

CHAPTER 1

EXECUTIVE SUMMARY

Mansfield Municipal Airport is located approximately two miles southeast of the Town of Mansfield, Massachusetts. The airport provides the local community with access to the National Aviation System for both business and pleasure purposes. Mansfield Municipal Airport supports corporate and business flight activities, law enforcement, emergency medical services, charter flights, flight schools, and recreational flying.

Mansfield Municipal Airport is publicly owned by the Town of Mansfield and operated privately by King Aviation. Of the approximately 2,500 general aviation aircraft based at airports in Massachusetts, approximately 109 aircraft are based at Mansfield Municipal Airport (4.4-percent). In 1999, the Commonwealth's Airport System handled over 2.5 million operations with an estimated 61,000 of these occurring at Mansfield Municipal Airport (2.4-percent).

A focus of this Airport Plan Update is to develop a conceptual development plan that will allow the airport to accommodate forecasted aviation demand and to position the airport for future growth. This Airport Plan Update will result in an updated Capital Improvement Program (CIP), a revised Airport Layout Plan, and a Long-Term Facilities Plan.

1.1 AIRPORT OVERVIEW

Mansfield Municipal Airport is owned by the Town of Mansfield and governed by the Mansfield Airport Commission under the authority granted to airport commissions by the Commonwealth of Massachusetts General Law Chapter 90, Sections 51E through 51N and consists of five members appointed by the Mansfield Board of Selectmen (see [Appendix A](#)). Mansfield Municipal Airport is classified as a General Aviation airport by the National Plan of Integrated Airport Systems (NPIAS) published by the Federal Aviation Administration (FAA). The airport consists of approximately 230-acres of land and straddles both the Town of Mansfield and the Town of Norton with a majority of the airport within the legal boundary of the Town of Mansfield. In 1977 approximately 20-acres of land were conveyed to the Commonwealth of Massachusetts for the construction of Interstate Highway 495.

The airport has two runways designated as Runway 14-32 and Runway 4-22. The primary runway at Mansfield Municipal Airport is Runway 14-32 which is a paved runway 3,495-feet in length and 75-feet in width. Runway 14-32 has two published non-precision instrument approaches: a Non Directional Beacon (NDB) approach and a Global Positioning System (GPS) approach to Runway 32 (see [Figures 4.1 and 4.2](#)). Runway 14-32 is equipped with medium intensity runway lights (MIRLs), and a Visual Approach Slope Indicator (VASI) light system to Runway 32. Both thresholds to Runway 14-32 are displaced due to trees obstructing the approaches. The Runway 32 threshold is displaced by 170-feet and the threshold to Runway 14 is

displaced by 583-feet. Runway 4-22 is the turf crosswind runway and is 2,316-feet long by 100-feet wide.

The airport has a paved parallel taxiway to Runway 14-32, and a paved terminal area taxiway. The parallel taxiway is 3,500-feet long by 30-feet wide and has four entrance/exit taxiways connecting it to Runway 14-32. The terminal taxiway is 500-feet long by 30-feet wide and has two entrance/exit taxiways connecting it to the terminal apron. Both taxiways have medium intensity edge lights.

The intersecting runways at Mansfield Municipal Airport divide the airport into four quadrants (see Figure 1.1). All the development at the airport to date has been in Quadrant One and is located in the northwestern area of the airport with access from Fruit Street. There are five buildings in Quadrant One: the main terminal building, a storage hangar, a maintenance hangar, and two ten-bay t-hangars. A turf blimp tie-down area, typically used by blimps visiting the area from April to November for promotional activities, is located in the northeastern portion of the airport in Quadrant Four. From These blimps typically stay between a few days to several weeks.

As of 1999, three aprons totaling approximately 33,720 square yards are provided for the parking of aircraft. The main apron is approximately 24,500 square yards in size, the east apron approximately 2,500 square yards in size, and the hangar apron is approximately 6,720 square yards in size.

1.2 FORCAST OF AVIATION DEMAND

The aviation demand forecasts utilized historical data for the years 1959 through 1997. The forecast methodology developed three growth scenarios based on local, regional, and national trends: a low-growth scenario, a moderate-growth scenario and a high-growth scenario. To calculate a twenty-year forecast of aviation demand, the three different growth scenarios were then applied to the number of based aircraft reported in 1999. The forecast of based aircraft was then used to forecast future operations and aircraft fleet mix based on the number of operations per based aircraft (OPBA) methodology.

The three growth rates established for this forecasting effort assume an average annual growth of between 1.4-percent and 3.5-percent. The most probable estimate, based on historical growth at Mansfield and forecasts for other airports in the immediate vicinity, is the moderate growth scenario of 2.9-percent per year rate of growth.

The moderate growth scenario forecasted approximately 129 based aircraft at the airport by the end of the short-term planning horizon (2000-2005) and approximately 199 based aircraft by the end of the long-term planning horizon (2006-2020). Likewise, annual operations are forecasted to grow from approximately 61,000 annual operations in 1999 and to approximately 111,500 annual operations by 2020.

FIGURE 1.1 QUADRANTS

The forecasting effort also includes a forecast of future aircraft fleet mix. An airport’s fleet mix is important since it identifies the airport’s “critical aircraft.” The critical aircraft is defined as the largest aircraft to use the airport on a regular basis which is considered by the Federal Aviation Administration (FAA) to be more than 500 operations a year. An operation is one takeoff or one landing. The size of the aircraft is determined by using FAA guidelines found in FAA Advisory Circular 150/5300-13 *Airport Design*. The FAA classifies airports by using an Airport Reference Code (ARC) which is a alpha-numeric code assigned to all public airports in the United States (see Table I-1). The letter portion of the ARC is based on the approach speed of the largest aircraft to regularly use the airport and the numeric portion of the ARC is based on the wingspan of the largest aircraft to regularly use the airport. The ARC of an airport determines the design standards for certain airside facilities at the airport.

TABLE I-1
AIRPORT REFERENCE CODES (ARC)

<u>Aircraft Approach Category</u>	
A	Speed less than 91 knots
B	Speed 91 knots or greater but less than 121 knots
C	Speed 121 knots or greater but less than 141 knots
D	Speed 141 knots or greater but less than 166 knots
E	Speed 161 knots or greater
<u>Airplane Design Group</u>	
I	Wingspan less than 49 feet
II	Wingspan 49 feet or greater but less than 79 feet
III	Wingspan 79 feet or greater but less than 118 feet
IV	Wingspan 118 feet or greater but less than 171 feet
V	Wingspan 171 feet or greater but less than 214 feet
VI	Wingspan 214 feet or greater but less than 262 feet

Source: FAA 150/5300-13

The current aircraft fleet mix includes approximately 98-percent design group A-I aircraft, 1.5-percent Design Group B-I aircraft, and 0.5-percent design group B-II aircraft. As of 1999, the design aircraft is the twin-engine Beechcraft Baron (BE58) that is classified as a group B-I aircraft. The forecast of future aviation demand indicates that in approximately 2007, the design aircraft will change from group B-I to group B-II that may necessitate a change in the layout of proposed facilities to group B-II design standards. Existing facilities will need to be upgraded to group B-II design standards if and when the forecasted annual operations by group B-II aircraft exceed 500 resulting in a subsequent change in the ARC to group B-II. The feasibility of such an upgrade is discussed in later sections of this report.

The twenty-year forecast for aircraft fleet mix concluded that the mix of aircraft would change slightly over this period to approximately 96-percent design group A-I aircraft, 2.5-percent design group B-I aircraft, and 1.5-percent design group B-II aircraft. Because the forecasts indicate a growth in the larger aircraft over the twenty-year period, improvements needed to accommodate design group B-II aircraft were identified in this report.

1.3 FACILITY ANALYSIS

An analysis of the airport's existing facilities was performed in order to identify a series of recommended improvements needed to meet current design standards and to accommodate forecasted aviation demand. It was found that several facilities do not meet current design standards and others need to be expanded to meet the current and future demand for aviation services.

The facilities not meeting current design standards include the runway safety areas off of each end of Runway 14-32, trees and vegetation within the object free area of Runway 14-32, the separation between the terminal taxiway and Runway 4-22, and the layout of the main parking apron. Specific recommendations needed to correct these deficiencies are identified.

A need-gap analysis concluded that the airport has a current shortage of aircraft apron and hangar space that will worsen as operations and based aircraft at the airport grows. Specific recommendations to correct the current and forecasted shortage are identified and are presented in Chapter Four *Facilities Analysis*.

Also included in the facility analysis was the likelihood of an increased usage of the airport by larger corporate aircraft and what facilities would need to be improved to accommodate these aircraft. Although the timing of these improvements is uncertain, it is likely that they will be needed during the ten to twenty year forecast period. Although these improvements are not recommended to be completed immediately, it is recommended that the airport reserve the appropriate areas so that when the demand for these facilities is sufficient, the airport has the ability to provide necessary facilities for these aircraft.

The recommended short-term improvements are:

1. Vegetative Management Plan Tree Clearing
2. Environmental Assessment
3. Purchase Tractor/Mower
4. Yearly Operational Plans
5. Establishment of adequate Group I safety areas off of each end of Runway 14-32;
6. New Access to Quadrant Four
7. Relocation of blimp tie-down
8. Construction of new apron, hangar and taxiway in Quadrant Four
9. Relocation and grading of Runway 4-22;

10. Avigation Easement Appraisals
11. Purchasing Off-Airport RPZ land
12. Reconstruction of western portion of the parallel taxiway
13. Reconstruction of t-hangar taxiways in Quadrant One
14. Airport Plan Update

Long-term planning means reserving areas for facilities 1) required to accommodate demand, or 2) whose funding is not expected within the time period of the Airport Plan Update. The following are examples of long-term projects that may or may not be constructed as dictated by economic conditions:

1. Expansion of the East Terminal Ramp;
2. Construction of access road and new apron, hangar and FBO facility in Quadrants Two and Three;
3. Construction of a new parallel taxiway on the south side of Runway 14-32;

Some of these development items will require the preparation of a federal-level Environmental Assessment (EA). These actions are specified in FAA Order 5050.4A "*Environmental Handbook*."

In addition to federal environmental requirements, the airport is required to satisfy the environmental requirements of the Commonwealth of Massachusetts. The Massachusetts Environmental Policy Act (MEPA) includes thresholds outlined in section 301 CMR 11.00 that require the filing of an Environmental Notification Form (ENF), that may or may not result in the need for further environmental review and possibly the preparation of an Environmental Impact Report (EIR). The proposed improvements to Mansfield Municipal Airport will trigger several thresholds requiring the need to file an ENF. The thresholds that will be triggered are (1) the construction of five or more acres of impervious surface; (2) the alteration of 500 or more linear feet of inland bank; (3) the construction of a new road .25 or more miles in length; and (4) the construction of a new taxiway.

1.4 AIRPORT LAYOUT PLANS

A set of Airport Layout Plans was prepared and a reduced set is included in this report in Chapter 5. The plans include an existing facilities drawing of Mansfield Municipal Airport, an airport layout plan drawing, a plan and profile view of the approaches to Runways 14-32 and 4-22, a terminal area plan drawing, and a Federal Aviation Regulation (FAR) Part 77 Imaginary Surfaces plan.

1.5 IMPLEMENTATION PLAN

The Implementation Plan included in this report is intended to provide the Mansfield Airport Commission with guidance on implementing the recommendations of this report. Significant coordination on the local level, close coordination with the Massachusetts Aeronautics

Commission, local, state and federal level environmental reviews, and approvals from the Federal Aviation Administration will be required.

An important product of this report is the Capital Improvement Program (CIP), which represents the beginning of a continuous programming effort between the Airport Commission, the MAC, and the FAA. The programming efforts of the MAC and FAA are key to an airport receiving state and federal funding assistance for capital improvements. Improvement priorities were established in order to help prioritize the recommended improvements:

1. **Compliance Improvements** are improvements designed to bring the airport facilities into compliance with current FAA Design Standards.
2. **Capacity Improvements** are improvements designed to increase the apron and hangar capacity to meet the current and forecasted shortage.
3. **Revenue Improvements** are improvements designed to increase the revenues received by the airport to sustain itself.
4. **Long-term Improvements** are blocks of airport owned land designated as future airport development.

The top priority of the airport is to fully comply with all current FAA Design Standards and to address the current shortage of apron space. An environmental review process will have to be completed before the runway safety areas can be constructed, Runway 4-22 can be relocated, and adequate apron space provided. The environmental review process will likely take twelve- to eighteen-months to complete which would result in a minimum of a year delay for some projects.

Considering this delay due to the environmental review process, the order in which projects are scheduled vary from their order of priority. Some projects were grouped together into the same fiscal year in order to take advantage of similar construction methods. The final Capital Improvement Program is as follows:

<u>Fiscal Year</u>	<u>Priority</u>	<u>Recommended Action</u>
<u>Phase I</u>		
2000	A	Yearly Operational Plan 1 of 5
2000		Vegetative Management Plan Tree Clearing
2001	B	Yearly Operational Plan 2 of 5
2001	1	Environmental Assessment.
2001	2	Purchase tractor/mower
2002	C	Yearly Operational Plan 3 of 5
2002	3	Establishment of 120-foot by 240-foot Runway Safety Areas for Runway 14-32
2002	4	New Access to Quadrant Four

2002	5	Relocation of blimp tie-down
2002	6	Construction of new apron, hangar and taxiway in Quadrant Four
2003	D	Yearly Operational Plan 4 of 5
2003	7	Relocation and grading of Runway 4-22
2003	8	Avigation easement appraisals
2003	9	Purchasing off-airport RPZ land
2004	E	Yearly Operational Plan 5 of 5
2005	10	Reconstruction of western portion of parallel taxiway to Runway 14-32
2005	11	Reconstruction of T-Hangar taxilanes in Quadrant One
2005	12	Airport Plan Update
 <u>Phase 2</u>		
2006	13	Expansion of East Ramp
2007	14	Purchase of Snow Removal Equipment (SRE)
2010	15	Update Airport Master Plan