CHAPTER 2

Aviation Activity Forecasts

2.0 OVERVIEW

This chapter contains aviation activity forecasts for Chippewa Valley Regional Airport over the 20-year planning horizon. Aviation demand forecasts are an important step in the master planning process. Ultimately, they form the basis for future demand-driven improvements at the Airport, provide data from which to estimate future off airport impacts such as noise and traffic, and are often incorporated by reference into other studies and policy decisions. This chapter, which presents aviation activity forecasts through 2031 using 2011 as a baseline, is organized as follows:

- Forecasting Approach
- Passenger Enplanement Forecasts
- Aircraft Operations and Fleet Mix Forecasts
- Air Cargo

The Federal Aviation Administration's (FAA) 2011-2015 ***National Plan of Integrated Airport Systems*** (NPIAS) categorizes Chippewa Valley Regional Airport as a "Primary Non-Hub Airport." The NPIAS identifies existing and proposed airports that are significant to the national air transportation system. It contains estimates of costs of airport development projects eligible for federal aid that are needed to meet aviation demand over the next five years.

- Peak Activity Forecasts
- Forecast Summary and TAF Comparison

Master Plan forecasts must be approved by the FAA. It is the FAA's policy, listed in AC 150/5070-6B, *Airport Master Plans*, that forecasts at non-hub airports should be consistent with its Terminal Area Forecast (TAF). The TAF is the annual report of historical aviation data and forecasts for all airports included in the NPIAS (see sidebar for definition). The TAF is prepared to assist the FAA in meeting its planning, budgeting, and staffing requirements, and to provide information for use by state and local authorities, the aviation industry, and the public. Non-hub airport forecasts are considered to be consistent with the TAF if they:

a) Differ by less than 10 percent in the five-year forecast period and less than 15 percent in the 10-year or 20-year period, or
b) Do not affect the timing or scale of an airport project

Since they will impact the timing and/or scale of projects, the forecasts contained in this chapter will be compared to TAF forecasts at the 5, 10 and 20 year time periods.

2.1 FORECASTING APPROACH

The goal of this chapter is to expand upon and evaluate the suitability of the FAA TAF forecasts for the Chippewa Valley Regional Airport. To do this, new forecasts need to be created. There is no one "correct" or "best" way to create forecasts for a given airport. Just as historic trends, national activity levels, and local demographics all play a role in determining current Airport activity levels, all of these factors will play a role in determining future activity. Given the many different factors that influence aviation activity, variations of three broad forecasting methodologies were used to create a series of scenarios for the Airport. The three methodologies are:

- Time–Series (assumes that historic trends will continue into the future)
- Market Share (assumes that the local share of national aviation activity levels will remain largely constant)
- Socioeconomic (assumes that aviation activity will change at the same rate as population and/or personal income)

2.1.1 Time-Series Methodologies

Time-series methodologies create forecasts by assuming patterns that have occurred in the past will continue into the future. These methodologies are most useful for a pattern of demand that demonstrates a historical relationship with time. Two different time-series methodologies are used in this chapter – growth rate and linear trend line. Both of these methodologies assume that future trends will continue to mimic past trends and that the factors that affected those trends in the past will continue to do so in the future. However, they differ in weight that is given to significant changes in activities from year to year.

2.1.1.1 Growth Rate

The growth rate variation is straightforward. It uses historical compounded annual growth rates (CAGR) for a selected period of time and extrapolates future data values by assuming the same CAGR will occur throughout the forecast period.

2.1.1.2 Linear Trend Line

The linear trend line is similar to the growth rate methodology in that it uses historical activity levels to forecast future activities. However, the formula used in a "trending" forecast puts more weight on variations from average activity levels. The results of the linear trend line methodology takes into account abrupt changes in available service or aircraft fleet that frequently occur in the airline industry.

2.1.2 Market Share Methodology

Market share methodologies look at the national or regional quantity of a given activity (enplanements, operations, etc.) and determine what percentage of this activity occurs at the Chippewa Valley Regional Airport. This percentage is the Airport's "market share" of the activity in question. The methodology then assumes that this market share will remain constant throughout the forecast period. The market share analysis implies the local proportion of activity is regular and predictable. Because many aspects of an airport (location, type of facilities, and appeal for travelers) remain relatively constant over time, market share methodologies are used extensively in the aviation industry.

2.1.3 Socioeconomic Methodologies

Though time series and market share analysis may provide mathematical and formulaic justification for demand forecasts, there are other factors that may impact local aviation demand. The socioeconomic factors examined in this chapter are population and per capita income trends. Based upon the observed and projected correlation between historical aviation activity and socioeconomic data sets, future aviation activity forecasts can be developed. Local population and per capita income can be strong indicators of commercial aviation demand, particularly at small hub and non-hub airports. The socioeconomic methodologies compare historical population and per capita income figures to passenger enplanements and based aircraft at the Chippewa Valley Regional Airport.

2.2 PASSENGER DEMAND ANALYSIS

An additional component of the aviation demand forecasts developed for this Master Plan was a Passenger Demand Analysis. This document, prepared by Sixel Consulting Group, contains three specific sections:

- True Market Study
- Analysis of Top Market Pricing in Comparison to Minneapolis
- Estimate of Future Air Carrier Operations and Equipment Types

The findings of each section of the Passenger Demand Analysis are summarized below, and the Air Carrier operations forecasts developed by Sixel are compared to those developed by Mead & Hunt, Inc. for the Master Plan Update.

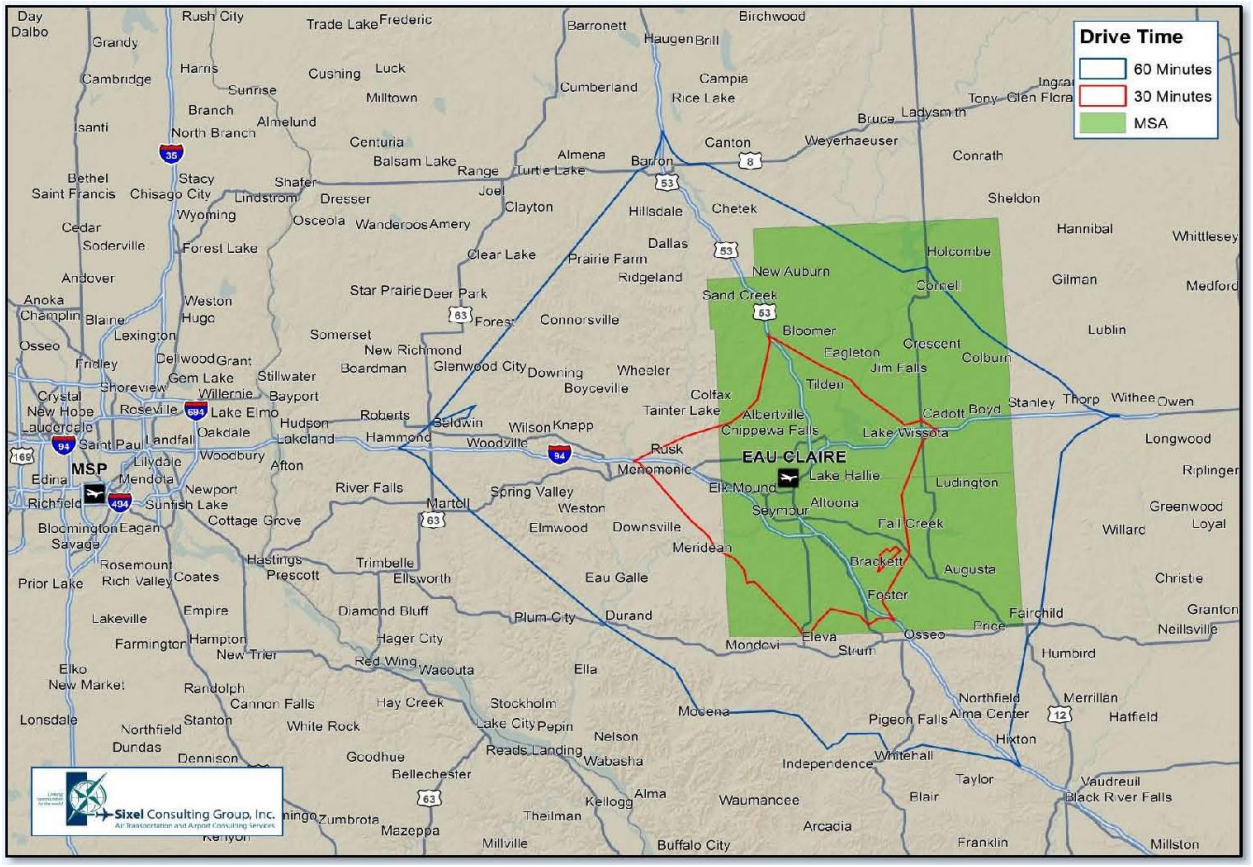
2.2.1 True Market Study

This section of the Passenger Demand Analysis estimated Chippewa Valley Regional Airport's "true market". The "true market" for an airport is the total number of air travelers, including those using a competing airport, within the geographic area served by the Airport. A true market estimate includes the size of the total market, and can also be used to provide estimates for specific destinations.

Background data used to develop an estimate of the "true market" was collected from three different sources. The first source was ticket information collected from travel agencies in the EAU service area. The second source consisted of adjustments to the ticket data to account for error rates from under-reported destinations (sample sizes too small to be accurate). The third information source accounts for population, earnings, and GDP from the Airport's catchment area to determine the macro level size of enplanements generated in the market.

Background Information:

Approximately 140,000 people live within a 30-minute drive of the Airport, and approximately 258,000 people live within a 60-minute drive of the Airport. The Chippewa Valley Regional Airport handled an average of 57 passengers per day each way during the twelve months ending in March 2012, while generating $6.7 million in annual total airline ticket revenue. The domestic average one-way fare for passengers using the Chippewa Valley Regional Airport was reported to the Department of Transportation as $155, which is an unusually low average fare for domestic and international passengers using the Airport.



Findings:

Roughly 346,744 total airline passengers per year originate from Eau Claire, Chippewa, and Dunn Counties, or 475 passengers per day each way. Competitive airports within the area include Minneapolis St. Paul International Airport (MSP), Dane County Regional Airport (MSN), and Central Wisconsin Airport (CWA). Approximately 12 percent of residents from these three counties use the Chippewa Valley Regional Airport while about 80 percent use MSP, and the remaining eight percent are split between MSN and CWA. The study found three most frequent origin and destination markets for passengers are New York City/Newark, Chicago, and Washington/Baltimore.

The results of the True Market Study suggest that there is potential for hundreds of additional daily passengers to fly in and out of Chippewa Valley Regional Airport, and that the Airport has a catchment area large enough to support additional daily service. Additional less-than-daily service by low-cost carriers such as Allegiant Air and Sun Country Airlines would also have the potential to pull passengers from other nearby catchment areas to the Chippewa Valley Regional Airport.

These findings alone are not likely sufficient to convince new airlines to begin service at Chippewa Valley Regional Airport. It is likely that the Airport would have to offer some type of risk mitigation program including fee waivers, marketing, and even ground handling, to convince another airline to launch service at EAU.

2.2.2 Analysis of Top Market Pricing in Comparison to Minneapolis

The Market Pricing Comparison portion of the Passenger Demand Analysis measured several aspects of airline pricing, including actual market average fare paid, level of air service, and published price points to develop a "snap shot in time" since air fares do occasionally change. This section of the Passenger Demand Analysis compared these pricing measures to those currently in effect at Minneapolis-St. Paul International Airport (MSP).

Background Information:

As of 2012, Chippewa Valley Regional Airport is served by one airline. While United Express currently has an air service monopoly in the market, it is important to note that the carrier prices the EAU market with recognition of pricing at nearby MSP. Small community air service, such as that which United Express provides at EAU, is expensive. Therefore, the economic cost to the airline of transporting Eau Claire passengers to the hub is an important airline pricing consideration. SkyWest Airlines, United's contract carrier at EAU, does receive Essential Air Service program subsidies to serve EAU and provides local service at its own risk. United Airlines, not SkyWest, controls the pricing of service except that of local travel to or from Chicago.

Findings:

Since 2010, average domestic one way fares at EAU have been less than fares for all network carriers operating at MSP, including Delta, United, and American Airlines. However, fares at EAU during that time have been higher than MSP low fare carriers such as Southwest/AirTran, Frontier, and Sun Country Airlines. The average one way fare to the top 15 destinations at EAU is lower ($149) than the market average ($170). Average international one way fares at EAU have dropped significantly since United service began in 2010. This is a result of Canada being the top international destination market, where many markets appear to be at sharply discounted fares or are considered leisure destinations that include group travel.

In Eau Claire domestic markets, United Airlines offers a consistent, standardized pricing structure. There are typically about ten saleable price points and a weekend stay or variable stay (usually three day) requirement on the low- and mid-level price points. Eau Claire price points are less competitive with those of low fare carriers at MSP, but still usually reasonable compared to Delta Airlines at MSP.

Conclusions:

Chippewa Valley Regional Airport air service endured a transition from Delta/MSP to United/ORD in 2010. Delta service was three trips per day with a turboprop aircraft, while United service is twice per day with a regional jet aircraft. Annual seat capacity is approximately equal between the two different service/equipment patterns. United Airlines does not appear to price EAU connect markets in any discernable formula with respect to pricing at MSP, either its own or that of Delta.

Average fares at EAU, both domestic and international, have dropped significantly since United Airlines service began. However, average net one way fares that are being reported are not consistent with the current published price points, and it is possible that some form of average fare reporting error is occurring involving both domestic and international average fares at EAU since 2010. Nonetheless, Eau Claire top market published price points are very competitive with those not only for Delta at MSP but also generally with low fare carriers at MSP.

2.2.3 Estimate of Future Air Carrier Operations and Equipment Types

Small community air service is volatile. Operating costs are increasing while small city traffic, average fares, and revenue are declining. Operating cost increases are due to the declining economics the aircraft types with 50 or fewer seats that are traditionally assigned to small community service. Low-cost carriers continue to expand service domestically, reaching more large- and medium-sized cities. Large- and medium-sized airports often draw significant price sensitive traffic from small communities, especially those within a two to three hour drive of the larger airport.

Network carriers are focused on international growth and are holding domestic capacity flat or are reducing it. Overall, network carriers are reducing the once large 50-seat fleets of their regional partners and have little inclination to partner with turboprop aircraft operators that could better exploit small community service declines created by regional jet shrinkage. Airline industry mergers are reducing the number of network carriers and the number of regional carriers that traditionally partner with network carriers to provide small community service.

This has resulted in significant subsidy cost increases of the Essential Air Service Program. The current annual subsidy at EAU is $1,733,576; or $1,214 per flight segment based on 98 percent completion of a twice daily schedule. For the twelve months ending in June 2012, Chippewa Valley Regional Airport generated 39,410 passengers in or out, for a subsidy of $44 per passenger.

Projected Scenarios for Airline Operations at Chippewa Valley Regional Airport:
Four equipment and service scenarios were projected for the Chippewa Valley Regional Airport and the Eau Claire market, based on current trends and expected future shifts in airline operations:

- Current service status quo "baseline"
  - The Current Network Carrier service has a wide airport operating window with a first departure at 0600 and a last arrival at 2300. None of the alternative scenarios is projected to involve normal airline operations outside of that 17 hour window.
- Expanded network carrier service
  - The Expanded Network Carrier scenario projects a logical expansion of existing SkyWest United Express service from two daily trips to three, as a natural outcome of continued modest traffic growth.
- Expanded network carrier service with less-than-daily service
  - The Expanded Network Carrier Plus Less-than-Daily scenario adds twice weekly Allegiant Air type leisure service to two major leisure destinations.
- Second network carrier service with expanded less-than-daily service
  - The Second Network Carrier with Expanded Less-than-Daily scenario imposes a second network service on MSP along with a third weekly service to each leisure destination.

The third scenario most closely mirrors the Air Carrier operations forecast developed by Mead & Hunt for the Master Plan Update (see Section 2.4.1). This scenario projects modest growth in Air Carrier operations over the 20-year planning period, as airlines are expected to increase passenger load factors while also expanding capacity to meet growing passenger demand for both traditional business-related air travel as well as low-cost, less-than-daily leisure travel.

2.2.4 Conclusion

The Passenger Demand Analysis completed by Sixel Consulting Group in 2012 provides a wealth of information regarding Chippewa Valley Regional Airport's "true market", current airline ticket pricing, and airline operational trends that are likely to affect future commercial service. This information can be used in discussions with potential new air carriers to promote the viability of future commercial service routes at the Airport, while allowing the Airport to plan for the facility needs associated with future airline service and fleet changes. The findings from the Passenger Demand Analysis support the forecasts of aviation demand developed for this Master Plan Update, which expect continued commercial air service at the Airport through the 20-year planning period by airlines seeking to maximize profit by increasing passenger load factors and expanding capacity to meet future demand.

2.3 PASSENGER ENPLANEMENT FORECASTS

Enplanements are defined as the activity of passengers boarding commercial service aircraft departing an airport. Enplanements include passengers on all sizes of scheduled commercial service aircraft, and un-scheduled charter aircraft with more than 60 seats, but do not include the airline crew. Forecasting passenger enplanements is an important part of the Master Planning process. Passenger enplanements are the driver for many internal terminal and external Airport improvements such as interior spaces and ground transportation infrastructure, and also impact overall airport finances.

2.3.1 Recent Enplanement History

National trends in aviation demand have been volatile in recent years. The events that occurred on September 11, 2001 had a significant impact on collective national travel behavior. The economic recession that began in 2008 has also resulted in fewer passenger enplanements at several airports in the U.S.

Passenger enplanement data is provided to Airport management on a periodic basis by commercial passenger airlines. Chippewa Valley Regional Airport saw passenger enplanements hold fairly steady between 2001 and 2007, decline significantly in 2008 and 2009, and recover almost to previous levels by the end of 2011. The decline in 2008 and 2009 mimics the national trend in passenger enplanements that resulted largely from a historic economic downturn and a rise in fuel prices. Overall, passenger enplanements at the Airport fell from 21,340 to 19,062 between 2001 and 2011, a Compounded Annual Growth Rate (CAGR) of -1.12 percent (see **Table 2-1**).

Table 2-1. Passenger Enplanement History	
Year	**Passenger Enplanements**
2001	21,340
2002	20,657
2003	21,484
2004	25,443
2005	23,812
2006	22,832
2007	22,193
2008	18,158
2009	13,192
2010	17,976
2011	19,062
CAGR 2001-2011	*-1.12%*

Notes: CAGR=Compounded Annual Growth Rate
Source: Airport Records

2.3.2 Federal Aviation Administration Terminal Area Forecast (TAF)

The FAA records passenger enplanements for all commercial service airports and releases its TAF annually. It should be noted that annual data is based on the federal fiscal year (October through September) rather than the calendar year, so historical figures differ slightly from the Airport's records.

The FAA's historical records and forecasts of passenger enplanements are shown in **Table 2-2.** As shown in Table 2-2, the FAA projects strong, steady growth in passenger enplanements at Chippewa Valley Regional Airport through 2031. The TAF predicts passenger enplanements will reach 22,027 by 2016 and grow to 30,557 by 2031. This growth represents a CAGR of 2.20 percent.

Table 2-2. Passenger Enplanements - Terminal Area Forecast	
Year	**Passenger Enplanements**
2001	21,914
2002	20,636
2003	20,384
2004	25,367
2005	26,616
2006	22,730
2007	22,840
2008	19,490
2009	15,272
2010	15,155
2011	19,790
CAGR 2001-2011	*-1.01%*
2016	22,027
2021	24,543
2026	27,371
2031	30,557
CAGR 2011-2031	*2.20%*

Notes: CAGR=Compounded Annual Growth Rate
Source: FAA Terminal Area Forecast, January, 2012

2.3.3 Growth Rate Methodology

The enplanement forecast methodologies presented in this and following sections were developed specifically for this Master Plan. The forecasts resulting from these methodologies will be compared against the TAF, and a preferred methodology will be selected.

The first of these methodologies is the growth rate methodology. As mentioned previously, the growth rate methodology examines the percent change in activity between two points in time, and assumes that future activity will change at this rate throughout the forecast period. Between 2001 and 2011, there was a -1.12 percent average annual decrease in passenger activity. This CAGR is applied using the growth rate methodology and predicts a slight decline in passenger enplanement, decreasing from 19,062 in 2011 to 15,210 in 2031 (see **Table 2-3**).

Table 2-3. Passenger Enplanement Forecasts - Growth Rate Methodology

Year	Passenger Enplanements	Growth Rate
2001	21,340	
2002	20,657	-3.20%
2003	21,484	4.00%
2004	25,443	18.43%
2005	23,812	-6.41%
2006	22,832	-4.12%
2007	22,193	-2.80%
2008	18,158	-18.18%
2009	13,192	-27.35%
2010	17,976	36.26%
2011	19,062	6.04%
CAGR 2001-2011	*-1.12%*	
2016	18,016	*-1.12%*
2021	17,027	*-1.12%*
2026	16,093	*-1.12%*
2031	15,210	*-1.12%*
CAGR 2011-2031	*-1.12%*	

Notes: CAGR=Compounded Annual Growth Rate
Sources: Airport Records, Mead and Hunt, Inc.

2.3.4 Linear Trend Line Methodology

As mentioned previously, the linear trend line methodology is similar to the growth rate methodology in that it uses historical activity levels to forecast future activities, but it also puts more weight on variations from average activity levels. The linear trend line methodology results in a dramatic decrease in passenger enplanements over the 20-year forecast, declining from 19,062 in 2011 to 6,200 in 2031, a CAGR of -5.46 percent (see **Table 2-4**). The reason for the decrease is that EAU experienced a sudden

significant decline in passenger enplanements in 2008 and 2009. Although there was a slight overall decrease in passenger enplanements from 2001 to 2011, the linear trend line methodology adjusts for the sudden decrease activity that occurred in 2008 and 2009 and results in a steeply negative forecast. As a result, the linear trend shows much steeper decreases in future enplanements than the more straightforward growth rate methodology.

Table 2-4. Passenger Enplanement Forecasts – Linear Trend Line Methodology

Year	Passenger Enplanements
2001	21,340
2002	20,657
2003	21,484
2004	25,443
2005	23,812
2006	22,832
2007	22,193
2008	18,158
2009	13,192
2010	17,976
2011	19,062
CAGR 2001-2011	*-1.12%*
2016	14,815
2021	11,944
2026	9,072
2031	6,200
CAGR 2011-2031	*-5.46%*

Notes: CAGR=Compounded Annual Growth Rate
Sources: Airport Records, Mead and Hunt, Inc.

2.3.5 Market Share Methodology

As mentioned previously, market share methodologies compare activity levels at an airport to a larger geographical region over a given length of time. This market share methodology applies the Airport's average market share of total U.S. domestic passenger enplanements between 2001 and 2011 to FAA forecasts for total U.S. domestic enplanements.

Between 2001 and 2011, Chippewa Valley Regional Airport's market share of total U.S. domestic passenger enplanements ranged from a minimum of 0.0019 percent in 2009 to a maximum of 0.0043 percent in 2004. Applying the average market share of 0.0032 percent over this period to FAA forecasts of total U.S. domestic enplanements, the market share methodology predicts a steady increase in passenger enplanements, rising from 19,062 in 2011 to 34,262 in 2031 (see **Table 2-5**), a CAGR of 2.98 percent.

Table 2-5. Passenger Enplanement Forecasts - Market Share Methodology			
Year	Passenger Enplanements	Total U.S. Domestic Enplanements (Millions)	EAU Market Share
2001	21,340	641.2	0.0033%
2002	20,657	625.8	0.0033%
2003	21,484	575.1	0.0037%
2004	25,443	587.8	0.0043%
2005	23,812	628.5	0.0038%
2006	22,832	669.5	0.0034%
2007	22,193	668.4	0.0033%
2008	18,158	690.1	0.0026%
2009	13,192	680.7	0.0019%
2010	17,976	630.8	0.0028%
2011	19,062	635.3	0.0030%
CAGR 2001-2011	-1.12%	-0.09%	
2016	24,376	752.5	0.0032%
2021	28,062	866.3	0.0032%
2026	31,291	966.0	0.0032%
2031	34,262	1,057.7	0.0032%
CAGR 2011-2031	*2.98%*	*2.58%*	

Notes: CAGR=Compounded Annual Growth Rate

Sources: Airport Records, FAA Terminal Aerospace Forecasts 2011-2031, Mead and Hunt, Inc.

2.3.6 Socioeconomic Methodology – Population Variable

Local population and per capita income can be a strong indicator of commercial aviation demand, particularly at small hub and non-hub airports. The socioeconomic population variable methodology compares historical population figures to passenger enplanements. Between 2001 and 2011, the population of the Eau Claire-Chippewa Falls Metropolitan Statistical Area (MSA) increased from 148,656 to 161,443. The average number of annual per capita enplanements from 2001 through 2011 was 0.133. For the purpose of this analysis, this ratio of flights per person was held constant throughout the planning period.

The ratio of 0.133 flights per person was applied to population forecasts created by the economic forecasting firm Woods and Poole, Inc. This methodology projects steady but slow growth of passenger enplanements, rising from 19,062 in 2011 to 25,884 by 2031, a CAGR of 1.54 percent (see **Table 2-6**).

Table 2-6. Passenger Enplanement Forecasts - Socioeconomic Methodology-Population Variable			
Year	Passenger Enplanements	Eau Claire-Chippewa Falls MSA Population	Enplanements Per Capita
2001	21,340	148,656	0.144
2002	20,657	149,655	0.138
2003	21,484	150,846	0.142
2004	25,443	151,816	0.168
2005	23,812	153,419	0.155
2006	22,832	154,809	0.147
2007	22,193	156,167	0.142
2008	18,158	157,654	0.115
2009	13,192	158,700	0.083
2010	17,976	160,271	0.112
2011	19,062	161,443	0.118
Average (2001-2011)			*0.133*
2016	22,499	168,943	0.133
2021	23,762	178,424	0.133
2026	24,827	186,423	0.133
2031	25,884	194,361	0.133
CAGR (2011-2031)	*1.54%*	*0.93%*	

Notes: CAGR=Compounded Annual Growth Rate
Sources: Airport Records, Woods & Poole, Inc., Mead and Hunt, Inc.

2.3.7 Socioeconomic Methodology – Income Variable

A second socioeconomic forecast was developed utilizing an average of the Airport's enplanements per $1 of income in the Eau Claire-Chippewa Falls MSA from 2001 to 2011. This second forecast was developed because per capita income in the Eau Claire-Chippewa Falls MSA is expected to increase at a faster rate than population over the next 20 years. As a result, this methodology takes into account the increased ability of local residents to afford commercial service at the Airport.

According to Woods and Poole, between 2001 and 2011 per capita income in the Eau Claire-Chippewa Falls MSA increased from $29,357 to $31,625. It should be noted that income figures are presented in 2005 dollars. These are "constant" dollars and are used to measure the "real" change in earnings and income when inflation is taken into account. The average number of annual enplanements per $1 of income between 2001 and 2011 was 0.683.

The ratio of 0.683 enplanements per $1 of income was applied to Woods and Poole income forecasts. This methodology projects a steady increase in passenger enplanements, rising from 19,062 in 2011 to 28,868 in 2031, a CAGR of 2.10 percent (see **Table 2-7**).

Table 2-7. Passenger Enplanement Forecasts - Socioeconomic Methodology- Income Variable

Year	Passenger Enplanements	Eau Claire-Chippewa Falls MSA Per Capita Income	Enplanements Per $1 Income
2001	21,340	$29,357	0.727
2002	20,657	$29,548	0.699
2003	21,484	$29,676	0.724
2004	25,443	$29,674	0.857
2005	23,812	$29,480	0.808
2006	22,832	$29,672	0.769
2007	22,193	$30,583	0.726
2008	18,158	$30,957	0.587
2009	13,192	$30,946	0.426
2010	17,976	$30,783	0.584
2011	19,062	$31,625	0.603
Average (2001-2011)			*0.683*
2016	22,745	$33,316	0.683
2021	24,659	$36,119	0.683
2026	26,606	$38,971	0.683
2031	28,868	$42,285	0.683
CAGR (2011-2031)	*2.10%*	*1.46%*	

Notes: CAGR=Compounded Annual Growth Rate

Source: Airport Records, Woods & Poole, Inc., Mead & Hunt, Inc.

2.3.8 Preferred Forecast Methodology

A comparison of projected enplanement forecasts resulting from the methodologies described in the previous sections is shown in **Chart 2-1** and **Table 2-8**.

Chart 2-1. Passenger Enplanement Forecast Methodology Comparison

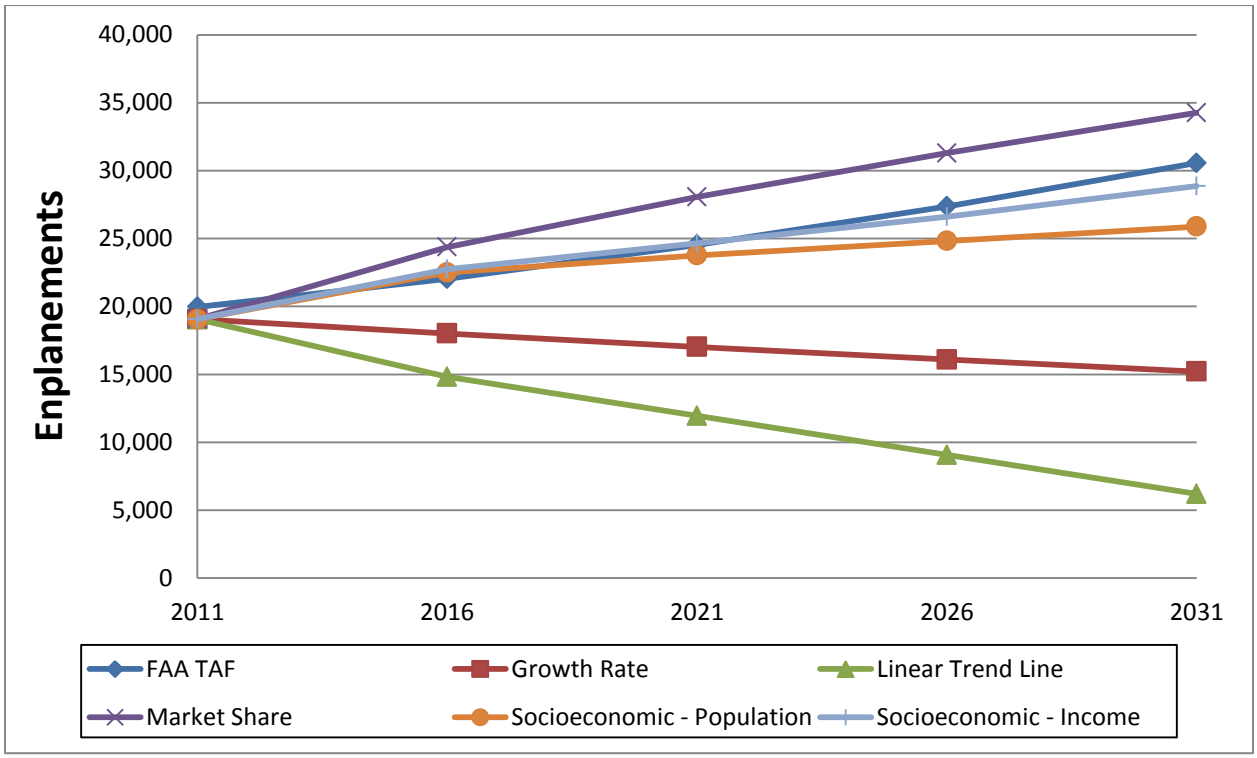


Table 2-8. Passenger Enplanement Forecasts - Forecast Comparison and Preferred Methodology

Year	FAA TAF Summary	Growth Rate	Trend Line	Market Share	Population Variable	Income Variable
2011	19,970	19,062	19,062	**19,062**	19,062	19,062
Projected						
2016	22,027	18,016	14,815	**24,376**	22,499	22,745
2021	24,543	17,027	11,944	**28,062**	23,762	24,659
2026	27,371	16,093	9,072	**31,291**	24,827	26,606
2031	30,557	15,210	6,200	**34,262**	25,884	28,868
CAGR (2011-2031)	*2.20%*	*-1.12%*	*-5.46%*	***2.98%***	*1.54%*	*2.10%*

Notes: CAGR=Compounded Annual Growth Rate

Sources: Airport Records, Terminal Aerospace Forecasts 2011-2031, Woods & Poole, Inc. Mead & Hunt, Inc.

While the time-series (growth rate and linear trend line) methodologies predict steep declines in passenger enplanements at the Chippewa Valley Regional Airport, the remaining methodologies (as well as the TAF) anticipate future growth in passenger enplanements. As discussed previously, non-hub airport forecasts are considered consistent with the TAF if they differ by less than 10 percent in the five-year forecast period and less than 15 percent in the 10-year and 20-year period. The variations of each methodology's results from the TAF in the 5-year, 10-year, and 20-year periods are summarized in **Table 2-9**.

Table 2-9. Passenger Enplanement Forecasts - Variance from the TAF

Year	Growth Rate Methodology	Linear Trend Line Methodology	Market Share Methodology	Population Variable	Income Variable
5 years	-18.2%	-32.7%	10.7%	2.1%	3.3%
10 years	-30.6%	-51.3%	14.3%	-3.2%	0.5%
20 years	-50.2%	-79.7%	12.1%	-15.3%	-5.5%

Sources: Airport Records, Terminal Aerospace Forecasts 2011-2031, Woods & Poole, Inc. Mead & Hunt, Inc.

Both time-series methodologies vary by more than 10% in the five-year period, and by more than 15 percent in both the 10-year and 20-year periods. As a result, these time-series methodologies are not consistent with the TAF and are eliminated from further consideration.

Both socioeconomic methodologies are consistent with the TAF according to FAA definitions. However, the socioeconomic methodologies do not bear a consistent relationship with the TAF forecasts, starting out above the TAF in the 5-year period and ending up below the TAF in the 20-year period. As a result, this Master Plan considers these socioeconomic methodologies inconsistent with the TAF. The socioeconomic methodologies are also eliminated from further consideration.

The sole remaining methodology is the market share methodology. Although this forecast varies from the TAF by slightly more than 10% in the 5-year period, it is within 15% of the TAF in both the 10-year and 20-year periods. This forecast assumes that the Airport's average market share of nationwide passenger enplanements during the years 2001 to 2011 (0.0032%) will remain consistent over the next 20 years. This market share percentage was fairly consistent during this period, and significant fluctuations in the Airport's market share of nationwide passenger enplanements are not expected in the next 20 years. As a result, this methodology is recommended as the preferred passenger enplanement forecast.

The preferred passenger enplanement forecast projects that enplanements at the Chippewa Valley Regional Airport will grow by approximately 75 percent over the planning period, from 19,062 in 2011 to 34,262 in 2031. The preferred passenger enplanement forecast will be used to inform possible improvements to the Airport terminal and airside facilities, as discussed in Chapter 3, Facility Requirements.

2.4 AIRCRAFT OPERATIONS AND FLEET MIX FORECASTS

Aircraft operations comprise both aircraft takeoffs and landings, and fleet mix refers to the various types and sizes of aircraft operating at an Airport. Aircraft operations and fleet mix forecasts are directly tied to the expected demand for overall aviation activity at an Airport, and have implications for whether an airport has adequate capacity in place to accommodate this activity. The following sections describe aircraft operation and fleet mix forecasts. As with passenger enplanements, several factors are taken into account when assessing demand in both commercial and non-commercial operations. Forecasts have been developed for the following categories:

- Commercial Fleet Mix and Operations Forecasts
- Based Aircraft
- General Aviation Operations
- Local/Itinerant General Aviation Operations
- Military Operations
- Instrument Operations

2.4.1 Commercial Fleet Mix and Operations Forecasts

This section presents commercial fleet mix and operations forecasts for the Airport. The FAA TAF separates commercial operations into three distinct categories: air carrier operations, commuter operations, and air taxi operations. The first, air carrier operations, are defined as takeoffs and landings by commercial aircraft with seating capacity of more than 60 seats. Air carrier operations can be either scheduled or non-scheduled. The second category, commuter operations, is defined as takeoffs and landings by commercial aircraft with 60 or fewer seats that transport regional passengers on scheduled commercial flights. Lastly, air taxi operations are defined as takeoffs and landings by aircraft with 60 or fewer seats on un-scheduled and on-demand flights, which are typically conducted by charter companies such as the local FBO and fractional ownership aircraft operators such as NetJets. Passengers on air carrier and commuter flights are counted by the FAA as passenger enplanements, but passengers on air taxi flights are not.

Because all commuter and air taxi operations are conducted by aircraft having 60 or fewer seats, the TAF combines commuter and air taxi operations into a single category, which it refers to as commuter/air taxi. This Master Plan, however, combines air carrier and commuter operations into a single category, which it refers to as passenger airline operations, and considers air taxi operations separately. The reason for this re-categorization is that the air carrier and commuter operations forecasts are derived from the preferred passenger enplanement forecast presented in the previous section, and passengers on air taxi flights were not reflected in the reported passenger enplanement figures. (See **Table 2-10)**.

Table 2-10. FAA Aircraft Classification		
Aircraft Classification	**Number of Seats**	**Do Passengers Count as Enplanements?**
Air Carrier	More than 60	Yes
Commuter	60 or Less	Yes
Air Taxi	60 or Less	No

With recent increases in aircraft operating costs, passenger airlines have been forced to maximize fleet efficiency. In many markets, airlines are reducing or retiring less fuel efficient aircraft and replacing them with larger regional and narrow-body jets that have more seats and lower operational costs per passenger. In many markets, the use of larger aircraft is reducing the frequency of particular routes. Because of increasing fuel and operational costs, airlines must maintain higher passenger load factors to remain profitable. Changes to the passenger airline fleet mix are an important factor in forecasting passenger airline operations. As a result, passenger airline fleet mix was considered prior to deriving the passenger airline operations forecasts.

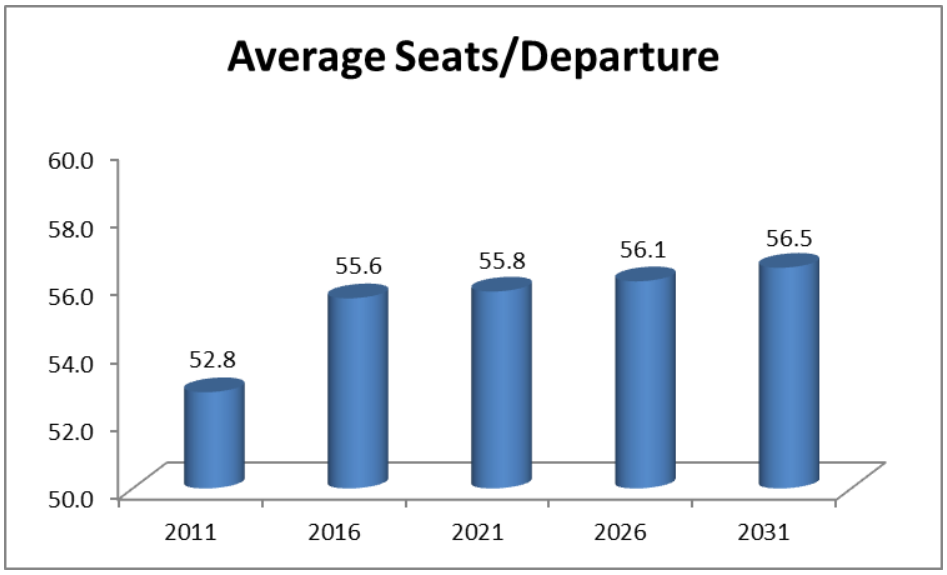
2.4.1.1 Passenger Airline Fleet Mix Forecast (Air Carrier and Commuter)

Nationwide, passenger airlines are moving away from using smaller aircraft with fewer seats and are beginning to use larger aircraft to reduce operational costs. In 2010, the 34-seat Saab 340 was replaced by the 50-seat CRJ-200 for all scheduled passenger airline operations at the Chippewa Valley Regional Airport. It is anticipated that the 50-seat CRJ-200, or similarly sized aircraft, will continue to be the predominant commercial aircraft in operation at the Airport throughout the forecast period (see **Table 2-11**). The Airport also offers charter service to Wendover, NV and Laughlin, NV on a periodic basis. These charter flights are typically conducted with larger aircraft such as 162-seat 737-800s and are anticipated to increase slightly throughout the forecast period.

Table 2-11. Scheduled Passenger Airline Departures Fleet Mix Forecasts					
	Seat Range/Example Aircraft				
Year	**Less than 40 seats (Saab 340)**	**40-60 seats (CRJ 100/200)**	**61-99 seats CRJ 700/900**	**100-130 seats (Bombardier CS 100/300)**	**131 seats or more (MD80, B737)**
2009	98.3%	0.1%	0.0%	0.0%	1.5%
2010	20.9%	77.4%	0.0%	0.0%	1.7%
2011	0.0%	97.5%	0.0%	0.0%	2.5%
Projected					
2016	0.0%	97.5%	0.0%	0.0%	2.5%
2021	0.0%	97.4%	0.0%	0.0%	2.6%
2026	0.0%	97.2%	0.0%	0.0%	2.8%
2031	0.0%	97.2%	0.0%	0.0%	2.8%

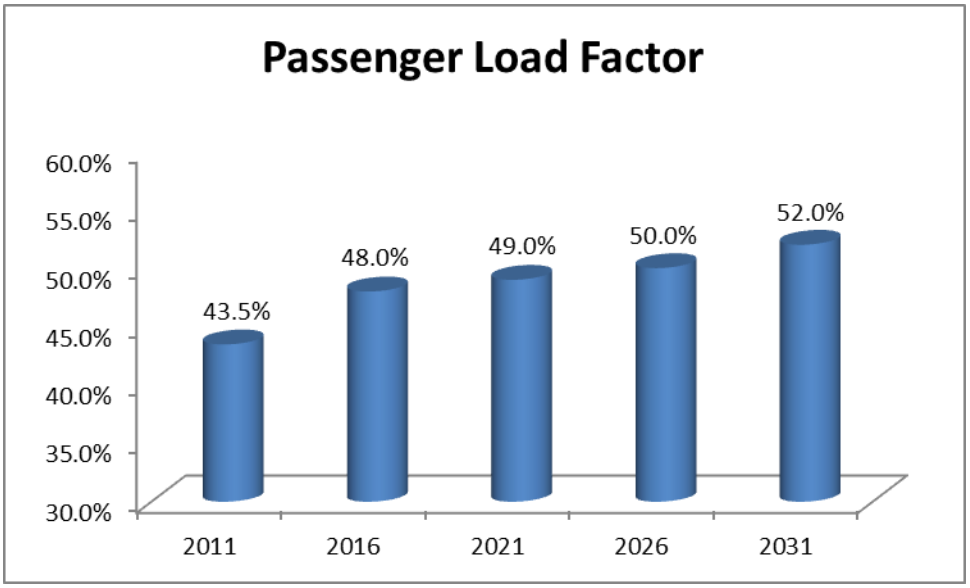
The available seats per flight are directly tied to the type of aircraft used by passenger airlines at the Airport. The forecasted shift towards larger aircraft will directly impact the number of available seats. This Master Plan projects that between 2011 and 2031, the average available seats per flight will increase slightly from 52.8 to 56.5, as shown in **Chart 2-2.**

Chart 2-2: Average Available Seats Forecast



Another factor that is important in forecasting is the load factor of the flight. For the purpose of this Master Plan, load factor reflects number of seats filled with a person compared to the total number of available seats. Because the national commercial aviation trend is to use larger aircraft with more available seats, the commercial carrier will attempt to fill as many seats on the aircraft as is possible. The result is a projected increase in the Airport's load factor from 43.5 percent in 2011 to 52.0 percent by 2031 (see **Chart 2-3**). This forecasted increase is relatively minor in relation to national trends, which indicate that load factors in the 70 to 80 percent range will be sought by passenger airlines in future years. While it is possible that load factors at the Airport may increase at a more rapid pace than forecasted, the lower load factors were used to forecast passenger airline operations because they result in an operations forecast that will allow the Airport to better plan for potential capacity needs.

Chart 2-3: Passenger Load Factor Forecast



2.4.1.2 Passenger Airline Operations Forecasts

The passenger airline operations forecast is based on the preferred passenger enplanement forecast selected in Section 2.3. To calculate future scheduled commercial operations, the average number of seats per departure at the Airport is multiplied by the passenger load factor. Projected annual passenger enplanements are divided by this figure to obtain passenger airline departures. It is assumed that the number of annual passenger airline departures and arrivals will be the same; therefore departures are multiplied by two to calculate total passenger airline operations (see **Table 2-12**). This forecast predicts a slow steady rise in commercial airline operations, increasing from 1,660 in 2011 to 2,332 in 2031, a CAGR of 1.71 percent.

Table 2-12. Passenger Airline Operations Forecast					
Year	Enplanements	Passenger Airline Departures	Average Seats per Departure	Passenger Load Factor	Passenger Airline Operations
Historical					
2008	18,158	1,876	36.5	26.5%	3,752
2009	13,192	1,618	36.0	22.6%	3,235
2010	17,976	1,092	48.6	33.9%	2,183
2011	19,062	830	52.8	43.5%	1,660
Projected					
2016	24,376	913	55.6	48.0%	1,827
2021	28,062	1,026	55.8	49.0%	2,053
2026	31,291	1,116	56.1	50.0%	2,231
2031	34,262	1,166	56.5	52.0%	2,332
CAGR (2011-2031)	*2.98%*	*1.71%*			*1.71%*

Notes: CAGR=Compounded Annual Growth Rate
Sources: Historical Enplanements - Airport Record; Historical Scheduled Air Carrier Dep's and Avg Seat Data - OAG Airline Schedules form apgDat (Feb. 2012); Forecasts – Mead & Hunt, Inc.

The fleet mix percentages described in the previous section were applied to total passenger airline operations forecast to derive the split between air carrier operations and commuter operations. The split between air carrier and commuter operations is shown in **Table 2-13**. Air carrier operations are forecasted to increase in the next five years from 42 operations in 2011 to 66 in 2031, a CAGR of 2.32%. Commuter operations are anticipated to increase from 1,618 in 2011 to 2,266 in 2031, a CAGR of 1.70%.

Table 2-13. Air Carrier and Commuter Operations Forecast					
Year	Passenger Airline Operations	Air Carrier %	Air Carrier Operations	Commuter %	Commuter Operations
2011	1,660	2.5%	42	97.5%	1,618
Projected					
2016	1,827	2.5%	46	97.5%	1,781
2021	2,053	2.6%	54	97.4%	1,998
2026	2,231	2.8%	61	97.2%	2,170
2031	2,332	2.8%	66	97.2%	2,266
CAGR (2011-2031)	*1.71%*		*2.32%*		*1.70%*

Sources: Historical Enplanements - Airport Record; Historical Scheduled Air Carrier Dep's and Avg Seat Data - OAG Airline Schedules form apgDat (Nov. 2011); Forecasts - Mead & Hunt, Inc.

2.4.1.3 Air Taxi Operations Forecast

Demand for air taxi flights can hinge on several factors and can be difficult to project. The overall number of air taxi operations at Chippewa Valley Regional Airport decreased from 1,925 in 2008 to 1,348 in 2011, but air taxi operations as a percentage of total commercial operations during that timeframe increased from 33.9 percent to 44.8 percent in. According to the *FAA Aerospace Forecasts 2011-2031*, the projected annual growth rate of the national general aviation and air taxi fleet is expected to be 0.90 percent. It is assumed that air taxi operations at Chippewa Valley Regional Airport will reflect this national trend; therefore, this figure is applied to the 2011 level of 1,348 operations and held constant throughout the forecast period, resulting in 1,613 air taxi operations in 2031.

2.4.1.4 Commercial Operations Forecast Summary

The commercial operations forecasts presented in the previous sections are summarized in **Table 2-14**. Total commercial operations are forecasted to increase over the next 20 years, rising from 3,008 in 2011 to 3,945, a CAGR of 1.36 percent. This commercial operations forecast is approximately 10 percent below the TAF for the 5-year and 10-year period, and approximately 15 percent below the TAF for the 20-year period. Steady increases in both passenger airline and air taxi operations indicate that planning is necessary for future Airport facilities. This commercial operations forecast will be used to assess commercial facility needs in Chapter 3, Facility Requirements.

Table 2-14. Commercial Operations Forecast Summary

Year	Total Commercial Operations	Air Carrier Operations	Commuter Operations	Air Taxi Operations
2011	3,008	*42*	1,618	1,348
Projected				
2016	3,236	46	1,781	1,410
2021	3,527	54	1,998	1,474
2026	3,773	61	2,170	1,542
2031	3,945	66	2,266	1,613
CAGR (2011-2031)	*1.36%*	2.32%	*1.70%*	*0.90%*

Notes: CAGR=Compounded Annual Growth Rate
Sources: Airport Records, Official Airline Guide (OAG), Air Traffic Activity Data System (ATADS), FAA Aerospace Forecasts 2011-2031, Mead & Hunt, Inc.

2.4.2 Based Aircraft

This Master Plan also reviews based aircraft statistics in order to forecast future based aircraft at the Chippewa Valley Regional Airport. Based aircraft forecasts are used to determine future needs for items including, but not limited to, hangars, tie-downs, and FBO services. These based aircraft forecasts will also be used in one of the methodologies that will forecast general aviation operations.

There are several factors that affect the number of aircraft based at an airport. The overall cost to own and operate an aircraft has increased significantly in recent years, which has contributed to a slight decline in the U.S. general aviation fleet since 2007. Based aircraft at the Chippewa Valley Regional Airport reflects the national trend, with the number of based aircraft declining from 91 in 2001 and to 80 in 2011. However, significant fluctuations in total based aircraft occurred during this period, reaching a low of 68 in 2004 before rising back to 77 the very next year.

Four of the methodologies used for passenger enplanement forecasts are also used for these based aircraft forecasts, including the linear trend line, market share, socioeconomic per capita income variable, and socioeconomic population variable methodologies. These methodologies, and not the growth rate methodology, were used to forecast based aircraft because the number of based aircraft at an Airport is more susceptible to shifts in both the national and local socioeconomic conditions than passenger enplanements.

2.4.2.1 Linear Trend Line Methodology

The linear trend line methodology – which assumes that historic trends will continue in the future but that more heavily weights variations than the growth rate methodology – projects a decrease in based aircraft from 80 in 2011 to 42 in 2031, a CAGR of -3.20 percent (see **Table 2-15**).

Table 2-15. Based Aircraft Forecasts - Trend Line Methodology	
Year	**Based Aircraft**
2001	91
2002	91
2003	91
2004	68
2005	77
2006	77
2007	77
2008	77
2009	78
2010	78
2011	80
CAGR (2001-2011)	*-1.28%*
2016	65
2021	57
2026	49
2031	42
CAGR (2011-2031)	*-3.20%*

Notes: CAGR=Compounded Annual Growth Rate
Sources: FAA TAF, Mead & Hunt, Inc.

2.4.2.2 Market Share Methodology

Chippewa Valley Regional Airport's market share of the total U.S. general aviation fleet declined from 0.042 percent in 2001 to 0.036 percent in 2011. Because of the significant variation in the reported number of based aircraft at the Airport in 2004 and 2005, the market share methodology does not consider market share information for years prior to 2005. This market share methodology assumes that the Airport's average 0.0344 percent market share of total active U.S. aircraft from 2005 to 2011 will remain constant throughout the forecast period. This percentage was applied to the total number of aircraft in the U.S. fleet forecasted by the FAA Aerospace Forecasts FY2011-2031 (see **Table 2-16**). This methodology predicts a slow but steady increase in based aircraft, rising from 80 in 2011 to 96 in 2031, a CAGR of 0.92 percent.

Table 2-16. Based Aircraft Forecasts - Market Share Methodology			
Year	EAU Based Aircraft	Total U.S. Active Aircraft	EAU Market Share
2001	91	217,533	0.04183%
2002	91	211,446	0.04304%
2003	91	211,244	0.04308%
2004	68	209,606	0.03244%
2005	77	224,350	0.03432%
2006	77	221,939	0.03469%
2007	77	231,606	0.03325%
2008	77	228,668	0.03367%
2009	78	223,920	0.03483%
2010	78	224,172	0.03479%
2011	80	224,475	0.03564%
Average (2005-2011)			*0.03446%*
2016	82	239,522	0.03446%
2021	86	249,440	0.03446%
2026	90	262,772	0.03446%
2031	96	278,723	0.03446%
CAGR (2011-2031)	*0.92%*	*1.09%*	

Notes: CAGR=Compounded Annual Growth Rate
Sources: FAA TAF, FAA Aerospace Forecasts 2011-2031, Mead & Hunt, Inc.

2.4.2.3 Socioeconomic Methodology – Income Variable

Income can often be a strong indicator of one's ability to own an aircraft. The socioeconomic income variable methodology compares historical based aircraft at Chippewa Valley Regional Airport to per capita income in the Eau Claire-Chippewa Falls MSA. According to data obtained by Woods and Poole, Inc. per capita income in the Eau Claire-Chippewa Falls MSA increased from $29,357 in 2001 to $31,625 in 2011 (see **Table 2-17**). It should be noted that income is presented in 2005 dollars. These are "constant" dollars and are used to measure the "real" change in earnings and income when inflation is taken into account. From 2001 to 2011, based aircraft per $100 income has increased overall from 0.41306 to 0.40726. However, like the market share methodology, this methodology does not consider information from years prior to 2005 because of the significant variation in the reported number of based aircraft at the Airport in 2004 and 2005. The average figure from 2005 to 2011 of 0.25423 based aircraft per $100 income was applied to forecasts of per capita income and shown in Table 2-17. This methodology predicts strong growth in based aircraft, rising from 80 in 2011 to 108 in 2031, a CAGR of 1.49 percent.

Table 2-17. Based Aircraft Forecasts – Socioeconomic Methodology - Income Variable			
Year	**Based Aircraft**	**Eau Claire-Chippewa Falls MSA Per Capita Income ($2005)**	**Based Aircraft Per $100 Income**
2001	91	$29,357	0.30998
2002	91	$29,548	0.30797
2003	91	$29,676	0.30665
2004	68	$29,674	0.22916
2005	77	$29,480	0.26119
2006	77	$29,672	0.25950
2007	77	$30,583	0.25177
2008	77	$30,957	0.24873
2009	78	$30,946	0.25205
2010	78	$30,783	0.25339
2011	80	$31,625	0.25296
Average (2005-2011)			*0.25423*
2016	85	$33,316	0.25423
2021	92	$36,119	0.25423
2026	99	$38,971	0.25423
2031	108	$42,285	0.25423
CAGR (2011-2031)	*1.49%*	*1.46%*	

Sources: FAA TAF, Mead and Hunt, Inc., Woods & Poole, Inc.

2.4.2.4 Socioeconomic Methodology – Population Variable

The socioeconomic population variable methodology is another way to forecast based aircraft at an airport. This methodology compares historical based aircraft at the Airport with the population of the Eau Claire-Chippewa Falls MSA. Between 2001 and 2011, the population of the Eau Claire-Chippewa Falls MSA increased from 148,656 to 161,443. During that same timeframe, based aircraft per capita decreased from 0.00061 to 0.00050. However, like the market share methodology, this methodology does not consider information from years prior to 2005 because of the significant variation in the reported number of based aircraft at the Airport in 2004 and 2005. The average figure of 0.00049 based aircraft per capita from 2005 to 2011 was applied to population forecasts of the Eau Claire-Chippewa Falls MSA as shown in **Table 2-18**. This methodology predicts a steady increase in based aircraft, rising from 80 in 2011 to 95 in 2031, a CAGR of 0.89 percent.

Table 2-18. Based Aircraft Forecasts – Socioeconomic Methodology - Population Variable

Year	Based Aircraft	Eau Claire-Chippewa Falls MSA Population	Based Aircraft Per Capita
2001	91	148,656	0.00061
2002	91	149,655	0.00061
2003	91	150,846	0.00060
2004	68	151,816	0.00045
2005	77	153,419	0.00050
2006	77	154,809	0.00050
2007	77	156,167	0.00049
2008	77	157,654	0.00049
2009	78	158,700	0.00049
2010	78	160,271	0.00049
2011	80	161,443	0.00050
Average (2001-2011)			*0.00058*
2016	83	168,943	0.00049
2021	88	178,424	0.00049
2026	92	186,423	0.00049
2031	95	194,361	0.00049
CAGR (2011-2031)	*0.89%*	*0.93%*	

Notes: CAGR=Compounded Annual Growth Rate

Sources: FAA TAF, Mead & Hunt, Inc., Woods & Poole, Inc.

2.4.2.5 Preferred Based Aircraft Forecast Methodology

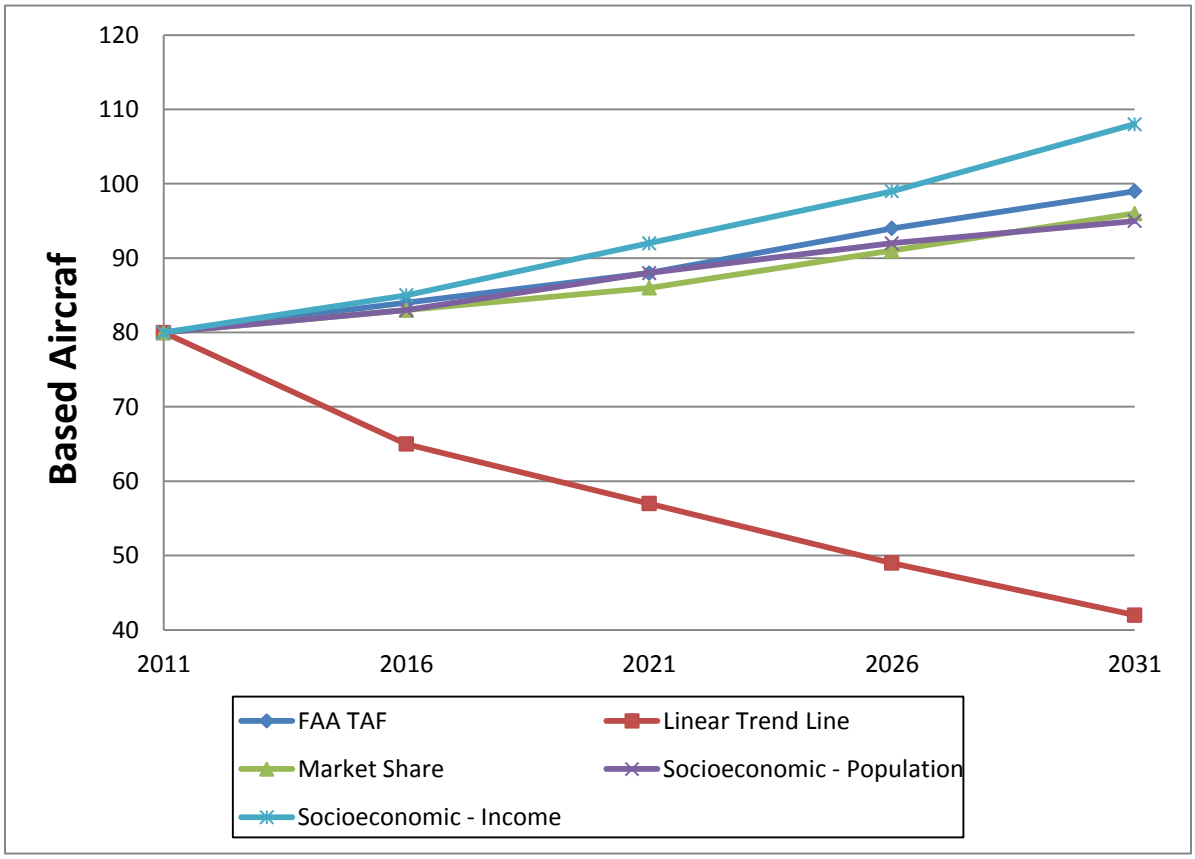
A comparison of the based aircraft forecasts created using the methodologies described in previous sections is shown in **Table 2-19** and **Chart 2-4**.

Table 2-19. Based Aircraft Forecasts - Forecast Comparison and Preferred Methodology

Year	FAA TAF Summary	Linear Trend Line Methodology	Market Share Methodology	Socioeconomic Methodology- Population Variable	Socioeconomic Methodology- Income Variable
2011	80	80	**80**	80	80
2016	84	65	**82**	83	85
2021	88	57	**86**	88	92
2026	94	49	**90**	92	99
2031	99	42	**96**	95	108
CAGR (2011-2031)	*1.07%*	*-3.20%*	***0.92%***	*0.89%*	*1.49%*

Notes: CAGR=Compounded Annual Growth Rate
Sources: FAA TAF, FAA Aerospace Forecasts, Mead & Hunt, Inc.

Chart 2-4. Based Aircraft Forecast Comparison



The linear trend line methodology results in a variation of more than 10 percent from the TAF during the 5-year period, and variations of more than 15 percent from the TAF during the 10-year and 20-year periods. As a result, this forecast is considered inconsistent with the TAF according to FAA definitions.

The remaining three forecast methodologies described above – market share, socioeconomic population variable, and socioeconomic income variable – are all consistent with the TAF according to FAA definitions. As mentioned previously, there was a significant change in the number of reported aircraft at the Airport from 2003 to 2005. From 2005 to 2011, the Airport's market share of based aircraft has remained virtually flat. Because of this consistency, even after the national economic downturn that began in 2008, the market share forecast is the preferred forecast methodology for based aircraft.

2.4.2.6 Based Aircraft Fleet Mix

The FAA TAF distinguishes between five categories of based aircraft: single-engine, multi-engine, jet, helicopter, and other aircraft (such as gliders or military aircraft). In general, these aircraft categories have different dimensions and performance characteristics, and as a result have different requirements in terms of airport facilities. Therefore, it is important to determine the breakdown of aircraft within these categories for the based aircraft forecast.

Historical based aircraft by type and the projected based aircraft fleet mix at Chippewa Valley Regional Airport are shown in **Table 2-20**. In 2011, 76 percent of the local fleet was comprised of single engine aircraft, 13 percent multi-engine aircraft, 10 percent jet aircraft, and 1 percent helicopter.

From 2001 to 2011, the proportion of jet aircraft in the based fleet increased steadily from 7% to 10%, while the other aircraft categories either held steady or declined slightly. The preferred forecast for this Master Plan anticipates that the 2011 based aircraft fleet mix percentages will remain consistent with these trends throughout the 20-year forecast period.

Table 2-20. Based Aircraft Fleet Mix Forecasts

Year	Single Engine		Multi Engine		Jet		Helicopter		Other		
	#	%	#	%	#	%			#	%	Total
2001	69	76%	14	15%	6	7%	2	2%	0	0%	91
2002	69	76%	14	15%	6	7%	2	2%	0	0%	91
2003	69	76%	14	15%	6	7%	2	2%	0	0%	91
2004	55	81%	7	10%	6	9%	0	0%	0	0%	68
2005	60	78%	10	13%	7	9%	0	0%	0	0%	77
2006	60	78%	10	13%	7	9%	0	0%	0	0%	77
2007	60	78%	10	13%	7	9%	0	0%	0	0%	77
2008	60	78%	10	13%	7	9%	0	0%	0	0%	77
2009	60	77%	10	13%	7	9%	1	1%	0	0%	78
2010	60	77%	10	13%	7	9%	1	1%	0	0%	78
2011	61	76%	10	13%	8	10%	1	1%	0	0%	80
Projected											
2016	62	75%	10	12%	10	12%	1	1%	0	0%	83
2021	64	74%	11	13%	11	13%	1	1%	0	0%	87
2026	66	72%	11	13%	13	14%	1	1%	0	0%	91
2031	68	71%	13	13%	14	15%	1	1%	0	0%	96
CAGR (2011-2031)	*0.56%*		*1.31%*		*2.98%*		*0.00%*		*0.00%*		*0.92%*

Notes: CAGR=Compounded Annual Growth Rate
Sources: FAA TAF, FAA Aerospace Forecasts, Mead & Hunt, Inc.

2.4.2.7 Based Jet Fleet Mix Forecast

Chippewa Valley Regional Airport has a number of based jets, and jet aircraft operations represent approximately one third of all operations at the Airport. Jet aircraft are typically the most demanding aircraft category in terms of size and speed. The dimensions, performance characteristics, and maintenance requirements of frequently used jet aircraft types have important implications for most airport facilities, including runways, taxiways, and hangars. This section describes the current based jet fleet mix at Chippewa Valley Regional Airport, and presents a forecast of future based jet fleet mix.

In 2011, there were eight based jets at the Airport, including five Citation Bravos, one Citation III, one Citation Encore, and one Citation X. These aircraft are owned and operated by corporate users, and the fixed base operator (FBO) Heartland Aviation. Technical specifications for these aircraft are listed in Table **2-21**.

Table 2-21: 2011 Based Jet Aircraft Specifications					
Aircraft Make/Model	**Seat Capacity**	**Wingspan (feet)**	**Length (feet)**	**Height (feet)**	**Gross Weight (lbs)**
Cessna Citation Bravo	10	52.2	47.2	15.0	14,800
Cessna Citation III	11	53.5	55.5	16.8	22,000
Cessna Citation Encore	11	54.1	48.9	15.2	16,630
Cessna Citation X	11	63.9	72.3	19.3	36,100

As discussed in the previous section, based jet aircraft are forecasted to increase from 8 in 2011 to 14 in 2031. For the purpose of this Master Plan Update, it is assumed that the fleet mix will continue to consist of the current based jet aircraft types, or variants with similar specifications. The based jet fleet mix forecast is presented in **Table 2-22**. It is expected that the Citation Bravo and Citation III will be phased out of the based fleet over time, as these aircraft are no longer produced by the manufacturer and will eventually exceed their useful life. This forecast predicts that these aircraft will be replaced with other aircraft types currently in the fleet, as well as newer models such as the Citation Mustang and the Citation Sovereign. This based jet fleet mix forecast will be used to determine jet facility needs in Chapter 3, Facility Requirements.

Table 2-22: Based Jet Aircraft Fleet Mix Forecast					
	Number of Based Aircraft by Year				
Aircraft Make/Model	**2011**	**2016**	**2021**	**2026**	**2031**
Cessna Citation Mustang	0	0	1	2	3
Cessna Citation Bravo	5	4	4	3	2
Cessna Citation III	1	1	0	0	0
Cessna Citation Sovereign	0	1	1	2	3
Cessna Citation Encore	1	2	3	3	3
Cessna Citation X	1	2	2	3	3
Total	**8**	**10**	**11**	**13**	**14**

2.4.3 General Aviation Operations

General aviation operations are those which are not categorized as commercial or military. General aviation includes a variety of users and activities, including corporate and business operators, cargo operators, recreational users, flight training, agricultural applications, and law enforcement and other government uses. It should be noted that the Chippewa Valley Regional Airport had an Air Traffic Control Tower (ATCT) installed in November 2006. Because the accuracy and reliability of recorded operations is typically higher at airports equipped with an ATCT, historical data from calendar year 2007 to 2011 were examined and previous historical data was discarded. Like passenger enplanements, annual ATCT operations counts vary slightly from TAF operations counts because they are collected on a calendar year, rather than Federal fiscal year, basis. Based on the historical ATCT data, general aviation operations account for approximately 80 percent of total aircraft operations at Chippewa Valley Regional Airport. General aviation activity at the Airport steadily declined between 2007 and 2011. This trend can be largely explained by the economic downturn that began in 2008 and the rise in fuel prices that occurred over this period. Two methodologies were used to determine forecasts of general aviation demand, the operations per based aircraft and market share methodologies. These are industry standard general aviation operations methodologies, for reasons described in the following sections.

2.4.3.1 Operations per Based Aircraft Methodology

The operations per based aircraft methodology is a common way to calculate general aviation operations because the majority of general aviation operations are typically conducted by based aircraft. Between 2007 and 2011 the number of based aircraft at Chippewa Valley Regional Airport increased slightly from 77 to 80. However, during the same timeframe, the number of general aviation operations decreased from 27,814 to 21,184 (see **Table 2-23**). The 2011 number of general aviation operations per based aircraft was 265. This ratio was applied to the preferred based aircraft forecast described in Section 2.3.4. This forecast predicts a steady rise in general aviation operations, increasing from 21,184 in 2011 to 25,432 in 2031, a CAGR of 0.92 percent.

Table 2-23. General Aviation Operations Forecasts - Operations Per Based Aircraft Methodology			
Year	**Based Aircraft**	**GA Operations**	**Operations Per Based Aircraft**
2007	77	27,814	361
2008	77	25,886	336
2009	78	23,717	304
2010	78	23,398	300
2011	80	21,184	265
Average (2001-2011)			*313*
2016	83	21,855	265
2021	87	22,760	265
2026	91	23,976	265
2031	96	25,432	265
CAGR (2011-2031)	*0.92%*	*0.92%*	

Notes: CAGR=Compounded Annual Growth Rate
Sources: Airport Records, FAA TAF, Mead and Hunt, Inc.

2.4.3.2 Market Share Methodology

The second methodology examined is the market share methodology. The market share methodology compares the trend in GA operations at a particular airport to the trend in national or regional general aviation operations. In general, this share is consistent over time for airports serving mostly general aviation operations. Between 2007 and 2011, Chippewa Valley Regional Airport's market share of total U.S. general aviation operations remained steady. It is anticipated that the Airport's 2011 market share of 0.0823 percent will remain constant throughout the forecast period. This figure was applied to total the number of projected total U.S. general aviation operations described in the *FAA Aerospace Forecasts 2011-2031* as shown in **Table 2-24**.

The market share methodology predicts a steady increase in general aviation operations, rising from 21,184 in 2011 to 28,847 in 2031, a CAGR of 1.56 percent.

Table 2-24. General Aviation Operations Forecasts - Market Share Methodology			
Year	**EAU GA Operations**	**Total U.S. Operations**	**Market Share**
2007	27,814	33,132,000	0.0839%
2008	25,886	31,573,800	0.0820%
2009	23,717	27,999,600	0.0847%
2010	23,398	26,571,400	0.0881%
2011	21,184	25,749,500	0.0823%
Average (2007-2011)			*0.0842%*
2016	23,721	28,833,363	0.0823%
2021	25,280	30,728,860	0.0823%
2026	26,988	32,804,953	0.0823%
2031	28,847	35,064,533	0.0823%
CAGR (2011-2031)	*1.56%*	*1.56%*	

Notes: CAGR=Compounded Annual Growth Rate

Sources: Airport Records, FAA Aerospace Forecast 2011-2031, Mead & Hunt, Inc.

2.4.3.3 Preferred General Aviation Operations Forecast Methodology

Both the operations per based aircraft and the market share methodologies were examined to predict future general aviation operations. The operations per based aircraft methodology draws on the low end of the significant decline in operations per based aircraft from 2007 to 2011, while the market share methodology relies on the 2011 market share that has remained relatively consistent during this same period. It is expected that operations per based aircraft will hold steady in the future as economic conditions improve. Therefore, the operations per based aircraft methodology was chosen as the preferred general aviation operations forecast methodology (see **Table 2-25**).

Table 2-25. General Aviation Operations Forecasts - Forecast Comparison and Preferred Methodology			
Year	**FAA TAF Summary**	**Operations Per Based Aircraft Methodology**	**Market Share Methodology**
2011	21,294	**21,184**	21,184
2016	21,047	**21,855**	23,721
2021	21,002	**22,760**	25,280
2026	20,957	**23,976**	26,988
2031	20,912	**25,432**	28,847
CAGR 2009-(2031)	*-0.06%*	***0.92%***	*1.56%*

Notes: CAGR=Compounded Annual Growth Rate

Sources: Airport Records, FAA TAF, Air Traffic Activity Data System (ATADS), FAA Aerospace Forecasts 2011-2031, Mead & Hunt, Inc.

General aviation operations are an important part of the planning process, because these operations represent approximately 80 percent of all aircraft operations at the Chippewa Valley Regional Airport. Using the operations per based aircraft methodology it is forecasted that general aviation operations will increase over the planning period. Understanding general aviation operations will help inform Chapter 3, Facility Requirements, as GA operators often use local fuel sources, hangars, runways, and associated facilities.

2.4.4 Local/Itinerant General Aviation Operations

The TAF distinguishes between two categories of general aviation operations, local and itinerant. Local operations are conducted by aircraft operating in the traffic pattern within sight of the air traffic control tower; aircraft departing or arriving from flight in local practice areas; or aircraft executing practice instrument operations at the Airport. All general aviation operations other than local operations are defined as itinerant operations. Local operations are typically conducted by users based at the Airport, while itinerant operations are conducted by both based and transient users. As a result, the two types of general aviation operations have different implications for required airport facilities.

Historically, itinerant general aviation operations have comprised the majority of total general aviation operations at Chippewa Valley Regional Airport. Between 2007 and 2011, itinerant general aviation operations comprised approximately 73 percent of total general aviation operations at the Airport, while local operations accounted for approximately 27 percent of total general aviation operations. It is anticipated that this split will remain constant throughout the forecast period. A summary of projected local and itinerant general aviation operations is shown in **Table 2-26**.

Table 2-26. Local/Itinerant Operations Forecasts

Year	Total GA Operations	Itinerant GA		Local GA	
		Operations	%	Operations	%
2007	27,814	19,862	71%	7,952	29%
2008	25,886	18,361	71%	7,525	29%
2009	23,717	17,220	73%	6,497	27%
2010	23,398	17,879	76%	5,519	24%
2011	21,184	15,677	74%	5,507	26%
Average (2007-2011)			*73%*		*27%*
2016	21,855	15,970	73%	5,885	27%
2021	22,760	16,631	73%	6,129	27%
2026	23,976	17,520	73%	6,456	27%
2031	25,432	18,584	73%	6,848	27%
CAGR (2011-2031)	*0.92%*	*0.85%*		*1.10%*	

Notes: CAGR=Compounded Annual Growth Rate

Sources: Air Traffic Activity Data System (ATADS), Mead & Hunt, Inc.

Using the average local/itinerant split from 2007 to 2011, it is expected that both local and itinerant general aviation operations at the Chippewa Valley Regional Airport will experience a gradual increase over the 20-year planning period. This forecast will be considered in Chapter 3, Facility Requirements, to ensure that future planning needs will be met.

2.4.5 Military Operations

Military operations are also important to forecast, although to a lesser extent than other operations at the Chippewa Valley Regional Airport. Historically, military operations have comprised approximately three percent of total operations at the Airport. Local military operations have consisted mostly of training and reconnaissance flights, while itinerant operations have consisted mostly of those required for special events and emergencies. Between 2007 and 2011, the number of annual military operations fluctuated from a low of 789 in 2011 to a high of 1,231 in 2009. Military operations are driven more by Federal policy decisions than by economic conditions; therefore the preferred forecast methodology for military operations is the FAA TAF (see **Table 2-27**). The number of military operations at the Airport is anticipated to remain flat throughout the forecast period.

Table 2-27. Military Operations Forecasts

Year	Total Military Operations	Itinerant		Local	
		Operations	%	Operations	%
2007	745	443	59%	302	41%
2008	1,138	649	57%	489	43%
2009	1,231	845	69%	386	31%
2010	803	617	77%	186	23%
2011	789	487	62%	302	38%
AVG. (2007-2011)	*973*	*822*	*84%*	*151*	*16%*
2016	789	487	62%	302	38%
2021	789	487	62%	302	38%
2026	789	487	62%	302	38%
2031	789	487	62%	302	38%
CAGR (2011-2031)	*0.00%*		*0.00%*		*0.00%*

Notes: CAGR=Compounded Annual Growth Rate

Sources: Air Traffic Activity Data System (ATADS), Mead and Hunt, Inc.

2.4.6 Instrument Operations

Instrument flight rules (IFR) apply in the airspace surrounding the Airport when visibility is less than 3 miles and/or the cloud ceiling is less than 1,000 feet. Pilots conducting operations during IFR conditions must have an instrument rating and file an IFR flight plan. Instrument operations can be conducted in any type of aircraft equipped with appropriate instruments, whether commercial, general aviation, or military. Commercial operators typically require that flight crews file IFR flight plans for operations in all weather conditions. Any operations conducted under an IFR flight plan are considered instrument operations. Forecasting instrument operations will help the Airport ensure that future airport facilities comply with equipment needs and standards associated with instrument approach and departure procedures.

Historically approximately 37 percent of all operations at Chippewa Valley Regional Airport are instrument operations. This figure is applied to the number of total projected aircraft operations and results in a steady increase in instrument operations from 9,139 in 2011 to 11,018 in 2031, a CAGR of 0.94 percent (see **Table 2-28**).

Table 2-28. Instrument Operations Forecasts

Year	Total Operations	Instrument Operations		Visual Operations	
		Operations	%	Operations	%
2011	24,981	9,139	37%	15,842	63%
AVG. (2007-2011)			*37%*		*63%*
2016	25,880	9,453	37%	16,428	63%
2021	27,076	9,889	37%	17,186	63%
2026	28,538	10,423	37%	18,115	63%
2031	30,165	11,018	37%	19,148	63%
CAGR (2011-2031)	*0.95%*	*0.94%*		*0.94%*	

Notes: CAGR=Compounded Annual Growth Rate
Sources: Air Traffic Activity Data System (ATADS), Mead & Hunt, Inc.

2.5 AIR CARGO

Currently, Chippewa Valley Regional Airport does not have regularly scheduled cargo operations as most freight is trucked from Minneapolis/St. Paul. However, there is a limited amount of air cargo activity at the airport. According to the FAA's Enhanced Traffic Management System Counts database, approximately six to ten air cargo operations occur at the Airport in a given year. Despite the current limited amount of air cargo activity at the Airport, a location on the airfield should be designated for a potential expansion in cargo activity in the future. This will be discussed in greater detail in Chapter 3, Facility Requirements.

2.6 PEAK ACTIVITY FORECASTS

Forecasts of annual passenger activity or aircraft operations may not adequately describe the complex needs of airport facilities. Annual metrics are only useful when activity tends to be evenly distributed over the hours, days, and months of the year. However, most airports have peak periods where demand surpasses annual averages. As a result, it is important to identify peak period activity levels, and to forecast future peak period activity levels.

Existing and expected peak volumes of both passengers and aircraft operations have important implications for airport facility and equipment planning. The peak activity forecasts presented in the following sections will be assessed in Chapter 3, Facility Requirements, to ensure that the Airport has adequate facilities and equipment to handle peak volumes. However, if planning is contingent on the absolute busiest periods of activity, it can lead to overestimation, overspending, and inefficiencies. As a result, these peak activity forecasts focus on the average day during the peak months for passenger and aircraft activity, rather than the peak day of the peak months. It should also be noted that peaking characteristics are based on scheduled commercial service. Charter activity may increase peak periods of activity, however, because of the infrequency of charter operations, facility planning should not be contingent on charter activity.

This section identifies monthly, daily, and hourly peaking characteristics for passenger and aircraft activity at Chippewa Valley Regional Airport. Peak activity forecasts are presented in the following subsections:

- Peak Month Passenger Activity
- Peak Day Passenger Activity
- Peak Hour Passenger Activity
- Peak Aircraft Operations

2.6.1 Peak Month Passenger Activity

The typical approach to developing peak activity forecasts is to identify the "design hour" flows of passengers and aircraft. The design hour is the estimate of the peak hour of the average day of the busiest month. This approach provides sufficient facility capacity for most days of the year, but recognizes that facilities should be neither underbuilt nor overbuilt. This section identifies the peak month of the year for passenger activity at the Chippewa Valley Regional Airport, and presents passenger activity forecasts for the peak month over the next 20 years. Subsequent sections will use this monthly forecast as a basis for identifying and forecasting average day and peak hour volumes for the peak month.

Monthly passenger enplanement data was obtained from the Airport for 2010 and 2011, and is shown in **Table 2-29**.

Table 2-29. Historical Peak Month Passenger Enplanements

Month	2010 Enplanements	%	2011 Enplanements	%
Jan	992	5.5%	1,598	8.4%
Feb	785	4.4%	1,329	7.0%
Mar	1,145	6.4%	1,668	8.8%
Apr	1,639	9.1%	1,459	7.7%
May	1,426	7.9%	1,588	8.3%
Jun	1,383	7.7%	1,696	8.9%
Jul	1,815	10.1%	1,632	8.6%
Aug	2,047	11.4%	1,468	7.7%
Sep	1,805	10.0%	1,613	8.5%
Oct	1,661	9.2%	1,615	8.5%
Nov	1,851	10.3%	1,478	7.8%
Dec	1,427	7.9%	1,918	10.1%
Totals	17,976		19,062	

Source: Airport Records

This analysis indicates that the average percentage of annual enplanements occurring during the peak month was 10.7 percent between 2010 and 2011. However, peak activity forecasts should include both enplanements and deplanements, as airport facilities must be able to handle the co-mingled needs of passengers that are both arriving and departing during the "design hour." It is assumed that peak monthly enplanements and deplanements will be equal, and that peak month enplanements will continue to be 10.7 percent of annual activity. This figure is applied to the preferred passenger enplanement forecast described in Section 2 as shown in **Table 2-30**. This forecast predicts a steady increase in peak month passenger activity, rising from 5,228 in 2016 to 7,349 in 2031.

Table 2-30. Peak Month Passenger Activity Forecast

Year	Projected Annual Enplanements	Peak Month % Total	Peak Month		
			Enplanements	Deplanements	Total Activity
2016	24,376	10.7%	2,614	2,614	5,228
2021	28,062	10.7%	3,010	3,010	6,019
2026	31,291	10.7%	3,356	3,356	6,712
2031	34,262	10.7%	3,674	3,674	7,349

Sources: Airport Records, OAG, Mead & Hunt, Inc.

2.6.2 Peak Day Passenger Activity Forecasts

As mentioned previously, the typical approach to peak activity forecasting is to identify the "design hour" flows of passengers and aircraft. This section identifies the historic average daily activity at the Chippewa Valley Regional Airport, during its peak month, and applies it to the peak month passenger activity forecast to develop a peak day forecast. This forecast will be used in a subsequent section to determine the "design hour" for passenger activity.

The average weekday during the peak month for passenger activity at the Airport typically has 2 commercial departures and 2 commercial arrivals, with approximately 15.7 percent of available weekly seats either departing or arriving at the Airport. **Table 2-31** presents the peak month activity for each day of the week at the Airport, including total passenger airline departures and departing seats, and total passenger airline arrivals and arriving seats.

Table 2-31. Peak Month Daily Passenger Activity Forecast

Day	Departures	Departing Seats	% Weekly Total	Arrivals	Arriving Seats	% Weekly Total
Mon	2	100	14.3%	2	100	14.3%
Tue	2	100	14.3%	2	100	14.3%
Wed	2	100	14.3%	2	100	14.3%
Thu	2	100	14.3%	2	100	14.3%
Fri	2	100	14.3%	2	100	14.3%
Sat	2	100	14.3%	2	100	14.3%
Sun	2	100	14.3%	2	100	14.3%

Sources: Official Airline Guide (OAG) February 2012 Schedule, Mead & Hunt, Inc.

This analysis indicates that every day of the week during the peak month has an identical number of arriving seats, representing 14.3 percent of weekly seats. It is assumed that the average peak month is 31 days long (4.4 weeks). The sum of forecasted peak month enplanements and deplanements presented in the previous section was divided by the average number of weeks in the peak month to determine the average number of weekly passenger enplanements/deplanements that occur in the peak month. This number was then divided by the percent of weekly activity that occurs on a typical weekday during the peak month to yield the average number of daily enplanements/deplanements that occurs in the peak month (see **Table 2-32**). This forecast projects a steady increase in average peak day enplaning and deplaning passengers, rising from 125 in 2011 to 237 in 2031.

Table 2-32. Peak Month Average Day Passenger Activity Forecast

Year	Peak Month Enpl/Depl	Weeks in Peak Month	Average Weekly Enpl/Depl	% of Weekly Activity on Typical Weekday		Average Weekday Passengers		
				Enplaning	Deplaning	Enplane-ments	Deplane-ments	Total
2011	1,918	4.4	436	14.3%	14.3%	62	62	125
2016	2,614	4.4	594	14.3%	14.3%	85	85	170
2021	3,010	4.4	680	14.3%	14.3%	97	97	194
2026	3,356	4.4	758	14.3%	14.3%	108	108	217
2031	3,674	4.4	830	14.3%	14.3%	119	119	237

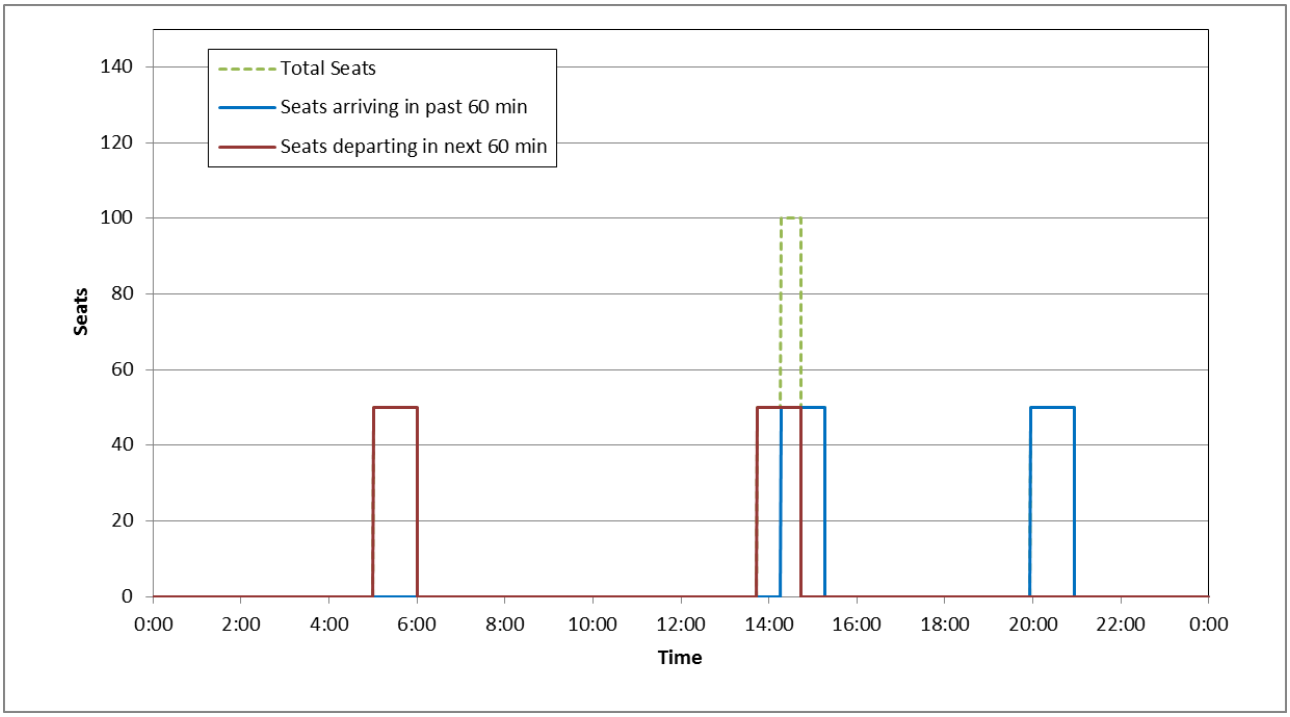
Sources: Airport Records, Official Airline Guide (OAG) February 2012 schedule, Mead and Hunt, Inc.

2.6.3 Peak Hourly Passenger Activity Forecasts

As mentioned previously, the typical approach to peak activity forecasting is to identify the "design hour" flows of passengers and aircraft. This section identifies the number of arriving and departing airline seats during the peak hour at the Chippewa Valley Regional Airport, and divides the peak day passenger activity forecast presented in the previous section by this number to develop a peak hour, or "design hour", passenger activity forecast.

The number of hourly arriving and departing seats during a typical weekday in the peak month is shown in **Chart 2-5**.

Chart 2-5. Peak Month Typical Weekday - Arriving and Departing Seats



The peak hour for total seats typically occurs between 1:45pm and 2:45pm, with 50 percent of all enplaning and deplaning passengers occurring during this time. The percentage of daily seats during the peak hour was applied to the average daily passenger forecast described in Section 2.6.2, and is shown in **Table 2-33**. This forecast predicts a steady increase in total peak hour passenger activity, rising from 62 in 2011 to 119 in 2031.

Table 2-33. Peak Hour Passenger Activity Forecast

	Average Day Passengers		Peak Hour Passengers		
			Enplanements	Deplanements	Total Passengers
Year	Enplanements	Deplanements	50.0%	50.0%	50.0%
2011	62	62	31	31	62
2016	85	85	42	42	85
2021	97	97	49	49	97
2026	108	108	54	54	108
2031	119	119	59	59	119

Sources: Airport Records, Official Airline Guide (OAG) February 2012 Schedule, Mead and Hunt, Inc.

2.6.4 Passenger Activity Peaking Characteristics Summary

A summary of the passenger activity peaking forecasts described in the previous sections is shown in **Table 2-34**, including the peak month, peak day, and peak hour passenger activity forecasts. These forecasts will be used in Chapter 3, Facility Requirements, to assess the appropriate capacity for facilities in the passenger terminal area. Among the key finding of this peak passenger activity analysis:

- An average of 10.7 percent of annual passenger activity occurs during the peak month at the Chippewa Valley Regional Airport.
- An average of 14.3 percent of weekly passenger activity occurs on the average day of the peak month.
- The peak hour for enplaning and deplaning passengers during the peak day is 1:45pm to 2:45pm.
- The Airport should plan for a peak hour of 119 arriving and departing passengers by 2031. However it should be noted that charter operations may require additional capacity.

Table 2-34. Passenger Activity Peaking Characteristics Summary				
Year	**Peak Factor**	**Enplanements**	**Deplanements**	**Total Passenger Activity**
2011	Projected			
	Annual	19,062	19,062	38,124
	Peak Month	1,918	1,918	3,836
	Peak Month Avg. Weekday	62	62	125
	Peak Hour Avg. Weekday	31	31	62
2016	Projected			
	Annual	24,376	24,376	48,751
	Peak Month	2,614	2,614	5,228
	Peak Month Avg. Weekday	85	85	170
	Peak Hour Avg. Weekday	42	42	85
2021	Projected			
	Annual	28,062	28,062	56,124
	Peak Month	3,010	3,010	6,019
	Peak Month Avg. Weekday	97	97	194
	Peak Hour Avg. Weekday	49	49	97
2026	Projected			
	Annual	31,291	31,291	62,583
	Peak Month	3,356	3,356	6,712
	Peak Month Avg. Weekday	108	108	217
	Peak Hour Avg. Weekday	54	54	108
2031	Projected			
	Annual	34,262	34,262	68,524
	Peak Month	3,674	3,674	7,349
	Peak Month Avg. Weekday	119	119	237
	Peak Hour Avg. Weekday	59	59	119

Sources: Airport Records, Official Airline Guide (OAG) February, 2012 Schedule, Mead & Hunt, Inc.

2.6.5 Peak Operations Forecasts

Like peak passenger activity forecasts, the typical approach to peak aircraft operations forecasting is to identify the "design hour" flows of aircraft operations, which is the estimate of the peak hour of the average day of the busiest month. This forecast will allow the Airport to assess the expected peak demand for airside facilities, such as runways and aircraft parking aprons, and to compare these demands to existing facility capacities. Historical monthly operations are shown in **Table 2-35**.

Table 2-35. Historical Peak Month - Aircraft Operations		
Month	**2011 Aircraft Operations**	**% Annual**
Jan	1,519	6.08%
Feb	1,530	6.12%
Mar	2,223	8.90%
Apr	2,031	8.13%
May	2,328	9.32%
Jun	2,255	9.03%
Jul	2,720	10.89%
Aug	2,457	9.83%
Sep	2,188	8.76%
Oct	2,018	8.08%
Nov	1,901	7.61%
Dec	1,814	7.26%
Totals	24,981	

Sources: Air Traffic Activity Data System, (ATADS), Mead & Hunt, Inc.

This analysis indicates that the peak month for aircraft operations at the Chippewa Valley Regional Airport is July. In 2011, the peak month accounted for approximately 10.89 percent of total operations at the Airport. To forecast peak month operations, the 10.89 percent peak month percentage of total operations in 2011 was applied to annual operations forecasts described in previous sections of this chapter. This peak month aircraft operations forecast was then divided by number of days in the peak month (31 days) to determine the average number of daily operations during the peak month. The FAA Enhanced Traffic Management System Counts (ETMSC) notes that the average number of aircraft operations in the peak hour of July 2011 totaled 33.1 percent of the total daily operations. It is expected that this percentage will remain constant throughout the forecast period. This percentage was applied to the average number of daily operations during the peak month to derive a peak hour aircraft operations forecast (see **Table 2-36**). This forecast predicts a steady increase in peak hour aircraft operations, rising from 29 in 2011 to 36 in 2031. This forecast will be used in Chapter 3, Facility Requirements, to assess the appropriate capacity for airside facilities such as runways and aircraft parking aprons.

Table 2-36. Peak Aircraft Operations Forecasts

Year	Annual Operations	Peak Month %	Peak Month Operations	Peak Month Avg. Day Operations	Peak Hour %	Peak Hour Operations
2011	24,981	10.89%	2,720	88	33.1	29
2016	25,880	10.89%	2,818	94	33.1	31
2021	27,076	10.89%	2,948	98	33.1	33
2026	28,538	10.89%	3,107	104	33.1	34
2031	30,165	10.89%	3,284	109	33.1	36
CAGR (2011-2031)	*0.95%*		*0.95%*	*1.11%*		*1.11%*

Notes: CAGR=Compounded Annual Growth Rate
Sources: Airport Records, FAA Enhanced Traffic Management Systems Counts (ETMSC), Mead and Hunt, Inc.

2.7 FORECAST SUMMARY AND FAA TAF COMPARISON

Based on the historic aviation activity information presented in this chapter, it is clear that passenger and aircraft activity at Chippewa Valley Regional Airport has fluctuated in recent years. However, this has not been uncommon at airports throughout the U.S., as economic uncertainty and increased travel costs have impacted travel behavior. Despite rapid increases in fuel cost, airline bankruptcies, system-wide route restructuring, and aircraft fleet overhauls, the forecasts developed for this Master Plan suggest positive growth in passenger enplanements, the number of based aircraft, and total aircraft operations at the Airport over the next 20 years. The following forecasts were identified in this chapter as the preferred forecasts for facility planning at Chippewa Valley Regional Airport:

- For passenger enplanements, the market share methodology was chosen as the preferred forecast methodology. This methodology assumes that the Airport's average share of total U.S. domestic passenger enplanements from 2001 to 2011 (0.0032 percent) will remain constant throughout the planning period. The preferred passenger enplanement forecast projects that enplanements at Chippewa Valley Regional Airport will grow by approximately 75 percent over the planning period, from 19,062 in 2011 to 34,262 in 2031.
- For passenger airline operations, the preferred passenger enplanement forecast was divided by the expected average passengers per flight over the next 20 years. Average passengers per flight is expected to increase in the future, as airlines phase out smaller aircraft and seek to increase passenger load factors to the maximum extent possible. For air taxi operations, the preferred forecast assumes that the FAA's projected annual growth rate for the national general aviation and air taxi fleet (0.90 percent) will also apply at the Airport. These preferred forecasts result in slow but steady growth in overall commercial aircraft operations, rising from 3,008 in 2011 to 3,945 in 2031.
- For based aircraft, the TAF was chosen as the preferred forecast methodology. This preferred forecast predicts moderate growth in based aircraft, rising from 80 in 2011 to 96 in 2031.
- For general aviation operations, the operations per based aircraft methodology was chosen as the preferred forecast methodology. This methodology assumes that the number of operations

per based aircraft in 2011 (265) will remain constant throughout the planning period. This preferred forecast projects steady growth in general aviation operations, rising from 21,184 in 2011 to 25,432 in 2031.

- For peak passenger and aircraft activity, the preferred forecast identified the "design hour" flows of passengers and aircraft, which are estimates of the peak hour of the average day of the busiest month. The peak passenger activity forecast predicts strong growth in total peak hour passengers, rising from 62 in 2011 to 119 in 2031. The peak aircraft operations forecast predicts slower growth in peak hour operations, rising from 29 in 2011 to 36 in 2031.

The FAA templates for summarizing and documenting airport planning forecasts and for comparing forecasts with the FAA TAF Forecasts are presented in **Table 2-37** and **Table 2-38**. These forecasts will be used in the next Chapter to determine facility requirements at the Airport.

Table 2-37. FAA Template for Comparing Airport Planning and TAF Forecasts
Chippewa Valley Regional Airport

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base Yr. Level	2011	19,062	19,790	-3.7%
Base Yr. + 5yr.	2016	24,376	22,027	10.7%
Base Yr. + 10yrs.	2021	28,062	24,543	14.3%
Base Yr. + 15yrs.	2026	31,291	27,371	14.3%
Base Yr. + 20yrs.	2031	34,262	30,557	12.1%
Commercial Operations				
Base Yr. Level	2011	3,008	3,292	-8.6%
Base Yr. + 5yr.	2016	3,236	3,590	-9.8%
Base Yr. + 10yrs.	2021	3,527	3,914	-9.9%
Base Yr. + 15yrs.	2026	3,773	4,268	-11.6%
Base Yr. + 20yrs.	2031	3,945	4,653	-15.2%
Total Operations				
Base Yr. Level	2011	24,981	25,375	-1.6%
Base Yr. + 5yr.	2016	25,880	25,426	1.8%
Base Yr. + 10yrs.	2021	27,341	25,705	6.4%
Base Yr. + 15yrs.	2026	28,538	26,014	9.7%
Base Yr. + 20yrs.	2031	30,165	26,354	14.5%

NOTES: TAF data is on a U.S. Government fiscal year basis (October through September). Airport Forecast is on a calendar year basis.

Table 2-38. FAA Template for Summarizing and Documenting Airport Planning Forecasts
Chippewa Valley Regional Airport

A. Forecast Levels and Growth Rates

	Specify base year: 2011					Average CAGR			
	2011	**2016**	**2021**	**2026**	**2031**				
	Base Yr. Level	**Base Yr. + 5yr.**	**Base Yr. + 10yrs.**	**Base Yr. + 15yrs.**	**Base Yr. + 20yrs.**	**Base Yr. + 5yr.**	**Base Yr. + 10yrs.**	**Base Yr. + 15yrs.**	**Base Yr. + 20yrs.**
Passenger Enplanements									
TOTAL Air Carrier & Commuter	19,062	24,376	28,062	31,291	34,262	5.0%	3.9%	3.4%	3.0%
Operations									
Itinerant									
Air carrier	42	46	54	62	66	1.8%	2.5%	2.6%	2.3%
Commuter/air taxi	2,966	3,190	3,473	3,711	3,879	1.5%	1.6%	1.5%	1.4%
Total Commercial Operations	3,008	3,236	3,527	3,773	3,945	1.5%	1.6%	1.5%	1.4%
General aviation	15,677	15,970	16,825	17,520	18,584	0.4%	0.7%	0.7%	0.9%
Military	487	487	487	487	487	0.0%	0.0%	0.0%	0.0%
Local									
General aviation	5,507	5,885	6,200	6,456	6,848	1.3%	1.2%	1.1%	1.1%
Military	302	302	302	302	302	0.0%	0.0%	0.0%	0.0%
TOTAL OPERATIONS	24,981	25,880	27,341	28,538	30,165	0.7%	0.9%	0.9%	0.9%
Instrument Operations	9,139	9,453	9,986	10,423	11,018	0.7%	0.9%	0.9%	0.9%
Peak Hour Operations	29	31	33	34	36	1.4%	1.2%	1.1%	1.1%
Cargo/mail (enplaned+deplaned tons)	0	0	0	0	0				
Based Aircraft									
Single Engine (Nonjet)	61	62	64	66	68	0.3%	0.5%	0.5%	0.6%
Multi Engine (Nonjet)	10	10	11	11	13	-0.2%	1.2%	0.6%	1.3%
Jet Engine	8	10	11	13	14	4.4%	3.5%	3.1%	3.0%
Helicopter	1	1	1	1	1	0.6%	0.8%	0.8%	0.9%
Other	0	0	0	0	0				
TOTAL	80	83	87	91	96	0.6%	0.8%	0.8%	0.9%

B. Operational Factors

	Base Yr. Level	**Base Yr. + 5yr.**	**Base Yr. + 10yrs.**	**Base Yr. + 15yrs.**	**Base Yr. + 20yrs.**
Average aircraft size (seats)					
Air carrier & Commuter	52.8	55.6	55.8	56.1	56.5
Average enplaning load factor					
Air carrier & Commuter	43.5%	48.0%	49.0%	50.0%	52.0%
GA operations per based aircraft	265	265	265	265	265

CAGR = Compound Annual Growth Rate