1.0 EXISTING AIRPORT FACILITIES & SETTING

This chapter contains an inventory of existing facilities at the Waterbury-Oxford Airport (OXC). An inventory of airport pavements, buildings, and other structures is presented, as well as a brief summary of the airport location and history, Air Traffic Control (ATC), activity levels, and the environmental overview. The following items are discussed:

- Airport Location, Role, and History
- Airport Facilities
- Airspace, Procedures, and Air Traffic Control
- Airport Activity
- Environmental Overview

1.1 Airport Location, Role, & History

The Waterbury-Oxford Airport is located approximately seven miles southwest of Waterbury and one mile south of Interstate 84 in Oxford, Connecticut (see Figure 1-1). However, a small northern portion of the Airport is located within the Town of Middlebury.

New Haven County, which is home to OXC, consists of 27 towns in south-central Connecticut – the Central Naugatuck Valley. According to the 2000 U.S. Census, 824,000 people inhabit the county year-round. Major industries include manufacturing, retail, trade, and services.

The Airport does not offer scheduled air service. Visitors who fly on airlines into the area arrive primarily at Bradley International Airport and the three New York metro airports, LaGuardia, JFK, and Newark. Several smaller commercial airports are also located within an hour drive of OXC, including Bridgeport, New Haven, and Stewart International Airport in Newburgh, NY. As such, airline service is not needed or anticipated at OXC. However, OXC serves many charter, corporate, and personal aircraft users residing in and visiting New Haven, Fairfield, and Litchfield Counties year-round. The Airport is therefore classified as a "General Aviation" (GA) facility.

A GA Airport serves communities that do not receive scheduled commercial service. Like Waterbury-Oxford Airport, GA airports may be included in the National Plan of Integrated Airport Systems (NPIAS) if they account for sufficient activity (usually at least 10 locally owned aircraft) and are at least 20 miles from the nearest NPIAS airport. The 2,558 general aviation airports in the NPIAS tend to be distributed on a one-per-county basis. These airports, with an average of 32 based aircraft, account for 38 percent of the Nation's general aviation fleet. These airports are the most convenient source of air transportation for about 19 percent of the population.

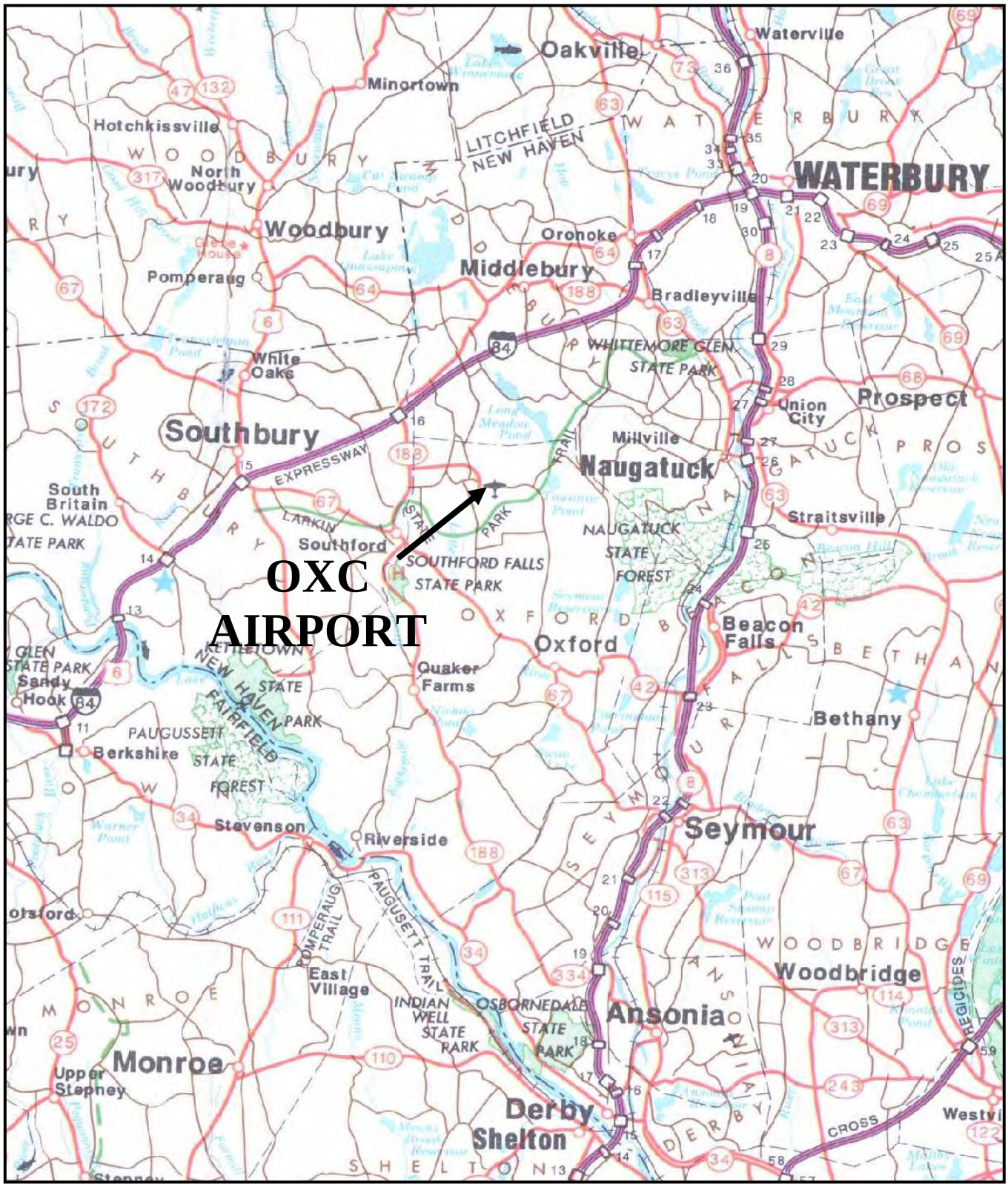

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Figure 1-1
General Location Map

Scale 1" = 2.5 Miles	CHA File No: 12489	Waterbury-Oxford Airport Master Plan Update

Recognizing a need for an airport in the Naugatuck Valley Region, the Federal Aviation Administration (FAA) allocated approximately $1.2 million for the construction of a public-use airport. Construction of the Airport began in May 1968. The Airport was opened for use on December 15, 1969. Initially, the Airport featured a 5,000-foot runway. A shorter 1,999-foot crosswind runway (13-31) was built several years later in the early-1970s.

In the early 1990s, Runway 13-31 was abandoned for further airport development. Over the Airport's 35 year history, many improvements have been implemented, including the construction of new taxiways, various new hangars and aprons, an Air Traffic Control Tower (ATCT), Runway Safety Areas (RSAs), and 500-foot and 300-foot runway extensions. A detailed history of OXC is provided in the 1995 Airport Master Plan.

1.2 Airport Facilities

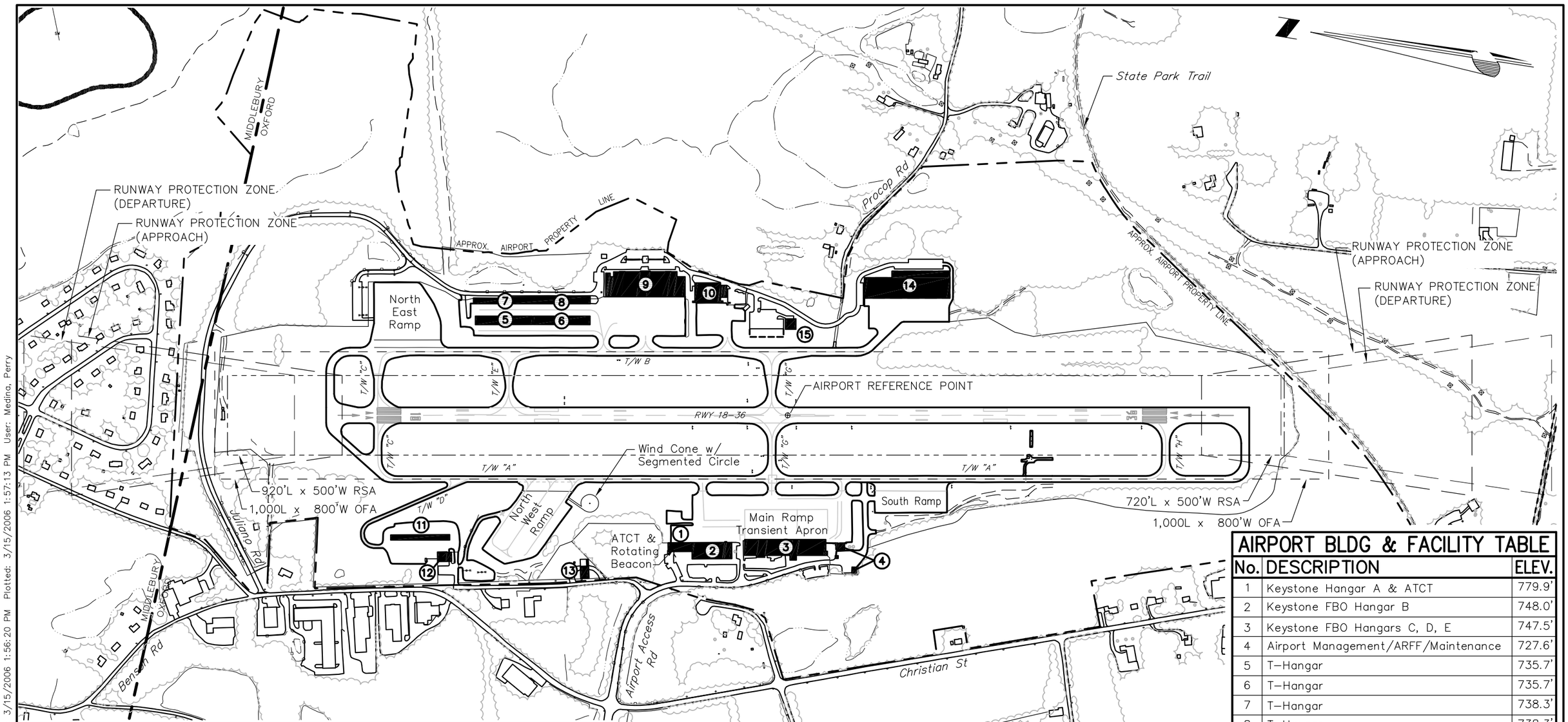
A primary role of master planning is developing a detailed listing of recommended facilities and improvements for implementation over the planning period. As such, the first step in this process is to inventory existing facilities and review their current condition.

Airport facilities are often described as either airside or landside. Airside (or airfield) facilities are those directly used by aircraft, such as runways, taxiways, aprons, lighting and instrumentation. Landside facilities are support buildings and structures, typically with access to the airside, such as the terminal, hangars, maintenance buildings, parking lots, and access roads. As part of this study, all airport facilities were inspected and inventoried, and are described in the sections below. Table 1-1 summarizes basic airport data; Figure 1-2 depicts the existing airport facilities.

TABLE 1-1 – AIRPORT DATA

Airport Three Letter Identifier	OXC
Airport Owner	Connecticut Department of Transportation
Date Established	December 15, 1969
Airport Category	General Aviation
Airport Acreage	430 acres
Airport Coordinates *	41°-28'-46" N 73°-08'-08."W
Airport Elevation	726 MSL

* Source: Airport Facility Directory 2004



LEGEND

DESCRIPTION	EXISTING	DESCRIPTION	EXISTING
Railroad		Stream/River/Body of Water	
Unpaved road		Airport Property Line	
Paved Areas, Roads		Runway Centerline	
Fence		Building Restriction Line (BRL)	
Treeline		Runway Protection Zone (RPZ)	
Airport Buildings & No.	①	Runway Safety Area (RSA)	
Other Buildings		Runway Object Free Area (OFA)	
Tiedowns			
Potential Wetland			
Utility Poles			

Note: Some Features In The Legend May Not Have Been Used

0 600 1,200

Scale in feet

AIRPORT BLDG & FACILITY TABLE

No.	DESCRIPTION	ELEV.
1	Keystone Hangar A & ATCT	779.9'
2	Keystone FBO Hangar B	748.0'
3	Keystone FBO Hangars C, D, E	747.5'
4	Airport Management/ARFF/Maintenance	727.6'
5	T-Hangar	735.7'
6	T-Hangar	735.7'
7	T-Hangar	738.3'
8	T-Hangar	738.3'
9	Key Air Hangar F	756.5'
10	Double Diamond	749.1'
11	T-Hangar	714.4'
12	Executive Flight	724.4'
13	Fuel Farm	–
14	Hangar G	739.9'
15	Restaurant	–

Note: Elevations Are Rooftop Elevations

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DATE: SEPTEMBER 2005 | SCALE: AS NOTED

Figure 1-2

EXISTING AIRPORT LAYOUT

Connecticut Department of Transportation
Waterbury-Oxford Airport Master Plan
Oxford, Connecticut

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1.2.1 Airside Facilities

This section describes the Airport's runways, taxiways, aprons, lighting, and navigational aids. The conditions reported in this section are based on a review of the Airport's plans and documents, and discussions with the airport manager.

Runway, Taxiways, Lighting, & Aprons

The Waterbury-Oxford Airport consists of approximately 430 acres of property encompassing all airport facilities. The Airport has one paved (bituminous) and lighted runway (18-36). This 5,800-foot long runway with displaced thresholds is oriented on an approximate 180-360 degree magnetic alignment (north to south), and is 100 feet in width. Runway markings are precision, as illustrated on Figure 1-2. The runway is served by a full parallel taxiway to the west and a partial parallel taxiway to the east. Three exit taxiways provide access to the aircraft parking aprons and hangar areas. Runway 18-36 is equipped with High Intensity Runway Lights (HIRLs). On the Runway 18 end, there is a Visual Approach Slope Indicator (VASI-L4) to the left of the runway. On the Runway 36 end, there are Runway End Identifier Lights (REILs) and a Precision Approach Path Indicator (PAPI-L4) to the left of the runway. The Airport is further equipped with a rotating beacon located on the ATCT on the west side of the Airport. The wind direction indicator includes a lighted wind cone with a segmented circle, and is located on the west side of the Airport.

Three tiedown aircraft aprons exist at OXC. The east apron (northeast ramp) contains based aircraft parking at the northeast corner of the Airport. This apron has 40 tiedowns on 100,000 square feet of pavement. The two other tiedown aprons are located on the west side of the Airport, one of which is located at the west end of the old crosswind runway (known as the northwest ramp) and the other to the south of the Airport Management office (known as the south ramp). These aprons consist of 140,000 and 24,000 square-feet of pavement and total approximately 60 tiedowns.

The main FBO apron, occupied Keystone Aviation, is located on the west side of the runway and is 150,000 square-feet. This ramp provides short- and long-term parking, and also serves as a staging area for Hangars A through E. Additionally, approximately 15 tiedowns exist along the east side of the ramp, parallel to Taxiway "A." Executive Flight, north of the northwest ramp, has an apron totaling approximately 20,000 square-feet, with approximately 15 based aircraft located along the apron perimeter and surrounding the T-hangar building.

Key Air and Double Diamond, on the east side of the runway, have an apron in front of their hangars totaling 100,000 and 40,000 square-feet respectively.

Table 1-2 and Figure 1-2 summarizes the existing airfield facilities.

TABLE 1-2 – EXISTING AIRFIELD FACILITIES				
Runway/Taxiway	**Length**	**Width**	**Surface Type**	**Lighting**
Runway 18-36	5,800’	100’	Asphalt Grooved	HIRL Runway 18: VASI Runway 36: REIL, PAPI
Taxiway “A”	6,300’	40’	Asphalt	MITL
Taxiway “B”	3,700’	50’	Asphalt	MITL
Taxiway “C”	300’	40’	Asphalt	MITL
Taxiway “D”	600’	25’	Asphalt	MITL
Taxiway “E”	300’	50’	Asphalt	MITL
Taxiway “G”	750’	40’- 100’	Asphalt	MITL
Parking Aprons	**Total Size**	**Tiedowns**	**Surface Type**	**Users**
Northeast Ramp	100,000 sf	40	Asphalt	Based
Northwest Ramp	140,000 sf	50	Asphalt	Based
South Ramp	24,000 sf	26	Asphalt	Based
Main Ramp	50,000 sf	10	Asphalt	Based/Itinerant
Executive Flight	20,000 sf	12	Asphalt	Based*
Key Air	100,000 sf	Staging	Concrete/ Asphalt	Tenant Use
Double Diamond	40,000 sf	Staging	Asphalt	Tenant Use
Keystone (A, B, C, D)	105,000 sf	Staging	Asphalt	Tenant Use
Transient - Keystone	72,000 sf	Variable	Asphalt	Visitors

Key:
HIRL – High Intensity Runway Lights **VASI** - Visual Approach Slope Indicator
PAPI – Precision Approach Path Indicator **MITL** – Medium Intensity Taxiway Lights **REIL** - Runway End Identifier Lights
* Based aircraft at Executive Flight are located along the perimeter of the apron and surround the T-hangar

Navigational Aids

Navigational Aids (navaids) are radio facilities that provide either enroute or approach guidance information. Navaids are generally used in conjunction with the airport lighting and visual aids (i.e., ALS, VASIs, etc.), and provide visual cues and orientation to the pilot. OXC navaids are described below.

Runway 36 is equipped with an Instrument Landing System (ILS) that is maintained by the FAA. An ILS is considered a precision-approach landing system and consists of a localizer, which provides horizontal guidance to the pilot; a glideslope, which provides vertical guidance; and marker beacons, which identify distance from the runway. OXC is the only GA airport in Connecticut that provides a full ILS. Additionally, RNAV GPS (Global Positioning System) non-precision approaches are available to both runway ends.

The closest long-range electronic navigational aid to OXC is the Bridgeport VOR (Very High Frequency Omni-Directional Range), located approximately 18 nautical miles south of the Airport. There is a VOR non-precision approach to Runway 18.

1.2.2 Landside Facilities

An inventory of the existing landside facilities was conducted through field observations, review of existing airport plans, and discussions with airport management. A description of these facilities is provided below and summarized in Table 1-3.

Hangars

Hangar facilities at OXC include eight conventional (or open-bay) hangars (Hangars A through F, Executive Flight, and Double Diamond) for private and fixed based operations, and five T-hangar buildings. The conventional hangars range from 2,500 to 62,500 square feet, and can house approximately 50 aircraft. The T-hangar buildings accommodate a total of 64 units. Presently under construction is a 62,500 square-foot hanger (Hangar G) on the east side of the Airport.

Fuel

OXC provides aircraft fueling facilities at three locations on the Airport. Keystone and Executive Flight each operate a fuel facility, which are located on the west side of the Airport along Christian Street. Double Diamond has a fuel facility located just south of their hangar. Fuel type and quantity is summarized in Table 1-4. Keystone FBO sells fuel at the Airport, while both Executive Flight and Double Diamond conduct self fueling operations exclusively.

Airport Access & Parking

Roadway access to the Airport's facilities is provided via I-84 Exit 16 (major interstate), to Route 188. Airport Access Road is the main road to the Airport off Route 188 and provides

access to many facilities and airport tenants on the west side of the Airport, including the following:

- Keystone Aviation FBO
- Airport Management
- Executive Flight
- West parking aprons and T-hangar

Main access to the east side of the Airport is provided via Airport Access Road, then north on Christian Street and east on Juliano Road, which provides access to the following:

- Key Air
- Double Diamond
- Northeast parking apron and T-hangars
- New Hangar G (scheduled for completion in 2006)
- Restaurant (scheduled for completion in 2006)

Automobile parking is provided in paved lots at each respective tenant facility. The amount of parking space provided is shown in Table 1-4.

Airport Management

Airport Management (ConnDOT) is located on the west side of the Airport, just south of midfield. This office provides day-to-day operations coordination with airport users and tenants, and the local community. Additionally, Airport Management coordinates all airfield maintenance and is the first responder for any on-airport aircraft incidents. Airport Management facilities are summarized in Table 1-3.

Air Traffic Control Tower

The Air Traffic Control Tower (ATCT) is located near midfield on the west side of the Airport. Specifically, the tower cab (i.e., enclosed glass area where the controllers work) is located above Keystone Aviation (Hangar A), and is 49 feet above ground level.

TABLE 1-3 – EXISTING LANDSIDE FACILITIES				
Bldg. Number*	**Facility**	**Area**	**Use**	**Condition**
1	Keystone FBO Hangar A	5,000 sf	Storage, Maintenance	Good
1	ATCT	2,500 sf	Air Traffic Control	Excellent
2 & 3	Keystone FBO Hangar B, C, D, & E	50,000 sf	Storage, Maintenance	Excellent
4	Airport Management/ ARFF/Maintenance	3,500 sf	Operations/Storage	Good
5	T-hangar	17,500 sf 16 units	Storage	Excellent
6	T-hangar	17,500 sf 16 units	Storage	Excellent
7	T-hangar	7,200 sf 6 units	Storage	Excellent
8	T-hangar	17,500 sf 16 units	Storage	Excellent
9	Key Air Hangar F	62,500 sf	Storage, Maintenance	Excellent
10	Double Diamond Hangar	15,000 sf	Storage, Maintenance	Excellent
11	T-hangar	13,000 sf 10 units	Storage	Good
12	Executive Flight Hangar	2,500 sf	Storage, Maintenance	Good
13	Fuel Farm	Three 15,000 gal. tanks	Fuel Storage	Excellent
14	Key Air Hangar G	62,500 sf	Storage, Maintenance	Under Construction
15	Restaurant	4,350 sf	Food Service	Under Construction

* As shown on Figure 1-2

1.2.3 Services & Primary Tenants

The Waterbury-Oxford Airport serves a variety of general aviation users, including those flying for business, government, and recreational purposes. As such, various types of services are provided to meet the needs of the users, as described below.

Four primary tenants operate at OXC, as illustrated on Figure 1-2 and summarized in Table 1-4.

TABLE 1-4 – AIRPORT SERVICES/TENANT SUMMARY				
Company	**Service Provided**	**Location**	**Fuel (gallons)**	**Parking (spaces)**
Keystone Aviation	Fuel sales, aircraft rental, flight training, aircraft maintenance	West side	45,000 Jet A 12,000 100LL	120
Key Air	Aircraft management, charter	East side	NA	100
Double Diamond	Charter	East side	15,000 Jet A	20
Executive Flight Services	Aircraft sales & maintenance, flight training, charter	West side	8,000 100LL	20
Note: separate auto parking is also provided for the east and west aprons, 50 and 75 spaces respectively				

1.3 Airspace, Air Traffic Control, & Procedures

Aircraft approaching and departing OXC are subject to a system of controls designed to serve the safe separation of aircraft from one another. Aircraft are subject to varying degrees of control depending on the specific airspace and meteorological conditions in which they operate. This system of air traffic control is the responsibility of the FAA. The FAA has the statutory duty to establish, operate, and maintain air traffic control facilities and procedures.

Airspace

There are two basic types of aircraft flight rules recognized by the air traffic control system: those operating under visual flight rules (VFR), and those operating under instrument flight rules (IFR). VFR operations depend primarily on visual conditions. IFR operations depend primarily on radar detection for separation by air traffic controllers. IFR flights are controlled from takeoff to touchdown, while VFR flights are controlled only within the vicinity of airports.

The United States airspace is structured into Controlled, Uncontrolled, and Special Use airspace, as defined below.

- **Controlled Airspace** – Airspace that is supported by ground to air communications, navigational aids, and air traffic services. Controlled airspace is further divided into five different Classes (A, B, C, D, or E). The classification of any airspace is determined by its special location.
- **Uncontrolled Airspace** – All airspace that has not been designated as Controlled or Special Use, and within which Air Traffic Control (ATC) has neither the authority nor the responsibility for control. All uncontrolled airspace is considered Class G.

- **Special Use** – Designated airspace where unique or hazardous situations (e.g., military activities) require special attention and restrictions.

These airspace classifications impose several requirements upon the operations of aircraft, including visibility minimums, cloud clearances, contact with air traffic control, and special aircraft equipment. The classification system is summarized as follows:

- Class A: All airspace above 18,000 feet mean sea level (MSL). Class A airspace contains all high altitude airways – jet-routes.

- Class B and C: The airspace surrounding major commercial airports. To enter this airspace, communication and/or clearances must be received from ATC. The closest Class B airspace surrounds the New York Metropolitan Airports which includes JFK, LaGuardia, and Newark. The closest Class C airspace surrounds Bradley International Airport to the northeast and Islip Airport to the south. Within Class B and C airspace, aircraft are required to communicate with ATC.

- Class D: The terminal area airspace surrounding towered and military airports with a radius of five statute miles. As shown in Figure 1-3, the OXC airspace is classified as Class D from the ground up to 3,200 feet above MSL (2,500 feet AGL). Nearby Danbury Airport to the west, Bridgeport to the south, and New Haven Airports to the southeast are also classified as Class D airspace. Within Class D airspace, aircraft are required to communicate with ATC.

- Class E: General controlled airspace that includes most of the remaining airspace. This airspace contains the low altitude airways. Aircraft operating in Class E must follow the general regulations for Controlled airspace. Class E airspace extends upward to the overlying Class A airspace. Thus, beyond the boundaries of the OXC Class D airspace, Class E airspace begins.

- Class G: Uncontrolled airspace; the airspace below Class E. Aircraft must still follow the specific traffic patterns established for the Airport. OXC becomes Class G airspace when the control tower is closed (9pm to 6am). Meridian Markham Municipal Airport, which has Class G airspace (from the ground up to 700 feet AGL), is the closest facility to OXC, located approximately 13 nautical miles east of OXC.

- Special Use Airspace: An area of special concern or restriction due to unusual hazards (e.g., military activity). Special Use airspace includes designated Prohibited Areas, Restricted Areas, Warning Areas, Military Operation Areas, and Alert Areas. The closest special use airspace is Restricted Area (R-5206), which surrounds the West Point Military Academy, located approximately 38 nautical miles southwest of OXC.

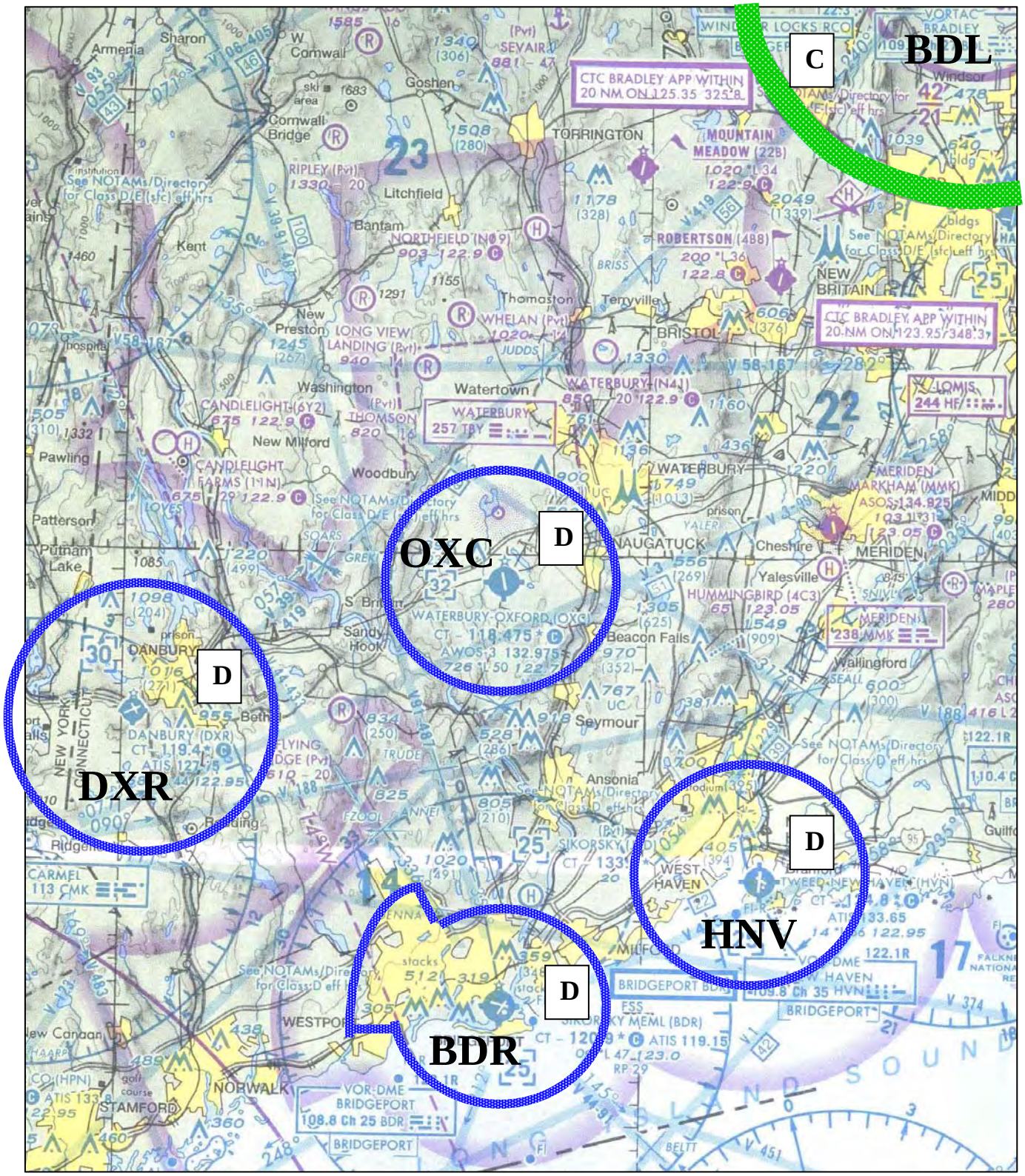

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Figure 1-3
Airspace Map

Scale 1" = 6 Nautical Miles	CHA File No: 12489	Waterbury-Oxford Airport Master Plan Update

In summary, with no nearby Class A, B, C or Special use airspace, the operational environment at OXC is relatively uncongested and unrestricted. VFR aircraft operating to and from OXC must contact the ATCT and follow given instructions. IFR aircraft must follow formal clearances provided by ATC. With the commissioning of the new ATCT, local airspace congestion during busy periods is readily managed by local ATC.

Air Traffic Control

At OXC, local traffic is controlled by the Air Traffic Control Tower (ATCT) that is located on the west side of the Airport just north of midfield. The ATCT was constructed and became fully operational on May 15, 2002.

ATC services are provided by a private company under a contract with the FAA. ATC operates daily from 6am to 9pm. Communications with ATC is via radio on 118.475 (tower) and 121.65 (ground).

Procedures

VFR Flight procedures at OXC follow standard traffic patterns established by the FAA. The patterns include flying straight-in to or straight-out from either runway end, or flying a standard rectangular traffic pattern with all left-hand turns. The full left-hand traffic pattern for aircraft staying in the pattern includes the departure leg, followed by left turns to the crosswind, downwind, base legs, and a turn to final for landing.

Ideally, all takeoffs and landings are conducted into the wind in order to reduce aircraft ground speed and improve safety. Thus, the runway end in use is primarily determined by the current wind. The single north-south runway at OXC mostly experiences winds from the north and northwest. Thus, it is estimated that over 70 percent of the takeoffs and landing occur on Runway 36 – landing from south to north and departing to the north. The 30 percent remainder of the flights would therefore be the opposite on Runway 18 – landing from the north and departing to the south.

During IFR conditions (visibility under 1-mile and cloud ceiling 1,000 feet above ground level), aircraft must file instrument flight plans and obtain “clearances” from ATC. IFR departure procedures all start with straight-out takeoffs, followed by the specific IFR flight clearance (heading and climbing instructions).

IFR approaches or Instrument Approach Procedures (IAP) are written and published by the FAA for specific runway ends. At OXC, the FAA has published a precision IAP to Runway 36 using an Instrument Landing System (ILS). In addition, several non-precision procedures have been published to both runway ends using both satellite based GPS and older ground based systems (e.g., NDB, VOR/DME).

As shown in Table 1-5, the ILS approach to Runway 36 has the lowest (i.e., best) approach minimums of any of the IAP at OXC. The ILS enables descents to 250 above ground level

(AGL), with visibility as low as 1-mile. The theoretical minimums for this approach would be 200 feet AGL and ½-mile visibility. However, such minimums would require installation of an Approach Lighting System (ALS) as well as removal of approach obstructions (e.g., power lines) south of the runway. Thus, an ALS is discussed in later chapters of the AMPU.

TABLE 1- 5 – INSTRUMENT APPROACH PROCEDURES

Instrument Approach Procedure	Aircraft Category	Minimum Decent		Visibility Minimum *(Mile)*
		MSL	*AGL*	
ILS RWY 36	All	971	250	1.0
LOC RWY 36	A & B	1,180	459	1.0
	C	1,180	459	1.25
	D	1,180	459	1.5
GPS RWY 18	A & B	1,220	494	1.0
	C	1,220	494	1.25
	D	1,220	494	1.5
GPS RWY 36	A & B	1,200	479	1.0
	C	1,200	479	1.25
	D	1,200	479	1.5
NDB RWY 18	A & B	1,280	554	1.0
	C	1,280	554	1.5
	D	1,280	554	1.75

Note: Circling minimums are also published for each of the IAP above.
Aircraft Approach Category (approach speed):
A: 0 – 90 Knots B: 91 – 120 knots C: 121–140 knots D: 141 knots and above

As shown in Table 1-5, each of the non-precision IAPs at OXC has higher minimums for decent altitude and equal or higher visibility requirements than the ILS. It is also noted that aircraft in faster approach categories have higher approach minimums. This is due to the reduced pilot reaction time available for aircraft traveling at higher speeds.

The Department of Transportation is currently working with the FAA Air Traffic division to update procedures, equipment, and airspace boundaries that better serve the needs of the airport. Poor radar coverage continues to limit capacity by restricting IFR operations.

1.4 Airport Activity

This section provides a summary of activity as of December 2003 at OXC, which will be used as the base year for this study. This data is incorporated into the forecasts of aviation demand.

1.4.1 Based Aircraft

The number of based aircraft at an airport is used to determine the need for hangars, apron area, and other related facilities. Based aircraft include those owned by individuals, businesses, or

organizations that are stored at OXC on a regular basis. At OXC, based aircraft include corporate and private-use aircraft. In 2003, there were 236 based aircraft at the Airport, as listed in Table 1-6.

1.4.2 Operations

Aircraft activity at OXC consists of corporate, charter, and private general aviation use. Table 1-6 shows the number of annual aircraft operations conducted at OXC. An aircraft operation is defined as either a landing or a takeoff. Thus, each flight includes at least two operations – one takeoff and one landing. Aircraft operations are categorized in a number of ways, including:

- Aircraft Type
- Type of operation (local or itinerant)
- Time of day (day or night)
- Type of operating procedure (visual flight rules vs. instrument flights rules)

TABLE 1-6 – EXISTING BASED AIRCRAFT & ACTIVITY

	Single & Multi-Engine Piston	**Turboprop**	**Jet**	**Rotor**	**Total**
Based Aircraft (Dec. 2003)	188	10	37	1	236
Annual Operations	58,656	3,120	3,700	473	65,949

At OXC, approximately 40% of all operations are local. Local flights are conducted mostly by based aircraft, and include primarily single and multi-engine piston aircraft. Itinerant operations (those arriving from outside the local area) are conducted by a mix of based and transient aircraft. The time of day and instrument flight operations are discussed in Chapter 2.

1.4.3 Existing Service Level & Classification

As discussed in Section 1.1., the Airport does not offer scheduled airline service, nor is it anticipated or pursued. However, OXC serves many charter, corporate, and personal aircraft users residing in and visiting the New Haven County area year-round. The Airport is therefore classified as a "General Aviation" (GA) facility.

Many of the facilitiy requirements at an airport are predicated on the level of activity and the largest or most demanding aircraft forecast to regularly use the Airport (500 or more annual operations), which is referred to as the "design aircraft." Thus, the design aircraft and associated FAA design criteria are defined at the outset of the requirement analysis.

Design Aircraft

The design aircraft is defined as the largest aircraft anticipated to use the airport on a regular basis (at least 500 annual operations). The selection of the design aircraft allows for the identification of the Airport Reference Code (ARC) for the airport. For OXC, the design aircraft is a corporate jet aircraft, such as the Gulfstream series of business jets.

Gulfstream IV

Airport Reference Code

Airport design criteria and dimensional standards for airport facilities are determined by the ARC. The ARC is a coding system used to relate airport design criteria to the operational and physical characteristics of the critical design airplane intended to operate at an airport. The ARC is comprised of two components – the aircraft approach category (an operational characteristic) depicted by a capital letter, and the airplane design group that relates to the airplane wingspan (a physical characteristic) is depicted by a Roman numeral. The ARC components are defined as follows in Table 1-7.

TABLE 1-7 AIRPORT REFERENCE CODE

Aircraft Approach Category		**Airplane Design Group**	
Category	**Dimension**	**Group**	**Dimension**
A	Speed of less than 91 knots	I	Up to but not including 49’
B	91 knots up to but <121 knots	II	49’ up to but not including 79’
C	121 knots up to but <141 knots	III	79’ up to but not including 118’
D	141 knots up to but <166 knots	IV	118’ up to but not including 171’
E	166 knots or more	V	171’ up to but not including 214’
		VI	214’ up to 262’

Source: FAA Advisory Circular 150/5300-13.

In the previous OXC Master Plan (1995), the design aircraft was listed as a Gulfstream III, which falls within Airport Approach Category C and Airplane Design Group II, for an ARC C-II (see Table 1-7). Thus, the ARC for OXC was C-II in 1995. The 1995 study forecast that the “new” Gulfstream IV (G450) aircraft would become a regular airport user in the future. The Gulfstream

IV (G450) has a higher approach speed than the Gulfstream III and an ARC of D-II. Therefore, the 1995 Master Plan forecast that the ARC for OXC would change from C-II to D-II.

Since 1995, the Gulfstream IV (G450) aircraft has become a regular user of OXC. In 2003, the FAA recorded 570 itinerant operations of the G450, which is sufficient activity to change the designated ARC. Thus, the current ARC for OXC is now ARC D-II.

1.5 Environmental Overview

This Airport Master Plan Update (AMPU) identifies various potential developments for OXC. However, before projects can be pursued, environmental constraints must be addressed. If not mitigated, environmental impacts can hinder or prohibit the implementation of certain development projects. This section provides an initial review of environmental categories of concern. Note that detailed environmental study, such as an Environmental Assessment/Impact Statement (EA/EIS), would be required prior to the development of any of the substantial project recommendations contained in the AMPU. Major categories include:

- Land Use
- Aircraft Noise
- Natural Environmental Inventory
- Larkin State Park Trail (Bridle Trail)

1.5.1 Land Use

As discussed in Section 1.1, OXC is located in both the Towns of Middlebury and Oxford. The municipal boundary intersects the northern end of the airport property, with a small portion of the Airport in Middlebury. The majority of the Airport is in Oxford. Airport property and town boundaries are illustrated in Figure 1-2.

Airport Land Use

The airside area is defined as that space reserved for the operation of aircraft (runways and taxiways), associated supporting navigational facilities, and Runway Protection Zones (RPZs). The RPZ is a trapezoidal area located beyond each runway end that should ideally be controlled by the airport for the protection of people and property on the ground. This may be achieved through airport property acquisition, easements, or zoning to control development and land use activities. The present airside area consists of Runway 18-36, associated taxiways, and RPZs on each runway end.

The landside area is defined as that space occupied by aircraft aprons, hangars, Fixed Based Operators (FBOs), and other support buildings occupied by Airport Management and ATC personnel. At OXC, landside areas on the east side of Runway 18-36 include the tiedown apron and T-hangars, Key Air hangar and apron, and the Double Diamond hangar and apron. Landside areas on the west side of Runway 18-36 include several tiedown aprons, Executive Flight T-

hangar, Keystone hangar and apron, the ATCT, and Airport Management's office and vehicle storage garage.

Surrounding Land Uses

The airport property is surrounded by a mix of open, wooded, residential, commercial, and industrial land uses. The land to the south of the Airport is predominately wooded and/or open, with light industrial establishments along Christian Street and several low density residential areas south of an electrical transmission line. Larkin State Park Trail (state parkland) also exists in this location. A wide mixture of industrial and residential land uses are located to the north and west of the Airport along Route 188 and other roadways. The land to the east is predominately wooded with scattered residential areas.

Residences are scattered along virtually every roadway in the airport vicinity (excluding I-84). The highest density of housing near the Airport is located to the north of Juliano Road and west of Christian Street (e.g., Triangle Blvd.). This area includes approximately 50 single-family homes and is located partly within the RPZ.

In addition to the existing land use patterns, the development of a power plant has been proposed in Oxford, in a location approximately ½-mile to the east of the Airport. The power plant would be constructed within the planned Woodruff Hill Industrial Park, and operated by Calpine/Towantic Energy LLC. Although this development is not associated with the Airport or the Master Plan Update, it has been discussed throughout the process due to concerns regarding the emission of vertical plumes and their associated impact to aviation activity.

Based on these concerns, the FAA has agreed to conduct a "Safety Risk Analysis of Aircraft Overflight of Industrial Exhaust Plumes" for the development of the Calpine facility. The FAA analysis will address the appropriateness of the power plant site from an aviation safety standpoint. Based on their findings, the previous conclusions regarding the power plant may be revised, including re-examination of a 2001 Declatory Ruling for the proposed facility. Furthermore, if the development moves forward, Calpine/Towantic Energy will have to submit an FAA Notice of Actual Construction or Alteration (FAA Form 7460-2), which would prompt the FAA to perform an standard Aeronautical Study of the proposed project addressing airspace and obstruction issues.

1.5.2 Aircraft Noise

Residential, educational, and institutional land uses represent the most sensitive noise receptors. As residential subdivisions are located to the north of the Airport in Middlebury (e.g., Triangle Hills, Steeple Chase, Brookside), and to the south of the Airport in Oxford (e.g., the proposed Glendale and Central Park developments), a FAA FAR Part 150 Noise Study was prepared to evaluate potential aircraft noise impacts in these surrounding communities.

Since incompatible residential development exists within the vicinity of the Airport, the Noise Study evaluated potential measures to reduce or prevent future noise exposure in these areas.

These measures included changes to aircraft/airport procedures (e.g., flight tracks, power settings), and changes to the affected land use (e.g., zoning, soundproofing, purchase of property, avigation easements). Additional noise analysis would also be included in a future environmental study for specific airport improvements.

1.5.3 Natural Environmental Inventory

A brief overview of environmental conditions is provided below. The information in this section was obtained through preliminary research and review of existing studies. A more detailed overview is provided in later sections of the AMPU.

Air Quality

Airborne pollutants created by airports and other human activities are of concern in most urbanized areas. Regulated and monitored air pollutants typically include ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, and particulate matter. The Connecticut Department of Environmental Protection (ConnDEP) maintains a statewide network of monitoring stations that sample ambient air quality. The pollutant data are used to determine compliance with the National and State Ambient Air Quality Standards.

Recent readings for stations in the vicinity of OXC (Waterbury, New Haven, and Hamden) indicate that the maximum measured concentrations of the criteria air pollutants were well below the applicable national and state standards, with the exception of ozone. Ozone has continued to read in concentrations over air quality standards (i.e., 0.12 parts-per-million for a 1-hour average), which has resulted in New Haven County's classification as a serious nonattainment area for ozone.[1]

Air quality models for general aviation airports typically indicate that the aviation activity itself results in no significant impact to the total pollutant emissions and concentrations in a given area. This is because the number of airport flights is very low compared to ground vehicles and other emissions. For example, OXC currently accommodates less than 100 landings per day, compared to local roads and highways that accommodate tens of thousands of daily vehicle trips in the region. While the Airport and aircraft do contribute to air pollution, past analysis of OXC and general aviation airports as a whole have found no significant air pollution impact.[2]

Ground Water Quality

The ConnDEP administers the State's Water Quality Standards (WQS) for Connecticut's clean water program, and provides classifications for groundwater. The DEP classifications and designated uses for each classification are listed below.

[1] Information based on the Environmental Protection Agency (EPA) Green Book and 2003 Airport EA
[2] Based on 2003 Airport EA

- Class GAA – Existing or potential public supply of water suitable for drinking without treatment; baseflow for hydraulically-connected surface water bodies
- Class GA – Existing private and potential public or private supplies of water suitable for drinking without treatment; baseflow for hydraulically-connected surface water bodies.
- Class GB – Industrial process water and cooling waters; baseflow for hydraulically-connected surface water bodies; presumed not suitable for human consumption without treatment.
- Class GC – Assimilation of discharges authorized by the Commissioner pursuant to Section 22a-430 of the General Statutes (not suitable for development of public supplies of potable water)

Groundwater on the property of OXC is classified as GA, which includes groundwater suitable for drinking or other domestic uses without treatment for both private and public water supply wells.

A small area east of Christian Street, adjacent to the Airport, is classified as GB/GA. This classification includes groundwater that may not be suitable for direct human consumption without treatment due to off-airport waste discharges, spills, or land use impacts. However, the goal for areas with this classification is to restore the groundwater to drinking water quality. Several private commercial establishments are located within this area.

No State Identified Aquifer Protection Areas are located in the airport vicinity. Most of the development surrounding the Airport, including the Triangle Boulevard neighborhood, remains dependant upon private wells for their drinking water supply.

Surface Water Quality

The DEP inland surface water classifications and designated uses for each classification are listed below.

- Class AA – Existing or proposed drinking water supplies; habitat for fish and other aquatic life and wildlife; recreation; and water supply for industry and agriculture.
- Class A – Habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture.
- Class B – Habitat for fish and other aquatic life and wildlife; recreation; navigation; and industrial and agricultural water supply.
- Class C – Results from conditions that are usually correctable through implementation of established water quality management programs to control point and non-point sources; may be suitable for certain fish and wildlife habitat, certain recreational activities, industrial use, and navigation.

- Class D – Results from conditions that are not readily correctable through implementation of established water quality management programs to control point and non-point sources; may be suitable for bathing or other recreational purpose, certain fish and wildlife habitat; industrial uses, and navigation.

Airport property does not contain any classified surface water bodies. The closest classified streams are located nearly a mile from OXC, and are classified as B/A.

Small airports in general do not typically impact surface or ground water. Contamination risks include spill of fuel or oil, or runoff contaminated with aircraft deicing fluid. At OXC, chemical deicing of aircraft only occurs within hangars, and the associated runoff is captured in an oil-water separator. Fuel and oil spills are prevented by maintaining and washing aircraft only in hangars that provide floor drains with holding tanks and through secondary containment systems for all stored fuels and petroleum products. During winter storm events, the Airport spreads urea pellets on the runway and other paved surfaces as needed.

OXC has and maintains a Storm Water Pollution Prevention Plan (SWPPP) and a General Permit for Discharge of Storm Water. The permit includes storm water monitoring activities, Best Management Practices and Material Management Practices, and is part of the overall approach to water quality protection. At OXC, three outfall locations are tested biannually to monitor the implementation of the SWPPP.

Wetlands

There are 18 identified wetland areas on the Waterbury-Oxford Airport property. Wetland field investigations were conducted for the AMPU, which included flagging and survey of the various wetlands boundaries between May and August of 2004.

The identified wetland areas consist of poorly drained and very poorly drained soils, and are located in many different areas of the Airport, including the western, southern, southeastern, and eastern edges of the property. The wetlands on the western side of the Airport are hydrologically connected by an unnamed intermittent stream that flows south to Little River. Similarly, the wetlands on the southern and eastern sides of the Airport are hydrologically connected by Little River and a few small, unnamed tributaries that flow into Little River.

Predominate wetland types found at OXC include deciduous wooded swamp, shrub swamp, wet meadow, and open water. Although these wetlands are proximate to the runway and taxiways, they are separated by either vegetated barriers or topographic variation. Nevertheless, some wetland areas are located on property that is otherwise desirable for additional airfield and landside facilities. As such, later sections of the AMPU that address future development incorporate potential wetland impacts as a primary consideration.

Other Natural Environment Items

- Historic and Cultural Resources – No properties or sites listed on the National Register of Historic Places are located on or adjacent to the Airport.
- Endangered and Threatened Species – An initial endangered species review was conducted as part of the 2003 EA using the "Town of Oxford State and Federal Listed Species and Significant Natural Communities" map. No known endangered species or significant natural biotic communities were identified.
- Floodplains – A small area of the airport property contains a flood prone band (i.e., 100-year floodplain). The location is to the southwest of the Runway 36 end, adjacent to the Larkin State Park Trail. This floodplain area is associated with a tributary of the Little River, and is situated at an elevation over 90 feet below the runway end.
- Farmland – The Farmland Protection Policy Act (FPPA) defines Prime Farmland, Unique Farmland, and Farmland of Statewide Importance based on soil type. The soils on airport property are generally classified as Urban Development (UD), which is not suitable for farming and not protected by the FPPA.

1.5.4 Larkin State Park Trail (Bridal Trail)

The Larkin State Park Trail is located directly to the south of the Airport. The trail is mainly used for horse riding with some limited use for hiking and biking. The trail will be avoided to the extent possible by airport projects; however, potential impacts from recommended projects are investigated in later sections of the AMPU.