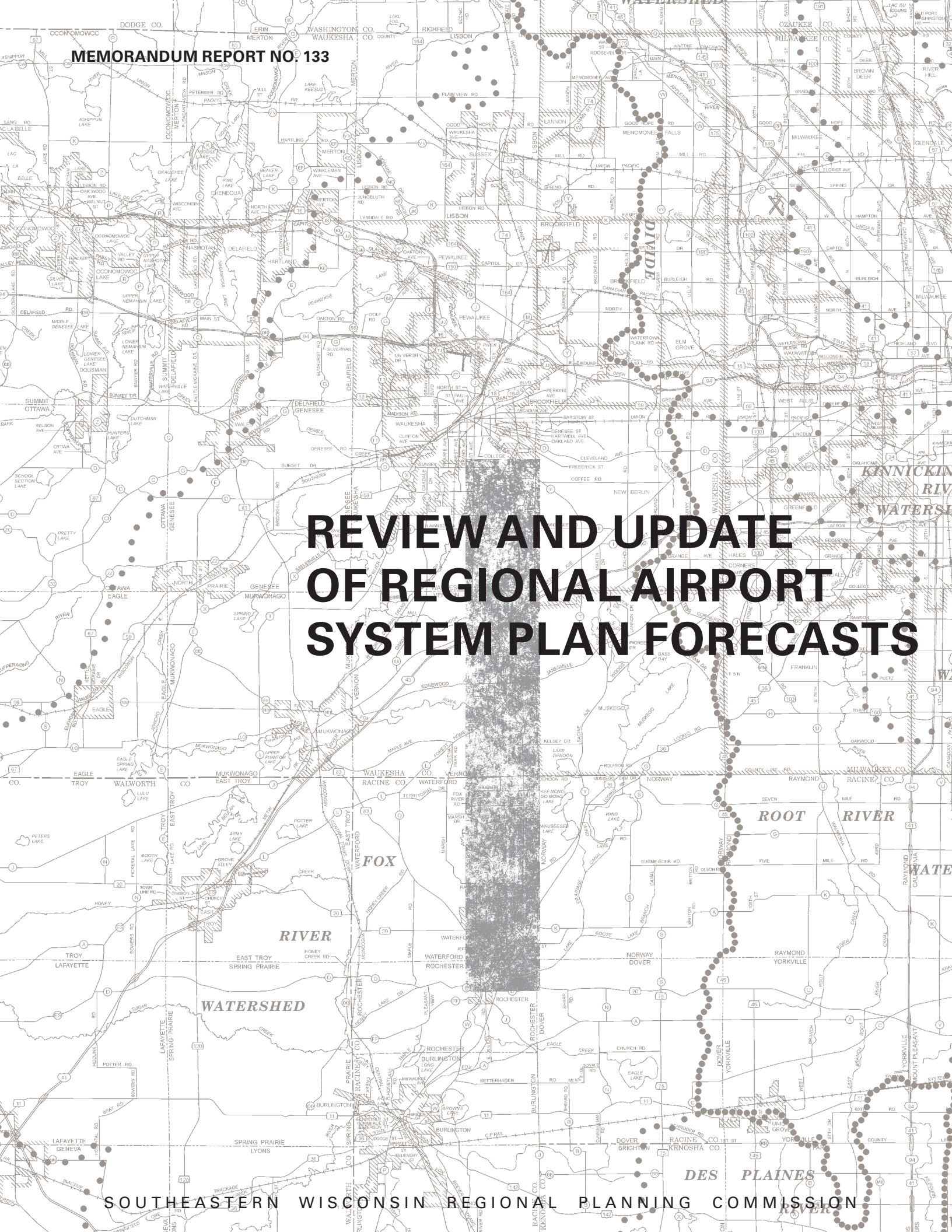

MEMORANDUM REPORT NO. 133

REVIEW AND UPDATE OF REGIONAL AIRPORT SYSTEM PLAN FORECASTS

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

Special acknowledgment is due Mr. Otto P. Dobnick, SEWRPC Principal Planner, and Mr. David M. Jolicoeur, SEWRPC Senior Engineer for their contributions to the preparation of this report.

MEMORANDUM REPORT
NUMBER 133

REVIEW AND UPDATE OF REGIONAL AIRPORT SYSTEM PLAN FORECASTS

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REVIEW AND UPDATE OF REGIONAL AIRPORT SYSTEM PLAN FORECASTS

This memorandum reviews existing aeronautical activity within the Southeastern Wisconsin Region and presents year 2030 forecasts of aeronautical activity for the eleven airports in southeast Wisconsin that comprise the regional airport system plan and are incorporated into the Wisconsin State Airport System Plan. The location of these eleven airports is shown on Map 1.

EXISTING AERONAUTICAL ACTIVITY

INTRODUCTION

This inventory of the existing aeronautical activity within the Southeastern Wisconsin Region is intended to facilitate an understanding of the extent, nature, and trends of such activity, and to provide a basis on which to review existing forecasts and prepare new forecasts. The existing aeronautical activity within Southeastern Wisconsin can be divided into six basic categories: 1) air carrier activity, 2) general aviation activity, 3) air cargo activity, 4) military aviation activity, 5) helicopter activity, and 6) other activity. Together, these six functional categories represent the demand which is placed upon the regional airport system. The purpose of the following sections of this memorandum is to describe those aspects of each of these categories of aeronautical activity pertinent to the preparation of updated regional airport system forecasts for Southeastern Wisconsin.

AIR CARRIER PASSENGER ACTIVITY

Passenger air carriers constitute the backbone of public intercity passenger transportation services used by individuals traveling into, or out of, the Southeastern Wisconsin Region. Most of the air carrier service is scheduled; only a very small portion is unscheduled. All of the passenger air carrier services utilize Milwaukee County's General Mitchell International Airport as the terminal for the Milwaukee metropolitan area and Southeastern Wisconsin. This section of the memorandum describes the air carriers serving Mitchell International, the level of service provided by passenger air carriers for Southeastern Wisconsin, and the current and historic passenger volumes and aircraft operations.

Air Carrier Passenger Service at General Mitchell Airport

As of February 2003, there were a total of 19 domestic air carriers providing scheduled airline passenger service to and from Milwaukee County's Mitchell International Airport.[1] There was one foreign-flag air carrier providing service to Milwaukee. The 19 domestic air carriers include both large certificated air carriers operating under authority of Part 121 of the Federal Aviation Regulations (FAR) and small certificated air carriers operating under authority of Parts 135 or 121 of the FAR. Air carriers are classified by the Federal Aviation Administration (FAA) in a number of different ways, depending upon the purposes involved. The most widely used classification of United States scheduled air carriers is on the basis of the amount of annual operating revenue. Table 1 lists the classification and identifies the basic airline hubs for each of the airlines serving Milwaukee as of February 2003. The domestic airlines serving Mitchell International may be classified into one of three categories: major carriers, national carriers, and regional carriers.

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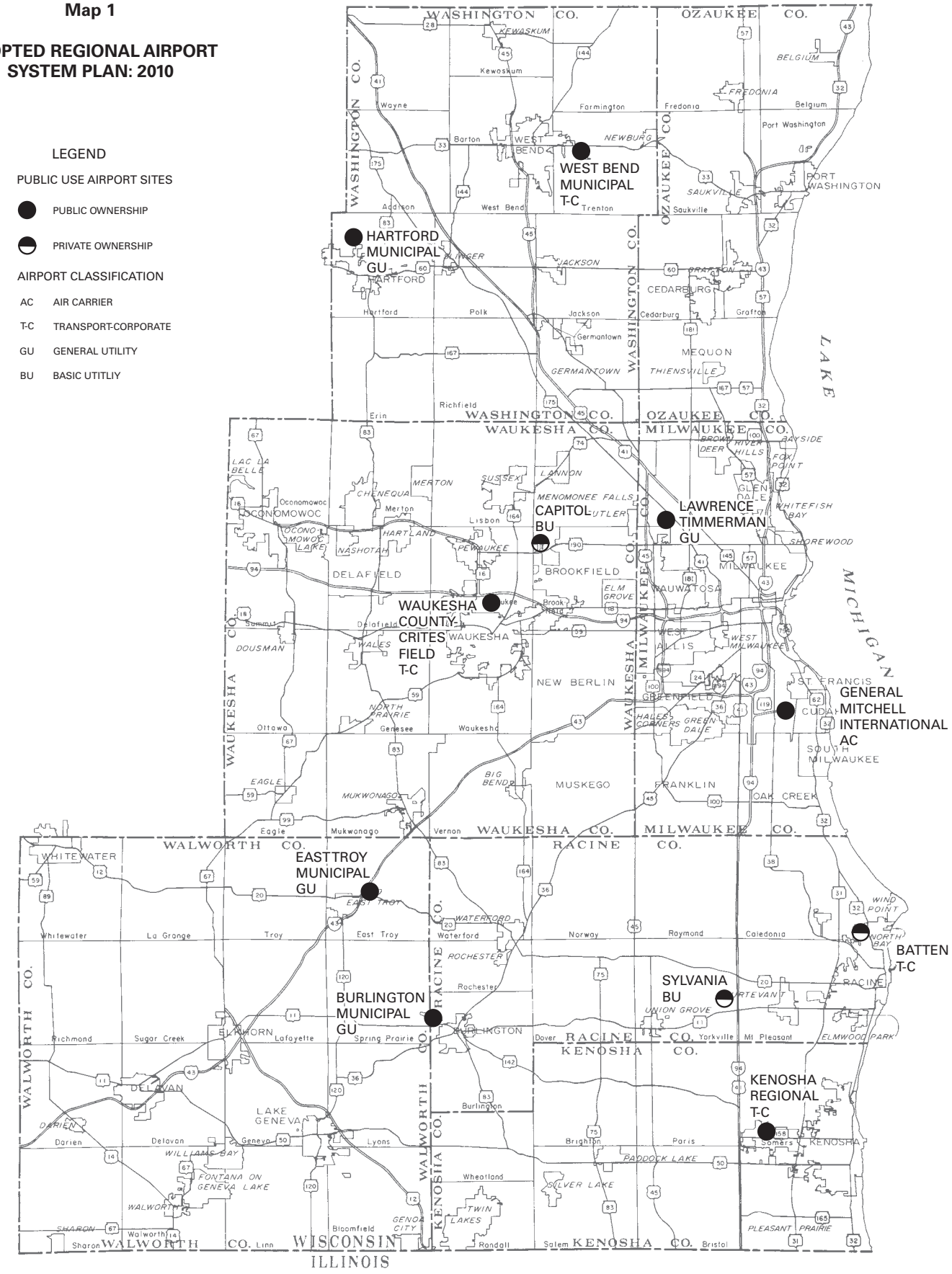
[1] *The number of air carriers providing scheduled service to Mitchell International changes from time to time depending upon market conditions.*

Map 1

ADOPTED REGIONAL AIRPORT SYSTEM PLAN: 2010



Source: SEWRPC.

Table 1

SCHEDULED AIR CARRIERS SERVING GENERAL MITCHELL INTERNATIONAL AIRPORT: FEBRUARY 2003

Airline Name and Carrier Group	Airline Hubs
Major Carriers	
America West Airlines	Las Vegas and Phoenix
American Airlines	Chicago, Dallas/Fort Worth, and Nashville
American Eagle	Chicago
Continental Airlines	Cleveland, Houston, and Newark
Delta Air Lines	Atlanta, Cincinnati, Dallas/Fort Worth, and Salt Lake City
Northwest Airlines	Detroit, Memphis, and Minneapolis/St. Paul
US Airways	Charlotte, Philadelphia, and Pittsburgh
National Carriers	
AirTran Airways	Atlanta and Orlando
Air Wisconsin Airlines (Doing business as United Express)	Chicago and Denver
Atlantic Southeast Airlines (Doing business as the Delta Connection)	Atlanta and Dallas/Fort Worth
Comair (Doing business as the Delta Connection)	Cincinnati
Continental Express	Cleveland, Houston, and Newark
Mesa Airlines (Doing business as US Airways Express)	Phoenix
Midwest Airlines	Milwaukee and Omaha
Regional Carriers	
Large Regional Carriers	
None	- -
Medium Regional Carriers	
Casino Express	Elko
Chicago Express Airlines (Doing business as ATA Connection)	Chicago
Small Regional Carriers	
Chautauqua Airlines (Doing business as American Eagle)	Indianapolis
Skyway Airlines (Doing business as Midwest Connect)	Milwaukee
US Airways Express	Charlotte, Philadelphia, and Pittsburgh
Foreign-Flag Carriers	
Air Canada	Calgary, Montreal, and Toronto

Source: Federal Aviation Administration, Milwaukee County, and SEWRPC.

Major Carriers: Major carriers are defined as air carriers with annual operating revenues of $1 billion or more. These carriers serve primarily the long-haul national markets, emphasizing nonstop service in many major domestic markets, service to most major United States cities, and service to selected foreign countries. Major carriers serving Milwaukee as of February 2003 included Northwest Airlines, American Airlines, American West Airlines, Continental Airlines, Delta Air Lines, and US Airways. For the purposes of this memorandum, the foreign-flag air carrier serving Mitchell International, Air Canada, is considered a major carrier, as Air Canada serves primarily long-haul markets, and emphasizes nonstop service in many major markets.

National Carriers: National carriers are defined as air carriers with annual operating revenues from $100 million to $1 billion. National carriers serve selected long-haul and short-haul markets throughout entire sections of the United States. Unlike major carriers, however, the national carriers do not offer nationwide service. Average lengths of flights and passenger trips for national carriers are significantly shorter than those of the major carriers. The national carriers serving Milwaukee as of February 2003 included Air Wisconsin, Midwest Airlines, AirTran Airways, Atlantic Southeast Airlines, Comair, Continental Express, and Mesa Airlines.

Large Regional Carriers: Large regional carriers are defined as scheduled air carriers with annual operating revenues from $20 million to $100 million. Most of their aircraft seat more than 60 passengers. Large regional carriers primarily serve as feeders to major and national airline hubs, serve smaller nonstop markets given up by major and national carriers, or serve special niche markets. As of February 2003, there were no large regional carriers serving Milwaukee.

Medium Regional Carriers: Medium regional carriers are defined as air carriers with annual operating revenues of less than $20 million. Medium regional carriers primarily serve as feeders to major and national airline hubs, serve smaller nonstop markets given up by major and national carriers, or serve special niche markets. In addition, many of the nonscheduled passenger and air cargo certificated air carriers are in this category. As of February 2003, Casino Express and Chicago Express Airlines were the medium regional carriers serving Milwaukee. Operations of these carriers typically extend over a three- to four-state area, with the routes being designed to act as feeders to the major and national carriers.

Small Regional Carriers: Small regional air carriers are airlines using small aircraft with 60 seats or less and performing at least five round trips per week between two or more points and publishing flight schedules. Small regional airlines are subject to less stringent Federal regulations and data reporting requirements than are large certificated air carriers. Small regional airlines typically provide local point-to-point service, providing feeder service to system hubs operated by major or national air carriers and linking smaller communities with larger cities and represent the largest segment of the national regional airline business. As of February 2003, commuter airlines serving Milwaukee included Skyway Airlines, Chautauqua Airlines, and U.S. Airways Express.

Air Carrier Passenger Traffic at General Mitchell International Airport

Existing and historic enplaning and deplaning passenger volumes for the air carriers serving Mitchell International are presented in Table 2. Most of the airline passenger travel data presented in this report are for enplaning passengers only. Data on enplaning passengers only are presented in order to remain consistent with Federal data collection and forecasting procedures. The FAA typically reports passenger volumes and passenger forecasts in terms of enplaning passengers. As shown in Table 2, the numbers of historic enplaning and deplaning passenger data are highly reciprocal in nature.

Passenger enplanements at Mitchell International have fluctuated from year to year, but have shown an overall constant increase over the long term. Passenger enplanements have increased at an average annual rate of about 6 percent from 1970 to 1980, and an average annual rate of about 3 percent from 1980 to 1990 and from 1990 to 2000. However, between 1980 and 1984, passenger enplanements first decreased at an average annual rate of about 6 percent; between 1984 and 1990 they increased at an average annual rate of about 9 percent. The 1980 through 1984 decrease in enplanements may be attributed to a period of severe economic recession in Southeastern Wisconsin and drastic changes in the airline industry as a result of deregulation. During this period, many of the largest airlines were adopting new marketing and pricing strategies and concentrating efforts on their

Table 2

ANNUAL ENPLANING AND DEPLANING AIR CARRIER PASSENGERS AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 1970-2003

Year	Enplaning Passengers	Deplaning Passengers	Total Number of Passengers	Enplaning Passengers as Percent of Total
1970	887,047	879,755	1,766,802	50
1971	976,609	970,833	1,947,442	50
1972	961,376	955,876	1,917,252	50
1973	1,020,979	1,020,475	2,041,454	50
1974	1,072,466	1,070,605	2,143,071	50
1975	1,176,940	1,064,805	2,241,745	53
1976	1,282,816	1,273,904	2,556,720	50
1977	1,391,169	1,411,969	2,803,138	50
1978	1,494,808	1,496,942	2,991,750	50
1979	1,740,282	1,720,159	3,460,441	50
1980	1,642,532	1,652,977	3,295,509	50
1981	1,558,549	1,559,334	3,117,883	50
1982	1,627,335	1,658,549	3,285,884	50
1983	1,463,227	1,460,414	2,923,641	50
1984	1,287,663	1,285,576	2,573,239	50
1985	1,530,169	1,532,785	3,062,954	50
1986	1,682,739	1,701,925	3,384,664	50
1987	1,798,679	1,771,661	3,570,340	50
1988	2,012,727	2,017,019	4,029,746	50
1989	2,132,541	2,175,754	4,308,295	49
1990	2,213,672	2,274,632	4,488,304	49
1991	2,027,689	2,086,362	4,114,051	49
1992	2,189,052	2,233,037	4,422,089	50
1993	2,264,402	2,257,470	4,521,872	50
1994	2,563,293	2,616,579	5,179,872	49
1995	2,593,359	2,628,346	5,221,705	50
1996	2,732,965	2,719,680	5,452,645	50
1997	2,804,596	2,794,375	5,598,971	50
1998	2,790,837	2,745,084	5,535,921	50
1999	2,906,189	2,919,481	5,825,670	50
2000	3,039,962	3,036,666	6,076,628	50
2001	2,811,954	2,788,106	5,600,060	50
2002	2,791,287	2,797,840	5,589,127	50
2003	3,074,422	3,067,702	6,142,124	50

Source: Milwaukee County and SEWRPC.

largest markets, such as New York City, Chicago, and Los Angeles. During the second half of the 1980 decade, the large airlines began competing more intensively in smaller markets such as Milwaukee and the regional economy had begun recovering from the previous recession. These factors were reflected in significant increases in enplaning passengers. From 2000 to 2002 enplanements decreased at an annual average rate of about 3.5 percent, from about 3.04 million to 2.79 million. This decrease in enplanements may be attributed, in part, to the terrorist attacks of September 11, 2001. From 2002 to 2003 enplanements increased about 10.1 percent from about 2.79 million to 3.07 million. Over the long term, from 1970 to 2003, enplanements at Mitchell International have increased at an annual average rate of about 3.8 percent, as shown in Figure 1.

Enplaning passenger trends at General Mitchell International Airport have generally been very similar to national enplaning passenger trends, as shown in Table 3 and Figure 2. Throughout the 1960's and 1970's and the first few years of the 1980's, Mitchell International enplanements typically represented about 0.55 percent of total domestic enplanements in the United States. From 1983 through 1987, the Mitchell International share of the national domestic enplanements decreased to about 0.40 percent. This was most likely a result of the combined impacts of the economic recession and post-deregulation efforts by the large airlines to emphasize marketing and pricing strategies for their largest markets. Since 1988, Mitchell International's share of the national domestic enplanements has remained fairly constant at about 0.46 percent. The ratio of enplanements at a specific airport, such as Mitchell International, to the total national enplanements is used by the Federal Aviation Administration to classify air traffic hubs as large, medium, or small, with Milwaukee falling into the medium hub category.[2]

The number of connecting passengers using Mitchell International to change from one scheduled flight to another has been estimated and is presented in Table 4, based on data from General Mitchell International Airport. As shown in this table, the number of connecting passengers using Mitchell International has typically varied from about 20 to 33 percent of total enplaning passengers from 1972 to 1983, from 10 to 16 percent of total enplaning passengers from 1984 to 1993, and from 6 to 11 percent of total enplaning passengers between 1994 and 2003.

Air Carrier Aircraft Operations

Air carrier aircraft operations have represented the largest share of total aircraft operations at General Mitchell International Airport since 1988. The existing and historic annual air carrier, general aviation, and military aircraft operations at General Mitchell International Airport are presented in Table 5 and Figure 3. Since 1970, total air carrier operations, which include regional aircraft operations, have increased from about 33 percent to about 84 percent of all aircraft operations at Mitchell International, while general aviation operations have decreased from about 60 percent to fewer than 14 percent of all aircraft operations. During the same period, military aircraft operations have decreased from about 6 percent to about 2 percent of the total. Total air carrier operations include not only scheduled flights but also other movements such as those made by charter operations, weather diversions, and deadhead and training flights.

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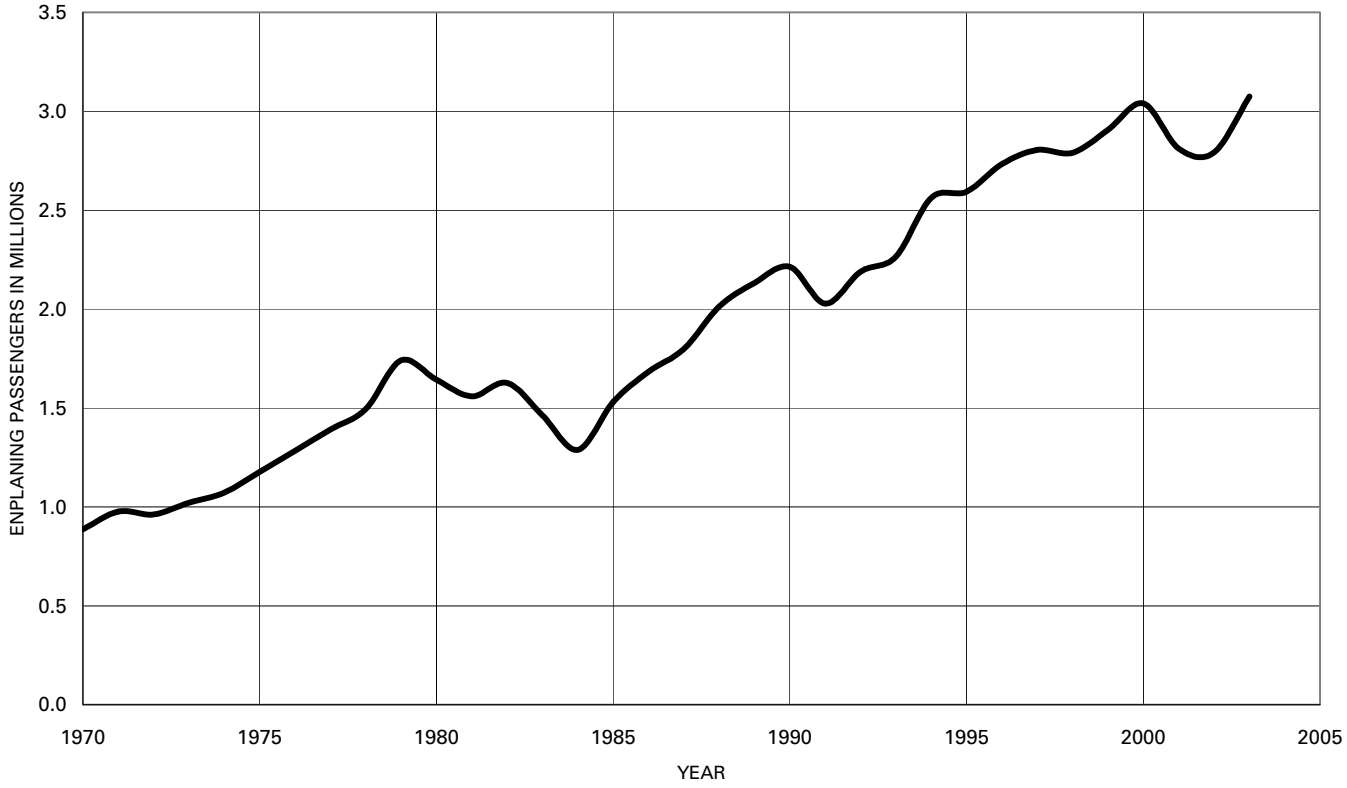
[2] *Air traffic hubs are not defined as airports but as cities or twin cities requiring aviation services. The hubs fall into four classes, determined by each community's percentage of the total enplaned passengers in all services and all operations of U.S. certified air carriers in the 50 States, the District of Columbia, and other U.S. areas.*

- *Large air traffic hub: A community enplaning 1 percent or more of the total passengers enplaned nationally.*
- *Medium air traffic hub: A community enplaning from 0.25 to 0.99 percent of the total passenger enplaned nationally.*
- *Small air traffic hub: A community enplaning from 0.05 to 0.24 percent of the total passengers enplaned nationally.*
- *Nonhub: A community enplaning less than 0.05 percent of the total passengers enplaned nationally.*

Figure 1

ENPLANING PASSENGER TRAFFIC AT GENTERAL MITCHELL INTERNATIONAL AIRPORT: 1970-2003



Source: Milwaukee County and SEWRPC.

Table 3

PASSENGER TRAFFIC ENPLANED AT ALL UNITED STATES STATIONS AND AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 1970-2003

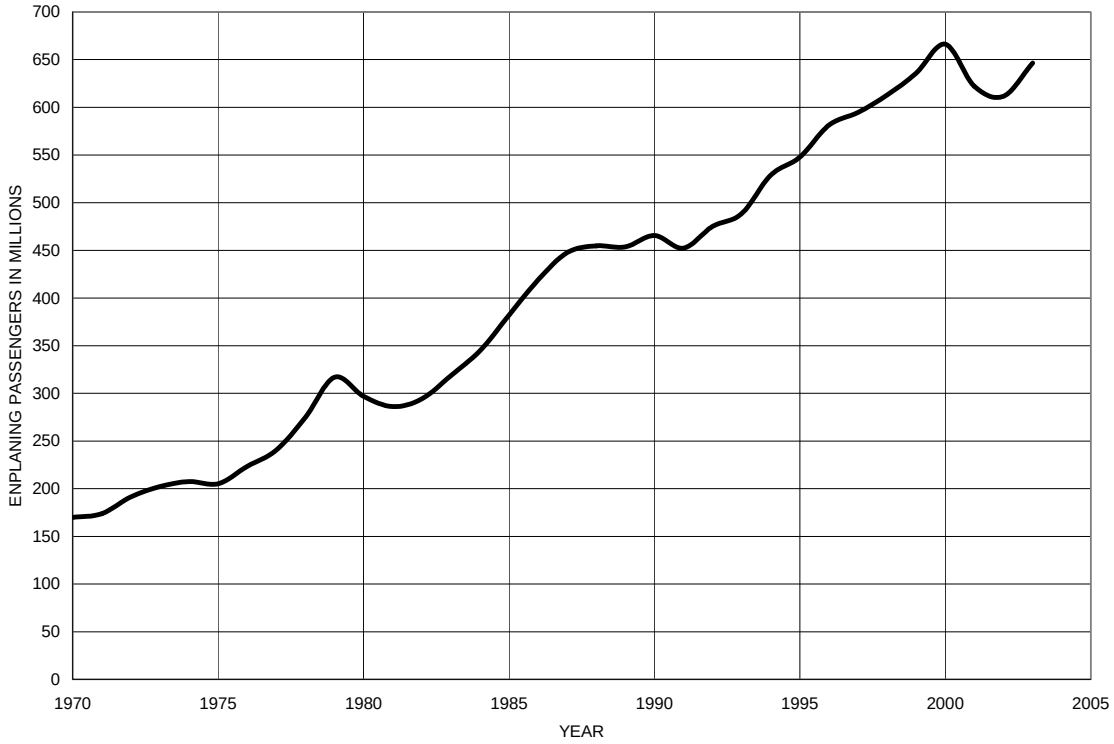
Year	Total Number of Enplaned Passengers		
		General Mitchell International Airport	
	United States	Number of Enplaned Passengers	Total as Percent of United States Total
1970	169,922,000	887,047	0.52
1971	173,669,000	976,609	0.56
1972	191,349,000	961,376	0.50
1973	202,208,000	1,020,979	0.50
1974	207,458,000	1,072,466	0.52
1975	205,062,000	1,176,940	0.57
1976	223,318,000	1,282,816	0.57
1977	240,326,000	1,391,169	0.58
1978	274,716,000	1,494,808	0.54
1979	316,863,000	1,740,282	0.55
1980	296,903,000	1,642,532	0.55
1981	285,976,000	1,558,549	0.54
1982	294,102,000	1,627,335	0.55
1983	318,638,000	1,463,227	0.46
1984	344,683,000	1,287,663	0.37
1985	382,022,000	1,530,169	0.40
1986	418,946,000	1,682,739	0.40
1987	447,678,000	1,798,679	0.40
1988	454,614,000	2,012,727	0.44
1989	453,692,000	2,132,541	0.47
1990	465,560,000	2,213,672	0.48
1991	452,301,000	2,027,689	0.45
1992	475,108,000	2,189,052	0.46
1993	488,520,000	2,264,402	0.46
1994	528,848,000	2,563,293	0.48
1995	547,773,000	2,593,359	0.47
1996	581,234,000	2,732,965	0.47
1997	594,725,000	2,804,596	0.47
1998	612,885,000	2,790,837	0.46
1999	635,959,000	2,906,189	0.46
2000	666,150,000	3,039,962	0.46
2001	622,129,000	2,811,954	0.45
2002	611,657,000	2,791,287	0.46
2003	646,523,000[1]	3,074,422	0.48

[1] *Preliminary estimate.*

Source: Air Transport Association, Milwaukee County, and SEWRPC.

Figure 2

ENPLANING PASSENGER TRAFFIC
IN THE UNITED STATES: 1970-2003



Source: Air Transport Association, Milwaukee County, and SEWRPC.

Table 4

ORIGINATING AND CONNECTING AIR CARRIER PASSENGERS AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 1972-2003

Year	Originating Passengers	Connecting Passengers	Enplaning Passengers	Connecting Passengers as a Percent of Total
1972	788,859	249,958	961,376	26.0
1973	1,020,979	250,140	1,020,979	24.5
1974	1,072,466	243,450	1,072,466	22.7
1975	896,828	280,112	1,176,940	23.8
1976	1,282,816	319,421	1,282,816	24.9
1977	1,391,169	346,401	1,391,169	24.9
1978	1,494,808	363,238	1,494,808	24.3
1979	1,740,282	452,473	1,740,282	26.0
1980	1,199,048	443,484	1,642,532	27.0
1981	1,558,549	522,114	1,558,549	33.5
1982	1,627,335	543,530	1,627,335	33.4
1983	1,085,714	377,513	1,463,227	25.8
1984	1,147,308	140,335	1,287,663	10.9
1985	1,367,971	162,198	1,530,169	10.6
1986	1,408,453	274,286	1,682,739	16.3
1987	1,579,240	219,439	1,798,679	12.2
1988	1,773,212	239,515	2,012,727	11.9
1989	1,906,492	226,049	2,132,541	10.6
1990	2,003,373	210,299	2,213,672	9.5
1991	1,861,418	166,271	2,027,689	8.2
1992	1,972,336	216,716	2,189,052	9.9
1993	2,033,433	230,969	2,264,402	10.2
1994	2,423,343	139,951	2,563,293	5.5
1995	2,406,685	186,674	2,593,359	7.2
1996	2,526,272	206,693	2,732,965	7.6
1997	2,604,727	199,869	2,804,596	7.1
1998	2,586,652	204,185	2,790,837	7.3
1999	2,684,898	221,291	2,906,189	7.6
2000	2,805,445	234,518	3,039,962	7.7
2001	2,542,132	269,823	2,811,954	9.6
2002	2,501,963	289,324	2,791,287	10.4
2003	2,739,290	335,132	3,074,422	10.9

Source: Milwaukee County and SEWRPC.

Table 5

TOTAL AIRCRAFT OPERATIONS AT GENERAL MITCHELL INTERNATIONAL AIRPORT BY TYPE OF OPERATION: 1970-2003

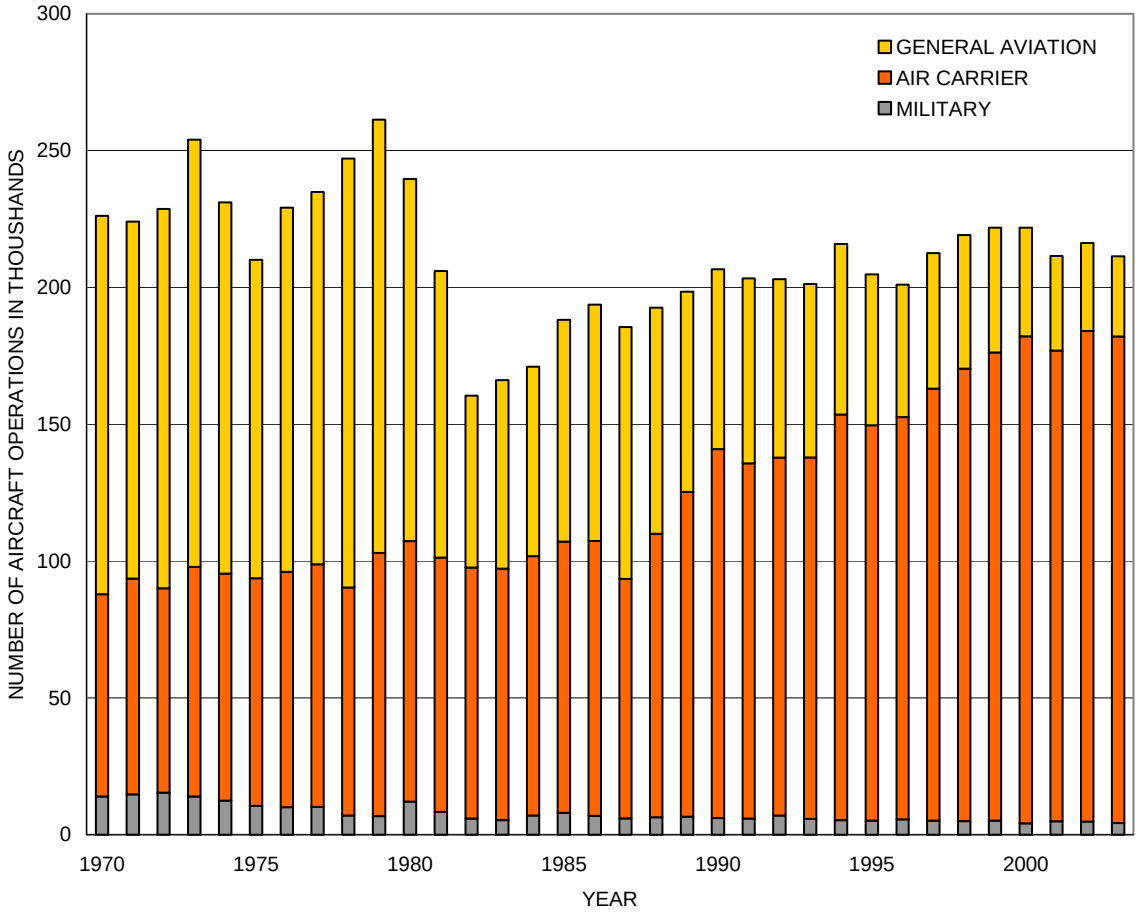
	Air Carrier[1]		General Aviation		Military		Total	
Year	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1970	73,817	32.6	138,264	61.1	14,069	6.2	226,150	100.0
1971	78,813	35.2	130,466	58.2	14,792	6.6	224,071	100.0
1972	74,623	32.6	138,676	60.6	15,407	6.7	228,706	100.0
1973	83,291	33.0	156,054	61.4	14,024	5.5	253,999	100.0
1974	82,986	35.9	135,575	58.7	12,502	5.4	231,063	100.0
1975	83,210	39.6	116,324	55.4	10,547	5.0	210,081	100.0
1976	86,041	37.5	133,074	58.1	10,069	4.4	229,184	100.0
1977	88,684	37.8	136,043	57.9	10,177	4.3	234,904	100.0
1978	83,335	33.7	156,654	63.4	7,052	2.9	247,041	100.0
1979	96,248	36.8	158,275	60.6	6,787	2.6	261,310	100.0
1980	95,167	39.7	132,345	55.2	12,082	5.0	239,594	100.0
1981	92,864	45.1	104,765	50.9	8,369	4.1	205,998	100.0
1982	91,689	57.1	62,864	39.2	5,930	3.7	160,483	100.0
1983	91,879	55.3	68,798	41.4	5,399	3.3	166,076	100.0
1984	94,788	55.4	69,225	40.5	7,016	4.1	171,029	100.0
1985	99,121	52.7	81,041	43.1	7,995	4.2	188,157	100.0
1986	100,431	51.8	86,356	44.6	6,913	3.6	193,700	100.0
1987	87,515	47.2	92,075	49.6	5,974	3.2	185,564	100.0
1988	103,608	53.8	82,639	42.9	6,374	3.3	192,621	100.0
1989	118,642	59.8	73,189	36.9	6,608	3.3	198,439	100.0
1990	134,772	65.2	65,768	31.8	6,129	3.0	206,669	100.0
1991	129,775	63.9	67,519	33.2	5,948	2.9	203,242	100.0
1992	130,801	64.4	65,237	32.1	6,992	3.4	203,030	100.0
1993	132,122	65.6	63,370	31.5	5,796	2.9	201,288	100.0
1994	148,205	68.6	62,336	28.9	5,348	2.5	215,889	100.0
1995	144,420	70.5	55,174	26.9	5,187	2.5	204,781	100.0
1996	146,998	73.1	48,336	24.1	5,629	2.8	200,963	100.0
1997	157,843	74.2	49,579	23.3	5,187	2.4	212,609	100.0
1998	165,248	75.4	48,809	22.3	5,030	2.3	219,087	100.0
1999	171,091	77.1	45,592	20.5	5,183	2.3	221,866	100.0
2000	177,937	80.2	39,695	17.9	4,223	1.9	221,855	100.0
2001	172,107	81.4	34,520	16.3	4,885	2.3	211,512	100.0
2002	179,260	82.9	32,105	14.9	4,814	2.2	216,179	100.0
2003	177,756	84.1	29,344	13.9	4,318	2.0	211,418	100.0

[1]Includes charter and air cargo operations.

Source: Milwaukee County and SEWRPC.

Figure 3

CATEGORIES OF AIRCRAFT OPERATIONS AT GENERAL MITCHELL INTERNATION AIRPORT: 1970-2003



Source: Milwaukee County and SEWRPC.

Table 6 presents the number of aircraft operations by type of passenger air carrier at General Mitchell International Airport. Between 1996 and 2001 the major and national air carriers accounted for about 45 to 54 percent of all passenger air carrier operations.

For purposes of forecasting air carrier passenger traffic, two other important characteristics include the average number of passengers per departure and the enplaning load factor. The enplaning load factor is defined as the percentage of available seats on board the aircraft that are occupied by revenue passengers. In recent years, the airline industry has pursued a number of marketing and management actions to increase such load factors in order to remain profitable. Nevertheless, the many full airplanes during peak and holiday travel periods are generally balanced by only partially filled aircraft during periods when passenger demand is relatively low.

The average number of passengers per departure and enplaning load factors at General Mitchell International Airport are presented in Table 7 for major and national air carriers. At Mitchell International the average number of passengers per departure on major and national air carriers has averaged about 66 from 1966 to 2001 and the respective enplaning load factor has averaged about 59 percent during the same period. It should be expected that the average number of passengers per departure and the enplaning load factor for major and national air carriers at Milwaukee will generally be lower than the similar national figures since all of the major and national airlines as a group would include a higher proportion of well-traveled markets, such as those between the East and West Coasts of the United States.

The average number of passengers per departure and enplaning load factors at General Mitchell International Airport are presented in Table 8 for regional air carriers. At Mitchell International the number of passengers per departure on regional air carriers has averaged about 19 from 1996 to 2001 and the respective enplaning load factor has averaged about 58 percent.

GENERAL AVIATION ACTIVITY

General aviation represents a wide range of aviation activities, including all segments of the aviation industry except air carrier and military activity. General aviation activities range from the training of new pilots through sport, recreational, and personal flying, to a wide variety of business related flying, such as corporate transportation, charter, and air taxi activities; emergency shipments; aerial photography; medical services, including “flight for life” operations; and crop dusting. Aircraft used in general aviation range from the one-seat, single-engine piston aircraft to the long-range corporate jet. General aviation is an important component of the aviation industry, the national transportation system, and the national and regional economies. It provides immediate, efficient, and direct aviation services that commercial air carriers cannot, or will not, provide. In addition, the production and sale of general aviation aircraft, avionics, and other equipment, along with the provision of such support services as flight schools, fixed-base operators, financing, and insurance, make the general aviation industry an important contributor to the economy.

This section describes the different types of general aviation activity, the general aviation fleet size, and aircraft operations and traffic levels in Southeastern Wisconsin.

Types of General Aviation Activity

All 120 airports within Southeastern Wisconsin are intended to serve general aviation activities, either solely or in combination with commercial and military aviation activities. Most of the general aviation activity in Southeastern Wisconsin is concentrated at about 20 of these 120 airports.

For the purposes of this memorandum, general aviation was defined as all civil aviation, that is, all nonmilitary aviation, except the transport of passengers and cargo by commercial air carrier. General aviation activity thus encompasses a variety of functional uses, as described by the following categories, based on the Federal Aviation Administration definitions of primary use categories for general aviation aircraft:

Table 6

PASSENGER AIR CARRIER ANNUAL AIRCRAFT OPERATIONS AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 1996-2001

	Major and National Air Carriers		Regional Air Carriers		Total	
Year	Number	Percent	Number	Percent	Number	Percent
1996	66,710	53.6	57,764	46.4	124,474	100.0
1997	65,938	51.2	62,786	48.8	128,724	100.0
1998	66,532	49.6	67,628	50.4	134,160	100.0
1999	69,574	50.1	69,332	49.9	138,906	100.0
2000	69,942	48.0	75,842	52.0	145,784	100.0
2001	63,520	44.9	77,982	55.1	141,502	100.0

Source: Milwaukee County and SEWRPC.

Table 7

AVERAGE NUMBER OF PASSENGERS FOR MAJOR AND NATIONAL AIR CARRIER DEPARTURES AND ENPLANING LOAD FACTORS AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 1996-2001

Year	Total Annual Major and National Air Carrier Enplanements	Total Annual Major and National Air Carrier Departures	Total Annual Major and National Air Carrier Seats	Average Number of Passengers per Departure	Average Number of Seats per Departure	Enplaning Load Factor
1996	2,234,052	33,355	3,653,500	67	110	61
1997	2,232,808	32,969	3,586,100	68	109	62
1998	2,147,859	33,266	3,639,500	65	109	60
1999	2,251,887	34,787	3,929,300	65	113	58
2000	2,327,560	34,971	4,080,000	67	117	57
2001	2,041,492	31,760	3,647,900	64	115	56

Source: Milwaukee County and SEWRPC.

Table 8

AVERAGE NUMBER OF PASSENGERS FOR REGIONAL AIR CARRIER DEPARTURES AND ENPLANING LOAD FACTORS AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 1996-2001

Year	Total Annual Regional Air Carrier Enplanements	Total Annual Regional Air Carrier Departures	Total Annual Regional Air Carrier Seats	Average Number of Passengers per Departure	Average Number of Seats per Departure	Enplaning Load Factor
1996	494,222	28,882	989,700	17	34	50
1997	561,616	31,393	1,050,800	18	33	55
1998	636,705	33,814	1,164,100	19	34	56
1999	644,199	34,666	1,142,700	19	33	58
2000	708,415	37,921	1,305,100	19	34	56
2001	735,082	38,991	1,360,900	19	35	54

Source: Milwaukee County and SEWRPC.

- Aerial Application: The use of aircraft for purposes which concern the production of food, fibers, or the protection of health in which aircraft are used in lieu of farm implements or ground vehicles for the particular task entailed. Aerial application includes fire-fighting operations, the distribution of chemicals or seeds in agriculture, reforestation, and insect control.

- Aerial Observation: The use of aircraft for aerial mapping, photography, fish spotting, patrol, traffic advisory, survey, search and rescue, hunting, or sight-seeing purposes.

- Business Transportation: The use of aircraft on a not-for-hire basis by individuals for the transport of employees and possibly other passengers and cargo in connection with the operation of a business, industrial enterprise, or a profession, including medical activities such as "flight for life" operations. Business transportation may, or may not, employ professional pilots for the operation of the aircraft.

- Corporate Transportation: The use of aircraft on a not-for-hire basis by corporations or other organizations for the transport of employees and possibly other passengers and cargo in connection with the operation of a business, industrial enterprise, or a profession, and employing professional pilots for the operation of the aircraft.

- Instructional Flying: The use of aircraft for the purpose of formal instruction with a flight instructor aboard or with the maneuvers during a particular flight specified by a flight instructor, excluding, however, proficiency flying.

- Personal Flying: The use of an aircraft on a not-for-hire basis for personal, recreation, and sport purposes not associated with the operation of a business, industrial enterprise, or a profession, including operation for the maintenance of pilot proficiency.

- Miscellaneous Work Use: the use of aircraft for construction work, including the lifting or hoisting of materials or equipment, towing of gliders, aerial advertising, and transporting of parachutists.

- Other Uses: The use of aircraft for purposes not included in the above categories, including aircraft experimentation, research and development, testing, demonstration, air shows, and air racing.

General Aviation Fleet Size

The general aviation fleet size is a basic indicator of general aviation activity. For this evaluation, the most recent year for which based general aviation aircraft fleet data were available was 2001. A historical record of based aircraft for the United States, the State of Wisconsin, and the Southeastern Wisconsin Region is provided in Table 9 and Figure 4. These data indicate that there were 1,442 general aviation aircraft based in the seven-county Southeastern Wisconsin Region in 2001. The current composition of the general aviation fleet is provided in Table 10, which presents the same based aircraft data for 2001 by type of aircraft. Table 11 indicates that the State of Wisconsin's share of all general aviation based aircraft in the United States has, over the long term, remained at about 2.5 percent since 1970. The Southeastern Wisconsin Region's share of all general aviation aircraft registered in Wisconsin, over the long term, has been at about 30 percent since 1970.

Table 12 identifies the number and types of general aviation aircraft based at each airport within the Southeastern Wisconsin Region at the end of 2001. Most of the larger general aviation airports within Southeastern Wisconsin include aircraft that are normally based at that airport but are registered in other counties, or even in other states. A number of reasons exist for this situation, one of the most common being that out-of-Region or out-of-State residents may find it more desirable to base the aircraft at a particular airport within Southeastern Wisconsin for reasons of convenience or cost. Table 12 reflects the most accurate count of based aircraft within Southeastern Wisconsin by airport and by aircraft type for 2001. These data indicate that there was a total of 1,442 general aviation aircraft based in the seven-county Southeastern Wisconsin Region in 2001. The current composition of the general aviation fleet based within the Region is shown in Table 13 and is very similar to the composition of

Table 9

NUMBER OF GENERAL AVIATION AIRCRAFT BASED IN THE UNITED STATES, WISCONSIN, AND THE REGION: 1990-2001[a]

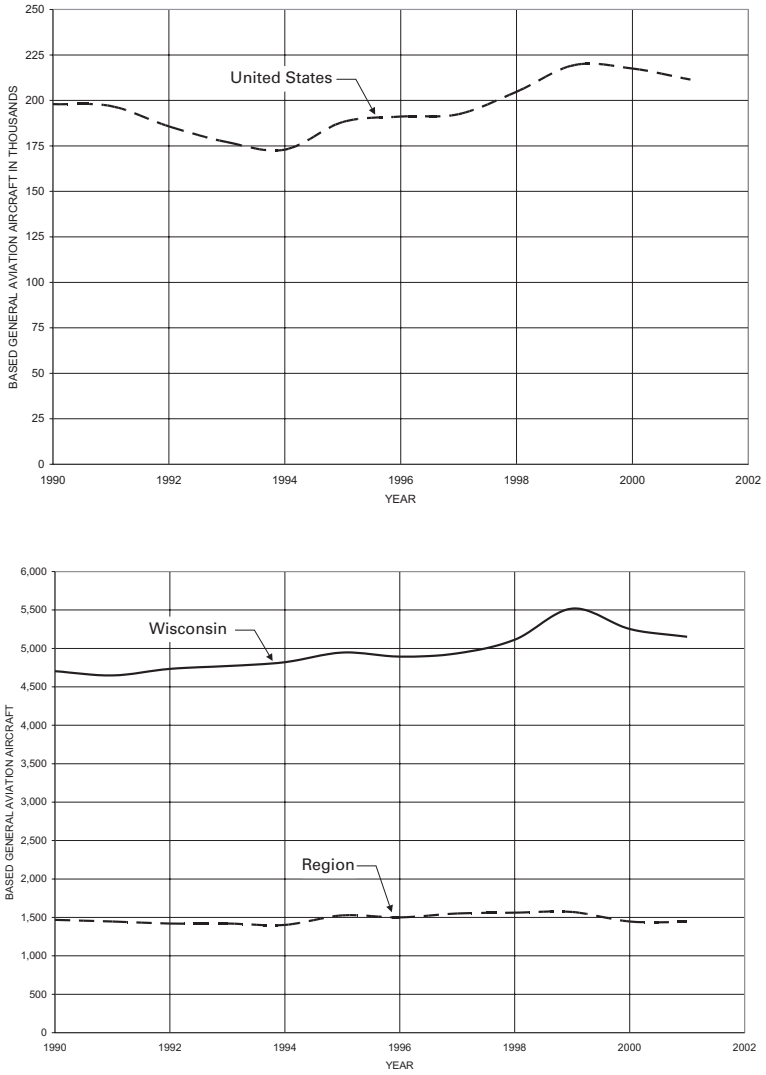
	United		Southeastern Wisconsin Region by County							Region
Year	States	Wisconsin	Kenosha	Milwaukee	Ozaukee	Racine	Walworth	Washington	Waukesha	Total
1990	198,000	4,703	195	358	28	228	127	191	341	1,468
1991	196,874	4,649	200	357	27	208	126	192	336	1,446
1992	185,650	4,733	197	355	25	194	134	188	328	1,421
1993	177,120	4,771	194	347	26	201	152	180	320	1,420
1994	172,935	4,821	186	331	24	218	162	175	306	1,402
1995	188,089	4,946	270	330	24	220	176	186	320	1,526
1996	191,129	4,893	256	323	23	223	177	183	315	1,500
1997	192,414	4,935	254	345	22	237	179	195	320	1,552
1998	204,710	5,112	247	338	23	241	185	197	331	1,562
1999	219,464	5,519	246	337	24	238	194	201	330	1,570
2000	217,533	5,252	235	283	22	223	173	196	314	1,446
2001	211,447	5,151	240	245	20	238	177	197	325	1,442

[a] *These totals represent estimates of active general aviation aircraft.*

Source: Federal Aviation Administration, Wisconsin Department of Transportation, and SEWRPC.

Figure 4

NUMBER OF GENERAL AVIATION AIRCRAFT BASED IN THE UNITED STATES, WISCONSIN, AND THE REGION: 1990-2001



Source: Federal Aviation Administration, Wisconsin Department of Transportation, and SEWRPC.

Table 10

TYPES OF GENERAL AVIATION AIRCRAFT BASED IN THE UNITED STATES, WISCONSIN, AND THE REGION: 2001

Aircraft Type	United States	Wisconsin	Southeastern Wisconsin Region by County							Region Total
			Kenosha	Milwaukee	Ozaukee	Racine	Walworth	Washington	Waukesha	
Piston										
Single-Engine	145,034	4,342	213	166	16	191	161	150	270	1,167
Other	18,281	350	19	24	- -	20	5	13	32	113
Subtotal	163,315	4,672	232	190	16	211	166	163	302	1,280
Turboprop										
Twin-Engine	5,643	132	1	20	- -	5	- -	1	5	32
Other	953	10	1	1	- -	1	- -	1	- -	4
Subtotal	6,596	142	2	21	- -	6	- -	2	5	36
Jet	7,787	132	4	21	- -	6	- -	1	12	44
Helicopter	6,783	76	1	7	1	5	9	5	- -	28
Other	26,966	129	1	6	3	10	2	26	6	54
Total	211,447	5,151	240	245	20	238	177	197	325	1,442

Source: Federal Aviation Administration, Wisconsin Department of Transportation, and SEWRPC.

Table 11

SHARE OF UNITED STATES GENERAL AVIATION AIRCRAFT BASED IN WISCONSIN AND THE REGION: 1990-2001

Year	United States	Based Aircraft				
		Wisconsin		Region		
		Number	Percent of U.S. Total	Number	Percent of Wisconsin Total	Percent of U.S. Total
1990	198,000	4,703	2.38	1,468	31.2	0.74
1991	196,874	4,649	2.36	1,446	31.1	0.73
1992	185,650	4,733	2.55	1,421	30.0	0.77
1993	177,120	4,771	2.69	1,420	29.8	0.80
1994	172,935	4,821	2.79	1,402	29.1	0.81
1995	188,089	4,946	2.63	1,526	30.9	0.81
1996	191,129	4,893	2.56	1,500	30.7	0.78
1997	192,414	4,935	2.56	1,552	31.4	0.81
1998	204,710	5,112	2.50	1,562	30.6	0.76
1999	219,464	5,519	2.51	1,570	28.4	0.72
2000	217,533	5,252	2.41	1,446	27.5	0.66
2001	211,447	5,151	2.44	1,442	28.0	0.68

Source: Federal Aviation Administration, Wisconsin Department of Transportation, and SEWRPC.

Table 12

NUMBER OF ACTIVE GENERAL AVIATION AIRCRAFT BASED IN SOUTHEASTERN WISCONSIN BY AIRPORT AND TYPE: 2001

County	Airport	Open to Public	Based Aircraft by Type				Helicopters	Other[a]	Total
			Single-Engine Piston	Multi-Engine Piston	Turboprop	Jet			
Kenosha	Kenosha Regional	Yes	144	16	2	4	1	--	167
	Camp Lake	Yes	2	--	--	--	--	--	2
	Vincent	Yes	1	--	--	--	--	--	1
	Olson	No	5	--	--	--	--	--	5
	Westosha	Yes	36	2	--	--	--	--	38
	Dutch Gap	No	2	--	--	--	--	--	2
	Winfield	No	7	--	--	--	--	--	7
	Thompson Strawberry Farm	No	3	--	--	--	--	--	3
	Elfering	No	1	--	--	--	--	--	1
	Westosha Emergency Center	No	3	--	--	--	--	--	3
	Chilcott Farm	No	1	--	--	--	--	--	1
	Flaglor	No	1	--	--	--	--	--	1
	Not at Airport	No	7	1	--	--	--	1	9
	Total		213	19	2	4	1	1	240
Milwaukee	Lawrence J. Timmerman	Yes	101	17	6	2	1	--	127
	Mitchell International	Yes	48	7	15	19	1	--	90
	Milwaukee Regional Medical Center	No	--	--	--	--	3	--	3
	Not at Airport	No	17	--	--	--	2	6	25
	Total		166	24	21	21	7	6	245
Ozaukee	Grob	No	7	--	--	--	--	--	7
	Ashenfelter Aerodrome	No	2	--	--	--	--	--	2
	SSS Aerodrome	No	5	--	--	--	1	--	6
	Didier Farm	No	1	--	--	--	--	--	1
	Not at Airport	No	1	--	--	--	--	3	4
	Total		16	--	--	--	1	3	20
Racine	John H. Batten	Yes	68	8	4	6	2	2	90
	Sylvania	Yes	26	1	--	--	--	4	31
	Burlington Municipal	Yes	56	9	2	--	--	--	67
	Cindy Guntly Memorial	Yes	25	2	--	--	1	--	28
	Valhalla	Yes	4	--	--	--	--	--	4
	Aero Estates	No	1	--	--	--	1	--	2
	Fox River	Yes	5	--	--	--	--	--	5
	Crash-In	No	1	--	--	--	--	--	1
	Not at Airport	No	5	--	--	--	1	4	10
	Total		191	20	6	6	5	10	238
Walworth	East Troy Municipal	Yes	82	5	--	--	6	--	93
	Air Troy Estates	No	21	--	--	--	1	--	22
	Lake Lawn	Yes	2	--	--	--	--	--	2
	Swan	No	3	--	--	--	--	--	3
	Grand Geneva	Yes	3	--	--	--	1	--	4
	Wag-Aero	No	8	--	--	--	--	--	8
	Big Foot Airfield	Yes	8	--	--	--	--	--	8
	Ames Farm	No	1	--	--	--	--	--	1
	Fletcher	No	2	--	--	--	--	--	2
	Paddock Field	No	2	--	--	--	--	--	2
	Plows and Props	No	2	--	--	--	--	--	2
	Lake Geneva Air Estates	No	12	--	--	--	--	1	13
	Weedhopper Meadow	No	1	--	--	--	--	--	1
	Barten	No	1	--	--	--	--	--	1
	Lottig	No	2	--	--	--	--	--	2
	Not at Airport	No	11	--	--	--	1	1	13
	Total		161	5	--	--	9	2	177
Washington	West Bend Municipal	Yes	81	10	2	1	1	3	98
	Hartford Municipal	Yes	60	3	--	--	1	17	81
	Miles Field	No	6	--	--	--	--	--	6
	Not at Airport	No	3	--	--	--	3	6	12
	Total		150	13	2	1	5	26	197
Waukesha	Waukesha County-Crites Filed	Yes	166	30	5	12	--	3	216
	Capitol	Yes	78	2	--	--	--	--	80
	Aero Park	Yes	5	--	--	--	--	1	6
	Oconomowoc	No	8	--	--	--	--	--	8
	Bartell Field	No	2	--	--	--	--	--	2
	Christenson	No	1	--	--	--	--	--	1
	O'Tortoise	No	1	--	--	--	--	--	1
	Not at Airport	No	9	--	--	--	--	2	11
	Total		270	32	5	12	--	6	325
Region	Total	--	1,167	113	36	44	28	54	1,442

[a]*Includes balloons, gliders, and registered ultralights.*

Source: Wisconsin Department of Transportation and SEWRPC.

Table 13

TYPES OF ACTIVE GENERAL AVIATION AIRCRAFT BASED IN SOUTHEASTERN WISCONSIN: 2001

Type of Aircraft	Southeastern Wisconsin	
	Number	Percent
Piston		
Single-Engine	1,167	81.0
Other	113	7.8
Subtotal	1,280	88.8
Turboprop		
Twin-Engine	32	2.2
Other	4	0.3
Subtotal	36	2.5
Jet	44	3.1
Helicopter	28	1.9
Other[a]	54	3.7
Total	1,442	100.0

[a]*Includes balloons, gliders, and registered ultralights.*

Source: Wisconsin Department of Transportation and SEWRPC.

the national active general aviation aircraft fleet; with the exception that there is a smaller percentage of helicopters within the Region than there is nationally.

General Aviation Aircraft Operations and Traffic Levels

Operations at each of the 22 general aviation public-use airports, including Milwaukee's Mitchell International Airport, within the Region are summarized in Table 14. An operation is defined as either an aircraft landing, aircraft take-off, or "touch-and-go" operation.[3] These annual operations statistics were obtained from estimates included in the FAA Airport Master Record Form 5010-1 for each public-use airport or from counts obtained from the airport (General aviation aircraft operation counts were obtained from the four airports with air traffic control towers in Southeastern Wisconsin: General Mitchell International Airport, Kenosha Regional Airport, Lawrence J. Timmerman Airport, and Waukesha County-Crites Field). The annual traffic counts include not only fixed-wing aircraft activity, but also helicopter and ultralight aircraft activity. Helicopter activity, however, was very limited at most general aviation public-use airports, representing a very small percentage of total general aviation activity. Similarly, ultralight aircraft activity occurred at only a few airports within the Region. The counts in Table 14 also include passenger air carrier operations, which occur only at General Mitchell International Airport, and military operations, which occur principally at Mitchell International and West Bend Municipal Airports.

In 2002, total aircraft operations at public-use general aviation airports in Southeastern Wisconsin were estimated to be about 886,400 operations. Much of this activity, however, was concentrated at a limited number of airports, as shown in Figure 5. By itself, Mitchell International accounted for almost 25 percent of all aircraft operations at public-use airports in the Region. About one-half of the total operations at public-use airports in the Region occurred at only four airports: Mitchell International, Waukesha County-Crites Field, Kenosha Regional Airport, and Lawrence J. Timmerman Airport. Also, the eleven airports that comprise the regional airport system plan accounted for about 91 percent of all public-use airport operations in the Region.

The 886,400 total aircraft operations estimated to have occurred at public-use general aviation airports in Southeastern Wisconsin during 2002 exceeded the total operations estimated for 1971 of 867,100, and for 1984 of 787,200, but represented a decline from 1993 estimated total operations of 907,500, as shown in Table 14. This suggests an overall trend, at least for general aviation aircraft operations within the Region, that may be consistent with national trends, which have indicated a slight overall decline in general aviation activity within the past decade. The total hours estimated to have been flown by general aviation aircraft in the United States and Wisconsin is shown in Table 15 and Figure 6.

General aviation operations may be subdivided into local, itinerant, and military categories of operations, as shown in Table 16. Local operations are defined as those which occur in the local traffic pattern or within sight of the airport control tower. Local operations include those flights known to be departing for, or arriving from, local practice areas which generally lie within a 20-mile radius of the airport. Itinerant operations are defined as all aircraft operations other than local operations. Typically, local operations are conducted for training and instructional purposes, but may also include such miscellaneous uses as sight-seeing. Military operations include both local and itinerant activity.

The distribution of total operations among local operations and itinerant operations provides an indication of the function each airport performs in the regional airport system. High volumes of local operations compared to other operations generally denote airports with substantial flying for instructional and pilot proficiency purposes and for personal and possibly aerial application purposes. Local general aviation operations accounted for an estimated 37 percent of all operations at the 22 public-use airports in the Region during 2002. At Mitchell International and John H. Batten airports, local operations incorporating touch-and-go maneuvers are either not encouraged or prohibited. The high volumes of itinerant operations compared to other operations denote airports with substantial

[3] *A "touch-and-go" operation is defined as an operation in which an aircraft touches down on an airport runway and immediately takes off again without stopping. Touch-and-go operations are normally performed by student and licensed pilots to improve proficiency.*

Table 14

TOTAL ANNUAL AIRCRAFT OPERATIONS AT PUBLIC-USE GENERAL AVIATION AIRPORTS IN SOUTHEASTERN WISCONSIN: 1971, 1984, 1993, AND 2002

County	Airport Name	Number of Annual Operations [a]			
		1971	1984	1993	2002
Kenosha	Camp Lake	1,200[b]	700	1,400	2,200
	Kenosha Regional	64,500	83,500	79,000	92,813
	Vincent	4,000	3,000	3,100	3,400
	Westosha	500[b]	20,000	20,350	22,385
Milwaukee	Hales Corners	25,200	- -[c]	- -[c]	- -[c]
	Mitchell International	224,071	171,029	201,288	216,179
	Rainbow	20,000	17,250	16,750	- -[c]
	Lawrence J. Timmerman	143,900	85,554	88,261	80,152
Ozaukee	Ozaukee	3,500	- -[b]	- -[b]	- -[b]
Racine	Burlington Municipal	8,000	45,350	46,300	55,300
	Fox River	3,200	12,000	4,000	5,000
	John H. Batten	35,000	28,000	51,250	60,000
	Cindy Guntly Memorial	800	13,500	5,700	6,700
	Sylvania	12,000	16,300	38,400	42,000
	Valhalla	200	30	30	110
Walworth	Big Foot Airfield	1,000	3,675	4,075	4,819
	East Troy Municipal	5,700	3,000	55,100	51,250
	Edgewood Seaplane Base	360	- -[c]	- -[c]	- -[c]
	Grand Geneva	5,700	16,100	- -[c]	6,200
	Gruenwald	1,600	- -[b]	- -[c]	- -[c]
	Lake Lawn	1,400	20,100	35,000	22,550
	Mt. Fuji	100	- -[b]	- -[b]	- -[b]
Washington	Hahn Sky Ranch	1,000	1,200	410	410
	Hartford Municipal	57,600	19,665	28,320	15,500
	West Bend Municipal	90,540	84,072	82,100	51,300
Waukesha	Aero Park	3,200	11,000	6,000	6,250
	Capitol	35,000	50,810	68,810	39,000
	O'Leary	800	- -[b]	- -[b]	- -[b]
	Waukesha County-Crites Field	117,000	81,322	71,876	102,891
Total	- -	867,071	787,157	907,520	886,409

[a] *Annual operations shown in this table include all general aviation, air carrier, military, and helicopter activity. Military and helicopter activity are significant at General Mitchell International Airport and West Bend Municipal Airport.*

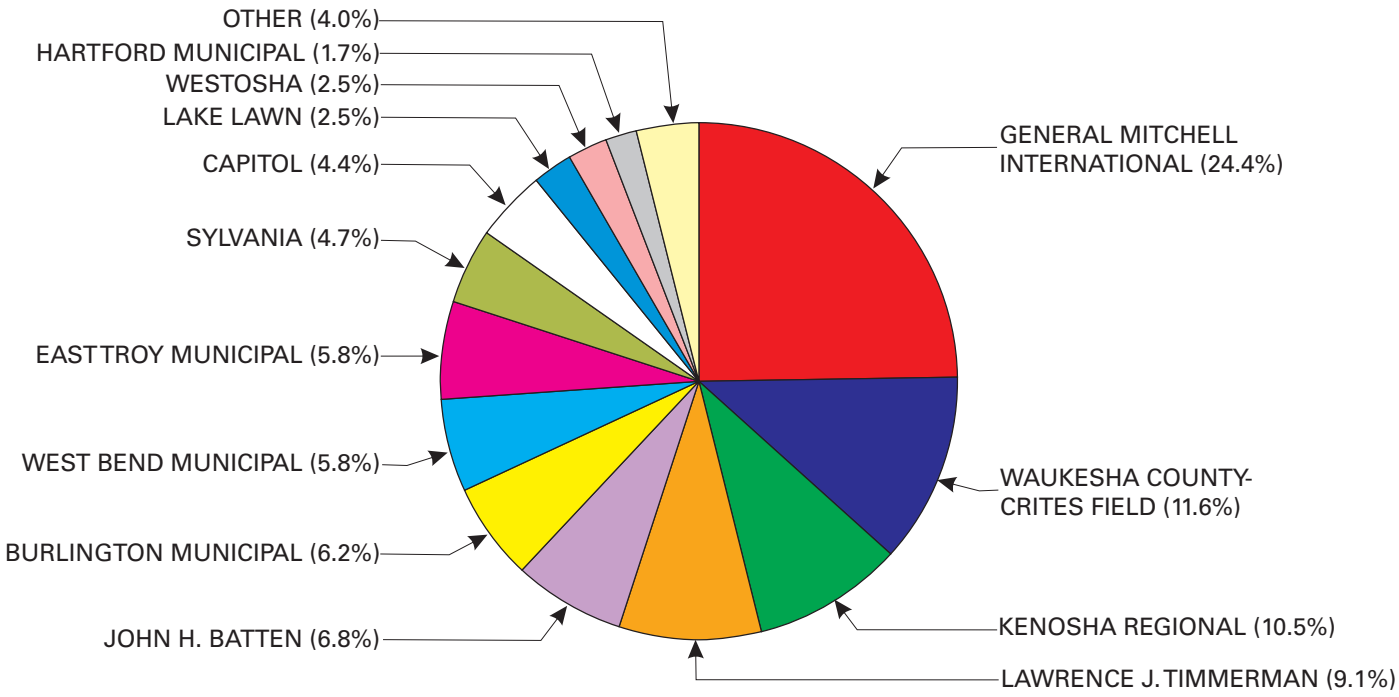
[b] *Private use airport, not open for public use.*

[c] *Airfield closed.*

Source: Federal Aviation Administration, City of Kenosha, Milwaukee County, Waukesha County, and SEWRPC.

Figure 5

ANNUAL AIRCRAFT OPERATIONS AT PUBLIC USE AIRPORTS IN SOUTHEASTERN WISCONSIN: 2002



Source: SEWRPC.

Table 15

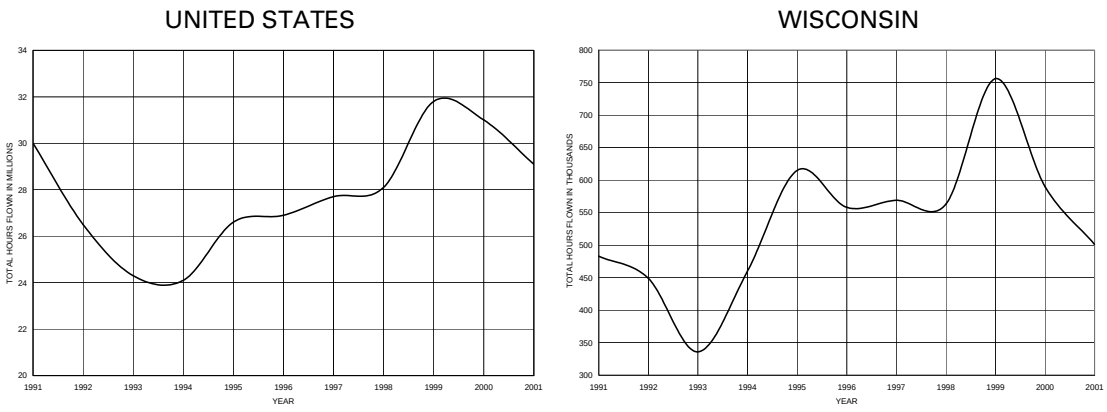
ACTIVE GENERAL AVIATION AIRCRAFT TOTAL ANNUAL HOURS FLOWN IN THE UNITED STATES AND WISCONSIN: 1991-2001

Year	United States (in millions)	Wisconsin (in thousands)	Percent of U.S. Total
1991	30.0	483	1.6
1992	26.5	449	1.7
1993	24.3	336	1.4
1994	24.1	460	1.9
1995	26.6	615	2.3
1996	26.9	558	2.1
1997	27.7	569	2.1
1998	28.1	563	2.0
1999	31.8	756	2.4
2000	31.0	590	1.9
2001	29.1	501	1.7

Source: Federal Aviation Administration.

Figure 6

ACTIVE GENERAL AVIATION AIRCRAFT TOTAL ANNUAL HOURS FLOWN IN THE UNITED STATES AND WISCONSIN: 1991-2001



Source: Federal Aviation Administration.

Table 16

ANNUAL AIRCRAFT OPERATIONS AT PUBLIC-USE AIRPORTS IN SOUTHEASTERN WISCONSIN: 2002

County	Airport Name	Operations[a]				
		Air Carrier	General Aviation		Military	Total
			Local	Itinerant		
Kenosha	Camp Lake	- -	2,000	200	- -	2,200
	Kenosha Regional	4	34,225	58,406	178	92,813
	Vincent	- -	2,100	1,300	- -	3,400
	Westosha	- -	11,330	11,055	- -	22,385
Milwaukee	Mitchell International	179,260	3,339	28,766	4,814	216,179
	Lawrence J. Timmerman	- -	36,392	43,695	65	80,152
Ozaukee	None	- -	- -	- -	- -	- -
Racine	Burlington Municipal	- -	30,000	24,800	500	55,300
	Fox River	- -	2,500	2,500	- -	5,000
	John H. Batten	- -	38,000	22,000	- -	60,000
	Cindy Guntly Memorial	- -	5,200	1,500	- -	6,700
	Sylvania	- -	30,000	12,000	- -	42,000
	Valhalla	- -	100	10	- -	110
Walworth	Big Foot Airfield	- -	3,224	1,595	- -	4,819
	East Troy Municipal	- -	25,700	25,050	500	51,250
	Grand Geneva	- -	1,000	5,200	- -	6,200
	Lake Lawn	- -	2,000	20,500	50	22,550
Washington	Hahn Sky Ranch	- -	200	200	10	410
	Hartford Municipal	- -	10,000	5,400	100	15,500
	West Bend Municipal	- -	16,300	21,000	14,000	51,300
Waukesha	Aero Park	- -	5,250	1,000	- -	6,250
	Capitol	- -	20,000	19,000	- -	39,000
	Waukesha County-Crites Field	- -	47,536	55,252	103	102,891
Total	- -	179,264	326,396	360,429	20,320	886,409

[a] *Activity data for General Mitchell International Airport are from actual air traffic control tower counts. Activity data from Kenosha Regional Airport, Lawrence J. Timmerman Airport, and Waukesha County-Crites Field are from air traffic control tower counts adjusted to include hours when the tower is not open. Activity data for other airports are based on estimates provided by airport officials.*

Source: Federal Aviation Administration, City of Kenosha, Milwaukee County, Waukesha County, and SEWRPC.

flying for business or corporate purposes. Itinerant general aviation operations accounted for an estimated 41 percent of all operations during 2002. Military operations are often itinerant and accounted for about 2 percent of all operations during 2002. The remaining 20 percent of all operations in the Region during 2002 were performed by air carriers, whose operations are also classed as itinerant.

An important measure useful in airport system planning is the average number of annual operations per aircraft. With respect to general aviation aircraft, the average number of annual operations for specific aircraft types is based on the average annual hours flown for each aircraft type and is derived from data provided in the annual General Aviation Activity Survey conducted by the Federal Aviation Administration. Table 17 presents the average hours flown per active general aviation aircraft in the United States by aircraft type. In 2002 the average number of hours flown for all types of aircraft was 137.8 hours per year. For comparison purposes, the survey noted that the average hours flown per active aircraft in the FAA's Great Lakes Region during 2002 was 115.8 hours. The Great Lakes Region includes the states of Wisconsin, Illinois, Indiana, Michigan, Minnesota, North Dakota, Ohio, and South Dakota. The same survey indicated that the average hours flown for active aircraft in the State of Wisconsin for all types of aircraft was 107.3 hours in 2002. This suggests that the annual aircraft utilization with respect to the entire active aircraft fleet is somewhat less in the Great Lakes Region and the State of Wisconsin than in the rest of the United States. Specific data pertaining to the average hours flown per aircraft are not available by type below the national level.

Table 18 presents the number of aircraft landings reported, the estimated hours per flight, and the estimated average number of operations per aircraft for the different types of active general aviation aircraft in the United States in 2001. Annual utilization, based on national analyses, varies from about 200 operations per year for miscellaneous aircraft, such as balloons and gliders, to about 850 operations per year for helicopters. The entire fleet of general aviation aircraft in the United States has an average of about 400 operations per aircraft. Aircraft with fewer annual operations than this average are those used primarily for personal, sport, and recreational purposes, including single-engine piston aircraft. Aircraft with a higher than average number of annual operations include those used for business, corporate, and commercial uses, such as the twin-engine turboprop aircraft, jet aircraft, and helicopters.

The estimated average number of aircraft operations per active based aircraft at the public-use general aviation airports within Southeastern Wisconsin in 2001 is provided in Table 19. With the exception of a small number of airports that have an unusually small number of based aircraft, the estimated operations per active based aircraft are generally comparable to the estimates derived from the 2002 FAA General Aviation Activity Survey shown in Tables 17 and 18. An important distinction is that the estimates of operations per based aircraft that use total annual airport operation counts also reflect operations of itinerant aircraft that are not based at the particular airport.

Table 19 does not include an estimate of operations per active based aircraft for private airports, since those airports are not required to report total annual operations. Within Southeastern Wisconsin, such private airports are typically a base for a very small number of small single-engine aircraft, many of which are used infrequently. A review of the specific aircraft based at these airports within Southeastern Wisconsin, together with annual aircraft utilization data from the FAA General Aviation Activity Survey by aircraft type and make, suggests that such aircraft are used chiefly for agriculture, sport, and experimental purposes and are used significantly less than the rest of the aircraft fleet. It was concluded that each of these aircraft are likely to generate from 200 to 400 operations per year. Similarly, general aviation aircraft that are reported in the State registration records as not being based at any specific airport may also be expected to generate from 200 to 400 operations per year.

It may be reasonably assumed that the level of operations at private airports is far below that at the public-use airports and that such operations are made entirely by small aircraft based at that airport. As shown on Table 12, a total of 1,238 active aircraft were based at the public-use airports in the Region in 2001, while a total of 123 aircraft were based at the private airports or heliports in the Region and a total of 81 aircraft were based at locations other than airports in the Region, such as private garages, barns, and at private residences. Based upon a review of these private airports and of the aircraft that are based both at these private airports, as well as at

Table 17

ACTIVE GENERAL AVIATION AIRCRAFT ANNUAL TOTAL AND AVERAGE HOURS FLOWN IN THE UNITED STATES BY AIRCRAFT TYPE: 2001

Aircraft Type	Total Hours Flown		Average Hours Flown per Aircraft
	Number	Percent	
Piston			
Single-Engine	17,897,929	61.5	123.4
Other	2,984,721	10.2	163.3
Subtotal	20,882,650	71.7	127.9
Turboprop			
Twin-Engine	1,596,798	5.5	283.0
Other	316,257	1.1	331.9
Subtotal	1,913,055	6.6	290.0
Jet	2,658,005	9.1	341.3
All Fixed-Wing	25,453,710	87.4	143.2
Helicopter	2,141,116	7.3	315.7
Other[a]	1,538,173	5.3	57.0
All Aircraft	29,132,999	100.0	137.8

[a]*Includes gliders, dirigibles, and balloons.*

Source: Federal Aviation Administration

Table 18

ACTIVE GENERAL AVIATION AIRCRAFT ANNUAL NUMBER OF LANDINGS AND AVERAGE NUMBER OF OPERATIONS IN THE UNITED STATES BY AIRCRAFT TYPE: 2001

Aircraft Type	Total Number of Annual Landings	Average Hours per Flight	Average Number of Operations per Aircraft
Piston			
Single-Engine	28,071,385	0.64	387
Other	3,036,797	0.98	332
Subtotal	31,108,182	0.67	381
Turboprop			
Twin-Engine	1,374,363	1.16	481
Other	529,470	0.60	1,111
Subtotal	1,903,833	1.00	577
Jet	1,999,534	1.33	514
All Fixed-Wing	35,011,549	0.73	394
Helicopter	4,869,983	0.44	864
Other[a]	2,258,401	0.68	201
All Aircraft	42,139,933	0.69	399

[a]*Includes gliders, dirigibles, and balloons.*

Source: Federal Aviation Administration and SEWRPC.

Table 19

AVERAGE NUMBER OF OPERATIONS PER ACTIVE BASED AIRCRAFT AT PUBLIC-USE GENERAL AVIATION AIRPORTS IN SOUTHEASTERN WISCONSIN: 2001

County	Airport Name	2001		
		Total Operations[a]	Total Active Based Aircraft	Operations Per Active Based Aircraft
Kenosha	Camp Lake	2,200	2	1,100
	Kenosha Regional	92,813	167	556
	Vincent	3,400	1	3,400
	Westosha	22,385	38	589
Milwaukee	Mitchell International	216,179	90	2,402
	Lawrence J. Timmerman	80,152	127	631
Ozaukee	- -	- -	- -	- -
Racine	Burlington Municipal	55,300	67	825
	Fox River	5,000	5	1,000
	John H. Batten	60,000	90	667
	Cindy Guntly Memorial	6,700	28	239
	Sylvania	42,000	31	1,355
	Valhalla	110	4	28
Walworth	Big Foot Airfield	4,819	8	602
	East Troy Municipal	51,250	93	551
	Grand Geneva	6,200	4	1,550
	Lake Lawn	22,550	2	11,275
Washington	Hahn Sky Ranch	410	- -	- -
	Hartford Municipal	15,500	81	191
	West Bend Municipal	51,300	98	523
Waukesha	Aero Park	6,250	6	1,042
	Capitol	39,000	80	488
	Waukesha County-Crites Field	102,891	216	476
Total	- -	886,409	1,238	716

NOTE: The average number of operations per based active aircraft represents not only those operations generated by each based aircraft, but also represents operations generated by itinerant aircraft not based at the airport. Therefore, airports with a low number of based aircraft may have estimates of operations per based aircraft which are outside of the normal range observed at other airports. Such airports within the Region include Camp Lake, Vincent, Fox River, Sylvania, Grand Geneva, Lake Lawn, and Aero Park.

[a] *Year 2001 and 2002 aircraft activity is assumed to be similar.*

Source: Wisconsin Department of Transportation and SEWRPC.

locations other than airports, it was estimated that these 204 active aircraft generated a total of about 63,300 annual operations within Southeastern Wisconsin in addition to the activity at the 22 public-use airports in the Region. A small number of these private airports, such as Air Troy Estates Airport and Lake Geneva Air Estates, did have a significant number of active based aircraft and, therefore, could be expected to generate a significant number of annual operations.

The FAA provides guidelines for use in estimating activity per based aircraft when more detailed local or regional information or data are not available. Use of these default estimates of operations per based aircraft, however, were found not to be necessary for this update since data that better reflects local conditions were available.

AIR CARGO ACTIVITY

Air cargo, which normally includes air freight, express, and mail, is accommodated at many of the airports within the Region. The center of air cargo activity, however, remains at General Mitchell International Airport, which provides direct access to national and world markets. Several of the general aviation airports within Southeastern Wisconsin contribute to the air cargo distribution system by accommodating various point-to-point shipments, such as corporate freight carried in corporate aircraft or shipments destined for Mitchell International for transfer to major air cargo carriers. Of the airports in the Region other than Mitchell International, Kenosha Regional Airport and Waukesha County-Crites Field probably have the largest amount of air cargo activity, having had freight forwarders regularly conducting business at the airports for many years.

While the air cargo industry is subject to changes in the national and world economy, it has been regarded by many as a rapidly expanding and potentially lucrative business area, and thus, has become very competitive. This has resulted in airlines and freight forwarders entering into alliances and partnerships in order to remain competitive and to provide customized transportation services for customers. The use of electronic communication in the management and tracking of shipments has become very common, as has the concept of "seamless" service so that customers need only deal with a single carrier. Trucking services have become an integral part of the air cargo network, not only for local pickup and delivery, but also to replace some of the aircraft segments of distribution and feeder services where more cost-effective.

At Mitchell International, air cargo and mail service is typically provided by all major and national airlines. Normally, such cargo and mail is handled in the lower holds of regularly scheduled air carrier aircraft, much of it in containers. Some large airlines, such as Northwest Airlines, have handled their cargo on cargo-only flights. The amount of air cargo handled in lower holds of scheduled air carrier aircraft may be gaining on the amount of cargo handled on aircraft exclusively used for air cargo operations, as passenger air carriers look for additional sources of revenue, as lower-hold capacity in new aircraft becomes larger, and as some of the older medium-sized air cargo aircraft are taken out of service.

Air cargo operations on aircraft exclusively used for air cargo operations typically occur at nonpeak times at Mitchell International, since much of the air cargo traffic moves overnight. As shown in Table 20, the volume of air cargo handled at Mitchell international has steadily increased, peaking at over 109,000 tons in 1999. The volume of airmail handled at Mitchell International has fluctuated, depending upon how much mail is trucked to the U.S. Postal Service's Chicago Regional Center, but in 2002 totaled almost 8,000 tons. As shown in Table 21, cargo enplaned at Mitchell International represented 0.40 percent of the United States total and mail handled at Mitchell International represented 0.52 percent of the United States total in 2000, the last year for which national data are available.

MILITARY AVIATION ACTIVITY

Although there are no exclusive military-use airports within, or immediately adjacent to, Southeastern Wisconsin, significant military aviation activity occurred at two public-use airports in the Region during 2002: General Mitchell International Airport and West Bend Municipal Airport. Military operating units were based at these two airports.

Table 20

TOTAL ANNUAL AMOUNT OF AIRMAIL AND AIR CARGO AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 1970-2002

Year	Cargo (tons)			Airmail (tons)		
	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total
1970	17,370	14,592	31,962	4,230	5,205	9,435
1975	14,682	12,316	26,999	5,932	5,788	11,720
1980	10,246	8,531	18,777	7,440	8,911	16,351
1985	12,965	10,746	23,712	5,787	10,732	16,518
1990	36,345	31,417	67,763	8,390	12,890	21,280
1991	38,918	34,119	73,037	13,644	17,351	30,995
1992	38,518	36,261	74,779	11,019	15,687	26,706
1993	42,794	37,718	80,512	8,995	12,848	21,843
1994	48,897	41,359	90,256	11,393	13,112	24,505
1995	48,149	40,596	88,744	13,934	13,877	27,811
1996	49,804	44,343	94,147	14,889	14,272	29,161
1997	51,615	45,717	97,333	13,983	13,643	27,626
1998	57,810	48,315	105,945	13,428	12,276	25,704
1999	57,628	51,423	109,051	11,883	10,467	22,350
2000	51,073	47,357	98,431	11,974	10,123	22,098
2001	44,452	42,308	86,759	9,097	7,245	16,342
2002	45,860	49,412	95,272	4,323	3,612	7,935

Source: Milwaukee County.

Table 21

ANNUAL AIRMAIL AND CARGO TRAFFIC ENPLANED AT UNITED STATES STATIONS AND AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 1970-2000

Year	United States		General Mitchell International Airport		General Mitchell International Airport Total as Percent of U.S. Total	
	Enplaned Cargo (tons)	Enplaned Mail (tons)	Enplaned Cargo (tons)	Enplaned Mail (tons)	Cargo (tons)	Mail (tons)
1970	1,926,258	782,229	17,370	4,230	0.90	0.54
1975	2,717,369	890,490	14,682	5,932	0.54	0.67
1980	3,504,028	1,520,132	10,246	7,440	0.29	0.49
1985	2,548,025	1,416,643	12,965	5,787	0.51	0.41
1990	4,629,653	1,558,021	36,345	8,390	0.79	0.54
1991	4,750,582	1,550,220	38,918	13,644	0.82	0.88
1992	4,952,683	1,676,037	38,518	11,019	0.78	0.66
1993	6,383,887	1,819,203	42,794	8,995	0.67	0.49
1994	6,802,375	1,915,706	48,897	11,393	0.72	0.59
1995	7,204,479	2,160,538	48,149	13,934	0.67	0.64
1996	8,047,795	2,285,503	49,804	14,889	0.62	0.65
1997	11,163,448	2,356,781	51,615	13,983	0.46	0.59
1998	11,784,514	2,299,255	57,810	13,428	0.49	0.58
1999	12,067,717	2,844,130	57,628	11,883	0.48	0.42
2000	12,688,205	2,301,666	51,073	11,974	0.40	0.52

Source: Federal Aviation Administration and Milwaukee County.

The headquarters of the 128th Air Refueling Group of the Wisconsin Air National Guard (ANG) and the 440th Tactical Airlift Wing of the United States Air Force Reserve (USAFR) are located at Mitchell International. There were about 4,800 military operations, about 2 percent of all operations, at Mitchell International during 2002. Both military units maintain their own apron areas, maintenance hangers, office space, and other support facilities.

A United States Army National Guard facility is located at West Bend Municipal Airport. There were about 14,000 military operations during 2002, representing about 27 percent of all aircraft operations, at the West Bend Municipal Airport. This military unit maintains its own apron, hangar, and other facilities at the airport.

In addition, other general aviation airports within the Region occasionally handle military operations, usually in connection with training and practice flights. During 2002, other airports reporting some military operations included Kenosha Regional, Lawrence J. Timmerman Airport, Burlington Municipal, East Troy Municipal, Lake Lawn, Hahn Sky Ranch, Hartford Municipal, and Waukesha County-Crites Field.

HELICOPTER ACTIVITY

Helicopters represent a special segment of aviation because of their unique maneuvering characteristics and minimal landing facility requirements. Accordingly, helicopters have normally been employed as specialized vehicles used extensively for such special assignments as emergency medical services and law enforcement; the military; the news media; and for construction and exploration purposes, including utility construction and offshore oil drilling. In addition, helicopters are extensively used by corporations and businesses, chiefly for employee transportation, especially in congested metropolitan areas. Some aviation officials believe that the use of helicopters represents a significant growth area in aviation because of their unique operational abilities.

In contrast to widespread helicopter activity -- especially for corporate and business purposes -- in many areas of the United States, such activity in Southeastern Wisconsin remains a small portion of all aviation activity. In 2001, there were 28 civil helicopters based within the Region, up from 18 in 1993. Of the 28 civil helicopters, it was estimated that half were used for business purposes and half were used for sport and personal purposes and included amateur-built craft. The sport, personal, and amateur-built helicopters were assumed to account for only a small number of annual operations. The 28 civil helicopters were estimated to account for about 24,200 operations within Southeastern Wisconsin during 2001.

OTHER AVIATION ACTIVITY

This section of the memorandum identifies miscellaneous types of aviation activity which, in Southeastern Wisconsin, consists chiefly of balloon, glider, and ultralight activity. The inventory of based aircraft for 2001 identified a total of 54 miscellaneous craft in the Region in this category. However, since many of these aircraft are stored at locations away from airports, are used only occasionally in many cases, and may not need to be registered, there are believed to be more balloons, gliders, and ultralights within the Region than those included in this inventory. Operations generated by these craft are minimal and may be expected to have negligible impact on the need for airport facilities within the context of the regional airport system. For example, balloons do not require any airfield facilities or a large area to take off and land. In fact, most balloons in the Region are not based at airports. Gliders, most of which are based at outlying general aviation airports, are towed by other aircraft during takeoff and stay within the local area. In the Region, the use of gliders is small and normally occurs during weekends and evenings in areas with little other traffic. Most of the glider activity within the Region is based at the West Bend Municipal, Sylvania, and Hartford Municipal Airports.

An ultralight is essentially a small glider equipped with an engine. Interest in ultralights in the United States grew significantly during the 1980s, in large part as an alternative to the more expensive conventional single-engine piston aircraft. The vehicle normally consists of a fabric-covered overhead wing, with a fabric-covered tail surfaces held in place by aluminum tubing and plastic-coated cables. A two-cylinder engine hangs under the wing and drives a rear-facing propeller. The pilot sits on a small seat that may or may not be enclosed and operates the

ultralight with two aluminum pedals and a control stick. Ultralights do not necessarily require the use of an airport or even an ultralight flight park, since takeoffs and landings can be made in a few hundred feet. They are relatively inexpensive to buy, are available either fully assembled or ready to build from a kit, are easy to maintain and to transport to suitable flying areas, and require neither advanced flying skills nor any licenses.

Because of the rapidly increasing popularity of ultralights, the Federal Aviation Administration recognized the vehicles in October 1982 by issuing Federal Aviation Regulation Part 103, which defined ultralights and provided appropriate operating rules. The FAA defines ultralights as vehicles that: are used, or intended to be used, for manned operation in the air by a single occupant; are used, or intended to be used, for recreation or sport purposes only; do not have any U.S. or foreign airworthiness certificate; if non-powered, weigh less than 155 pounds and if powered weigh less than 254 pounds, empty weight, excluding floats and safety devices which are intended for deployment in a potentially catastrophic situation; have a fuel capacity not exceeding five U.S. gallons; are not capable of more than 55 knots calibrated airspeed at full power; and have a power-off stall speed which does not exceed 24 knots calibrated airspeed.

The FAA currently does not consider ultralights to be aircraft in a regulatory sense and, thus, does not stringently regulate them, require them to be registered, or require their operators to be certificated. However, Federal Aviation Regulation Part 103 does set forth operation rules governing such craft. For example, ultralight vehicles may be operated only in daylight hours, in uncontrolled airspace, and not over urbanized or congested areas or over groups of people. Furthermore, ultralights must be operated by visual reference with the ground surface and shall yield the right-of-way to all other aircraft.

Accurate measures of the number of ultralights or of ultralight activity are not available, since ultralights are not required to be registered and there are no agencies or organizations that maintain exact counts of the machines or activity. Some ultralight vehicles are issued airworthiness certificates and thus are considered to be aircraft and subject to all Federal Aviation Regulations. In such cases, an ultralight cannot be operated interchangeably as a certificated aircraft and as an ultralight. In Southeastern Wisconsin, some ultralights are based at the smaller general aviation public-use airports. In addition, ultralights can be, and are flown out of many open areas not designated as airports. Ultralight activity typically occurs in the early morning or late afternoon hours to avoid strong winds.

Other types of aviation-related activity that occur in Southeastern Wisconsin include parachute jumping and banner towing. Most parachute jumping in the Region occurs at and around Aero Park, East Troy Municipal, and Winfield Airports and is organized by sky-diving clubs. Banner towing normally occurs only for special events and has been based at a number of airports within the Region, including Kenosha Regional and West Bend Municipal Airports.

AIRPORT SYSTEM FORECASTS

INTRODUCTION

The forecasts of airport system demand presented in this chapter are divided into six categories. These categories are: 1) passenger air carrier activity, 2) general aviation activity, 3) air cargo activity, 4) military aviation activity, 5) helicopter activity, and 6) other aviation activity. The forecasts of passenger air carrier and general aviation activity represent the overwhelming majority of future total aviation activity in Southeastern Wisconsin. The preparation of these forecasts of aviation demand was accomplished through the review, updating, and extension to the year 2030 of the existing regional airport system plan forecasts. The base year for the forecasts was 2002, reflecting the most current available annual data on existing demand.

PASSENGER AIR CARRIER FORECASTS

With respect to facility requirements to meet passenger air carrier demand, perhaps the most important forecast is that of annual air carrier passenger enplanements. The forecast of annual air carrier passenger enplanements in the Region provides the basis for developing other air carrier related forecasts, including the number of annual aircraft operations and terminal facility requirements. Forecasts of aircraft operations are developed by factoring the forecast air carrier passenger volumes by forecasts of aircraft size and load factor. The passenger air carrier forecasts presented in this memorandum are for Milwaukee County's General Mitchell International Airport, the only airport serving scheduled passenger air carriers in the Region, and include regularly scheduled certificated air carrier, commuter air carrier, and supplemental passenger air carrier activity.

Review of Existing and Past Regional Airport System Plan Forecasts

Forecasts of enplaning passengers were developed under the original, the second-generation, and the third-generation regional airport system planning efforts. As discussed earlier and as shown in Figure 1 of this memorandum, enplaning passenger traffic at Mitchell International has steadily increased over the long term, except during periods of severe economic recession, following air carrier deregulation and attendant changes in the level of air carrier service at Mitchell International, and as a result of the terrorist attacks of September 11, 2001. Overall, this long term increase has been very similar to the trend of total enplaning passenger traffic in the United States. In 2003, there were a total 3.07 million passenger enplanements at Mitchell International.

Under the original regional airport system planning effort, total annual air carrier passenger enplanements were forecast to increase from about 1.02 million in the base year 1973 to about 2.97 million in the forecast year 1995. This forecast envisioned an increase in enplanements of about 190 percent over the base year, or an average annual increase to the year 1995 of about 5 percent.

Under the second-generation regional airport system planning effort, total annual air carrier passenger enplanements were forecast to increase from about 1.53 million in the base year 1985 to about 2.60 million in the forecast year 2010. This forecast envisioned an increase of about 70 percent over the base year, or an average annual increase to the year 2010 of about 2 percent. It should be noted that the second-generation plan forecast was significantly more conservative than the original plan forecast. This was a result of the second-generation plan forecast having been prepared during a period in the early 1980s, when severe economic recession conditions and the impacts of airline response to industry deregulation had caused a significant reduction in passenger enplanements at Mitchell International.

Beginning in the mid-1980s, annual enplanements at Mitchell International began to recover and, in some cases, to increase at a higher rate than enplanements nationally. There was renewed interest in the Southeastern Wisconsin market by some major air carriers, including the possible development of Mitchell International into a major hub facility. The second-generation plan forecast was reviewed and updated by the Commission staff in late 1988.[4] Under this enplaning passenger forecast update, total annual air carrier passenger enplanements were forecast to increase from about 1.80 million in 1987 to about 3.80 million in the forecast year 2010 under the most likely future conditions and to about 6.00 million under optimistic conditions. Future optimistic conditions for enplaning passenger growth would include the development of Mitchell International as a major hub by at least one major airline. This forecast range reflected an average annual increase in enplaning passengers to the year 2010 of about 3 percent under most likely conditions and of about 5 percent under optimistic conditions.

Under the third-generation regional airport system planning effort, total annual air carrier passenger enplanements were forecast to increase from about 2.26 million in the base year 1993 to about 4.00 million in the forecast year 2010 under most likely future conditions and to about 7.00 million under optimistic conditions. This forecast range reflected an average annual increase to the year 2010 of about 3.5 percent under the most likely conditions and of about 6.8 percent under optimistic conditions that assumed development of a major hub.

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[4] *See SEWRPC Staff Memorandum,* Review of SEWRPC Year 2010 Enplaning Passenger Forecasts for General Mitchell International Airport, *December 1988.*

These forecasts of air carrier passenger enplanements may be compared to actual trends in historic passenger enplanements. As discussed earlier, enplanements at Mitchell International have fluctuated from year to year, but have exhibited an overall constant increase over the long term. From 1970 through 2003, enplanements at Mitchell International have increased at an annual average rate of about 3.8 percent. Figure 7 shows this trend, together with the passenger enplanements forecasts described above.

A comparison of these forecasts with the actual enplanements indicates that the first generation, revised second-generation and third-generation plan forecasts proved to be very close to actual enplanements over the period 1973 to 1995, 1987 to 2003 and 1993 to 2003, respectively.

Forecast Procedure

The procedure for reviewing and updating the passenger air carrier forecast under this effort consisted of several steps. A number of potential projection methods were first identified and applied. These included regression analyses of historic trends; a ratio, or "top-down," approach, based upon the regional share of future U.S. passenger traffic; and, a socio-economic indicator approach utilizing relationships between passenger traffic levels and certain socio-economic characteristics of the Region. The results of the applications of the various methods were then reviewed and compared to projections and forecasts prepared independently by other agencies and to the forecasts prepared under previous regional airport planning efforts. Then a "most likely" projection was adopted as the forecast. That forecast is presented here, together with an alternative projection representing a possible high-growth future. In considering the projections and forecast, it must be recognized that many factors affect air carrier demand and, therefore, contribute uncertainty to the forecast.

In the development of these projections, and particularly in the selection of a forecast, consideration was given to a number of factors that may be expected to affect the passenger air carrier demand within Southeastern Wisconsin. These factors included the strength of the economy in the Upper Midwest, which has historically correlated well with enplanements; characteristics of the air carrier industry, including such factors as the creation of operational hubs, the financial condition of airline companies, and the entry into the industry of new carriers; possible changes in the future demand for business travel as a result of continuing improvements in telecommunications technology; and possible changes in the future demand for leisure travel as a result of lower fares and the availability of individual disposable income.

Projections Based on Historic Trends

One way of developing air carrier passenger traffic forecasts is to project future enplanements by extrapolating historic trends in enplanements. Such projections of future enplaning passengers at Mitchell International provide an indication of future enplaning passenger levels, assuming that the factors currently affecting air carrier travel demand remain relatively stable. If, under this approach, all the years from 1970 through 2003 are used in the regression equation, total enplanements within the Region may be expected to reach about 4.8 million by 2030. An alternative projection was prepared only using the trends of the last decade, 1990 through 2000, and not including the effects of the September 11, 2001 terrorist attacks. The result was a projected total 2030 enplanements of about 5.9 million. These projections are shown in Figure 8, together with the actual historic enplanements for comparative purposes.

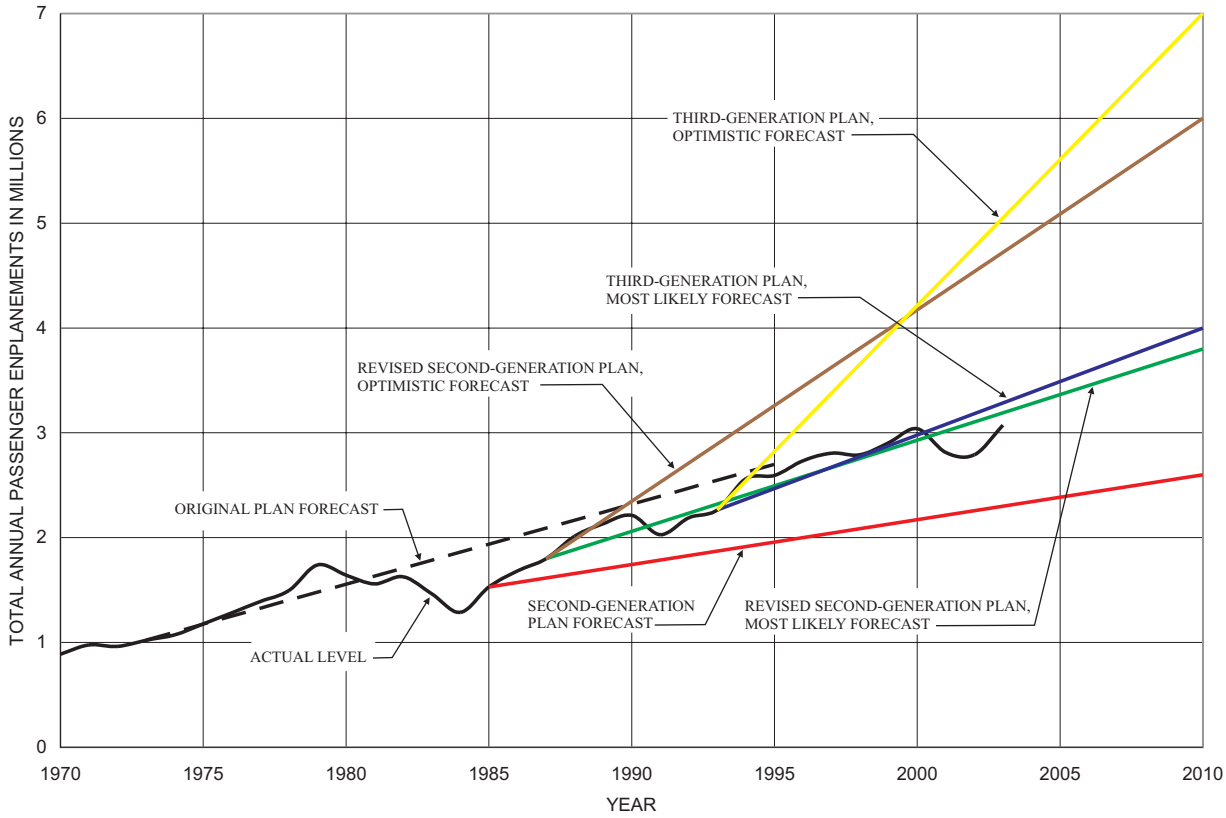
Projections Based on Ratio Approach

Another way of developing air carrier passenger traffic forecasts is by the use of a projection method known as the ratio, or "top-down" approach. Under this method, projections of enplaning passengers are developed by examining the historic trend in the percentage of total U.S. air carrier passenger traffic using the airport concerned. That percentage is then applied to a design year forecast of total U.S. air carrier enplanements as prepared by the U.S. Department of Transportation, Federal Aviation Administration (FAA).

The historic trend in the percentage of total domestic enplaning passenger traffic in the United States represented by enplanements at Mitchell International was shown in Table 3. Throughout the 1960s and 1970s and the first few years of the 1980s, Mitchell International enplanements typically accounted for about 0.55 percent of total

Figure 7

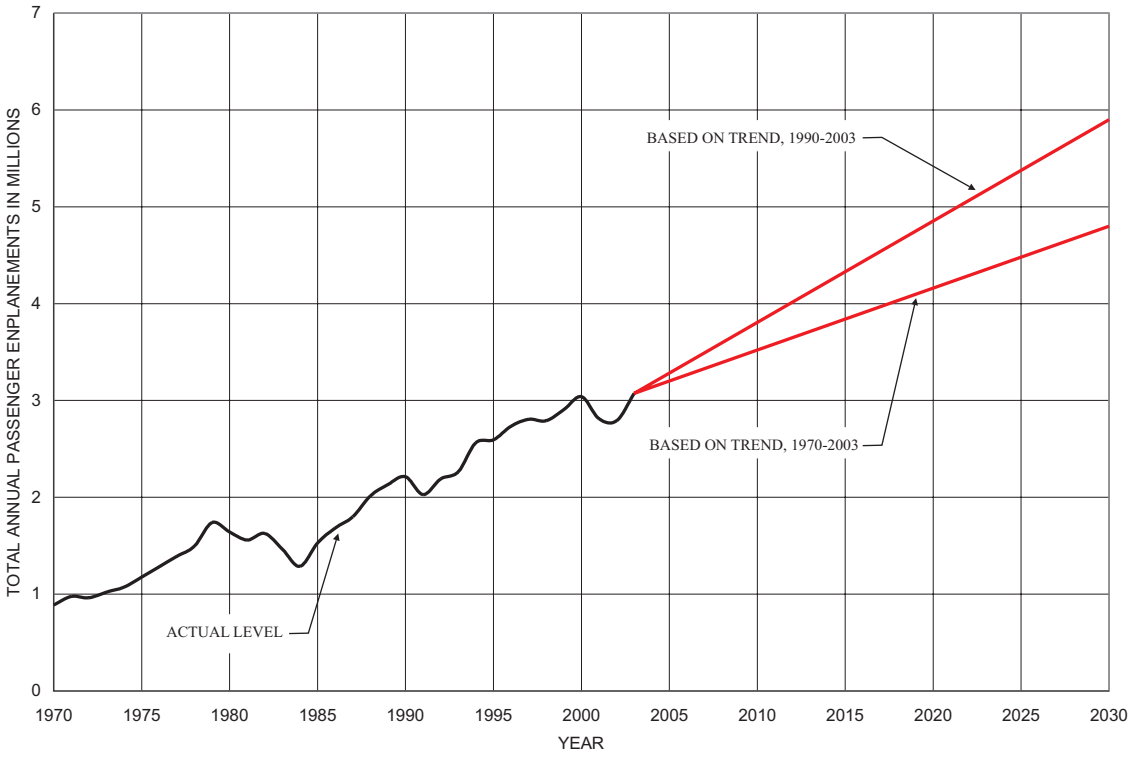
PREVIOUS REGIONAL AIRPORT SYSTEM PLAN ENPLANING PASSENGER FORECASTS FOR GENERAL MITCHELL INTERNATIONAL AIRPORT



Source: SEWRPC.

Figure 8

PROJECTED PASSENGER ENPLANEMENTS AT GENERAL MITCHELL INTERNATIONAL AIRPORT, BASED ON LINEAR REGRESSION ANALYSES OF HISTORIC ENPLANEMENTS



Source: SEWRPC.

domestic enplanements in the United States. From 1983 through 1987, the Mitchell International share of the national domestic enplanements decreased to about 0.40 percent. This was most likely a result of the combined impacts of the economic recession and post-deregulation efforts by the large airlines to emphasize marketing and pricing strategies for their largest markets. Since 1988, Mitchell International's share of the national domestic enplanements has been about 0.46 percent.

The most recent forecasts of U.S. aviation activity prepared by the FAA were published in 2001 and have the year 2025 as the forecast year. These forecasts envision total domestic enplaning passengers to increase from about 666 million in 2000 to about 1.48 billion by 2025, an increase of about 120 percent. The FAA forecasts thus envision an average annual growth rate of approximately 3.2 percent over those next 25 years. Extrapolating the FAA forecasts to the year 2030 provides a projection of total U.S. annual domestic air carrier enplaning passengers of approximately 1.73 billion.

Two different scenarios were developed to represent the range of shares of the U.S. enplaning passenger traffic, including both originating and connecting passenger, that Mitchell International may be expected to generate. Each of these shares was then applied to the FAA nationwide forecast to arrive at projections for enplaning passengers at Mitchell International. The two scenarios include a most likely and possible high-growth projection. Under the most likely scenario, Mitchell International's share of the nationwide domestic traffic would be expected to remain at about 0.46 percent. The most likely scenario reflects the belief that the economy of the Upper Midwest will be strong, allowing enplaning passenger traffic at Mitchell International to remain stable. Under the high-growth scenario, that share would gradually increase to a long-term average of 0.60 percent, representing a larger share of the nationwide traffic than Mitchell International has captured in the recent past. This scenario assumes that the economy of the Upper Midwest will be healthy, that use of Mitchell International as a hub by Midwest Airlines will continue to increase and that the number of passengers who use Mitchell International from the northern suburbs of Chicago will increase significantly. Based on these projections, the year 2030 enplaning passenger totals at Mitchell International would be 8.0 million under the most likely projection and 10.4 million under the high-growth scenario. These projections are shown in Figure 9.

Projection Based on Socio-Economic Indicator Approach

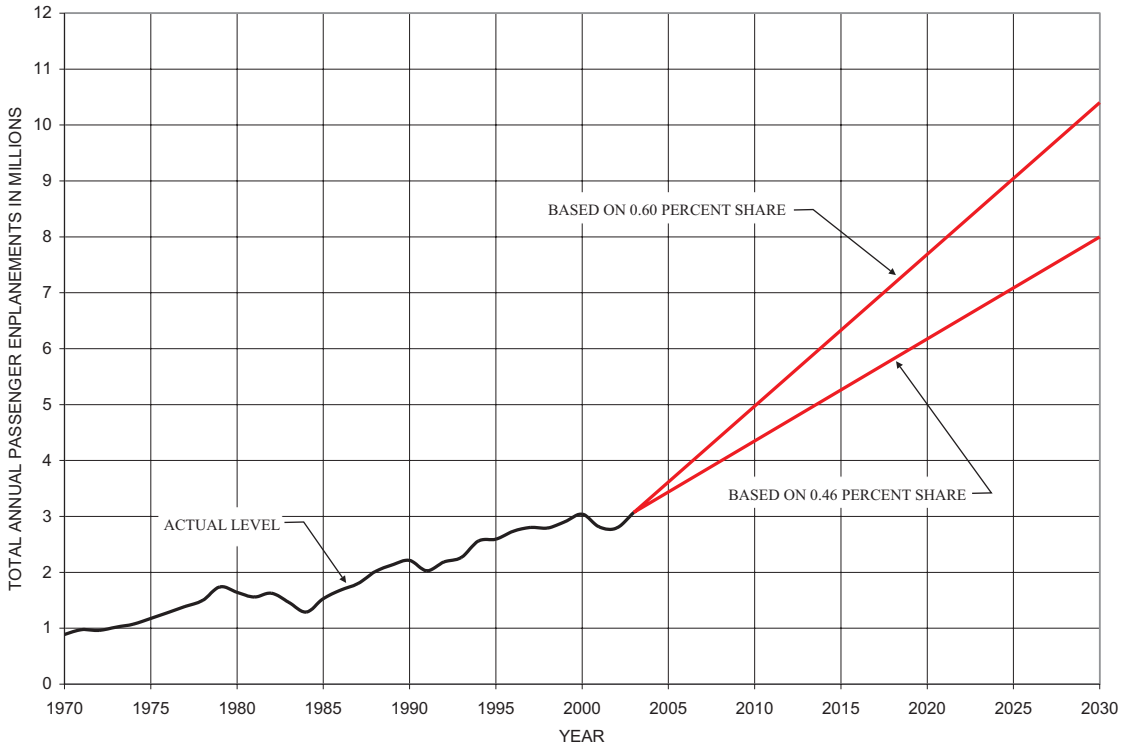
Under another method, known as the "socio-economic indicator" method, projections of air carrier passenger traffic at Mitchell International Airport were developed by establishing the relationship between enplaning passenger levels and selected socio-economic characteristics of the Region. These relationships were then applied to design year forecasts of the socio-economic characteristics prepared by the Regional Planning Commission under other planning programs. Under this approach, originating and connecting passenger traffic at Mitchell International were projected separately. In addition, consideration was given to the potential increase in the volume of originating passengers from Northeastern Illinois who might begin the air portion of their trips at Mitchell International.

Originating Passengers: Table 22 presents air carrier originating passenger traffic for Mitchell International for the years 1970 to 2002, together with several socio-economic characteristics of the Southeastern Wisconsin Region that may be expected to influence the level of originating air carrier passenger traffic. These socio-economic characteristics include regional employment, population, and households.

The level of originating air carrier passenger traffic at Mitchell International may be expected to be significantly related to the employment level of the Southeastern Wisconsin Region. A significant portion of the originating air carrier passenger traffic at Mitchell International is business related. The level of regional employment provides an indicator of the potential level of such business related traffic. The level of employment is also an indicator of social-recreational air travel, since the employment level is a measure of the relative economic health of the Region and of the availability of discretionary income. As shown in Figure 10, a comparison of air carrier passenger originations at Mitchell International with regional employment during the past two decades indicates a direct positive relationship. The sharp decline in employment in the early 1980s followed by a rebound into the 1990s was accompanied by a sharp decline and rebound in originating air carrier passenger traffic. The decline in employment in the years 2001 and 2002 is accompanied by a decline in originating air carrier passenger traffic.

Figure 9

PROJECTED PASSENGER ENPLANEMENTS AT GENERAL MITCHELL INTERNATIONAL AIRPORT BASED ON RATIO OF FEDERAL AVIATION ADMINISTRATION FORECAST NATIONAL ENPLANEMENTS



Source: SEWRPC.

Table 22

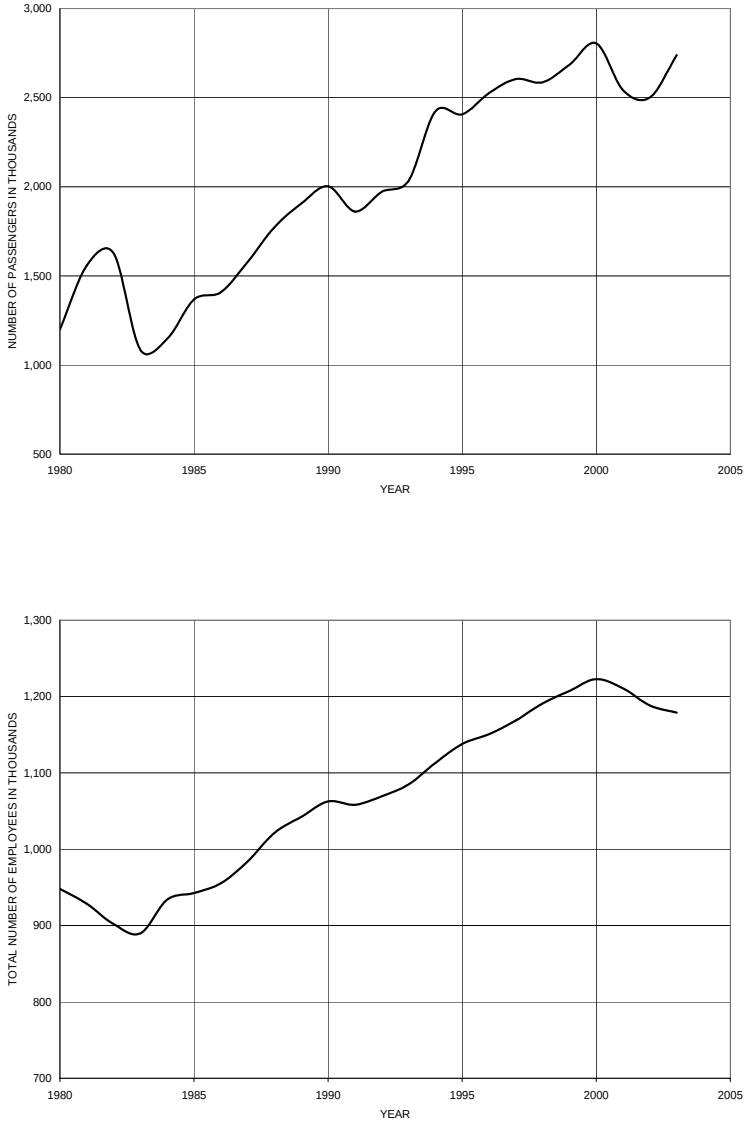
COMPARISON OF GENERAL MITCHELL INTERNATIONAL AIRPORT AIR CARRIER ORIGINATING PASSENGER TRAFFIC AND SOUTHEASTERN WISCONSIN EMPLOYMENT, POPULATION, AND HOUSEHOLDS

Year	General Mitchell International Air Carrier Originating Passengers	Regional Population	Regional Employment	Regional Households
1970	714,350	1,756,100	784,900	536,500
1971	- -	1,763,800	778,600	- -
1972	788,859	1,771,600	802,500	- -
1973	1,020,979	1,778,400	848,200	- -
1974	1,072,466	1,784,600	868,400	- -
1975	896,828	1,788,300	850,100	- -
1976	1,282,816	1,782,200	867,200	- -
1977	1,391,169	1,776,400	897,500	- -
1978	1,494,808	1,770,500	933,600	- -
1979	1,740,282	1,769,500	962,800	- -
1980	1,199,048	1,764,800	948,200	628,000
1981	1,558,549	1,769,700	928,600	- -
1982	1,627,335	1,762,200	901,800	- -
1983	1,085,714	1,743,300	889,900	- -
1984	1,147,308	1,742,300	933,900	- -
1985	1,367,971	1,742,700	942,600	- -
1986	1,408,453	1,743,200	955,400	- -
1987	1,579,240	1,742,600	984,200	- -
1988	1,773,212	1,750,900	1,021,400	- -
1989	1,906,492	1,767,800	1,042,500	- -
1990	2,003,373	1,810,400	1,062,600	676,100
1991	1,861,418	1,822,000	1,058,200	- -
1992	1,972,336	1,839,500	1,069,400	- -
1993	2,033,373	1,856,300	1,084,900	- -
1994	2,423,343	1,869,300	1,113,000	- -
1995	2,406,685	1,879,200	1,137,800	- -
1996	2,526,272	1,889,300	1,150,700	- -
1997	2,604,727	1,899,300	1,168,800	- -
1998	2,586,652	1,908,100	1,191,000	- -
1999	2,684,898	1,918,400	1,207,400	- -
2000	2,805,445	1,931,200	1,222,800	749,000
2001	2,542,132	1,938,500	1,210,700	753,400
2002	2,501,963	1,951,500	1,188,200	763,000
2003	2,739,290	1,959,800	1,179,000	770,900

Source: SEWRPC.

Figure 10

COMPARISON OF AIR CARRIER ORIGINATING PASSENGER TREND AT GENERAL MITCHELL INTERNATIONAL AIRPORT WITH REGIONAL EMPLOYMENT TREND IN SOUTHEASTERN WISCONSIN: 1980-2003



Source: SEWRPC.

The following regression equation was developed to project Mitchell International air carrier passenger traffic originations through the year 2030 based upon change in Southeastern Wisconsin employment:

$$P = 4.60 (E) - 3.0 \times 10^6$$

Where: P = Annual Mitchell International air carrier passenger originations
E = Total employment in the Southeastern Wisconsin Region

Forecasts of employment to the year 2030 prepared by the Regional Planning Commission[5] indicate a most likely future employment in Southeastern Wisconsin of about 1,365,000 jobs in the year 2030 and, under a potential high-growth scenario, a level of about 1,500,000 jobs in the year 2030. Consequently, the application of this regression equation indicates that the most likely air carrier passenger traffic originations at Mitchell International may be expected to be 3.30 million originations in the year 2030, with 3.90 million originations under a high-growth scenario. In addition, these projections require adjustment to reflect increasing originations at Mitchell International by northeastern Illinois residents. The number of annual Mitchell International originating passengers which are northeastern Illinois residents has increased from an estimated 12,000 in 1971 to 48,000 in 1989, 68,000 in 1993, and 200,000 in 2003. Based upon projected growth in northeastern Illinois, northeastern Illinois resident passenger originations at Mitchell International in the year 2030 may be expected to increase to about 600,000 under most likely conditions and about 900,000 under high growth conditions.

Airline fares are another factor significantly affecting historic, and potential future, levels of originating air carrier passenger traffic at Mitchell International. Airline fares have affected historic levels of passenger traffic at Mitchell International, as increased fares in the early 1980s contributed to the decline in passenger traffic and as competitive and declining fares in the late 1980s and early 1990s contributed to increased passenger traffic. Airline fares may be expected to affect future passenger traffic as well. The potential effect of future airline fares may be subjectively considered in the preparation of any enplaning passenger forecast for Mitchell International.

Connecting Passengers: In order to complete the enplaning passenger traffic forecasts at Mitchell International using the socio-economic indicator approach, it was necessary to prepare specific estimates of future connecting passengers at Mitchell International. The level of future connecting air passenger traffic at Mitchell International will depend on the extent to which this airport will serve as a hub for one or more major air carriers in the future. It is important in this respect to note that, while Mitchell International currently serves as the operational hub for Midwest Airlines, it cannot be considered a major hub, such as the airports serving Chicago, Minneapolis-St. Paul, Detroit, Atlanta, or Pittsburgh.

Because of the uncertainties involved, the projected number of future connecting passengers at Mitchell International was developed as a range. Under what may be considered most likely conditions, it was assumed that Mitchell International will continue to serve a volume of connecting passengers similar to its historic range of connecting passengers. As shown in Table 4 earlier in this memorandum, the percentage of connecting passengers at Mitchell International has varied significantly over the last two decades. Prior to deregulation of the airline industry, connecting passengers at Mitchell International comprised about 25 percent of total enplaning passengers. In the early years of the post-deregulation period, when Northwest Airlines operated a mini-hub at Mitchell International, that percentage rose to about 33 percent, then decreased sharply when Northwest Airlines decided to move all of its hubbing operations to other airports. Starting about 1990, the percentage has generally remained stable at about 10 percent. The percentage of total air passenger enplanements that is connecting traffic at Mitchell International may be expected to increase somewhat as a result of the anticipated continuation of overall growth in passenger enplanements. Therefore, under the most likely conditions, the connecting passengers may be expected to comprise about 15 percent of total enplaning passengers at Mitchell International to the year 2030, when the number of connecting passengers may be expected to approximate 700,000.

[5] *The Commission is currently working to update employment forecasts to the year 2035. The employment forecasts shown above are preliminary.*

Under high growth conditions, it was assumed that Mitchell International would become a hub for one or more air carriers in addition to Midwest Airlines and thereby support a greatly increased volume of connecting passengers. Viable hubbing operations for large air carriers require a strong base of originating passengers, as well as an appropriate mix of originating and connecting passengers, at the hub airport. Therefore, under a high-growth scenario, the connecting passengers may be expected to compromise about 25 percent of total enplaning passengers at Mitchell International to the year 2030. Accordingly, the projected number of connecting passengers could be expected to reach about 1.6 million by the year 2030 under a high-growth alternative. It should be noted that, under these conditions, should a hubbing operation be developed by another airline, additional flights would be added to serve Mitchell International, with a corresponding increase in the level of service to passengers. Such an increased level of service may be expected to attract additional originating passengers.

Total Enplaning Passengers: Under the socio-economic indicator forecast method, the total of projected enplaning passengers was calculated by summing the originating passengers and the connecting passengers. The resulting projection under most likely future conditions and as well under potential high-growth future conditions and as well under potential high-growth future conditions is presented in Table 23. Accordingly, under this projection method, the total enplaning passengers by the year 2030 at Mitchell International may be expected to approach 4.6 million enplanements under most likely conditions and 6.4 million enplanements under potential high-growth conditions. The projections, as prepared under the socio-economic indicator approach are shown in Figure 11. In considering these projections as prepared under the socio-economic indicator approach, it should be noted that estimated actual employment has been following and exceeding the high-growth employment projection over the last several years.

Forecasts by Others

As part of the process of reviewing and updating the passenger air carrier forecasts under the plan reevaluation, other pertinent projections of enplanements at Mitchell International[6] were reviewed and evaluated. These include forecasts recently prepared under the current airport master plan update effort for Mitchell International and the Federal Aviation Administration's annual terminal area forecasts.[7] Figure 12 shows these two passenger enplanement forecasts, together with the actual historic enplanements.

Forecasts of enplaning passengers were prepared under the current airport master plan update effort for General Mitchell International Airport. The forecast was developed with a regression equation considering area population -- including three northeastern Illinois counties -- and a measure of average airline fares at Mitchell International. Under this scenario total enplanements were forecast to reach about 6.4 million by the year 2021, of which about 1.0 million, or about 16 percent, would be connecting passengers. About 5.4 million passengers, or 84 percent, would be originating passengers.

Another forecast of enplanements was prepared by the Federal Aviation Administration as part of their terminal area traffic forecasting process. The FAA annually prepares traffic projections for all airports with enplaning passenger traffic in the United States. The procedure utilized is essentially a top-down approach, applying national growth rates to the current air passenger traffic at the airports considered. The most recent FAA terminal area traffic forecast shows a total of about 5.4 million enplanements at Mitchell International by the year 2020. The forecast enplanements are not divided into originating and connecting passengers.

[6] *See Aviation Incorporated,* General Mitchell International Airport-Master Plan Update Study, Preliminary Draft, *Milwaukee, Wisconsin March 2003.*

[7] *See Federal Aviation Administration,* Terminal Area Forecasts Fiscal Years 2003—2020, *Washington, D.C., March 2004.*

Table 23

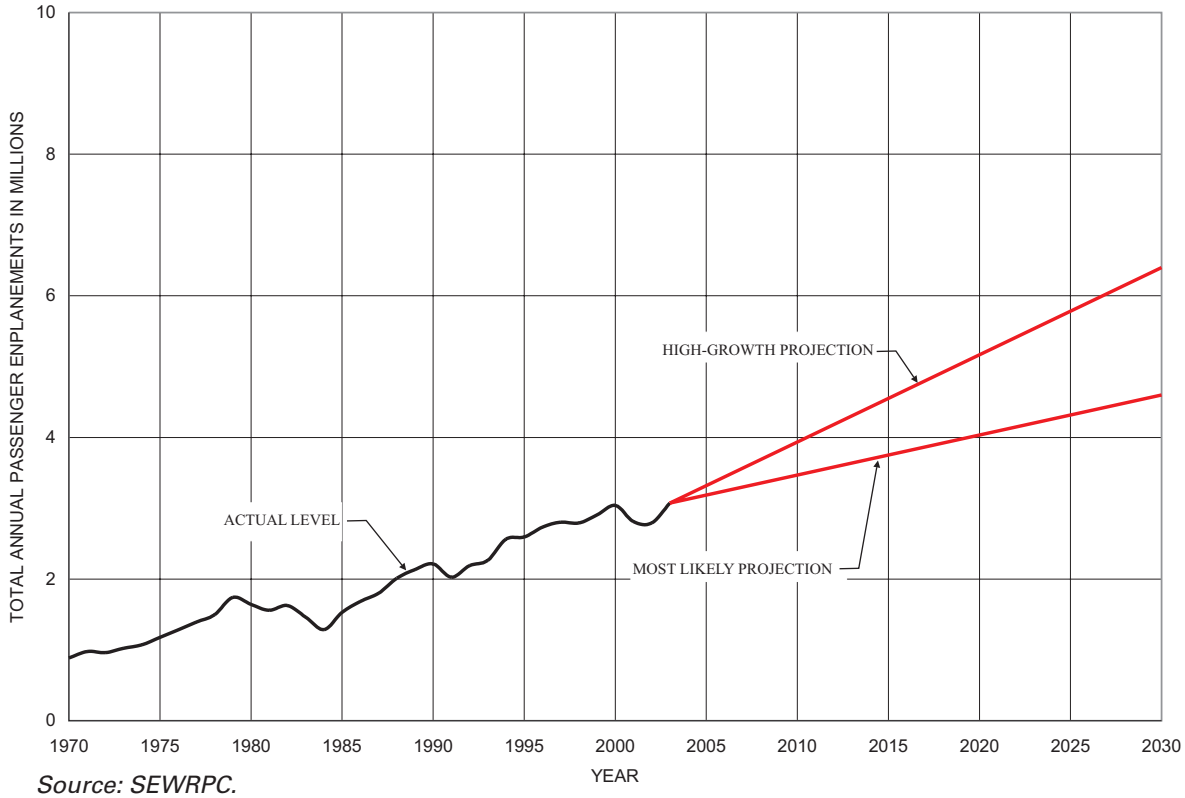
AIR CARRIER PASSENGER TRAFFIC FORECASTS AT GENERAL MITCHELL INTERNATIONAL AIRPORT BASED ON THE SOCIO-ECONOMIC INDICATOR METHOD: 2030

Forecast Types	Most Likely Projection	High Growth Projection
Regional Employment	1,365,000	1,500,000
Originating Passengers	3,900,000	4,800,000
Connecting Passengers	700,000	1,600,000
Total Enplaning Passengers	4,600,000	6,400,000

Source: SEWRPC.

Figure 11

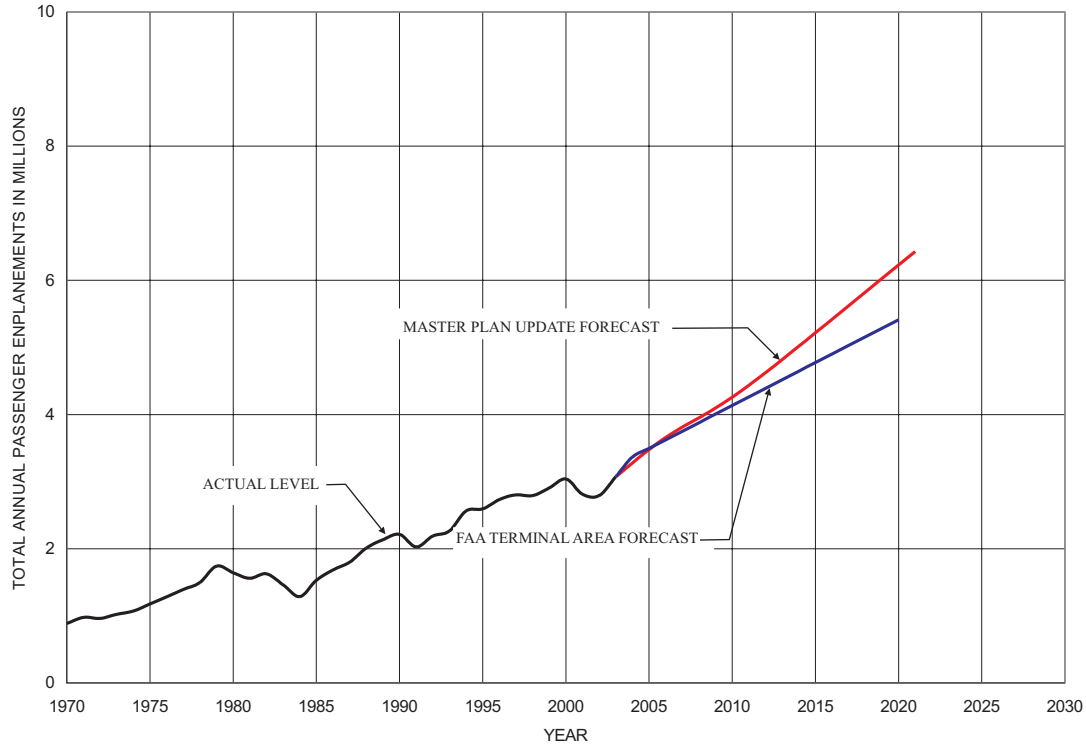
PROJECTED PASSENGER TRAFFIC AT GENERAL MITCHELL INTERNATIONAL AIRPORT, BASED ON SOCIO-ECONOMIC INDICATOR PROJECTIONS OF ENPLANING PASSENGERS



Source: SEWRPC.

Figure 12

COMPARISON OF FORECASTS OF GENERAL MITCHELL INTERNATIONAL AIRPORT ENPLANING PASSENGER TRAFFIC TO THE YEAR 2030



Source: SEWRPC.

Revised Enplaning Passenger Forecast for Southeastern Wisconsin

The various projections of enplaning passenger traffic at Mitchell International were considered in preparing a revised enplaning passenger forecast for the system plan reconsideration. Figure 13 and Table 24 provide a comparison of these projections. Based upon a review and comparison of the various projections and forecasts, a most likely forecast level was selected of 8.0 million in the year 2030 including 6.7 million originating passenger enplanements and 1.3 connecting passenger enplanements.

This most likely forecast is consistent with the recently developed forecast under the Mitchell International airport master plan, and with projections which expect that Mitchell International would continue to maintain its historic share of projected national air passenger traffic. The most likely forecast envisions future enplaning passenger growth will exceed extrapolations of historic growth.

A high-growth forecast was also developed. Under the high-growth forecast, total enplaning passengers would be about 10.0 million in the year 2030, including 7.5 million originating passenger enplanements and 2.5 million connecting passenger enplanements. The high-growth forecast assumes employment growth in southeastern Wisconsin continuing to substantially exceed high-growth projections, and a substantial increase in airline service and hubbing activity and attendant highly competitive airline fares at Mitchell International. These forecasts of passenger enplanements are presented in Table 25 and shown in Figure 14.

Revised Air Carrier Aircraft Operation Forecast for Plan Reevaluation

Air carrier airport capacity is measured by the number of air carrier aircraft operations that the airport can safely accommodate without inordinate delay. Therefore, to determine the relationship between capacity and use at Mitchell International and thereby the need for any long-range improvements, forecasts of enplaning passengers must be converted to forecasts of air carrier aircraft operations.

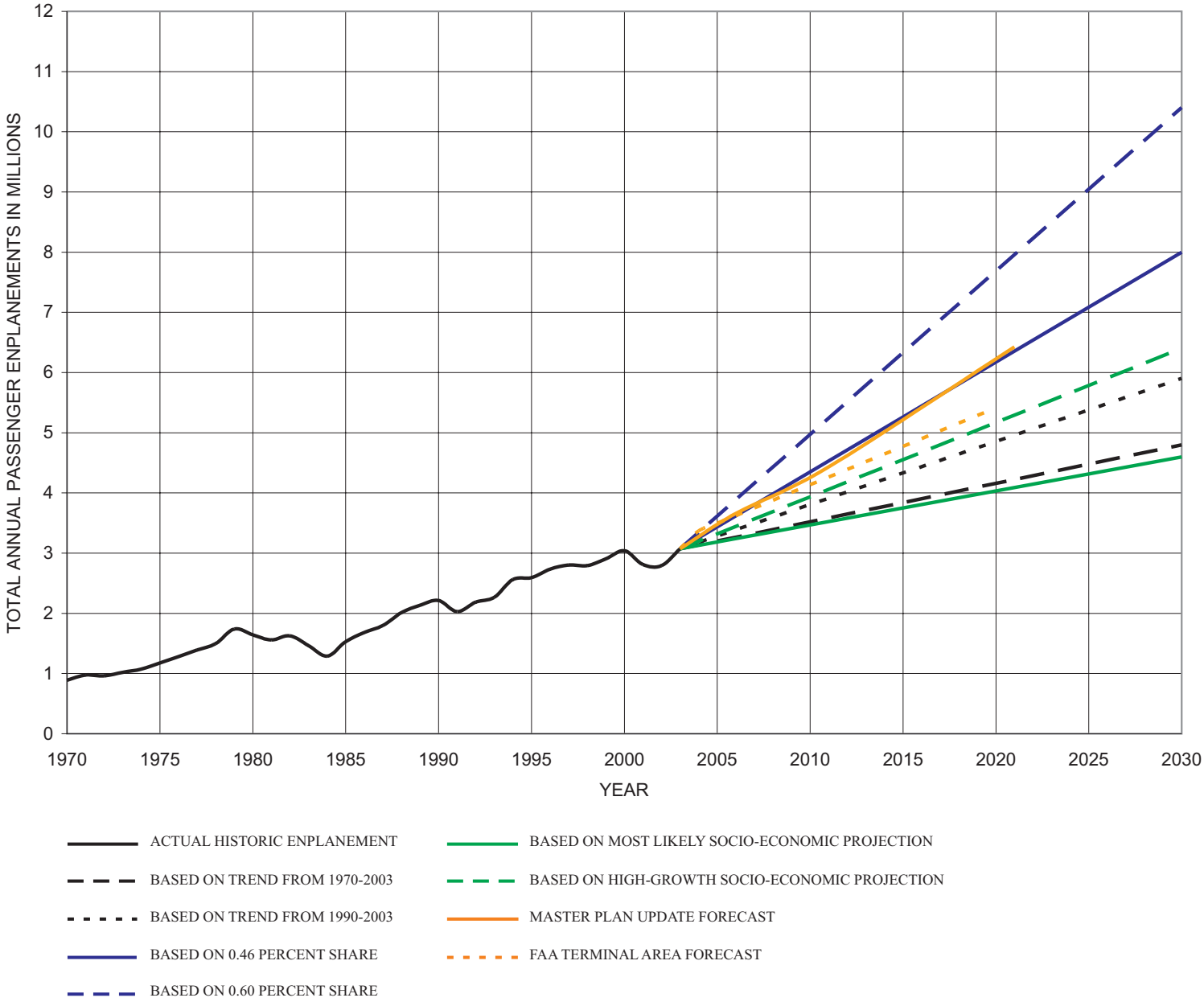
Forecasts of air carrier aircraft operations are typically prepared by applying to forecasts of enplaning air carrier passenger forecasts of the percent of enplaning passengers to be carried by large and small air carriers, forecasts of the number of seats per departure for large and small air carriers, and forecasts of load factors for large and small air carriers. Under the third-generation regional airport system plan, the forecast air carrier aircraft operations was anticipated to range from 168,000 operations in the year 2010, to about 303,000 operations in the year 2010, the latter under high-growth conditions. While actual enplaning passenger traffic has closely followed the third-generation plan most likely forecast, air carrier aircraft operations have exceeded the most likely forecast of the third-generation plan, but remain below the high-growth forecast, as shown on Figure 15.

The historic trends in the number of enplaning air carrier passengers per aircraft, the average aircraft capacity, and the enplaning load factor for aircraft departures at General Mitchell International Airport for the years 1996 through 2001 were presented in Tables 7 and 8 earlier in this memorandum for large and small air carriers. The number of passengers per aircraft departure and the load factor at Mitchell International has typically been lower than that for the United States as a whole. This may be expected to continue, since the Milwaukee markets are smaller than many of the very highly traveled national markets, such as those on the East and West Coasts of the United States. A summary of the historic number of seats per departure and load factors since 1996 for large and small air carriers for both Mitchell International and domestic United States traffic is provided in Tables 26 and 27.

The FAA prepares national forecasts of average aircraft size and average load factor. Average aircraft size is defined as the average number of seats per departure, and average load factor is defined as the average percentage of seats occupied by revenue passengers per aircraft departure. These two factors determine the average number of passengers per departure. As part of the most recent FAA forecasts, the average aircraft size, for large air carriers as measured by seating capacity per large air carrier departure is expected to increase over the long term from an average of 140 seats per large air carrier departure in 2002 to 160 seats by the year 2025. The FAA, also forecasts that the large air carrier average load factor will remain stable, only increasing from its level of about 70 percent in 2002 to about 71 percent by 2025. With respect to small air carriers, the FAA expects that the average seating capacity of the small air carrier fleet will also continue to increase in size, and the average number of seats

Figure 13

COMPARISON OF PROJECTIONS OF GENERAL MITCHELL INTERNATIONAL AIRPORT ENPLANING PASSENGER TRAFFIC TO THE YEAR 2030



Source: SEWRPC.

Table 24

COMPARISON OF PROJECTIONS AND FORECASTS OF GENERAL MITCHELL INTERNATIONAL AIRPORT ENPLANING PASSENGER TRAFFIC TO THE YEAR 2030

Projection or Forecast	Annual Passenger Enplanements (millions)	
	Most Likely Scenario	High-Growth Scenario
Projection Based on Historic Trends	4.8	5.9
Projection Based on Ratio Approach	8.0	10.4
Projection Based on Socio-Economic Indicator Method	4.6	6.4
Airport Master Plan Update Forecast (2021 Forecast of 6.4 million extended to 2030)	8.0	- -
FAA Terminal Area Forecast (2020 Forecast of 5.4 million extended to 2030)	7.1	- -
Recommended Regional Airport System Plan Forecast	8.0	10.0

Source: SEWRPC.

Table 25

AIR CARRIER PASSENGER ENPLANEMENT FORECASTS AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 2030

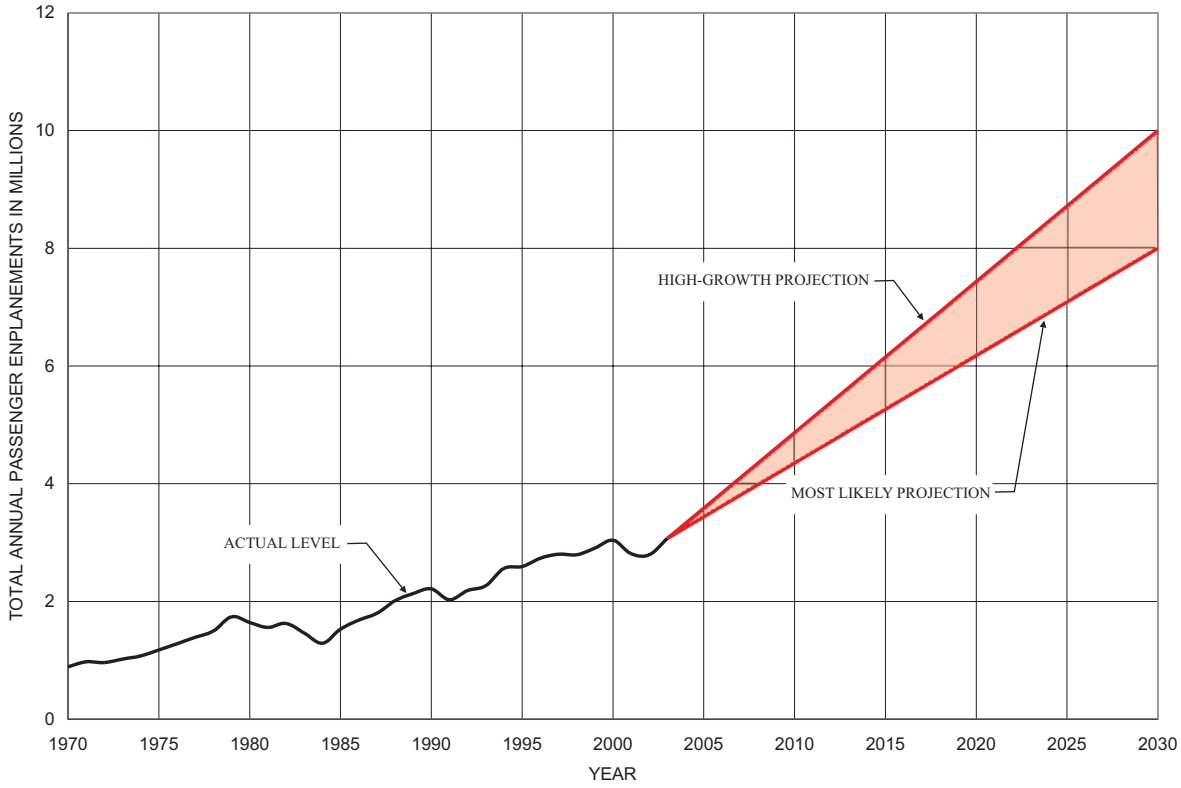
Forecast Types	Most Likely Forecast	High-Growth Forecast
Originating Passengers	6,700,000	7,500,000
Connecting Passengers	1,300,000	2,500,000
Total Enplaning Passengers	8,000,000	10,000,000

NOTE: Enplanements for the intermediate forecast years of 2005, 2010, and 2020 are provided in Appendix A.

Source: SEWRPC.

Figure 14

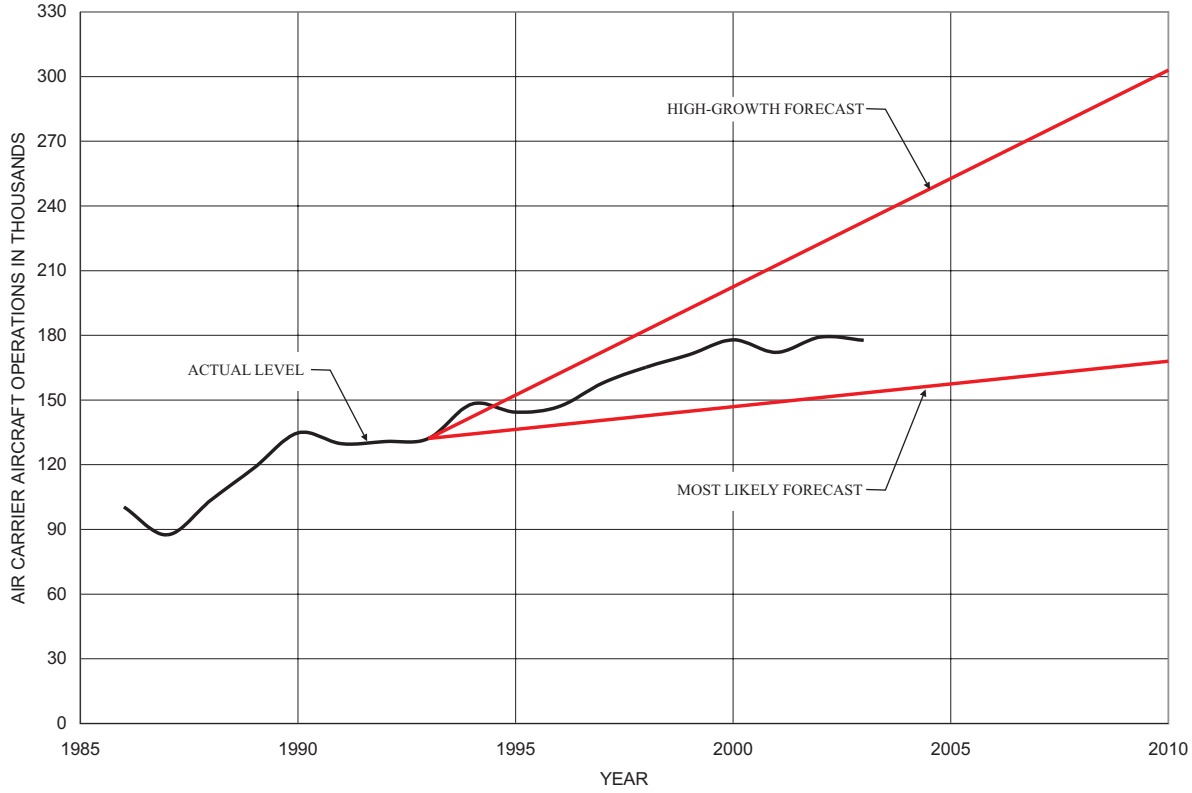
FORECAST OF ENPLANING PASSENGER TRAFFIC AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 2030



Source: SEWRPC.

Figure 15

THIRD-GENERATION REGIONAL AIRPORT SYSTEM PLAN AIR CARRIER OPERATIONS FORECAST FOR GENERAL MITCHELL INTERNATIONAL AIRPORT: 2010



Source: SEWRPC.

Table 26

AVERAGE NUMBER OF SEATS PER DEPARTURE BY TYPE OF AIR CARRIER FOR GENERAL MITCHELL INTERNATIONAL AIRPORT AND TOTAL DOMESTIC UNITED STATES TRAFFIC: 1990-2002

Year	Average Number of Seats per Departure			
	Large Air Carriers		Small Air Carriers	
	General Mitchell International Airport	Domestic United States Total	General Mitchell International Airport	Domestic United States Total
1996	109.5	141.3	34.3	30.3
1997	108.8	142.2	33.5	31.7
1998	109.4	141.6	34.4	32.5
1999	113.0	140.4	33.0	36.3
2000	116.7	140.7	34.4	37.1
2001	114.9	139.3	34.9	37.5

Source: Federal Aviation Administration, Milwaukee County, and SEWRPC.

Table 27

ENPLANING LOAD FACTOR BY TYPE OF AIR CARRIER FOR GENERAL MITCHELL INTERNATIONAL AIRPORT AND TOTAL DOMESTIC UNITED STATES TRAFFIC: 1990-2002

Year	Enplaning Load Factor			
	Large Air Carriers		Small Air Carriers	
	General Mitchell International Airport	Domestic United States Total	General Mitchell International Airport	Domestic United States Total
1996	60.9	66.7	50.0	52.7
1997	62.4	68.9	54.5	53.3
1998	59.6	70.1	55.9	56.7
1999	57.5	69.9	57.6	57.3
2000	57.3	71.3	55.9	58.1
2001	55.7	70.8	54.3	59.8

Source: Federal Aviation Administration, Milwaukee County, and SEWRPC.

per small air carrier departure is forecast to increase from an average of 38 seats in 2002 to 55 seats by 2025. Small air carriers are expected to increasingly serve a greater number of primary short-haul markets and use more regional-type jet aircraft. The FAA also forecasts that the load factor for small air carriers will continue to increase from its level of about 60 percent in 2002 to about 66 percent by 2025.

Historically, the average aircraft size and load factors for large air carriers at Mitchell International have generally followed national trends, although large air carrier average aircraft size and average load factor has always been somewhat less than national averages at Mitchell International. For large air carriers at Mitchell International, the average number of seats per departure is forecast to increase to an average of 140 seats per departure by the year 2030 and the average load factor is forecast to increase to about 68 percent. The resultant average number of passengers per large air carrier departure is forecast to increase to an average of 95 at Mitchell International in the year 2030, as compared to an FAA national forecast of 114. The 95 passengers per large air carrier departure forecast for this reevaluation at Mitchell International is similar to the 84 passengers per large air carrier departure identified in the Mitchell International master plan update for the year 2021. Extrapolating the master plan update average passengers per large air carrier departure to the year 2030 would result in an average forecast of 95 passengers per large air carrier departure.

With respect to small air carriers, the average number of seats per departure and average load factor at Mitchell International has generally equaled national averages and followed national trends. For small air carriers at Mitchell International, the average number of seats per departure is forecast to increase to about 55 by the 2030 – the same as the FAA national forecast of 55 – and the enplaning passenger average load factor is forecast to increase to an average of 66 percent – the same as the FAA national forecast. The resultant average number of passengers per departure on small air carriers at Mitchell International is forecast to increase to an average of about 36 as shown in Table 28. The 36 passengers per small air carrier departure forecast for this reevaluation at Mitchell International is similar to the 31 passengers per small air carrier departure identified in the Mitchell International master plan update for the year 2021. Extrapolating the master plan update average passengers per small air carrier departure to the year 2030 would result in an average forecast of 36 passengers per small air carrier departure.

These factors relating to the average aircraft size, the enplaning load factor, and the resultant average number of passengers per departure at Mitchell International were applied to the revised enplaning passenger forecast to determine the revised number of air carrier aircraft operations for this plan update. Also, the forecast of enplaning passengers must be divided between those passengers traveling by major and national air carriers and those passengers traveling by regional air carriers. Table 29 shows the historic number and percentage of passengers traveling annually on major and national and regional air carriers at Mitchell International. For this plan reevaluation, it was assumed that major and national air carriers would represent an average of 70 percent of all enplaning passengers over the long term under the most likely future conditions, which is the same as forecast for the year 2021 as identified in the Mitchell International master plan update; it was further assumed that regional air carriers would represent the remaining average share of 30 percent over the long term under the most likely future conditions. Under high-growth conditions, major and national and regional air carriers were assumed to represent averages of 75 percent and 25 percent, respectively, of all enplaning passengers, which assume a substantial increase in airline service and hubbing activity at Mitchell International.

The resultant forecasts of major and national air carrier, regional air carrier, and total passenger air carrier aircraft operations at Mitchell International by the year 2030 are summarized in Table 30 and are shown in Figure 16. This forecast anticipates that by the year 2030, total annual passenger-carrying air carrier operations will increase from a level of about 143,000 passenger air carrier aircraft operations in 2001 to about 251,000 passenger air carrier aircraft operations under most likely future conditions and potentially approach 297,000 passenger air carrier aircraft operations under potential high-growth conditions. The most likely forecast of passenger air carrier aircraft operations of 251,000 and the high-growth forecast of passenger air carrier aircraft operations of 297,000 is somewhat higher than the Mitchell International master plan update forecast for the year 2021 of about 232,800 air carrier aircraft operations. Extrapolating the master plan update annual passenger air carrier operations to the year 2030 would result in a forecast of about 290,000 passenger air carrier operations.

Table 28

FORECAST LARGE AND SMALL AIR CARRIER AIRCRAFT CAPACITY, LOAD FACTOR, AND AVERAGE NUMBER OF PASSENGERS PER DEPARTURE: 2030

Forecast Category	Forecast
Average Number of Seats per Departure	
Large Air Carriers	140
Small Air Carriers	55
Enplaning Load Factor	
Large Air Carriers	68
Small Air Carriers	66
Average Number of Passengers per Departure	
Large Air Carriers	95
Small Air Carriers	36

Source: SEWRPC.

Table 29

HISTORIC ANNUAL NUMBER OF ENPLANING PASSENGERS AT GENERAL MITCHELL INTERNATIONAL AIRPORT TRAVELING BY LARGE AND SMALL AIR CARRIERS: 1996-2001

Year	Passenger Enplanements				
	Number			Percent	
	Large Air Carriers	Small Air Carriers	Air Carrier Total	Large Air Carriers	Small Air Carriers
1996	2,234,052	494,222	2,728,274	81.9	18.1
1997	2,232,808	561,616	2,794,424	79.9	20.1
1998	2,147,859	636,705	2,784,564	77.1	22.9
1999	2,251,887	644,199	2,896,086	77.8	22.2
2000	2,327,560	708,415	3,035,975	76.7	23.3
2001	2,041,492	735,082	2,776,574	73.5	26.5

Source: Milwaukee County and SEWRPC.

Table 30

GENERAL MITCHELL INTERNATIONAL AIRPORT AIR CARRIER OPERATIONS FORECASTS: 2030

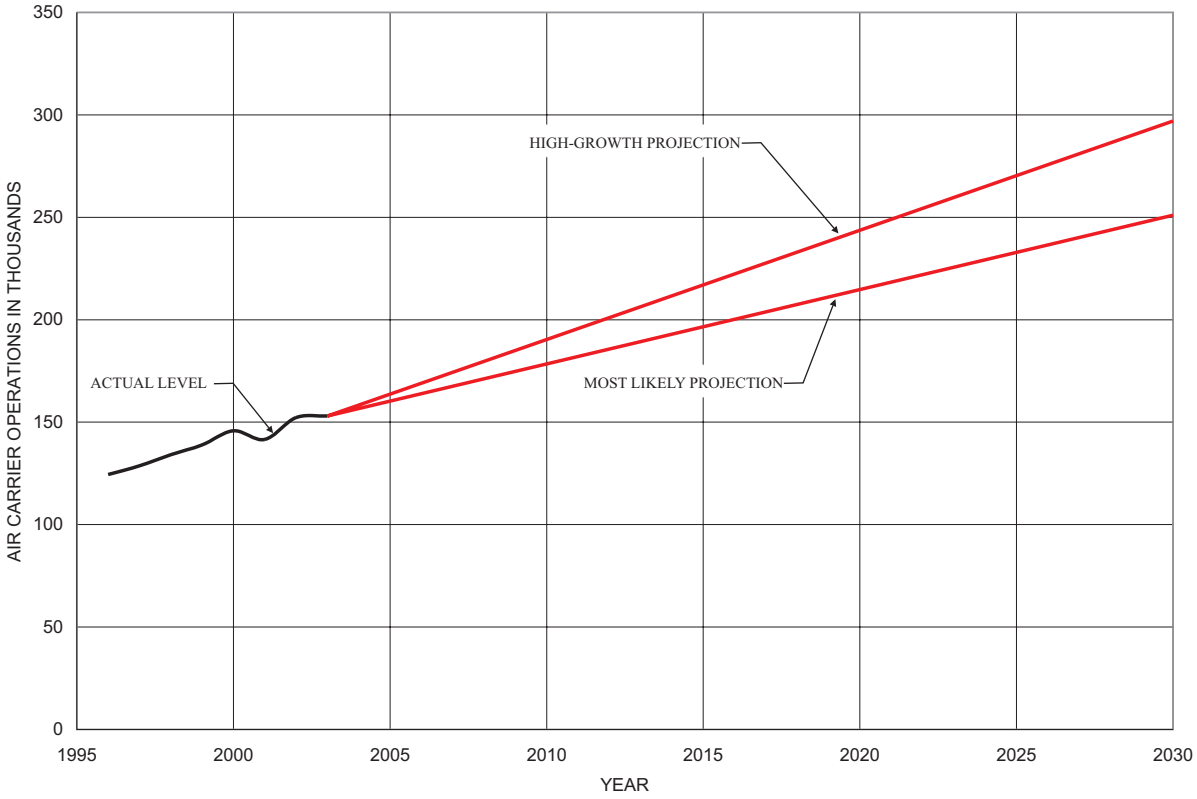
Forecast Category	Most Likely Forecast	High Growth Forecast
Large Air Carrier Operations.....	118,000	158,000
Small Air Carrier Operations.....	133,000	139,000
Total Air Carrier Operations	251,000	297,000

NOTE: Air carrier operations for the intermediate forecast years of 2005, 2010, and 2020 are provided in Appendix A.

Source: SEWRPC.

Figure 16

GENERAL MITCHELL INTERNATIONAL AIRPORT AIR CARRIER AIRCRAFT OPERATIONS FORECASTS: 2030



Source: SEWRPC.

GENERAL AVIATION FORECASTS

With respect to facility requirements to meet general aviation demands, an important required forecast is the size of the general aviation aircraft fleet. The forecast of aircraft fleet size provides the basis for developing forecasts of the number of future annual general aviation aircraft operations. The general aviation forecasts presented in this memorandum are for the entire seven-county Southeastern Wisconsin Region and are intended to include general aviation aircraft used for all general aviation purposes, regardless of the based location of such aircraft.

General aviation is an important part of all aviation activity in the Southeastern Wisconsin Region. During 2002, it was estimated that 78 percent of all aircraft operations in the Region were the result of general aviation activity. The remaining activity consisted of air carrier operations, which accounted for 20 percent of all aircraft operations in the Region, and military operations, which accounted for 2 percent.

Review of Existing and Past Regional Airport System Plan Forecasts

Forecasts of the general aviation aircraft fleet size and general aviation operations in Southeastern Wisconsin were developed under the original, second-generation, and third-generation regional airport system plans. As noted earlier in this memorandum, general aviation has over the past decade experienced reductions in activity as measured by total annual hours flown and activity at airports with air traffic control towers. These reductions are believed to be the result of the increasing cost of purchasing, maintaining, and operating general aviation aircraft. Over this same decade, however, the total fleet size, both nationally and in the Region, has remained essentially stable. This indicates that the fleet as a whole is being utilized less. However, the business and corporate aviation segment of general aviation, which is largely comprised of the high-performance aircraft such as twin-engine turboprops and jets, has been growing with respect to the number of aircraft and the number of aircraft operations. These aircraft represent less than 5 percent of all active general aviation aircraft in the United States and in the Region.

Under the original regional airport system planning effort, the regional general aviation fleet was forecast to increase from about 1,000 aircraft in the base year 1971 to about 3,500 aircraft by the forecast year 1995. This forecast envisioned an increase of about 250 percent over the base year, or an average annual increase of over 5 percent. Under the second generation regional airport system planning effort, the regional general aviation fleet was forecast to increase from about 1,360 aircraft in 1985 to 2,400 aircraft by the forecast year of 2010. This would represent an increase of about 75 percent, or about 2.3 percent annually. Under the third generation regional airport system planning effort, the regional general aviation fleet was forecast to increase from about 1,420 aircraft in 1993 to 1,640 aircraft in 2010, an increase of about 15 percent or about 0.9 percent annually.

With respect to total general aviation operations in the Region, the original regional airport system plan forecast an increase from about 773,000 operations in 1971 to about 2.86 million operations in 1995, an increase of about 270 percent. The second generation regional airport system plan forecast an increase from about 680,000 operations in 1984 to about 1.38 million operations in 2010, an increase of about 100 percent. The third generation regional airport system plan forecast in increase from about 797,000 in 1993 to about 960,000 by 2010, an increase of about 20 percent.

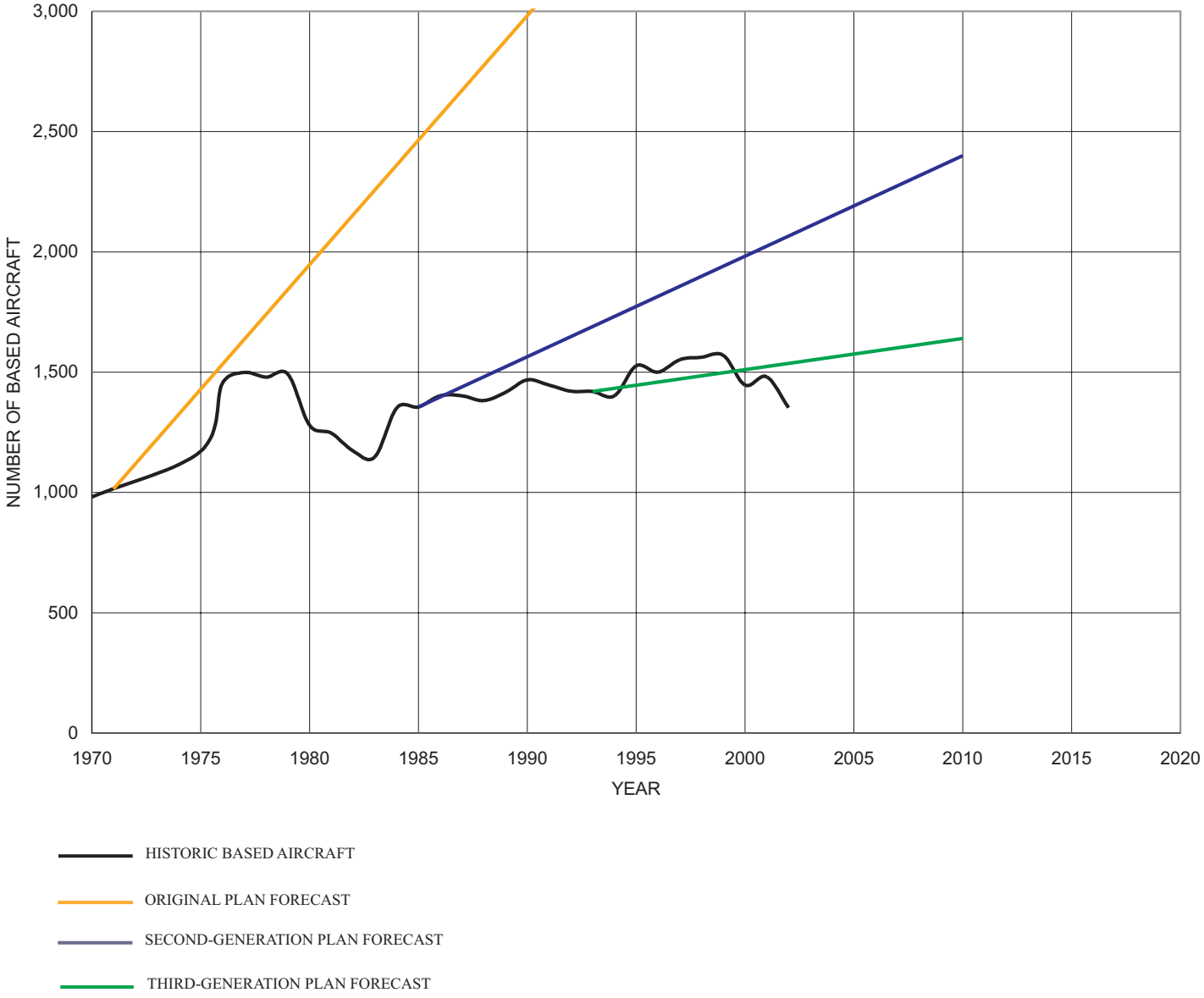
These forecasts of general aviation based aircraft and operations may be compared to actual trends in historic numbers of based aircraft and operations as shown in Figures 17 and 18. A comparison shows that actual based aircraft and operations have not met the forecast levels.

Forecast Procedure

The procedure for updating the general aviation forecast under this reevaluation was similar to that used in preparing the third-generation regional airport system plan. Two projection methods were utilized: a ratio approach based on a projection of the regional share of the future national general aviation fleet and a socio-economic indicator approach that utilized relationships between fleet size and selected socio-economic characteristics of the Region. The two sets of projections were then examined and compared and a most likely

Figure 17

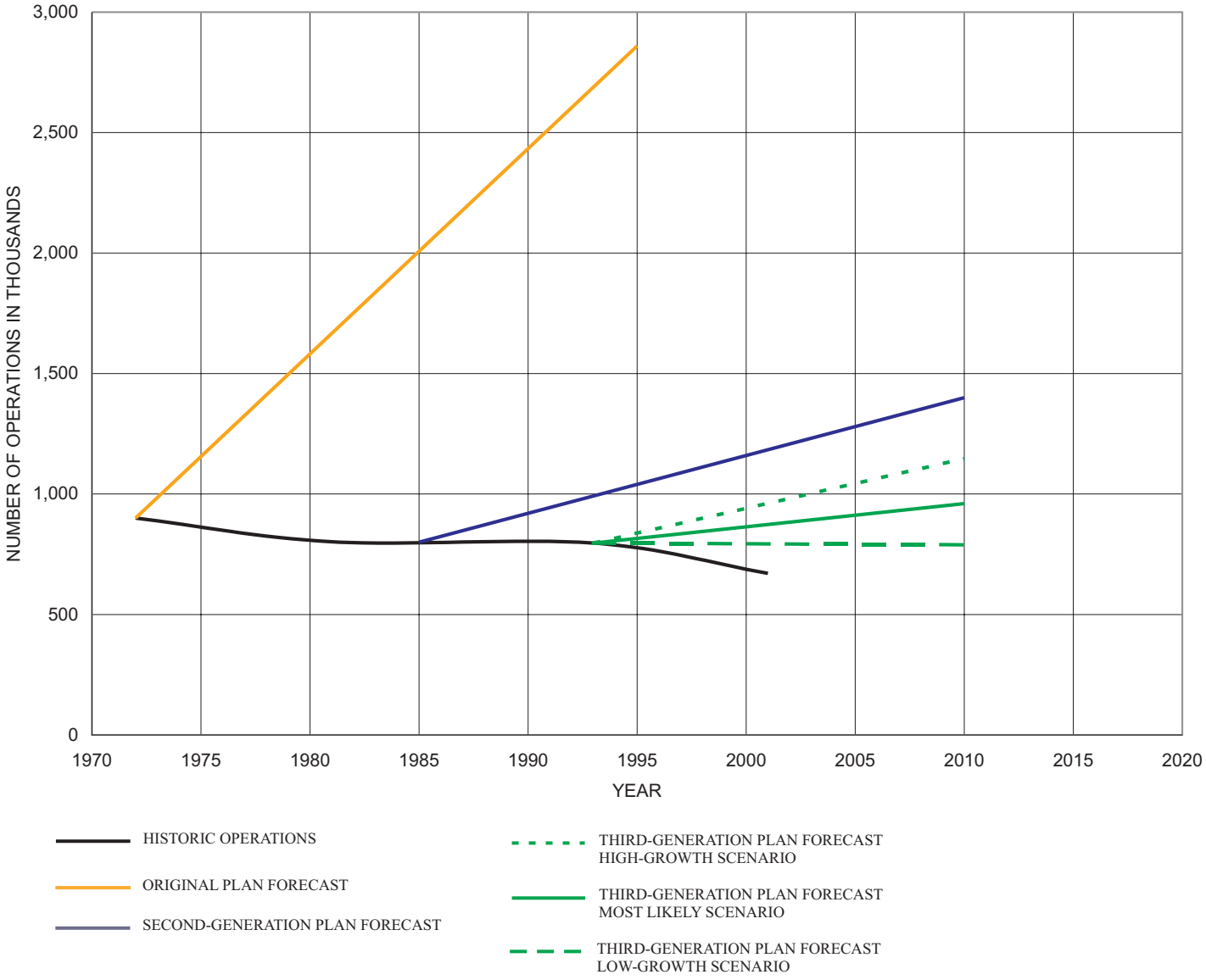
PREVIOUS REGIONAL AIRPORT SYSTEM PLAN GENERAL AVIATION BASED AIRCRAFT FORECASTS FOR SOUTHEASTERN WISCONSIN



Source: SEWRPC.

Figure 18

PREVIOUS REGIONAL AIRPORT SYSTEM PLAN GENERAL AVIATION OPERATIONS FORECASTS FOR SOUTHEASTERN WISCONSIN



Source: SEWRPC.

forecast level selected, together with accompanying alternate high and low forecast levels. The forecasts of the general aviation fleet size were then converted into forecasts of the fleet composition and number of general aviation operations.

Both the ratio and socio-economic projections of fleet size use the Commission estimates of based aircraft as presented earlier in this report as the estimate of base year size of the general aviation fleet. The Commission estimates of based aircraft in southeastern Wisconsin were made directly from the Wisconsin Department of Transportation aircraft registration records. These based aircraft represent the active portion of the total general aviation fleet and therefore generate activity and demand for facilities. The number of based aircraft in southeastern Wisconsin was presented in detail earlier in this report in Tables 10, 12, and 13. Also, the Federal Aviation Administration prepares forecasts of the national general aviation fleet size in terms of active, not total, aircraft.

Projection of Fleet Size under Ratio Approach

Under the ratio approach, a projection of the general aviation fleet was developed by projecting the percentage of the national general aviation fleet based in the Region and applying that percentage to a design year forecast of the national general aviation fleet as prepared by the FAA. The historic trends of the percentage of general aviation aircraft based within the State and the Region were provided earlier in this memorandum. These data indicate Wisconsin's share of the total national fleet steadily increased from 2.38 percent in 1990 to 2.79 percent in 1994, and then steadily declined to 2.44 percent in 2001. Over that same period the share of the total statewide general aviation fleet based in southeastern Wisconsin has generally remained stable at about 30 percent. The historic trends in the share of the nationwide general aviation fleet based in southeastern Wisconsin indicate an increase in the Region's share of the total United States general aviation fleet from 0.74 percent in 1990 to 0.81 percent in 1995 and then declining to 0.68 percent in 2001.

The Federal Aviation Administration prepares forecasts of active general aviation aircraft for national planning purposes. The most recent forecasts prepared by the FAA were published in 2001 and have as their base year 2000 and as their forecast year 2025. These forecasts project total active general aviation aircraft in the United States to increase from 217,500 in 2000 to 272,800 in 2025, an average annual growth rate of approximately 0.9 percent over the 25 years from 2000 to 2025. Almost all the fleet growth is expected to be attributable to increases in the number of turboprop and jet aircraft and helicopters. Extrapolation of the FAA forecast to the year 2030 provides a projection of 285,400 aircraft by the year 2030. The FAA general aviation forecasts are based on a set of assumptions that include an outlook for moderate and sustained growth in the national economy.

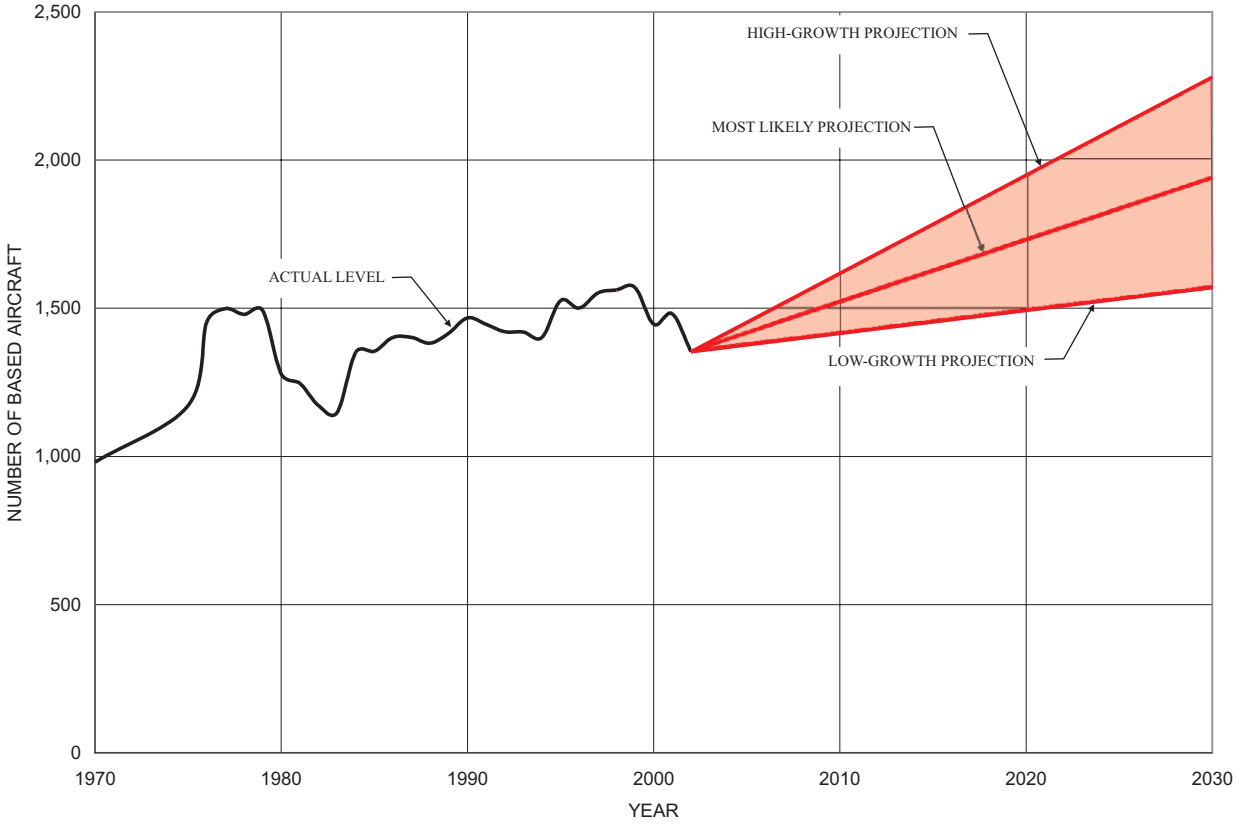
Three different scenarios were developed, representing the range of shares of the forecast national active general aviation aircraft fleet that may be expected to be based in Southeastern Wisconsin. Each of these three shares was then applied to the FAA national forecast to arrive at projections for the general aviation fleet size in the Region. These three scenarios include a low-growth, a most likely, and a high-growth projection.

Under a most likely scenario, the regional share of the active United States general aviation fleet would be expected to remain at about the levels experienced in 2001. At the end of 2001, there were an estimated 1,442 active based aircraft in the Region, representing about 0.68 percent of the national active fleet of about 211,000 aircraft. The most likely scenario reflects the assumption that general aviation trends within the Region will continue to replicate trends at the national level over the long term, and the regional share will continue to approximate 0.68 percent of the national fleet. Under the low-growth scenario, the regional share of the active United States general aviation fleet would decrease to an average of about 0.55 percent. Under the high-growth scenario, the regional share of the active United States general aviation fleet would be expected to increase again to the historic high share of 0.80 percent.

On the basis of these projections, the year 2030 active based general aviation aircraft totals for the Southeastern Wisconsin Region would be expected to range from 1,570 to 2,280, with 1,940 representing the most likely projection. This range of ratio projections is shown in Figure 19. The most likely projection under this method represents an increase of about 500 based aircraft within the Region to the year 2030.

Figure 19

PROJECTED ACTIVE GENERAL AVIATION FLEET SIZE IN SOUTHEASTERN WISCONSIN BASED ON TOP-DOWN PROJECTIONS



Source: SEWRPC.

Projection of Fleet Size Based on Socio-Economic Indicator Approach

Under the second method, known as the socio-economic indicator method, a projection of the general aviation fleet was developed by establishing relationships between the size of the general aviation fleet based in the Region and selected socio-economic characteristics of the Region. These relationships were then applied to design year forecasts of the socio-economic characteristics as prepared by the Regional Planning Commission under other planning programs. Because this projection was developed from region-level data, major factors from outside the Region, such as the impact of aircraft previously based in northeastern Illinois being relocated to Southeastern Wisconsin airports, were specifically considered.

Under this approach, the historic levels of the based general aviation fleet within the Region for the years 1975 to 2001 were compared to the historic levels of the socio-economic characteristics of the Region that may be expected to influence the size of the general aviation fleet, including employment and population. This comparison indicated that, more than any other socio-economic characteristic of the Region considered, employment was related to the general aviation fleet size of Southeastern Wisconsin. This was the same conclusion that was reached under the original, second-generation, and third-generation regional airport system planning efforts, and as well during the preparation of the air carrier passenger forecasts under this effort. Accordingly, the following regression equation was developed to project the size of the based general aviation fleet in the Region to the year 2030:

$$F = 0.0008 (E) + 620.42$$

Where: F = Size of the regional general aviation fleet
E = Total employment in the Southeastern Wisconsin Region

Forecasts to the year 2030 prepared by the Regional Planning Commission indicate a potential range in employment in Southeastern Wisconsin from 1,250,000 to 1,500,000 jobs, with 1,365,000 jobs being the most likely level. Accordingly, application of the regression equation results in a size of based general aviation fleet in Southeastern Wisconsin from about 1,620 to about 1,820 aircraft, with about 1,710 aircraft being the most likely total. A summary of these results is shown on Figure 20.

Revised General Aviation Fleet Size Forecast for Southeastern Wisconsin

A revised forecast of the regional general aviation fleet size was then assembled by comparing projections prepared by the two methods used and selecting a forecast figure on the basis of careful consideration and collective judgment. In this comparison, it was noted that the most likely projection of the number of based aircraft in the general aviation fleet prepared under the ratio method was 1,940, while under the socio-economic method it was 1,710 aircraft.

On the basis of a review and comparison of the projections provided by the two methods used, it was concluded that the forecast regional general aviation fleet size ranges from 1,600 aircraft under low-growth to 2,000 aircraft under high-growth conditions with 1,850 the most likely projection, as shown on Figure 21. The most likely forecast level for the regional fleet assumes a long term increase of about 410 aircraft, or about 28 percent, over the 2001 level of 1,442 aircraft. This would represent about a 0.9 percent average annual increase in the size of the regional general aviation fleet to the year 2030.

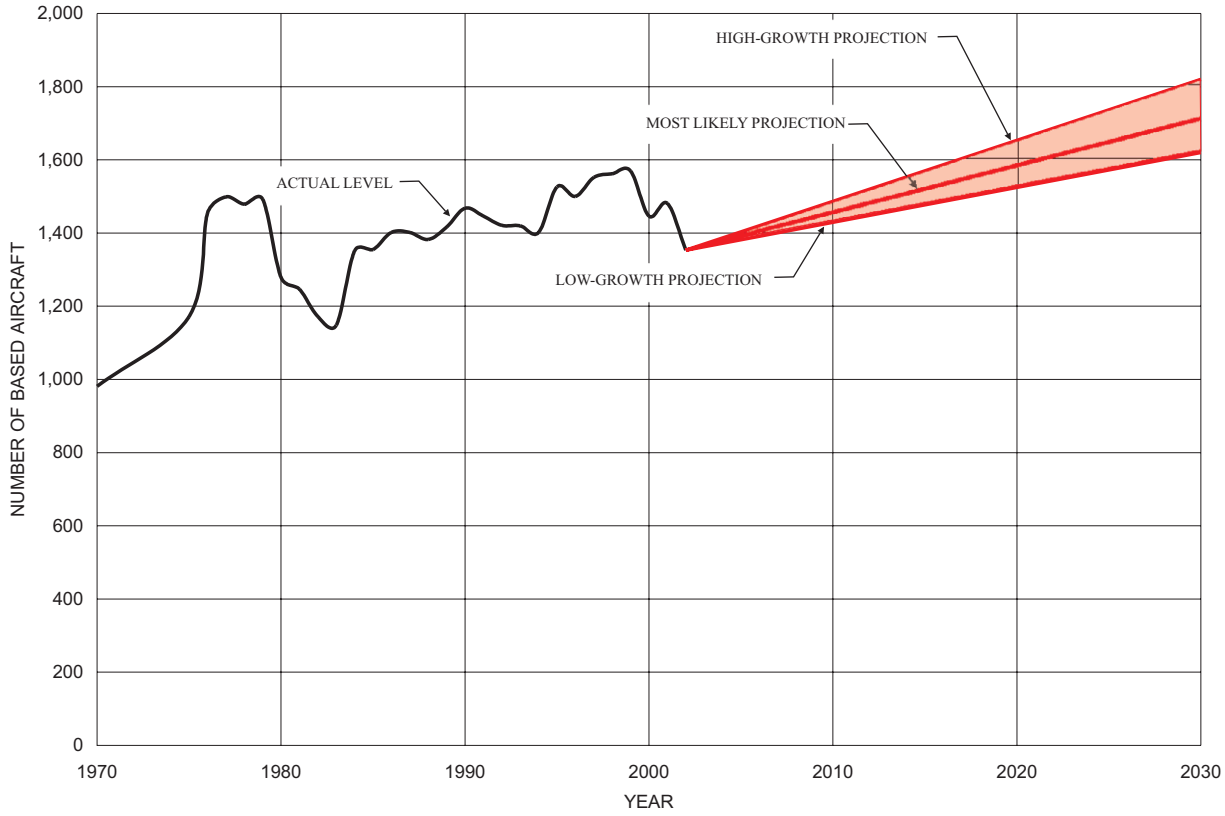
Forecast General Aviation Fleet Composition

Since different categories of aircraft normally have different rates of use, it was necessary to project the future composition of the general aviation fleet by aircraft type. The procedures used in past regional airport system planning efforts were used for this purpose.

The composition of the general aviation fleet within the Region historically has not differed significantly from that of the composition of the national fleet, with the exceptions that the Region has a greater proportion of piston aircraft and lesser proportions of helicopters and other aircraft, including balloons and gliders.

Figure 20

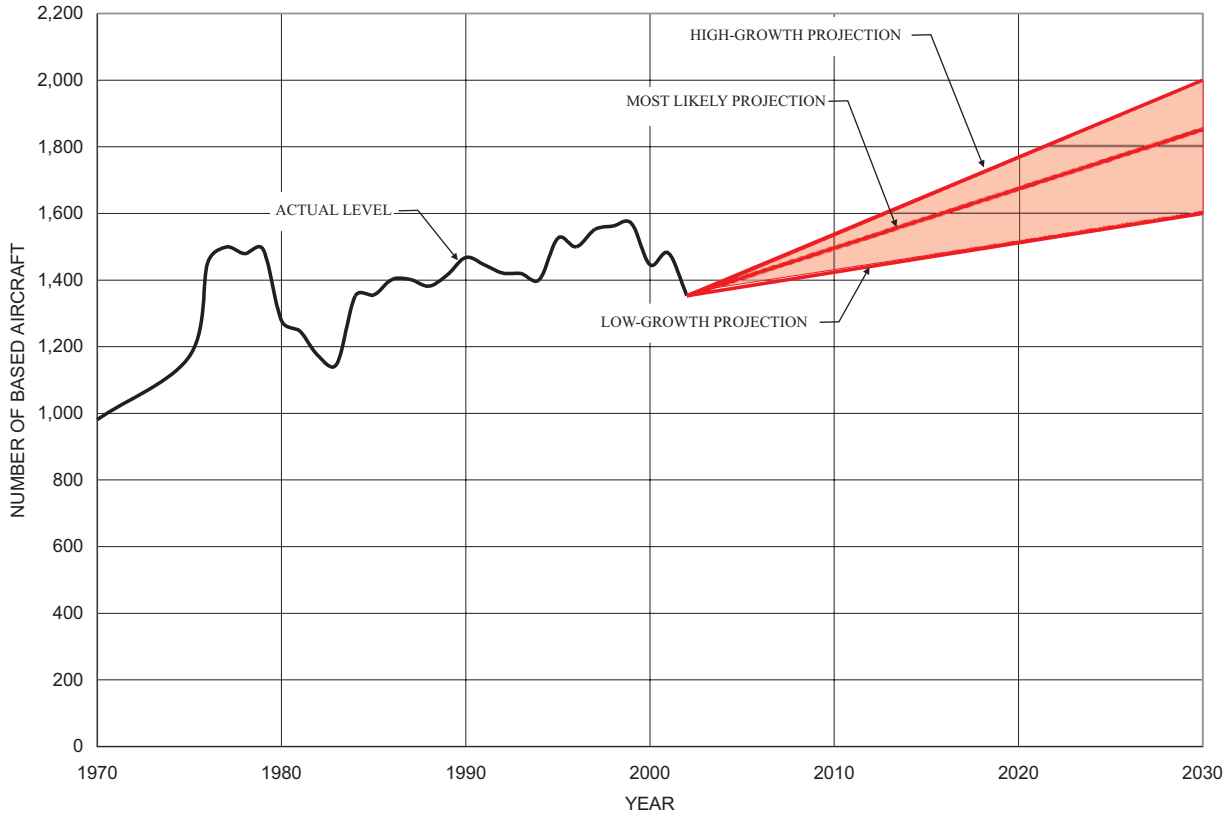
PROJECTED ACTIVE GENERAL AVIATION FLEET SIZE IN SOUTHEASTERN WISCONSIN BASED ON THE SOCIO-ECONOMIC INDICATOR METHOD



Source: SEWRPC.

Figure 21

FORECAST ACTIVE GENERAL AVIATION FLEET SIZE BASED IN SOUTHEASTERN WISCONSIN: 2030



Source: SEWRPC.

Forecasts prepared by the Federal Aviation Administration anticipate only modest future change in general aviation fleet composition, including increases in the proportions of jet, turboprop and other aircraft, and decreases in the proportions of piston aircraft and helicopters. The revised forecast of the Regional general aviation fleet composition presented in Table 31 reflects changes similar to those forecast by FAA for national fleet composition. Table 32 presents the resultant forecast number of aircraft by type under each of the three alternative future scenarios considered for the Region.

The forecast number of general aviation aircraft at each airport in the regional airport system plan was determined by making an assignment of the total forecast number of active general aviation aircraft in southeastern Wisconsin under a most likely future scenario. The assignment methodology was based on a number of factors, the primary factor being the existing and forecast future employment for the Region and by county. As noted previously, more than any other socioeconomic characteristic, employment continues to be the most strongly related characteristic to regional general aviation fleet size. The assignment was made for each type of aircraft including single-engine piston, multi-engine piston, turboprop, jet, helicopter, and other miscellaneous aircraft. Assignments were made with regard to the ability of individual airports to handle the most demanding type -- or "critical" type of aircraft. Each airport was assumed to be improved to the Federal Aviation Administration classification recommended in the current regional airport system plan for Southeastern Wisconsin. While the location and size of employment by county was a primary factor, other important factors were also considered depending on the type of aircraft being assigned. The other factors included: existing and historic levels of based aircraft at each airport; immigration and emigration of based aircraft to and from airports outside the Region; the continuing long-term shift of general aviation activity away from General Mitchell International Airport to other airports; impacts of conflicting types of aviation activity and relative appeal of each airport to specific types of activity, and likely interest and ability of airport owners to attract and promote desired types of aircraft and levels of activity.

Changes in the relative level of general aviation based aircraft at each airport in the system plan were specifically considered in the assignment of forecast aircraft. A comparison of the number of based general aviation aircraft by type and total at each of the regional airport system airports from 1984 to 2001 is shown in Table 33. This shows the increasing use of higher performance aircraft, especially business and corporate jets, both in number and proportion of the total fleet throughout southeastern Wisconsin airports. This also shows the share of aircraft by type and by airport and provides an indication of how those shares have changed during this time period. At airports where major airfield improvements have been made during this time period, increases in the share of all based general aviation aircraft have been experienced. Such airports include Kenosha Regional and East Troy Municipal Airports, and to a lesser extent John H. Batten and Burlington Municipal Airports and Waukesha County-Crites Field. Some airports have maintained little or no change in their share of all based aircraft including Sylvania, West Bend Municipal, and Hartford Municipal Airports.

The two airports in Milwaukee County have experienced a decrease in their share of based general aviation aircraft. At Mitchell International, this is likely due to a long-term shift of general aviation use other than that of high performance business and corporate aircraft away from Mitchell to other surrounding airports. As the volume of scheduled air carrier operations has steadily grown and air traffic control procedures and requirements have become increasingly complicated, general aviation pilots have elected to use other less congested airports. The improvement of other airports in southeastern Wisconsin to perform such a reliever function has enabled this to occur at a significant level. The trend of general aviation activity at Mitchell International decreasing as commercial air carrier activity increases is shown in Table 34. Between 1984 and 2003, general aviation operations at Mitchell International have decreased by over 50 percent while air carrier operations have almost doubled. General aviation based aircraft have decreased by about 50 percent, but based general aviation jets have increased by almost 50 percent and air carrier aircraft based at Mitchell International have grown from zero to over 30 aircraft. The decrease in Timmerman Field's share of total based aircraft is likely due to a combination of other outlying airports being improved and becoming capable of handling more and higher performance aircraft, and those outlying airports becoming better located to serve the population and economic activity growth occurring outside Milwaukee County.

Table 31

EXISTING AND FORECAST UNITED STATES AND REGIONAL ACTIVE GENERAL AVIATION AIRCRAFT FLEET COMPOSITION BY PERCENTAGE

Aircraft Type	United States			Region	
	Existing 2001	Forecast 2010	Forecast 2014	Existing 2001	Forecast 2030
Piston:					
Single Engine	68.6	66.2	65.2	81.0	74.0
Other	8.6	8.0	7.8	7.8	7.0
Subtotal	77.2	74.2	73.0	88.8	81.0
Turboprop	3.1	3.4	3.5	2.5	4.5
Jet	3.7	4.8	5.4	3.1	6.0
Helicopter	5.3	3.2	3.2	1.9	2.1
Other[a]	10.7	14.4	14.9	3.7	6.4
Total	100.0	100.0	100.0	100.0	100.0

[a] *Includes balloons, gliders, and registered ultralights.*

Source: Federal Aviation Administration and SEWRPC.

Table 32

FORECAST NUMBER OF ACTIVE GENERAL AVIATION AIRCRAFT IN THE SOUTHEASTERN WISCONSIN FLEET BY TYPE: 2030

Aircraft Type	Existing 2001	Year 2030 Forecast		
		Low-Growth Forecast	Most Likely Forecast	High-Growth Forecast
Piston:				
Single Engine	1,167	1,190	1,370	1,480
Other	113	110	130	140
Subtotal	1,280	1,300	1,500	1,620
Turboprop	36	70	80	90
Jet	44	100	110	120
Helicopter	28	30	40	40
Other[a]	54	100	120	130
Total	1,442	1,600	1,850	2,000

[a] *Includes balloons, gliders, and registered ultralights.*

Source: Federal Aviation Administration, Wisconsin Department of Transportation, and SEWRPC.

Table 33

COMPARISON OF ACTIVE GENERAL AVIATION FIXED-WING BASED AIRCRAFT AT REGIONAL AIRPORT SYSTEM PLAN AIRPORTS IN SOUTHEASTERN WISCONSIN: 1984 AND 2001

County and Airport		Based Aircraft By Type																			
		Number of Aircraft										Percentage of Total									
		SE		ME		TP		J		Total		SE		ME		TP		J		Total	
		1984	2001	1984	2001	1984	2001	1984	2001	1984	2001	1984	2001	1984	2001	1984	2001	1984	2001	1984	2001
Kenosha	Kenosha Regional	80	144	8	16	--	2	--	4	88	166	10	16	7	15	--	6	--	9	9	15
Milwaukee	Lawrence J. Timmerman	129	101	16	17	1	6	1	2	147	126	17	11	14	16	4	16	5	5	16	11
	General Mitchell International	96	48	30	7	18	15	13	19	157	89	12	5	25	6	67	41	68	43	17	8
Ozaukee		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Racine	John H. Batten	43	68	6	8	4	4	3	6	56	86	6	7	5	7	15	11	17	14	6	8
	Sylvania	24	26	4	1	--	--	--	--	28	27	3	3	3	1	--	--	--	--	3	3
	Burlington Municipal	31	56	8	9	--	2	--	--	39	67	4	6	7	8	--	6	--	--	4	6
Walworth	East Troy Municipal	20	82	--	5	--	--	--	--	20	87	3	9	--	5	--	--	--	--	2	8
Washington	West Bend Municipal	74	81	9	10	2	2	1	1	86	94	9	9	8	9	7	6	5	2	9	9
	Hartford Municipal	41	60	4	3	--	--	--	--	45	63	5	7	3	3	--	--	--	--	5	6
Waukesha	Waukesha County - Crites Field	134	166	28	30	2	5	1	12	165	213	17	18	24	28	7	14	5	27	17	19
	Capitol	113	78	5	2	--	--	--	--	118	80	14	9	4	2	--	--	--	--	12	7
All Airports		785	910	118	108	27	36	19	44	949	1098	100	100	100	100	100	100	100	100	100	100

Notes: Does not include aircraft registered to air carriers or helicopters and miscellaneous aircraft such as balloons, gliders, and registered ultralights.

SE = Single Engine Piston ME = Multi-engine Piston TP = Turboprop J = Jet

Source: Wisconsin Department of Transportation and SEWRPC.

Table 34

SUMMARY OF BASED AIRCRAFT AND AIRCRAFT OPERATIONS AT GENERAL MITCHELL INTERNATIONAL AIRPORT: 1960-2003

Year	Based Aircraft				Aircraft Operations			
	General Aviation		Air Carrier	Total	General Aviation	Air Carrier	Military	Total
	Non-Jet	Jet						
1960	N/A	N/A	N/A	N/A	69,508	67,812	19,367	156,687
1965	N/A	N/A	N/A	N/A	107,680	57,795	15,821	181,296
1970	N/A	N/A	N/A	N/A	138,264	73,817	14,069	226,150
1975	N/A	N/A	N/A	N/A	116,324	83,210	10,547	210,081
1980	N/A	N/A	N/A	N/A	132,345	95,167	12,082	239,594
1984	144	13	--	157	69,225	94,788	7,016	171,029
1985	123	14	--	137	81,041	99,121	7,995	188,157
1986	129	15	--	144	86,356	100,431	6,913	193,700
1987	116	21	--	137	92,075	87,515	5,974	185,564
1988	87	18	3	108	82,639	103,608	6,374	192,621
1989	94	17	4	115	73,189	118,642	6,608	198,439
1990	89	14	6	109	65,768	134,772	6,129	206,669
1991	89	14	7	110	67,519	129,775	5,948	203,242
1992	95	15	9	119	65,237	130,801	6,992	203,030
1993	93	20	7	120	63,370	132,122	5,796	201,288
1994	87	20	16	123	62,336	148,205	5,348	215,889
1995	90	18	21	129	55,174	144,420	5,187	204,781
1996	86	22	27	135	48,336	146,998	5,629	200,963
1997	N/A	N/A	N/A	N/A	49,579	157,843	5,187	212,609
1998	94	22	38	154	48,809	165,248	5,030	219,087
1999	87	23	39	149	45,592	171,091	5,183	221,866
2000	69	26	39	134	39,695	177,937	4,223	221,855
2001	73	18	39	130	34,520	172,107	4,885	211,512
2002	55	19	39	113	32,105	179,260	4,814	216,179
2003	57	20	31	108	29,344	177,756	4,318	211,418

N/A: Not Available.

Source: Milwaukee County, Wisconsin Department of Transportation, and SEWRPC.

Table 35 presents the forecast number of aircraft by type and by airport for the airports included in the regional airport system plan. Consideration was also given in the assignment to aircraft expected to be based at public airports not in the regional airport system plan, private fields, and non-airport locations. Smaller airports will continue to be attractive to pilots of smaller aircraft because of less traffic, less congestion, no jet operations, and less complicated air traffic control procedures and regulations. This trend is expected to continue for small aircraft owners, particularly those who fly primarily for recreation and sport. The assignment of forecast aircraft also assumes the continued long-term operation of the current public-use airports which are not included in the regional airport system plan as well as the current private fields throughout southeastern Wisconsin. The difference between the total number of forecast aircraft at the system plan airports shown in Table 35 and the region-wide forecast number of aircraft shown under the most likely scenario in Table 32 represents the general aviation aircraft expected to be based at smaller public-use airports not in the system plan, at private fields and airstrips, and kept at non-airport locations. To the extent that any of these smaller facilities are ultimately closed, the affected based aircraft and attendant activity may result in increased demand and an additional burden on the public-use airports in the system plan.

In general, the forecast for general aviation activity expects the continued relocation of general aviation activity away from General Mitchell International Airport as commercial air carrier activity continues to increase. Most of the smallest general aviation aircraft now based at Mitchell International are expected to relocate to other airports including Timmerman Field. It is expected that the share of general aviation based aircraft at Mitchell International will eventually stop decreasing and then remain stable during the forecast period. Most of the general aviation aircraft that will be based at Mitchell International in the future is expected to be the higher performance business and corporate aircraft. To a lesser extent, some of the smallest general aviation activity is also expected to move away from the busier business-corporate oriented airports such as Kenosha Regional Airport, John H. Batten Airport, and Waukesha County-Crites Field to the smaller airports that serve sport and recreational activity.

Revised General Aviation Aircraft Operations Forecast

General aviation airport capacity is measured by the number of aircraft operations an airport can safely accommodate. Therefore, in order to establish a relationship between airport capacity and use at general aviation airports in the Region and, thereby, the existing and probable future need for airport capacity improvements, forecasts of general aviation fleet size and fleet composition must be converted to forecast general aviation aircraft operations. Forecast general aviation aircraft operations are typically prepared by applying forecasts of annual operations per aircraft to forecasts of the general aviation fleet size. Forecasts of annual operations per aircraft were obtained by combining forecasts of annual numbers of hours of use per aircraft and forecasts of operations per hour of use.

Table 36 presents the Federal Aviation Administration estimated existing year 2001 and forecast future year 2014 annual number of hours of use per aircraft for each type of general aviation aircraft. The FAA forecasts were extended to the year 2030 under the assumption that much of the general aviation fleet will continue to be used more efficiently, resulting in a continuation of the increase in average hours of use.

Table 37 presents FAA historic estimates of the number of operations per hour of general aviation aircraft use by type of aircraft for the years 1970, 1981, 1992, and 2001. These estimates indicate that only modest change has occurred over the long term, and particularly over the last 10 years. The rates of operations per hour estimated by FAA for 2001 therefore were used in the preparation of the year 2030 forecasts.

The FAA estimates of annual general aviation operations per aircraft were reviewed for applicability in southeastern Wisconsin by determining how well the 2001 FAA estimates would replicate 2001 observed general aviation operations in southeastern Wisconsin. It was determined that the FAA estimates for 2001 would result in an under-estimate of 2001 operations in southeastern Wisconsin of about 30 percent, and 2030 forecasts of annual operations per type of general aviation aircraft were adjusted accordingly. The year 2030 forecast numbers of average annual operations per aircraft in the region were 590 for single-engine piston aircraft, 480 for multi-engine piston aircraft, 740 for turboprop aircraft, 1,170 for general aviation jet aircraft, 1,100 for helicopters, and

Table 35

NUMBER OF FORECAST ACTIVE GENERAL AVIATION AIRCRAFT BASED AT AIRPORTS COMPRISING THE REGIONAL AIRPORT SYSTEM PLAN UNDER A MOST LIKELY SCENARIO BY AIRPORT AND TYPE: 2030

County	Airport	Based Aircraft by Type				Helicopters	Other [a]	Total
		Single-Engine Piston	Multi-Engine Piston	Turboprop	Jet			
Kenosha	Kenosha Regional	174	9	7	15	2	- -	207
Milwaukee	Lawrence J. Timmerman	120	26	16	4	2	- -	168
	Mitchell International	11	8	17	39	2	- -	77
	Total	131	34	33	43	4	- -	245
Ozaukee	None	- -	- -	- -	- -	- -	- -	- -
Racine	John H. Batten	80	8	8	13	3	4	116
	Sylvania	40	3	- -	- -	- -	6	49
	Burlington Municipal	75	11	4	- -	- -	4	94
	Total	195	22	12	13	3	14	259
Walworth	East Troy Municipal	96	8	2	2	5	2	115
Washington	West Bend Municipal	95	13	7	6	1	4	126
	Hartford Municipal	70	5	- -	- -	1	18	94
	Total	165	18	7	6	2	22	220
Waukesha	Waukesha County-Crites Filed	195	31	19	31	2	3	281
	Capitol	104	4	- -	- -	2	3	113
	Total	299	35	19	31	4	6	394
Total at Airports in Regional Airport System Plan [b]	Total	1,060	126	80	110	20	44	1,440

NOTE: *The number and type of general aviation aircraft based at each of these airports for the intermediate forecast years of 2005, 2010, and 2020 is provided in Appendix B.*

[a] *Includes balloons, gliders, and registered ultralights.*
[b] *Does not include 410 forecast aircraft based at public-use and private-use airports not in the regional airport system plan and at non-airport locations.*

Source: SEWRPC.

Table 36

CURRENT AND FORECAST ANNUAL HOURS OF USE OF ACTIVE GENERAL AVIATION AIRCRAFT BY AIRCRAFT TYPE IN THE UNITED STATES: 2001 EXISTING, 2014 FORECAST, AND 2030 FORECAST

Aircraft Type	Annual Hours of Use per Aircraft		
	2001 Existing	2014 FAA Forecast	2030 Forecast[a]
Single-Engine Piston	123	129	135
Other Piston	163	165	170
Turboprop	290	287	285
Jet	341	486	600
Helicopter	316	331	350
Other[b]	57	66	75

[a] *Extension of 2014 FAA forecast.*

[b] *Includes balloons, gliders, and registered ultralights.*

Source: Federal Aviation Administration and SEWRPC.

Table 37

HISTORIC, CURRENT, AND FORECAST OPERATIONS PER HOUR OF GENERAL AVIATION AIRCRAFT USE BY AIRCRAFT TYPE IN THE UNITED STATES: 1970, 1981, 1992, 2001, AND 2030

Aircraft Type	Operations per Hour of Use				
	Historic 1970	Historic 1981	Historic 1992	Existing 2001	Forecast 2030
Single-Engine Piston	4.4	4.1	3.2	3.1	3.1
Other Piston	2.0	1.9	1.9	2.0	2.0
Turboprop	2.0	2.4	2.4	2.0	2.0
Jet	1.4	1.5	1.7	1.5	1.5
Helicopter	4.3	3.4	3.7	4.5	4.5
Other[a]	4.5	3.0	2.9	2.9	2.9

[a] *Includes balloons, gliders, and registered ultralights.*

Source: Federal Aviation Administration and SEWRPC.

250 for other miscellaneous type aircraft. These estimates of annual aircraft operations are intended to represent the annual average activity generated by a typical aircraft for each type of aircraft and not by a specific individual aircraft. Therefore, an estimate of operations for each aircraft based at an airport includes not only the operations generated by that aircraft, but also represents the average operations generated by other aircraft of the same type that are visiting the airport but are not based there.

These forecast aircraft utilization rates were then applied by aircraft type to the forecasts of active general aviation aircraft in the Region to arrive at the anticipated number of general aviation operations in the Region in the year 2030. The resultant activity forecasts are presented in Table 38 by alternative future scenarios. The estimated existing 2001 general aviation aircraft operations in the Region are also presented in this table for comparison purposes. The number of total general aviation operations in the Region is envisioned to increase to about 952,200 operations under low-growth conditions and to about 1,223,900 aircraft operations under high-growth conditions, with a most likely forecast level of about 1,132,600 aircraft operations. These forecasts represent a change in general aviation activity ranging from an increase of about 27 percent under low-growth conditions to an increase of about 63 percent under high-growth conditions, with a most likely increase of about 51 percent between 2001 and the year 2030. This forecast general aviation aircraft operations is shown graphically in Figure 22. Table 39 presents the forecast general aviation aircraft operations at each of the 11 airports comprising the regional airport system plan under a most likely scenario.

The forecast of general aviation operations in the Region was further refined to provide an estimate of total local and itinerant general aviation operations. Local general aviation operations consist primarily of training and instructional flights. Local operations are those which occur in the local traffic pattern or within sight of a control tower; are known to be departing for, or arriving from, local practice areas generally located within a 20-mile radius of the airport; or are for the execution of simulated instrument approaches to the airport. Itinerant operations are all aircraft operations other than local operations.

Table 40 provides information showing the existing and historic distribution of local and itinerant general aviation aircraft operations at public-use airports located within the Region. This table indicates that at public-use airports in the Region with air traffic control towers, local operations account for about 40 percent of all traffic, while itinerant operations account for about 60 percent. In 2002, four airports within the Region had air traffic control towers, Kenosha Regional Airport, General Mitchell International Airport, Lawrence J. Timmerman Airport, and Waukesha County-Crites Field. At public-use airports within the Region that do not have air traffic control towers, about 56 percent, or slightly over half of the operations were local in nature and 44 percent of the operations were itinerant. Since airports that do have control towers are likely to experience relatively high traffic levels, the potential for some congestion, and use by higher performance aircraft, these same airports would be expected to have a lower percentage of local operations, which are made up largely of training and proficiency activities. Table 40 also shows that the proportion of local and itinerant operations at airports with and without control towers has not significantly changed from 1993 to 2002.

Finally, it is important to note that a number of crucial assumptions are implicit in these forecasts of general aviation activity including based aircraft as well as operations.

- These general aviation forecasts are based on a set of economic assumptions that include a strong national recovery starting during the latter half of 2003 and continuing through 2005, with moderate sustained growth thereafter. In recent years, the level of general aviation activity has been significantly affected by relatively weak economic conditions, a slow economic recovery, and the lingering effects of the events of September 11, 2001. The FAA expects general aviation to experience slow growth during 2004, then return to more normal growth patterns as the United States economy continues to recover.
- These forecasts assume that the regulatory environment affecting general aviation will not change dramatically. Specifically, it is assumed that noise and emissions requirements on business and corporate aircraft will remain within the bounds prescribed by current rules and regulations. The forecast also assumes that general aviation activity will not be subject to new user-fees or limited access to airports and airspace.

Table 38

FORECAST NUMBER OF GENERAL AVIATION OPERATIONS GENERATED BY THE ACTIVE SOUTHEASTERN WISCONSIN FLEET BY AIRCRAFT TYPE: 2030

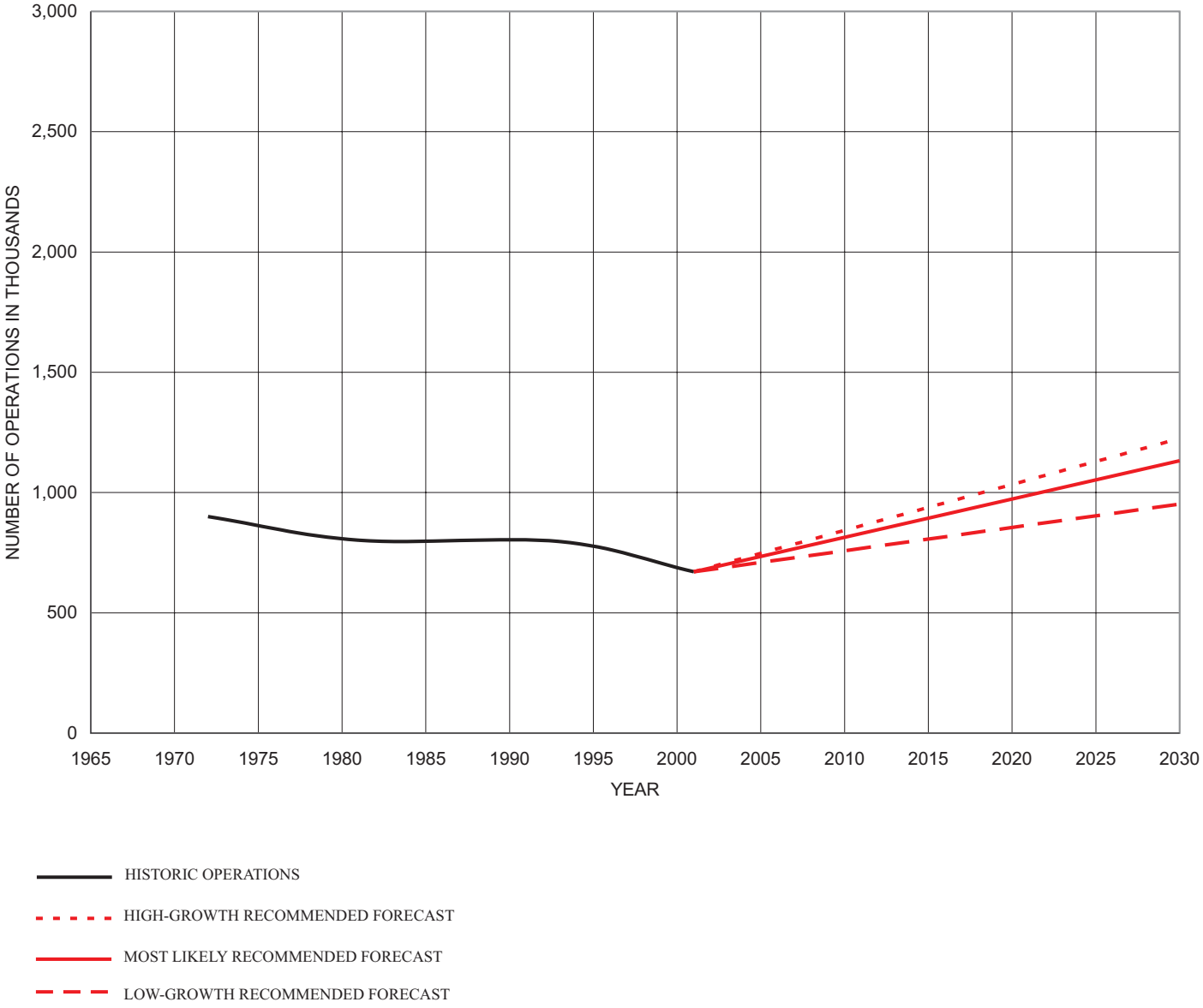
Aircraft Type	Existing 2001	Year 2030 Forecast		
		Low-Growth Forecast	Most Likely Forecast	High-Growth Forecast
Fixed-Wing Aircraft				
Piston				
Single-Engine	620,500	672,600	808,300	873,200
Other	44,500	52,800	62,400	67,200
Subtotal	665,000	725,400	870,700	940,400
Turboprop	25,000	51,800	59,200	66,600
Jet	27,000	117,000	128,700	140,400
Fixed-Wing Total	717,000	894,200	1,058,600	1,147,400
Helicopter	24,200	33,000	44,000	44,000
Other[a]	8,900	25,000	30,000	32,500
All Types Total	750,100	952,200	1,132,600	1,223,900

[a] *Includes balloons, gliders, and registered ultralights.*

Source: Federal Aviation Administration and SEWRPC.

Figure 22

FORECASTS OF GENERAL AVIATION AIRCRAFT OPERATIONS FOR SOUTHEASTERN WISCONSIN: 2030



Source: SEWRPC.

Table 39

NUMBER OF FORECAST GENERAL AVIATION OPERATIONS AT AIRPORTS COMPRISING THE REGIONAL AIRPORT SYSTEM PLAN UNDER A MOST LIKELY SCENARIO BY AIRPORT AND TYPE: 2030

County	Airport	Fixed Wing Operations				Helicopters	Other [a]	Total
		Single-Engine Piston	Multi-Engine Piston	Turboprop	Jet			
Kenosha	Kenosha Regional	102,700	4,300	5,200	17,600	2,200	- -	132,000
Milwaukee	Lawrence J. Timmerman	70,800	12,500	11,800	4,700	2,200	- -	102,000
	Mitchell International	6,500	3,800	12,600	45,600	2,200	- -	70,700
	Total	77,300	16,300	24,400	50,300	4,400	- -	172,700
Ozaukee	None	- -	- -	- -	- -	- -	- -	- -
Racine	John H. Batten	47,200	3,800	5,900	15,200	3,300	1,000	76,400
	Sylvania	23,600	1,400	- -	- -	- -	1,500	26,500
	Burlington Municipal	44,200	5,300	3,000	- -	- -	1,000	53,500
	Total	115,000	10,500	8,900	15,200	3,300	3,500	156,400
Walworth	East Troy Municipal	56,600	3,800	1,500	2,300	5,500	500	70,200
Washington	West Bend Municipal	56,000	6,200	5,200	7,000	1,100	1,000	76,500
	Hartford Municipal	41,300	2,400	- -	- -	1,100	4,500	49,300
	Total	97,300	8,600	5,200	7,000	2,200	5,500	125,800
Waukesha	Waukesha County-Crites Filed	115,000	14,900	14,100	36,300	2,200	800	183,300
	Capitol	61,400	1,900	- -	- -	- -	800	66,300
	Total	176,400	16,800	14,100	36,300	4,400	1,600	249,600
Total at Airports in Regional Airport System Plan [b]	Total	625,300	60,300	59,300	128,700	22,000	11,100	906,700

NOTE: General aviation operations at each of these airports for the intermediate forecast years of 2005, 2010, and 2020 are provided in Appendix B.

[a] Includes balloons, gliders, and registered ultralights.

[b] Does not include about 226,000 aircraft operations forecast to be generated by aircraft based at public-use and private-use airports not in the regional airport system plan and at non-airport locations.

Source: SEWRPC.

Table 40

PERCENTAGES OF LOCAL AND ITINERANT GENERAL AVIATION AIRCRAFT OPERATIONS AT SELECTED PUBLIC-USE AIRPORTS IN SOUTHEASTERN WISCONSIN: 1993 AND 2002

County	Airport Name	1993		2001	
		Local	Itinerant	Local	Itinerant
Kenosha	Camp Lake	86	14	91	9
	Kenosha Regional	57	43	38	62
	Vincent	68	32	62	38
	Westosha	51	49	51	49
Milwaukee	Mitchell International	23	77	10	90
	Lawrence J. Timmerman	52	48	46	54
Ozaukee	None	- -	- -	- -	- -
Racine	Burlington Municipal	46	54	56	44
	Fox River	50	50	50	50
	John H. Batten	60	40	66	34
	Cindy Guntly Memorial	74	26	78	22
	Sylvania	70	30	71	29
	Valhalla	33	67	91	9
Walworth	Big Foot Airfield	64	36	68	32
	East Troy Municipal	44	56	52	48
	Lake Lawn	19	81	9	91
Washington	Hahn Sky Ranch	50	50	50	50
	Hartford Municipal	60	40	67	33
	West Bend Municipal	53	47	52	48
Waukesha	Aero Park	83	17	84	16
	Capitol	70	30	51	49
	Waukesha County-Crites Field	41	59	47	53
Public-Use Airports with Air Traffic Control Towers		39	61	40	60
Public-Use Airports without Air Traffic Control Towers		55	45	56	44
All Public-Use Airports		51	49	49	51

Source: Federal Aviation Administration, Milwaukee County, and SEWRPC.

- These forecasts assume that the fractional ownership market will continue to expand and bring new operators and shareholders into business aviation. The fractional ownership community is not expected to be inhibited by new or additional certification and regulatory requirements.
- These forecasts assume the growth in single-engine piston aircraft including the addition of a new aircraft category -- light sport aircraft -- that is expected to start entering the national active fleet in 2004. The FAA expects this category to account for almost 21,000 aircraft nationally by 2015. This includes over 15,000 existing ultralight aircraft not currently in the FAA's aircraft registry count. In addition, the FAA is expecting between 350 and 500 newly manufactured light sport aircraft to enter the national active fleet annually beginning in 2006.

To the extent that industry and government programs and initiatives are successful in expanding the market for general aviation products and services, the national and regional forecasts for general aviation fleet size, hours flown, and pilots, and therefore forecasts for fleet size and operations in southeastern Wisconsin may be achieved. To date, industry and government efforts toward promoting general aviation have been somewhat successful. For example, the General Aviation Revitalization Act of 1994 has resulted in product liability reform which has counteracted rising product liability costs in the industry. In addition, shipments of new general aviation aircraft by United States manufacturers had been increasing up until the September 11, 2001 events and new aircraft models and equipment have been introduced. If any of the above-cited assumptions do not hold over the forecast period, or if some unforeseen but significant adverse event occurs, then the forecast levels of based aircraft and activity may be expected to be impacted accordingly.

AIR CARGO FORECASTS

Air cargo traffic at Mitchell International may be expected to continue at about current levels in terms of the share of national air cargo traffic. At Mitchell International, express and small package traffic may be expected to continue to represent the largest segment of the total air cargo movements. In total, all air cargo at Mitchell International was forecast to more than double, from about 103,000 tons in 2002 to about 215,000 tons by the year 2030 under medium growth conditions. Under low-growth and high-growth conditions, all air cargo handled at Mitchell International was forecast to increase to about 136,000 tons and 360,000 tons, respectively by the year 2030.

As part of the process of reviewing and updating the air cargo forecasts under the plan reevaluation, other pertinent projections of air cargo at Mitchell International were reviewed and evaluated. These include forecasts prepared under the current airport master plan update effort for Mitchell International.

Forecasts of air cargo were prepared under the current airport master plan update effort for General Mitchell International Airport. Under this effort, total air cargo including air freight and air mail were forecast to reach about 179,000 tons by the year 2021, of which about 160,000 tons, or about 89 percent would be air freight. Consequently, about 19,000 tons, or 11 percent, would be air mail. Extending the forecast to the year 2030 would provide a projection of approximately 232,000 tons of combined air freight and air mail.

The various projections of air cargo at Mitchell International were considered in making a revised forecast. Based on a review and comparison of the various projections and forecasts, it was concluded that the medium growth forecast was very similar to, and consistent with, the recently developed Mitchell International master plan forecast. Therefore, a most likely forecast level of 232,000 tons of combined freight and air mail in the year 2030 was selected of which 206,000 tons would be air freight and 26,000 tons would be air mail (also see Table A-2 in Appendix A). Furthermore, under low-growth and high-growth conditions, total air cargo handled at Mitchell International was forecast to increase to about 147,000 tons and 388,000 tons, respectively by the year 2030. This forecast assumes a continued strong interest by both all-cargo and passenger carriers to handle freight and mail traffic by air at Milwaukee, long-term national and regional economic conditions that promote air cargo traffic at Milwaukee, and continued use of air transportation to move significant amounts of air mail through Mitchell International.

MILITARY AVIATION FORECASTS

Within Southeastern Wisconsin, aviation activity attendant to military operations has historically constituted a relatively small portion of all aviation activity. As noted earlier, most military aviation activity in 2002 occurred at only two airports in the Region, General Mitchell International Airport and West Bend Municipal Airport. There were no exclusively military-use airports located within the Region. In terms of activity, military units at these two airports together accounted for about 18,800 operations during 2002. These operations accounted for 93 percent of all military operations estimated to have occurred in the Region during 2002.

The level of such military activity in Southeastern Wisconsin has remained relatively constant since the mid-1980s and consists largely of training exercises. Any significant increase in military activity would probably be due to large-scale national defense emergencies which cannot be foreseen. Accordingly, military aircraft operations activity in Southeastern Wisconsin was forecast to remain stable at about the 2002 level, representing an annual volume of about 19,000 operations. Of these total annual military operations, about 5,050 would be expected to take place at Mitchell International.

As part of the process of reviewing and updating the military operations forecasts under the plan reevaluation, other pertinent projections of military operations at Mitchell International were reviewed and evaluated. These forecasts include forecasts prepared under the current airport master plan update effort for Mitchell International.

Forecasts of military operations were prepared under the current airport master plan update effort for General Mitchell International Airport. Under this effort, total military operations were forecast to remain fairly stable – reaching about 5,050 operations in all forecast years (2006, 2011, and 2021). There were about 4,800 military operations at Mitchell International during 2002.

HELICOPTER ACTIVITY FORECASTS

Civil helicopter activity within Southeastern Wisconsin is comparatively minimal relative to more widespread activity in other areas of the United States, especially by business and corporate users. In 2001, it was estimated that there were 28 civil helicopters based in the Region, estimated to account for about 24,200 operations, or about 3 percent of all aviation activity during the year.

The Federal Aviation Administration has forecast that the active helicopter fleet may be expected to continue to increase to the year 2014 at an average annual growth rate of about 0.6 percent. Helicopter use in Southeastern Wisconsin should also increase at about the same rate. Much of the increase will continue to be in the form of specialized operations. Accordingly, the FAA forecast growth rate was extended to the year 2030, resulting in a forecast increase in the civil helicopters based within the Region from 28 in 2001 to 30 in 2030 under low-growth conditions, to 40 under most likely and high-growth conditions.

The FAA expects that helicopter flight-hours will experience an average annual growth rate of about 1.0 percent, with much of this growth represented by the increased use of turbine-powered helicopters. Under this reevaluation, it was assumed that most of the helicopter trips will remain relatively short, but that such use in the Region will follow forecast national trends, increasing at an average annual rate of about 1.0 percent through the year 2030. The average trip length of helicopters within the Region is expected to remain about the same, however, resulting in more intensive use of the regional fleet. Accordingly, the level of civil helicopter activity within the Region is forecast to increase from the 24,200 operations in 2001 to 33,000 under low-growth conditions and 44,000 under most likely and high-growth conditions.

FORECASTS OF OTHER AVIATION ACTIVITY

Like military and helicopter activity, such miscellaneous aircraft activity as that generated by balloons, gliders, and ultralight aircraft, represents a very small portion of all aircraft activity in the Region. In 2001, it was estimated that such activity generated about 8,900 operations, or about 1.2 percent of all operations in

Southeastern Wisconsin. Most of the aircraft in this category do not require extensive airfield facilities, if any at all, and are used only occasionally, mostly for recreation or sport purposes.

It is expected that activity in this category will continue to increase slowly as individuals with discretionary income choose these aviation activities for recreation, sport, or hobby purposes. Accordingly, the number of based aircraft in this category is estimated to increase, from 54 in 2001 to between 100 and 130 in the year 2030, with a level of 120 being the most likely. The number of operations created by these aircraft may be expected to increase from about 8,900 in 2001 to a range of 25,000 to 32,500 operations, with a level of 30,000 operations being the most likely by the year 2030. This forecast assumes that most of this activity will be generated by balloons, gliders, and ultralights that do not need to be registered with the FAA and are, therefore, not considered by the FAA to be aircraft in a regulatory sense.

SUMMARY

Forecasts of aviation demand provide an important basis for determining the need for new or expanded airport facilities. New year 2030 forecasts of aviation demand prepared under this reevaluation include forecasts of passenger air carrier activity, general aviation activity, air cargo activity, military aviation activity, helicopter activity, and other miscellaneous aviation activity. Together, these categories of aviation demand constitute the anticipated future demand for air transportation facilities in Southeastern Wisconsin. The forecasts of aviation demand presented in this memorandum constitute a revision of the forecasts prepared under the original, second-generation, and third-generation regional airport system planning efforts.

With respect to future air carrier passenger demand, the most important forecast component is that of annual air carrier passenger enplanements within the Region. All other measures of future air carrier demand are, in effect, based on the forecast passenger enplanements. In 2003, air carrier passenger enplanements for Southeastern Wisconsin, which occur solely at General Mitchell International Airport, were estimated to total about 3.1 million. These enplanements may be expected to increase to about 8.0 million by the year 2030 under most likely future conditions. Under high-growth conditions, that include the assumption that Mitchell International will support a significantly greater percentage of connecting passengers, total passenger enplanements may be expected to approach 10.0 million passengers annually.

Forecasts of air carrier aircraft operations were made by applying forecasts of the average aircraft size and aircraft load factors to the forecasts of enplaning air carrier passenger traffic. Under the most likely future conditions, total annual air carrier operations may be expected to increase from about 178,000 annual operations in 2003 to about 251,000 operations by 2030. Under high-growth conditions, that assume a significant increase in hubbing activities, total annual air carrier operations may be expected to reach about 297,000 operations by 2030.

The general aviation fleet based within the Region may be expected to change from the 2001 level of 1,442 aircraft by 2030 to about 1,600 aircraft under low-growth conditions and to about 2,000 aircraft under high-growth conditions by the year 2030, with a most likely forecast level of about 1,850 aircraft. The composition of the regional general aviation fleet is anticipated to change modestly over the plan design period. It is expected that the share of single-engine and multi-engine piston aircraft will decrease from about 89 percent to about 81 percent of the total regional fleet. Furthermore, the combined shares of turboprop, jet, helicopter, and other aircraft in the regional fleet may be expect to increase from about 11 percent to about 19 percent of the total fleet.

It is also expected that overall general aviation aircraft utilization rates will increase, resulting in a higher number of average annual operations per aircraft by the year 2030 than in 2001. Given these anticipated trends for general aviation, it was forecast that the level of total general aviation fixed-wing aircraft operations in the Region may be expected to increase from an estimated 717,000 operations in 2001 to a most likely level of about 1,058,600 by the year 2030. Under low-growth conditions, such operations may be expected to increase to about 894,200 operations per year; under high-growth conditions, to increase to about 1,147,000 operations per year.

Other categories of regional aviation demand include military activity, helicopter activity, and miscellaneous aircraft activity. Military aircraft operations within the Region were forecast to continue to remain stable at about the 2002 level of about 19,000 operations per year.

Civil, or nonmilitary, helicopter activity was forecast to increase by 2030 from about 24,200 operations in 2001 to a low of about 33,000 and a high and most probable level of about 44,000 operations in the year 2030. With respect to other miscellaneous aircraft activity, the forecasts assume that such activity will continue to be generated by balloons, gliders, and a small portion of the ultralight aircraft within the Region. Activity by these aircraft may be expected to increase from about 8,900 operations per year in 2001 to a low of about 25,000 and a high of about 32,500 operations per year, with a most probable level about 30,000 operations per year. Miscellaneous aircraft activity in most cases does not require extensive airfield facilities, if any at all.

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APPENDICES

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APPENDIX A

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Table A-1

FORECAST AIR CARRIER ACTIVITY AT GENERAL MITCHELL INTERNATIONAL AIRPORT BY FORCAST YEAR: 2005, 2010, 2020, AND 2030

Year	*Number of Annual Enplaning Passengers By Type of Air Carrier (in millions)*		
	Large	Small	Total
Existing			
2001	2.08	0.73	2.81
2003	2.14	0.93	3.07
Forecast			
2005	2.40	1.04	3.44
2010	3.04	1.31	4.35
2020	4.32	1.85	6.17
2030	5.61	2.39	8.00
	Number of Annual Enplaning Passengers By Type of Passenger Trip (in millions)		
	Originating	Connecting	Total
Existing			
2001	2.54	0.27	2.81
2003	2.74	0.33	3.07
Forecast			
2005	3.03	0.41	3.44
2010	3.77	0.58	4.35
2020	5.23	0.94	6.17
2030	6.70	1.30	8.00
	Number of Annual Aircraft Operations By Type of Air Carrier		
	Large	Small	Total
Existing			
2001	63,500	78,000	141,500
2003	62,900	90,100	153,000
Forecast			
2005	67,000	93,300	160,300
2010	77,200	101,200	178,400
2020	97,600	117,100	214,700
2030	118,000	133,000	251,000

Source: SEWRPC.

Table A-2

FORECAST AIR CARGO TRAFFIC AT GENERAL MITCHELL INTERNATIONAL AIRPORT BY FORCAST YEAR: 2005, 2010, 2020, AND 2030

Year	Category of Air Cargo (in tons)		
	Air Freight	Air Mail	Total
Existing			
2002	95,000	8,000	103,000
2003	92,000	7,000	99,000
Forecast			
2005	101,000	9,000	110,000
2010	122,000	12,000	134,000
2020	164,000	19,000	183,000
2030	206,000	26,000	232,000

Source: SEWRPC.

Table A-3

FORECAST TOTAL AIRCRAFT OPERATIONS AT GENERAL MITCHELL INTERNATIONAL AIRPORT BY FORCAST YEAR: 2005, 2010, 2020, AND 2030

Year	Number of Annual Aircraft Operations By Type of Operation				
	Air Carrier	General Aviation	Air Cargo and Misc. Charter	Military	Total
Existing					
2001	141,500	34,500	30,600	4,900	211,500
2003	153,000	29,300	24,800	4,300	211,400
Forecast					
2005	160,300	37,500	27,300	5,000	230,100
2010	178,400	44,200	33,500	5,000	261,100
2020	214,700	60,500	45,900	5,000	326,100
2030	251,000	70,700	58,200	5,000	384,900

Source: SEWRPC.

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APPENDIX B

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Table B-1

FORECAST GENERAL AVIATION ACTIVITY AT KENOSHA REGIONAL AIRPORT BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	144	16	2	4	1	--	167
Forecast							
2005	148	15	3	6	1	--	173
2010	153	14	4	8	1	--	180
2020	164	11	6	12	2	--	195
2030	174	9	7	15	2	--	207
	Number of Annual Operations						
Existing							
2001[a]	79,900	7,400	1,500	2,700	1,100	--	92,600
Forecast							
2005	83,000	7,000	2,000	4,700	1,300	--	98,000
2010	86,900	6,500	2,600	7,300	1,500	--	104,800
2020	94,800	5,400	3,900	12,500	1,900	--	118,500
2030	102,700	4,300	5,200	17,600	2,200	--	132,000

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

Source: SEWRPC.

Table B-2

FORECAST GENERAL AVIATION ACTIVITY AT LAWRENCE J. TIMMERMAN AIRPORT BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	101	17	6	2	1	--	127
Forecast							
2005	104	18	7	2	1	--	132
2010	107	20	9	3	2	--	141
2020	115	23	13	3	2	--	156
2030	120	26	16	4	2	--	168
	Number of Annual Operations						
Existing							
2001[a]	63,000	9,100	5,200	1,500	1,300	--	80,100
Forecast						--	
2005	64,100	9,600	6,100	1,900	1,400	--	83,100
2010	65,400	10,200	7,200	2,500	1,600	--	86,900
2020	68,100	11,400	9,500	3,600	1,900	--	94,500
2030	70,800	12,500	11,800	4,700	2,200	--	102,000

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

Source: SEWRPC.

Table B-3

FORECAST GENERAL AVIATION ACTIVITY AT GENERAL MITCHELL INTERNATIONAL AIRPORT BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	48	7	15	19	1	--	90
Forecast							
2005	43	7	15	22	1	--	88
2010	37	7	16	25	1	--	86
2020	24	8	16	32	2	--	82
2030	11	8	17	39	2	--	77
	Number of Annual Operations						
Existing							
2001[a]	15,300	1,900	6,700	7,500	700	--	32,100
Forecast							
2005	14,100	2,200	7,500	12,800	900	--	37,500
2010	12,600	2,500	8,500	19,400	1,200	--	44,200
2020	9,500	3,200	10,600	32,500	1,700	--	60,500
2030	6,500	3,800	12,600	45,600	2,200	--	70,700

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

Source: SEWRPC.

Table B-4

FORECAST GENERAL AVIATION ACTIVITY AT BURLINGTON MUNICIPAL AIRPORT BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	56	9	2	--	--	--	67
Forecast							
2005	59	9	2	--	--	1	71
2010	62	10	3	--	--	2	77
2020	69	10	3	--	--	3	85
2030	75	11	4	--	--	4	94
	Number of Annual Operations						
Existing							
2001[a]	46,200	6,300	2,300	--	--	--	54,800
Forecast							
2005	45,900	6,200	2,400	--	--	100	54,600
2010	45,600	6,000	2,500	--	--	300	54,400
2020	44,900	5,600	2,800	--	--	700	54,000
2030	44,200	5,300	3,000	--	--	1,000	53,500

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

Source: SEWRPC.

Table B-5

FORECAST GENERAL AVIATION ACTIVITY AT JOHN H. BATTEN AIRPORT BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	68	8	4	6	2	2	90
Forecast							
2005	69	8	5	7	2	2	93
2010	72	8	6	8	3	3	100
2020	76	8	7	11	3	3	108
2030	80	8	8	13	3	4	116
	Number of Annual Operations						
Existing							
2001[a]	43,900	4,400	3,600	4,800	2,700	600	60,000
Forecast							
2005	44,400	4,300	3,900	6,200	2,800	700	62,300
2010	45,000	4,200	4,300	8,000	2,900	800	65,200
2020	46,100	4,000	5,100	11,600	3,100	900	70,800
2030	47,200	3,800	5,900	15,200	3,300	1,000	76,400

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

Source: SEWRPC.

Table B-6

FORECAST GENERAL AVIATION ACTIVITY AT SYLVANIA AIRPORT BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	26	1	--	--	--	4	31
Forecast							
2005	28	1	--	--	--	4	33
2010	30	2	--	--	--	5	37
2020	35	2	--	--	--	5	42
2030	40	3	--	--	--	6	49
	Number of Annual Operations						
Existing							
2001[a]	38,100	1,300	--	--	--	2,600	42,000
Forecast							
2005	36,100	1,300	--	--	--	2,500	39,900
2010	33,600	1,300	--	--	--	2,300	37,200
2020	28,000	1,400	--	--	--	1,900	31,300
2030	23,600	1,400	--	--	--	1,500	26,500

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

Source: SEWRPC.

Table B-7

FORECAST GENERAL AVIATION ACTIVITY AT EAST TROY MUNICIPAL AIRPORT BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	82	5	--	--	6	--	93
Forecast							
2005	84	5	--	--	6	--	95
2010	86	6	1	1	6	1	101
2020	91	7	1	1	5	1	106
2030	96	8	2	2	5	2	115
	Number of Annual Operations						
Existing							
2001[a]	41,300	2,200	--	--	6,300	--	49,800
Forecast							
2005	43,400	2,400	--	--	6,200	--	52,000
2010	46,000	2,700	500	700	6,100	200	56,200
2020	51,300	3,300	1,000	1,500	5,800	400	63,300
2030	56,600	3,800	1,500	2,300	5,500	500	70,200

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

Source: SEWRPC.

Table B-8

FORECAST GENERAL AVIATION ACTIVITY AT HARTFORD MUNICIPAL AIRPORT BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	60	3	--	--	1	17	81
Forecast							
2005	61	3	--	--	1	17	82
2010	63	4	--	--	1	17	85
2020	67	4	--	--	1	18	90
2030	70	5	--	--	1	18	94
	Number of Annual Operations						
Existing							
2001[a]	12,800	600	--	--	400	1,600	15,400
Forecast							
2005	16,700	800	--	--	500	2,000	20,000
2010	21,600	1,200	--	--	600	2,500	25,900
2020	31,500	1,800	--	--	900	3,500	37,700
2030	41,300	2,400	--	--	1,100	4,500	49,300

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

Source: SEWRPC.

Table B-9

FORECAST GENERAL AVIATION ACTIVITY AT WEST BEND MUNICIPAL AIRPORT BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	81	10	2	1	1	3	98
Forecast							
2005	83	10	3	2	1	3	102
2010	85	11	4	3	1	3	107
2020	90	12	6	5	1	4	118
2030	95	13	7	6	1	4	126
	Number of Annual Operations						
Existing							
2001 [a]	31,100	3,300	1,100	500	800	500	37,300
Forecast [b]							
2005	34,500	3,700	1,700	1,400	800	600	42,700
2010	38,800	4,200	2,400	2,500	900	700	49,500
2020	47,400	5,200	3,800	4,800	1,000	900	63,100
2030	56,000	6,200	5,200	7,000	1,100	1,000	76,500

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

[b] *Total forecast operations do not include military activity, forecast to remain at an annual level of about 14,000 operations in all forecast years.*

Source: SEWRPC.

Table B-10

FORECAST GENERAL AVIATION ACTIVITY AT CAPITOL AIRPORT BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	78	2	--	--	--	--	80
Forecast							
2005	94	2	--	--	1	1	98
2010	95	3	--	--	1	2	101
2020	99	3	--	--	2	3	107
2030	104	4	--	--	2	3	113
	Number of Annual Operations						
Existing							
2001[a]	38,200	800	--	--	--	--	39,000
Forecast							
2005	41,400	1,000	--	--	300	100	42,800
2010	45,400	1,100	--	--	700	200	47,400
2020	53,400	1,500	--	--	1,400	500	56,800
2030	61,400	1,900	--	--	2,200	800	66,300

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

Source: SEWRPC.

Table B-11

FORECAST GENERAL AVIATION ACTIVITY AT WAUKESHA COUNTY - CRITES FIELD BY AIRCRAFT TYPE: 2005, 2010, 2020, AND 2030

Year	Type of Aircraft						Total
	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopters	Other	
	Number of Based Aircraft						
Existing							
2001	166	30	5	12	--	3	216
Forecast							
2005	170	30	7	15	1	3	226
2010	175	30	9	18	2	3	237
2020	185	31	14	25	2	3	260
2030	195	31	19	31	2	3	281
	Number of Annual Operations						
Existing							
2001[a]	79,500	12,300	3,300	7,100	--	600	102,800
Forecast							
2005	84,400	12,700	4,800	11,100	300	600	113,900
2010	90,500	13,100	6,700	16,100	700	700	127,900
2020	102,700	14,000	10,400	26,200	1,400	700	155,400
2030	115,000	14,900	14,100	36,300	2,200	800	183,300

[a] *Operations by aircraft type are estimated based on actual total annual airport operations.*

Source: SEWRPC.