprop, jet, rotorcraft, and experimental aircraft. The FAA anticipates that these trends will continue throughout the planning period. Fueled by significant increases in jet and turboprop aircraft, the overall active fleet is projected to increase from 203,880 aircraft in 2015 to 210,695 in 2035, which represents an annual growth rate of approximately 0.2 percent. It should also be noted that the piston fleet, both single-engine and multi-engine is anticipated to decrease in size throughout the projection period.

FAA Forecast Summary

The cyclical nature of general aviation activity is illustrated in the historical national data presented in this analysis. While national general aviation activity experienced rebounded growth during the mid and late-1990s, the terrorist attacks of 2001 and the economic downturn of 2008 dampened this nationwide activity. FAA projections of U.S. general aviation activity, including active pilots, active aircraft, and hours flown, all show varied levels of growth and decline through the FAA's forecast horizon of 2036 (the data presented in this chapter include years through 2035).

Implications for HWO

The implications of the preceding discussion on metropolitan trends and both FDOT statewide aviation projections and the FAA's national forecasts present a mix of both positive factors and challenges to an airport such as HWO whose expansion opportunities are limited by adjacent development and by the impact of the weight restriction on the mix of aircraft that can operate at the airport. The robust nature of growth in south Florida points to factors that are proven to influence growth in aviation activity as new residents arrive, some of these new residents bring aircraft with them or have the financial means to enter the aviation market. While the forecast for the light GA sector would present a less desirable perspective, much of the growth at HWO is not anticipated to be the result of new aircraft manufacturing, but rather from the relocation of light aircraft out of other airports, such as FXE, FLL and OPF, to HWO as these facilities become more crowded and as they focus on accommodating the activities of the growing fleet of mid to heavy business jets.

Robust growth in the rotorcraft fleet is another positive for HWO given the fact that the airport already operates as the base for media helicopter operations and has a helicopter flight school on site. Finally, the continued stability in the number of student pilots nationally is also a positive sign as Florida is a major center of flight school activity and HWO already sees strong flight training operational activity. Thus, while nationally the growth in the fixed-wing general aviation industry is being driven by Turbo-prop and turbine powered aircraft which are unlikely to see significant activity at HWO, this growth will result in operators of light GA being potentially priced out of airports in the immediate region that are focusing on serving the upper end turbine market segments, not to mention the desire by light GA pilots to look for a location having a more similar/compatible mix of aircraft operations.

Thus, it is anticipated that HWO will experience growth in both based aircraft and operational activity as a result of the following factors:

- Influx of new residents to the area some of whom will be relocating aircraft from their previous home to the Broward County Area.
- Relocation of aircraft within the southeast Florida area from commercial service airports (FLL primarily) and airports focusing on Corporate Jet users such as OPF, FXE and BCT. This shift results from cost issues and from redevelopment/development on the airports

- Given the homogenous nature of the HWO fleet, HWO remains a good location for flight school and flight training activity while retaining and growing other existing general aviation related commercial activities that presently operate from the airport.
- Competitive facility costs versus other regional airports

Table 5-9: Historical and Projected U.S. Active Pilots

Certificate Type	Historical						Projected				Annual Growth 2001-2015	Annual Growth 2015-2035
	2001	2011	2012	2013	2014	2015	2020	2025	2030	2035		
Students	94,920	118,657	119,946	120,285	120,546	122,729	126,150	128,150	130,000	131,550	2.1%	0.3%
Recreational	316	227	218	238	220	190	190	185	180	180	-2.8%	-0.3%
Sport	N/A	4,066	4,493	4,824	5,157	5,482	7,600	9,750	12,000	14,150	N/A	4.8%
Private	243,823	194,441	188,001	180,214	174,883	170,718	164,350	156,000	152,850	150,600	-2.1%	-0.6%
Commercial	120,502	120,865	116,400	180,206	104,322	101,164	93,000	90,350	89,400	89,000	-1.3%	-0.6%
Transport	144,702	142,511	145,590	149,824	152,933	154,730	156,200	158,600	162,800	167,600	0.1%	0.4%
Rotorcraft	7,727	15,220	15,126	15,114	15,511	15,566	16,630	18,440	21,015	23,820	7.2%	2.2%
Glider	8,473	21,141	20,802	20,381	19,927	19,460	19,075	18,915	18,835	18,835	9.3%	-0.2%
Total:	**619,963**	**617,128**	**610,576**	**599,086**	**593,499**	**590,039**	**582,895**	**580,390**	**587,080**	**595,735**	**-0.4%**	**0.1%**
Instrument Rated[1]	315,276	314,122	311,952	307,120	306,066	304,329	303,950	304,100	307,000	310,550	-0.3%	0.1%

[1]Instrument rated pilots should not be added to other categories in deriving total.

Source: FAA Aerospace Forecasts, Fiscal Years 2016-2036. Prepared: March 2016

Table 5-10: Active General Aviation and Air Taxi Hours Flown (in thousands)

Certificate Type	Historical						Projected				Annual Growth 2001-2015	Annual Growth 2015-2035
	2001	2011(E)	2012	2013	2014	2015(E)	2020	2025	2030	2035		
Single-engine Piston	16,549	11,844	11,442	10,706	10,395	10,312	9,946	9,596	9,321	9,146	-3.3%	-0.6%
Multi-engine Piston	2,644	1,782	1,766	1,646	1,573	1,555	1,505	1,489	1,496	1,503	-3.7%	-0.2%
Turboprop	1,773	2,463	2,733	2,587	2,613	2,582	2,570	2,710	3,032	3,478	2.7%	1.6%
Jet	2,654	3,407	3,418	3,488	3,881	3,913	4,619	5,389	6,236	7,216	2.8%	3.1%
Rotorcraft	1,952	3,411	3,454	2,949	3,242	3,240	3,766	4,313	4,807	5,321	3.7%	2.5%
Experimental	1,157	1,203	1,243	1,191	1,244	1,260	1,391	1,533	1,691	1,849	0.6%	1.9%
Sport	N/A	278	169	173	165	180	253	331	410	489	N/A	5.0%
Other	287	181	180	135	158	154	152	151	151	150	-4.4%	-0.1%
Total:	**27,016**	**24,570**	**24,404**	**22,876**	**23,271**	**23,196**	**24,201**	**25,513**	**27,143**	**29,152**	**-1.1%**	**1.2%**

Sources: FAA Aerospace Forecasts, Fiscal Years 2016-2036

Note: E=Estimate Prepared: March 2016

Table 5-11: Historical and Projected U.S. Active General Aviation Fleet

Certificate Type	Historical						Projected				Annual Growth 2001-2015	Annual Growth 2015-2035
	2001	2011(E)	2012	2013	2014	2015(E)	2020	2025	2030	2035		
Single-engine Piston	145,034	136,895	128,847	124,398	126,036	125,050	120,485	115,960	111,495	107,780	-1.1%	-0.7%
Multi-engine Piston	18,192	15,702	14,313	13,257	13,146	13,085	12,810	12,545	12,175	11,765	-2.3%	-0.5%
Turboprop	6,596	9,523	10,304	9,619	9,777	9,570	9,190	9,600	10,705	12,280	2.7%	1.3%
Jet	7,787	11,650	11,793	11,637	12,362	12,475	13,680	15,340	17520	20,175	3.4%	2.5%
Rotorcraft	6,783	10,082	10,055	9,765	9,966	10,240	11,710	13,080	14,450	15,935	3.0%	2.2%
Experimental	20,421	24,275	26,715	24,918	26,191	26,435	27,485	28,500	29,850	31,365	1.9%	0.9%
Sport	N/A	6,645	2,001	2,056	2,231	2,410	3,310	4,230	5,110	5,940	N/A	4.5%
Other	6,633	5,681	5,006	4,277	4,699	4,615	4,525	4,490	4,470	4,445	-2.6%	-0.2%
Total:	**211,446**	**220,453**	**209,034**	**199,927**	**204,408**	**203,880**	**203,195**	**203,745**	**205,775**	**210,695**	**-0.3%**	**0.2%**

*Experimental Light-sport category that was previously shown under Sport Aircraft is moved under Experimental Aircraft category, starting in 2012.
Note: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.
Source: FAA Aerospace Forecasts, Fiscal Years 2016-2036 Prepared: March 2016

5.5 Based Aircraft Forecasts

Several sources have been analyzed in the preparation of forecasts of based aircraft at HWO. These include the FAA TAF, the 2009 Master Plan, and FDOT forecasts. Year 2014 and 2015 data and projected forecasts for these sources are identified in **Table 5-12.** As shown, the FAA TAF shows a total of 258 based aircraft in 2015, and 294 in 2035, resulting in a CAGR of 0.66 percent. The 2009 Master Plan projected a total of 344 based aircraft in 2015, and 402 by 2035, a CAGR of 0.78 percent. And the most recent FDOT forecasts identified 353 based aircraft in 2015 and 439 in 2035, a CAGR of 1.10 percent. It should be noted that trend line in the 2009 Master Plan and FDOT projections have been extrapolated out to the 20-year horizon for this analysis.

Table 5-12: HWO Based Aircraft Comparison

Historical	FAA TAF	FDOT Forecast	2009 Master Plan Forecast
2014	258	349	342
2015	258	353	344
Projected			
2020	267	373	357
2025	274	394	372
2035	294	439	402
CAGR 2015-2035	0.66%	1.10%	0.78%

Source: FAA TAF, Accessed January 2016. FDOT website 2014 forecasts.
2009 Airport Master Plan Update Prepared: March 2016

Neither of the noted projections reflect the level of existing based aircraft that was fully documented at HWO in late 2015/early 2016. Because these forecasts do not incorporate the actual Airport-reported total of 398 based aircraft, adjustment to the baseline point of beginning for the projection of Based aircraft is necessary and additional approaches to projecting future based aircraft have been developed for planning purposes.

Based Aircraft Forecast Methodologies

As noted previously, the Airport identified a total of 245 based aircraft to the National Based Aircraft Inventory Program in 2010 and recently completed a detailed airport-wide count of based aircraft in late 2015/early 2016 that identified a total of 398 based aircraft. Other sources such as the FAA TAF and FDOT have historical inventories of based aircraft at HWO, but given the level of detail of the actual Airport count it is clear that this recent count represents the most accurate figure of based aircraft at the Airport. The drawback to having only year 2010 and 2015 actual airport count data for based aircraft (inter years are extrapolated) is that certain types of projection methodologies typically employed for forecasting typically require a more complete data set to be useful for projection presented in this document. Methodologies such as regression or trend analysis utilize historical data to project future activity. Regression based forecasts for general aviation activity have been problematic for years and this fact was noted several years ago by the FAA when they noted the inability to obtain an acceptable level of correlation between trends in GA and typical variables used in forecasting. Since these methodologies will not provide an accurate portrayal of aviation-related activity for based aircraft at HWO, based aircraft forecasts are derived from three alternative approaches to forecasting: socioeconomic, market share, and FAA Comparison.

Socioeconomic Methodology – Population Variable

Socioeconomic characteristics of a community do not always correlate well or reflect aviation-related activity at a nearby airport; however, they can often provide anecdotal evidence of the overall health of the local economy and the level of aircraft activity that might occur at that airport. According to data obtained from Woods and Poole, the population of the Miami-Fort Lauderdale MSA is anticipated to increase from approximately 5.9 million in 2015 to 7.6 million in 2035, which reflects a CAGR of 1.2 percent. The general basis of this approach is that experience has shown that typically the larger the community the greater the range and extent of aviation related activity typically found in that community.

The Socioeconomic-Population Variable Methodology for based aircraft forecasts assumes that between 2016 and 2035, the number of based aircraft at the Airport will increase at the same rate as the rate of population growth in the Miami-Fort Lauderdale MSA (see **Table 5-13**). As shown, based on the assumed relationship between population and based aircraft the number of based aircraft at HWO would increase from 398 in 2015 to 505 in 2035.

Table 5-13: HWO Socioeconomic – Population Variable Based Aircraft Forecast

Historical	Miami MSA Population	HWO Based Aircraft
2010	5,582,000	245
2011	5,688,000	276
2012	5,763,000	306
2013	5,828,000	337
2014	5,895,000	367
2015	5,965,000	398
CAGR 2010-2015	1.34%	10.19%
Projected		
2020	6,344,000	423
2025	6,744,000	450
2035	7,570,000	505
CAGR 2015-2035	1.20%	1.20%

Sources: Woods and Poole Economics, Inc., Kimley-Horn
Prepared: March 2016

Socioeconomic Methodology – Employment Variable

The number of employed individuals in the Miami-Fort Lauderdale MSA is anticipated to increase from approximately 3.1 million in 2015 to 4.8 million in 2035, a CAGR of 1.56 percent. Similar to the Socioeconomic-Population Variable Methodology, the Socioeconomic-Employment Variable Methodology assumes that between 2016 and 2035, the number of based aircraft at HWO would increase at the same rate as the growth in employment and the number of employed individuals in the Miami-Fort Lauderdale MSA (see **Table 5-14**). As shown, the number of based aircraft at HWO is projected to increase from 398 in 2015 to 542 in 2035, which reflects a 1.56 percent CAGR.

Table 5-14: HWO Socioeconomic – Employment Variable Based Aircraft Forecast

Historical	Miami MSA Employment	HWO Based Aircraft
2010	3,142,000	245
2011	3,255,000	276
2012	3,341,000	306
2013	3,419,000	337
2014	3,483,000	367
2015	3,547,000	398
CAGR 2010-2015	2.46%	10.19%
Projected		
2020	3,865,000	434
2025	4,189,000	470
2035	4,830,000	542
CAGR 2015-2035	1.56%	1.56%

Sources: Woods and Poole Economics, Inc., Kimley-Horn
Prepared: March 2016

Socioeconomic Methodology – Per Capita Personal Income Variable

Per capita personal income (PCPI) can also be an indicator of a local population's propensity to travel or own an aircraft. Commercial service is not provided at North Perry Airport; however, the Airport receives significant transient and charter activity. Per capita personal income is examined to project based aircraft at the Airport and the result is depicted in **Table 5-15**. As shown, per capita income in the Miami-Fort Lauderdale MSA is anticipated to increase from $43,542 in 2015 to $55,766 in 2035, a CAGR of 1.24 percent. This methodology is premised upon the assumption that as income increases there is a propensity for a portion of that income to be used for aviation related pursuits. This methodology projects that the number of based aircraft at the Airport will increase at the same rate as growth in the per capita income in the Miami-Fort Lauderdale MSA. According to the Socioeconomic-Per Capita Personal Income Variable Methodology, the number of based aircraft at HWO is projected to increase from 398 in 2015 to 510 in 2035. It should be noted that per capita data obtained from Woods and Poole is reported in constant dollars (year 2009) to adjust for inflation over time.

Table 5-15: HWO Socioeconomic – Per Capita Personal Income Variable ($2005) Based Aircraft Forecast

Historical	Miami MSA Per Capita Personal Income ($2009)	HWO Based Aircraft
2010	$40,874	245
2011	$41,676	276
2012	$42,253	306
2013	$42,277	337
2014	$42,897	367
2015	$43,542	398
CAGR 2010-2015	1.27%	10.19%
Projected		
2020	$46,725	427
2025	$50,056	458
2035	$55,766	510
CAGR 2015-2035	1.24%	1.24%

Sources: Woods and Poole Economics, Inc., Kimley-Horn Prepared: March 2016

Socioeconomic Methodology – Summary of Results

A summary of the results of the socioeconomic methodologies used to project based aircraft at the Airport is shown in **Table 5-16**, including the CAGR for each methodology from 2015 through 2035.

Table 5-16: Socioeconomic Forecasts of HWO Based Aircraft

Historical	Population Variable	Employment Variable	Per Capita Personal Income Variable
2010	245	245	245
2011	276	276	276
2012	306	306	306
2013	337	337	337
2014	367	367	367
2015	398	398	398
CAGR 2010-2015	10.19%	10.19%	10.19%
Projected			
2020	423	434	427
2025	450	470	458
2035	505	542	510
CAGR 2015-2035	1.20%	1.56%	1.24%

Sources: Woods and Poole Economics, Inc., Kimley-Horn Prepared: March 2016

Based Aircraft Forecast - Market Share Methodology

The second methodology used to project based aircraft at HWO involves the application of a market share projection technique. Aviation market share techniques the portion of a specified market that is captured by a specific airport. In HWO's case this approach looks at what share of aircraft at towered airports within the State of Florida and the U.S. as a whole are captured, or in this case, based at HWO.

Based on the recent airport inventory, there were 398 based aircraft at the Airport in 2015. According to the FAA TAF, there were 8,069 based aircraft at FAA and Contract Towers in the State of Florida, and 76,040 based aircraft at FAA and Contract Towers in the U.S. HWO accounted for a 4.9 percent market share of based aircraft in Florida in 2015, and 0.5 percent market share in the U.S. These figures are held constant throughout the projection period and compared with FAA TAF projections of based aircraft in Florida and the U.S. (see **Table 5-17**). As shown, the Florida Market Share Methodology projects an increase from 398 based aircraft at HWO in 2015 to 542 in 2035, a CAGR of 1.55 percent, while the U.S. Market Share Methodology projects an increase from 398 based aircraft in 2015 to 515 based aircraft in 2035, a CAGR of 1.3 percent.

Table 5-17: HWO Market Share Methodology Based Aircraft Forecast

Historical	Florida Based Aircraft	HWO Market Share	FL – Projected Aircraft	U.S. Based Aircraft	HWO Market Share	U.S. - Projected Aircraft
2010	7,493	3.27%	245	75,348	0.32%	245
2011	7,367	3.74%	276	72,937	0.37%	276
2012	7,504	4.08%	306	73,497	0.41%	306
2013	7,659	4.40%	337	73,918	0.45%	337
2014	7,959	4.62%	367	75,059	0.48%	367
2015	8,069	4.93%	398	76,040	0.52%	398
CAGR 2010-2015	1.49%		10.19%	0.18%		10.19%
Projected						
2020	8,715	4.93%	430	81,185	0.52%	425
2025	9,433	4.93%	465	86,704	0.52%	454
2035	10,984	4.93%	542	98,379	0.52%	515
CAGR 2015-2035	1.55%		1.55%	1.30%		1.30%

Sources: FAA TAF, Accessed January 2015, Kimley-Horn Prepared: March 2016

Based Aircraft Forecast – FAA Comparison Methodology

The final approach that was employed to project future based aircraft at HWO involved a review of the rate of based aircraft growth set forth in the FAA TAF for HWO. While it is firmly believed that the number of currently based aircraft listed in the TAF for HWO does not accurately represent actual level of based aircraft at HWO, this does not mean that the growth rates identified for future levels of based aircraft is inherently incorrect. This methodology assumes that the growth rate in based aircraft at the Airport forecasted by the FAA TAF between 2015 and 2035 will occur, but that the number of based aircraft reported in 2015 by the TAF is not reflective of the actual number that exists. As such, the CAGR from the FAA TAF between 2015 and 2035 for HWO is applied to the 398 based aircraft reported by the Airport in 2015 (see **Table 5-18**). As shown, this methodology projects an increase from 398 based aircraft in 2015 to 454 in 2035.

Table 5-18: HWO Based Aircraft Forecast – FAA Comparison Methodology

Historical	FAA TAF Forecast	HWO Based Aircraft
2010	247	245
2011	247	276
2012	252	306
2013	253	337
2014	258	367
2015	258	398
CAGR 2010-2015	0.88%	10.19%
Projected		
2020	267	412
2025	274	423
2035	294	454
CAGR 2015-2035	0.66%	0.66%

Sources: Woods and Poole Economics, Inc., Kimley-Horn
Prepared: March 2016

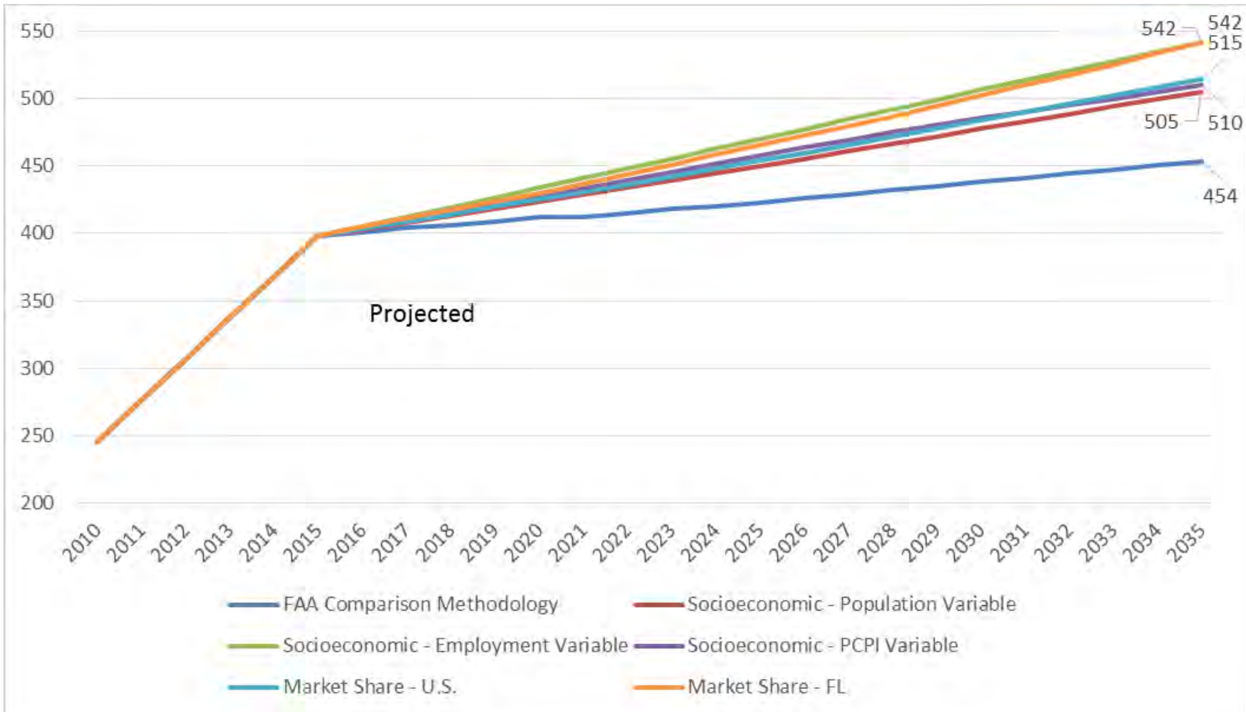
Based Aircraft Forecast – Preferred Methodology

In total, six approaches were used to develop forecasts of based aircraft at HWO (see **Figure 5-2**). Additionally, forecasts developed in the previous Master Plan, as well as those reported by the FAA and FDOT have been examined for validity. In recent years, HWO has seen a significant increase in the number of based aircraft, due in part to growth in the fleet of banner tow operators along with relocation of aircraft from other nearby airports.

While the projections of based aircraft using local socioeconomic activity and market share display a continuation of this trend, they do not factor in the constraints in play at HWO and how these may influence future basing of aircraft. These include airspace challenges that adversely impact the ability to make improvements to the existing approach capabilities, proximity to the approach and departure routes to FLL that further impact instrument operations, the 12,500 lb. aircraft weight limit and available runway length. These factors all come into play in the decision process on the part of pilots looking to base an aircraft. For example, the number of instrument rated pilots has consistently risen, particular since the deployment of GPS instrument procedures and this increase has not just been limited to operators of corporate jets, but has been throughout the ranks of the light general aviation aircraft operators as well. These operators look for facilities that have either non-precision capabilities that go down to as low a visibility minimum as allowed or full precision instrument capabilities such as those provided at FXE or OPF. It is anticipated that the limiting factors noted above will have a dampening effect on the rate of growth in aircraft being based at HWO in the future.

As such, and in consideration of the above, the FAA Comparison Methodology produces the preferred forecast for based aircraft at HWO and will be referenced for the remainder of this document and should be used for planning purposes at the Airport.

Figure 5-2: HWO Based Aircraft Forecast – Summary



Sources: Woods and Poole Economics, Inc., FAA TAF, Accessed January 2015, Kimley-Horn
Prepared: March 2016

Based Aircraft Fleet Mix Forecast

As with most general aviation airports, the majority of the based aircraft fleet at HWO is composed of single-engine piston aircraft. According to the FAA, the national based aircraft fleet mix in 2015 is anticipated to remain fairly stable with little change through 2035 with one exception. National trends and FAA TAF forecasts indicate strong growth in the number of general aviation jet aircraft in operation in the U.S. through 2035.

In 2015, there was one based jet at HWO, and despite a projected increase in the number of based aircraft at the Airport through 2035, it is anticipated that the composition of the fleet mix will remain generally consistent mix that is evident today. This is primarily due to the fact that the area surrounding HWO is completely developed, which makes any sort of expansion of the Airport's existing boundaries unlikely. As such, any extensions to existing runways or significant upgrades to instrument approaches are equally unlikely, thus narrowing the types of aircraft that can operate at HWO. Furthermore, the Airport is closed to aircraft over 12,500 lbs. which limits the vast majority of the business jet fleet from operating at HWO. It should be noted that the Airport does experience occasional jet operations, typically by smaller jet type aircraft such as versions of very light jet category such as the HondaJet, and a very limited set of more traditional models such as the Cessna Citation V and Cessna Citation CJ1.

The Dade/Broward County area is currently served by several airports that accommodate larger jets including Fort Lauderdale Executive Airport (FXE), Fort Lauderdale/Hollywood International Airport (FLL), Opa-Locka Executive Airport (OPF), Miami Executive Airport (TMB), Boca Raton Airport (BCT), while Pompano Beach Airpark (PMP) is more similar to HWO, but does accommodate small to mid-size jet models.

Based on data provided by Airport Management, the based aircraft fleet mix in 2015 included 335 single-engine piston aircraft, 41 multi-engine piston and turbo-prop aircraft, 21 helicopters, and one jet (see **Table 5-19**). Other resources for based aircraft information such as the FAA TAF and 5010 Airport Master Record do not accurately represent the number of historical based aircraft at HWO.

The fleet of single engine will experience the most significant numerical increase of any category over the forecast period, although the overall single engine percentage of total based aircraft at the airport will decline slightly. Some growth in the number of Multi-Engine (Twin-engine) piston and smaller turbo-prop models is also projected. Included in the turbo-prop models are aircraft such as the Beechcraft B200, Cessna 425 and 441 Conquest I and II, or the Piper Cheyenne I and II.

HWO is not projected to experience significant operations nor basing of jet aircraft. The vast majority of business jets exceed the 12,500 lb. operational limit in place at HWO and as such, must therefore look to other nearby airports including FXE, BCT, TMB or OPF. The exception to this are a relatively new class of small, highly capable and low noise generating Very Light Jet (VLJ) aircraft that began entering the market place approximately 10 years ago. At the time of their introduction, industry forecasts were projecting significant growth in this category of jet. These aircraft were generally about the same price as twin engine turbo prop aircraft and could operate at airports with limited runway length. While several manufacturers are producing aircraft in this class, the projected rapid growth of the VLJ aircraft segment has not occurred. Expansion of jet activity at HWO will be limited by a number of factors even for aircraft that could conform to the 12,500 lb. operational weight limitation. Operators of these aircraft typically want full instrument landing capabilities and while capable of operating off of relatively short runways, the availability of longer runways at a nearby facility would be attractive. For these reasons, only a minimal increase in the number of jets has been projected.

HWO already has a significant number of Rotorcraft based on the airport and given the robust forecasts of future rotorcraft nationally and the significant use of rotorcraft in the Fort Lauderdale and Miami areas growth in the number of based rotorcraft and their percentage of the based fleet are projected to increase. The projection of based aircraft fleet mix is summarized in **Table 5-19** below.

Table 5-19: HWO Based Aircraft Fleet Mix Forecast

Historical	Single-Piston	%	Multi-Piston/ Turbo-Prop	%	Jet	%	Rotor	%	Total
2015	335	84.2%	41	10.3%	1	0.3%	21	5.3%	398
Projected									
2020	347	84.2%	42	10.2%	1	0.2%	22	5.3%	412
2025	356	84.2%	43	10.2%	2	0.5%	22	5.2%	423
2035	382	84.1%	45	9.9%	3	0.7%	24	5.3%	454

Sources: Airport Management, Kimley-Horn Prepared: March 2016

5.6 Aircraft Operations Forecasts

Aircraft operations projections are used to determine funding and design criteria at airports. At airports with air traffic control towers, aircraft operations are tracked and recorded by the air traffic controller.

There are several factors that impact the number of aircraft operations that occur at a particular airport. The number of based aircraft, local demographics, national economic and aviation-related trends, proximity to other airports, capability and existing condition of facilities, business needs, and several other factors influence aircraft operations at an airport.

FAA TAF and Other Forecasts

As with based aircraft, several sources were examined to analyze the validity of existing forecasts of aircraft operations at HWO. The FAA TAF, 2009 Master Plan, and FDOT forecasts for aircraft operations are depicted in **Table 5-20**. As shown, the FAA TAF reports 168,192 estimated aircraft operations in 2015, and projects 184,752 operations in 2035, a CAGR of 0.47 percent. The most recent FDOT forecasts report 147,775 operations in 2015 and project 214,056 in 2035, a CAGR of 1.87 percent. The 2009 Master Plan projected 169,055 operations in 2015 and 218,627 in 2035, a CAGR of 1.29 percent. FDOT and 2009 Master Plan forecasts have been extrapolated.

Table 5-20: HWO Operations Forecast Comparison

Historical	FAA TAF	FDOT Forecast	2009 Master Plan Forecast
2014	154,808	145,062	166,562
2015	168,192	147,775	169,055
Projected			
2020	178,947	162,118	181,060
2025	180,855	181,179	192,949
2035	184,752	214,056	218,627
CAGR 2015-2035	0.47%	1.87%	1.29%

Source: FAA TAF, Accessed January 2016. FDOT website 2014 forecasts.
2009 Airport Master Plan Update Prepared: March 2016

Based on the review of the FAA TAF, the 2009 Master Plan Update, and FDOT's operational forecasts, other methodologies have been developed to project future operational activity at HWO.

Aircraft Operations Forecast Methodologies

Historical aircraft operations data have been obtained from the ATADS database. As noted previously, these data are directly derived from the airport traffic control tower. It should be noted that because there is adequate historical aircraft operations data, analysis of historical activity encompasses a 10-year timeframe dating to 2005 (as opposed to 2010 for based aircraft due to unavailability of data). Based on the available data, three types of methodologies have been utilized to develop forecasts of aircraft operations at HWO: Socioeconomic, Market Share, and Operations per Based Aircraft. These forecasts are described in detail in the subsequent sections.

Socioeconomic Methodology – Population Variable

Similar to the forecasts developed for based aircraft, the Socioeconomic-Population Variable Methodology for aircraft operations forecasts assumes that between 2016 and 2035, the number of aircraft operations at the Airport will increase at the same rate as the population of the Miami MSA (see **Table 5-21**). As shown, the number of aircraft operations at HWO is projected to increase from 171,550 in 2015 to 217,707 in 2035, which reflects a CAGR of 1.2 percent.

Table 5-21: HWO Socioeconomic – Population Variable Aircraft Operations Forecast

Historical	Miami MSA Population	HWO Operations
2005	5,411,000	137,667
2006	5,430,000	164,378
2007	5,423,000	182,190
2008	5,455,000	170,077
2009	5,505,000	162,885
2010	5,582,000	120,322
2011	5,688,000	136,104
2012	5,763,000	127,648
2013	5,828,000	142,399
2014	5,895,000	155,776
2015	5,965,000	171,550
CAGR 2005-2015	0.98%	2.22%
Projected		
2020	6,344,000	182,453
2025	6,744,000	193,950
2035	7,570,000	217,707
CAGR 2015-2035	1.20%	1.20%

Sources: Woods and Poole Economics, Inc., Kimley-Horn
Prepared: March 2016

Socioeconomic Methodology – Employment Variable

The number of employed individuals in the Miami MSA is anticipated to increase from approximately 3.1 million in 2015 to 4.8 million in 2035, a CAGR of 1.56 percent. The Socioeconomic-Employment Variable Methodology assumes that between 2016 and 2035, the number of based aircraft at HWO will increase at the same rate as the number of employed individuals in the Miami MSA (see **Table 5-22**). As shown, the number of aircraft operations at HWO is projected to increase from 171,550 in 2015 to 233,595 in 2035, which reflects a 1.56 percent CAGR.

Table 5-22: HWO Socioeconomic – Employment Variable Aircraft Operations Forecast

Historical	Miami MSA Employment	HWO Operations
2005	3,169	137,667
2006	3,236	164,378
2007	3,306	182,190
2008	3,259	170,077
2009	3,134	162,885
2010	3,142	120,322
2011	3,255	136,104
2012	3,341	127,648
2013	3,419	142,399
2014	3,483	155,776
2015	3,547	171,550
CAGR 2005-2015	1.13%	2.22%
Projected		
2020	3,865,000	186,921
2025	4,189,000	202,570
2035	4,830,000	233,595
CAGR 2015-2035	1.56%	1.56%

Sources: Woods and Poole Economics, Inc., Kimley-Horn
Prepared: March 2016

Socioeconomic Methodology – Per Capita Personal Income Variable

Per capita personal income is examined to project Aircraft operations at the Airport and is shown in **Table 5-23**. As shown, per capita income in the Miami MSA is anticipated to increase from $43,542 in 2015 to $55,766 in 2035, a CAGR of 1.24 percent. This methodology projects that the number of based aircraft at the Airport will increase at the same rate as per capita income in the Miami MSA. According to the Socioeconomic-Per Capita Personal Income Variable Methodology, the number of aircraft operations at HWO is projected to increase from 171,550 in 2015 to 219,711 in 2035. Per capita data obtained from Woods and Poole is reported in constant dollars (year 2009) to adjust for inflation over time.

Table 5-23: HWO Socioeconomic – Per Capita Personal Income Variable ($2005) Based Aircraft Forecast

Historical	Miami MSA Per Capita Personal Income ($2009)	HWO Operations
2005	42,890	137,667
2006	44,494	164,378
2007	45,252	182,190
2008	44,505	170,077
2009	40,482	162,885
2010	40,874	120,322
2011	41,676	136,104
2012	42,253	127,648
2013	42,277	142,399
2014	42,897	155,776
2015	43,542	171,550
CAGR 2005-2015	0.15%	2.22%
Projected		
2020	$46,725	184,091
2025	$50,056	197,214
2035	$55,766	219,711
CAGR 2015-2035	1.24%	1.24%

Sources: Woods and Poole Economics, Inc., Kimley-Horn
Prepared: March 2016

Socioeconomic Methodology – Summary of Results

A summary of the results of the socioeconomic methodologies used to project aircraft operations at the HWO is shown in **Table 5-24**, including the CAGR for each methodology from 2015 through 2035.

Table 5-24: Socioeconomic Forecasts of HWO Aircraft Operations

Historical	Population Variable	Employment Variable	Per Capita Personal Income Variable
2005	137,667	137,667	137,667
2006	164,378	164,378	164,378
2007	182,190	182,190	182,190
2008	170,077	170,077	170,077
2009	162,885	162,885	162,885
2010	120,322	120,322	120,322
2011	136,104	136,104	136,104
2012	127,648	127,648	127,648
2013	142,399	142,399	142,399
2014	155,776	155,776	155,776
2015	171,550	171,550	171,550
CAGR 2005-2015	2.22%	2.22%	2.22%
Projected			
2020	182,453	186,921	184,091
2025	193,950	202,570	197,214
2035	217,707	233,595	219,711
CAGR 2015-2035	1.20%	1.56%	1.24%

Sources: Woods and Poole Economics, Inc., Kimley-Horn Prepared: March 2016

Aircraft Operations Forecast – Market Share Methodology

Similar to based aircraft forecasts, the Market Share methodology is also used to forecast aircraft operations at HWO. This methodology compares aircraft operations at HWO with general aviation operations at all FAA and contract-towered facilities in the U.S. as well as those in the State of Florida. Towered facilities are examined as they include only airports that have the capability to record and report accurate operations data. This methodology assumes that general aviation aircraft operations activity at HWO will mimic activity that occurs nationally or in the State of Florida (see **Table 5-25)**.

Between 2005 and 2015, the Airport's market share of operations in the U.S. and Florida has fluctuated significantly, and experienced a 10-year high in 2015 of 0.67 percent and 4.38 percent of operations respectively. Because of the significant historical fluctuation, and because operations at HWO have been steadily trending upward from 2013 through 2015, the Market Share Methodology applies the Airport's market share from 2015 to FAA projections of total general aviation operations at towered airports in the U.S. and Florida. As shown in Table 25, when compared to U.S. general aviation operations, this methodology forecasts an increase in operations at the Airport from 171,550 in 2015 to 183,878 in 2035, a CAGR of 0.35 percent. When compared to general aviation operations in the State of Florida, the methodology projects an increase from 171,550 in 2015 to 184,932 in 2035, which represents a CAGR of 0.38 percent.

Table 5-25: HWO Operations – Market Share Methodology

Historical	U.S. GA ATCT Operations	HWO Market Share	HWO Operations	FL GA ATCT Operations	HWO Market Share	HWO Operations
2005	36,210,946	0.38%	137,667	4,913,642	2.80%	137,667
2006	35,130,806	0.47%	164,378	4,703,108	3.50%	164,378
2007	34,925,153	0.52%	182,190	4,797,479	3.80%	182,190
2008	32,690,844	0.52%	170,077	4,607,077	3.69%	170,077
2009	28,861,853	0.56%	162,885	4,133,835	3.94%	162,885
2010	27,129,042	0.44%	120,322	3,639,767	3.31%	120,322
2011	26,333,702	0.52%	136,104	3,754,589	3.63%	136,104
2012	26,302,962	0.49%	127,648	3,849,048	3.32%	127,648
2013	25,925,725	0.55%	142,399	3,921,724	3.63%	142,399
2014	25,654,036	0.61%	155,776	3,906,328	3.99%	155,776
2015	25,578,216	0.67%	171,550	3,918,297	4.38%	171,550
Projected						
2020	26,025,752	0.67%	174,552	4,000,278	4.38%	175,139
2025	26,472,894	0.67%	177,550	4,072,617	4.38%	178,306
2035	27,416,314	0.67%	183,878	4,223,957	4.38%	184,932
CAGR 2015-2035	0.35%		0.35%	0.38%		0.38%

Sources: FAA TAF, Accessed January 2016, Kimley-Horn Prepared: March 2016

Aircraft Operations Forecast – OPBA

The final methodology employed to forecast aircraft operations at HWO is the application of operations per based aircraft (OPBA). This is a commonly used methodology that determines a historical number of aircraft operations at a facility compared with based aircraft and applies that figure to forecasts of based aircraft. Historical and projected based aircraft, operations, and OPBA are shown in **Table 5-26**.

As shown, aircraft operations, based aircraft, and OPBA all changed significantly between 2010 and 2015. As noted previously, the number of based aircraft has increased in recent years, primarily due to relocation of aircraft from nearby airports. Because of the changing nature of historical activity at HWO, this methodology applies and holds constant the 2015 figure of 431 operations per based aircraft that occurred in 2015 to the preferred methodology based aircraft forecasts. The 431 operations per based aircraft level is in the mid-range of the operational levels experience over the past six years at HWO and reflects both the conditions associated with the slow recovery from the most recent and very deep recession as well as more recent up-tick in economic conditions nationally and locally. The OPBA methodology projects an increase in aircraft operations from 171,550 in 2015 to 195,487 in 2035, which reflects a CAGR of 0.66 percent. In reviewing the projection of future operations it is important to consider the operational fluctuations that routinely occurred over the past 10-years and, frankly, fluctuations in operational activity that go back more than two decades where activity approached the forecast level and then retrenched due to any of a number of external influences.

To illustrate these fluctuations, in 1993 as the nation emerged from an earlier recession, HWO experience a total of 174,992 aircraft operations, however by 1997, even while economic activity had sharply improved, total annual operations had dropped to 114,225. By 2001 activity had exceeded the 1993 level reaching 183,284 annual landings and takeoffs only to drop back to 134,581 operations two years later. This will likely be the pattern in the future as recessions will occur, recoveries will follow and unforeseeable other factors will come into play. Taking into considerations these past trends and factoring in characteristics of HWO and competing airports the use of the FAA growth rate was determined to represent a realistic basis for projecting future operational activity.

Table 5-26: HWO Operations per Based Aircraft Forecast Methodology

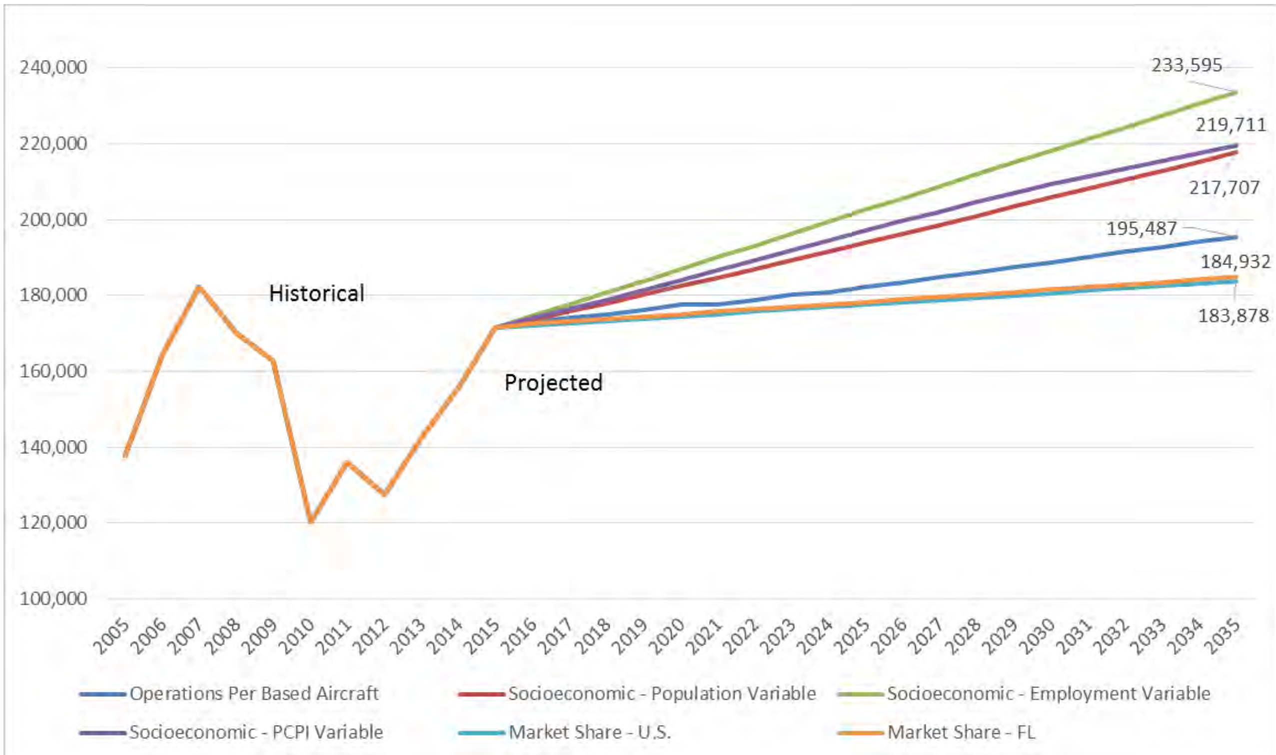
Historical	Aircraft Operations	Based Aircraft	Operations per Based Aircraft
2010	120,322	245	491
2011	136,104	276	494
2012	127,648	306	417
2013	142,399	337	423
2014	155,776	367	424
2015	171,550	398	431
CAGR 2010-2015	7.35%	10.19%	-2.58%
Projected			
2020	177,534	412	431
2025	182,189	423	431
2035	195,487	454	431
CAGR 2015-2035	0.66%	0.66%	0.00%

Sources: FAA TAF Accessed January 2016, Kimley-Horn Prepared: March 2016

Aircraft Operations Forecast – Preferred Methodology

Six different methodologies have been developed for forecasts of aircraft operations at HWO (see **Figure 5-3**. Similar to historical based aircraft activity, the number of aircraft operations at HWO have fluctuated significantly in recent years. Volatility in the U.S. economy, increasing costs of aircraft fuel and maintenance, a recent upswing in based aircraft at the Airport and other factors have all impacted aircraft operations locally. Some of these factors can be accounted for when cross examined with local socioeconomic data and the Airport's market share of operations compared with the State of Florida and the U.S., but a strong correlation cannot be made. The Operations per Based Aircraft methodology incorporates activity levels that are current and pairs them with a projected growth rate that is equal to the FAA's forecasts of based aircraft. As such, it is estimated that this is the most accurate portrayal of future activity and is selected as the preferred methodology for aircraft operations at HWO. These data will be used in subsequent sections of this chapter and are recommended for planning purposes.

Figure 5-3: HWO Aircraft Operations Forecast – Summary



Sources: Woods and Poole Economics, Inc., FAA TAF, Accessed January 2015, Kimley-Horn
Prepared: March 2016

Aircraft Operations Forecast – Local/Itinerant Operations

According to the FAA, local operations are defined as those conducted by aircraft that operate in the local traffic pattern or within sight of the Airport; are known to be departing for, or arriving from, flight in local practice areas located within a 20-mile radius of the Airport; or execute simulated instrument approaches or low passes at the Airport. Itinerant operations are all aircraft operations other than local operations. As noted previously, HWO experiences regular business and leisure itinerant aircraft operations as well as operations to international destinations, particularly in the Caribbean.

According to the ATADS database, between 2005 and 2015, the percentage of annual itinerant operations fluctuated between 33.8 percent and 39.9 percent, and the average percentage of annual itinerant operations during that time was 35.9 percent. Because of this historical fluctuation, the 10-year average from 2005-2015 is applied to projected levels of future operations and held constant through 2013 (see **Table 5-27**).

Table 5-27: HWO Operations Forecast – Local/Itinerant Operations

Historical	Total Operations	Local Operations	% Local Ops	Itinerant Operations	% Itinerant Ops
2005	137,667	86,380	62.7%	51,287	37.3%
2006	164,378	106,770	65.0%	57,608	35.0%
2007	182,190	120,682	66.2%	61,508	33.8%
2008	170,077	110,084	64.7%	59,993	35.3%
2009	162,885	105,326	64.7%	57,559	35.3%
2010	120,322	72,297	60.1%	48,025	39.9%
2011	136,104	85,419	62.8%	50,685	37.2%
2012	127,648	79,834	62.5%	47,814	37.5%
2013	142,399	92,015	64.6%	50,384	35.4%
2014	155,776	103,010	66.1%	52,766	33.9%
2015	171,550	112,664	65.7%	58,886	34.3%
Average 2005-2015			64.1%		35.9%
Projected					
2020	177,534	113,805	64.1%	63,729	35.9%
2025	182,189	116,789	64.1%	65,400	35.9%
2035	195,487	125,314	64.1%	70,174	35.9%
CAGR 2015-2035	0.66%	0.53%		0.88%	

Sources: ATADS database Accessed January 2016, Kimley-Horn. Prepared: March 2016

As shown, this methodology projects an increase in local aircraft operations from 112,664 in 2015 to 125,314 in 2035, which reflects a CAGR of 0.53 percent. Itinerant aircraft operations are projected to increase from 58,886 in 2015 to 70,174 in 2035, a CAGR of 0.88 percent.

Aircraft Operations Forecast – Daytime/Evening Operations

Another component of this document is development of forecasts of daytime/evening operations. This is an important element to include as noise impacts created by aircraft arriving or departing at night are greater than during the day.

Flight-specific operations data were obtained from the airport traffic control tower and the FAA Traffic Flow Management System (TFMSC) from the Aircraft Situation Display to Industry (or ASDI) data. The ASDI data feed includes messages entered into the TFMS from the National Airspace System (NAS). These messages include aircraft departures, arrivals, tracking information, and flight management information.

According to data obtained by TFMSC, the percentage of nighttime operations (defined by the FAA as 10:00PM to 7:00AM) has fluctuated between 2005 and 2015. As such, the 10-year historical average of 5.5 percent nighttime operations is applied to total projected aircraft operations and held constant throughout the projection period (see **Table 5-28**).

Table 5-28: HWO Operations Forecast – Daytime/Evening Operations

Historical	Total Operations	Daytime Operations	% Daytime	Evening Operations	% Evening
2005	137,667	129,132	93.8%	8,535	6.2%
2006	164,378	156,981	95.5%	7,397	4.5%
2007	182,190	173,991	95.5%	8,199	4.5%
2008	170,077	159,702	93.9%	10,375	6.1%
2009	162,885	152,460	93.6%	10,425	6.4%
2010	120,322	114,547	95.2%	5,775	4.8%
2011	136,104	123,446	90.7%	12,658	9.3%
2012	127,648	120,755	94.6%	6,893	5.4%
2013	142,399	133,428	93.7%	8,971	6.3%
2014	155,776	149,857	96.2%	5,919	3.8%
2015	171,550	165,803	96.7%	5,747	3.4%
Average 2005-2015			94.5%		5.5%
Projected					
2020	177,534	167,746	94.5%	9,789	5.5%
2025	182,189	172,144	94.5%	10,045	5.5%
2035	195,487	184,709	94.5%	10,778	5.5%
CAGR 2015-2035	0.66%	0.54%		3.19%	

Sources: ATADS database Accessed January 2016, Kimley-Horn. Prepared: March 2016

As shown, this methodology projects an increase in daytime operations from 165,803 in 2015 to 184,709 in 2035, which reflects a CAGR of 0.54 percent. Nighttime operations are projected to increase from 5,747 in 2015 to 10,778 in 2035, a CAGR of 3.19 percent.

Aircraft Operations Forecast – Commuter/Air Taxi Operations

An air taxi operator conducts operations in an aircraft with 30 or fewer passenger for hire or compensation. An air taxi operator operates on-demand and does not have the flight scheduled qualifications of a commuter. A commuter air carrier is designated as any air taxi operator which performs at least five roundtrips per week between two or more points and publishes flight schedules which specify the times, days of the week.

Historical commuter/air taxi data have been obtained from the ATADS database. Historically, HWO has not received a significant proportion of Commuter/Air Taxi Operations. As such, the FAA TAF is used to project future Commuter/Air Taxi operations (see **Table 5-29**). As shown, the TAF projects 220 commuter/air taxi operations annually throughout the projection period.

Table 5-29: HWO Commuter/Air Taxi Operations Forecast

Historical	Total Operations	Commuter/Air Taxi Operations	% Commuter/Air Taxi Operations
2005	137,667	6	0.0%
2006	164,378	4	0.0%
2007	182,190	0	0.0%
2008	170,077	5	0.0%
2009	162,885	50	0.0%
2010	120,322	92	0.1%
2011	136,104	457	0.3%
2012	127,648	93	0.1%
2013	142,399	224	0.2%
2014	155,776	230	0.1%
2015	171,550	210	0.1%
CAGR 2005-2015	2.22%	42.69%	
Projected			
2020	177,534	220	0.1%
2025	182,189	220	0.1%
2035	195,487	220	0.1%
CAGR 2015-2035	0.66%	0.23%	

Sources: FAA TAF Accessed January 2016, ATADS database Accessed January 2016. Kimley-Horn
Prepared: March 2016

Aircraft Operations Forecast – Military Operations

Military operations at general aviation airports tend to fluctuate based on escalation or de-escalation of military engagement activity and training requirements. Unless an airport has a joint agreement with a specific military branch or outfit, operations tend to be intermittent. Historical military operations data have been obtained from the ATADS database. HWO experiences relatively minimal military activity (see **Table 5-30**). As such, the FAA TAF is used to project future military operations. As shown, the TAF projects 89 annual military operations throughout the projection period.

Table 5-30: HWO Military Operations Forecast

Historical	Total Operations	Military Operations	% Military Operations
2005	137,667	41	0.1%
2006	164,378	245	0.1%
2007	182,190	140	0.1%
2008	170,077	194	0.1%
2009	162,885	1,126	0.7%
2010	120,322	317	0.3%
2011	136,104	433	0.3%
2012	127,648	43	0.1%
2013	142,399	99	0.1%
2014	155,776	99	0.1%
2015	171,550	87	0.1%
CAGR 2005-2015	2.22%	7.81%	
Projected			
2020	177,534	89	0.1%
2025	182,189	89	0.1%
2035	195,487	89	0.1%
CAGR 2015-2035	0.66%	0.11%	

Sources: FAA TAF Accessed January 2016, ATADS database Accessed January 2016. Kimley-Horn
Prepared: March 2016

Aircraft Operations Forecast – Operational Fleet Mix

Operational fleet mix projections identify the type of aircraft that currently operate and are anticipated to operate at HWO. These forecasts are calculated based on data obtained from the airport traffic control tower and TFMSC data. 2015 Data include total operations by aircraft type (excluding overflights). Professional judgement was applied to the historic split of operations to account for the moving of Socata Aircraft service from HWO (manufacturer of the TBM 750 & 800 single-engine turbo-prop aircraft) and the recent growth in helicopter training and sightseeing flights. Similar to the based aircraft fleet mix, the operational fleet mix is not anticipated to change significantly in the future. As such, the proportions of aircraft operations by aircraft type are held constant throughout the projection period (see **Table 5-31**).

Table 5-31: HWO Total Operational Fleet Mix Forecast

Year	Total Operations	Single-Engine Piston		Multi-Engine Piston		Jet		Helicop,70ter		Single Turbo		Multi-Turbo	
		Ops	%	Ops	%	Ops	%	Ops	%	Ops	%	Ops	%
2015	171,550	142524	83.1%	17,327	10.1%	446	0.3%	2,505	1.5%	6,313	3.7%	2,436	1.4%
Projected													
2020	177,534	147,495	83.1%	17,931	10.1%	462	0.3%	2,592	1.5%	6,533	3.7%	2,521	1.4%
2025	182,189	151,362	83.1%	18,401	10.1%	474	0.3%	2,660	1.5%	6,705	3.7%	2,681	1.4%
2035	195,487	162,411	83.1%	19,744	10.1%	508	0.3%	2,854	1.5%	7,194	3.7%	2,776	1.4%
CAGR 2015-2035	0.66%	0.66%		0.66%		0.66%		0.66%		0.66%		0.66%	

Sources: TFMSC Database Accessed January 2015, Kimley-Horn Prepared: March 2016

5.7 Peaking Characteristics and Peak Operations Projections

An important component in the development of forecasts of aviation demand is peak activity levels. Understanding peaking characteristics assists in facility and capacity planning. The following section present peak operations forecasts.

ATADS data available from 2006-2015 were analyzed to identify aircraft operations by month and day as presented in **Table 5-32**. To project future peak month operations, the ratio of 11.1 percent of peak month operations to total operations in 2015 is applied to projected total operations for years 2020, 2025, and 2035. Because it was the most frequent peak month for operations between 2006 and 2015, March is used as the example peak month for future projections. Peak month average day forecasts are determined by dividing peak month operations by the number of days in the peak month (31 days in March).

Also depicted in **Table 5-32** are historical and projected peak day activity for the peak month. Although this figure should not necessarily be used for planning purposes, it is useful to understand the maximum anticipated activity level during busy periods at the Airport. Historical data is taken directly from the ATADS database. Projected peak month peak day activity is determined by applying the percentage (4.7%) of operations that occurred on the peak day of the peak month to the total operations in the peak month in year 2015, and applying that figure to projected peak month activity in years 2020, 2025, and 2035.

Table 5-32: HWO Operations Forecast – Peak Month and Peak Day Forecasts

Year	Peak Month	% Operations in Peak Month	Operations/ Month	# of Days in Peak Month	Peak Month Avg. Day Operations	Peak Month Peak Day Operations	% Peak Month Peak Day to Monthly Ops
2006	March	9.9%	16,293	31	526	800	4.9%
2007	April	9.7%	17,733	30	591	867	4.9%
2008	April	10.1%	17,117	30	571	758	4.4%
2009	February	11.8%	19,192	28	685	905	4.7%
2010	November	10.4%	12,570	30	419	1,101	8.8%
2011	February	10.1%	13,766	28	492	653	4.7%
2012	November	10.5%	13,456	30	449	663	4.9%
2013	March	11.0%	15,713	31	507	791	5.0%
2014	March	11.0%	17,089	31	551	758	4.4%
2015	March	11.1%	19,117	31	617	898	4.7%
Projected							
2020	March	11.1%	19,784	31	638	929	4.7%
2025	March	11.1%	20,303	31	655	954	4.7%
2035	March	11.1%	21,784	31	703	1,023	4.7%

Sources: ATADS Accessed January 2015, Kimley-Horn Prepared: March 2016

Peaking characteristics described in the previous section are applied to annual operations forecasts and the results are presented in **Table 5-33**. In addition, projected peak month average peak hour and peak month peak hour operations are shown. Peak hourly data were obtained from ATADS, however, only year 2015 data are available.

In 2015, the number of peak hour operations that occurred in the peak month was 134. It is assumed that this figure will increase at the same rate as annual and peak month operations. It should be noted that this figure should not necessarily be used as a planning benchmark, but rather, a general indication of the maximum amount of activity the HWO may experience in an hourly timeframe.

Peak month average peak hour operations projections provide a more reasonable figure of regular heightened activity that occurs at the Airport and this figure is more appropriate for planning purposes. Peak month average peak hour projections for 2015 were determined averaging peak hour operations for each day during the peak month (March). It is estimated that peak month average peak hour operations will continue to grow at the same rate as annual and peak month operations.

Table 5-33: HWO Peak Operations Forecast

Historical		Projected		
	2015	2020	2025	2035
Annual Operations	171,550	177,534	182,189	195,487
Peak Month Operations	19,117	19,784	20,303	21,784
Peak Month Avg. Day Operations	617	638	655	703
Peak Month Avg. Peak Hour Operations	99	102	105	113
Peak Month Peak Hour Operations	134	139	142	153

Sources: ATADS, Kimley-Horn Prepared: March 2016

5.8 Forecast Summary

It is anticipated that HWO will see steady growth in based aircraft and annual aircraft operations throughout the 20-year projection period. This growth is propelled by an improving local economy, growing population base, strong tourism market, and the fact that HWO has ample facilities and available land to accommodate growth in general aviation traffic. While the general aviation industry has struggled in recent years faced with fluctuating fuel prices and a volatile national economy, the Miami area is home to large local employment centers and has significant transient aircraft activity. Summaries of projections of aviation demand are presented in **Table 5-34**.

Table 5-34: Summary of HWO Forecasts

Category		Projected		
	2015	2020	2025	2035
Total Aircraft Operations	171,550	177,534	182,189	195,487
Itinerant	58,886	63,729	65,400	70,174
Local	112,664	113,805	116,789	125,314
Total Based Aircraft	398	412	423	454
Single-Engine Piston	335	347	356	382
Multi-Engine Piston	41	42	43	45
Jet	1	1	2	3
Helicopter	21	22	22	24

Sources: Kimley-Horn Prepared: March 2016

5.9 FAA Forecast Review and Approval

FAA Airport District Offices (ADOs) or Regional Airports Divisions are responsible for forecast approvals. When reviewing a sponsor's forecast, FAA must ensure that the forecast is based on reasonable planning assumptions, uses current data, and is developed using appropriate forecast methods. Additional discussion on assumptions, data and methodologies can be found in the APO report "Forecasting Aviation Activity by Airport." After a thorough review of the forecast, FAA then determines if the forecast is consistent with the TAF.

For all classes of airports, forecasts for total enplanements, based aircraft, and total operations are considered consistent with the TAF if they meet the following criterion: Forecasts differ by less than 10 percent in the 5-year forecast period, and 15 percent in the 10-year forecast period.

If the forecast is not consistent with the TAF, differences must be resolved if the forecast is to be used in FAA decision-making. This may involve revisions to the airport sponsor's submitted forecasts, adjustments to the TAF, or both. A comparison of forecasts of aviation compared with TAF forecasts are presented in **Table 5-35**. As shown, and as noted previously, there is a significant difference between the number of based aircraft reported in the FAA TAF for 2015 and what was reported by the Airport.

Table 5-35: North Perry Airport FAA TAF Comparison

Based Aircraft	Year	HWO Forecast	TAF Forecast	HWO/TAF % Difference
Base yr.	2015	398	258	54.3%
Projected				
Base yr. + 5	2020	412	267	54.3%
Base yr. + 10	2025	423	274	54.3%
Base yr. + 20	2035	454	294	54.3%

Itinerant Operations	Year	HWO Forecast	TAF Forecast	HWO/TAF % Difference
Base yr.	2015	58,886	57,642	2.2%
Projected				
Base yr. + 5	2020	63,729	60,472	5.4%
Base yr. + 10	2025	65,400	60,592	7.9%
Base yr. + 20	2035	70,174	60,832	15.4%

Local Operations	Year	HWO Forecast	TAF Forecast	HWO/TAF % Difference
Base yr.	2015	112,664	110,550	1.9%
Projected				
Base yr. + 5	2020	113,805	118,419	-3.9%
Base yr. + 10	2025	116,789	120,207	-2.8%
Base yr. + 20	2035	125,314	123,864	1.2%

Total Operations	Year	HWO Forecast	TAF Forecast	HWO/TAF % Difference
Base yr.	2015	171,550	168,192	2.0%
Projected				
Base yr. + 5	2020	177,534	178,947	-0.8%
Base yr. + 10	2025	182,189	180,855	0.7%
Base yr. + 20	2035	195,487	184,752	5.8%

Sources: FAA TAF, Issued January 2016, Kimley-Horn Prepared: March 2016

Appendix B

Based Aircraft Determination

(Derived from physical inventory performed March 2016)

Appendix B: Based Aircraft Determination

The Broward County Aviation Department (BCAD) is the owner and operator of two airports consisting of Fort Lauderdale Hollywood International Airport (FLL) and North Perry Airport (HWO). North Perry Airport is managed by an on-airport professional Airport Manager with supporting professional and operations personnel who are responsible for the operation of the airport. The management staff at HWO maintain records of all hangar leases on the airport and also develop an updated count of based tenants on a scheduled basis in conjunction with facility inspections conducted by the Broward County Fire Department to ensure conformity with County fire codes. The process used in the based aircraft count involves the following activities.

1. HWO senior staff coordinate with Broward County Fire Department inspectors and with each airport tenant to access each conventional hangar and T-hangar unit on the airport for required fire inspections. During these inspections, senior BCAD staff verify occupancy of each hangar or hangar unit and collects the aircraft registration number for comparison against tenant lease information to confirm the basing status of the aircraft in the hangar. These inspections occur for all T-hangars and based business tenants including accounting for the aircraft fleets associated with Aerial Banners, Inc., Van Wagner Aerial Media, the Florida Aero Club, three separate air tour operators, multiple flight schools, and other tenants. Aircraft are identified by N-number and are them compared against airport records and those of the major FBO and commercial tenants to establish that they meet based aircraft criteria.

2. BCAD management staff coordinated with Fixed Base Operators (FBOs) to derive aircraft that are based in FBO conventional hangars also by N-number along with those aircraft based on leased tiedown spaces and other aircraft parking positions within FBO leaseholds with the exception of those using spaces for short or seasonal durations. Information was derived from FBO records and as noted was defined by aircraft type and by aircraft registration.

3. BCAD management coordinated with the Broward Community College and obtained a listing of their operational aircraft based at HWO as a part of their flight training activities and that are routinely operated at HWO.

Given the steps noted above, HWO senior management identified the following aircraft by registration number and by aircraft type as being based at North Perry Airport.

Registration Number	Aircraft Type	Registration Number	Aircraft Type
N477MM	RW162F	N2307L	BE-23
N247LP	R-44	N3685R	PA-28-180
N674RG	R-22	N277SM	PA-28-236
N468AB	Mosquito	N32490	PA-28-151
N83U	Bell 206	N2434T	C-172R
C-GGLM	Bell 206	N25476	C-152
Chopper 7	Bell 206	N6132P	C-152
Chopper 10	Bell 206	N32171	PA-28-180

C-GLEF	Bell 206	N917FA	C-172P
N8369F	R-44	N360J	LANCAIR 320
N658JL	HUGHES 369	AB PROJECT	SINGLE
N487YG	GYRO	AB PROJECT	SINGLE
N166RK	R-66	AB PROJECT	SINGLE
N301BP	R-22	AB PROJECT	SINGLE
N205RB	R-44	AB PROJECT	SINGLE
N272JW	R-44	AB PROJECT	SINGLE
N544MH	R-44	AB PROJECT	SINGLE
N8369F	R-44	AB PROJECT	SINGLE
N194HC	R-22	AB PROJECT	SINGLE
N645KA	S-269C	AB PROJECT	SINGLE
N160DS	PITTS S-1	TECHNAM	COLLEGE
N519DC	PITTS S-1	TECHNAM	COLLEGE
N161DS	PITTS S-2	TECHNAM	COLLEGE
N2561G	CHAMP 7	TECHNAM	COLLEGE
N5532O	C-172P	TECHNAM	COLLEGE
N717B	BE-A35	WARRIOR	COLLEGE
N46028	C-172L	WARRIOR	COLLEGE
N1962G	C-T206	WARRIOR	COLLEGE
N65367	C-182T	WARRIOR	COLLEGE
N220MF	SYMPHONY 100	WARRIOR	COLLEGE
N77869	LUSCOMBE 8A	N96D	PA-18
N936TE	AG-5B	N6094D	PA-18
N115DE	COMMANDER 114TC	N3257B	PA-18
N7923B	C-172K	N102VW	PA-18
N4486	AT-6	N9692D	PA-18
N2030Y	C-172C	N8574C	PA-18
N720P	SR-22	N4388A	PA-18
N6605W	PA-28-140	N294T	PA-18
N91790	C-182M	N7199K	PA-18
N79MH	BE-35	N2792P	PA-18
N3187X	C-150G	N5428H	PA-18
N249J	EA-300L	N103VW	PA-18
N9177V	C-206T	N17080	PA-18
N9616X	C-210B	N6971D	PA-18
N82808	PA-28-236	N224T	PA-18
PROECT	NOT NOTED	N51539	PA-J3C
M1540C	SR-22	N6804D	RAWDAN T1
N6166N	C-185F	N6099V	RAWDAN T1
N2444N	PA-46	N2192M	PA-J3C
N20320	C-172M	N148SP	PA-J3C
N113AG	C-206G	N35266	PA-J3C
N7046P	PA-24	N6460D	PA-J3C
N89PA	C-206H	N70659	PA-J3C
N3299R	PA-28-180	N2143M	PA-J3C

N79089	C-172K	N3666K	PA-J3C
N2926	HARMON ROCKET	N42183	PA-J3C
N353W	C-150M	N7510H	P-12
N18XP	RV-6A	N3793M	P-12
N234CZ	SR-22	N35288	PA-J5A
N2PE	LANCAIR 360	N41236	PA-J5A
N67PN	PITTS S-2	N33180	PA-J5A
N293DM	RV-7	N40718	PA-28-140
N382WM	LANCEAIR 320	N409FP	DA-40F
N463C	SR-22	N53095	C-172S
N5810Q	M-20K	N8752C	PA-28-140
N707DP	C-206H	N4830G	C-172N
N53095	C-172S	N804ND	PA-28R-201
N789PB	GLASSAIR 3	N7830V	M-20E
N72972	C-140	N1801E	BE-C23
N3999Z	PA-18-150	N9915B	C-172RG
N6727V	BE-36TC	C-FRNN	PA-28-151
N1506P	PA-22	N2027G	C-182A
N100NT	RV-6A	N20PG	PA-28-140
N2214V	PA-28-201	N67MS	C-172S
LONG EZ PROJECT	NOT NOTED	N211PP	C-O1A
N4989L	PA-28-180	N169AB	PA-25-260
N387DS	DA-40	N6319Z	PA-25
N91714	NAVION	N1154W	C-172S
N162CS	C-182S	N7172V	M-20C
N1602P	PA-22	N1302Y	CH601XL SLSA
N1779M	C-182P	N40793	C-172C
N972Q	BE-P35	N28786	C-172M
N965TB	TB-20	N4534J	AA-5B
N388ES	C-172R	N5237T	PA-28R-180
N692HM	RV-6	N2911G	PA-28-140
N132HM	C-R182	N75820	PA-28-161
N9166J	PA-28-180	N6344R	C-172N
N5186Z	PA-22	N96729	PA-28-140
N17JF	COMMANDER-114	N953B	C-172P
N31605	PA-18	N2639O	C-152
N480562	LUSCOMBE	N149T	AA-5A
N9280K	PA-46	N56617	C-182R
N432EM	KITFOX	N3493W	PA-28-140
C-GOZO	SR-22	C-GPHT	NOT NOTED
N313AB	LANCEAIR 300	N4918L	PA-28-180
N408LW	PA-28-161	N719LC	C-182
N260SJ	PITTS S-2	N728JG	BE-B33
N9092R	CULKEY COUGAR	N2107D	PA-28-161
N7ER	VARI-EZ	N7585G	C-172L
N735Q	C-182Q	N36445	PA-32RT-300

N5212X	C-172S	N7117T	C-172
N9461V	M-20C	N9482C	PA-28-161
N57673	DECATHALON	N5736V	BE-V35
N8173H	PA-28-236	N6804C	RAWDON T1
N4762J	BE A-23-19	N1393U	C-172M
N998JG	B-36TC	N3999V	C-R172K
N373SC	SPORTCRUISER	N3822W	PA-32-260
C-GGKM	TB-20	N3636Y	C-210C
N179TW	BELANCA 17	N723G	C-172N
N8206P	PA-24-250	N152WP	FK 9 MARK IV
N5736V	BE V35	N3551Z	PA-22-160
PROJECT	NOT NOTED	N9659L	AA-5
N8680U	C-172F	N7551G	C-172L
N22BY	BE-S35	N627FL	PA-28-140
N72884	C-172M	N193WT	SR 20
N5453L	AA-5	N5630R	C-172F
N81AV	TB-20	N12936	C-172M
N7036D	PA—22-150	N9741U	AA-5A
N32337	PA-28-150	N3211L	BE-23
N26103	AA-5A	C-GCEE	NOT NOTED
N2537C	C170B	N5566U	PA-28-140
N3025G	AIRCOUPE	C-GNOY	NOT NOTED
N5894L	AA-5	N3086S	C-172L
N9840W	PA-28-140	N5990E	C-172N
N273F	PA-32-300	N5106W	PA-28-160
N28805	AA-5B	N75293	PA-28R-200
N8331U	PA-32R-301T	N4327E	PA-28-112
N7061Q	C-172L	N44302	PA-28-151
N21774	C-172M	N5974U	PA-28-140
N4011U	C-150E	N1208X	M-20C
N80213	C-172M	N201HM	M-20J
N15684	PA-28R-200	N4477U	C-150D
N9721J	PA-28-180	N6840N	M-20C
N35122	C-177B	N316AP	PA-32R-300
N9285J	PA-28-180	N99344	C-172P
N177PH	C-177RG	N64238	C-172M
N9466J	PA-28-180	N66213	C-172P
N34289	C-177B	N63263	C-150M
N5787L	AA-1	N4248T	PA-28-180
N4208G	C-172N	N47929	PA-28-161
N423FL	PA-28-140	N5763E	C-172N
N6000R	C-172G	N209MM	C-172P
N737VT	C-TR182	N131FR	C-172P
N5675B	C-182	N8199X	C-172B
N66WM	PA-32-300	N8PS	PA-24
N39TF	BE-F33A	N29021	PA-28RT-201

N252AP	M-20K	N9285J	PA-28-180
N5SK	PITTS S-1	N72562	C-140
N101ME	VELOCITY RG	N93772	C-152
N531NA	PA-28-181	N821SD	C-172P
N555GQ	SR-20	N5302V	C-T210L
N20521	C-172M	PROJECT	TWIN
N5891W	PA-28-150	N6151H	PA-28-181
N6288W	PA-28-140	N34830	C-177B
N828BS	SEA-RAY	N9315D	C-172RG
N21690	C-172M	N5453L	AA-5
N45915	C-152	N957WA	TAMPICO TB 9C
N2888V	C-150	N68MJ	DA-42
N98244	PA-28-140	N728K	PA-34-200
N8072H	PA-28RT-201T	N2432S	C-337B
N726	PA-18	N291BP	BE-55
N36968	BE-F33	N39530	PA-34-200
N2896E	C-172N	N4516S	BE-55
N4792Y	PA-25-260	N4662	BE-55
N72AB	PA-25-235	N109CC	PA-23-250
N86AB	PA-25-235	N6269Y	PA-23-250
N5240G	C-305A	N44FD	PA-23
N37AB	PA-25	N5896Y	PA-23-250
BL PROJECT	NOT NOTED	N6777M	C-310F
BL PROJECT	NOT NOTED	N3229P	PA-23
N2171W	BE-19	N62580	PA-23
N1893H	C-310C	N2100P	PA-23
N5619B	C-182	N711PQ	C-421B
N3243U	C-182F	N310BG	C-310R
N1228T	PA-28R-200	N7130Y	PA-30
N695DT	PA-32R-301	N242PA	PA-31-310
N317NC	PA-28R-200	N7826Y	PA-30
N1064U	M-20J	N3232Q	C-401
N898BB	PA-46R-350T	N21KA	PA-31-310
N213GD	AA-1C	N63RJ	BE-55
N93ER	AG-5B	N528FA	C-402C
N9551M	M-20F	N63830	PA-23-250
N200DB	PA-24-250	N28UA	AERO COMMANDER
C-FZWP	C-177RG	N35BC	C-421C
C-FDRU	PA-J3	N6015Z	BE-76
N5509E	C-150	N43TA	BE-200
N4376Y	CYGNET SF-2A	N856BC	ISLANDER
N4932M	C-152	N9540Y	BE-A55
N13447	C-172M	N911SQ	C-310Q
N9372H	C-172M	N824BC	C-340A
N72274	C-206D	N797RW	C-441
N1220X	M-20D	N101JD	PA-23-250

N4385Y	PA-25-235	N6750T	C-310D
N4845F	PA-32R-3000	N5467S	C-337B
N2335J	BE-23	N2196V	PA-44-180
N7824W	PA-28-180	N34LM	PA-34-200T
N19597	C-150L	TECHNAM	COLLEGE TWIN
N34LM	PA-34-200T	N711P	PA-23-160