CHAPTER 2
AVIATION DEMAND FORECAST

MASTER PLAN UPDATE
BISMARCK AIRPORT

Prepared For
THE CITY OF BISMARCK
Bismarck, North Dakota

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DRAFT

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CHAPTER 2
AVIATION DEMAND FORECAST

Aviation demand forecasts at Bismarck Airport are presented in this chapter for the 20-year planning period (2005-2025). Forecasts of aviation demand provide a basis for determining the type, size, and timing of aviation facility development. Consequently, the forecasts influence virtually all phases of the planning process.

Forecasting future activity involves both analytical techniques and subjective considerations. Regardless of the methodology used, assumptions must be made about how internal and external forces might change in the future. Factors that can influence aviation activity levels include regulatory policy on the local and national level, technological innovations, aviation industry trends, and local fluctuations in population and employment. The objective of forecasting is to develop a realistic measure of the potential for these changes so their effect can be estimated in a rational manner and preparations can be made to smoothly and cost-effectively accommodate their impact on airport facilities. The development of forecasts of aviation demand for Airport are presented in the following sections of this chapter.

- Historical Activity Review
- Factors Affecting Future Aviation Demand
- Forecast of Annual Enplaned Passengers
- Forecasts of Annual Aircraft Operations
- Forecast of Air Cargo
- Based Aircraft Forecast
- Instrument Approaches
- Design Day/Design Hour Activity Forecasts
- Comparison with Other Forecast Efforts
- Summary of Forecasts

The forecasts provide three planning activity levels (PAL1, PAL2, and PAL3) for five, 10, and 20-year estimates of future aviation activity levels at the Airport. The association of planning activity levels with specific time frames is necessary in order to develop a schedule of improvement needs and assess the ability of the Airport to finance the recommended development plan. It is important, however, to view the projections independent of specific years, and consider the projections to be planning activity levels, which identify trigger points for future airport facilities. If actual growth occurs faster than anticipated, the implementation schedule should be reassessed and accelerated as necessary. Similarly, slower than projected growth may warrant deferment of planned improvements to a later date. Actual activity growth should be frequently compared to projected growth so schedule corrections can be identified and implemented.

2.1 HISTORICAL ACTIVITY REVIEW

This section presents a general overview of commercial service airports followed by a brief review of long-term historical trends in various elements of aviation activity at Bismarck Airport. Elements reviewed included airlines serving the Airport, market services, market share, annual enplaned passengers, and annual aircraft operations.

2.1.1 Regional Commercial Service Airports

Bismarck Airport is classified as a non-hub airport by the Federal Aviation Administration (FAA). The FAA's definition of a hub is not to be confused with the designation of a city/airport used by an airline where flights are concentrated in a hub-and-spoke operating concept. The FAA definitions are important because federal Airport Improvement Program (AIP) funding is dependent, in part, upon hub classification.

Table 2-1
NORTH DAKOTA AIRPORT RANKINGS

Class	National National	Airport Airport	Airport Name	City	State	CY 2004 ACAIS Data Annual		Percent of
N	158	FAR	Hector International	Fargo	ND	261,872		0.04%
N	187	BIS	Bismarck Airport	Bismarck	ND	163,420	*	0.02%
N	215	GFK	Grand Forks International	Grand Forks	ND	91,746		0.01%
N	225	MOT	Minot International	Minot	ND	74,594		0.01%
			Total All US Airports			706,424,048		100.00%

Source: FAA's CY04 Air Carrier Activity Information System (ACAIS) Database
*Airport Records vary slightly from FAA Records

The FAA hub classifications are based on the percentage of enplanements at an airport compared to the total number of enplanements in the United States. These percentages are as follows:

- **Large Hub** – Enplanes more than 1.0 percent of the nation's enplaned passengers
- **Medium Hub** – less than 1.0 percent but greater than 0.5 percent
- **Small Hub** – less than 0.5 percent but greater than 0.25 percent
- **Non-Hub** – less than 0.25 percent

In 2004, Bismarck Airport was ranked the 187th busiest airport in the nation, 47th largest of the 259 non-hub airports. It is the second busiest commercial service airport in North Dakota.

2.1.2 Airlines Serving the Airport

Air carrier and commuter passenger airlines that have operated at Bismarck Airport since calendar year 2000 are identified in Table 2-2.

Table 2-2
AIR CARRIERS SERVING THE AIRPORT

	2000	2001	2002	2003	2004	2005
AIR CARRIER						
Allegiant					•	•
Northwest	•	•	•	•	•	•
Northwest Airlink (Big Sky)	•	•	•	•	•	
Northwest Airlink (Mesaba)	•	•	•	•	•	•
Northwest Airlink (Pinnacle)			•	•	•	•
United Express (Air Wisconsin)	•	•	•	•	•	•
United Express (Skywest)			•	•	•	•
TOTAL AIR CARRIERS	4	4	6	6	7	6

Source: Bismarck Airport Records

2.1.3 Market Services

Since airline economic deregulation in 1978, most of the major airlines adopted a hub-and-spoke operating concept. A hub is a collecting point for traffic where passengers arrive on flights from multiple origination points, connect to other flights timed to provide multiple destination options, and depart again to their final destination. Bismarck Airport operates chiefly as a spoke airport with mainline and/or their commuter airlines feeding traffic to the airlines' respective hub airports. The hub-and-spoke system is a means for a single flight from a spoke airport to have multiple one-stop markets through the hub airport. Principal hub information by the major airlines is as follows:

Table 2-3
PRIMARY DOMESTIC HUB AIRPORTS

Airline	Hub City
AirTran	Atlanta
Alaska	Seattle, Anchorage
Allegiant	Las Vegas
American	Dallas-Ft.Worth, Chicago (O'Hare), St. Louis, Miami
Continental	Houston, Newark, Cleveland
Delta	Atlanta, Cincinnati, Salt Lake City, Orlando
Frontier	Denver
JetBlue	New York (JFK)
Northwest	Detroit, Minneapolis-St. Paul, Memphis
Southwest	Dallas (Love Field), Chicago (Midway), Las Vegas, Phoenix, Houston (Hobby), Baltimore
US Airways	Philadelphia, Charlotte, Phoenix, Las Vegas
United	Chicago (O'Hare), Denver, San Francisco, Washington (Dulles)

As a spoke airport, the air service at Bismarck Airport is focused on the hub airports of the major and regional airlines. Because the Airport is a relatively small market, flights to an airline hub provide multiple service destinations that could not be supported by the amount of locally generated traffic. Most spoke airports typically have service limited to hub airports, except for some key recreational and/or seasonal services to cities such as Las Vegas or Orlando. The current direct markets served at the Airport fit this pattern of service:

- Allegiant Air serves Las Vegas
- Northwest Airlines and Northwest Airlink (Mesaba Aviation and Pinnacle Airlines) serve Minneapolis
- United Express (Sky West) provides service to Denver

This pattern of service reflects the industry trends in hub and spoke services and offers insight into potential future services. Specifically, airlines compete by offering hub services that are equal to or greater than those of other airline hubs, the objective being to maximize the size of the hub by serving as many spoke markets as feasible. This implies that hub airlines not currently serving Bismarck are candidates for future services to assure the competitiveness of their hub.

In addition, airlines currently serving the Airport have a reasonable expectation of having service to multiple hubs so long as they can be served with an aircraft that suits the market in terms of size and range. This implies that Bismarck Airport is a potential candidate particularly for non-stop regional airline service with regional jets. The introduction of regional jets into the airline fleets provides the opportunity for more distant hub services to communities such as Bismarck.

The key positive aspect of the hub-and-spoke concept for airports like Bismarck Airport is numerous one-stop service destinations, available through the hub airports that would not typically be available on a non-stop basis. The negative impact is that passengers must make flight connections at the hub airport.

2.1.4 Market Share

The passenger market share for the airlines serving Bismarck Airport in 2004 and 2005 is presented in Table 2-4. As shown, Northwest Airlines carried the largest percentage of the enplanements in both years.

Table 2-4
AIRLINE MARKET SHARE

Airline	CY 2005 Enplanements	Percent of Total	CY 2004 Enplanements	Percent of Total
Allegiant	15,795	9.1%	9,548	6.1%
Northwest/Northwest Airlink	118,277	67.8%	113,640	72.1%
United Express	40,419	23.2%	34,449	21.9%
Total	174,491	100.0%	157,637	100.0%

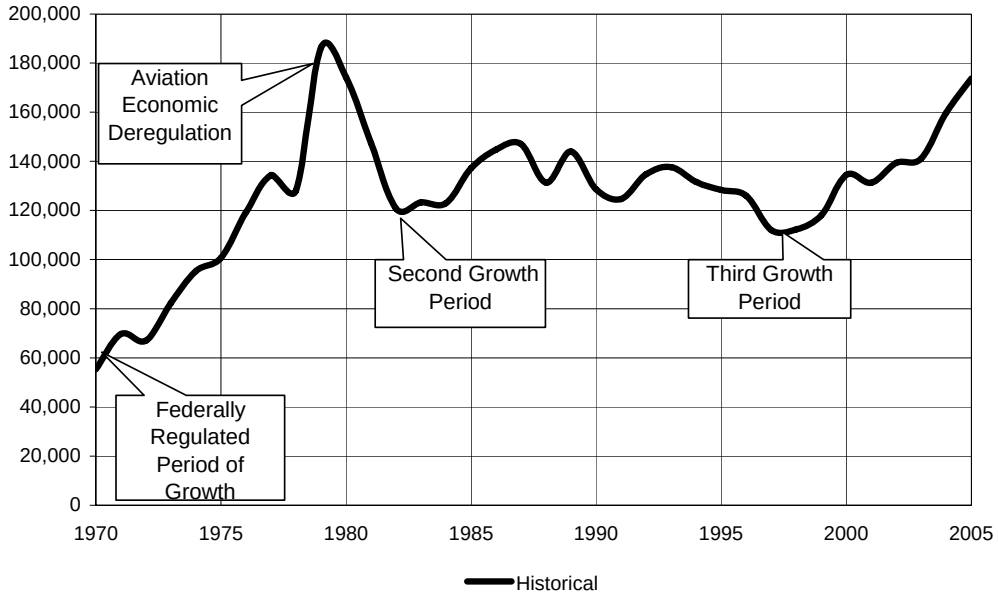
Source: Bismarck Airport Records

2.1.5 Annual Enplaned Passengers

An extended history of passengers boarding commercial service aircraft, or enplanements, at the Airport is presented in Table 2-5. Enplanements at Bismarck Airport have grown at an average annual rate of 3.3 percent over the last 35 years. This growth rate has varied with several multi-year peak and drop fluctuations in enplanements due to national and local economic conditions. Over the last eight years, enplanements at Bismarck Airport have grown at an average annual rate of about 6.5 percent.

Prior to a period of expansions and contractions from 1985 to 1997, the Airport experienced a period of relatively strong growth from 1970 to 1979. After approximately three years of decline (as the US airline industry adjusted fares and service in response to deregulation and the national economic recession in the early 1980s), enplanements at the Airport entered a second short period of growth. This second period of growth consisted of an underlying cycle of small expansions and contractions. Enplanement activity at the Airport has been expanding since 1997.

Table 2-5
HISTORICAL ENPLANEMENTS



Year	Total Enplanements	Annual Increase / Decrease
1970	55,271	
1975	100,755	
1980	174,199	
1985	137,245	
1990	128,691	
1995	128,369	
1996	125,999	- 1.8%
1997	112,073	-11.1%
1998	112,267	0.2%
1999	117,943	5.1%
2000	134,483	14.0%
2001	131,246	- 2.4%
2002	139,343	6.2%
2003	141,090	1.3%
2004	159,963	13.4%
2005	173,738	8.6%

Source: Bismarck Airport Records

2.1.6 Annual Aircraft Operations

An aircraft operation is defined as either a takeoff or a landing. Table 2-6 presents a long-term history of the annual aircraft operations recorded at the Airport in four categories: air carrier, commuter/air taxi (commuter), general aviation, and military. An air carrier operation represents either a takeoff or a landing of a commercial aircraft with seating capacity of more than 60 seats. Commuter operations represent scheduled commercial flights for aircraft with 60 or fewer seats and include air taxi operations, which are nonscheduled flights or for-hire flights of aircraft with 60 or fewer seats. General Aviation operations represent all civil aviation aircraft takeoffs and landings not classified as commercial (air carrier or commuter) or military.

Air carrier operations were at their highest annual historical level at more than 17,700 operations in 1980. Air carrier operations declined each year through 1994 and have remained relatively steady between 2,600 and 3,000 operations in recent years.

Commuter operations have grown considerably since 1980, increasing from approximately 1,300 to a peak of more than 16,500 operations in 1994. After declines in the mid 1990's, commuter operations have remained relatively steady between 9,000 and 11,000 annual operations in recent years.

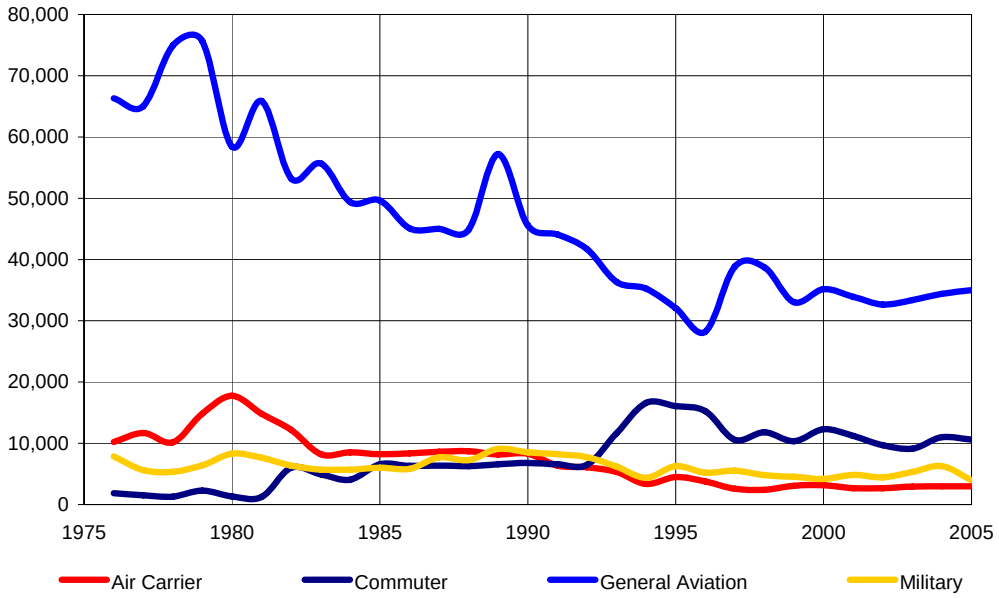
Until the early 1990s, air carrier operations significantly exceeded commuter operations. However, consistent with airline industry trends throughout the US, Bismarck air service became much more reliant on commuter category aircraft in the 1990s as evidenced by the increase in the number of annual commuter operations relative to air carrier operations. This trend has grown even more pronounced throughout the US and at Bismarck in recent years. At Bismarck Airport, commuter operations now outnumber air carrier operations by roughly a 3 to 1 margin.

The changes in air carrier versus commuter operations are not necessarily a negative factor in the air service trend. Today, many commuter airlines operate regional jet aircraft that offer 50 seats (or more). The use of regional jet aircraft has allowed a much higher level of perceived quality of service to many communities, as passenger preferences for jet aircraft relative to propeller, has been demonstrated. The changes made in fleet aircraft size have contributed to this transition as airlines assign the most economical aircraft to the market. Since 1978, most of the major airlines have accomplished this by transitioning the services to their affiliated or code share partners that operate smaller aircraft than those of the mainline carrier. Early on, these commuter aircraft were 19 seat propeller aircraft. These aircraft transitioned to 30 seat turboprop aircraft. The 30 seat turboprop aircraft appear to be in transition to the 50 seat and larger regional jet aircraft now appearing in the commuter fleet.

General aviation operations represent all civil aviation aircraft takeoffs and landings not classified as commercial (air carrier or commuter) or military. As shown in Table 2-6, general aviation operations were at their highest annual level at more than 75,000 operations throughout the late 1970's. General aviation operations had a generally declining trend with the exception of a few spikes through 1996 where there was a slight increase to about 40,000 operations followed by a stabilizing trend to approximately 35,000 annual operations thereafter through 2005.

Military aircraft operations have fluctuated within a range of approximately 4,000 to 8,500 annual operations over the past 15 years. There were slightly less than 4,000 annual military operations at Bismarck Airport in 2005.

Table 2-6
HISTORICAL OPERATIONS



	Commercial Service			General		
Year	Air Carrier	Commuter	Total	Aviation	Military	Total
1976	10,218	1,848	12,066	66,308	7,892	86,266
1980	17,761	1,324	19,085	58,450	8,321	85,856
1985	8,230	6,571	14,801	49,625	6,007	70,433
1990	8,302	6,785	15,087	45,566	8,514	69,167
1991	6,380	6,575	12,955	44,095	8,215	65,265
1992	6,093	6,505	12,598	41,729	7,773	62,100
1993	5,320	11,633	16,953	36,338	6,188	59,479
1994	3,361	16,608	19,969	35,245	4,374	59,588
1995	4,487	16,061	20,548	32,073	6,287	58,908
1996	3,754	15,253	19,007	28,255	5,189	52,451
1997	2,590	10,572	13,162	38,852	5,550	57,564
1998	2,413	11,832	14,245	38,732	4,792	57,769
1999	3,059	10,354	13,413	33,053	4,566	51,032
2000	3,163	12,292	15,455	35,184	4,206	54,845
2001	2,673	11,219	13,892	33,918	4,859	52,669
2002	2,688	9,702	12,390	32,647	4,446	49,483
2003	2,928	9,130	12,058	33,406	5,348	50,812
2004	3,009	11,008	14,017	34,374	6,301	54,692
2005	2,982	10,621	13,603	35,018	3,985	52,606

Source: FAA Terminal Area Forecast (FY76 - FY05)
Bismarck Airport Records

Total operations at the Airport have decreased at an average annual rate of approximately 1.7 percent over the last 29 years, with most of the change attributable to the decline in general aviation activity.

2.2 FACTORS AFFECTING FUTURE AVIATION DEMAND

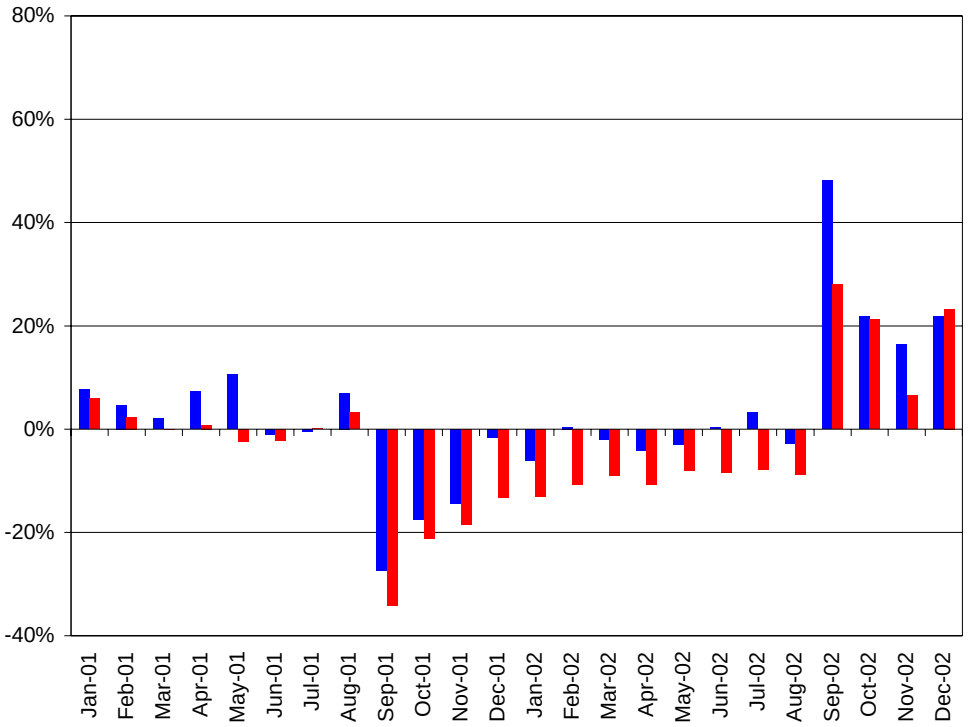
The terrorist acts of September 11, 2001, resulted in a pronounced negative impact on the aviation industry. A brief review of what has happened at the Airport since September 11, 2001, is followed by a discussion of other factors that will have an affect on the aviation industry. The national economy, local socioeconomic conditions, airfare levels, airline competition, and the quality of airline service are reviewed to determine what effect these variables may have on the demand for future aviation activity at Bismarck Airport.

2.2.1 Impact of September 11, 2001

The events of September 11th had a profound impact on passenger interest to travel in the ensuing months. All airports were negatively affected, some more than others. Bismarck Airport and many other airports were impacted by the airline economic troubles that followed September 11th. Service cutbacks were widespread and many smaller communities were deeply impacted.

Table 2-7 tracks monthly enplanements at Bismarck Airport compared to the airline industry during 2001 and 2002. The Airport outperformed the industry throughout the period. In general, month to month percentage increases in enplanements at Bismarck Airport were greater than the industry overall and percentage declines were less. Moreover, Bismarck's recovery from the September 11th events appeared to have been quicker and more pronounced.

Table 2-7
MONTHLY ENPLANEMENTS – BISMARCK AND THE AIRLINE INDUSTRY



Month	Bismarck Municipal Airport 2001	Change Prior Year	2002	Change Prior Year	Airline Industry (in thousands) 2001	Change Prior Year	2002	Change Prior Year
January	10,536	7.7%	9,899	- 6.0%	43,832	6.0%	38,126	- 13.0%
February	9,987	4.7%	10,026	0.4%	47,560	2.3%	42,429	- 10.8%
March	10,878	2.1%	10,659	- 2.0%	52,825	- 0.1%	48,047	- 9.0%
April	9,982	7.2%	9,561	- 4.2%	52,097	0.8%	46,477	- 10.8%
May	12,372	10.6%	11,988	- 3.1%	50,720	- 2.4%	46,581	- 8.2%
June	11,941	- 1.2%	11,977	0.3%	54,889	- 2.2%	50,293	- 8.4%
July	14,072	- 0.6%	14,532	3.3%	55,497	0.2%	51,156	- 7.8%
August	12,152	7.0%	11,820	- 2.7%	56,143	3.2%	51,226	- 8.8%
September	7,648	- 27.4%	11,332	48.2%	31,409	- 34.2%	40,224	28.1%
October	11,080	- 17.6%	13,498	21.8%	39,817	- 21.2%	48,273	21.2%
November	9,881	- 14.5%	11,499	16.4%	41,503	- 18.5%	44,226	6.6%
December	10,717	- 1.7%	13,057	21.8%	40,450	- 13.4%	49,865	23.3%
Total	131,246	- 2.4%	139,848	6.6%	566,743	- 6.5%	556,923	- 1.7%
Jan - Aug		4.4%		- 1.6%		0.8%		- 9.5%

Source: Bismarck Airport Records

2.2.2 National Economic Conditions

The national economy began slowing during the latter stages of 2000. Since the conclusion of the Persian Gulf War in early 1992, the national economy was in an expansion mode for a record number of quarters until 2000. On November 26, 2001, the National Bureau of Economic Research announced that the US Economy had entered its 10th recession since the end of World War II. However, the severity of the recession was not known until early 2002. Many analysts predicted the recession would last for one quarter but the economy actually declined for three consecutive quarters, starting with the first quarter of 2001. Not coincidentally, the downturn in US domestic passenger and cargo demand also began during this same quarter.

By the third quarter of 2001 the US economy was in full recovery with quarter to quarter growth in GDP surging to more than 7.0 percent by the third quarter of 2003. Quarter to quarter GDP growth has remained solid for most periods varying around 3.5 to 4.0 percent.

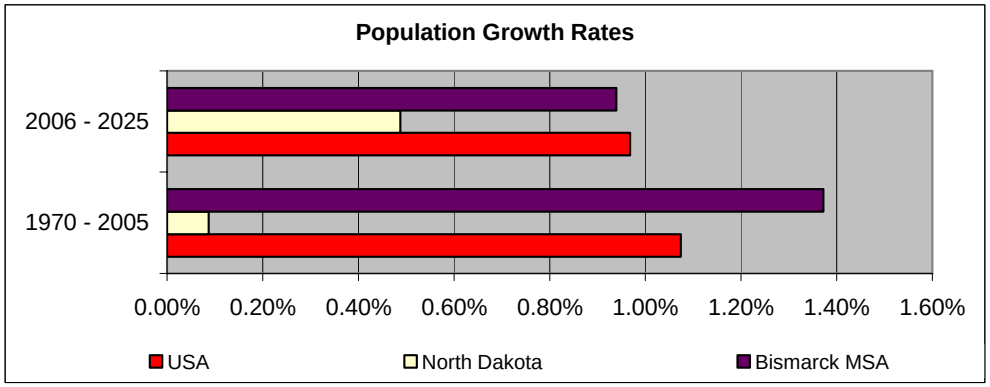
According to the Bureau of Economic Analysis, the US Gross Domestic Product grew at 4.6 percent annually in 2005. The FAA and other national forecasts anticipate GDP to level off in 2006 and 2007 between 3.4 and 3.1 percent. The long-term forecast period anticipates a growth rate of 3.1 percent. These forecasts have been considered in calculating future annual growth rates at the Airport. The timing, extent, and rate of annual growth in the US economy and future changes in real disposable income will affect the rate of future airline traffic both nationally and at Bismarck Airport.

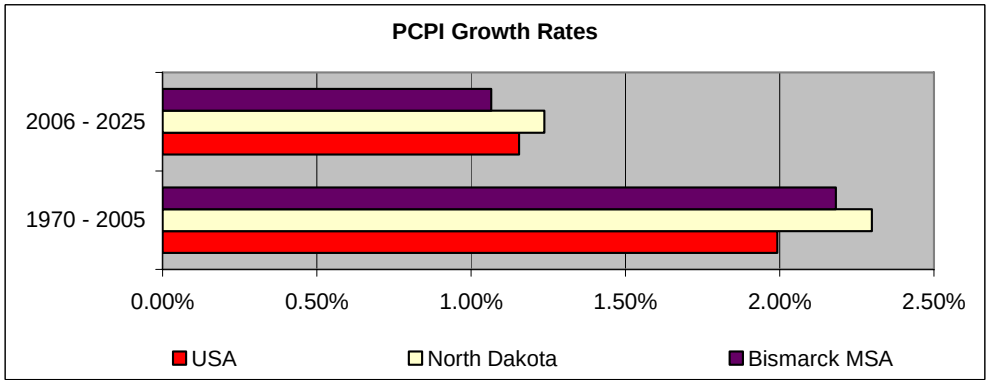
Passengers' concerns for safety have largely diminished; however, the problematic economic conditions within the Airline industry still persist. Most airlines struggled to remain solvent during the economic downturn made worse by September 11th. Several airlines have been particularly hard hit by the economic slowdown discussed above and filed for bankruptcy protection (United Airlines in 2002, US Airways in 2002, ATA Airlines in 2004, Delta Air Lines and Northwest in 2005). While conditions are now improving, past occurrences illustrates the severity of the airline industry's economic condition. The very high cost of fuel continues to be a major economic problem for the airline industry.

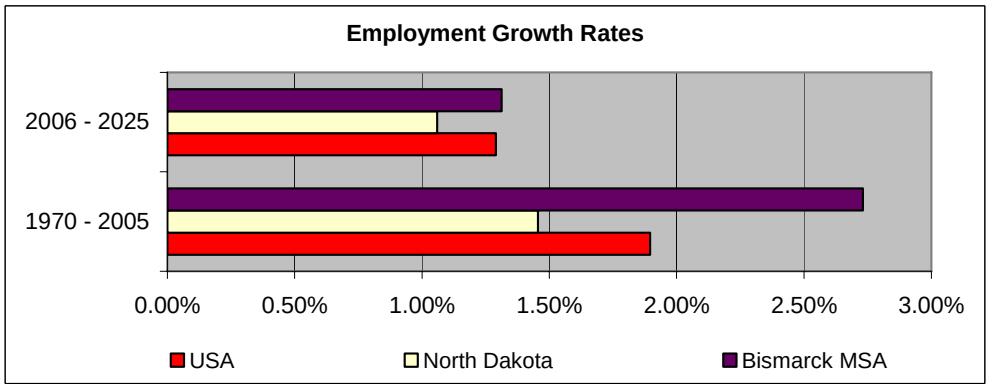
2.2.3 Local Socioeconomic Conditions

Consideration of a community's economic character is particularly important to the determination of business travel, general aviation, and air cargo levels. Prior to developing the aviation demand forecasts for the Airport, current and projected economic trends and population projections associated with the Airport's primary air service area were examined. The Airport's primary service area is the city of Bismarck and includes Burleigh County, and the central region of North Dakota. Table 2-8 shows historical and projected information for the Bismarck metropolitan statistical area, North Dakota, and the US.

Table 2-8
HISTORICAL AND DEMOGRAPHIC INFORMATION







Source: Woods & Poole

The following summarizes demographic information depicted in Table 2-8:

- Population growth rates for the Bismarck air service area are lower than they are for the US, for the historical period from 1970 through 2005. Population growth rates in the Bismarck air service area are projected to rise above the rates projected for the US and for North Dakota.
- Historical per capita personal income (PCPI) is higher for the US and North Dakota when compared to the Bismarck air service area. PCPI for the Bismarck air service area is projected to increase above the rate projected for the US and North Dakota.
- Historical and projected growth rates for employment for the air service area are higher than the US and North Dakota, from 1970 through 2005, and are projected to remain higher.

The local socioeconomic picture derived from examination of the historical trends and forecasts presented in Table 2-8 presents positive outlooks for the air service area. It is expected that population and the economy will continue to grow at a moderate rate as experienced over the last 30 years.

2.2.4 Airline Hubs

The disadvantage of air service from a spoke city is the necessity to make a connection. Bismarck Airport has a far driving distance from several hub airports (Northwest Airline's hub at Minneapolis International Airport and United's hub at Denver International Airport). As a result, no other airports can be identified as significant sources of passenger diversion for Bismarck Airport.

2.2.5 Air Fares

Air fare levels have an important effect on the demand for airline service nationally and at the Airport. Air fares are influenced by airline operational costs such as aircraft maintenance, industry competition, and fuel. Overall, aviation fuel has dramatically increased in price since 1980. A slight increase in fuel prices was recorded in the early 1990s as a result of the Persian Gulf War however fuel prices have risen sharply over the past three years. The FAA's long range fuel cost forecast acknowledges the short range increases and calls for cost stability for the balance of the forecast period. Other costs impacting air fares, such as labor costs, are forecast to increase nominally during the forecast period. Significant competition from low-cost carriers will limit the industry's ability to pass on higher operating costs to passengers via higher air fares.

Low-cost, point-to-point airlines have survived with small passenger service growth since September 11, 2001. These operators have increased the enplanements by offering affordable direct flights to vacation and resort locations from non-airline hub airports like Bismarck Airport. Allegiant Airlines offers this type of service at Bismarck Airport.

2.2.6 Airline Competition

Competitive factors have a significant influence on air fares. On routes that are more competitive or in a city with a competitive environment such as one to two major air carriers and a low-fare carrier, airfares are significantly lower. Changes in competitive forces such as airline bankruptcies, mergers, and acquisitions would significantly influence, positively or negatively, airline traffic at the Airport.

2.2.7 Summary

The variables discussed in this portion of the master plan play an important role in the future demand for aviation activity at the Airport. The air service area has experienced steady population, economic, and employment growth since 1969 to the present, and these socioeconomic factors are projected to continue to grow through the forecast period. Air service provided at Bismarck has also grown considerably from 2000 to the present. During periods of expanded air service, the Airport's enplanements increased rapidly. Air service retractions have a corresponding downward impact on enplanements.

2.3 ENPLANED PASSENGER FORECAST

The forecast of enplaned passengers is the foundation upon which other commercial service activity forecasts are developed. The enplaned passenger forecasts are also the basis for determination of the future facilities needed to accommodate projected passenger demands. Each of the following analytical techniques is employed in the preparation of enplanement projections for the Airport:

- Historical trend line analyses including time series analyses and historical growth
- Regression analyses, which examine various socioeconomic indicators to determine if strong relationships exist between the indicators and elements of aviation activity
- Market share analyses, which compare the performance of the local market to the national market
- Comparable market analyses of other regional airport markets
- The FAA's February 2006 Terminal Area Forecasts for Bismarck Airport

A preferred forecast is subsequently selected based on the results of the above analytical techniques.

2.3.1 Trend Analysis Projections

Trend line analysis is one of the simplest and most familiar forecasting techniques. This technique provides projections of the aviation demand element by extrapolating long-term historical data trends into the future. A fundamental assumption of this technique is that historical stimuli for aviation demand will continue to exert a similar influence on future demand levels. As broad as this assumption may be, this projection technique serves as a benchmark against which the results of other projection methods may be compared. The two different types of trend analyses utilized are ratio and growth rate projections and time series analyses.

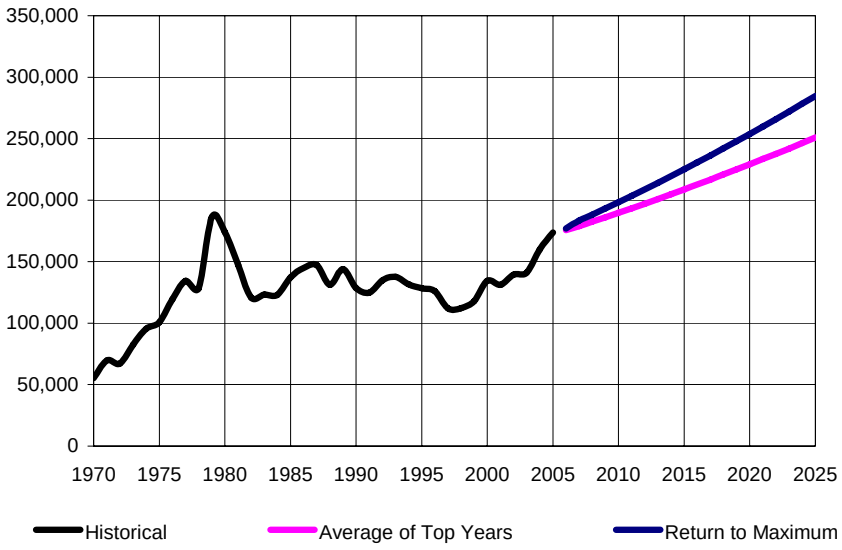
2.3.1.1 Ratio and Growth Rate Projections

Six enplanement scenarios were developed using ratio and growth rate projections. Ratio and growth rate projections rely on historical trends and the forecaster's judgment to develop possible future activity levels. Each projection is associated with a scenario relating to historical data. For example, one scenario will show the historical ratio of enplanement per capita growing at historical rates.

The first two scenarios relate historical annual ratios of air passengers to Bismarck area population totals and calculate the potential annual enplanement growth (see Table 2-9). The first scenario assumes the enplanements per capita ratio will return to the above average ratios experienced in the past. The second scenario grows to the historical maximum enplanements per capita ratio of 2.40 by 2025.

Average annual compound growth rate scenarios were used to develop the enplanement projections presented in Table 2-10. The first scenario using this trend analysis technique assumes the 35-year historical average growth rate (3.3 percent per year from 1970 to 2025) would continue through the planning period. The second scenario reflects an annual growth rate (1.6 percent per year from 1982 to 2005). The final scenario using this trend analysis technique assumes the eight-year annual growth rate (5.6 percent per year from 1997 to 2005) would continue through the planning period.

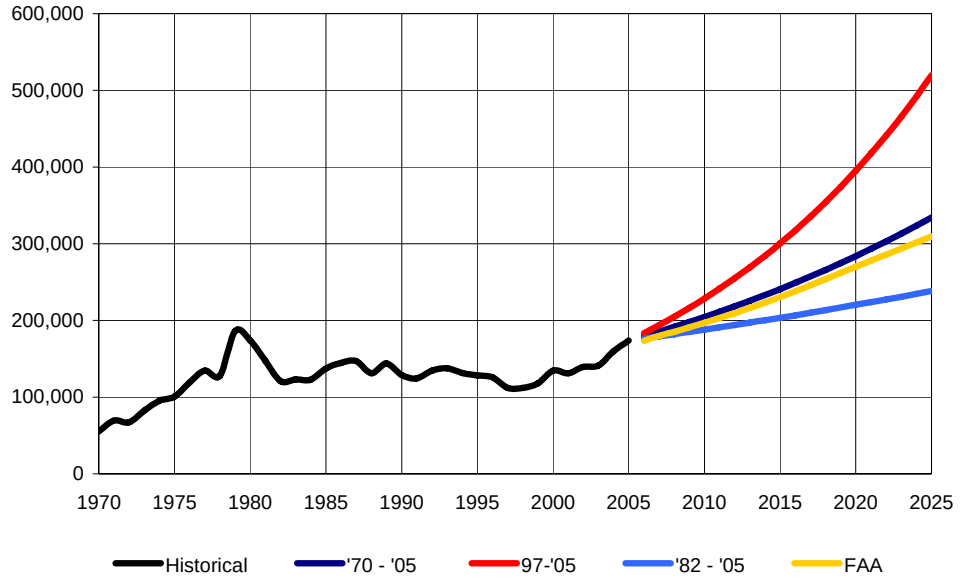
Table 2-9
ENPLANEMENT PROJECTIONS USING PER CAPITA TRENDS



				Per Capita Trend Scenarios			
				Average of Top Years		Return to Maximum	
Year	Enplanements	Pop	Enpl / Capita	Enpl / Capita	Enpl	Enpl / Capita	Enpl
1970	55,271	61,210	0.90				
1975	100,755	69,095	1.46				
1980	174,199	80,234	2.17				
1985	137,245	85,323	1.61				
1990	128,691	83,965	1.53				
1995	128,369	90,288	1.42				
2000	134,483	94,831	1.42				
2005	173,738	98,627	1.76				
2010		103,265		1.85	189,700	1.92	198,300
2015		108,275		1.95	208,700	2.08	225,100
2025		118,847		2.13	250,900	2.40	284,700
Avg Growth Rate							
2005 - 2010					1.7%		2.7%
2005 - 2015					1.8%		2.6%
2005 - 2025					1.9%		2.5%

Table 2-10

ENPLANEMENT PROJECTIONS USING AVERAGE ANNUAL GROWTH RATES



Year	Enplanements	Avg Annual Growth Rate	BIS Average Annual Growth Rates '70 - '05	BIS Average Annual Growth Rates '82 - '05	BIS Average Annual Growth Rates '97 - '05	FAA National Growth Rate
1970	55,271					
1975	100,755	12.8%				
1980	174,199	11.6%				
1985	137,245	- 4.7%				
1990	128,691	- 1.3%				
1995	128,369	- 0.1%				
2000	134,483	0.9%				
2005	173,738	5.3%				
2010			204,600	188,000	228,500	196,800
2015			241,000	203,500	300,500	230,400
2025			334,300	238,400	519,900	309,700
Avg Growth Rate						
2005 - 2010			3.3%	1.6%	5.6%	2.5%
2005 - 2015			3.3%	1.6%	5.6%	2.9%
2005 - 2025			3.3%	1.6%	5.6%	2.9%

2.3.1.2 Time Series Analysis

A time series analyses of historical enplanements was performed to project future enplanements by examining the 35 year period from 1970 through 2005 and the 23 year period from 1982 through 2005 (see Table 2-11).

These projection analyses provide a look at future enplanement growth without the dramatic peaks and valleys from national and regional events. The variances in the analyses are due to the selected time series with the largest growth forecast (1970 – 2005) anticipating 200,000 enplanements and the total historical time series forecast (1982 – 2005) anticipating 185,300 enplanements by the end of the planning period. Note that both time series "underprojected" 2005 annual enplanements and were indexed upward to adjust for this fact.

2.3.2 Econometric and Socioeconomic Regression Analysis

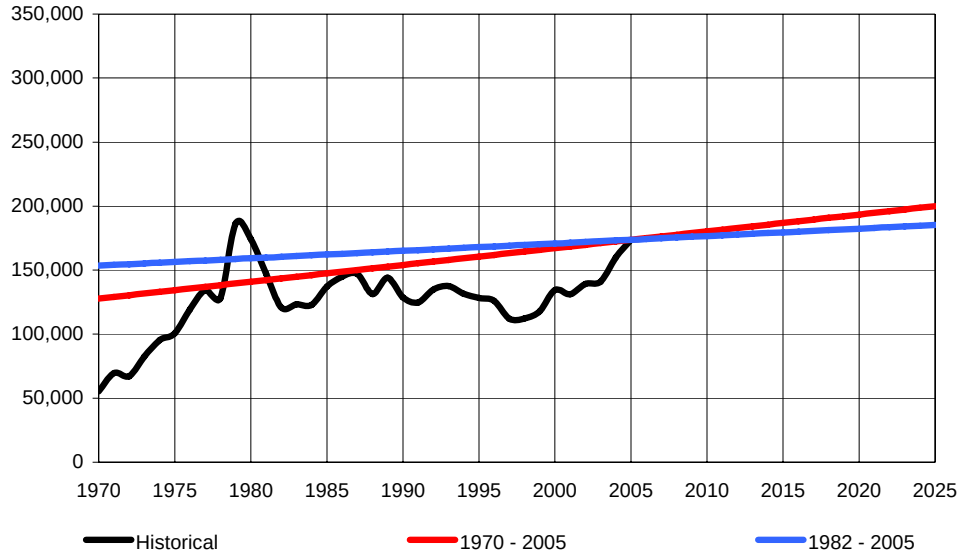
Several local socioeconomic indicators were reviewed and analyzed to determine if a statistically significant relationship exists between historical enplanements at Bismarck Airport and the selected indicators. The indicators reviewed in this analysis included: population, employment, per capita personal income (PCPI), and airline yields. These independent variables typically are good predictors of enplanement levels, absent air service constraints. Airline yield is defined as total passenger revenue divided by total passenger miles. The US carriers' domestic yield is assumed to continue its historical long term decline based on an extension of the Federal Aviation Administration's yield projections from 11.26 (11.46 in 2004) cents per mile in 2005 to 9.37 cents per mile in 2016.

The statistical significance of projections produced by a regression analysis is assessed using the coefficient of determination, or R^2 value. The R^2 value is the square of the correlation coefficient and measures the contribution of the independent variables in the prediction of the dependent variable. The R^2 value will range between 0.00 and 1.00 with 1.00 indicating a perfect correlation between the independent and dependent variables. R^2 values of less than 0.70 generally indicate there is little correlation between the two variables.

Table 2-12 presents the results of this projection technique for predicting future enplanements at the Airport. Two socioeconomic independent variables were examined using a single independent variable regression analysis. In addition, several multi-variable analyses are illustrated.

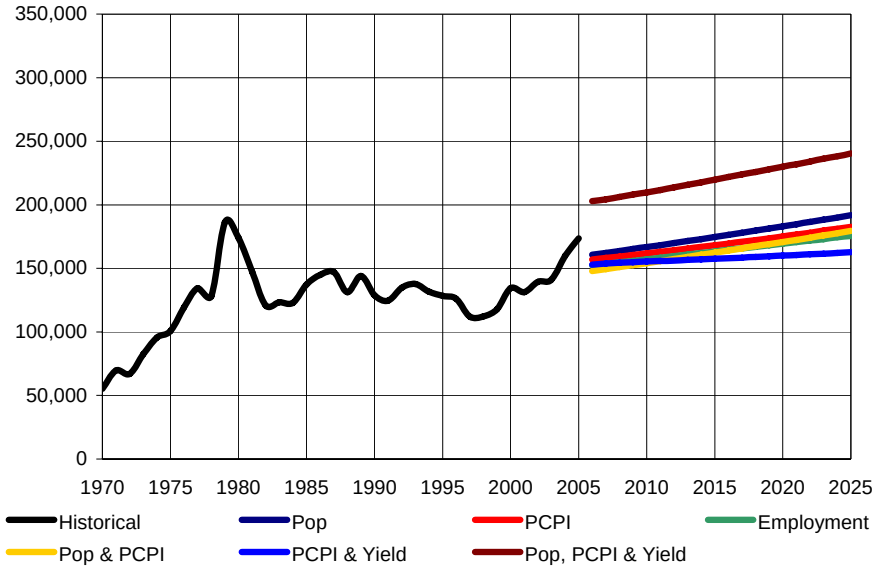
The R^2 value for all six regression analyses range between 0.23 to 0.40, which indicates very little statistical correlation between the independent and dependent variables. The absence of statistical correlation between the independent variables (socioeconomic and yield data) and enplanements indicates that factors other than local socioeconomics have impacted enplanement levels at the Airport.

Table 2-11
TIME SERIES ANALYSIS



Year	Enplanements	Time Series 1970 - 2005	Time Series 1982 - 2005
1970	55,271		
1975	100,755		
1980	174,199		
1985	137,245		
1990	128,691		
1995	128,369		
2000	134,483		
2005	173,738		
2010		180,298	176,600
2015		186,859	179,500
2025		199,980	185,300
Avg Growth Rate			
2005 - 2010		0.7%	0.3%
2005 - 2015		0.7%	0.3%
2005 - 2025		0.7%	0.3%

Table 2-12
REGRESSION ANALYSIS PROJECTION SUMMARY



		Independent Variables					
Year	**Enpl**	**Population**	**PCPI**	**Employment**	**Population & PCPI**	**PCPI & Yield**	**Population, PCPI & Yield**
1970	55,271						
1975	100,755						
1980	174,199						
1985	137,245						
1990	128,691						
1995	128,369						
2000	134,483						
2005	173,738						
2010		166,700	161,800	157,200	154,100	155,400	209,800
2015		174,700	168,200	163,300	162,400	157,600	219,800
2025		191,800	182,700	175,600	179,400	162,700	240,400
R^2 Values		0.39	0.30	0.28	0.40	0.33	0.23
Average Annual Growth							
2005 - 2010		- 0.8%	- 1.4%	- 2.0%	- 2.4%	3.8%	- 2.2%
2005 - 2015		0.1%	- 0.3%	- 0.6%	- 0.7%	2.4%	- 1.0%
2005 - 2025		0.5%	0.3%	0.1%	0.2%	1.6%	- 0.3%

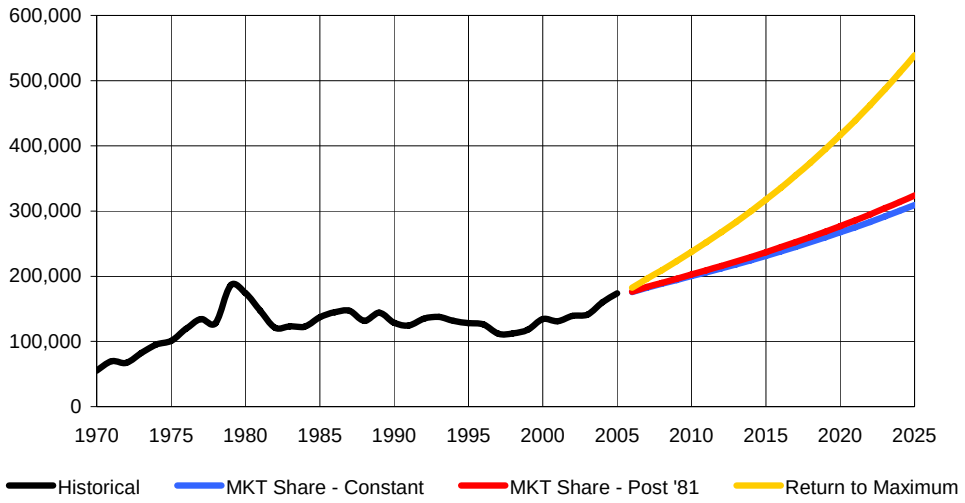
2.3.3 Market Share Analysis

The historical market share for the Airport is calculated by dividing each year's enplanements at the Airport by total domestic US commercial enplanements for the corresponding year. The resulting historical market share percentages were reviewed and a projection of future market share percentages were applied to the FAA's forecast of total US enplanements.

Table 2-13 presents the historical market share of commercial service enplanements at the Airport as well as three different scenarios to project future enplanements. The first scenario assumes the future market share of enplanements would remain at the existing 2005 level of 0.024 percent. The second scenario assumes that the current market share of enplanements at the Airport will return to the average market share (0.025 percent) experienced at the Airport from 1982 through 2005. The final scenario assumes that the current market share of enplanements at the Airport will return to the maximum, market share (0.041 percent) experienced in 1981.

The information from these analyses shows the range from maintaining current to attaining maximum enplanement levels based on the Bismarck Airport to US market share ratios.

Table 2-13
MARKET SHARE COMPATIBILITY



	Bismarck		US Enpl	Market Share Scenarios					
				Constant Current		Return to Post '81 Avg		Return to Post '81 Max	
Year	Enpl	US Share	(000s)	Enpl	Share	Enpl	Share	Enpl	Share
1970	55,271								
1975	100,755								
1980	174,199	0.053%	326,249						
1985	137,245	0.039%	355,786						
1990	128,691	0.027%	481,131						
1995	128,369	0.022%	582,014						
2000	134,483	0.019%	704,888						
2005	173,738	0.024%	731,698						
2010			843,236	200,200	0.024%	202,600	0.024%	237,400	0.028%
2015			974,580	231,400	0.024%	237,000	0.024%	317,400	0.033%
2025			1,302,402	309,200	0.024%	324,100	0.025%	539,000	0.041%
Average Annual Growth									
2005 - 2010					2.9%		3.1%		6.4%
2005 - 2015					2.9%		3.2%		6.2%
2005 - 2025					2.9%		3.2%		5.8%

2.3.4 FAA Terminal Area Forecast

The Federal Aviation Administration prepares the Terminal Area Forecast (TAF), which is the official aviation activity forecast for all airports in the National Plan of Integrated Airport Systems. The TAF is the forecast of the overall national aviation system growth, breaking that growth down into the numerous categories, and then distributing the growth to the individual airports according to size and activity levels. The February 2006 TAF enplanements forecast for Bismarck Airport is presented on Table 2-14. Note that the TAF understates the number of enplanemets for 2005. Therefore the TAF is also indexed upward, to match 2005 actual enplanements on this table for illustrative purposes.

2.3.5 Preferred Annual Enplanement Forecast and Alternative Forecasts

The projections of future enplanements developed through use of the various analytical methods are shown in Table 2-15. The process of developing a preferred forecast is interpretative and is based on knowledge of aviation trends and understanding of the factors that affect those trends. Therefore, the accuracy of the forecasts depends greatly upon how well future trends are predicted and how these trends impact traffic at the Airport. The enplanement forecast analyses are separated into the following three categories:

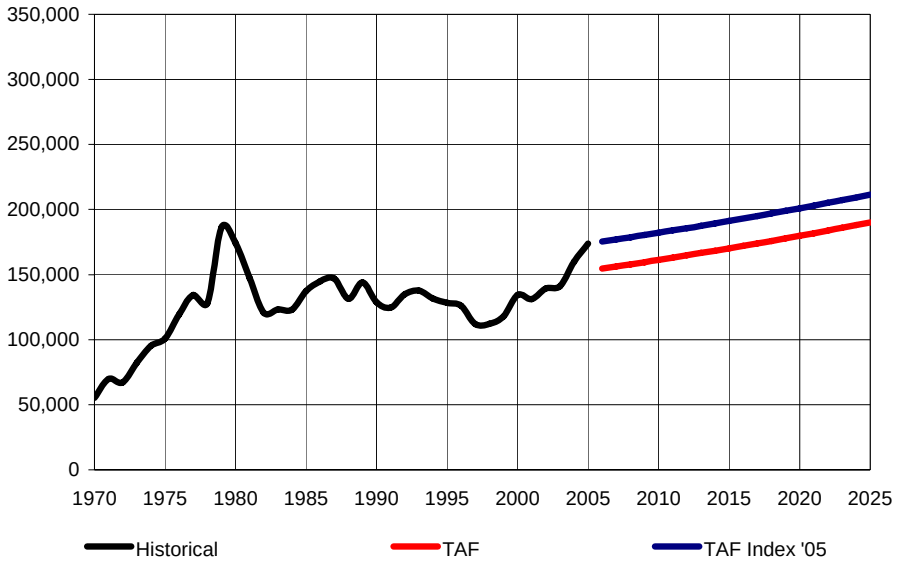
- **"Doldrums"** – Where Airport enplanement levels follow long-term, low-growth trends with few changes in air service. Two forecast methodologies support this scenario, with an increase to approximately 200,000 annual passenger enplanements by the end of the planning period.
- **"Current Trends"** – This scenario reflects the continuation of the positive air service and passenger growth trends of the past 10 years. Four forecast methodologies support this scenario with increases to approximately 280,000 to 320,000 annual passenger enplanements by the end of the planning period.
- **"Super-Growth"** – This scenario represents a break-out of the current air service model with the entrance of several air carriers providing low fare, frequent service. These additional operators would add competition, reduce existing fares, and provide a wider selection of service for passengers using Bismarck Airport. While unlikely, it does indicate an upper limit for the forecast period.

For the purposes of this study, the "Current Trends" scenario will serve as the basis for planning. There are a number of economic and socioeconomic trends that indicate that the basic character of the Bismarck service area has changed in a way that more readily supports and relies on air travel. This change is judged to be more pronounced in the past 10 to 15 years, and judged to be a fundamental and permanent shift in the character of the market. Therefore, the "Current Trends" scenario, with its focus on a ten to 15 year historical period, is most reflective of likely future conditions. (Note that "Doldrums" scenario has a 30 to 40-year historical focus and the "Super-Growth" scenario is based on trends evident in the very short term past.)

The preferred enplaned passenger forecast is Enplanement per Capita technique from the "Current Trends" scenario. The enplanement forecast predicts an overall 2.5 percent growth rate for the planning period. Enplanements are projected to increase from 173,738 annual enplanements in 2005 to approximately 284,700 in 2025.

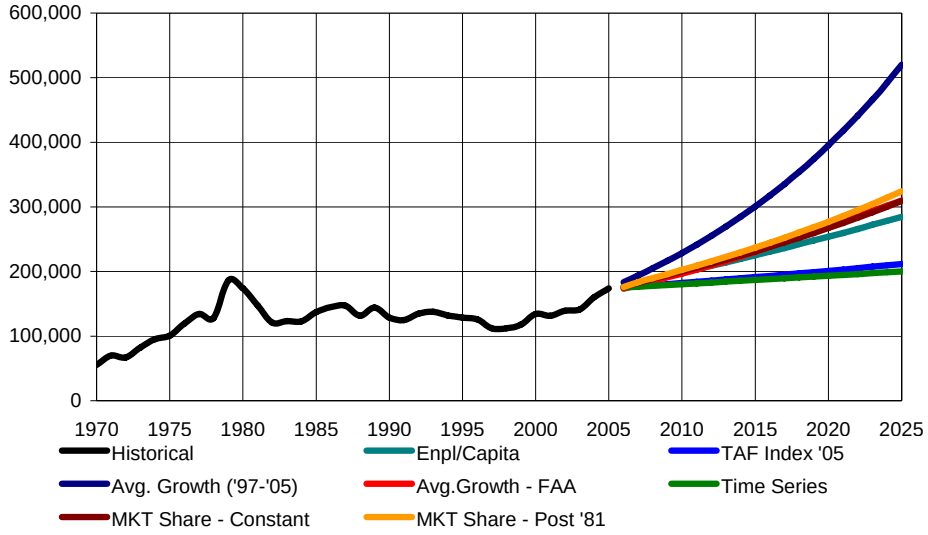
In addition to the preferred forecast, the master plan also establishes a higher and lower forecast range. The preferred enplanement forecast and sensitivity ranges are shown in Table 2-16.

Table 2-14
FAA TERMINAL AREA FORECAST



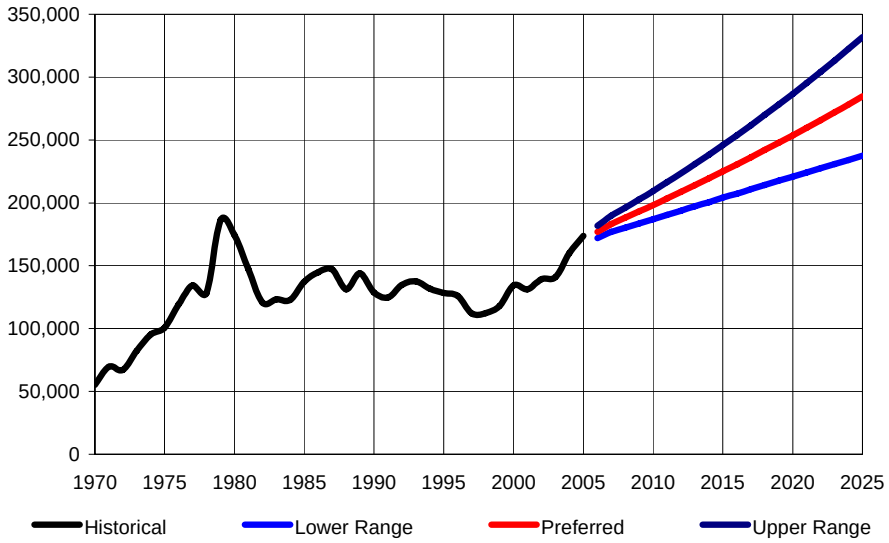
Year	Historical Enplanements	TAF	TAF Indexed to 2005
1970	55,271		
1975	100,755		
1980	174,199		
1985	137,245		
1990	128,691		
1995	128,369		
2000	134,483		
2005	173,738		
2010		163,007	182,163
2015		172,068	191,224
2025		192,333	211,489
Avg Growth Rates			
2005 - 2010		- 1.3%	1.0%
2005 - 2015		- 0.1%	1.0%
2005 - 2025		0.5%	1.0%

Table 2-15
ENPLANEMENT PROJECTIONS



		"Doldrums"		"Current Trends"				"Super-Growth"
		Time	TAF	Enpl /	U.S. Market Share		Average Annual Growth	
Year	Enpl	Series	Indexed	Capita	Constant	Post '81	FAA	1997-2005
1970	55,271							
1975	100,755							
1980	174,199							
1985	137,245							
1990	128,691							
1995	128,369							
2000	134,483							
2005	173,738							
2010		180,298	182,163	198,300	200,200	202,600	196,800	228,500
2015		186,859	191,224	225,100	231,400	237,000	230,400	300,500
2025		199,980	211,489	284,700	309,200	324,100	309,700	519,900
Avg Growth Rates								
2005 - 2010		0.7%	1.0%	2.7%	2.9%	3.1%	2.5%	5.6%
2005 - 2015		0.7%	1.0%	2.6%	2.9%	3.2%	2.9%	5.6%
2005 - 2025		0.7%	1.0%	2.5%	2.9%	3.2%	2.9%	5.6%

Table 2-16
PREFERRED ENPLANEMENT PROJECTION AND ALTERNATIVE SCENARIOS



Year	Historical Enplanements	Lower Range	Preferred	Upper Range
1970	55,271			
1975	100,755			
1980	174,199			
1985	137,245			
1990	128,691			
1995	128,369			
2000	134,483			
2005	173,738			
2010		187,000	198,300	209,500
2015		204,100	225,100	246,000
2025		237,500	284,700	331,900
Avg Growth Rates				
2005 - 2010		0.7%	2.7%	2.5%
2005 - 2015		0.7%	2.6%	2.9%
2005 - 2025		0.7%	2.5%	2.9%

2.4 AIR CARGO FORECAST

The projections of air cargo activity for the Bismarck Airport master plan are much more tailored to support the subsequent chapter's facility requirements than may have been done in past planning efforts. Bismarck, like many similar size airports, has extensive operations by full-service cargo operators (DHL, FedEx, and UPS) and very limited activity beyond these full-service cargo operations. Because the facilities needed to support cargo operations at Bismarck Airport are driven more by the type of operation rather than pounds of cargo (the traditional measure), this section focuses on the size and type of cargo operation and does not address pounds of cargo.

The quick turn around and highly flexible nature of the full-service cargo operations at Bismarck make records of historical cargo poundage difficult to maintain and of very limited value for long term planning. The Airport maintains records of cargo aircraft landed weight, but very limited enplaned cargo statistics are available. This focus on aircraft landed weight is appropriate, because FAA Cargo Grants are based on cargo aircraft landed weight. While it is not anticipated that Bismarck will reach the threshold for FAA Cargo Grant eligibility, such record keeping should continue[1].

Air cargo activity at Bismarck Airport reflects several fundamental and likely permanent industry trends. The first trend is the long-term emergence and dominance of the cargo package industry by full-service carriers like DHL, FedEx and UPS. These door-to-door shippers now carry the preponderance of packages shipped by air, and a very large volume of the time sensitive packages shipped by truck or combination of air and truck. A second trend is the long-term reduction in cargo carried by passenger airlines, partially accelerated by the temporary shipping restrictions placed on cargo carriage following the events of September 11, 2001 and partially as the US Mail contracts have shifted away from passenger airlines to other carriers. A final trend impacting air cargo carriage is the Check Clearing for the 21st Century Act (Check 21)[2] which drastically diminished the need to quickly move canceled bank checks from bank to a Federal Reserve Bank to bank. The elimination of this banking requirement in late 2004 reduced the demand for specialized air cargo carriers that provide this service.

A large potential future impact on air cargo activity at Bismarck is the Northern Plains Commerce Center. While in the very early stages, activity at such an intermodal facility has the potential to support a more extensive cargo operation at the Airport as well as increase activity by the full-service carriers. Therefore, the air cargo forecast examines both the full-service carriers and the potential impacts of the Northern Plains Commerce Center.

[1] Cargo Service Airports are airports that, in addition to any other air transportation services that may be available, are served by aircraft providing air transportation of only cargo with a total annual landed weight of more than 100 million pounds.

[2] The Check Clearing for the 21st Century Act (Check 21) was signed into law on October 28, 2003, and became effective on October 28, 2004. Check 21 is designed to foster innovation in the payments system and to enhance its efficiency by reducing some of the legal impediments to check truncation. The law facilitates check truncation by creating a new negotiable instrument called a substitute check, which permits banks to truncate original checks, to process check information electronically, and to deliver substitute checks to banks that want to continue receiving paper checks.

2.4.1 Full Service Carriers

The predominate and most notable cargo activity at Bismarck Airport is the air-to-truck services conducted by DHL, FedEx, UPS and their respective contract airlines. The airlines providing air cargo carriage for DHL, FedEx, and UPS are under contract to provide the service. As the contracts are competitively bid from time to time, changes in the serving airlines occur frequently.

Air-to-truck cargo services at Bismarck follow a similar pattern where a relatively small "feeder" cargo aircraft (Beech 1900, Cessna 208 Caravan, Metro III, etc.) connect Bismarck cargo with one of the full-service carrier's mainline flights (at Grand Forks or Fargo). This cargo is typically transferred from/to the aircraft to/from trucks at Bismarck early in the morning (in bound) and late in the evening (out bound). DHL, FedEx, and UPS conduct these transfers on the ramp at Bismarck, as is typical nation wide for similar size airports. In some cases the Bismarck feeder cargo aircraft may continue beyond Bismarck to connect with other area airports (Williston, Dickenson, etc.).

In addition, the Airport continues to accommodate a very limited bank document cargo operation. As noted above, Check 21 has almost completely eliminated the need for this type of air cargo service nationwide.

Approximately 3,600 operations by aircraft supporting DHL, FedEx, UPS, and others were conducted at the Airport in 2005. There were two major and one small air-to-truck connecting operations occurring on the Bismarck twice per weekday and three at limited times over the weekend. Each of the air-to-truck operations involved one or two aircraft and one to six trucks. Typical daily loads vary from carrier to carrier, but the numbers of aircraft and trucks change in response to varying needs.

When examining future trends in the full-service cargo industry overall, it is likely that the historical pressure to consolidate will continue. The initial number of full-service cargo companies that were established soon after FedEx was founded, has diminished. What remains is a handful of dominant companies with substantial domestic and international shipping holdings and capabilities. Bismarck is fortunate in that it currently is serviced by three of the most dominate carriers. However, it is possible that a fourth full-service carrier could establish service in the future (such as Purolator or an international carrier). Such an operation would add about 600 to 700 annual operations per year. This potential increase is reflected in the subsequent commercial service operations forecast.

2.4.2 Northern Plains Cargo Center

A large potential future impact on air cargo activity at Bismarck is the Northern Plains Commerce Center. While in the very early stages, activity at such an intermodal facility has the potential to support a more extensive cargo operation at the Airport as well as increased activity by the full-service carriers.

Estimating cargo activity for the Northern Plains Commerce Center is extremely difficult given that the concept is in the formative stages, and the exact nature and extent of the business that will locate there is not known. Therefore, the master plan contemplates a possible scenario based on judgment and knowledge of cargo operations at other US airports.

The Bismarck Airport master planning scenario for the Northern Plains Commerce Center, once the Center is fully established, the envisions a positive impact on the full-service carriers as well as

the possible establishment of a heavy-lift or more traditional air cargo operation. The scenario calls for an additional aircraft to be added to each carrier's air-to-truck connecting operation each weekday night within 10 years (a total of approximately 1,600 annual operations). This potential increase is reflected in the subsequent commercial service operations forecast.

In terms of a heavy-lift or traditional air cargo operation, the master plan scenario envisions a three aircraft feed to traditional air cargo hubs such as Toledo's BAX Global hub or to destination-specific locations driven by the nature of the yet to be determined businesses at the Center. These destinations could be domestic or international airports; however, it is likely that international destinations would be served through a domestic gateway or tech stop point (an east coast airport for European cities, Anchorage for the Far East). The types of aircraft envisioned by the scenario include typical mid to large cargo aircraft such as the B-757-300, B-767-300, or A-300. The scenario calls for six daily operations by these example types of aircraft six days per week within 10 years (a total of approximately 3,100 annual operations). This potential increase is reflected in the subsequent commercial service operations forecast. Note that activity levels of this nature would make Bismarck Airport eligible for FAA Cargo Grants.

2.5 BASED AIRCRAFT FORECAST

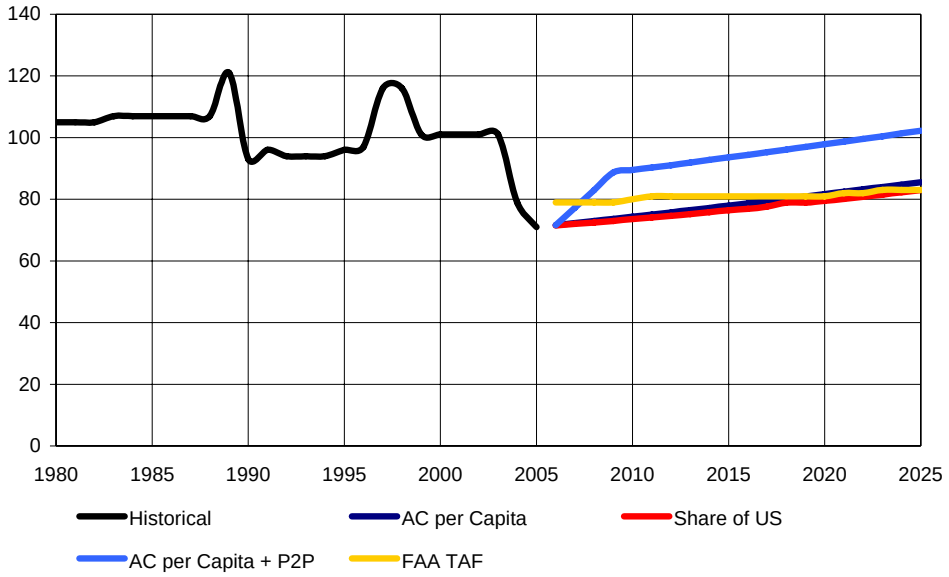
Based aircraft at an airport represent the total number of active civil aircraft permanently located or projected to be located at an airport during a specific period. Based aircraft categories include single-engine, multi-engine, jet, rotorcraft, and other. The national general aviation industry has experienced declines in nearly all measures of activity since the early 1980s including new aircraft shipments, active fixed base operators (FBOs), hours flown, etc. The number of aircraft based at individual airports also dropped at many facilities, including Bismarck Airport.

According to the FAA records, the number of based aircraft at the Airport varied around 100 aircraft from 1980 through 2004 with year to year variances of 15 to 20 aircraft. However, Airport managements reports that actual based aircraft may have been somewhat lower than the FAA records due in part to a move from Bismarck Airport to Mandan Airport by a number of recreational aircraft. A detailed count of based aircraft in early 2006 by Airport management indicates approximately 71 based aircraft. This figure serves as the base year for the forecast. Three methodologies were utilized to forecast future based aircraft, all with similar results for 2025 (see Table 2-17).

Aircraft per capita is the preferred forecast. To that forecast, the Master Plan adds the potential numbers of based aircraft in the Point 2 Point (a point to point charter flying service) long range business plan. This adjustment increases the forecast number of based aircraft from 74 to 89 for 2010, from 78 to 94 in 2015, and from 86 to 102 in 2025.

Estimates of future types of based aircraft at Bismarck Airport are presented on Table 2-18. Because Mandan Airport is assumed to continue its role as the airport of choice for recreational flying, the future fleet at Bismarck Airport is anticipated to become increasingly oriented toward the more sophisticated single engine aircraft, as well as multi-engine aircraft. The fleet mix forecast calls for no increase in the number of single engine aircraft other than the possible number of Point 2 Point aircraft and material increases in the numbers of based multi-engine and jet aircraft.

Table 2-17
BASED AIRCRAFT PROJECTIONS



Year	Based Aircraft	Percentage Change	FAA TAF	AC per Capita	Share of US	AC per Capita + P2P
1980	105					
1985	107	1.9%				
1990	93	- 13.1%				
1995	96	3.2%				
2000	101	5.2%				
2005	71	- 29.7%				
2010			80	74	74	89
2015			81	78	76	94
2025			83	86	83	102
Avg Growth Rate						
2005 - 2010			2.4%	0.9%	0.7%	4.7%
2005 - 2015			1.3%	0.9%	0.7%	2.8%
2005 - 2025			0.8%	0.9%	0.8%	1.8%

Table 2-18
BASED CIVIL AIRCRAFT

Year	Single Engine Base	Single Engine P2P	Multi	Jet	Rotorcraft	Other	Total
2005	51	0	13	7	0	0	71
2010	51	15	15	8	0	0	89
2015	51	16	18	9	0	0	94
2025	51	17	22	13	0	0	102
Avg Growth Rate							
2005 - 2010	0.0%	N/A	2.9%	3.6%	0.0%	0.0%	4.7%
2005 - 2015	0.0%	N/A	3.3%	2.5%	0.0%	0.0%	2.8%
2005 - 2025	0.0%	N/A	2.7%	3.0%	0.0%	0.0%	1.8%

2.6 ANNUAL AIRCRAFT OPERATIONS FORECAST

Forecasts of annual aircraft operations were prepared for three categories of aviation activity. The three categories include commercial service (air carrier and commuter) operations, general aviation operations, and military operations. General Aviation operations represent all civil aviation aircraft takeoffs and landings not classified as commercial (air carrier or commuter) or military.

2.6.1 Commercial Service Operations Forecast

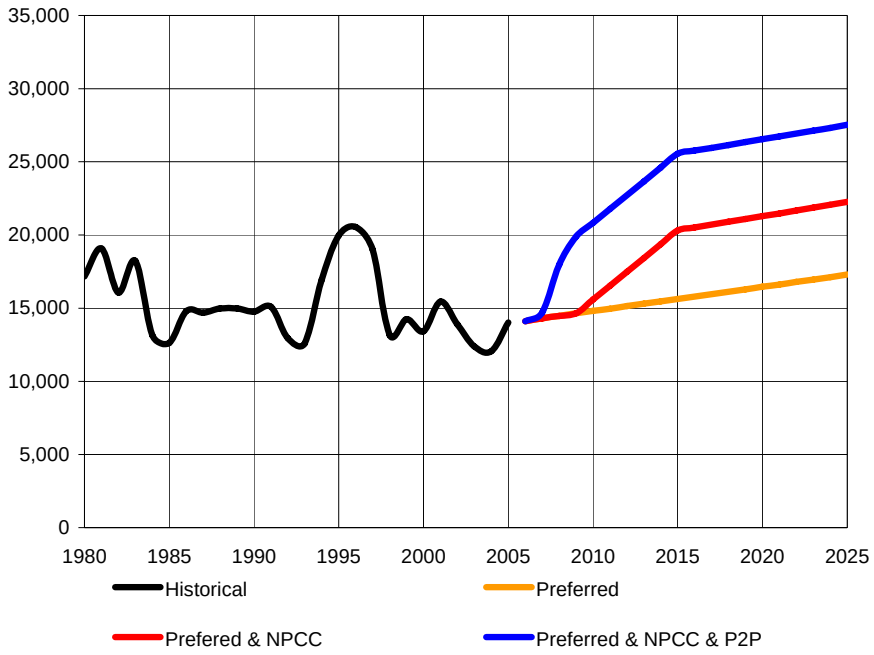
The total forecast commercial service operations are based on the passenger enplanement forecast and the air cargo forecast. The commercial service operations forecast is dependent on the number of passengers carried on air carrier and commuter aircraft, or the air carrier / commuter "split". Note that the FAA defines air carrier and commuter operations based on the size of the aircraft (above and equal to 60 seats and less than 60 seats and a similar weight-based measure for cargo aircraft.)

The number of air carrier and commuter operations at the Airport "inverted" by 1995 when the number of commuter operations exceeded the number of air carrier operations. This was a common occurrence at many airports as the airlines shifted from air carrier category aircraft to increasing numbers of commuter aircraft. At first this shift was to turbo-prop commuter aircraft, a trend replaced by a shift to more desirable regional jets.

The preferred commercial service forecast calls for this reliance on a mix of regional jets (commuter category) and larger jets (air carrier category) to continue into the future at Bismarck.

In addition to the preferred commercial service forecast, the Master Plan also considers the possible impact of an extensive air cargo operation associated with an intermodal facility such as the Northern Plains Commerce Center and the planned long range operations associated with the Point 2 Point business plan. As illustrated on the commercial service forecast table, the air cargo operation associated with the Northern Plains Commerce Center is estimated to moderately increase the numbers of air carrier and commuter operations. The increase in commercial service operations associated with Point 2 Point are anticipated to impact only the commuter operations category as the business plan calls for the use of smaller aircraft only.

Table 2-19
COMMERCIAL SERVICE OPERATIONS FORECAST



Year	Historical & Preferred			Preferred & NPCC Cargo			Preferred & Cargo & P2P		
	Air Carrier	Commuter	Total	Air Carrier	Commuter	Total	Air Carrier	Commuter	Total
1980	14,878	2,296	17,174						
1985	8,541	4,072	12,613						
1990	8,175	6,593	14,768						
1995	3,361	16,608	19,969						
2000	3,059	10,354	13,413						
2005	3,009	11,008	14,017						
2010	3,220	11,590	14,810	3,740	11,850	15,590	3,740	17,100	20,840
2015	3,430	12,200	15,630	6,550	13,760	20,310	6,550	19,010	25,560
2025	3,860	13,440	17,300	7,178	15,099	22,277	7,178	20,349	27,527
Avg Growth Rate									
2005 - 2010			1.1%			2.1%			8.3%
2005 - 2015			1.1%			3.8%			6.2%
2005 - 2025			1.1%			2.3%			3.4%

2.6.2 General Aviation Forecast

Except for several spikes in growth from year to year, general aviation operations at the Airport generally declined overall from 1976 though 2000 and remained generally flat at approximately 35,000 operations from 2000 through 2005 (see Table 2-20). This overall decline is similar to overall trends nationwide.

Future general aviation operations at the Airport are projected to grow at a moderate rate similar to the average annual growth rate projected by the FAA nationwide for general aviation operations at airports with an air traffic control tower. Bismarck Airport general aviation operations are projected to increase from the 2005 level of 35,018 to 44,500 annual operations by 2025.

2.6.3 Military Operations Forecast

Annual activity by military aircraft is a function of Department of Defense policy, military appropriations, and the mission assigned to a particular flying unit. As such, projections of future operations by military aircraft are not reliably predictable through use of socioeconomic indicators or trend analyses.

Military activity at Bismarck Airport has historically ranged between approximately 4,000 and 9,000 annual operations with lower annual counts in recent years.

Annual military operations have remained relatively flat at approximately 3,900 to 4,000 operations over the past 10 years. The Master Plan forecast holds the military operations forecast constant throughout the planning period at 3,990 annual operations.

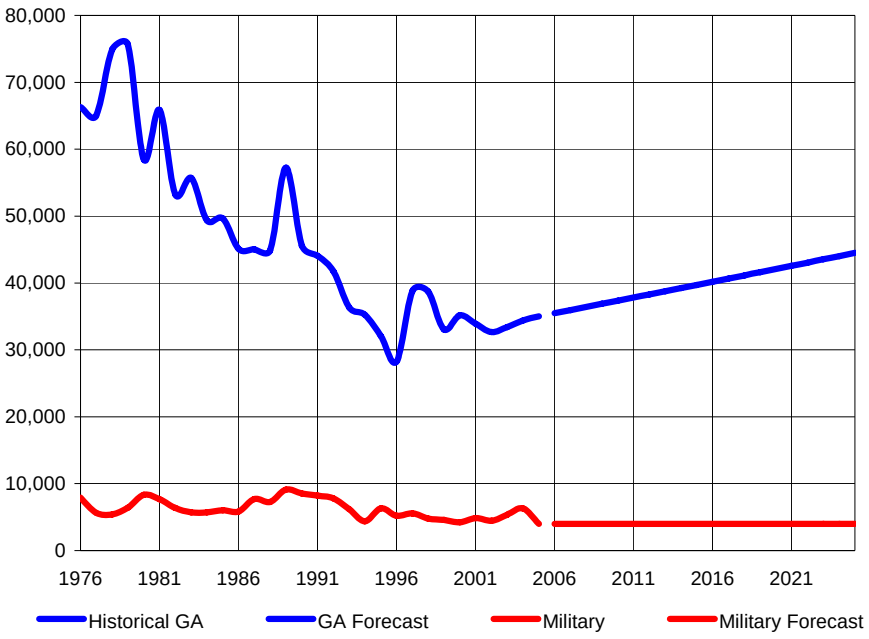
2.6.4 Itinerant and Local Operations Forecast

Aircraft operations are classified in this chapter as commercial service, general aviation, or military operations. General aviation and military operations can be further segregated into two additional categories -- local or itinerant. Aircraft operating in the traffic pattern or within sight of the tower, aircraft known to be departing to or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the Airport are classified by the FAA air traffic controllers as local operations. Itinerant operations are all other aircraft operations and represent takeoffs and landings from one airport to another. All commercial service operations are itinerant operations.

Local and itinerant general aviation and military operations are shown in Table 2-21. General aviation itinerant operations have made up about 65 percent of total operations for the past 10 years. This trend is projected to continue into the future.

The proportion of itinerant and local military operations has varied significantly over the past 25 year period, with a greater proportion of itinerant operations in recent years. Consistent with this general trend, itinerant operations are assumed to make up 64.4 percent of future military operations.

Table 2-20
FORECAST OF GENERAL AVIATION AND MILITARY OPERATIONS



Year	General Aviation	Military	Total
1980	58,450	8,321	74,200
1985	49,625	6,007	55,632
1990	45,566	8,514	54,080
1995	32,073	6,287	38,360
2000	35,184	4,206	39,390
2005	35,018	3,985	39,003
2010	37,350	3,990	41,340
2015	39,700	3,990	43,690
2025	44,500	3,990	48,490
Avg Growth Rate			
2005 - 2010	1.3%	0.0%	1.2%
2005 - 2015	1.3%	0.0%	1.1%
2005 - 2025	1.2%	0.0%	1.1%

Table 2-21

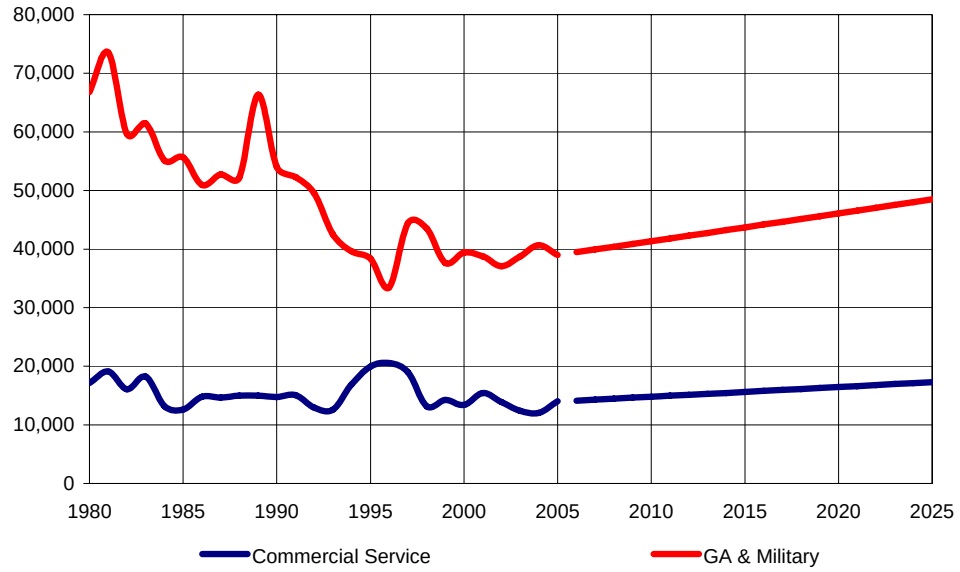
GENERAL AVIATION MILITARY OPERATIONS – LOCAL AND ITINERANT

	General Aviation				Military				Total General Aviation and Military Ops
	Itinerant		Local		Itinerant		Local		
Year	Ops	Percent	OPS	Percent	Ops	Percent	Ops	Percent	
1980	40,971	70.1%	17,479	29.9%	2,557	30.7%	5,764	69.3%	66,771
1985	35,592	71.7%	14,033	28.3%	2,844	47.3%	3,163	52.7%	55,632
1990	32,524	71.4%	13,042	28.6%	3,336	39.2%	5,178	60.8%	54,080
1995	22,939	50.3%	9,134	28.5%	3,105	49.4%	3,182	50.6%	38,360
2000	22,627	64.3%	12,557	35.7%	2,571	61.1%	1,635	38.9%	39,390
2005	22,605	64.6%	12,413	35.4%	2,569	64.5%	1,416	35.5%	39,003
2010	24,300	65.1%	13,050	34.9%	2,570	64.4%	1,420	35.6%	41,340
2015	26,000	65.5%	13,700	34.5%	2,570	64.4%	1,420	35.6%	43,690
2025	29,390	66.1%	15,110	33.9%	2,570	64.4%	1,420	35.6%	48,490
Avg Growth Rate									
2005-2010	1.5%		1.0%		0.0%		0.1%		1.2%
2005-2015	1.6%		1.0%		0.0%		0.0%		1.1%
2005-2025	1.3%		1.0%		0.0%		0.0%		1.1%

2.6.5 Total Operations Forecast

Table 2-22 presents the forecast of total operations at the Airport for the combined elements of commercial service operations, general aviation operations, and military operations.

Table 2-22
FORECAST TOTAL OPERATIONS



	Commercial Service			GA and Military		
Year	Air Carrier	Commuter	Total	General Aviation	Military	Total
1980	17,761	1,324	19,085	58,450	8,321	66,771
1985	8,230	6,571	14,801	49,625	6,007	55,632
1990	8,302	6,785	15,087	45,566	8,514	54,080
1995	4,487	16,061	20,548	32,073	6,287	38,360
2000	3,163	12,292	15,455	35,184	4,206	39,390
2005	2,982	10,621	13,603	35,018	3,985	39,003
2010	3,220	11,590	14,810	37,350	3,990	41,340
2015	3,430	12,200	15,630	39,700	3,990	43,690
2025	3,860	13,440	17,300	44,500	3,990	48,490
Avg Growth Rate						
2005-2010	1.4%	4.1%	1.1%	1.3%	0.0%	1.2%
2005-2015	2.7%	1.0%	1.1%	1.3%	0.0%	1.1%
2005-2025	1.3%	1.0%	1.1%	1.2%	0.0%	1.1%

2.7 INSTRUMENT APPROACH FORECAST

An instrument approach, as defined by the FAA for towered airports, is an approach to an airport by an aircraft with an instrument flight plan where visibility is less than three miles or the ceiling is at or below the minimum initial approach altitude. Instrument approaches are used by the FAA to determine an airport's eligibility for enhanced instrument approach capability and additional navigational aides.

Historical and forecast instrument approach data for the Airport are presented in Table 2-23. Annual instrument approaches have decreased from 2,548 operations in 1995 to 358 operations in 2005. Because instrument approaches are recorded only when an approach is conducted in instrument conditions, it is likely that the extremely low numbers of instrument approaches in 2002, 2004 and 2005 are attributable to dry weather conditions rather than a fall off in activity. Therefore, the forecast is based on the ratio of instrument approaches to total operations in more typical weather years.

Table 2-23
INSTRUMENT APPROACHES

Year	Air Carrier	Commuter	General Aviation	Military	Total
1995	350	1,164	914	120	2,548
1996	245	913	567	57	1,782
1997	261	820	843	93	2,017
1998	252	1,087	1,306	115	2,760
1999	314	815	1,088	142	2,359
2000	145	420	420	67	1,052
2001	239	642	573	73	1,527
2002	122	438	392	37	989
2003	155	492	766	68	1,481
2004	83	242	242	38	605
2005	37	121	177	23	358
2010	185	623	806	85	1,699
2015	197	656	862	85	1,800
2025	222	723	974	85	2,004
Average Growth Rates					
2005 - 2010	38.0%	38.8%	35.4%	29.9%	36.5%
2005 - 2015	18.2%	18.4%	17.2%	14.0%	17.5%
2005 - 2025	9.4%	9.3%	8.9%	6.8%	9.0%

2.8 DESIGN DAY/DESIGN HOUR ACTIVITY FORECASTS

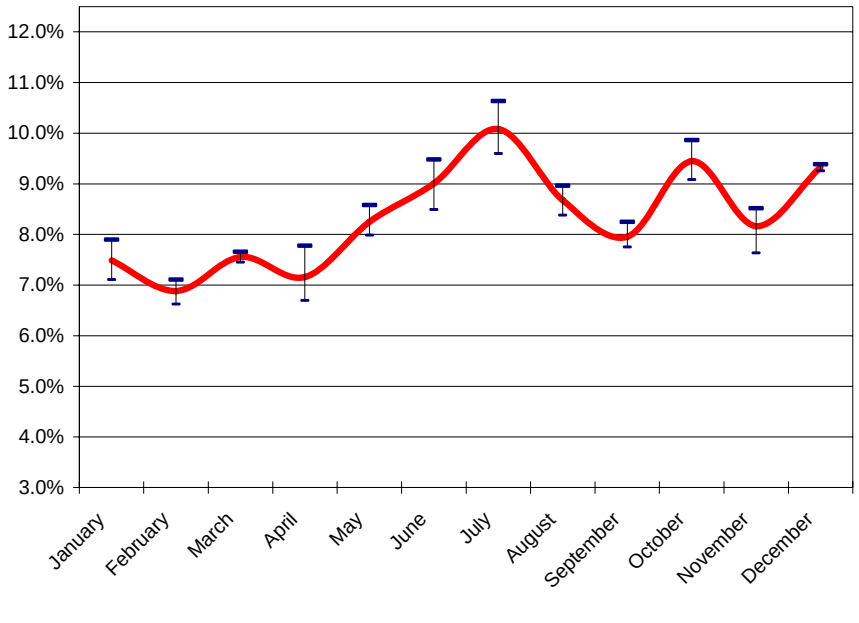
Capacity analyses and determination of future facility requirements of various elements of airport facilities are often based on design day or design hour activity levels. To avoid the construction and operational cost of acquiring capacity that would be rarely used, design day and design hour activity levels should not be the absolute busiest period at the Airport. Rather the design day and design hour activity levels should be representative of busy periods but not the absolute peak periods. Often the design day is generally equivalent to the 85th percentile of activity for the design year. Facilities designed to accommodate this level of activity in the design year will provide a comfortable level of service for the large majority of the time. During unusually high activity periods such as the Wednesday before and the Sunday after Thanksgiving Day, Airport facilities can be expected to experience more crowded conditions and longer, but not unreasonable or intolerable, processing times.

The design day level of activity is often calculated in airport planning efforts using a peak month/average day definition. Tables 2-24 through 2-26 show the high, low, and average monthly distributions of annual enplanements, annual total operations, and annual commercial service operations from 2002 to 2005 at the Airport. As is common when evaluating such data at various airports, the calendar month that experienced the highest level of activity in a given year often varies. However, the annual activity in the peak month expressed as a percentage of annual activity is usually fairly constant from year to year. If annual activity were equally distributed among all 12 months in a year, monthly activity would be approximately 8.0 percent.

For passenger enplanements and commercial service operations, the peak hour is projected to be 24.8 percent and 15.0 percent respectively, of the average day activity. This figure is based on the current 2006 peak weekday flight schedule, which had approximately 24.8 percent of total daily departing seats in the peak 60-minute period (12:15 pm to 1:15 pm).

The total operations percentage for peak hour is 15 percent. The design day and design hour activity levels that result from the application of these factors to annual forecasts of the respective demand elements are presented on Table 2-27.

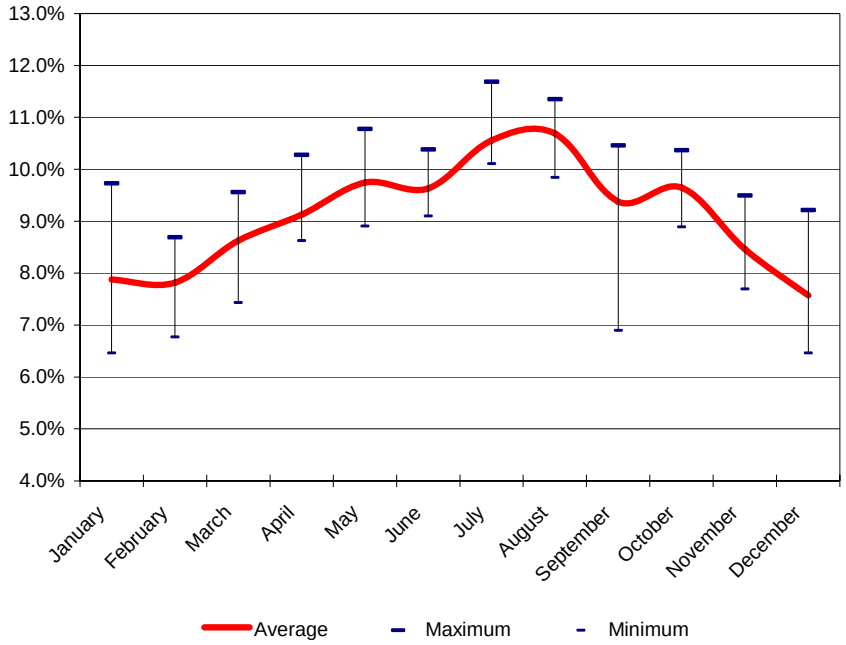
Table 2-24
MONTHLY DISTRIBUTION OF ANNUAL ENPLANEMENTS



Month	Average	Maximum	Minimum
January	7.5%	7.9%	7.1%
February	6.9%	7.1%	6.6%
March	7.6%	7.7%	7.5%
April	7.2%	7.8%	6.7%
May	8.2%	8.6%	8.0%
June	9.0%	9.5%	8.5%
July	**10.1%**	**10.6%**	**9.6%**
August	8.7%	9.0%	8.4%
September	8.0%	8.2%	7.7%
October	9.4%	9.9%	9.1%
November	8.2%	8.5%	7.6%
December	9.3%	9.4%	9.3%

Source: Bismarck Airport Records, 2002 to 2005

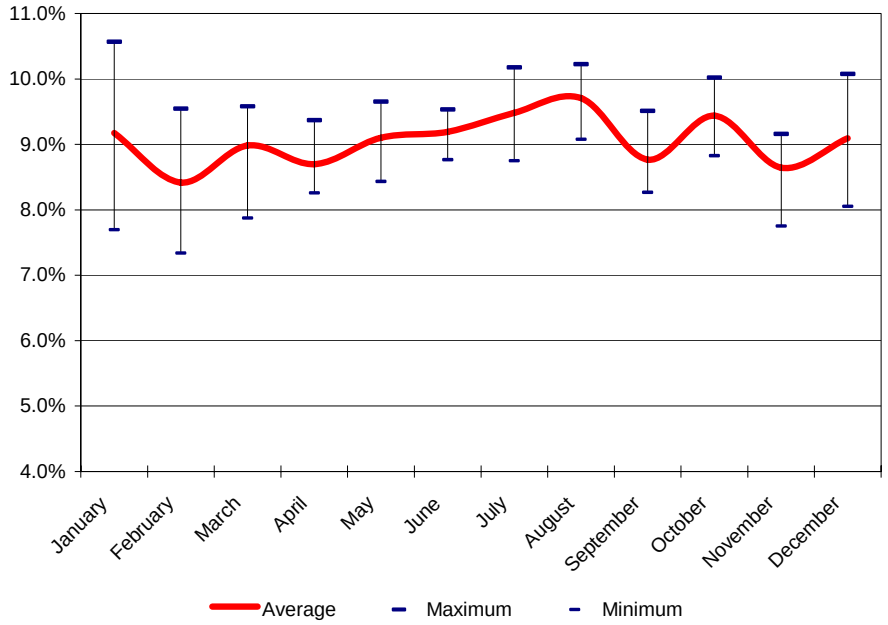
Table 2-25
MONTHLY DISTRIBUTION OF TOTAL OPERATIONS



Month	Average	Maximum	Minimum
January	7.9%	9.7%	6.5%
February	7.8%	8.7%	6.8%
March	8.6%	9.6%	7.4%
April	9.1%	10.3%	8.6%
May	9.7%	10.8%	8.9%
June	9.6%	10.4%	9.1%
July	10.6%	11.7%	10.1%
August	**10.7%**	**11.3%**	**9.8%**
September	9.4%	10.5%	6.9%
October	9.6%	10.4%	8.9%
November	8.5%	9.5%	7.7%
December	7.6%	9.2%	6.5%

Source: FAA, 2002 to 2005

Table 2-26
MONTHLY DISTRIBUTION OF COMMERCIAL SERVICES OPERATIONS



Month	Average	Maximum	Minimum
January	9.2%	10.6%	7.7%
February	8.4%	9.5%	7.3%
March	9.0%	9.6%	7.9%
April	8.7%	9.4%	8.3%
May	9.1%	9.7%	8.4%
June	9.2%	9.5%	8.8%
July	9.5%	10.2%	8.7%
August	**9.7%**	**10.2%**	**9.1%**
September	8.8%	9.5%	8.3%
October	9.4%	10.0%	8.8%
November	8.6%	9.2%	7.8%
December	9.1%	10.1%	8.1%

Source: Airport Records, 2000 to 2005 (excluding 2001)

Table 2-27
DESIGN DAY/DESIGN HOUR ACTIVITY FORECASTS

Description	2005	Planning Activity Level 2010	2015	2025
Enplanements				
Annual Enplanements	173,738	198,300	225,100	284,700
Peak Month (10.1% of annual)	17,517	19,994	22,696	28,705
Average Day (31 days)	565	645	732	926
Peak Hour Passenger Enplanements (24.8%)	140	160	182	230
Peak 20 Minute Passenger Enplanements (18.7%)	106	121	137	173
Total Operations				
Annual Operations	39,003	41,340	43,690	48,490
Peak Month (10.7% of annual)	4,169	4,419	4,670	5,183
Average Day (31 days)	134	143	151	167
Peak Hour (15.0%)	20	21	23	25
Passenger Airline Operations				
Annual PAX Airline Operations	9,561	10,190	10,850	12,220
Peak Month (9.7% of annual)	928	989	1,053	1,186
Average Day (31 days)	30	32	34	38
Peak Hour Departures (20.0%)	3	3	3	4
Peak Hour Passenger Arrivals (20.0%)	3	3	3	4

2.9 COMPARISON WITH OTHER FORECASTS

Forecasts prepared in a master plan are reviewed by the FAA and compared to the Terminal Area Forecast (TAF) projections. The FAA Revision to Guidance on Review and Approval of Aviation Forecasts letter states that the FAA Office of Aviation Policy and Plans will find a locally developed forecast for operations, based aircraft, and enplanements consistent with the Terminal Area Forecast if it meets any of the following three conditions for a Commercial Service airport.

- First, the forecast differs less than 10 percent in the 5-year forecast period and 15 percent in the 10-year period.
- Second, the forecast activity levels do not affect the timing or scale of an airport project.
- Third, the forecast activity levels do not affect the role of the Airport as defined in FAA Order 5090.3C.

Table 2-28 presents a comparison of the enplanements forecasts prepared in this chapter with FAA projections, as published in the Feb, 2006 TAF, and the forecasts prepared in the previous master plan undertaken for the Airport in 1996. Actual enplanements at Bismarck have tracked below the previous master plan's forecast for the period 1994 through 2005. Conversely, actual enplanements for 2003, 2004 and 2005 are higher than predicted by the February 2006 TAF for 2006.

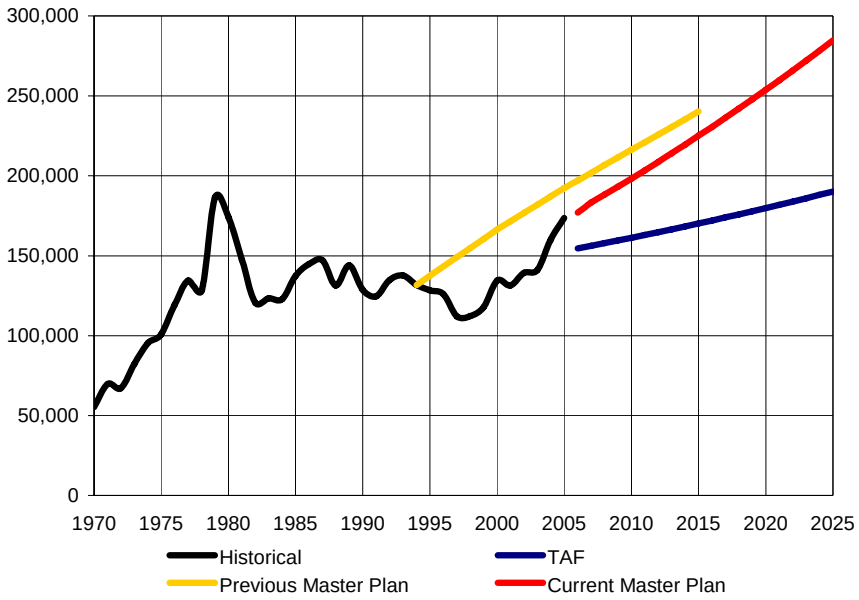
The forecasts of aircraft operations prepared in this chapter are lower than the previous master plan forecasts and very similar to the February 2006 TAF (see Table 2-29).

To illustrate conformance with the FAA's TAF, a comparison between the enplanements, operations, and based aircraft projections in this master plan and the February 2006 TAF are presented in Table 2-30.

- The enplanement projections in the master plan are somewhat higher than of those contained in the TAF. A portion of this margin of difference is the 12.4 percent difference in base year projections (as the TAF understates actual enplanements by about 12.4 percent). The difference in future years is attributable to the TAF's more pessimistic outlook for future Bismarck enplanements.
- Total operations projections in this master plan are within the TAF five and 10-year threshold limits.
- Based aircraft projections are higher in the TAF than in the master plan forecast. A portion of this margin of difference is the 10.4 percent difference in base year projections (as the TAF overstates actual based aircraft by about 10.4 percent).

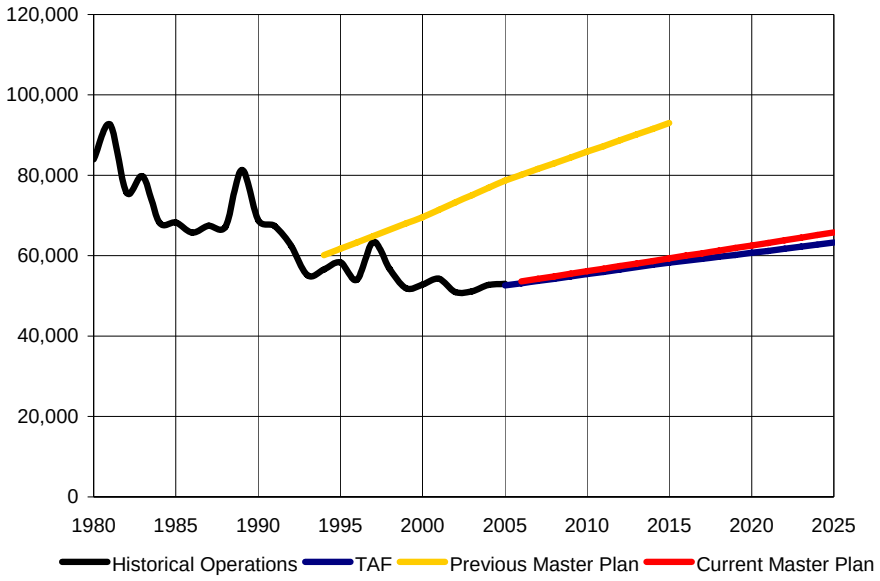
FAA guidance on the review and approval of locally produced aviation forecasts is that the forecast must meet one or more of the conditions stated above to be consistent with the TAF. This master plan's enplanement forecast meets conditions two and three; the operations forecast meets conditions one, two, and three; and the based aircraft forecast meets conditions one, two, and three.

Table 2-28
ENPLANEMENT COMPARISON



Year	Historical	TAF	Previous Master Plan	Current Master Plan
1975	100,755			
1980	174,199			
1985	137,245			
1990	128,691			
1995	128,369		137,434	
2000	134,483		166,400	
2005	173,738	154,582	192,300	
2010		163,007	216,250	198,300
2015		172,068	240,200	225,100
2020		181,822		253,800
2025		192,333		284,700

Table 2-29
OPERATIONS COMPARISON



Year	Historical	TAF	Previous Master Plan	Current Master Plan
1980	83,945			
1985	68,245			
1990	68,848			
1995	58,329		61,728	
2000	52,803		69,600	
2005	53,020	52,606	78,700	
2010		55,415	85,850	56,150
2015		58,251	93,000	59,320
2020		60,705		62,540
2025		63,273		65,790

Table 2-30
TAF COMPARISON

Description	Year	Master Plan Forecast	TAF Forecast	Percent Higher / (Lower)
ENPLANEMENTS				
Base Year	2005	173,738	154,582	12.4%
Base Year + 5 Years	2010	198,300	163,007	21.7%
Base Year + 10 Years	2015	225,100	170,202	32.3%
Base Year + 20 Years	2025	284,700	190,167	49.7%
TOTAL OPERATIONS				
Base Year	2005	53,020	52,606	0.8%
Base Year + 5 Years	2010	56,150	55,415	1.3%
Base Year + 10 Years	2015	59,320	58,251	1.8%
Base Year + 20 Years	2020	65,790	63,273	4.0%
BASED AIRCRAFT (excludes Point 2 Point)				
Base Year	2005	71	79	-10.1%
Base Year + 5 Years	2010	74	80	- 7.1%
Base Year + 10 Years	2015	78	81	- 3.8%
Base Year + 20 Years	2020	86	83	3.1%

2.10 SUMMARY OF FORECASTS

Table 2-31 presents a summary listing of the aviation demand forecasts at the Airport. These projections are used in the next chapter of the master plan to assess the capacity of existing facilities and determine facility expansions or improvements needed to satisfy future activity levels.

Comment [K1]: is that correct?

Table 2-31
FORECAST SUMMARY

Description	2005	Planning Activity Level 1	2	3	Average Annual Growth (2005 - 2025)
ENPLANEMENTS					
Annual	173,738	198,300	225,100	284,700	2.5%
Peak Month	17,517	19,994	22,696	28,705	
Average Day	565	645	732	926	
Peak Hour	140	160	182	230	
ANNUAL OPERATIONS					
Commercial Service					
Air Carrier	3,009	3,220	3,430	3,860	1.3%
Commuter	11,008	11,590	12,200	13,440	1.0%
Annual Subtotal	14,017	14,810	15,630	17,300	1.1%
General Aviation					
Local	12,413	13,050	13,700	15,110	1.0%
Itinerant	22,605	24,300	26,000	29,390	1.3%
Annual Subtotal	35,018	37,350	39,700	44,500	1.2%
Military					
Local	1,416	1,420	1,420	1,420	0.0%
Itinerant	2,569	2,570	2,570	2,570	0.0%
Annual Subtotal	3,985	3,990	3,990	3,990	0.0%
Total Annual Operations	53,020	56,150	59,320	65,790	1.1%
PEAK OPERATIONS					
Total Operations	39,003	41,340	43,690	48,490	1.1%
Peak Month	4,169	4,419	4,670	5,183	
Average Day	134	143	151	167	
Peak Hour	20	21	23	25	
Total PAX Operations	9,561	10,190	10,850	12,220	1.2%
Peak Month	928	989	1,053	1,186	
Average Day	30	32	34	38	
Peak Hour	3	3	3	4	
BASED AIRCRAFT (includes Point 2 Point)	71	89	94	102	1.8%