



Chapter 4 – AVIATION DEMAND FORECASTS

4.01 GENERAL

Preparing forecasts of aviation demand is an essential element in any airport planning project. Demand forecasts, based upon the desires and needs of the service area, provide a basis for determining the type, size and timing of aviation facility development and a platform upon which this master planning study will be based. Consequently, these forecasts influence all phases of the planning process.

The aviation demand forecasts will serve four purposes in the development of the master plan. Specifically, they provide for:

- Determining the necessary capacity of the airfield, apron, and ground access system serving the airport.
- Determining the airport's role and resulting size and type of facility development.
- Evaluating the potential environmental effects, such as noise, due to the airport's development and operation, and
- Evaluating the financial feasibility of alternative airport development proposals.

Forecast data presented in this study is provided by the Federal Aviation Administration's *National Plan of Integrated Airport Systems* (NPIAS) for 1998-2002, *FAA Aviation Forecasts for Fiscal Years 1998-2009*, and *Terminal Area Forecasts (1990-2015)*. *New York State Aviation Activity Forecasts Study* (NYSAAF) for 1992 and *New York State Aviation System Plan (NYSASP)* for 1998 are used as other sources of forecasts data. The information in these reports will serve as a comparative basis of forecasting aviation demand at the airport to the year 2020. Specific portions of these statewide and federal planning studies will be referenced, compared, and adjusted to more accurately reflect the present and expected future conditions at the airport.

The consultant conducted an informal survey of downstate airports in order to assess current and projected demand for aircraft storage. Responses to this survey were obtained contingent upon confidentiality of airport identity should the results be made public. Additionally, survey results from registered aircraft owners and businesses within the immediate service area of the Dutchess County Airport were completed in order to gain insight into the needs of current and potential users at Dutchess County Airport. Summary analyses of the current market and local impact of the airport condensed from the results of the pilot and business surveys are included in Appendix B. The surveys provide additional data for determining aviation demand. They will be considered along with federal and state studies of aviation demand through the twenty-year planning period.



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4.02 AVIATION DEMAND ELEMENTS

Forecasts of aviation demand require the evaluation of the following variables:

General Aviation Activity

- Based Aircraft
- Fleet Mix
- Operations
- Peak Period Activity

The term "general aviation" (GA) refers to all flying except the military or the airlines. Typically, the measure of based aircraft and annual operations are used to gauge general aviation aeronautical activity. Additionally, there are a number of other activity indicators that must be forecast in order to generate necessary facility requirements for Dutchess County Airport. The following sections detail the methodology and results of the aviation activity forecasting effort.

4.03 GENERAL AVIATION ACTIVITY

4.03-1 BASED AIRCRAFT

By definition, a based aircraft is a general aviation aircraft that is stationed at an airport as its home base. In this study, the forecast of based aircraft has previously been determined in the NYSAAF, NYSASP, and the FAA TAF, and shall be compared, updated, and applied to the present and expected future conditions at the airport (i.e., the preferred forecast). Historical based aircraft figures, along with the forecasts, are presented in Table 4-1.

The NYSASP forecasted an annual growth rate of 0.2 percent for based aircraft statewide through to 2015. The SASP compared the state's rate to that of the 1995 FAA TAF national forecast rate of 0.9 percent using Upstate New York's lagging economic recovery behind the rest of the nation as the basis of the lower forecast. The NYSASP also forecasted their base year of 1995 with 192 based aircraft at the Dutchess County Airport at that time. The NYSAAF forecast employed trend analysis to forecast based aircraft from base year 1989 at 189 based aircraft. In the *FAA Aviation Forecasts for Fiscal Years 1998-2009*, a 1.0 percent annual growth rate is estimated for the general aviation increases in the active fleet through 2009 at the national level.

An interview with the Airport Manager revealed that there is a critical demand for hangar storage space at the Dutchess County Airport. The Airport Manager had indicated that the airport has a waiting list of approximately 60 pilots that are looking for hangar storage space from the downstate region.

The previous *1984 Dutchess County Airport Master Plan* had identified a deficit of 60 hangar units and recommended an additional 70 units for development over the planning period. This development recommendation has not been implemented to date.



TABLE 4-1
Based Aircraft History and Forecast

Year	Historical ¹	NYSAAF ²	NYSASP ³	TAF ⁴	Preferred ⁵
Historical					
1985					
1986					
1987	188				
1988					
1989					
1990	188				
1991					
1992					
1993					
1994					
1995					
1996	191				
1997					
1998					
1999	187				
Forecast					
2005			196	212	199
2010		228	198	226	209
2015			200	241	219
2020			202*	257*	230

¹ SOURCE: Dutchess County Airport

² SOURCE: New York State Aviation Activity Forecast (1992)

³ SOURCE: New York State Aviation System Plan (1998)

⁴ SOURCE: Federal Aviation Administration (FAA) Terminal Area Forecasts (1998)

⁵ SOURCE: C&S preferred forecasts

* Extrapolated for forecast years for comparison purposes.

A deficiency in storage units at the Dutchess County Airport combined with the following conditions have resulted in a decline of based aircraft at the Dutchess County Airport in spite of demand for hangar space since 1995.

- Westchester County Airport, which maintains one of the largest based corporate fleets in the United States, has issued a no expansion policy because of environmental constraints.
- An informal survey of airports servicing general aviation in the downstate region indicates that there has been growth in the number of based aircraft at these airports as well as an increased demand for hangar space. (Note: The survey was conducted by the consultant and responses were contingent upon airport confidentiality). One neighboring airport, similar in size to the Dutchess County Airport, has doubled their based aircraft since 1995 to 214, building 32 hangar bays per year over the past five years. Additionally, the downstate region survey of airports indicated that neighboring airports are completing capacity enhancements, including the construction of new hangars, to meet the demand in the downstate region.

These conditions as well as hangar storage deficiencies at the Dutchess County Airport have resulted in a reduction of based aircraft since 1995. Available bays at other airports have drawn based aircraft away from the Dutchess County Airport. The 11/30/2000 FAA Form 5010 record indicates 183 based aircraft at Dutchess County Airport for 2000, a 4% decrease



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since 1996. Notwithstanding the reduction in based aircraft, demand for hangar storage space in the downstate region is indicative of an above average rate of growth over the 20-year planning period for based aircraft at the Dutchess County Airport. Subsequently, a 1.0 percent annual increase in based aircraft is projected for the Dutchess County Airport and will be carried forward as the preferred forecast.

4.03-2 BASED AIRCRAFT FLEET MIX

The C&S preferred fleet mix estimate, presented in Table 4-6 was derived from a comparison of the New York State Aviation Activity Forecasts and the existing fleet mix. The current fleet mix at Dutchess County Airport consists of 85% single engine, 8% multi-engine, 0% turbo prop, 1% turbo-jet, 5% rotorcraft and 1% other. The comparison of existing and forecasted fleets indicates that the primary aircraft operating in the region are single engine aircraft; and therefore, would continue to dominate the fleet.

TABLE 4-2
Based Aircraft Fleet Mix Percentage Forecast

Year	PISTON		TURBINE		Rotor Craft	Other
	Single Engine	Multi-Engine	Turbo Prop	Turbo Jet/Fan		
2005						
NYSAAF ¹	81.6%	9.3%	0.0%	7.7%	1.4%	0.0%
C&S ²	82.8%	8.0%	0.6%	2.0%	6.0%	0.5%
2010						
NYSAAF	80.7%	10.5%	0.0%	7.5%	1.3%	0.0%
C&S ²	82.6%	8.1%	0.6%	1.9%	6.2%	0.5%
2015						
NYSAAF ¹	80.3%	10.5%	0.0%	7.9%	1.4%	0.0%
C&S ²	80.8%	8.2%	1.0%	2.3%	6.8%	0.9%
2020						
NYSAAF ¹	79.9%	10.4%	0.0%	8.3%	1.4%	0.0%
C&S ²	80.4%	8.3%	0.9%	2.2%	7.4%	0.9%

¹ New York State Aviation Activity Forecast (1992) with interpolation/extrapolation for 2005, 2015, and 2020 by consultant.

² Consultant estimate for Dutchess County Airport.

SOURCE: C&S Engineers

General aviation has shown a positive trend related to business and corporate flying over the past five years. The *FAA Aviation Forecasts: Fiscal Years 2000-2011* assumes that business use of general aviation aircraft will expand at a more rapid pace than personal use of general aviation aircraft. The continued rapid growth in fractional ownership is reflected in a changing composition of the general aviation fleet mix.

According to FAA Aviation Forecasts, the more costly and sophisticated turbine-powered fleet (including rotorcraft) is projected to grow at four times the rate forecast for the piston aircraft categories—2.8 compared to 0.7 percent. The active turbine-powered fleet is



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expected to increase at a rate of 3.2 percent annually over the 12-year forecast period, while the turbine-powered rotorcraft fleet is expected to increase 1.6 percent annually.

The forecast of the based aircraft fleet mix is based upon expected national trends adjusted to local conditions. The New York State Aviation Activity fleet mix forecast shown in Table 4-2 does not reflect the newly established AAG, Inc., charter helicopter business at Dutchess County Airport in 1998. AAG, Inc. serves specifically the commercial and corporate market and offers a helicopter fractional ownership share program. Table 4-3 presents the preferred fleet mix estimate for Dutchess County Airport.

TABLE 4-3
Fleet Mix Forecast

Year	PISTON		TURBINE		Rotor Craft	Other	Total
	Single Engine	Multi-Engine	Turbo Prop	Turbo Jet/Fan			
2005	165	16	1	4	12	1	199
2010	173	17	1	4	13	1	209
2015	177	18	2	5	15	2	219
2020	185	19	2	5	17	2	230

SOURCE: C&S Engineers

4.03-3 ANNUAL GENERAL AVIATION OPERATIONS

An aircraft operation is a measure of activity that is defined as either a takeoff or a landing. A takeoff and a landing are two operations. The annual general aviation operations forecast was derived for both local and itinerant operations through the use of an Operations-Per Based Aircraft (OPBA) ratio. Typically, the OPBA ratios are calculated as an average of historical information.

For this study, information concerning historical OPBA level averages was also taken from the NYSAAF and the FAA TAF for years between 1980 and 1999. The following OPBA estimates provided from the data:

		<u>Range</u>
• Dutchess County Airport (1995-1999)	OPBA – 725	703 to 747
• NYSAAF (1980-1988)	OPBA – 834	646 to 1,174
• FAA TAF (1989-1999)	OPBA – 746	707 to 804

After viewing these figures, it is believed that the based aircraft operations will stabilize at the number reported by the Dutchess County Airport with a local/itinerant split of 56 percent local and 44 percent itinerant. Using this information in conjunction with based aircraft forecasts yields the operations forecast for Dutchess County Airport (Table 4-4). The results of the general aviation operations forecast show a growth from an estimated 144,275 general aviation operations in 2005 to 166,750 in 2020.



TABLE 4-4
Annual General Aviation Operations Forecast

Year	Based Aircraft	OPBA	Local Operations	Itinerant Operations	Total Operations
2005	165	725	80,794	63,481	144,275
2010	182	725	84,854	69,861	151,525
2020	221	725	93,380	73,370	166,750

SOURCE: C&S Engineers, Inc.

4.03-4 PEAK PERIOD ACTIVITY FORECASTS

Since many of the airport’s facility needs are related to the levels of activity during peak periods, forecasts were developed for peak month and peak hour operations. These measures are defined as:

- **Peak Month Operations:** This level of activity is defined as the calendar month when peak aircraft operations occur. Peak Month percentages at airports such as Dutchess County Airport are typically 10 percent busier than an average month of the year.

$$\text{Peak Month Operations} = (\text{Annual Operations}/12) \times 1.10$$

- **Design Day Operations:** This level of operations is defined as average day within the peak month.

$$\text{Design Day Operations} = \text{Peak Month Operations}/30$$

- **Design Hour Operations:** This level of operations is defined as the peak hour within the design day. Typically, these operations will range between 10 and 15 percent of the design day operations. The lower the annual number of operations, the higher the design hour percentage of design day. Considering our operational forecasts, a figure of 10 percent was used to estimate design hour operations.

$$\text{Design Hour Operations} = \text{Design Day Operations} \times 0.10$$

Table 4-5 presents the forecast of peaking characteristics for operations at Dutchess County Airport.



TABLE 4-5
General Aviation Operational Peaking Forecast

Year	Annual Operations	Peak Month Operations	Design Day Operations	Design Hour Operations
2005	144,275	13,225	441	44
2010	151,525	13,890	463	46
2020	166,750	15,285	510	51

SOURCE: C&S Engineers, Inc.

4.04 INSTRUMENT APPROACHES

A necessary task in assessing the need for new or improved landing aids is a forecast of the levels of instrument approaches at the airport. An instrument approach can be defined as a series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions (i.e., poor weather) from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. A review of historic data provided by the ACT at the Dutchess County Airport in the Airport Traffic Record (1995-1999) indicated the number of annual instrument approaches at the Dutchess County Airport averages 6% of annual operations. It is projected that instrument approaches for the future will be 6% of the total annual operations at Dutchess County Airport (see Table 4-6).

TABLE 4-6
Forecast Instrument Approaches

Year	Total Operations	Approach Percentage	Forecast Approach
2005	144,275	6%	8,657
2010	151,525	6%	9,527
2020	166,750	6%	10,005

SOURCE: C&S Engineers, Inc.

4.05 DEMAND FORECAST SUMMARY

The major demand forecast elements of the study are summarized in Table 4-7. Demand elements from these forecasts will be used throughout the master plan to help in the development of facility requirements and the identification of development alternatives.



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TABLE 4-7
Demand Forecast Summary

Aviation Demand Element	Forecast Year		
	2005	2010	2020
Based Aircraft	199	209	230
General Aviation Activity			
Local	80,794	84,854	93,380
Itinerant	63,481	69,861	73,370
Total Operations	144,275	151,525	166,750
Design Hour Operations	44	46	51
Total Operations	144,275	151,525	166,750
Annual Instrument Approaches	8,657	9,527	10,005
Total Design Hour Operations	44	46	51

SOURCE: C&S Engineers, Inc.