CHAPTER 3
AVIATION DEMAND FORECASTS

The demand for aviation facilities is typically expressed in terms of based aircraft and operations. This chapter presents the baseline data and the forecasted aviation demand that is reasonably expected to occur at Mansfield Municipal Airport over the next twenty years. The forecasts facilitate proper planning of facilities at the airport by assessing the existing capacity of facilities as compared to the forecasted future demand. When facilities at the airport cannot accommodate the anticipated demand, facility improvements will be recommended in accordance with FAA guidelines based on the future design aircraft and corresponding airport design standards.

It is important to understand that forecasts are only as good as existing information since aviation activity is dependent upon socioeconomic conditions and trends in the aviation industry. For the purposes of this Airport Plan Update, the forecasts of future activity are based on historical data and forecasted growth rates and trends from other sources (i.e., FAA and MAC forecasts) and from previously approved airport planning documents prepared for Mansfield Municipal.

3.1 CURRENT AVIATION ACTIVITY

At many general aviation airports, no actual recordings of historical aircraft activity beyond those reported to the FAA on FAA Form 5010 "Airport Master Record." At these airports, estimates of annual operations and based aircraft are through general observations made by airport personnel and not through actual activity counts. The reason many general aviation airports do not have detailed historical records for aircraft activity is simply because no mechanism (i.e., a control tower) exists for the recording of aircraft activity.

3.1.1 Based Aircraft

Based aircraft are considered as aircraft permanently stored at the airport during any given year. In ~~1999~~2002, there were ~~109~~ 130 aircraft based at Mansfield Municipal Airport consisting of approximately ~~106~~ 126 single-engine piston aircraft (97-percent) and approximately ~~3~~4 twin-engine piston aircraft (3-percent). Representative single-engine piston aircraft based at the airport include the Cessna 172, Piper 140, Grumman Tigers and Yaks. Representative twin-engine aircraft based at Mansfield Municipal Airport include the Piper Aztec and the Piper Twin Comanche.

3.1.2 Aircraft Fleet Mix & Design Aircraft

An airport's *fleet mix* refers to the mix of aircraft operating at an airport and typically includes based aircraft and visiting aircraft that routinely use the airport. The aircraft fleet mix using an airport is typically defined by the type of aircraft, number of engines, type of engines, aircraft weight, aircraft wing span, and approach speed. Each of these categories will determine the design standards used for specific airport facilities.

For Mansfield Municipal Airport, the aircraft fleet mix includes single-engine aircraft (SE), twin-engine aircraft (TE) and lighter-than-air (LTA) aircraft. Based on estimates of annual operations in ~~1999~~2002, an aircraft fleet mix was calculated for Mansfield Municipal Airport. A majority of aircraft operating at Mansfield Municipal Airport can be characterized as fixed wing, single-engine piston aircraft weighing less than 12,500 pounds with wing-spans less than 49-feet and approach speeds less than 121 knots. These aircraft account for approximately ~~99.5~~96.8-percent of all the aircraft operating at Mansfield Municipal Airport. The larger B-II aircraft (such as the Beechcraft Super King Air) have wingspans of 49-feet or more and less than 79-feet, with the same approach speeds as B-I aircraft and account for 0.4% of operations. The remaining 2.8% includes helicopters and LTA aircraft. and ~~with the remaining 0.5-percent of aircraft as larger aircraft with wider wingspans or faster approach speeds (i.e., the Beechcraft Super King Air a B-II aircraft).~~ The most demanding aircraft that routinely uses the airport today is the Beechcraft Baron, which has a wing-span of approximately 38-feet and an approach speed of approximately 100 knots (design group B-I) (see Figure 3-1).

3.1.3 Total Annual Operations

An aircraft operation is defined as either an aircraft landing, taking off, making a low pass over the airport, or simulating an instrument approach. Historical operations at general aviation airports are difficult to measure simply because many general aviation airports do not have physical means to count or record every landing and departure. For the purposes of this Airport Plan Update, the baseline for aircraft operations was derived from estimates by airport personnel. The airport personnel based their estimates on observations of key indicators such as fuel sales, tie-down fees, aircraft rentals, and flight instruction. In ~~1999~~2002, approximately ~~61,000~~ 71,000 laircraft operations occurred at Mansfield Municipal Airport (see Table 3.1).

Mansfield Municipal Airport also has operations by air taxi, military, lighter-than-air, and banner towing. Air taxi operations are commercial aircraft that are available for hire. Military operations at Mansfield Municipal Airport are typically flight training operations by military helicopters and Lighter-Than-Air operations include operations by both blimps and hot air balloons. Over the past few years, several commercial blimp operators have stationed their aircraft at Mansfield Municipal Airport. Banner towing operations are a special category of operations because the number of operations per aircraft is greater than regular general aviation aircraft. When a regular general aviation aircraft departs and arrives, it is counted as two operations. However, when a banner towing aircraft departs and arrives, it is counted as six operations assuming that the banner pick-up and drop-off zones are located on-airport property. The first operation is the banner towing aircraft taking-off from Mansfield Municipal Airport, the second operation is when the banner towing aircraft is on approach to pick up the banner, the third operation is the banner towing aircraft leaving the local traffic area, the fourth operation is the banner towing aircraft approaching the drop-off zone, the fifth operation is the banner towing aircraft leaving the drop-off zone and re-entering the local traffic pattern, and the sixth and final operation is the banner-towing aircraft landing at the airport (see Figure 3.2).

Airport personnel estimate that other operations accounted for approximately ~~10.7~~9.3-percent of

total annual operations. In ~~1999~~2002, approximately 6,600 other operations are estimated to occur ~~occurred~~ at the airport. In ~~1999~~2002, Air Taxi operations are expected to account for ~~accounted for~~ approximately ~~673~~ 1,670 operations (~~10.2~~25.3 percent), military operations accounted for approximately ~~108~~ 100 operations (1.6 percent), lighter-than-air operations accounted for approximately ~~323~~320 operations (~~4.9~~4.8 percent), and banner towing operations

FIGURE 3.1 BE-58 Figure

1 July 2002 Airport Manager estimate.

FIGURE 3.2

accounted for approximately ~~5,489~~ 4,510 operations (~~83.3~~68.0 percent) (see Table 3-1).

3.1.4 Local Operations

Local operations are typically defined as takeoffs and landings by an aircraft that have remained in the general vicinity of a particular airport without an intermediate stop at another airport. Many training and recreational flights are counted as local operations. Airport personnel estimated that approximately ~~74~~70 percent of all airport operations ~~were~~ are local operations. In ~~1999~~2002, Airport personnel estimate that approximately ~~46,500~~ 49,700 annual local operations ~~occurred~~ occur at the airport (see Table 3-1).

3.1.5 Itinerant Operations

Itinerant operations are operations that originate at a different airport or operations that occur outside the local traffic pattern (typically 20 miles) of the airport. Operations by visiting aircraft, some flight training operations and recreational flights to other airports are counted as itinerant operations. In 2002, Airport personnel ~~estimated~~ estimate that approximately ~~24~~30 percent of all airport operations ~~were~~ are itinerant operations. In ~~1999~~2002, approximately ~~14,700~~ 21,300 itinerant operations ~~occurred~~ occur at the airport (see Table 3-1).

3.1.6 Peaking Characteristics

Peaking characteristics are usually defined as peak month, average day peak month and peak hour activity. Many elements of general aviation airports (i.e., runways, taxiways, and apron systems) are designed to accommodate the peak month.

Using the capacity based assumptions in FAA Advisory Circular 150/5060-5 "Airport Capacity", the peaking characteristics at Mansfield Municipal Airport can be derived. Typically, the peak month of aviation activity in the Northeast is during the temperate summer months. This is true at Mansfield Municipal Airport with the month of July representing approximately 12.9 percent of annual operations (~~7,900~~ 9,160 total operations in July ~~1999~~2002).

Because Mansfield Municipal Airport has such a large number of aircraft below 12,500 pounds, the aircraft fleet mix for airport capacity purposes is near 100. Using the capacity based assumptions in AC 150/5060-5, the average day of the peak month is commonly found by dividing the number of annual operations by a factor of 310. Using this methodology, the average day of the peak month in ~~1999~~ 2002 had ~~197~~229 operations. Continuing the capacity based assumptions, the peak hour of the average day can be found by dividing the average day operations by a factor of 11. Using this methodology, the peak hour during the peak month in ~~1999~~ 2002 ~~had~~ would be ~~18~~21 operations (see Table 3-1).

TABLE 3-1

BASE-LINE AIRPORT OPERATIONS DATA – ~~1999~~2002

	Base Line Data
Total Operations	~~61,149~~71,000
General Aviation Operations	~~54,557~~64,400
Air Taxi Operations	~~673~~1,670
Military Operations	~~108~~100
Lighter-Than-Air (LTA) Operations	~~323~~320
Banner Towing Operations	~~5,489~~4,510
Total Based Aircraft	~~109~~130
Operations Per Based Aircraft	~~561~~546
Local Operations	~~46,473~~49,000
Itinerant Operations	~~14,676~~21,300
Peak Month Operations (July)	~~7,888~~9,160
Average Day/Peak Month Operations	~~197~~229
Peak Hour/Average Day/Peak Month Operations	~~18~~21

Campbell and Paris Engineers, P.C. 2001 2002 data by HNTB Corporation

3.1.7 Runway Utilization

Runway utilization refers to the amount of time each runway is used at the airport and is generally determined by meteorological conditions (i.e., wind direction). Without recorded operations from a control tower available, airport personnel provided an estimate of runway use. It was estimated that Runway 14-32 is used approximately 75-percent of the time and Runway 4-22 is used approximately 25-percent of the time.

The recent estimate of runway utilization is different from the previous master plan completed in ~~1981 which~~1981 that established a 90-percent utilization rate for Runway 14-32 and a 10-percent utilization rate for Runway 4-22. The previous master plan forecasted the runway utilization would change to approximately 80-percent utilization for Runway 14-32 and 20-percent utilization for Runway 4-22. The reason for the larger than forecasted change in the runway utilization from 1980 to 1999 is because the crosswind runway has had an increase in operations due to an increase in blimp and banner towing operations and the fact that the runway has been kept operational throughout most of the year.

3.2 FORECAST OF FUTURE GROWTH RATES

Low-, moderate- and high-growth scenarios were developed for use in subsequent sections of the Airport Plan Update. The three different growth scenarios were developed from forecast data from other airports and data from federal forecasts.

Airports similar in size to Mansfield Municipal Airport have grown at an annual rate between .5-percent and 3.5-percent over the past several decades. Based on the estimates of annual

operations and based aircraft at Mansfield Municipal Airport over the past thirty years, it appears that Mansfield has experienced growth above the national average. Annual operations are estimated to have grown at an average of 4.3-percent per year ~~since 1967~~in the 1967-1997 period, while the number of based aircraft has grown at an average of approximately 2.9-percent per year during the same period (see Table 3-2). The rates of growth are significantly higher for the 1967-2002 period (9.6% for annual operations and 5.8% for number of based aircraft). Because the number of based aircraft is easier to determine than the number of operations at a non-towered general aviation airport and a ratio of operations per based aircraft can be used to forecast operations; the historical rate of growth in based aircraft will represent the historical rate of growth at the airport. The rapid and recent increase in Annual Average Rate of Growth from 1997 to 2002 represents a "spike" and cannot be expected to continue throughout the planning period. Therefore the 1967-1997 growth rates will be discussed further in this chapter.

TABLE 3-2

HISTORICAL GROWTH DATA

	1967	1997	2002
AIRCRAFT OPERATIONS			
Reported Operations	16,300	57,850	71,000
Annual Average Rate of Growth		**4.3%**	9.6%
BASED AIRCRAFT			
Reported Aircraft	43	102	130
Annual Average Rate of Growth		**2.9%**	5.8%

Source: Campbell and Paris Engineers, P.C., 2001. 2002 data by HNTB Corporation.

3.2.1 Low-Growth Scenario

The low-growth scenario assumed that future growth at Mansfield will occur at a slower rate than the historical annual (1967-1997) growth rate of 2.9-percent. Possible changes in economic conditions, the general aviation industry, or capacity issues at the airport could constrain future airport growth.

Even if growth rates are to slow, there is every indication that the airport will continue to grow in the future because of recent improvements to airport facilities and continued service improvements. A prime indication can be found in the regional and national forecasts of general aviation activity prepared by the FAA in their "Terminal Area Forecasts (TAF)." The terminal area forecasts for Mansfield Municipal Airport forecasted little growth over the next decade while the nationwide forecasts indicate a moderate growth in aviation activity. The FAA is forecasting the national active fleet of general aviation aircraft to grow at an average rate of approximately 1.0-percent per year through 2009~~. Hours flown by general aviation aircraft are expected to grow at an average rate of approximately 1.4 percent through 2009.~~ For planning purposes, the low-

growth scenario used for this study is 1.4 percent per year, or approximately half the historical rate of growth. applied to Year 2002.

3.2.2 Moderate-Growth Scenario

The historical rate of growth in based aircraft of 2.9 percent over the ~~past thirty years~~ 1967-1997 period is a good indication that Mansfield Municipal Airport will continue to grow and remain a viable airport in the future. This sustained growth indicates that the airport is meeting the expectations, wants and desires of the flying public.

The moderate-growth scenario assumes the airport will continue to grow at an annual rate of 2.9 percent over the next ~~twenty~~ 18 years. This growth rate continues the historical rate of growth over the last thirty years.

3.2.3 High-Growth Scenario

The high-growth scenario assumed the possibility of Mansfield Municipal Airport improving the facilities to accommodate other types of aircraft that could otherwise not operate at Mansfield Municipal Airport. As previously mentioned, the estimated annual operations at Mansfield Municipal Airport grew by approximately 4.3 percent per year during the ~~past thirty years~~ 1967-1997 period. The previous master plan completed for Mansfield Municipal Airport in 1981 concluded that the most likely growth rate of based aircraft would be approximately 3.1 percent. The high-growth scenario assumed that Mansfield Municipal Airport would grow at an annual average of approximately 3.5 percent over the next ~~twenty~~ 18 years. beginning in 2002.

3.3 FORECAST OF FUTURE AVIATION ACTIVITY

3.3.1 Based Aircraft

The long-term forecast of based aircraft for Mansfield Municipal Airport are based on the low-, moderate-, and high-growth rates established above. The three long-range forecasts for Mansfield Municipal Airport estimate that the number of based aircraft will increase to approximately between ~~146~~ 165 and ~~224~~ 234 aircraft by the year 2020 depending on what growth scenario is realized. The moderate-growth scenario is the most likely annual rate of growth at Mansfield Municipal Airport since it represents the historical annual growth rate over the ~~past thirty years~~ 1967-1997 period. The moderate-growth scenario forecasts approximately ~~199~~ 211 based aircraft in 2020 (see Table 3-3).

3.3.2 Annual Operations

The forecast for annual aircraft operations is predicated on the forecast of based aircraft at Mansfield Municipal Airport since the airport does not have the capability to record actual aircraft operations. The forecasts of annual operations was calculated using a methodology known as Operations Per Based Aircraft (OPBA). The OPBA is determined by dividing a statically significant sample of operations and dividing the total operations by the recorded number of based aircraft at the airport. The OPBA methodology takes into consideration the total number of operations regardless of type of operation (i.e., local versus itinerant) or type of

aircraft performing the operation (i.e., lighter-than-air versus military).

The OPBA resulted in an estimate of ~~561~~546 operations per based aircraft. The three long-range forecasts for Mansfield Municipal Airport estimate that annual operations will increase to approximately between ~~80,000~~90,000 and ~~126,000~~127,760 operations by the year 2020 depending on what growth scenario is realized. The moderate-growth scenario is the most likely annual rate of growth at Mansfield Municipal Airport since it represents the historical annual growth rate over the ~~past thirty years~~1967-1997 period. The moderate-growth scenario forecasts approximately ~~111,000~~115,200 annual operations in 2020 (see Table 3-4).

Included in the forecasted operations for Mansfield Municipal Airport is the forecasted operations by other aircraft. Throughout the planning horizon, it is assumed that the percentage of total operations accounted for by "other aircraft" will remain constant at approximately 10.8-percent. Under the moderate-growth scenario, total operations by other aircraft is estimated to be approximately ~~8,000~~ 9,490 b~~b~~y 2010 and ~~12,000~~12,440 by 2020 (see Table 3-5). Air Taxi operations are estimated to total ~~1,200~~2,740 operations by 2020 while military operations are estimated to remain constant at 200 ~~total 200 operations~~ by 2020. Lighter-than-air operations are estimated to total 600 operations by 2020 while banner towing operations are estimated to total ~~10,000~~9,000 operations by 2020.

TABLE 3-3

FORECASTED BASED AIRCRAFT BY GROWTH SCENARIO – 2000-2020

YEAR	Low-Growth Scenario (1.4%)	Moderate-Growth Scenario (2.9%)	High-Growth Scenario (3.5%)
~~2000~~	~~111~~	~~112~~	~~113~~
~~2001~~	~~112~~	~~115~~	~~117~~
2002	~~114~~130	~~119~~130	~~121~~130
~~2003~~	~~115~~	~~122~~	~~125~~
~~2004~~	~~117~~	~~126~~	~~129~~
2005	~~118~~135	~~129~~141	~~134~~144
~~2006~~	~~120~~	~~133~~	~~139~~
~~2007~~	~~122~~	~~137~~	~~144~~
~~2008~~	~~124~~	~~141~~	~~149~~
~~2009~~	~~125~~	~~145~~	~~154~~
2010	~~127~~144	~~149~~161	~~159~~169
~~2011~~	~~129~~	~~154~~	~~165~~
~~2012~~	~~131~~	~~158~~	~~170~~
~~2013~~	~~132~~	~~163~~	~~176~~
~~2014~~	~~134~~	~~167~~	~~183~~
2015	136154	172184	189199
~~2016~~	~~138~~	~~177~~	~~196~~
~~2017~~	~~140~~	~~182~~	~~202~~

2018	142	188	210
2019	144	193	217
2020	146165	199211	224234

Source: Campbell and Paris Engineers, P.C. 2001. Revisions by HNTB Corporation

TABLE 3-4

FORECASTED OPERATIONS BY GROWTH SCENARIO – 2000-2020

YEAR	Low-Growth Scenario (1.4%)	Moderate-Growth Scenario (2.9%)	High-Growth Scenario (3.5%)
2000	62,005	62,922	63,289
2001	62,873	64,747	65,504
2002	63,75371,000	66,62571,000	67,79771,000
2003	64,646	68,557	70,170
2004	65,551	70,545	72,626
2005	66,46973,710	72,59176,990	75,16878,620
2006	67,399	74,696	77,799
2007	68,343	76,862	80,522
2008	69,300	79,091	83,340
2009	70,270	81,385	86,257
2010	71,25478,600	83,74587,900	89,27692,300
2011	72,251	86,174	92,400
2012	73,263	88,673	95,634
2013	74,288	91,244	98,982
2014	75,328	93,890	102,446
2015	76,38384,080	96,613100,460	106,032108,650
2016	77,452	99,415	109,743
2017	78,537	102,298	113,584
2018	79,636	105,364	117,559
2019	80,751	108,317	121,674
2020	81,88290,090	111,458115,200	125,932127,760

Source: Campbell and Paris Engineers, P.C. 2001. Revisions by HNTB Corporation

TABLE 3-5

FORECASTED TOTAL ANNUAL OPERATIONS BY AIRCRAFT TYPE

Year	Moderate-Growth Ops.	Total Ops. by "Other Aircraft"	Total GA Ops.	Ops. by Single-Engine	Ops. by Multi-Engine	Ops. by Twin-Turbine
2000	62,922	6,783	56,139	54,736	1,123	281
2001	64,747	6,980	57,767	56,323	1,155	289
2002	66,62571,000	7,1826,600	59,44364,400	57,957	1,189	297
2003	68,557	7,390	61,167	59,638	1,223	306
2004	70,545	7,605	62,940	61,367	1,259	315
2005	72,59176,990	7,8258,320	64,76668,670	63,147	1,295	324
2006	74,696	8,052	66,644	64,645	1,499	500
2007	76,862	8,286	68,576	66,519	1,543	514
2008	79,091	8,526	70,565	68,448	1,588	529
2009	81,385	8,773	72,612	70,434	1,634	545
2010	83,74587,900	9,0289,490	74,71778,410	72,475	1,681	560
2011	86,174	9,290	76,884	74,193	1,922	769
2012	88,673	9,559	79,114	76,345	1,978	791
2013	91,244	9,836	81,408	78,559	2,035	814
2014	93,890	10,121	83,769	80,837	2,094	838
2015	96,613100,460	10,41510,850	86,19889,610	83,181	2,155	862
2016	99,415	10,717	88,698	85,594	2,217	887
2017	102,298	11,028	91,270	88,076	2,282	913
2018	105,364	11,348	94,016	90,725	2,350	940
2019	108,317	11,677	96,640	93,258	2,416	966
2020	111,458115,200	12,01512,440	99,443102,760	95,962	2,486	994

Source: Campbell and Paris Engineers, P.C., 2001

3.3.3 Local Operations

The local versus itinerant operations are forecasted assuming local operations will account for 76-percent of total annual operations and itinerant operations will account for 2430-percent of total annual operations. The three long-range forecasts for Mansfield Municipal Airport estimate that local operations will increase to approximately between 62,000-63,100 and 95,000-89,430 operations by the year 2020 depending on what growth scenario is realized. The moderate-growth scenario is the most likely annual rate of growth at Mansfield Municipal Airport since it represents the historical annual growth rate over the past thirty years1967-1997 period. The moderate-growth scenario forecasts approximately 85,000-80,640 annual local operations in 2020

(see Table 3-6).

TABLE 3-6

YEAR 2020 FORECASTED OPERATIONS AND PEAK PERIOD ACTIVITY

Forecasted Data	Low-Growth Scenario (1.4%)	Moderate-Growth Scenario (2.9%)	High-Growth Scenario (3.5%)
Annual Operations	~~81,882~~90,090	~~111,458~~115,200	~~125,932~~127,760
Local Operations	~~62,230~~63,100	~~84,708~~80,640	~~95,708~~89,430
Itinerant Operations	~~19,652~~26,990	~~26,750~~34,560	~~30,224~~38,330
Peak Month Operations	~~10,563~~11,620	~~14,378~~14,860	~~16,245~~16,480
Average Day/Peak Month Operations	264	359	406
Peak Hour/Average Day/Peak Month Ops	24	33	37

Source: Campbell and Paris Engineers, P.C., 2001

3.3.4 Itinerant Operations

The local versus itinerant operations are forecasted assuming local operations will account for 70~~76~~-percent of total annual operations and itinerant operations will account for ~~24~~30-percent of total annual operations. The three long-range forecasts for Mansfield Municipal Airport estimate that itinerant operations will increase to approximately between ~~19,700~~ 26,990 and ~~30,200~~ 38,330 operations by the year 2020 depending on what growth scenario is realized. The moderate-growth scenario is the most likely annual rate of growth at Mansfield Municipal Airport since it represents the historical annual growth rate over the past thirty years. The moderate-growth scenario forecasts approximately ~~111,000~~ 115,200 annual operations in 2020 comprised of ~~85,000~~ 80,640 annual local operations and ~~26,000~~34,560 annual itinerant operations (see Table 3-6).

3.3.5 Peaking Characteristics

Using the capacity based assumptions in FAA Advisory Circular 150/5060-5 "Airport Capacity", the peaking characteristics at Mansfield Municipal Airport can be derived. Peaking characteristics are usually defined as peak month, average day peak month and peak hour activity.

Peak Month:

The peak month of activity at Mansfield Municipal has historically been July. Total historical activity in July has represented 12.9-percent of total historical annual operations. The three long-range forecasts for Mansfield Municipal Airport estimate that operations during the month of July will increase to approximately between ~~10,500~~ 11,620 and ~~16,200~~ 16,480operations by the year 2020 depending on what growth scenario is realized. With the moderate-growth scenario

representing the historical annual growth rate over the ~~past thirty years~~ 1967-1997 period at Mansfield Municipal Airport, the moderate-growth scenario is the most plausible. The peak month operations anticipated in the moderate-growth scenario forecasts presented in Table 3-6 total ~~14,000~~ 14,860 by the end of the planning horizon.

Average Day Peak Month:

Guidance provided by the FAA suggests that the average day of the peak month can be found by dividing total annual operations by 310. Using this methodology, the three long-range forecasts for Mansfield Municipal Airport estimate that operations during the average day of the peak month will increase to approximately between ~~260~~ 291 and ~~410~~ 412 operations by the year 2020 depending on what growth scenario is realized. The moderate-growth scenario is the most likely annual rate of growth at Mansfield Municipal Airport since it represents the historical annual growth rate over the ~~past thirty years~~ 1967-1997 period. The moderate-growth scenario forecasts approximately ~~360~~ 372 operations during the average day of the peak month in 2020 (see Table 3-6).

Peak Hour:

The peak hour during the average day can be found by dividing average day operations by a factor of 11. This methodology results in the peak hour operations during the average day ranging from ~~20~~ 27 to ~~40~~ 37 operations depending on what growth scenario is realized. As the moderate growth scenario represents the most plausible growth scenario for the airport, the anticipated peak hour operations will be ~~33~~ 34 operations by the end of the planning horizon.

3.4 FORECAST OF FUTURE FLEET MIX

It is important to understand the types and sizes of aircraft currently using and those reasonably expected to use the airport in the future in order to properly plan the airport's facilities. This is of particular importance when planning the airport's runway, taxiway, and apron areas. Aircraft fleet mix is described in terms of Aircraft Approach Categories A through E and Airplane Design Groups 1 through 6 (see Table 1-1).

Use of the airport by additional rotorcraft and lighter-than-air aircraft will not affect the design aircraft or airport design standards. However, if the mix of fixed-wing aircraft changes, and more twin-engine turbine aircraft begin using the airport, the airport design standards may change. Therefore, it is prudent to assess the likelihood of additional twin-engine turbine aircraft using the airport in the near future, and how this might affect airport design standards.

Most twin-engine turbine aircraft are used for commercial or corporate purposes (corporate use includes aircraft owned by individuals and used for business purposes). The most influential factors governing the use of these aircraft are the general economic conditions and industrial/commercial developments in the vicinity of an airport. If the economic conditions are good, and the airport is favorably located near industrial and commercial developments, then the airport's facilities become key, meaning, the airport must have the capacity to accommodate these

types of aircraft if the demand is present.

Currently, the use of twin-engine turbine aircraft at Mansfield Municipal Airport is mainly by visiting aircraft. There are no turbine aircraft based at the airport, and only three twin-engine piston aircraft are based at Mansfield Municipal Airport. With strong economic conditions and the location of several industrial/commercial developments in the vicinity of the airport, the factor limiting the use of the airport by corporate aircraft is likely the facilities at the airport. The length of Runway 14-32, the limited apron and hangar space, and the lack of fuel storage capacity for Jet A fuel needs to be improved if Mansfield Municipal Airport is to attract corporate aircraft in the future.

The key planning issues in the Airport Plan Update is:

- Removal of the displaced thresholds on the primary runway thus increasing the runways usable landing length,
- The development of new hangar and apron areas, and
- The addition of more fuel storage capacity.

If these improvements are completed the likelihood of additional twin-engine corporate activity occurring at the airport during the long-term planning period (2010-2020) should increase.

Additional twin-engine turbine aircraft based at the airport in the future would not change the forecasted growth rates at the airport, however, it may change the design aircraft. Most of the twin-engine corporate aircraft that are likely to use the airport, given the current and potential size of the facilities, are the smaller turbo-prop and jet aircraft. Some of these are Design Group B-I aircraft, and others are Design Group B-II aircraft. It is forecasted that the larger B-II aircraft will use the airport enough times to possibly necessitate a change in airport design standards. This is expected to occur in ~~2007~~ 2012 because of general industry trends and the fact that the airport does not currently have the facilities to accommodate the larger twin turbine aircraft. Projected based aircraft mix is shown in Table 3.7. Projected operational mix is shown in Table 3.8 ~~(see Table 3-7). Projected operational mix based on the moderate growth scenario is shown in Table 3-8.~~

TABLE 3.7 (SEE ATTACHED)

~~TABLE 3-7~~

~~FORECASTED AIRCRAFT MIX~~

	~~ARC~~	~~1999~~	~~2000-2005~~	~~2005-2010~~	~~2010-2020~~
~~Single-Engine Piston (SE)~~	~~B-I~~	~~98.0%~~	~~97.5%~~	~~97.0%~~	~~96.5%~~
~~Twin-Engine Piston (ME)~~	~~B-I~~	~~1.5%~~	~~2.0%~~	~~2.25%~~	~~2.5%~~
~~Twin-Engine Turbine~~	~~B-II~~	~~.5%~~	~~.5%~~	~~.75%~~	~~1.0%~~

Source: Campbell and Paris Engineers, P.C., 2001

TABLE 3.8 (SEE ATTACHED)

TABLE 3-8

FORECASTED OPERATIONAL MIX 1/

	ARC	1999	2000-2005	2005-2010	2010-2020
Single-Engine Piston (SE)	B-I	59,926	71,139	81,233	107,557
Twin-Engine Piston (ME)	B-I	917	1,089	2,094	2,786
Twin-Engine Turbine	B-II	306	363	419	1,115
		61,149	72,591	83,745	114,458

1/ Based on Moderate Growth Scenario
Source: Campbell and Paris Engineers, P.C., 2001