Chapter 2: Forecasts of Aviation Demand

2.1 Introduction

Projections of future activity are essential in preparing an Airport Master Plan. They provide the basis for evaluating the adequacy of existing airport facilities and their capacity to accommodate future traffic levels. Projections of demand also can be used to plan the type, quantity, and timing of needed improvements.

This chapter describes the development of aviation demand forecasts for Pompano Beach Air Park (PMP). Forecasts were made for several components of demand at the airport. These include:

- Based aircraft (number, type)
- Aircraft operations (total annual, local/itinerant)
- Annual instrument approaches
- Aircraft mix and Design aircraft

Consistent with federal and state guidelines for airport master planning, the forecasts were prepared for three planning horizons – short-range (five years), intermediate-range (10 years), and long-range (20 years). Subsequent sections describe the context within which the forecasts were developed, data used, methods employed, and the results obtained in this forecasting task.

2.2 Trends and Conditions Affecting the Forecasts

PMP has been the subject of previous master planning studies, the most recent being completed in 1997. Since that time many events have occurred and general economic conditions have changed, all of which can affect general aviation activity.

The most notable occurrence concerns the events of September 11, 2001. The terrorist attacks upon the United States had a chilling effect upon commercial air travel; however, the measures taken to prevent recurrences of such attacks are considered by many to have encouraged business/corporate use of general aviation.

Other factors affecting general aviation negatively since year 2000 include the general economic downturn early in the new century and increased fuel costs encountered in the post-2006 period. Positive influences have been exerted by the economic recovery of 2005-2006, as well as rapid growth of fractional aircraft ownership.

Evidence of the effects of these events and conditions may be illustrated by data concerning aircraft shipments. The General Aviation Manufacturers Association is a trade group that, among other activities, monitors the industry and assembles data pertaining to general aviation aircraft shipments. Data from their *GAMA Industry Review and 2007 Market Outlook,* presented in Table 2.1, indicate substantial growth in aircraft shipments in 2006. According to GAMA,

total aircraft shipments in 2006 were the highest since 1982. This suggests continued recovery of the industry from lows experienced in the 1980s and 1990s.

Table 2.1: General Aviation Aircraft Shipments by Year

Aircraft Type	2005	2006	% Change
Piston	2,485	2,750	11.6
Turboprop	365	407	11.5
Business Jet	750	885	18.0
Totals	3,580	4,042	12.9

Source: General Aviation Manufacturers Association.

Other data reported by GAMA suggest that activity by general aviation aircraft is declining. The above referenced report indicates that general aviation aircraft operations at airports with air traffic control towers (ATCT) declined 1.6% from 2005 to 2006. Instrument operations performed by general aviation aircraft declined by 1.2%. Such developments should be considered in the preparation of forecasts for PMP.

Future activity at PMP may also be influenced by the system of airports in which PMP operates. Broward County is home to four publicly owned, public use airports. Ft. Lauderdale Hollywood International Airport (FLL) is a commercial scheduled service facility owned and operated by Broward County. Ft. Lauderdale Executive Airport (FXE) is a high activity reliever airport owned by the City of Ft. Lauderdale. North Perry Airport (HWO) is also a reliever airport and is owned by Broward County.

High levels of commercial aircraft activity and forecasts of continued growth at FLL have produced consideration of alternative plans that would reduce the amount of space and facilities available for general aviation activity at the airport. If such plans are adopted and implemented, one substantial impact could be a shifting of some general aviation activity to other airports in the area. This would most likely involve business jets whose owners and operators would require the higher level facilities available at FXE. An increase in activity, including basing additional aircraft, at FXE could result in a domino effect involving a shifting of smaller aircraft and operations to PMP and North Perry Airports. Realization of this scenario would increase the need for aviation facilities and services at PMP. These data and information provide context within which the forecasts of activity at Pompano Beach Air Park were prepared.

2.3 Forecasting Methodologies

Aviation demand forecasts are generally prepared in a series of steps. First, historical aviation activity data are gathered and examined to identify existing and past levels of traffic as well as trends or patterns of change. Simultaneously, data are gathered which may indicate conditions or circumstances that have affected, or will influence, aviation activity levels. The second step in the process involves projecting past growth patterns and/or projecting historical relationships between aviation activity and other indicators into the future. When independent forecasts are

available from other sources, such as federal and state agencies, these are also reviewed as part of this process. The resulting projections are employed in the third step, subjective judgments concerning the extent to which one projection, or a combination of several projections, represents a reasonable estimate of future aviation activity. This judgmental evaluation culminates in the selection of a recommended forecast. Several techniques were considered in forecasting demand at PMP. These include regression analysis, trend analysis, market share analysis, and growth rate projections. Regression analysis involves the use of historical data to identify a relationship between the selected dependent variable, such as based aircraft, and an independent variable, such as population. This relationship is then applied to projections of the independent variable to produce future values for the dependent variable.

The second statistical technique, trend analysis, provides estimates of future values for the desired element (aviation demand) by determining a pattern of past change and projecting that pattern into the future. The fundamental assumption of this methodology is that the same factors will influence future aviation demand as have affected it in the past. It is further assumed that effects will continue to be similar.

A third way to estimate aviation demand, market share analysis, involves review of past activity at the airport as a percentage of activity in a larger regional, statewide, or national market. These percentages, or market shares, are then applied to activity forecasts for the larger market to produce a market share projection for the subject airport.

The fourth method, growth rate analysis, involves identifying projected rates of increase for a larger universe, or population, such as national estimates for general aviation aircraft ownership. These growth rates are then examined for applicability to the specific location for which projections are being developed. With consideration for past growth at the specific location, national, state, or regional level, growth rates may be adjusted upward or downward. The resulting rate is then applied to the specific location to produce estimates of increases.

2.4 Forecast Results

Forecasts were developed for four components of demand at PMP. The methodologies employed and the results for each component are described in the subsections that follow.

2.4.1 Forecast of Based Aircraft

The number of based aircraft at an airport is an important indicator in determining future activity levels and the need for expanded or improved airport facilities. Forecasts of based aircraft are used directly to estimate the need for certain types of facilities such as hangars and aircraft aprons. Projections of based aircraft also may serve as the basis for projecting other components of demand such as aircraft operations.

The inventory for this study produced initial reliance upon the FAA's Form 5010 information for based aircraft data. These records show a total of 158 based aircraft including 17 helicopters.

Historical data reported in the FAA's Terminal Area Forecast indicated that based aircraft levels have declined since the 1990s but have remained relatively constant over the past five years.

Repeated efforts were made to obtain based aircraft data from the primary fixed base operator at PMP. No data were provided; therefore, the Form 5010 information was used.

After review of historical data and consideration of alternative approaches for developing the forecasts, two methods were ultimately used to prepare independent based aircraft projections. For the first projection, national growth rates indicated in the FAA's *Aerospace Forecasts Fiscal Years 2006-2017* and *Long-Range Aerospace Forecasts Fiscal Years 2020, 2025 and 2030,* were applied to existing based aircraft data to estimate future based aircraft. The results are presented in Table 2.2.

Additional projections were prepared using market share analysis. These were developed in the following manner:

- Step 1 – The existing number of registered aircraft in Broward County was determined from an FAA aircraft registration database.
- Step 2 – This number was divided by total registered aircraft in the nation to determine the County's share of the national market.
- Step 3 – That percentage was applied to projections of national registered aircraft to estimate future registered aircraft for Broward County.
- Step 4 – PMP's based aircraft as a percent of county registered aircraft were determined.
- Step 5 – Projections of PMP's based aircraft were calculated by applying the market share from Step 4 to projections of registered aircraft in the county (from Step 3).

The market share projections were developed for three scenarios. The first assumes a constant market share based upon the existing percentage (6.31 percent) of PMP's based aircraft relative to county registered aircraft. Application of this percentage to projected county aircraft produced the Constant Market Share projections shown in Table 2.2.

Given the potential for developments at other Broward County airports that could affect demand at PMP, additional examinations were made including a larger role for the airport in serving area demand. Review of historical data for PMP's based aircraft versus county registered aircraft shows that PMP's percentage shares of the registered aircraft in the county have generally been higher than the current level, ranging as high as 13.3 percent. Using an assumption that PMP's share has been negatively influenced by lack of development to accommodate growth, a second market share projection was prepared using an increased market share of 9.8 percent. This represents the average of the existing share (6.31 percent) and the historical share (13.29 percent). It was assumed that achieving this increased share would be done in a gradual manner culminating in 9.8 percent in 2027. The results of this approach are shown as Increased Market Share in Table 2.2.

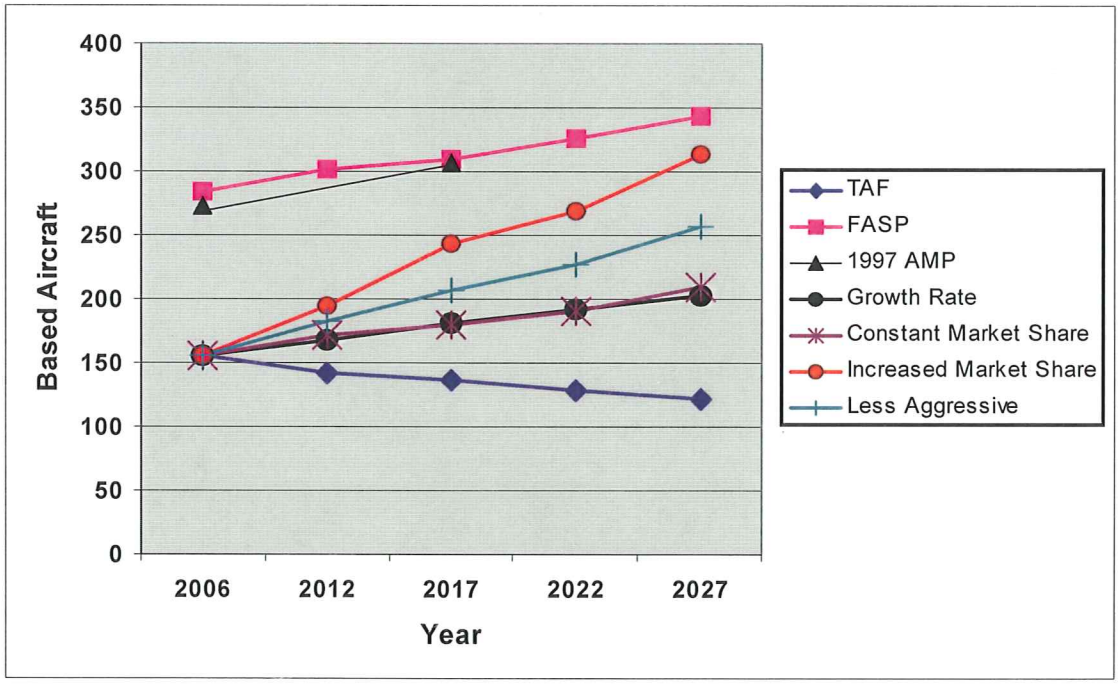
A third market share, the Increased Market Share (Less Aggressive), is also shown in Table 2.2. That projection assumes that PMP's share will increase during the planning period but only to approximately 8.0 percent of registered aircraft in the county. These increased market shares might also be considered as indicative of a greater role at PMP in meeting the county's aviation demand as developments at FLL and FXE produce changes in the roles of those airports relative to small general aviation airplanes.

Forecasts from other sources were also examined. The Florida Department of Transportation (FDOT) conducts the Florida Aviation System Plan (FASP). Forecasts of based aircraft at PMP prepared as part of the FASP are provided in Table 2.2. The FAA's TAF has already been mentioned. Forecasts from the FASP and the TAF are also presented in Table 2.2 and depicted graphically in Figure 2.1.

Table 2.2: Alternative Projections of Based Aircraft

Year	TAF	FASP	1997 Airport Master Plan	National Growth Rate	Constant Market Share	Increased Market Share	Increased Market Share (Less Aggressive)
2006	155	155	273	155	155	155	155
2012	142	167		168	171	195	183
2015		176	307				
2017	133	182		181	180	230	204
2022	126	197		192	191	269	229
2027		213		203	202	314	257

Figure 2.1: Alternative Projections of Based



Relative to estimated based aircraft (159), these forecasts showed the following:

- TAF: This forecast indicates steady declines in based aircraft throughout the planning period. These results may have been influenced by past relations between the FAA and the City of Pompano Beach that have resulted in the City's not being eligible for FAA grants for airport improvements. The recent agreement signed by the City and the FAA could position the City to receive and use FAA funds for airport improvements that are consistent with the City's vision of the airport's role as a community air transportation facility.

- FASP: The forecast from FDOT anticipates an increase greater than 110 percent during the planning period. In the consultant's experience, that level of increase is unlikely under normal growth conditions, would require substantial shifting of airplanes from other airports, and would require airport improvements for which local support could be uncertain.

- National Growth Rate and Constant Market Share: These projections are similar in result, yielding increases of 28.5 percent and 27.9 percent, respectively, during the planning period. The limitation in these projections involves an implicit assumption that local conditions, especially changes in airport facilities, will not impact growth rates. In the consultant's view, local actions such as construction of new hangars, could encourage basing of additional aircraft in amounts greater than would be implied under the National Growth Rate and Constant Market Share scenarios. Conversely, local actions that limit facilities could produce less growth than these projections produce.

- Increased Market Share: This projection produces an increase of 98.7 percent for the 20-year planning period, an increase also considered unlikely but perhaps worth considering as an upper bound for a range of forecast possibilities.

- Increased Market Share (Less Aggressive): This projection anticipates an increase of 62.7 percent during the planning period. It perhaps represents a balance of optimism and more limited growth deriving from national long-range forecasts that suggest lower growth in small, single-engine aircraft and activity than exhibited by turboprop and jet equipment. Recent GAMA data, however, suggest that these long-range projections may need re-visiting.

Given the recent agreement between the FAA and the City regarding future distribution and use of proceeds from rents at the airport, the consultant concluded that adequate justification existed to select a projection that shows more than minimal growth; however, sufficient uncertainty remains in the implementation of this agreement, as well as the future plans at FLL, to suggest projecting activity within a range of values.

The range ultimately selected for consideration is established by an upper limit produced by the Increased Market Share Projection and a lower limit set by the Constant Market Share Projection. The limits of this range, by forecast horizon year are as follow:

- 2012: 171 to 195 based aircraft
- 2017: 180 to 230 based aircraft
- 2022: 191 to 269 based aircraft
- 2027: 202 to 314 based aircraft

For facility planning purposes, however, it is necessary to select a single projection. **The Increased Market Share (Less Aggressive), in the middle of the range defined above, was selected as the recommended forecast. This forecast, by horizon year, is as follows:**

- **2012: 183 based aircraft**
- **2017 204 based aircraft**
- **2022: 229 based aircraft**
- **2027: 257 based aircraft**

This forecast is unconstrained; that is, it assumes the availability of facilities and services desired by users. It also assumes full resolution of the City's current situation with respect to FAA compliance and concomitant eligibility for FAA funding that would facilitate development of airport improvements such as taxiway and aircraft ramp development and would allow expansion of T-hangar and related landside facilities.

2.4.2 Aircraft Operations

Forecasts of annual operations are an important input for development of an airport master plan. (An operation is a take-off or a landing. Touch-and-go activity and stop-and-go activity that simulate take-offs and landings constitute two operations for each touch-and-go or stop-and-go cycle.) Operations forecasts are used to examine airport capacity and are also employed to determine future facility requirements.

As the initial step in the development of operations forecasts, historical data for PMP were obtained from the FAA's Air Traffic Activity Database System (ATADS). These data are summarized in Table 2.3. The tower data are limited by the current operating hours of the facility – 8:00 a.m. to 8:00 p.m. Observations and experience at the airport indicate that significant activity occurs outside these hours resulting in underreporting of operations if the tower counts are used as the sole source of data.

Table 2.3: Historical Aircraft Operations Data								
	Total	Itinerant Operations				Local Operations		
Year	Annual Operations	Air Taxi	General Aviation	Military	Subtotal	General Aviation	Military	Subtotal
1997	122661	0	44723	8	44731	77930	0	77930
1998	172756	21	49721	164	49906	122435	415	122850
1999	184191	19	56807	5	56831	127360	0	127360
2000	182780	52	56610	11	56673	126107	0	126107
2001	186415	142	56998	80	57220	129195	0	129195
2002	213325	118	66371	18	66507	146816	2	146818
2003	177965	121	55620	7	55748	122195	22	122217
2004	155341	78	52077	19	52174	103167	0	103167
2005	130784	50	42636	16	42702	88080	2	88082
2006	101686	167	37808	9	37984	63696	6	63702
2007 (to August)	87815	86	28151	0	28237	59574	4	59578

Source: FAA Air Traffic Activity Database System (ATADS).

Airport staff conducted a survey of operations from 8:00 p.m. to 10:00 p.m. during an 18-day period September 4, 2007 – September 21, 2007. The results of the survey are summarized below:

- Total operations during these hours for the 18 days surveyed – 470
- Average daily operations – 26
- Busy day – Saturday
- Estimate of annualized operations (=26x365) – 9,490

These data suggest that the tower reports understate total annual operations by approximately nine percent; however, the survey did not include the hours from 6:00 a.m. to 8:00 a.m. so the understatement is perhaps greater. In addition, the estimated understatement assumes that September is an average month; yet, additional analysis of data for 2004-2006 indicated that September was the slowest month, on average, which suggests the need to increase the estimate of annualized operations. This conclusion, in the consultant's opinion, was tempered by a significant upward skewing of the September sample by a single day's activity.

On September 8, 2007, 95 operations were recorded during the two-hour period. Of these, 34 were helicopter operations. Analyzed within the context of the full sample, the total operations for that day comprised 20.2 percent of the 18-day sample; the 34 helicopter operations constituted 42 percent of total helicopter operations for the sample period. The subsequent Saturday's activity count was only 32 total operations with no helicopter operations recorded.

The FAA maintains estimates of hourly operations for towers not open 24 hours per day. These are prepared by prorating the annual activity recorded in their Enhanced Traffic Management System Counts (ETMSC). The results are available on their Operations Network (OPSNET) database. The approach used appears simply to be a distribution over 24 hours of operations

recorded by the air traffic control tower. No adjustment appears to be made to increase the total number of operations to reflect additional activity occurring outside the tower's hours of observation. This method produces an estimate indicating that 3.96 percent of operations occur between 8:00 p.m. and 10:00 p.m., substantially lower than the approximately eight to nine percent that would result from annualizing the survey data.

Airport management also reports that operations have increased substantially in 2007 versus 2006. Review of monthly data from the ATADS database confirms this observation. According to that source, data for the first eight reporting periods in 2006 showed 71,038 operations at PMP; data for a similar period in 2007 indicate 87,815 operations, an increase of 23.6 percent. In view of these factors, it was concluded that the following method would be used to estimate existing annual operations:

- The three most recent full years of data (2004 – 2006) were averaged, producing an annual average operations total of 120,404.
- The monthly distribution of this average was compared to the monthly distribution of operations in 2007 through the month of August and total operations for this period were also compared. This showed that average operations for the three-year period were somewhat higher (92,945) than the 87,815 reported for same months in 2007, a difference of 5.5 percent.
- Preliminary projected annual operations for 2007 were estimated by reducing the annual average by 5.5 percent. This results in an estimate of 113,782 operations, but that does not reflect the undercount due to limited hours of tower operations.
- A final estimate of existing operations was made by adjusting the 113,782 figure upward by 15 percent to reflect those operations that occur in hours during which the tower does not record data. The 15 percent factor is consistent with the OPSNET's percentage (15.25 percent) for these hours. **This approach yields an estimated level of operations of 130,849 in 2007. That will be used as the base number for the forecasts of operations.**

In addition to these data, forecasts from other sources were examined to provide context for this study's independent estimates as well as a basis for comparative evaluations of the differing forecasts. Information from the TAF and the FASP are presented in Table 2.4.

Table 2.4: Alternative Forecasts of Operations

Year	TAF	FASP	OPBA	National Growth Rate	National Market Share
2012	116,667	127,605	140,910	113,174	
2017	127,129	134,247	150,960	122,518	144,095
2022	137,448	141,235	166,025	133,949	146,592
2027	147,662	148,586	179,900	146,446	162,822

Unlike its forecast of declining based aircraft, the TAF projects growth in operations during the planning period. The FASP anticipates much higher growth with operations increasing by more than 90 percent during the planning period.

Additional background for the forecasts was also provided by examination of *FAA Aerospace Forecasts Fiscal Years 2006-2017* and *FAA Long-Range Aerospace Forecasts Fiscal Years 2020, 2025 and 2030*. Notable conclusions from these reports include the following:

- The first of these reports indicates that general aviation activity at towered airports is expected to increase at an average rate of 2.0 percent per year from 2007 to 2017.
- This report also indicates that the total number of hours by general aviation aircraft is expected to increase by 3.2 percent annually. Much of that increase is attributable to activity by jet and turboprop aircraft with hours flown by piston-engine aircraft increasing by only 1.8 percent per year.
- The long-range forecast indicates an increase in hours flown of 3.2 percent annually during the "intermediate" period and 2.8 percent for the overall period of 2005 to 2030. Much of these increased rates can be attributed to growth in fractional aircraft ownership programs and corporate flying.

Alternative projections of annual operations for PMP were prepared using information from the above referenced sources with respect national trends and growth rates. An additional independent projection was prepared using an operations-per-based-aircraft (OPS per BAC) ratio of 750 operations per based aircraft derived from historical data. This ratio, which reflects high numbers of training operations, was progressively reduced to 700 operations per based aircraft in 2027 to reflect FAA long-range projections of lower growth in activity by piston-engine aircraft. The resulting coefficients were applied to projections of based aircraft to estimate future operations. A third alternative projection was prepared based upon national projections of general aviation activity and PMP's share of that national market. These alternative projections are presented in Table 2.4.

These projections were reviewed within the context of the recent national and state trends including increased fuel prices and the potential impacts of microjets upon general aviation activity. The TAF projections were ultimately considered as representing a lower bound to the range of probable forecasts. Conversely, the FASP forecast was considered too high, principally because it is derived from a much higher level of based aircraft that currently prevails. It was taken as the upper limit of the forecast range. For this plan, the OPBA projection was ultimately selected as the recommended forecast of aircraft operations. This forecast is higher than the TAF; however, the TAF's growth projection for 2012 is lower than estimated annual operations for 2007. Further, the OPBA projection appears more consistent with an increased role for PMP in Broward County as changes occur at FLL and FXE and provides a forecast based upon an average annual growth rate of 1.66 percent, less than the FAA's long-range projections for growth in activity by piston-engine aircraft. **Based upon these considerations, the recommended forecast of operations is as follows:**

- 2012 140,910 operations
- 2017 150,960 operations
- 2022 166,025 operations
- 2027 179,900 operations

Although higher than the TAF, this forecast represents a mid-range value when viewed within the context of historical activity at the airport. Comparison of the forecast for horizon year 2027 with the annual data in Table 2.3 shows that this 20-year projection was exceeded by annual activity in four of the 10 years noted. On this basis, the forecasts were considered reasonable.

2.4.3 Itinerant/Local Operations

Forecasts of annual operations were used to prepare estimates for additional components of demand. First among these were projections of local and itinerant operations. A local operation is a takeoff or a landing performed by an aircraft that will operate within the local traffic pattern, within sight of the airfield, or one that simulates a takeoff or a landing. Itinerant operations are all other arrivals and departures.

Projections of local and itinerant operations included consideration of historical levels of operations. The ATADS database showed that itinerant operations ranged from approximately 30.6 percent to 37.2 percent of total annual operations for the period 1997 to 2006. The average for the period was 32.4 percent, and the most recent annual value (2006) was 37.2 percent.

FAA forecast reports anticipate that the business/corporate flying component of overall activity will grow faster than recreational flying during in the future. This factor would tend to increase itinerant activity versus local, training flying. Balancing that consideration somewhat is the FAA's conclusion that the number of pilots will increase from 609,737 in 2005 to 791,440 in 2030. This increase in pilot population will necessitate continued instructional flying including local operations.

Based upon these factors, the recommended forecast for PMP's local/itinerant split of operations assumes a gradual increase in itinerant operations throughout the planning period culminating in 2027 when itinerant operations are forecast to constitute 40 percent of total operations. Table 2.5 presents these forecasts.

Table 2.5: Forecast of Local and Itinerant Operations

Year	Total	Itinerant	Local
2006	**101,686**	**37,984**	**63,702**
2012	140,910	52,137	88,773
2017	150,960	57,365	93,595
2022	166,025	64,750	101,275
2027	179,900	71,960	107,940

2.4.4 Design Hour Operations

Design hour operations were also forecast as a function of total annual operations. The methodology involved the following steps. Step one calculated average day operations by dividing total annual operations by 365. Step two calculated design day operations by multiplying average day operations by 1.9. Step three involved an assumption that a typical design hour constituted a fixed percentage (15 percent) of design day operations. The forecasts are presented in Table 2.6.

Table 2.6: Forecast of Design Hour Operations

Year	Annual Ops.	Average Day	Design Day	Design Hour
2012	140,910	386	734	110
2017	150,960	414	786	118
2022	166,025	455	864	130
2027	179,900	493	936	140

2.4.5 Annual Instrument Approaches

Two factors that induce instrument landing activities are the ease and economy with which instrument approach procedures may be established. Global Positioning System (GPS) technology supports instrument approach procedures without the need to install ground-based equipment at the airport.

As noted in the inventory, PMP has multiple instrument approach procedures that are substantially used. As noted, the TAF anticipates substantially increased aircraft operations at PMP as well as commensurate increases in instrument operations. Because the air traffic control tower at PMP does not provide en route advisory services, these projected operations were considered instrument approaches. On that basis, the TAF projects the following instrument approaches:

- 2012: 8,437
- 2017: 9,146
- 2022: 9,821
- 2027: N/A

For the purposes of this report, Annual Instrument Approaches (AIAs) were estimated to comprise 7.0 percent of annual operations, the approximate value used in the TAF. This produces the recommended planning forecast presented below:

- 2012: 9,884 AIAs
- 2017: 10,567 AIAs
- 2022: 11,622 AIAs
- 2027: 12,953 AIAs

2.4.6 Aircraft Mix and Design Aircraft

Aircraft mix refers to the types of airplanes that use, and will use, the airport. Mix is considered in requirements for runway length, strength, and width among other design parameters. Mix also reflects three primary aircraft characteristics with respect to airfield design – weight, approach speed, and wingspan. Review and consideration of these factors produces planning inputs including the design aircraft for the airport as well as the mix of based aircraft and the overall operational fleet mix.

FAA Advisory Circular (AC) 150/5300-13, *Airport Design,* suggests two categories of aircraft weight. Aircraft weighing 12,500 pounds or less are classified as small aircraft, and aircraft weighing more than 12,500 pounds are classified as large aircraft. The AC lists five Aircraft Categories with respect to approach speed:

- Category A: with speeds of less than 91 knots
- Category B: with speeds of 91 knots or more but less than 121 knots
- Category C: with speeds of 121 knots or more but less than 141 knots
- Category D: with speeds of 141 knots or more but less than 166 knots
- Category E: with speeds of 166 knots or more

The FAA's classification system also divides aircraft into six Airplane Design Groups according to wingspans, as follows:

- Group I: with wingspans of up to but not including 49 feet
- Group II: with wingspans of up to but not including 79 feet
- Group III: with wingspans of up to but not including 118 feet
- Group IV: with wingspans of up to but not including 171 feet
- Group V: with wingspans of up to but not including 197 feet
- Group VI: with wingspans of up to but not including 262 feet

The based aircraft complement at PMP includes Approach Category B, Design Group II equipment such as the Cessna Citation II. Review of the FAA's Enhanced Traffic Management System Counts (ETMSC) database also indicated that the airport is used by equipment types including Beechcraft KingAir 200s, 350s, Cessna Conquests, and Citation IIs, all of which are B-II types. Examination of the most recent six years data indicated an average of more than 800 annual operations by Approach Category B types and than 363 annual operations recorded in the database for Design Group II equipment. In the consultant's opinion, the counts are incomplete

and understate the number of aircraft operations, especially by Design Group II airplanes.

Recent FAA forecasts have shown a continuing growth in the percent of total general aviation activity conducted by larger, heavier and faster turbine engine types. Nationally and regionally, these larger aircraft are expected to perform more operations as a percentage of total activity. With this information, it seems reasonable to conclude that operations by large equipments types at PMP will increase at least in proportion to total operations and more likely will increase at a somewhat higher rate. Operations by Approach Category B aircraft already exceed the FAA's 500 annual operations threshold. With respect to Design Group, as the number of operations increases during the planning period, the number of Design Group II operations is anticipated to increase somewhat more than proportionally due to factors such as the FAA's projections of greater increases in turbine powered aircraft than in piston-engine equipment. As a result, more than 500 annual operations by Design Group II Equipment are expected.

A similar conclusion applies to the weight of the design aircraft. FAA standards consider two classifications, small and large aircraft. A small airplane is one which has a maximum certification takeoff weight of 12,500 pounds or less. Large airplanes exceed that threshold weight. The ETMSC data indicate an average of 345 annual operations by large airplanes during the last six years. It can be anticipated that operations by these airplane types will also increase somewhat more than in proportion to total operations producing more than 500 annual operations by large airplanes during the planning period.

As a consequence, the recommended design aircraft for this airport master plan is a B-II, large airplane.

The FAA form 5010 reports 159 based aircraft at PMP. The distribution of these by equipment type is noted as follows:

- Single-engine 125 (78.6 percent)
- Multi-engine 12 (7.5 percent)
- Jet 4 (2.5 percent)
- Helicopters 17 (10.8 percent)
- Blimp 1 (0.6 percent

The future aircraft mix was estimated on the basis of the existing distribution of based aircraft with adjustments made to reflect trends in the industry and local conditions. Future growth is anticipated in multi-engine and jet equipment types, a trend consistent with national forecasts. Conversely, single-engine types are forecast to decline as a percentage of total aircraft. The percentage of helicopters was held constant.

The based aircraft fleet mix forecast presented in Table 2.7 reflects these assumptions. It should be noted that projections of increased based jet aircraft result from consideration of the emergence of Very Light Jets (VLJs) as a factor in the aviation market.

Table 2.7: Forecast of Based Aircraft Mix						
Year	**Total BAC**	**SE**	**ME**	**Jet**	**Helo**	**Blimps**
2006	**159**	**125**	**12**	**4**	**17**	**1**
2012	184	144	14	5	20	1
2017	205	159	17	6	22	1
2022	230	177	21	7	25	1

The operational fleet mix is more difficult to estimate because of the lack of reliable data for extended periods of time. The FAA's ETMSC database, for example, does not indicate any helicopter operations occurring at the airport, apparently because ETMSC records instrument operations only. The 18-day sample of after tower hours of operations indicated the following:

- Single-engine 71.1 percent
- Multi-engine 7.6 percent
- Jet 2.5 percent
- Helicopters 17.1 percent

As noted previously, the helicopter operations were skewed upward by data for one day during the 18-day period of the sample. The consultant considered the helicopter data to be insufficiently reliable to use as a stand-alone justification for projecting operations. An alternative approach was used to balance the operations data, the operational percentage, 17.1, was averaged with the helicopters' based aircraft percentage, 10.8, to produce the 14.0 percent (rounded) average used to estimate future helicopter contributions to operational mix. This percentage, which reflects high levels of training activity attributable to transient aircraft, was gradually reduced to 13.0 percent over the 20-year planning period. Similarly, operations by single-engine airplanes were reduced slightly but ultimately held at 75 percent of the total, a reflection of the primary airport role for PMP. Jets as a percentage of operations were increased slightly over the planning period as a reflection of the introduction of VLJs noted above. The forecasts of operational fleet mix are presented in Table 2.8.

Table 2.8: Forecast of Operational Fleet Mix					
	Annual Operations				
Year	**Total**	**Single-Engine**	**Multi-Engine**	**Jet**	**Helo**
2012	140,910	108,501	12,682	352	19,727
2017	150,960	115,484	15,096	453	20,757
2022	166,025	126,179	17,433	664	22,413
2027	179,900	135,825	21,588	900	23,387

2.4.7 Forecast of Pilots and Passengers

The numbers of persons using the airport during design hour conditions must be considered when defining future needs for terminal and automobile parking space. Data presented in past FAA studies suggest applicability of a ratio of 1.2 persons per general aviation design hour operation. Using this planning ratio in combination with forecasts of activity for the airport gives the projections of design hour pilots and passengers listed below:

- 2012: 132 persons
- 2017: 141 persons
- 2022: 156 persons
- 2027: 169 persons

2.4.8 Design Hour Surface Traffic

To account for service and related vehicles, a ratio of 0.8 vehicles per design hour pilot/passenger was used in estimating future levels of surface traffic accessing the airport. This ratio applied to projections of design hour pilots/passengers gives the following results:

- 2012: 107 vehicles
- 2017: 114 vehicles
- 2022: 122 vehicles
- 2027: 135 vehicles

2.4.9 Air Cargo

PMP does not have any cargo operations or regularly scheduled air cargo flights. Some operations involve the delivery of parts and equipment to local area businesses; however, these activities generate no substantial need for specialized air cargo facilities or equipment. For these reasons, no forecasts of air cargo were prepared.

2.5 Summary

The aviation demand forecasts developed in this chapter are used throughout the remainder of this report as the basis for future planning. As noted earlier, activity levels should be reviewed periodically to ascertain whether projected activity is being attained or perhaps exceeded. Table 2.9 provides a summary of key elements of the forecasts. These will be used in subsequent sections of the report to determine facility requirements and evaluate alternatives.

Table 2.9: Summary of Forecasts					
		Horizon Year			
Forecast Element	2006	2012	2017	2022	2027
Based Aircraft					
Single-engine	125	144	159	177	197
Multi-engine	12	14	17	21	24
Jet	4	5	6	7	8
Helicopter	17	20	22	25	28
Blimps	1	1	1	1	1
Total	**159**	**184**	**205**	**231**	**258**
Annual Operations					
Local	63,702	88,773	93,595	101,275	107,940
Itinerant	37,984	52,137	57,365	64,750	71,960
Total	**101,686**	**140,910**	**150,960**	**166,025**	**179,900**
Design Hour Operations	79	110	118	130	140
Annual Instrument Approaches	7,118	9,884	10,567	11,622	12,593
Design Aircraft	B-II Large	B-II Large	B-II Large	B-II Large	B-II Large

The forecasts of aviation demand were reviewed and approved by the Air Park Advisory Board at a special Airport Master Plan workshop held on October 29, 2007. The meeting was advertised in the local newspaper to encourage community attendance. Following AAB approval and consistent with agency guidelines for the development of airport master plans, the consultant forwarded the Interim Report to the FAA Orlando Air District Office for review and comment. The FAA issued a letter to the Airport Manager on October 15, 2007 concurring with the underlying assumptions and approving the use of the recommended forecasts for the development of the on-going Airport Master Plan and Airport Layout Plan. A copy of the letter is included in Appendix A.