Airport Master Plan

Windham Airport

April 2016

CONNECTICUT DEPARTMENT OF TRANSPORTATION

CHA design/construction solutions

CAA CONNECTICUT AIRPORT AUTHORITY

AIRPORT MASTER PLAN

for

WINDHAM AIRPORT

Final Report

January 2015

Prepared For:
Connecticut Department of Transportation
Connecticut Airport Authority

Prepared By:
CHA Consulting, Inc.
Rocky Hill, CT.

Contents

Tables

Figures

Appendices

Executive Summary

In November 2013, the Connecticut Airport Authority (CAA) and the Connecticut Department of Transportation (CTDOT) began updating the 20-year Master Plan for the Windham Airport (IJD). An Airport Master Plan consists of a narrative report and a plan-set of drawings, referred to as the Airport Layout Plan (ALP). The narrative report details the existing airport infrastructure, forecasts anticipated airport activity, identifies facility deficiencies, and recommends improvements and funding mechanisms to maintain the facility throughout the 20-year planning period. The narrative report includes the following chapters:

- Chapter 1: Inventory of Existing Conditions
- Chapter 2: Forecasts of Aviation Demand
- Chapter 3: Facility Requirements Evaluation
- Chapter 4: Environmental Overview
- Chapter 5: Airport Development Alternatives
- Chapter 6: Implementation Plan

The ALP drawing-set depicts the recommended development discussed within the narrative report, and is a prerequisite for an airport to qualify for federal funding assistance. The ALP includes the following sheets:

- Title Sheet
- Existing Airport Layout Plan
- Future Airport Layout Plan
- Inner Approach Surface Drawings
- Terminal Area Plan
- Airspace Drawings
- Land Use Plan
- Property Map

Airport Location & Infrastructure

Chapter 1, Inventory of Existing Conditions outlines the location of IJD in relation to the greater Hartford area and New England region. The Airport's location positions IJD to serve as an alternate destination with convenient roadway connectivity to the surrounding metropolitan areas. This chapter also

presents the existing IJD infrastructure, which accommodates a variety of aircraft ranging from single-engine piston to small- and mid-sized jet aircraft. IJD operates under a bi-directional, crosswind runway system accommodating the arrival and departure of aircraft from all directions.

Two instrument approach procedures (e.g., GPS LPV approaches) are available for Runway 9-27.

Forecasts of Aviation Demand

Projecting future aviation activity at an airport is a vital step in the planning process. FAA-approved methodologies were used to predict levels of activity, which served as the basis for identifying future facility requirements during the planning period (2013-2033). The forecasts developed for IJD are presented in *Chapter 2, Forecasts of Aviation Demand* and within the table below.

Year/Growth	Based Aircraft	Operations
2013	68	14,250
2018	68	14,560
2023	70	14,820
2028	71	15,060
2033	72	15,290
2013-2033 Growth	6.9%	6.9%
2013-2033 AAGR	0.3%	0.3%
5-Year Growth Above TAF	1.8%	1.8%
10-Year Growth Above TAF	4.0%	4.0%

TAF: FAA Terminal Area Forecast

Airport Facility Requirements Evaluation

Based on the forecasts of airport activity, *Chapter 3, Facility Requirements Evaluation*, identifies whether existing facilities and airport capacity can adequately support the projected demand throughout the 20-year planning period while complying with Federal Aviation Administration (FAA) design standards. The following items are evaluated to identify necessary improvements:

Airside

- Airfield Lighting
- Airfield System & Capacity Analysis
- Airspace Requirements
- Environmental Considerations
- Instrument Approach Procedures
- Pavement Strength/Condition Analysis
- Runways, Taxiways, & Apron Pavement
- Runway & Taxiway Safety Areas

Landside

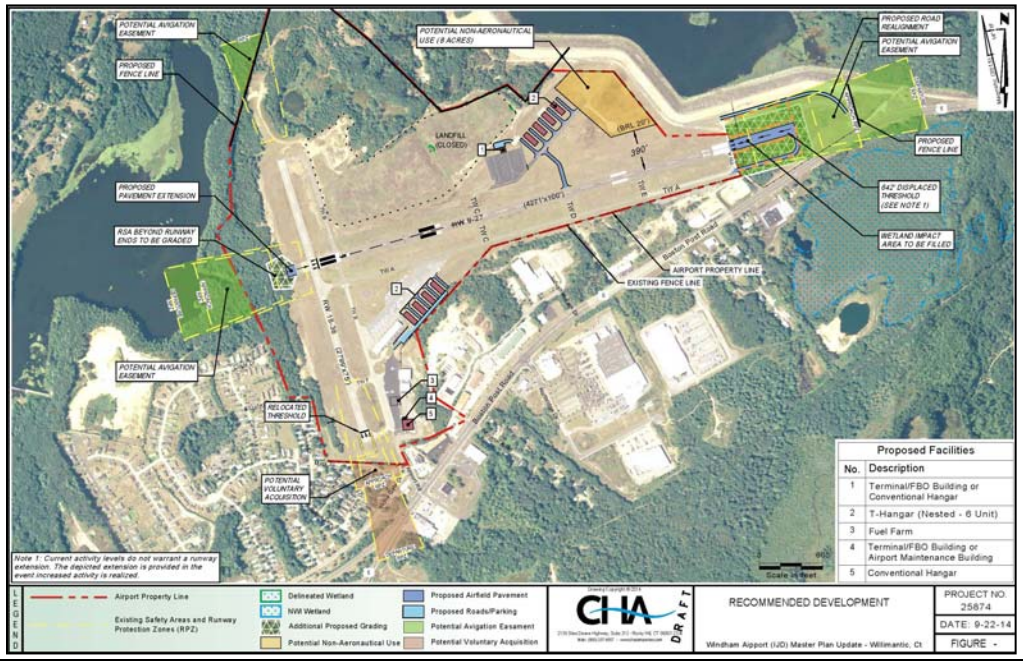
- Airport Fencing
- Airport Security Requirements
- Support Facility Analysis
- Terminal Area, Parking, Access

Environmental Overview

Chapter 4, Environmental Overview provides information on the existing environmental conditions and constraints within the IJD Master Plan study area. The various sections presented within this chapter details environmental features for Airport property along with the immediate surrounding area.

Future Development

Chapter 5, Development Alternatives and *Chapter 6, Implementation Plan* identifies and evaluates potential development alternatives for IJD leading to a recommended plan. The alternatives designed addressed the airport facility deficits identified in *Chapter 3.* To facilitate the facility deficiencies, both airside and landside alternatives were developed. Ultimately, a preferred, or recommended, plan was developed that addressed was determined to provide the greatest feasibility while addressing all airport deficiencies.



Chapter 1
Inventory of Existing Conditions

1 Inventory of Existing Conditions

Understanding the background of an airport and the region it serves is essential to making informed decisions pertaining to airport-related improvements. Therefore, to develop a well-rounded understanding of the Windham Airport (IJD), an inventory of key airport elements is presented.

1.1 Regional and Airport Overview

IJD is a public-use airport owned and operated by the Connecticut Airport Authority (CAA). According to the Federal Aviation Administration's (FAA) 2013 – 2017 *National Plan of Integrated Airport Systems (NPIAS) Report*, IJD is designated with a service level of "General Aviation" (GA) and is classified with a role of "local". As defined in the NPIAS, a local airport, "Supplements local communities by providing access to local and regional markets. These airports have moderate levels of activity with some multi-engine propeller aircraft. These airports average about 33-based propeller-driven aircraft and no jets."

1.1.1 Airport History

The Windham Airport, originally known as the Willimantic Municipal Airport, was constructed in 1937 as part of the Works Progress Administration. Throughout the decades, the Airport has received numerous grants for various improvements including: perimeter fencing, obstruction lighting, tree removal, and runway and taxiways extensions. The first hangars were constructed in 1947; one by the City of Willimantic and the other by Card Flying Service.[1] In 1950, the City sold 51 acres of the original 250 acres for the Mansfield Hollow Dam and Reservoir project. In 1968, 52 acres were deeded from the U.S. Government to the City for use in extending Runway 18-36. In 1975, the State of Connecticut received ownership of the Airport through a public referendum. The Airport was originally constructed with three runways. As part of the 1980 master plan, however, the third runway (Runway 6-24) was closed to provide additional aircraft storage area.

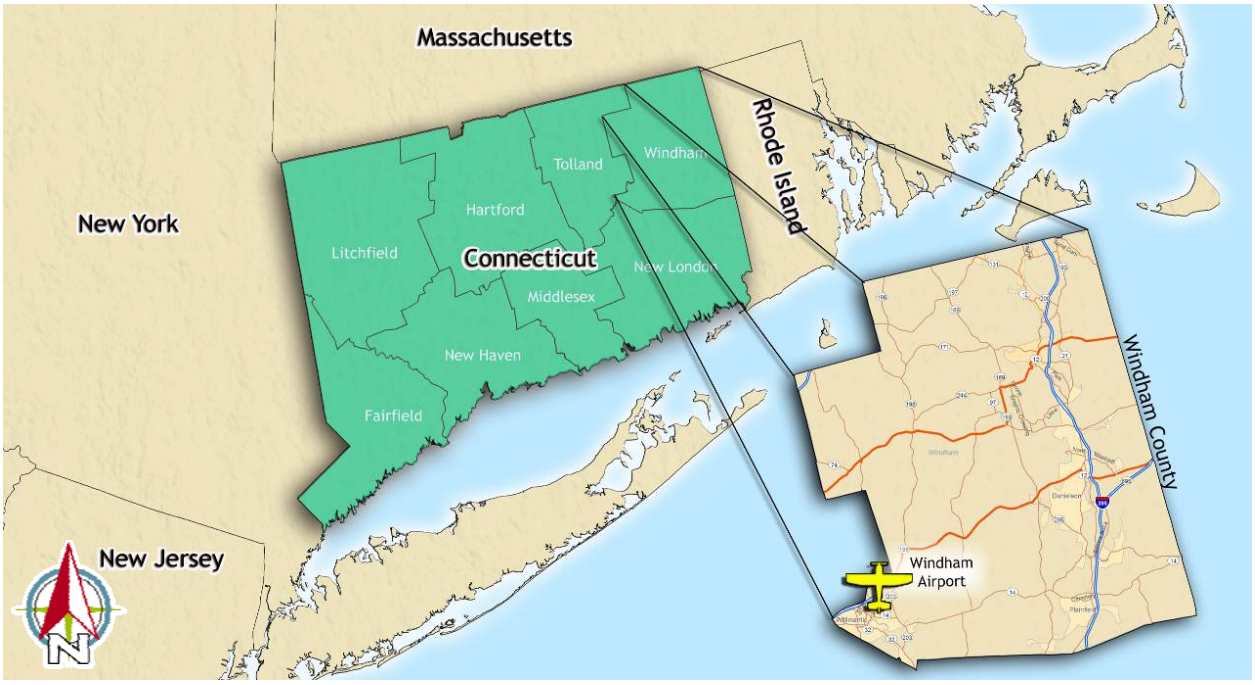
Most recently, the CAA assumed ownership and operation of the Airport on July 1, 2013. The CAA was established in 2011 to develop, improve, and operate the Bradley International Airport and the State of Connecticut's five GA airports. Prior to the CAA, the Airport was owned and operated by the Connecticut Department of Transportation (CTDOT).

[1] The City of Willimantic was consolidated with the Town of Windham in 1983.

1.1.2 Airport Location

IJD is located in the Town of Windham and approximately three miles northeast of the Willimantic district. The Town of Windham is located in Windham County and is situated approximately: 25 miles east of Hartford, CT; 40 miles west of Providence, RI; 70 miles southwest of Boston, MA; and 120 miles northeast of New York, NY. The Airport is accessible via State Route 6 (Boston Post Road), which is a major route between the Hartford, CT and Providence, RI. Figure 1-1 depicts the location of IJD relative to both the State of Connecticut and the New England region.

Figure 1-1 – IJD Location



Source: CHA

1.1.3 Airport Service Area and Surrounding Airports

Airport service areas are generally described as the location from which people are expected to use the airport as a first choice, as compared to other neighboring facilities. The airport service area encompasses the majority of businesses, passengers, and based aircraft owners utilizing an airport, as well as the tourist destinations of visitors. Socioeconomic data (e.g., population, per capita income, employment) within the service area can serve as the basis for developing and justifying forecasts of aviation demand. In general, a service area boundary for a GA airport is defined with a 20-mile radius, or a 30-minute driving time to the airport.

As listed on Table 1-1, there are a total of four public-use airports located within 20 miles of IJD: the Danielson Airport, the Toutant Airport, the Salmon River Airfield, and the Ellington Airport. IJD continues to maintain a competitive edge over these airports by providing two active

runways (Runway 9-27 and Runway 18-36) and the longest runway length (4,271 feet) within the area. Of these airports, the Danielson Airport is the only other publicly-owned airport (also owned/operated by the CAA); the others are small privately-owned airports with limited facilities and services.

Table 1-1 – Airports Surrounding IJD (20 Miles)

Airport Name	ID	No. of Runways	Longest Runway	Runway Surface	Instrument Approach	Distance/ Direction from IJD*	NPIAS
Windham Airport	*IJD*	*2*	*4,271'*	*Asphalt*	*GPS, VOR*	-	*Yes*
Danielson Airport	LZD	1	2,700'	Asphalt	VOR	13.3 / E	Yes
Toutant Airport	C44	1	1,756'	Asphalt	-	13.9 / NE	No
Salmon River Airfield	9B8	1	2,000'	Turf	-	15.0 / SW	No
Ellington Airport	7B9	1	1,800'	Asphalt	-	16.5 / NW	No

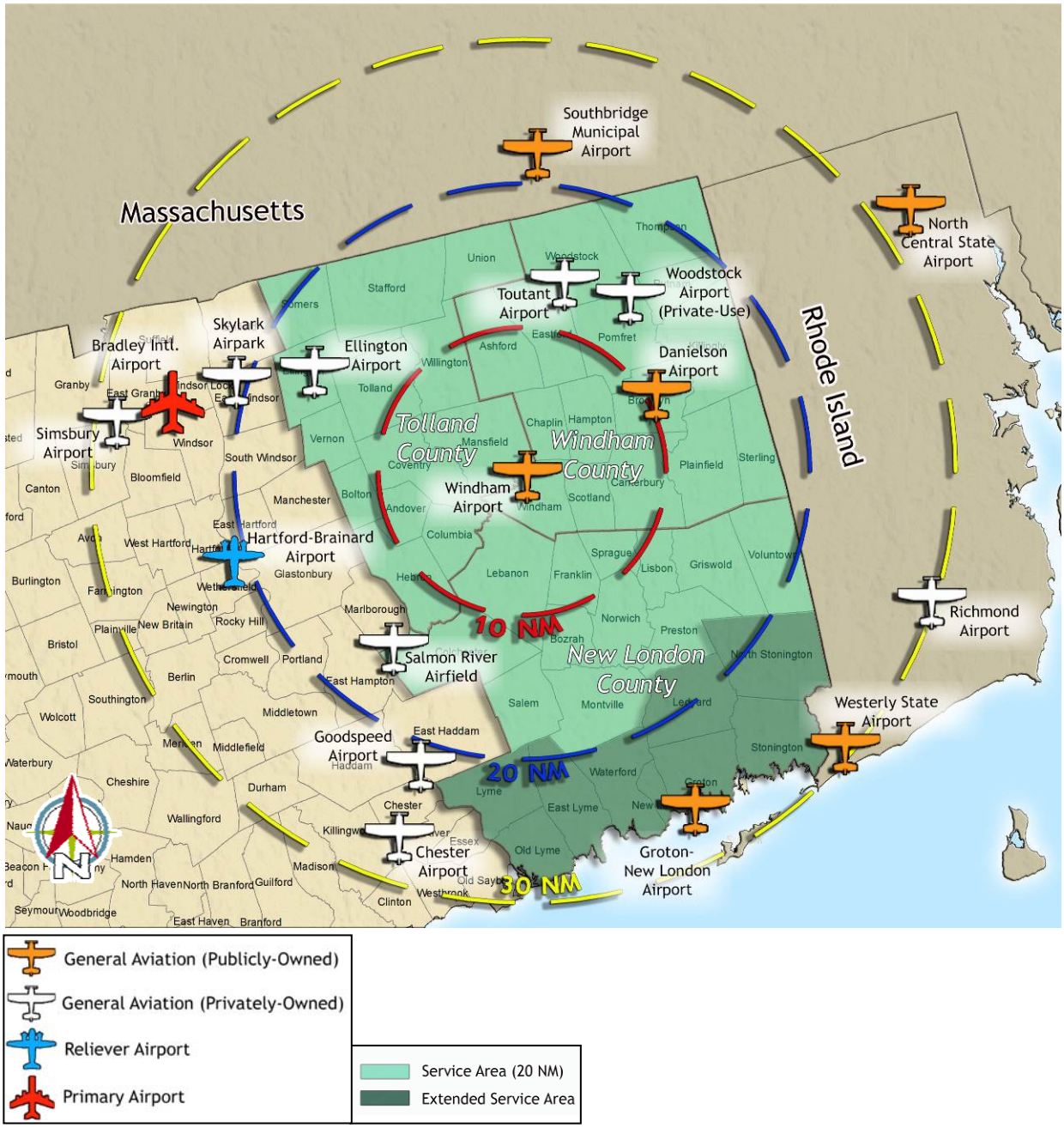
Source: FAA Obstruction Evaluation/Airport Airspace Analysis, 5010-1 Form, CHA
*Distance is in Nautical Miles

As depicted on Figure 1-2, the Counties of Windham, New London, and Tolland, are located within 20 miles of IJD and have been identified as the IJD service area. Although portions of Hartford and Middlesex Counties are also located within 20 miles of IJD, due to a relatively high saturation of airports within that area (e.g., Bradley International Airport, Hartford-Brainard Airport, and several other GA airports) those counties are not included within the IJD service area boundary.

In addition, an IJD extended service area is depicted along the southeastern coast of Connecticut. It is noted that the extended service area has a lesser propensity to utilize IJD primarily due its distance from the Airport (i.e., beyond 20 miles) and proximity to the Groton-New London Airport. Additionally, the socioeconomic data gathered for this report includes the municipalities identified within the extended service as they are located within the boundary of New London County.

The depicted IJD service area for this master plan encompasses a larger area than that generated for the 2006 Connecticut State Airport System Plan. When developing the service area, it was assumed the enhanced amenities at IJD (e.g., longer runway, ability to facilitate on-airport development, etc.) warranted a more expansive service area.

Figure 1-2 – IJD Service Area



Source: CHA

1.2 Socioeconomic Profile

The percentage of aircraft ownership and utilization of GA airports is often relative to the strength of the economy along with the cost and availability of airport facilities and services. On a macro scale, the factors that have the greatest impact on the growth prospects of an airport are the socioeconomic characteristics, such as population, per capita income, and employment, present within the airport's market or service area. Consequently, a clear understanding of local

economic forces and trends is important in understanding an airport's environment and locale. Historical and forecasted data of population, income, and employment in the IJD service area, Windham County, the State of Connecticut, and the United States are presented in this section.

Woods & Poole Economics, Inc., an independent corporation which specializes in long-term economic and demographic projections, is the primary source for the following socioeconomic data.[2] It is important to note that the historical and long-term projections in this section were based on reported historical databases and revised assumptions provided by Woods & Poole, Inc. As such, additional socioeconomic data sources may contain slightly different projections. Woods & Poole is a complete source for socioeconomic data and allows for accurate comparison of historical and projected data.

1.2.1 Population

Table 1-2 shows the historic and projected populations and corresponding average annual growth rates (AAGR) for the IJD service area, Windham County, the State of Connecticut, and the United States for years 2002 through 2012 (historic) and 2013 through 2033 (projected).

Table 1-2 – Population Growth Trends

Year	IJD Service Area (000)	AAGR	Windham County (000)	AAGR	State of Connecticut (000)	AAGR	United States (000)	AAGR
2002	518	-	111	-	3,459	-	287,625	-
2007	538	0.7%	117	1.1%	3,527	0.4%	301,231	0.9%
2012	548	0.4%	119	0.3%	3,595	0.4%	314,659	0.9%
AAGR 2002-2012		**0.6%**		**0.7%**		**0.4%**		**0.9%**
2013	553	0.8%	120	0.7%	3,610	0.4%	317,791	1.0%
2018	576	0.8%	124	0.7%	3,692	0.4%	333,953	1.0%
2023	599	0.8%	129	0.7%	3,779	0.5%	350,532	1.0%
2028	623	0.8%	133	0.7%	3,866	0.5%	367,162	0.9%
2033	647	0.8%	138	0.7%	3,952	0.4%	383,612	0.9%
AAGR 2013-2033		**0.8%**		**0.7%**		**0.5%**		**0.9%**

Source: Woods & Pool Economics, Inc.
*Note: 2012 Woods & Poole Economics data is an estimated value

These trends indicate that the local (i.e., IJD service area and Windham County) historic population has grown at a rate slightly above that reported for the State of Connecticut. The State as whole, however, has grown slightly less than that reported for the United States.

Future population projections indicate that the local historic population is anticipated to remain strong and increase at a rate closer to that of the United States. Additionally, the local service

[2] Chapter 2: Technical Description of the Woods & Poole, Economics Inc.

area is also anticipated to outpace the growth rate of the State of Connecticut. This is a significant indicator of continued airport demand within the IJD service area.

1.2.2 Per Capita Income

Table 1-3 shows the historic and projected per capita income for the IJD service area, Windham County, the State of Connecticut, and the United States. As depicted, the historic per capita income AAGRs for each area listed in the table remained relatively close, with the State of Connecticut and the United States having the greatest historic growth rates.

Similar to population, the local service area per capita income is projected to remain strong throughout the planning horizon. According to the table, the IJD service area is anticipated to grow at a rate slightly above that for Windham County and on par with the State of Connecticut. Additionally, the IJD service area is anticipated to be only 0.1 percent below that of the United States.

Table 1-3 – Per Capita Income Trends

Year	IJD Service Area ($)	AAGR	Windham County ($)	AAGR	State of Connecticut ($)	AAGR	United States ($)	AAGR
2002	50,643	-	29,472	-	43,243	-	31,481	-
2007	63,395	4.6%	35,577	3.8%	55,859	5.3%	39,507	4.6%
2012	66,841	1.1%	38,771	1.7%	57,413	0.6%	42,567	1.5%
AAGR 2002-2012		**2.8%**		**2.8%**		**2.9%**		**3.1%**
2013	68,871	3.0%	40,301	3.9%	59,016	2.8%	43,756	2.8%
2018	82,894	3.8%	48,946	4.0%	71,899	4.0%	53,495	4.1%
2023	104,418	4.7%	61,425	4.6%	90,826	4.8%	67,799	4.9%
2028	134,434	5.2%	78,373	5.0%	116,599	5.1%	87,389	5.2%
2033	165,701	4.3%	95,795	4.1%	143,099	4.2%	107,661	4.3%
AAGR 2013-2033		**4.5%**		**4.4%**		**4.5%**		**4.6%**

Source: Woods & Pool Economics, Inc., CHA

*Note: 2012 Woods & Poole Economics data is an estimated value

1.2.3 Employment

Table 1-4 shows the historic and projected number of persons employed and percent of population group employed (i.e., persons employed divided by total population) for each. As depicted, employment within the IJD service area has remained even with the State of Connecticut, but slightly lower than that reported for just Windham County. Local and state employment growth has been below that reported for the United States.

Table 1-4 – Employment Trends

Year	IJD Service Area (000)	Percent Employed	Windham County (000)	Percent Employed	State of Connecticut (000)	Percent Employed	United States (000)	Percent Employed
2002	275	53.1%	50	44.8%	2,117	61.2%	165,063	57.4%
2007	292	54.3%	54	45.7%	2,243	63.6%	179,900	59.7%
2012	283	51.5%	52	43.8%	2,191	61.0%	177,066	56.3%
AAGR 2002-2012	**0.3%**		**0.5%**		**0.3%**		**0.7%**	
2013	286	51.7%	53	43.9%	2,211	61.2%	179,451	56.5%
2018	302	52.4%	55	44.3%	2,312	62.6%	191,872	57.5%
2023	319	53.2%	58	44.8%	2,420	64.0%	205,152	58.5%
2028	338	54.2%	61	45.5%	2,533	65.5%	219,350	59.7%
2033	358	55.3%	63	46.0%	2,629	66.5%	231,413	60.3%
AAGR 2013-2033	**1.1%**		**0.9%**		**0.9%**		**1.3%**	

Source: Woods & Pool Economics, Inc., CHA

*Note: 2012 Woods & Poole Economics data is an estimated value

Future employment projections indicate that the IJD service area employment growth rate will increase at a rate above that projected for Windham County and the State of Connecticut. As indicated, the projected IJD service area AAGR is anticipated to growth within 0.2 percent of the United States. Conversely, employment AAGRs for Windham County and the State of Connecticut are anticipated to remain on par with each other.

1.2.4 Socioeconomic Summary

On a national level, aviation activity has experienced gains and losses throughout history. Since the onset of the recent economic recession, many sectors within the industry have experienced decline while others have witnessed success. Nevertheless, socioeconomic data continues to provide valid insight regarding the strengths and weakness of an economy.

Although IJD has also experienced a recent decline in overall activity, historic industry trends coupled with strong socioeconomic projections, such as population and per capita income, indicate that the area, overall, remains economically viable to continue supporting demand for aviation activity. It is acknowledged that future growth in aviation activity, both at IJD and within its service area, may be gradual and modest as the economy recovers. Chapter 2, *Forecasts of Aviation Demand*, will provide airport activity forecasts for IJD.

1.3 Windham 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, depending upon the type of operation they support. Airside facilities are those related to the landing, takeoff, and taxiing of aircraft in the airport environment. Examples of airside facilities include: the runway and taxiway system; airfield lighting, marking and visual aids; and aircraft parking and apron areas. Landside facilities are those related to the transition from air to ground movement or vice versa. Examples of landside facilities include: the airport terminal building, aircraft refueling area, aircraft storage, and vehicle parking. Figure 1-3 depicts the current facilities at IJD.

1.3.1 Airside Facilities

1.3.1.1 Runways

IJD operates under a bi-directional, crosswind runway system accommodating the arrival and departure of aircraft from all directions. Runway 9-27 serves as the primary runway and is 4,271 feet long and 100 feet wide. It is constructed of asphalt and is in good condition. The runway's load-bearing capacity is estimated at 30,000 pounds for single-wheel aircraft. The Runway 9 approach end has a 258 foot displaced threshold due to obstructions (i.e., trees) located within the Federal Aviation Regulation (FAR) Part 77 approach surface. Runway 18-36 serves as the crosswind runway and is 2,799 feet long and 75 feet wide. Similar to the primary runway, Runway 18-36 is constructed of asphalt and is in good condition. The runway's load-bearing capacity is also estimated at 30,000 pounds for single-wheel aircraft. The Runway 18 approach end has a 799 foot displaced threshold due to obstructions (i.e., trees) located within the FAR Part 77 approach surface. A recent obstruction removal project included the clearing of on-airport tree obstructions, plus some of the off-airport obstructions. This master plan will evaluate if obstruction removal will enable the reduction or elimination of the existing displaced thresholds. Table 1-5 presents the characteristics for each runway.

AIRPORT PROPERTY LINE

PARKING

LANDFILL (CLOSED)

RPZ

ROFA

RSA

RVZ

RW 9-27 (4271'x100')

RW 18-36 (2799'x75')

TW A

TW B

TW C

TW D

TW E

TW F

DEPARTURE RPZ

APPROACH RPZ

Boston Post Road

Industrial Park Dr

Northridge Dr

Crystal Road

Airport Rd

Stone Gate Dr

Circle Dr

Elizabeth La

Carolyn La

James Dr

Mark St

Wright Dr

Moyne Dr

6

7

6

5

4

3

2

1

Magnetic (2013) 14°W

No.	EXISTING BUILDINGS
1	Maintenance Building
2	Fuel Pumps/Tanks
3	Terminal Building/Hangar
4	Conventional Hangar
5	Electrical Vault
6	Conventional Hangar
7	T-Hangar (14 Unit)

LEGEND

Airport Property Line

Existing Facility ID No.

0 600 1,200

Scale in feet

CHA
2139 Silas Deane Highway, Suite 212 · Rocky Hill, CT 06067-2336
Main: (860) 257-4557 · www.chacompanies.com

DRAFT

EXISTING FACILITIES

Windham Aipport (IJD) Master Plan Update – Willimantic, Ct

PROJECT NO. 25874

DATE: MAR. 2014

FIGURE 1-3

Table 1-5 – IJD Runways

Runway Feature	Runway 9-27	Runway 18-36
Length	4,271’	2,799’
Width	100’	75’
Pavement Type	Asphalt – Good Condition	Asphalt – Good Condition
Pavement Strength	30,000 lbs. Single-Wheel	30,000 lbs. Single-Wheel
Gradient	0.0%	0.4%
Edge Lighting	MIRL	*
Approach Instrumentation	GPS, VOR-A	None
Approach Lighting	RWY 27 – REIL,**	None
Approach Aids	None	None
Runway Markings	Non-Precision	Visual

Source: FAA 5010-1 Form, CAA
*Runway 18-36 has MIRLs installed, but are not currently in use until obstruction clearance and reinstatement of obstruction lighting is completed
**Runway 27 has PAPIs installed, but the system is currently inoperative

1.3.1.2 Visual Aids and Lighting

An airport rotating beacon light universally indicates the location and presence of an airport. The Airport’s beacon is equipped with an optical system that projects two beams of light (one green and one white) 180 degrees apart. IJD’s rotating beacon is located southeast of the terminal area within an industrial park, accessible via Industrial Park Drive. Although located outside of the airport property boundary, the perimeter of the beacon contains security fencing and resides on property owned by the Town of Windham. The beacon site is higher in elevation than the airport property, thus avoiding the need for a tall tower and concealment by trees.

A segmented circle is a 100 foot in diameter circular area sited at an airport that aids pilots in locating the wind cone (i.e., windsock) and direction of the traffic pattern. IJD has a segmented circle located southeast of the intersection of Taxiway “A” and Taxiway “B” and adjacent to the main apron. A lighted wind cone is located in the center of the segmented circle, which provides pilots general wind direction and speed. The absence of traffic pattern indicators at IJD identifies that pilots are to use standard left-hand traffic for all runway ends.

The Runway 27 approach end is equipped with Runway End Identifier Lights (REILs), owned and maintained by the FAA, that provide identification of the runway approach end at night and during Instrument Meteorological Conditions (IMC). The REIL system consists of a pair of synchronized white flashing lights located on both sides of the runway threshold. Both Runway 9-27 and Runway 18-36 have Medium Intensity Runway Lights (MIRLs).

Although currently inoperative, the Runway 27 approach end also has a Precision Approach Path Indicator (PAPI), which provides pilots visual guidance on the approach decent. The CAA has expressed a desire to replace and readjust the Runway 27 PAPI and install PAPIs and REILs for both ends of Runway 9-27.

1.3.1.3 Runway Markings and Instrument Approach Procedures

Runway markings denote the type of approach (e.g., visual, non-precision, precision) associated with the runway. Currently, Runway 9-27 has non-precision markings in good condition and has GPS, or LP and LNAV, Instrument Approach Procedures (IAPs) for both the Runway 9 and Runway 27 approach ends. Runway 18-36 has basic, or visual, markings that are in good condition.

IJD also has a VOR-A IAP. A VOR-A is an IAP that has a final approach heading offset more than 30 degrees from the runway heading. As such, the VOR-A IAP at IJD is not associated with a specific runway approach end and requires aircraft to "circle to land". This procedure is not as accurate as the GPS approaches, but provides an alternative or backup IAP using ground-based radio equipment.

A localizer IAP for Runway 27 was once available at IJD. This localizer approach for Runway 27 is indefinitely out of service, and the equipment located near the Runway 9 approach end will likely be removed. The existing GPS IAPs have functionally replaced the localizer IAP.

Additionally there are Special take-off minimums/departure procedures and special alternative minimums that apply. Table 1-6 presents the IAPs at IJD along with minimum ceilings and visibilities.

Table 1-6 – IJD Instrument Approach Procedures

Instrument Approach Procedure	Category A		Category B		Category C	
	Minimum Ceiling (AGL)	Minimum Visibility (MI)	Minimum Ceiling (AGL)	Minimum Visibility (MI)	Minimum Ceiling (AGL)	Minimum Visibility (MI)
RWY 9 - RNAV (GPS)						
LP	400	1	400	1	400	1 ⅛
LNAV	700	1	700	1	700	1 ¾
Circling	700	1	700	1	800	2
RWY 27 - RNAV (GPS)						
LP	700	1	700	1	700	2
LNAV	800	1	800	1	800	2
Circling	800	1	800	1	800	2
VOR-A						
Circling	800	1	800	1 ¼	800	2 ¼

Source: FAA Terminal Procedures Publication
AGL – Above Ground Level (Feet)
MI – Statute Mile

1.3.1.4 Taxiways

Both Runway 9-27 and Runway 18-36 are served by full-length, parallel taxiways that provide aircraft access between the terminal area and each runway. Each parallel taxiway and taxiway connector is 35 feet wide and equipped with Medium Intensity Taxiway Lights (MITLs). Both Taxiway "A" and Taxiway "B" provide direct access to the main apron. Taxiway "C" provides access to the north apron located north of Runway 9-27. Each taxiway is constructed of bituminous concrete and is in good condition.

1.3.1.5 Aprons

As shown in Table 1-7, there are three main aprons at IJD. These aprons and associated tie-downs are owned by the CAA and leased directly to aircraft owners.

Table 1-7 – IJD Aircraft Parking Aprons

Apron Area	Tie-Downs	Surface Type	Approximate Size (SF)	Users
Main Apron	46	Asphalt	200,000	Based
	13	Turf	33,000	Based
Terminal Apron	7	Asphalt	112,000	Itinerant
North Apron	20	Asphalt	105,000	Based
	20	Turf	42,000	Based

Source: 1999 IJD Master Plan; 2011 IJD Pavement Management Plan

The main apron is located southeast of the Runway 9-27 and Runway 18-36 intersection. Aircraft can access the main apron via either Taxiway "A" from the north side or Taxiway "B" from the south side. The main apron provides 46 asphalt tie-downs and 13 turf tie-downs located south of the apron's pavement edge. According to the CAA, there are only a few available tie-downs currently available for lease on the main apron. The main apron, along with the north apron, was constructed on the site of the former third runway.

The terminal ramp is located east of the Runway 36 approach end. Aircraft can access the terminal apron via Taxiway "B". The terminal apron provides seven asphalt tie-downs.

The north ramp is located north of Runway 9-27. Aircraft can access the north ramp via Taxiway "C". The north ramp provides 20 asphalt tie-downs and 20 turf tie-downs. The north ramp was constructed as an aircraft overflow parking apron and as a location for additional airport facilities and tenants.

1.3.1.6 Automated Surface Observing System

An Automated Surface Observing System (ASOS) provides pilots with current meteorological conditions, such as wind speed, direction, and cloud ceiling. An ASOS at IJD is located adjacent to the segmented circle and the main apron. The ASOS is maintained by the National Weather Service (NWS). ASOS weather data is uploaded directly in the NWS database and available for public review.

1.3.2 Landside Facilities

1.3.2.1 Airport Buildings

There is currently one terminal building, two conventional hangars, one T-hangar, and one maintenance building located at IJD. The CAA owns all of the buildings and property on the Airport. Table 1-8 provides a list of the on-airport buildings at IJD.

Table 1-8 – IJD Buildings

Building	Size
Terminal/Hangar (#3)	
- Hangar	5,600 sq. ft.
- Office/End-Units	5,450 sq. ft.
Conventional Hangar (#4)	10,000 sq. ft.
T-Hangar (#7)	14 Stalls
T-Hangar End-Unit (#6)	3,600 sq. ft.
Maintenance Building (#1)	1,120 sq. ft.

Source: 1999 IJD Master Plan; 2012 IJD Business Plan

The terminal building/hangar is located adjacent to the terminal ramp and is directly accessible via Airport Road. The terminal building consists of a 5,600 square foot central hangar and two end-units located on the north and south ends of the building. The north end-unit is leased by Sensenich Propeller Service, a manufacture and servicer of aircraft propellers. Sensenich Propeller Service also leases the central hangar for their operations. The south end-unit is configured as office space and formally housed the Fixed Base Operator (FBO), Freedom Jets Aviation, which departed IJD in 2012. Since the departure of the FBO, the south end-unit has remained vacant. The terminal building/hangar is approaching 70 years in age.

The conventional hangar is located directly adjacent to and north of the terminal building/hangar and is also accessible via Airport Road. Although this hangar is mostly vacant, the CAA has indicated a light-sport aircraft manufacture has expressed interest in leasing the hangar for their operations. The conventional hangar is approximately 25 years in age.

The T-hangar is located north of the terminal building/hangar and conventional hangar, adjacent to the main apron. The vehicle entrance to the T-hangar is provided via an airport service road which connects onto Airport Road through a key coded security gate. The T-hangar has a total of 14 aircraft stalls (seven on the northwest side, six on the southeast side, and one on the east side). In addition, a 3,600 square foot conventional hangar is located on the west side of the T-hangar. The conventional hangar is leased by Windham Aircraft Repair, a part-time aircraft maintenance and repair operator.

The maintenance building, a Quonset hut style building, is located in the southern portion of the terminal apron, south of the terminal building/hangar. The maintenance building is primarily used for the storage of airport maintenance equipment. This building is nearing the age of its useful life.

1.3.2.2 Aircraft Refueling

Aircraft refueling is not currently available at IJD due to the recent removal of underground fuel storage tanks. The CAA intends to install two new 10,000 gallon aboveground fuel storage tanks in the same location by the end of 2014. Plans include both 100LL and Jet-A fuel, along with a credit card reader for self-fueling.

1.3.2.3 Vehicle Parking

Vehicle parking is provided near the entrance of the Airport for tenants, visitors, and employees. There are approximately 40 parking spaces in the lot adjacent to the terminal building/hangar, an additional 40 parking spaces behind the south T-hangar, and 11 parking spaces near the maintenance building.

In addition, there are 19 parking spaces located north of Runway 9-27 that provide tenants access to the north apron and turf tie-downs. Access to the north side of the airport is provided by a special access road located off Boston Post Road. This road runs through a portion of the Runway Object Free Area (ROFA) along the Mansfield Hollow Lake dike. The road is accessed through a key card activated gate. Currently, this gate is located in an undesirable location as it does not provide adequate clearance from State Route 6 while waiting for the gate to open or close.

1.4 Airport Security

Many GA airports have limited security procedures and rely heavily on the flying community to report suspicious or hazardous activity. As compared to other facilities, IJD is well equipped with security measures including security cameras, perimeter fencing, and key card and key code activated security gates. The Facility Requirements portion of this master plan will further discuss general recommendations regarding existing security practices and procedures in

accordance with the Transportation Security Administration's (TSA) *Airport Characteristics Measurement Tool*.

1.4.1 Perimeter Fencing and Security Gates

Perimeter fencing spans the majority of the Airport's boundary. Currently, fencing is not located along portions of the north side of the Airport. The perimeter fencing consists of a six foot, chain linked fence with angled barbed wire on top.

In addition, several key card and key code activated security gates provide pedestrian and vehicle access beyond the perimeter fencing to the airside portion of the Airport.

1.4.2 Security Cameras

Several security cameras are positioned at pedestrian and vehicle entry points throughout the Airport. Each camera feeds to both CAA offices located at the Hartford-Brainard Airport and the security/office trailer located near the southern portion of the terminal apron.

1.5 Utilities

The main terminal area contains utility services including: electricity, telephone, and water. The following providers offer utility service to the terminal area:

- Electric – Connecticut Light and Power Company
- Telephone – AT&T
- Water – Willimantic Water Department

Sanitary sewer lines do not currently feed into the terminal area. Therefore, there are three septic fields located within the terminal area; one south of the terminal building, one south of the maintenance building, and one west of the T-hangar. Although natural gas lines also do not currently feed into the terminal area, two aboveground LP tanks located east of the terminal building/hangar provide gas for the terminal building/hangar and two end-units.

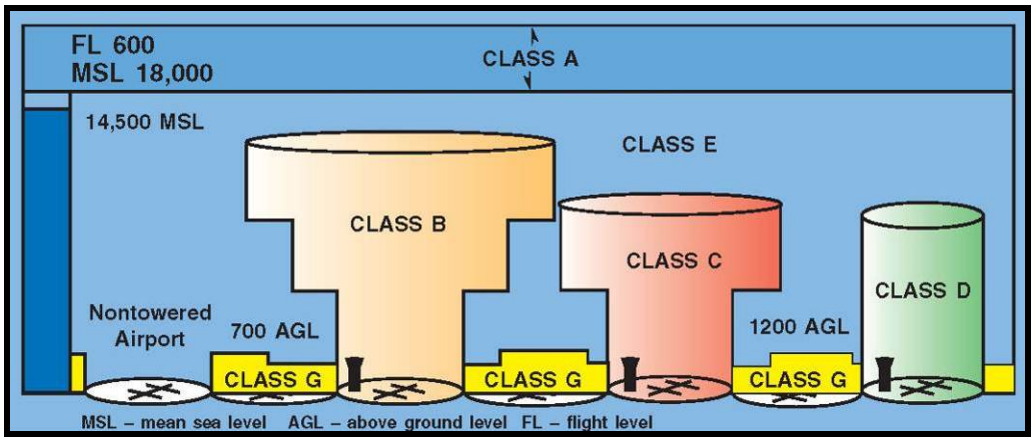
Additionally, the north area (i.e., north of Runway 9-27) does not currently have available utilities. However, utility underground conduits are located adjacent to the service road near the Runway 27 end. Current development plans include the leasing of 15 acres of airport property by Connecticut Light and Power Company to bring additional utilities to this area.

1.6 Airspace

There are two types of aircraft flight operations in the National Airspace System (NAS): Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). VFR operations rely on pilots maintaining visual separation from aircraft and objects and require minimum weather conditions for operation. Conversely, IFR operations rely on radar detection, instrument navigation, and separation by Air Traffic Control (ATC). IFR permits operations below VFR weather minimums (i.e., during IMC).

The NAS classifies airspace uses a lettering-system (e.g., Class A, B, C, D, E, and G) and includes controlled and uncontrolled areas of airspace. Class A airspace is a controlled airspace and is generally reserved for business and commercial aircraft as it begins at 18,000 feet above Mean Seal Level (MSL). Class A airspace requires operation under IFR and communication with ATC. The Class B, C, and D airspaces are also considered controlled airspace and are generally centered about larger airports. Communication with ATC must be established prior to entering the Class B, C, or D airspaces. The Class E and G airspaces encompass the majority of the NAS's airspace below 18,000 feet MSL. Class E airspace can be either controlled or uncontrolled, depending on the type of operation (i.e., VFR or IFR). Class G airspace is completely uncontrolled. Figure 1-4 depicts the NAS configuration.

Figure 1-4 – National Airspace System

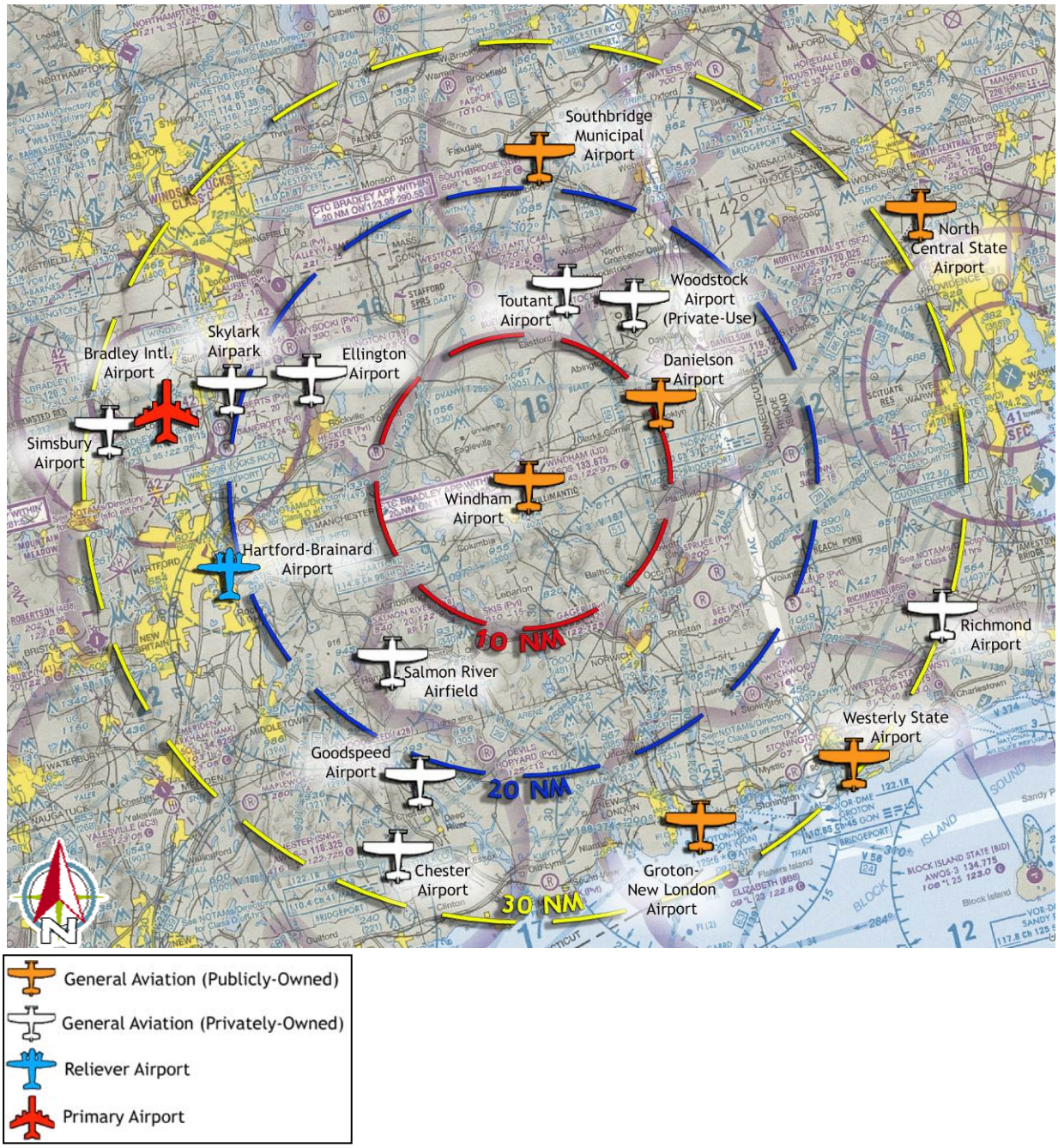


Source: FAA Aeronautical Information Manual

Busier airports generally have higher categories of control and associated airspace. For example, the Groton-New London Airport has a control tower and is within Class D airspace. Commercial airports, such as the Bradley International and the T.F. Green Airport, are within the Class C airspace. The nearest Class B airspace is located in the area surrounding the Boston-Logan International Airport.

IJD is a non-towered airport located within Class G airspace. Above IJD, Class E airspace begins at 700 feet Above Ground Level (AGL) and extends vertically to the Class A airspace at 18,000 feet MSL. This airspace configuration is denoted by the faded magenta circular area surrounding IJD on the FAA aeronautical sectional chart. Figure 1-5 depicts the IJD airspace, along with the airports within 30 miles of the airport.

Figure 1-5 – IJD Airspace



Source: FAA Sectional Aeronautical Chart (New York July 25, 2013); CHA

1.7 Existing Airport Activity Data

Although IJD is not serviced by scheduled commercial flights, the Airport is active with several different types of aviation activity from both public and private users. The majority of the activity is generated by light, private, recreational, and training aircraft utilizing single- and multi-engine piston, turbo-prop, and jet aircraft.

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. According to the 2013 FAA Terminal Area Forecast (TAF), there were approximately 14,250 annual operations at IJD in 2012. Of that total, local operations comprised approximately 72 percent. Local flights are conducted mostly by based aircraft, and primarily include single- and multi-engine piston aircraft. Itinerant operations (i.e., those arriving from outside of the local area) are conducted by a mix of based and transient aircraft.

The number of based aircraft at an airport is used to determine the need for aircraft hangar space, apron area, and other related facilities. Based aircraft include those owned by individuals, businesses, or organizations that are stored at the Airport on a regular basis. According to state registration records provided by the CAA, IJD has a total of 68 based aircraft. Of that total there are 67 are single-engine piston aircraft and one multi-engine piston aircraft. Although there are no jet aircraft currently based at IJD, the Airport has previously accommodated many small- to mid-sized jet aircraft . Table 1-9 provides a depiction of the types of aircraft based at IJD along with aircraft that frequently utilize the Airport.

Table 1-9 – Aircraft Utilizing IJD

Piston	Turbo-Prop	Jet
Single-Engine Piston  Piper Archer	*Single-Engine Turbo-Prop*  Pilatus PC-12	*Small-Sized Jet*  Cessna Citation II
Multi-Engine Piston  Piper Aztec	*Multi-Engine Turbo-Prop*  King Air 200	*Mid-Sized Jet*  Cessna Citation XLS

Chapter 2
Forecasts of Aviation Demand

2 Forecasts of Aviation Demand

Projecting the future demand of aviation activity at an airport is one of the most important and vital steps in the airport master planning process. The forecasts of aviation activity presented in this section will serve as the basis for effective decision-making, airport development guidance, and facility recommendations in subsequent sections of the Windham Airport (IJD) Master Plan Update. The projections help guide airport development over the 20-year planning horizon by providing a general timeline of when future developments will be needed. Prior to use in the master planning effort, the recommended forecasts are submitted to the Federal Aviation Administration (FAA) for review and approval. Once approved, the forecasts are then used to perform the demand/capacity analysis and to prepare a development plan for this master plan update.

Forecasts are typically prepared for short-term (1-5 years), intermediate-term (6-10 years), and long-term (11-20 years) intervals. Short-term forecasts are used to identify deficiencies that need immediate attention. Medium-term forecasts are typically used in planning foreseeable capital improvement needs. Long-term forecasts provide more generalized information and are used for space and land use planning to accommodate potential future demand.

2.1 Airport Role

According to the Federal Aviation Administration's (FAA) 2013 – 2017 *National Plan of Integrated Airport Systems (NPIAS) Report*, IJD is designated with a service level of GA and is classified with a role of "local". As defined in the NPIAS, a local airport, "Supplements local communities by providing access to local and regional markets. These airports have moderate levels of activity with some multi-engine propeller aircraft. These airports average about 33-based propeller-driven aircraft and no jets." Additionally, both the 2006 Connecticut State Airport System Plan (CTSASP) and the New England Regional Airport System Plan (NERASP) also list IJD as a GA facility.

2.2 Forecasting Data Sources

Aviation activity forecasting is not considered an exact science and, as such, can be difficult to project future airport demand based on historic facility information alone. There are many uncontrollable variables that can affect the true outcome of activity levels throughout the forecast period. Therefore, several data resources were reviewed to ensure regional, national, and industry trends that can affect future activity at IJD were incorporated into the forecast methodologies. Guidance provided by the FAA in Advisory Circular (AC) 150-5070-6B, *Airport Master Plans* was also used to identify suggested forecast methodologies. The following provides a brief

overview of each data resource and how the information was applied to the aviation activity forecasts for IJD:

- **The FAA Aerospace Forecast*, Fiscal Years (FY) 2013-2033*** provides an overview of aviation industry trends and expected growth for each aviation market segment (e.g., GA activity, air taxi operations, commercial and cargo carrier operations, etc.). The FAA Aerospace Forecast also provides projected fleet mix operations by aircraft by type (e.g., single- and multi-engine piston, turboprop, turbine, etc.). National growth rates are provided over a 20-year forecast horizon. Subsequent forecasts utilized the FAA Aerospace Forecasts to develop potential activity scenarios along with potential fleet mix projections.

- **GCR & Associates, Inc.** is a firm contracted by the FAA to design, develop, and manage facility information for the nation's airports. GCR also provides airport inspections and updates to the FAA's Airport Master Record (5010-1) form. Historical flight plan activity for IJD was obtained through GCR in order to formulate assumptions regarding historic and future airport activity and aircraft fleet mix.

- **Woods & Poole Economics, Inc.** specializes in developing long-term economic and demographic projections for counties, Metropolitan Statistical Areas (MSAs), states, and the United States as a whole. Historical and projected socioeconomic data, obtained from Woods & Poole, was used to verify and modify, as necessary, the FAA forecast factors based on local conditions within the IJD service area.

- **Connecticut Airport Authority (CAA)** owns and operations IJD. As such, information obtained from the CAA, such as based aircraft and historical airport activity, was used to assist in formulating assumptions for various forecast methodologies.

In addition to the listed data resources, forecasts prepared for IJD as part of the 2006 Connecticut State Airport System Plan (CTSASP) were reviewed to gauge how historical projections compared against present-day conditions. The CTSASP was developed, however, prior to the onset of the recent economic recession. Consequently, the 2006 forecasts did not project aviation and socioeconomic activity trends post-recession. As a result, many of the forecasts presented in the CTSASP are considered optimistic and were not used as part of the following forecasts.

2.3 Forecast Categories

Aviation demand forecasts are prepared for a variety of aviation categories. These categories are determined based on the type and level of activity expected at an airport over the planning horizon. They can also vary in relevance depending on the size and category of an airport and the

basic objectives of a specific master plan. The forecasts prepared for IJD include the following categories:

- **Based Aircraft:** Based aircraft are defined as aircraft that use a specific airport as a home base. These are the aircraft that typically rent tie-down or hangar space for extended periods of time and, are registered as based at that specific airport, and (depending on state and local regulations) pay local user taxes to that jurisdiction. It is important to note that the number of based aircraft at a most GA airports is, perhaps, the most important indicator of growth as based aircraft most directly affect the daily aircraft activity.
- **Operations:** An operation can be defined as either a take-off or landing of an aircraft. Operations are typically segregated into three sectors based on the aircraft/operator's purpose and operating certifications. These sectors include:
    - **General aviation (GA)** encompasses all other operations not including air carrier, air taxi and commuter, and military. These operations can include: personal and recreational flying, emergency flight response, search and rescue operations, crop-dusting, and sightseeing.
    - **Air taxi** operations are considered itinerant GA operations within the forecast. These operations refer to carriers that operate aircraft with 60 or fewer seats or cargo on-demand operations.
    - **Military** includes operations conducted by the nation's military forces. Note that military activity within in the IJD TAF is nominal and remains static throughout the forecast. Therefore, military is assumed to be contained within total itinerant operations and is not specifically forecasted within this report.

Based aircraft and operations are further categorized into a fleet mix, which is a breakdown of aircraft by specific type. Aircraft fleet mix typically refers to the aircraft power plant, such as: single-engine piston; multi-engine piston; turboprop; jet; and rotorcraft/helicopter. In some analyses it can also refer to an aircraft's Airport Reference Code (ARC) (e.g. B-II). Additional operations forecasts conducted as part of this forecasting effort include: local/itinerant operations, peak activity, and annual instrument approaches. A discussion of the critical aircraft will also be conducted.

2.4 Baseline Data

Prior to developing forecasts of aviation activity, it is important to first identify a baseline of current airport activity to be used as a datum at which all forecasts begin. To identity baseline activity at IJD, two sources were used: current state aircraft registration records, provided by the CAA, for based aircraft and the 2013 FAA Terminal Area Forecast (TAF) for operations. It is important to note that while state aircraft registration records were used as the baseline for based aircraft, the TAF projections were used as the comparative benchmark.

The TAF is a detailed economic model, prepared by the FAA, which provides historical and projected growth of passenger enplanements, operations, and GA aircraft activity. The national level TAF is a cumulative total of all U.S. airport activity. These projections account for national economic conditions and trends within the aviation industry as a whole. From the national forecasts, airport specific projections are derived that reflect regional market and socioeconomic conditions and anticipated demand. In this relatively top-down approach, specific airport development and marketing actions do not influence FAA projections. Table 2-1 provides a summary of the most recent (2013) TAF developed by the FAA for IJD.

Table 2-1 – 2013 IJD Terminal Area Forecast

	Itinerant Operations				Local Operations				
Year	Air Taxi & Commuter Ops.	GA Ops.	Military Ops.	Total	Civil Ops.	Military Ops.	Total	Total Ops.	Based Aircraft
Historic:									
2002	475	7,358	307	**8,175**	22,515	0	22,515	**30,690**	**64**
2003	475	7,450	250	**8,175**	22,515	0	22,515	**30,690**	**64**
2004	475	7,450	250	**8,175**	22,515	0	22,515	**30,690**	**64**
2005	475	7,450	250	**8,175**	22,515	0	22,515	**30,690**	**67**
2006	475	7,450	250	**8,175**	22,515	0	22,515	**30,690**	**67**
2007	475	7,450	250	**8,175**	22,515	0	22,515	**30,690**	**67**
2008	475	7,450	250	**8,175**	22,515	0	22,515	**30,690**	**67**
2009	48	4,950	24	**5,022**	15,000	0	15,000	**20,022**	**43**
2010	48	4,950	24	**5,022**	15,000	0	15,000	**20,022**	**67**
2011	250	5,800	200	**6,250**	8,000	0	8,000	**14,250**	**67**
2012	250	5,800	200	**6,250**	8,000	0	8,000	**14,250**	**67**
2002-2012 AAGR	**-6.2%**	**-2.4%**	**-4.2%**	**-2.7%**	**-9.8%**	**0.0%**	**-9.8%**	**-7.4%**	**0.5%**
Projected:									
2013	250	5,800	200	**6,250**	8,000	0	8,000	**14,250**	**67**
2018	250	5,800	200	**6,250**	8,000	0	8,000	**14,250**	**67**
2023	250	5,800	200	**6,250**	8,000	0	8,000	**14,250**	**67**
2028	250	5,800	200	**6,250**	8,000	0	8,000	**14,250**	**67**
2033	250	5,800	200	**6,250**	8,000	0	8,000	**14,250**	**67**
2013-2033 AAGR	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: 2013 IJD Terminal Area Forecast
Note: AAGR – Average Annual Growth Rate

According to the IJD TAF, the projected total number of operations in 2012 was 14,250. Of that total, 13,800 were classified as GA operations, 250 were classified as air taxi and commuter operations, and 200 were classified as military operations. Although the IJD TAF indicates that total operations have declined since the onset of the recent economic recession, total itinerant operations have increased slightly since 2010.

When using the FAA methodology to develop the TAF, a further decline in overall operations would typically be forecasted. Rather than depicting a gradual decline, however, the FAA

provides a static forecast that provides an outlook if the Airport's activity remains as it is currently.

2.4.1 Baseline Based Aircraft Summary

The existing based aircraft count, provided by the CAA, serves as the based aircraft baseline for this forecast. Table 2-2 summarizes the existing based aircraft fleet by aircraft type for the Airport. There are currently 67 single-engine piston aircraft and one multi-engine piston aircraft based at IJD.

Table 2-2 – IJD Baseline Based Aircraft

Aircraft Category	Aircraft Count
Single-Engine Piston	67
Multi-Engine Piston	1
Turboprop	-
Jet	-
Total	**68**

Source: Connecticut State Registration Records, CAA

2.4.2 Baseline Operations Summary

The 2012 operations reported in the IJD TAF serve as the operations baseline for this forecast. Table 2-3 summarizes the Airport's baseline operations (local and itinerant) by type.

Table 2-3 – IJD Baseline Operations

Operations Category	Operations
GA Local	8,000
GA Itinerant	5,800
Air Taxi Itinerant	250
Military Itinerant	200
Total	**14,250**

Source: 2013 IJD TAF

2.5 Aviation Activity Forecasts

The forecast of aviation activity presented in this section consists of a projection of based aircraft and operations through the 2033 planning horizon. As discussed previously, the existing based aircraft provided by the CAA and the 2012 operations reported in the 2013 IJD TAF were used as the baseline for this forecasting effort. Note that each forecast was developed assuming unconstrained conditions.

This section will consist of an explanation and execution of the following data and forecast methodologies for based aircraft and aircraft operations:

- State, Regional, and National Market Share Forecasts
- TAF Based Population Econometric Forecasts

- Operations per Based Aircraft Forecasts
- Historic Trend (Time-Trend) Forecasts

Per FAA guidance, activity forecasts developed for an airport should be within 10 percent of the data reported in TAF for the five-year forecast period, and within 15 percent of the 10-year forecast period. If projected activity data is greater than these percentages for each forecast period, additional justification is generally required for forecast approval from the FAA.

2.5.1 Market Share Forecasts

The market share forecast methodology assumes that based aircraft and airport operations will grow at a proportional rate as compared to that of the state, region, or nation, thus maintaining its relative share of aircraft activity throughout the forecast period.

To develop an understanding of how IJD compares to state, regional, and national growth trends, three market share forecasts were developed; a state GA market share forecast, an FAA New England regional market share forecast, and a national market share forecast. Each market share forecast was developed using historical TAF growth rates for based aircraft and operations. The growth rates were then applied to the IJD baseline data. The following provides a brief description and summary of each market share forecast.

State GA Market Share: The State GA market share forecasts examined the historical aviation activity levels at the GA airports within the State of Connecticut. The two primary airports, however, (i.e., Bradley International and Tweed-New Haven International) were not included within this analysis in order to develop a more comparative historical outlook of airports serving mostly GA activity. Table 2-4 provides a summary of the State GA market share forecasts.

Table 2-4 – State GA Market Share Forecasts

Year	Based Aircraft	Operations
2013	68	14,110
2018	72	14,300
2023	76	14,500
2028	81	14,710
2033	86	14,920
2013-2033 Growth	**26.4%**	**5.7%**

Source: CHA 2013

FAA New England Region Market Share: The FAA New England region market share forecasts examined the historical aviation activity levels within the FAA's New England Region. The FAA New England Region includes the states of: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. Although this forecast provided a broader market share, it also included larger airports located within each state. As a result, the market share percentage

of aviation activity for IJD was slightly less than that calculated for the GA airports within the State of Connecticut. Table 2-5 provides a summary of the FAA New England region market share forecasts.

Table 2-5 – FAA New England Region Market Share Forecasts

Year	Based Aircraft	Operations
2013	68	14,080
2018	71	14,160
2023	75	14,260
2028	78	14,360
2033	82	14,470
2013-2033 Growth	**21.4%**	**2.8%**

Source: CHA 2013

National Market Share: The national market share forecasts examined historical aviation activity levels at the national level to project future activity at IJD. National market share forecasts do not account for regional fluctuations in the local market or incorporate individual considerations into the forecast (e.g., excluding large airports from the total share). As a result, national market share forecasts are generally considered less reliable for GA airports. Table 2-6 provides a summary of the national market share forecasts.

Table 2-6 – National Market Share Forecasts

Year	Based Aircraft	Operations
2013	68	14,270
2018	71	14,540
2023	74	14,840
2028	77	15,160
2033	80	15,500
2013-2033 Growth	**19.1%**	**8.6%**

Source: CHA 2013

2.5.2 TAF Based Population Econometric Forecasts

The TAF based population econometric forecasts adjusted the IJD TAF projections to account for population growth within the IJD service area. As discussed previously in the Chapter 1, *Inventory of Existing Conditions*, according to Woods & Poole Economics, the population growth rate within the IJD service area is projected to outpace that anticipated for the State of Connecticut. Additionally, the IJD service area growth rate is only anticipated to be one-tenth of a percent less than that projected for the nation by the end of the forecast period. Therefore, to account for the above-average socioeconomic growth within the IJD service area, a population adjustment percentage for each year was calculated and applied to the baseline data for each forecast year. Table 2-7 provides a summary of the TAF based population econometric forecasts.

Table 2-7 – TAF Based Population Econometric Forecasts

Year	Based Aircraft	Operations
2013	67	14,300
2018	68	14,560
2023	70	14,820
2028	71	15,060
2033	72	15,290
2013-2033 Growth	**6.9%**	**6.9%**

Source: CHA 2013

2.5.3 Operations per Based Aircraft & FAA Fleet Mix Forecasts

Operations per based aircraft (OPBA) forecasts involve a relatively straightforward forecasting methodology which assumes a total number of annual operations conducted by each aircraft based at the Airport. This methodology is often used at non-towered airports, such as IJD, where historical annual operations are not as easily obtainable. According to FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, it is acceptable to assume 250 OPBA for a typical GA airport, 350 OPBA for a busier GA airport with more itinerant traffic, and 450 OPBA for busy reliever airports.

To develop OPBA forecasts for IJD, the following two components were developed:

- **Future Based Aircraft:** The first component of this methodology involved developing a forecast of based aircraft. To accomplish this task, annual fleet mix growth projections provided in the FAA Aerospace Forecast were used to incrementally increase the number of based aircraft throughout the forecast period. Table 2-8 presents the average annual growth rates (AAGRs) for each aircraft category as provided by the FAA.

Table 2-8 – FAA Fleet Mix Projection

Period	Single-Engine Piston	Multi-Engine Piston	Turbo-Prop	Jet	Rotorcraft
2013-2017 AAGR	-0.2%	-0.3%	1.3%	2.7%	2.5%
2018-2022 AAGR	-0.1%	-0.6%	1.4%	2.6%	2.1%
2023-2027 AAGR	0.1%	-0.6%	1.4%	2.9%	2.0%
2028-2033 AAGR	0.4%	-0.5%	1.4%	3.3%	1.9%

Source: FAA Aerospace Forecast, *FY 2013 – 2033*
Note: AAGR – Average Annual Growth Rate
Note: The experimental and sport aircraft categories have been combined with the single-engine piston category

Since the existing based aircraft fleet mix at IJD is comprised mostly of single-engine piston aircraft, this methodology yielded a modest increase from 68 to 69 aircraft by 2033. Note that a fleet mix breakdown for IJD is presented in subsequent sections of this forecast. Table 2-9 presents the based aircraft forecast using the FAA fleet mix projections.

Table 2-9 – Based Aircraft Forecast using the FAA Fleet Mix

Year	Based Aircraft
2013	68
2018	67
2023	67
2028	68
2033	69
2013-2033 Growth	**1.9%**

Source: CHA 2013

- **Future OPBA:** To supplement the guidance provided in Order 5090.3C, the second component of this methodology involved calculating the existing OPBA for IJD. The existing OPBA for IJD (210) was calculated using the IJD TAF and carried forward as the OPBA baseline. This baseline was then incrementally increased throughout the forecast period from 210 to 269, which is the calculated OPBA for the GA airports within the State of Connecticut. In addition to the two primary airports mentioned previously, the Groton-New London Airport was not included in the Connecticut GA airport OPBA count due to the relatively high number of annual operations experienced at that facility.

Using the discussed methodology, an OPBA positive growth forecast, an adjusted OPBA forecast, and an OPBA negative growth forecast was developed for IJD. The following is a description of each:

OPBA Positive Growth: To develop the OPBA positive growth forecast, the projected OPBA for IJD was applied to the based aircraft forecast using the FAA fleet mix projections. Table 2-10 provides a summary of the OPBA positive growth forecasts.

Table 2-10 – OPBA-Positive Growth Forecasts

Year	OPBA	Based Aircraft*	Operations
2013	210	68	14,280
2018	225	67	15,080
2023	240	67	16,080
2028	255	68	17,340
2033	269	69	18,560
2013-2033 Growth	**28.1%**	**1.9%**	**30.0%**

Source: CHA 2013

*Based aircraft derived using FAA fleet mix projections

OPBA & FAA Fleet Mix (Adjusted): There are currently three privately-owned airports within the 20-mile IJD service area that are open to the public. Because of land development pressures, property taxes, high maintenance costs and other financial issues, privately-owned airports have been closing throughout the nation, and Connecticut is not immune to such airport closures. The three privately-owned airports include: the Ellington Airport, the Toutant Airport, and the

Salmon River Airfield. In addition to these airports, the Woodstock Airport is within this area, but is private-use.

With this information, this forecast scenario examined the potential relocation of based aircraft if the privately-owned airports within the 20-mile IJD service area close or consolidate within the planning period. To accomplish this task, it was assumed that a total of approximately 40 aircraft are based at these airports.[3] Based on the proximity of these airports in relation to IJD and other publicly-owned airports, such as the Danielson Airport and the Southbridge Municipal Airport (located in Massachusetts), it was further assumed IJD has the propensity to attract 15 (30 to 40 percent) of the displaced aircraft. IJD is well equipped to accommodate additional based aircraft and has ample space for additional hangar units. The 15 additional aircraft were incrementally added to the FAA Fleet Mix forecast presented in Table 2-9.

Similar to the OPBA positive growth forecast presented in Table 2-10, the number of based aircraft for each year was then applied to the projected OPBA for IJD to develop a projected number of operations. Table 2-11 provides a summary of the OPBA & FAA Fleet Mix adjusted forecasts.

Table 2-11 – OPBA & FAA Fleet Mix (Adjusted)

Year	OPBA	Based Aircraft	Operations
2013	210	68	14,280
2018	225	72	16,200
2023	240	76	18,240
2028	255	80	20,400
2033	269	84	22,600
2013-2033 Growth	**28.1%**	**23.5%**	**57.9%**

Source: CHA 2013

OPBA Negative Growth: The OPBA negative growth forecast examined the historical OPBA AAGRs for the GA airports within the State of Connecticut (minus the Groton-New London Airport) and calculated the average of the growth rates. This average resulted in a negative historical OPBA (-1.1 percent). This percentage was then applied to the IJD baseline OPBA (210) throughout the forecast period. Using the FAA fleet mix of based aircraft, this forecast yielded a negative growth in aviation activity at the Airport. Table 2-12 provides a summary of the OPBA negative growth forecasts.

[3] Although the Salmon River Airfield is open to the public, it is also home to a fly-in community and was not included in the forecast scenario.

Table 2-12 – OPBA-Negative Growth

Year	OPBA	Based Aircraft	Operations
2013	210	68	14,280
2018	200	67	13,400
2023	190	67	12,730
2028	180	68	12,240
2033	170	69	11,730
2013-2033 Growth	**-19.0%**	**1.5%**	**-17.9%**

Source: CHA 2013

2.5.4 Historic Trend (Time-Trend) Forecast

A historic trend forecast is a simple time-series model that relies on extrapolating historical based aircraft and operations growth rates, specific to the airport, and projecting them forward.

For both the based aircraft and operations forecasts, historical AAGRs derived from the IJD TAF were applied to the baseline data. The IJD TAF reported a slight increase in based aircraft from 64 aircraft in 1997 to 67 aircraft in 2012 (0.5 percent growth). Therefore, the historic trend based aircraft forecast resulted in a positive growth in based aircraft throughout the forecast period from 68 to 75. Conversely, since the IJD TAF reported a negative AAGR for historic operations (-7.4 percent), the historic trend operations forecast resulted in a further decline of annual operations by the end of the forecast period.

Historic trend forecasts can provide a plausible outlook if an airport has experienced steady historical trends. IJD, however, has experienced a relatively significant decline in aviation activity in recent years. In addition to a recent national economic decline in GA activity, the decline in aviation activity at IJD is also likely the result of a loss of airport services with the departure of the FBO. The FBO provided a variety of airport services including: aircraft charter service, flight instruction, aircraft fueling, and a pilot lounge area. As a result of the decline, the historic trend forecasts were not carried forward.

2.5.5 Summary of Forecasts

The discussed based aircraft and operations forecasts were derived using a variety of forecasting methodologies and incorporated various external data resources to further refine the projected activity data at IJD. Table 2-13 and Table 2-14 present each forecast.

Table 2-13 – Based Aircraft Forecast Summary

Year	IJD TAF	State GA Market Share	FAA New England Market Share	National Market Share	TAF Based Population Econometric	FAA Fleet Mix	FAA Fleet Mix (Adjusted)
2012	*67*	*68*	*68*	*68*	*68*	*68*	68
2013	67	68	68	68	67	68	68
2014	67	69	68	68	67	68	69
2015	67	69	69	69	68	68	70
2016	67	70	70	69	68	68	70
2017	67	71	70	70	68	67	71
5-Year Growth Above TAF	-	**6.0%**	**4.8%**	**4.4%**	**1.8%**	**0.7%**	**6.0%**
2018	67	72	71	71	68	67	72
2019	67	73	72	71	69	67	73
2020	67	74	72	72	69	67	74
2021	67	75	73	72	69	67	74
2022	67	75	74	73	69	67	75
2023	67	76	75	74	70	67	76
10-Year Growth Above TAF	-	**14.2%**	**11.2%**	**10.1%**	**4.0%**	**0.4%**	**13.4%**
2024	67	77	75	74	70	67	77
2025	67	78	76	75	70	67	78
2026	67	79	77	76	70	67	78
2027	67	80	77	76	71	68	79
2028	67	81	78	77	71	68	80
15-Year Growth Above TAF	-	**20.9%**	**16.7%**	**14.9%**	**5.7%**	**1.2%**	**19.4%**
2029	67	82	79	78	71	68	81
2030	67	83	80	78	71	68	82
2031	67	84	81	79	71	69	82
2032	67	85	81	80	72	69	83
2033	67	86	82	80	72	69	84
20-Year Growth Above TAF	-	**27.8%**	**22.5%**	**20.1%**	**7.3%**	**3.3%**	**25.4%**
2013 - 2033 AAGR	-	**1.2%**	**1.0%**	**0.9%**	**0.3%**	**0.1%**	**1.1%**

Source: 2013 IJD Terminal Area Forecast, FAA Aerospace Forecast, CHA 2013
Note: AAGR – Average Annual Growth Rate

Table 2-14 – Operations Forecast Summary

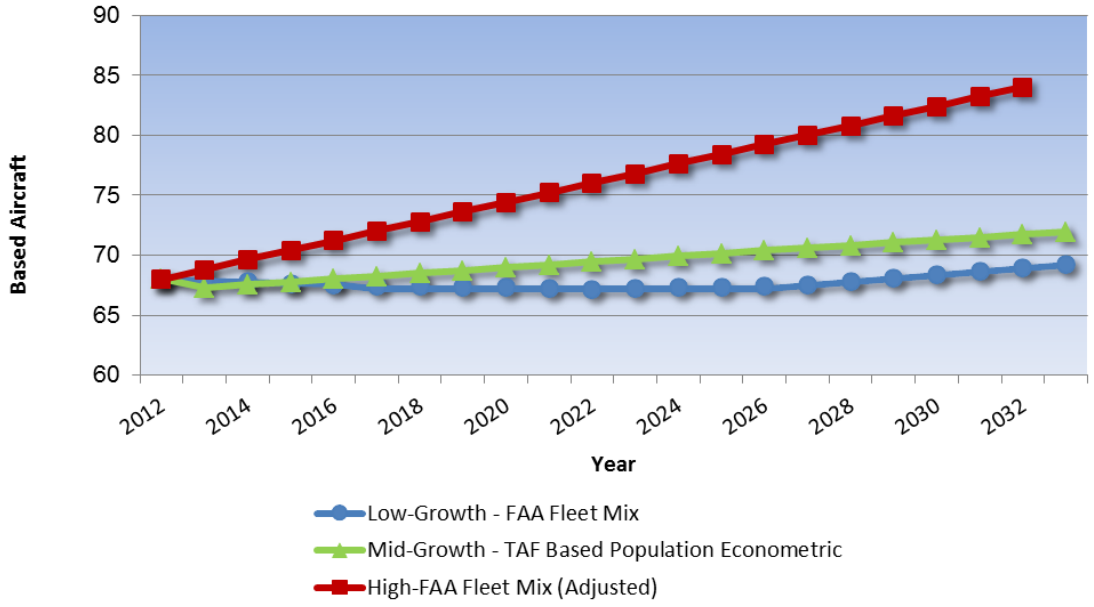
Year	IJD TAF	State GA Market Share	FAA New England Market Share	National Market Share	TAF Based - Population Econometric	OPBA - Positive Growth	OPBA - Adjusted	OPBA - Negative Growth
2012	*14,250*	*14,250*	*14,250*	*14,250*	*14,250*	*14,250*	*14,250*	*14,250*
2013	14,250	14,110	14,080	14,270	14,300	14,280	14,280	14,280
2014	14,250	14,150	14,090	14,320	14,360	14,480	14,700	14,140
2015	14,250	14,180	14,110	14,380	14,410	14,690	15,120	14,010
2016	14,250	14,220	14,130	14,430	14,460	14,890	15,330	13,870
2017	14,250	14,260	14,150	14,490	14,510	14,870	15,760	13,740
5-Year Growth Above TAF	-	**0.1%**	**-0.7%**	**1.7%**	**1.8%**	**4.4%**	**10.6%**	**-3.6%**
2018	14,250	14,300	14,160	14,540	14,560	15,080	16,200	13,400
2019	14,250	14,340	14,180	14,600	14,610	15,280	16,640	13,270
2020	14,250	14,380	14,200	14,660	14,670	15,480	17,090	13,130
2021	14,250	14,420	14,220	14,720	14,720	15,680	17,320	13,000
2022	14,250	14,460	14,240	14,780	14,770	15,880	17,780	12,860
2023	14,250	14,500	14,260	14,840	14,820	16,080	18,240	12,730
10-Year Growth Above TAF	-	**1.8%**	**0.1%**	**4.1%**	**4.0%**	**12.8%**	**28.0%**	**-10.7%**
2024	14,250	14,540	14,280	14,900	14,870	16,280	18,710	12,600
2025	14,250	14,580	14,300	14,960	14,910	16,480	19,190	12,460
2026	14,250	14,630	14,320	15,030	14,960	16,680	19,420	12,330
2027	14,250	14,670	14,340	15,090	15,010	17,140	19,910	12,190
2028	14,250	14,710	14,360	15,160	15,060	17,340	20,400	12,240
15-Year Growth Above TAF	-	**3.2%**	**0.8%**	**6.4%**	**5.7%**	**21.7%**	**43.2%**	**-14.1%**
2029	14,250	14,750	14,380	15,230	15,110	17,540	20,900	12,100
2030	14,250	14,800	14,400	15,290	15,150	17,750	21,400	11,970
2031	14,250	14,840	14,420	15,360	15,200	18,220	21,650	11,830
2032	14,250	14,880	14,440	15,430	15,250	18,420	22,160	11,870
2033	14,250	14,920	14,470	15,500	15,290	18,560	22,600	11,730
20-Year Above TAF	-	**4.7%**	**1.5%**	**8.8%**	**7.3%**	**30.2%**	**58.6%**	**-17.7%**
2013 - 2033 AAGR	-	**0.3%**	**0.1%**	**0.4%**	**0.3%**	**1.3%**	**2.3%**	**-1.0%**

Source: 2013 IJD Terminal Area Forecast, FAA Aerospace Forecast, CHA 2013
Note: AAGR – Average Annual Growth Rate

2.5.6 Preferred Forecasts

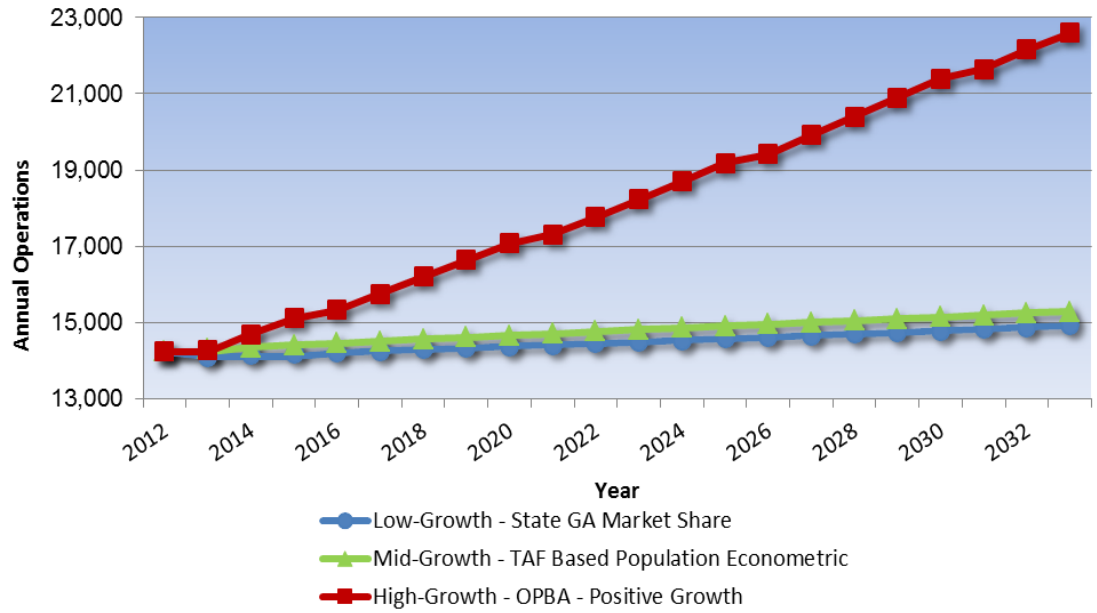
After review of each forecast, high-, mid-, and low-growth forecasts were selected for both based aircraft and operations at IJD. From the three growth scenarios, a preferred forecast was then selected for airfield and facility planning purposes.

Figure 2-1 – Low-, Mid-, and High-Growth Based Aircraft Forecasts



Source: CHA 2013

Figure 2-2 – Low-, Mid-, and High-Growth Operations Forecasts



Source: CHA 2013

With a strong projected population, enhanced airfield capabilities over the other GA airports within its service area, land development potential, and the ability to continue accommodating small-, to mid-size corporate aircraft, IJD is well poised to gradually experience an increase in airport activity throughout the forecast period. However, recent declines in aviation activity in conjunction with a slow national economic recovery suggest that growth in aviation activity at IJD will likely be gradual and modest. Therefore, the mid-growth forecast scenarios for both based aircraft and operations (i.e., TAF based econometric) will be carried forward as the preferred forecasts and used to develop the following supplemental forecasts.

2.6 Local/Itinerant Operations

The percentage of local and itinerant operations at GA airports can vary greatly by airport location, size, and type of activity. Rural airports that mostly experience activity by based aircraft generally have a greater percentage of local operations while airports nearby larger metropolitan areas or tourist destinations may have a greater percentage of itinerant operations. Although IJD currently has a greater percentage of local operations (56 percent), according to the IJD TAF, the local/itinerant percentage has shifted in recent years (i.e., decreasing local and increasing itinerant). This shift is likely the result a national decline in recreational flying. As such, the local/itinerant forecast for IJD assumes the operational split will continue to balance as the Airport experiences a relatively static forecast of piston aircraft activity and a gradual increase in turboprop and jet activity.

Table 2-15 provides a summary of the forecast local/itinerate operations for IJD throughout the forecast period.

Table 2-15 – Local/Itinerant Operations

Year	Local Operations	Local Percent	Itinerant Operations	Itinerant Percent	Total Operations
2013	8,010	*56.0%*	6,290	*44.0%*	**14,300**
2018	7,940	*54.5%*	6,620	*45.5%*	**14,560**
2023	7,850	*53.0%*	6,970	*47.0%*	**14,820**
2028	7,760	*51.5%*	7,300	*48.5%*	**15,060**
2033	7,650	*50.0%*	7,650	*50.0%*	**15,290**

Source: CHA 2013

2.7 Aircraft Fleet Mix

The mix of aircraft using an airport, referred to as the aircraft fleet mix, determines the type and size of facilities required to accommodate airport activity. Fleet mix forecasts for both based aircraft and total operations were developed for IJD.

2.7.1 Based Aircraft Fleet Mix

Using assumptions from the TAF based population econometric forecasts along with FAA projections, a fleet mix forecast for IJD is presented in Table 2-8. As shown, the based aircraft fleet mix forecast for IJD assumes the addition of one single-engine piston aircraft, one multi-engine, and two turboprop aircraft by the end of the forecast period. Note that if nearby airport closures occur or additional aircraft storage facilities are constructed at IJD, the high-growth based aircraft forecast may provide a slightly different fleet mix.

Table 2-16 – Based Aircraft Fleet Mix Forecast

Year	Single-Engine Piston	Multi-Engine Piston	Turboprop	Jet	Based Aircraft
2013	67	1	-	-	**68**
2018	66	1	-	-	**67**
2023	67	2	1	-	**70**
2028	67	2	2	-	**71**
2033	68	2	2	-	**72**

Source: CHA 2013

2.7.2 Operations Fleet Mix

The operations fleet mix forecast was developed using historical flight plan data obtained from GCR & Associates. This data was then projected forward using the FAA projected fleet mix growth rates presented in Table 2-8. Table 2-17 presents the operations fleet mix for IJD.

Table 2-17 – Operations Fleet Mix Forecast

Year	Single-Engine Piston	Multi-Engine Piston	Turboprop	Jet	Total Operations
2013	13,490	560	100	150	**14,300**
2018	13,720	540	130	170	**14,560**
2023	13,920	520	170	210	**14,820**
2028	14,100	510	200	250	**15,060**
2033	14,270	490	240	290	**15,290**

Source: CHA 2013

2.8 Peak Activity

It is important to identify peak periods of airport activity to ensure adequate facilities and infrastructure are available during times when the airport experiences its maximum use. For the purposes of this forecast, historic flight plan activity (2009 through 2012) for IJD obtained from GCR & Associates was used to develop the following peak periods:

- **Peak Month:** It is estimated that approximately 12 percent of peak month operations occur in the month of July.
- **Peak Day:** It is estimated that approximately 17 percent of peak day operations occur on Saturday.

- **Peak Hour:** It is estimated that approximately nine percent of the peak hour operations occur at 2:00 P.M. local time.

Table 2-18 provides a forecast of the peak month, day, and hour for IJD.

Table 2-18 – Peak Activity

Year	Peak Month Operations	Peak Day Operations	Peak Hour Operations	Total Operations
2013	1,680	286	28	**14,300**
2018	1,710	292	28	**14,560**
2023	1,740	298	28	**14,820**
2028	1,770	302	30	**15,060**
2033	1,790	306	30	**15,290**

Source: CHA 2013

2.9 Annual Instrument Operations

According to historic flight plan activity, just over three percent of total operations at IJD are conducted under Instrument Flight Rules (IFR) while the majority are conducted under Visual Flight Rules (VFR). With a forecasted increase in turboprop and jet activity throughout the forecast period, it is anticipated the percentage of IFR operations will increase to four percent by 2033. Table 2-19 provides a forecast of the annual instrument operations at IJD.

Table 2-19 – Annual Instrument Operations

Year	VFR	VFR Percent	IFR	IFR Percent	Total Operations
2013	13,812	*96.6%*	488	*3.4%*	14,300
2018	14,040	*96.4%*	520	*3.6%*	14,560
2023	14,270	*96.3%*	550	*3.7%*	14,820
2028	14,480	*96.1%*	580	*3.9%*	15,060
2033	14,680	*96.0%*	610	*4.0%*	15,290

Source: CHA 2013

2.10 Critical Aircraft

The design, or critical, aircraft is defined as the largest or most demanding aircraft using or forecast to regularly use an airport (at least 500 annual operations). The existing critical aircraft for IJD is the Beech King Air 200, which is classified as an ARC B-II aircraft. It is anticipated the Beech King Air 200 will remain as the critical aircraft for IJD throughout the forecast period.

Chapter 3
Facility Requirements Evaluation

3 Facility Requirements Evaluation

This chapter analyzes the ability of the Windham Airport (IJD) and its existing facilities to accommodate the current and anticipated levels of activity as described in Chapter 2, *Forecasts of Aviation Demand*. The analysis provided has been used to identify deficiencies and determine facility needs throughout the 20-year planning period. The elements assessed in this chapter include:

- Airside Facility Requirements
- Landside Facility Requirements
- Airport Security
- Airport Business and Development Potential

The demand/capacity and facility requirement analysis provides a basis for assessing the capability of existing Airport facilities to accommodate current and future levels of activity. The evaluation of this relationship frequently results in the identification of deficiencies that can be alleviated through planning and development activities. Analyses of various airside and landside functional areas were performed with the guidance of several publications, including Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A, *Airport Design;* AC 150/5060-5, *Airport Capacity and Delay*; and FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS). These facility requirement calculations were developed for the planning period of 2013 through 2033 and were based on various forecast components. They should be regarded as generalized planning tools. Should the forecast prove conservative, the schedule for proposed developments should be advanced. Likewise, if traffic growth materializes at a slower rate than projected, deferral of additional facilities would be practical.

3.1 Forecast Summary

Table 3-1 provides a summary of the preferred forecasts presented in Chapter 2, which have been used to estimate when activity levels will trigger the need for various improvements.

Table 3-1 – Forecast Summary

	Planning Period (year)				
Activity	2013	2018	2023	2028	2033
Annual Operations	14,300	14,560	14,820	15,060	15,290
Local	8,010	7,940	7,850	7,760	7,650
Itinerant	6,290	6,620	6,970	7,300	7,650
Peak Operations					
Peak Month	1,680	1,710	1,740	1,770	1,790
Peak Day	286	292	298	302	306
Peak Hour	28	28	28	30	30
Annual Instrument Operations	488	520	550	580	610
Based Aircraft	68	67	70	71	72

Source: CHA

3.2 Airside Facility Requirements

It is important for airports to assess their existing infrastructure to determine the need for future improvements and associated airfield requirements. The airside facility requirements analysis includes an examination and evaluation of:

- Design Aircraft
- FAA Safety Areas and Zones
- Runway Design Standards
- Taxiway Design Standards
- Airfield Capacity
- Runway Length Analysis
- Lighting and Visual Aids
- Instrument Approach Procedures

The following provides a description of each item and an evaluation of existing and future requirements according to current FAA and industry standards.

3.2.1 Design Aircraft

The design, or critical, aircraft is defined as the most demanding aircraft operating or projected to operate on the airport's runway, taxiway, or apron. According to the FAA, the design aircraft can be either a specific aircraft model or a composite of several aircraft, and must account for a minimum of 500 annual itinerant operations. The design aircraft is classified using three parameters:

- **Aircraft Approach Category (AAC):** Consists of a letter (e.g., A through E) corresponding to the design aircraft's approach speed.
- **Airplane Design Group (ADG):** Consists of a Roman numeral (e.g., I through VI) corresponding to the design aircraft's wingspan or tail height, whichever is most restrictive.
- **Taxiway Design Group (TDG):** Consists of a number (e.g., 1 through 7) corresponding to the Main Gear Width (MGW) and the Cockpit to Main Gear (CMG) distance.

The selected ACC and ADG are combined to form the Runway Design Code (RDC), which specifies the appropriate design standards for each runway to be built. As such, each runway is classified with an RDC. In addition to the ACC and ADG, the RDC consists of a third component related to runway visibility minimums, expressed as Runway Visual Range (RVR). The AAC and ADG classification systems are listed in Table 3-2. The RDC visibility minimums are listed in Table 3-3.

Table 3-2 – Aircraft Approach Category & Airplane Design Group

Aircraft Approach Category	V_{REF}/Approach Speed
A	<91 knots
B	91 - <121 knots
C	121 - <141knots
D	141 - <166 knots
E	166 knots or more

Airplane Design Group	Tail Height (feet)	Wingspan (feet)
I	<20	<49
II	20 - <30	49 - <79
III	30 - <45	79 - <118
IV	45 - <60	118 - <171
V	60 - <66	171 - <214
VI	66 - <80	214 - <262

Source: FAA AC 150/5300-13A, *Airport Design*

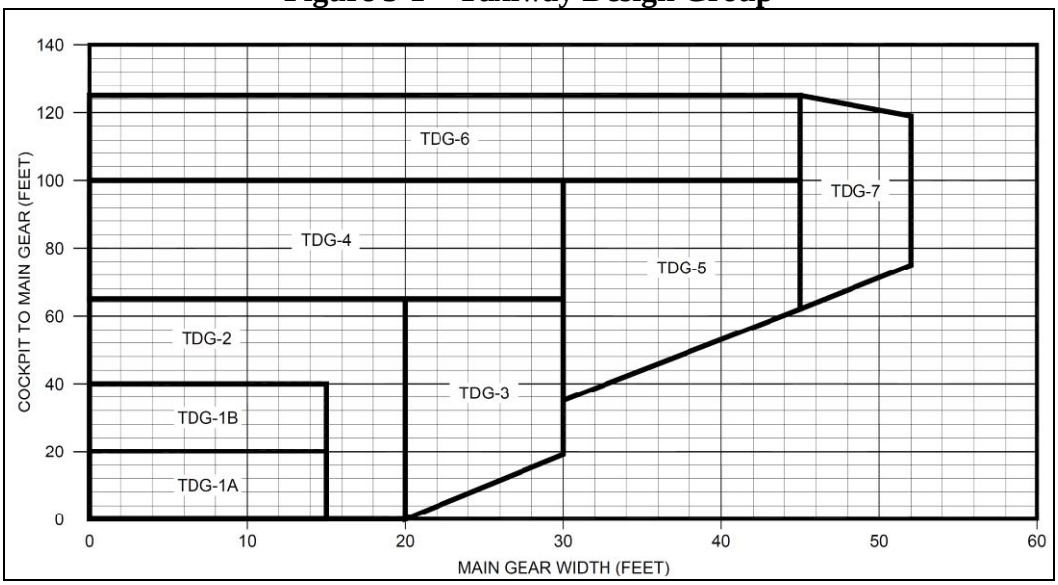
Table 3-3 – Runway Design Code Visibility Minimums

Runway Visual Range (feet)	Instrument Flight Visibility Category (Statute Miles)
VIS	Visual Only Approach
5000	Not lower than 1 mile
4000	Lower than 1 mile, but not lower than ¾ mile
2400	Lower than ¾ mile, but now lower than ½ mile
1600	Lower than ½ mile, but not lower than ¼ mile
1200	Lower than ¼ mile

Source: FAA AC 150/5300-13A, *Airport Design*

The TDG is used to specify runway to taxiway, and taxiway/taxilane, to taxiway/taxilane separation standards. Figure 1-1 provides a chart for determining the appropriate aircraft TDG.

Figure 3-1 – Taxiway Design Group



Source: FAA AC 150/5300-13A, *Airport Design*

For Runway 9-27, the Beech King Air 200 has been identified as the design aircraft and is classified with an AAC of B, an ADG of II, and a TDG of 2. Therefore, based on these design aircraft characteristics and a runway visibility minimum of not lower than one mile, the RDC for Runway 9-27 is B-II-5000. For Runway 18-36, the Piper Navajo has been identified as the design aircraft and is classified with an AAC of B, an ADG of I, and a TDG of 1A. Therefore, based on these design aircraft characteristics and the fact Runway 18-36 is a visual runway, the RDC for Runway 18-36 is B-I-VIS. Table 3-4 provides a summary of the RDC classifications for both runways at IJD.

Table 3-4 – Runway Design Code Summary

Runway	Design Aircraft	AAC	ADG	RVR
9-27	Beech King Air 200	B	II	5000
18-36	Piper Navajo	B	I	VIS

Source: FAA AC 150/5300-13A, *Airport Design*


King Air 200

Piper Navajo

After determining the RDC, the airport itself is classified with an Airport Reference Code (ARC). The ARC is used for airport planning and design purposes and is signified by the highest RDC at the airport. The ARC uses the same classification system as the RDC, minus the runway visibility component.

Runway 9-27 is classified with the highest RDC at the Airport. Therefore, the ARC for IJD is classified as B-II. It is recommended this ARC is maintained throughout the planning period.

3.2.2 FAA Design Standards

AC 150/5300-13A identifies safety areas and zones surrounding runways and taxiways that must be protected from foreign objects, hazards, or obstacles that may impact safety. The areas that protect the runway and taxiway areas consist of the following:

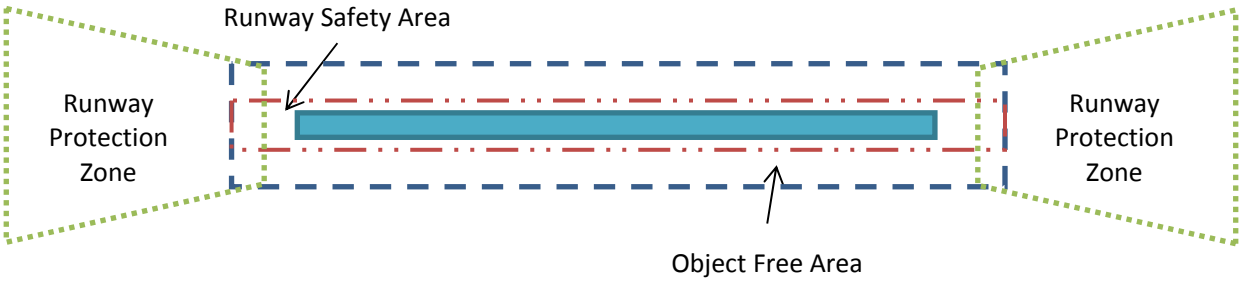
- **Runway Safety Area (RSA) and Taxiway Safety Area (TSA):** The RSA is a defined surface surrounding a runway prepared for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. This area must also support snow removal, aircraft rescue, and firefighting equipment. The RSA should be free of objects, except for those that must be located in the area because of their function.

The TSA is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft deviating from the taxiway. Safety area enhancement projects are considered high priority by the FAA.

- **Runway Object Free Area (ROFA) and Taxiway Object Free Area (TOFA):** The ROFA and TOFA are areas centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by remaining clear of objects (e.g., roads, buildings, other aircraft, etc.), except for those that need to be within the area due to their function.
- **Runway Protection Zone (RPZ):** The RPZ is a trapezoidal area generally offset 200 feet from each runway end that is used to enhance the protection of people and property on the ground. For runways with displaced thresholds, such as Runway 9 and Runway 36 at IJD, there may be both an approach and departure RPZ. The FAA encourages airport property ownership and compatible land uses within each RPZ, and clearing of all above ground objects. Homes are wildlife attractants are considered incompatible land uses within an RPZ.

Figure 3-2 depicts the discussed FAA design standards.

Figure 3-2 – FAA Safety Areas and Runway Protection Zones



- **Runway Visibility Zone (RVZ):** The RVZ is an area defined with a clear line-of-sight between two intersecting runways. The RVZ boundaries are defined by imaginary lines between designated visibility points located on each runway along with runway length and configuration. The terrain within the RVZ

Figure 3-3 – Runway Visibility Zone

should be graded and permanent objects designed so that there is an unobstructed line-of-sight. According to AC 150/5300-13A, no part of parked aircraft should penetrate the RVZ.

The spatial dimensions of the RSA/TSA, ROFA/TOFA, and RPZ are defined by the RDC and runway approach visibility minimums. As mentioned, the RVZ is defined by runway length and configuration. Table 3-5 presents the current FAA design standards applicable to IJD.

Table 3-5 – Runway and Taxiway Design Standards

Airfield Area	Runway 9-27 (RDC B-II)	Runway 18-36 (RDC B-I)
Runway Width	75’	60’
RSA		
- Width	150’	120’
- Length Beyond & Prior to Runway End	300’	240’
ROFA		
- Width	500’	250’
- Length Beyond & Prior to Runway End	300’	240’
Approach & Departure RPZ		
- Length	1,000’	1,000’
- Inner Width	500’	250’
- Outer Width	700’	450’
Runway Centerline to		
- Parallel Taxiway Centerline	240’	150’
- Edge of Aircraft Parking	250’	125’
Taxiway Width	35’	25’
Taxiway Centerline to		
- Fixed or Movable Object	65.5’	44.5’
Taxilane Centerline to		
- Fixed or Movable Object	57.5’	39.5’
TSA	79’	49’
TOFA	131’	89’
Taxilane OFA	115’	79’

Source: FAA AC 150/5300-13A, *Airport Design*

3.2.3 Runway Design Standards

Using the FAA design standards listed in Table 3-5, this section reviews the existing runway conditions at IJD and discusses any related deficiencies.

3.2.3.1 Runway Width

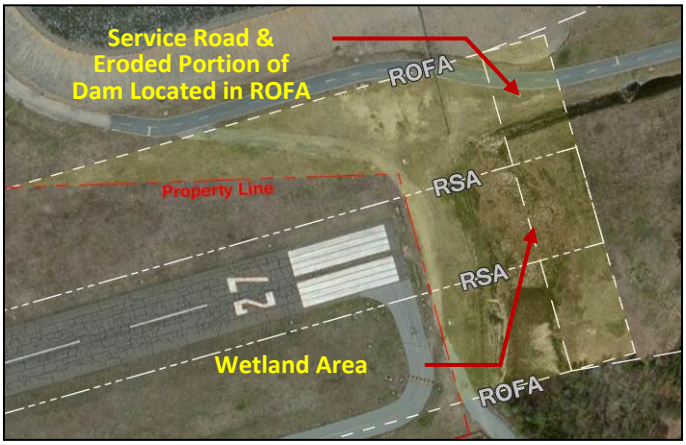
The current widths of Runway 9-27 and Runway 18-36 are 100 feet and 75 feet, respectively. These widths exceed the minimum requirements of 75 feet for RDC B-II and 60 feet for RDC B-I, as listed on Table 3-5. As the Airport accommodates a wide variety of aircraft, including a light sport aircraft manufacturer that requires test flights prior to delivery and occasional use by large corporate jets, it is recommended the current runway widths are maintained in order to provide an added margin of safety and preserve the existing airfield infrastructure. In addition,

this will avoid the cost of narrowing the runways and relocating edge lights. The cost to reconfigure the runways is significantly greater than the cost to resurface the wider runways.

3.2.3.2 Runway Safety Area (RSA)

The Runway 9-27 RSA is 150 feet in width and extends 300 feet beyond each runway end. As shown Figure 3-4, a portion of the RSA beyond the Runway 27 end is located off airport property in an area owned by the U.S. Army Corps of Engineers (USACE), and contains a portion of a wetland area. Wetlands do not satisfy RSA requirements and, thus, this non-standard condition should be addressed. The Connecticut Airport Authority (CAA) should obtain a property easement for the RSA located off airport property.

Figure 3-4 – Runway 27 RSA & ROFA



Additionally, the elevation of the terrain declines beyond the Runway 9 and Runway 27 ends. As such, the longitudinal grade of the RSA beyond the runway ends exceeds the three percent maximum requirement as defined in AC 150/5300-13A. Grading beyond the runway threshold is needed to comply with FAA requirements. Clearing obstructions from the RSA is considered a high priority by the FAA.

Figure 3-5 – Runway 36 RSA & OFA

The Runway 18-36 RSA is 120 feet in width and the length extends 240 feet beyond each runway end. The northern runway end meets FAA standards; however, as shown in Figure 3-5, a portion of a public roadway (Mark Drive) and trees are located within the RSA near the airport property line beyond the Runway 36 end. To satisfy standards, this area should be acquired and cleared of incompatible objects, or the runway end should be shifted to correspondingly shift the RSA. Clearing obstructions from the RSA is considered a high priority by the FAA.

3.2.3.3 Runway Object Free Area (ROFA)

The Runway 9-27 OFA is 500 feet in width and extends 300 feet beyond each runway end. Similar to the RSA, the ROFA located along the Runway 27 end is located off airport property. In addition to the wetland area contained within the RSA, an airport service road and eroded

portion of the Mansfield Hallow Dam is located within the ROFA beyond the Runway 27 end. Ideally, the eroded portion of the Mansfield Hallow Dam located within the Runway 9-27 ROFA should be repaired and cleared of this area. Clearing obstructions from the RSA is considered a high priority by the FAA.

The Runway 18-36 OFA is 250 feet in width and extends 240 feet beyond each runway threshold. Similar to the RSA, a public roadway and trees are located within a portion of the ROFA near the airport property line beyond the Runway 36 end. This area should be acquired and cleared of incompatible objects, or the runway end should be shifted to correspondingly shift the ROFA. Clearing obstructions from the RSA is considered a high priority by the FAA.

3.2.3.4 Runway Protection Zone (RPZ)

Airport ownership and control of the RPZs, either through easement or acquisition, is desirable to ensure compatible land uses, airspace, and ground protection within the area. Although RPZs are primarily designated to protect people and property on the ground, the FAA considers the clearing of all objects within RPZs a safety benefit.

Each RPZ at the airport has a portion that is located off airport property. The following discusses each of these areas (highlighted on Figure 3-6 through Figure 3-9).

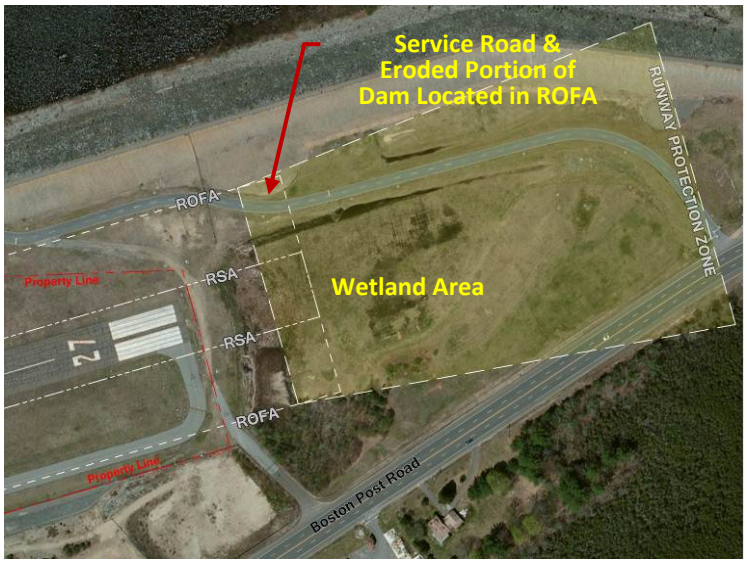
Figure 3-6 – Runway 9 RPZs

Runway 9 RPZ: Runway 9 has both an approach and departure RPZ. The approach RPZ begins 200 feet from the runway threshold, while the departure RPZ begins 200 feet from the edge of the usable runway pavement. The majority of both RPZs are located within the Willimantic Reservoir area. Although it is desirable to own the entire RPZ, the Runway 9 RPZ area located off airport property is compatible with airport operations as it is owned by the Town of Windham and does not facilitate future development. To ensure this area remains clear of incompatible objects, however, an avigation easement (i.e., air easement), is recommended. Clearing obstructions from the RPZs is considered a high priority by the FAA.

Tree clearing has recently occurred on airport property located within the Runway 9 RPZs, but is not reflected in the above photo. Figure 3-6 depicts the Runway 9 RPZs.

Runway 27 RPZ: The Runway 27 RPZ is located entirely off airport property. The majority of the area within the RPZ is owned by the USACE and is not an area that supports future development. However, in addition to the aforementioned wetland area, the airport service road and a portion of State Route 6 (Boston Post Road) are located within the RPZ. In conjunction with acquiring an easement for the RSA and ROFA, an avigation easement is recommended for the RPZ area within the USACE property to ensure the area remains clear of incompatible objects. Clearing obstructions from the RPZ is considered a high priority by the FAA. Figure 3-7 depicts the Runway 27 RPZ.

Figure 3-7 – Runway 27 RPZ



Runway 18 RPZ: The majority of the Runway 18 RPZ is located on airport property and contains compatible land uses. The portion of the RPZ located off airport property is owned by the USACE. To ensure this area remains clear of incompatible objects, an avigation easement is recommended. Clearing obstructions from the RPZ is considered a high priority by the FAA.

Tree clearing has recently occurred within this area for approach protection. Figure 3-8 depicts the Runway 18 RPZ.

Figure 3-8 – Runway 18 RPZ

Figure 3-9 –
Runway 36 RPZs

Runway 36 RPZ: As with Runway 9, Runway 36 has both an approach and departure RPZ beginning 200 feet from the runway threshold and edge of the usable runway pavement, respectively. The majority of the departure RPZ is located off airport property and contains all, or a portion of, 15 mobile homes, one commercial building, and portions of Mark Drive, Wayne Drive, James Drive, Stone Gate Drive, and State Route 6. The mobile homes are located on property owned by the Stonegate Manor residential manufactured housing community. As the area is located within the RPZ, the property is eligible for voluntary acquisition. However, the FAA and the CAA has indicated acquisition of this area is considered low priority. Clearing obstructions from the RPZs is considered a high priority by the FAA. Figure 3-9 depicts the Runway 36 RPZs.

3.2.3.5 Runway Visual Zone (RVZ)

The purpose of the RVZ is to provide arriving and departing aircraft a clear line-of-sight to other aircraft or vehicle movement that could create a conflict. Within the RVZ, all locations on a runway centerline must be mutually visible to any other point five feet above the centerline of the crossing runway. As depicted on Figure 3-3, portion of the main apron crosses through the RVZ. While the main apron is the primary location for the storage of based aircraft, it is recommended that any future aircraft be parked in locations outside of the RVZ.

3.2.4 Taxiway Design Standards

Using the FAA design standards presented in Table 3-5, the following sections review the existing taxiway conditions at IJD and discusses deficiencies related to each taxiway standard. Figure 1-3 in Chapter 1 depicts the taxiways at IJD.

3.2.4.1 Taxiway/lane Width

The current width of all taxiways, including taxiway connectors, at IJD is 35 feet. These widths comply with the requirements for ADG II taxiways.

A taxilane is located along the south side of the T-hangar (Building #7) and accommodates ADG I aircraft. As such, the minimum width for the taxilane is 25 feet. However, the current width is 20 feet, for a deficit of five feet. This taxilane should be widened to 25 feet.

3.2.4.2 Taxiway/lane Safety Area (TSA) & Taxiway/lane Object Free Area (TOFA)

Taxiway "A" serves as a full-length parallel taxiway for Runway 9-27. As such, Taxiway "A" is an ADG II taxiway and has a TSA of 79 feet and a TOFA of 131 feet. While the TSA for this taxiway complies with FAA clearance requirements, airport perimeter fencing located south of the taxiway, beginning at Taxiway "C", is located within the TOFA. The perimeter fencing should be shifted to the south in order to clear the Runway 9-27 TOFA. Alternatively, an FAA Modification to Standards may be requested.

Taxiway "B" serves as a full-length parallel taxiway for Runway 18-36. Therefore, Taxiway "B" is an ADG I taxiway and has a TSA of 49 feet and a TOFA of 89 feet. Both the TSA and the TOFA for Taxiway "B" comply with FAA taxiway clearance requirements.

Taxiway "C", which serves the north apron area, is also an ADG II taxiway and complies with FAA clearance requirements.

In addition to the taxiway connectors for Taxiways "A" and "B", there are three additional connectors at IJD: Taxiways "D", "E", and F". Taxiways "D" and "E" are located between Taxiway "C" and the Runway 27 end. They are designated as ADG II and have a TSA of 79 feet, a TOFA of 131 feet, and comply with FAA taxiway clearance requirements. Taxiway "F" is located adjacent to the terminal apron and connects Runway 18-36 to Taxiway "B". Taxiway "F" is designated as ADG I and has a TSA of 49 feet, a TOFA of 89 feet, and also complies with FAA taxiway clearance requirements.

Lastly, the discussed taxilane located south of Building #7 (the T-hangar) accommodates ADG I aircraft and has a TSA of 49 and a TOFA of 79. A portion of the vehicle parking lot along with the service road is located within the taxilane TSA and TOFA. This portion of the vehicle parking lot and service road should be removed/relocated.

3.2.5 Airfield Capacity

Airfield capacity is defined as the maximum rate that aircraft can arrive at, or depart from, an airfield with an acceptable level of delay. It is a measure of the number of operations that can be accommodated at an airport during a given time period, which is determined based on the available airfield system (e.g., runways, taxiways, NAVAIDs, etc.) and airport activity characteristics.

The current guidance provided by the FAA to evaluate airfield capacity is described in AC 150/5060-5, *Airport Capacity and Delay*. The following provides a brief definition of the two capacity parameters:

- **Annual Service Volume (ASV):** A reasonable estimate of the airport's annual maximum capacity, accounting for annual weather characteristics, runway use, aircraft fleet mix, and other conditions.
- **Hourly Airfield Capacity:** The maximum number of aircraft operations that can take place on the runway system in one hour. As airport activity occurs in certain peaks throughout the day, accommodating the peak hour activity is most critical.

AC 150/5060-5 provides the estimated ASV and hourly airfield capacity for VFR and IFR operations based on various runway configurations and the type of aircraft operating, or projected to operate, at the airport. Table 3-6 presents the ASV and hourly airfield capacity for the dual runway configuration and type of aircraft operating at IJD.

Table 3-6 – ASV and Hourly Capacity

ASV*	Hourly Operations (VFR & IFR)*	2033 Annual Operations	2033 Peak Hour Operations
230,000	157	15,290	30

Source: AC 150/5060-5, *Airport Capacity and Delay*; CHA
*Based on runway configuration #9 and mix index of 0 to 20

Based on the runway configuration and operating aircraft at IJD, the ASV is 230,000 operations and the hourly airfield capacity is 157 operations. A total of 15,290 annual operations and 30 peak hour operations are projected at IJD by the end of the planning period. Therefore, the Airport has sufficient airfield capacity to accommodate existing and projected growth in operations.

3.2.6 Runway Length

Runway length requirements are based on a variety of conditions including: airport elevation, mean daily maximum air temperature, runway gradient, and the gross takeoff and landing weights of the critical aircraft expected to substantially (i.e., at least 500 annual itinerant operations) use the runway.

AC 150/5325-4B, *Runway Length Requirements for Airport Design*, outlines the process for determining recommended runway length at an airport. In summary, this process involves: identifying the critical aircraft, or family of aircraft, and its maximum certified takeoff weight (MTOW); calculating the recommended runway length for the critical aircraft based on the appropriate "runway length curves"; and, if appropriate, adjusting the recommended runway length for aircraft and runway characteristics (e.g., runway gradient, wet runway conditions).

As discussed in Chapter 2, the Beech King Air 200 has been identified as the existing and future critical aircraft for IJD. The Beech King Air 200 has a MTOW of 12,500 pounds and is listed as

a small aircraft with 10 or more passenger seats. Based on these aircraft characteristics, Table 3-7 presents the recommended runway length at IJD for aircraft with 10 or more passenger seats.

Additionally, prior to the departure of the FBO in 2012, IJD experienced frequent operations by small- to mid-sized turbine aircraft. Although the forecasts of aviation activity presented in Chapter 2 do not anticipate substantial activity by these aircraft throughout the forecast period, it is possible the Airport may experience an increase in operations from small- to mid-sized jet aircraft if demand is realized from either an on-airport operator or off-airport business. Therefore, Table 3-7 also presents the recommended runway lengths if substantial jet activity occurs.

Table 3-7 – Recommended Runway Length

Aircraft Type (Runway Length Curve)	Recommended Runway Length	
	Dry	Wet
Small Airplanes Having ≥ 10 Passenger Seats*	4,125’	-
75% Fleet Mix (60% Useful Load)**	4,625’	5,320’
75% Fleet Mix (90% Useful Load)**	6,400’	7,000’

Source: AC 150/5325-4B, *Runway Length Requirements for Airport Design*
Note: Dry runway length increased by 15% for turbojet aircraft (7,000’ for 90% useful load) for wet conditions
*Example Aircraft: Beech King Air 200, Mitsubishi MU-2L, Metroliner II
**Example Aircraft: Cessna Citation Excel, Falcon 50, Hawker 600

Currently, Runway 9-27 provides the greatest runway length at IJD at 4,271 feet. For the purposes of this report, it is recommended the Runway 9-27 length is maintained throughout the forecast period to continue serving the critical aircraft. Should additional demand be realized, the appropriate length listed in Table 3-7 for the 75 percent fleet mix at 60 percent useful load may be required for small- to mid-sized turbine aircraft.

3.2.7 Wind Coverage

Local wind conditions at an airport can play a significant role in runway use as aircraft operate most efficiently when landing and departing into the wind. Runways not oriented to take full advantage of the prevailing wind patterns are used infrequently. Pilots must ensure that the crosswind component, or wind component perpendicular to the direction of travel, is not beyond the limits of the aircraft. Crosswind components differ depending on the size of aircraft and the associated ARC for the runway. According to FAA criteria, an airport should provide at least 95 percent wind coverage for any aircraft projected to use the airport regularly. The 95 percent wind coverage is computed on the basis of a crosswind not exceeding 10.5 knots for ARC A-I and B-I; 13 knots for ARC A-II and B-II; 16 knots for ARC A-III, B-III, and C-I through D-III.

Since the ARC for IJD is B-II, Table 3-8 provides the coverage for the all-weather, VFR, and IFR weather wind conditions for a 10.5- and 13-knot crosswind for both runways at the Airport.

Table 3-8 – Runway Wind Coverage

Weather Condition	Runway					
	9-27		18-36		Combined	
	10.5 Knots	13 Knots	10.5 Knots	13 Knots	10.5 Knots	13 Knots
All-Weather	94.12%	97.08%	95.85%	98.09%	99.42%	99.91%
VFR	93.87%	96.99%	95.36%	97.84%	99.36%	99.90%
IFR	94.98%	97.22%	98.89%	99.65%	99.73%	99.97%

Source: NOAA National Climatic Data Center (Windham Airport 2000 – 2009)

Table 3-8 shows that the combined runway wind coverage at IJD for each weather condition (i.e., all-weather, VFR, and IFR) exceeds the 95 percent minimum wind coverage for 10.5 and 13 knots. Therefore, adequate wind coverage is provided at IJD.

3.2.8 Airfield Pavement

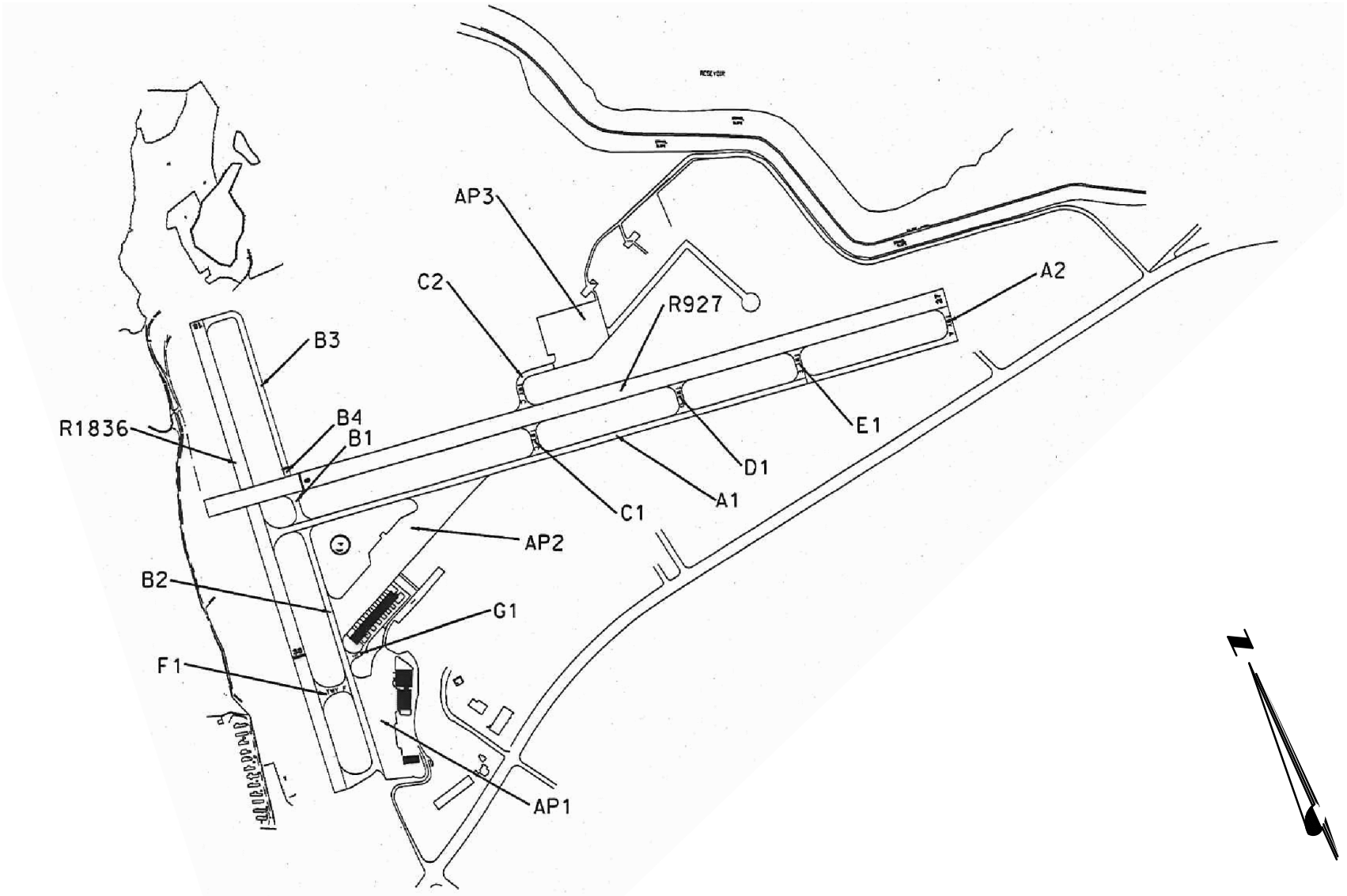
3.2.8.1 Airfield Pavement Strength

An important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight. The design strength of the pavement at an airport is typically determined by the strength of both the top course and subgrade, the weight of the aircraft utilizing the airfield, and the number of operations from these aircraft. The current pavement design has a single-wheel load bearing capacity of 30,000 pounds (estimated by the CAA). As mentioned previously, the maximum takeoff weight of the critical aircraft is 12,500 pounds. It is anticipated this pavement strength will remain sufficient throughout the forecast period.

3.2.8.2 Airfield Pavement Condition

A visual inspection of all pavement at IJD was performed in September 2011. The following provides a brief summary of the pavement according to the 2011 *Windham Airport Pavement Management Plan*. Figure 3-10 illustrates the areas of pavement discussed below from the management plan.

Runway 9-27: Runway 9-27 was originally constructed in 1938 and reconstructed in 1993. The runway pavement consists of three inch bituminous concrete surface course on a four inch crushed aggregate base course on a 10 inch subbase. Runway pavement distresses include: joint cracks, thermal parallel and perpendicular cracks, some raveling, and small loss of coarse aggregate. Crack sealing was recently performed on the runway pavement. Runway 9-27 is represented as section "R927" on Figure 3-10.



NOT TO SCALE

Source: 2011 Pavement Management Plan for Windham Airport (Connecticut Airport Authority)

CHA
2139 Silas Deane Highway, Suite 212 · Rocky Hill, CT 06067-2336
Main: (860) 257-4557 · www.chacompanies.com

DRAFT

WINDHAM AIRPORT PAVEMENT SECTIONS

Windham Aipport (IJD) Master Plan Update – Willimantic, Ct

PROJECT NO. 25874

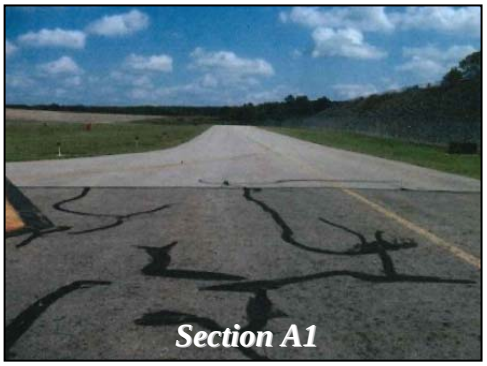
DATE: FEB. 2014

FIGURE 3-10

Runway 18-36: Runway 18-36 was originally constructed in 1938 and reconstructed in 1996. The runway pavement consists of three inch bituminous concrete surface course on a five inch crushed aggregate base on an unknown subbase. Runway pavement distresses include: joint cracks and thermal cracks and slight raveling. Crack sealing was also recently performed on the runway pavement. Runway 18-36 is represented as section "R1836" on Figure 3-10.


Section R1836

Taxiway "A": The original portion of Taxiway "A" (section A1) was constructed in 1992, terminating at Taxiway "E". The taxiway was then extended to full-length (section A2) in 2001. Taxiway "A" is represented as sections "A1" and "A2" on Figure 3-10.


Section A1

Section A1 consists of four inch bituminous concrete surface course on a six inch crush aggregate base on a 10 inch subbase. Taxiway pavement distresses include: slight raveling, small loss of coarse aggregate and dense thermal cracks and joint cracks. Crack sealing was recently performed.


Section A2

Section A2 consists of three inch bituminous concrete surface course, five inch crush aggregate base, and seven inch subbase. Taxiway pavement distresses include: slight raveling and joint cracks. Crack sealing was recently performed.

Taxiway "B": Taxiway "B" was constructed in sections beginning with the central portion between Runway 9-27 and Taxiway "A" in 1992 (section B1), the southern portion between Taxiway "A" and the Runway 36 approach end in 1996 (section B2), and the northern portion between Runway 9-27 and the Runway 18 approach end in 2008 (section B3). A portion of Taxiway "B" (section B4), was replaced in 2008 due to asphalt mix failure. Taxiway "B" is represented as sections "B1" through "B4" on Figure 3-10.


Section B1

Section B1 consists of four inch bituminous concrete surface course on a six inch crush aggregate base on a 10 inch subbase. Taxiway pavement distresses include: slight raveling and joint and thermal cracks. Crack sealing was recently performed.


Section B2

Section B2 consists of three inch bituminous concrete surface course, five inch crushed aggregate and variable depth subbase. Taxiway pavement distresses include: slight raveling and joint and thermal cracks. Crack sealing was recently performed.

Sections B3 and B4 both consist of a four inch bituminous concrete surface course on an eight inch crushed aggregate base. The taxiway pavement is in excellent condition does not currently require maintenance.

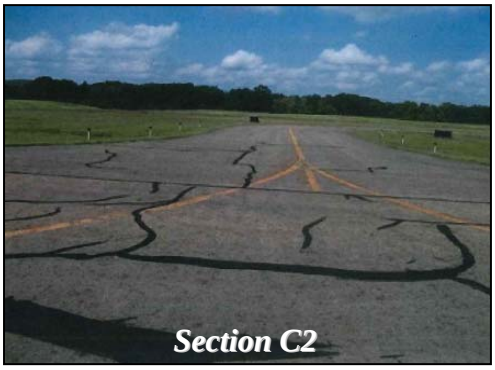

Section B3


Section B4

Taxiway "C": Taxiway "C" serves the north apron and was originally constructed in 1992 (Section C1) and extended in 1993 (Section C2). Taxiway "C" is represented as sections "C1" and "C2" on Figure 3-10.


Section C1

Section C1 consists of four inch bituminous concrete surface course on a six inch crushed aggregate based on a 10 inch subbase. Taxiway pavement distresses include: small raveling, small loss of coarse aggregate and thermal cracks. Crack sealing was recently performed on the taxiway pavement.


Section C2

Section C2 consists of three inch bituminous concrete surface course, four inch crushed aggregate base, and 10 inch subbase. Taxiway pavement distresses include: small raveling, small loss of coarse aggregate, and block and terminal cracks. Crack sealing was recently performed on the taxiway pavement.

Taxiway "D" and Taxiway "E": Taxiway "D" and Taxiway "E" were both constructed in 1992 and provide taxiway connection between Runway 9-27 and Taxiway "A". Both taxiway pavement sections consist of four inch bituminous concrete surface course on a six inch crush aggregate based on a 10 inch subbase. Taxiway pavement distresses include: small raveling and small loss of course aggregate and thermal cracks. Crack sealing was recently performed on the taxiway pavement. Taxiway "D" and Taxiway "E" are represented as sections "D1" and "E1" on Figure 3-10.

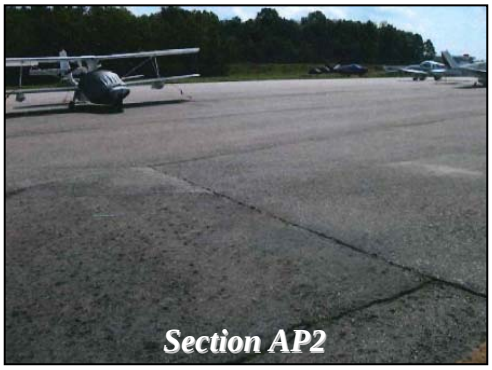

Section D1


Section E1

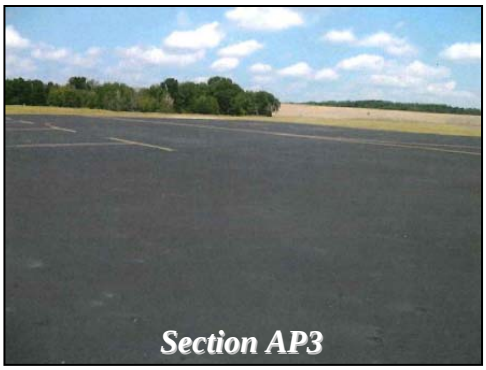
Taxiway "F": Taxiway "F" provides access between Runway 18-36 and Taxiway "B" and was constructed in 1996, along with the southern portion of Taxiway "B" (section B2). Taxiway pavement consists of three inch bituminous concrete course, five inch crushed aggregate base, and variable depth subbase. Taxiway pavement distresses include: slight raveling and joint and block cracks. Crack sealing was recently performed on the taxiway pavement, but some cracks are one inch in width and need to be resealed. Taxiway "F" is represented as sections "F1" on Figure 3-10.

Taxiway "G": Taxiway "G" was constructed in 1996 and provides access to Building #6 and Building #7 (the T-hangar). The taxiway pavement consists of three inch bituminous concrete surface course, five inch crushed aggregate based, and variable depth subbase. Taxiway pavement distresses include: slight raveling and unsealed thermal and joint cracks. The pavement is scheduled for resealing. Taxiway "G" is represented as section "G1" on Figure 3-10.

Aprons: The terminal apron was originally constructed between 1952 and 1953, and reconstructed in 2008. The bituminous top layer was replaced in 2011, and now consists of a three and half inch bituminous concrete surface course on a six inch crushed aggregate base. The terminal apron is represented as section "AP1" on Figure 3-10.



The main apron and tie-down area was reconstructed in 2002 and consists of three and half inch bituminous concrete surface course on a six inch crushed aggregate base. Apron pavement distresses include: slight raveling and unsealed block and joint cracks. Crack sealing is recommended for this apron. The main apron is represented as section "AP2" on Figure 3-10.



The north apron was constructed in 2004 and consists of three inch bituminous concrete surface course, six inch crushed aggregate based on a six inch base. Apron pavement distresses include: slight raveling, rutting, and thermal cracks. Crack sealing is recommended for this apron. The north apron is represented as section "AP3" on Figure 3-10.

3.2.9 Runway Lighting, Marking, and Navigational Aids

Runway lighting, marking, and instrumentation allows for the safe operation of aircraft during nighttime hours and low visibility conditions. As previously discussed in Chapter, 1 Runway 9-27 and Runway 18-36 are equipped with Medium Intensity Runway Lights (MIRLs). Due to obstructions (i.e., trees) south of the runway, however, the Runway 18-36 MIRLs are not currently in use in order to restrict nighttime operations on the runway. It is recommended these obstructions are removed in order to activate the MIRLs and allow nighttime operations on Runway 18-36. Clearing these obstructions from the approach surface is considered a high priority by the FAA.

The Runway 27 approach end is equipped with Runway End Identifier Lights (REILs) that are owned and maintained by the FAA, and a Precision Approach Path Indicator (PAPI). The Runway 27 PAPI, however, is currently inoperative. As the primary runway, both ends of Runway 9-27 should be equipped with working REILs and PAPIs. To maintain approaches under current standards, the CAA has expressed a desire to replace and readjust the Runway 27 PAPI and install PAPIs and REILs for both ends of Runway 9-27 with FAA ownership of the PAPIs.

Currently, Runway 9-27 has non-precision markings in good condition. Runway 18-36 has basic, or visual, markings that are also in good condition. It is recommended these marking be maintained throughout the forecast period.

3.2.10 Instrument Approach Procedures & Obstructions

Instrument Approach Procedures (IAPs) are published by the FAA for specific runway ends. Three non-precision IAPs are published at IJD including: a GPS (i.e., RNAV) approach to each end of Runway 9-27 and a VOR-A approach to the Airport. Although a localizer IAP was once available for Runway 27, the existing GPS IAPs have functionally replaced the localizer IAP. The GPS approaches provide IJD cost efficient IAPs without the use of ground-based equipment.

To ensure each GPS IAPs remain available during day and night operations along with airspace protection, potential obstructions should be cleared. Any obstructions could potential result in the loss of an IAP. Obstruction (i.e., tree) clearing recently occurred at the Runway 9 and Runway 18 approach ends. Chapter 5, *Development Alternatives Analysis*, will identify potential airspace obstructions that will be recommended for clearing. Obstruction clearing is considered a high priority by the FAA.

3.3 Landside Facility Requirements

The landside facility requirements examine existing airport facilities and structures that accommodate the movement and storage of aircraft, pilots, passengers, and employees on the ground. The landside facility requirements analysis includes an examination and evaluation of:

- Aircraft Storage Space Requirements
- Apron Space Requirements
- Airport Administration Space Requirements
- Fuel Storage and Dispensing
- Roadway Access
- Vehicle Parking
- Airport Maintenance Buildings

The following provides a description of each item and an evaluation of existing and future requirements according to current FAA and industry standards.

3.3.1 Aircraft Storage

3.3.1.1 T-Hangar Storage

Due to various weather conditions, hangars are highly desirable in the Northeast and New England region as snow storms, frost, and intense cold can cause icing on parked aircraft; which can be extremely disrupting to aircraft operations. Additionally, during warmer months, heat and sun exposure can damage avionics and fade paint, and thunder storms and hail can cause significant damage. For GA airports, hangar requirements are generally a function of the number of based aircraft, type, owner preferences, hangar rental costs, and area climate.

As listed on Table 3-9, only approximately 20 percent of all based aircraft at IJD currently use covered storage. It is important to note that although Building #3 and Building #6 are capable of storing aircraft, these hangars are used for aircraft maintenance operations and only temporarily store aircraft during maintenance operations. Refer to Figure 1-3 in Chapter 1 for a depiction of the existing buildings and facilities locations.

Table 3-9 – Aircraft Hangar Units

Building Number	Hangar Type	Approximate Size	Percent of Based Aircraft
3	Conventional Hangar (Terminal Building)	5,450 sq. ft.	-
4	Conventional Hangar (Adjacent to Terminal Building)	10,000 sq. ft.	-
6	Conventional Hangar (Adjacent to T-Hangar)	3,600 sq. ft.	-
7	T-Hangar	14 Stalls	20%

Source: CHA

According to the CAA, all 14 aircraft stalls in the T-hangar are occupied and there is waiting list for aircraft storage in the hangar. As such, it is likely that additional T-hangar space is warranted at IJD to accommodate this demand. To develop a projection of required T-hangar space, it is assumed that the percentage of based single-engine piston aircraft currently utilizing T-hangar storage (20 percent) will incrementally increase to 50 percent by the end of the planning period. It is also assumed that all based multi-engine piston aircraft will continue to utilize hangar storage. Table 3-10 provides anticipated T-hangar space requirements based on these assumptions.

Table 3-10 – T-Hangar Space (Stalls) Requirements

Aircraft Type	Existing Number of Stalls	Planning Period (Recommended Number of T-Hangar Stalls)				
		2013	2018	2023	2028	2033
Single-Engine Piston	14	13	18	23	28	34
Multi-Engine Piston		1	1	2	2	2
Total T-Hangar Stalls	**14**	**14**	**19**	**25**	**30**	**36**

Source: CHA

As shown on Table 3-10, it is suggested that there is an immediate demand for additional T-hangar space at IJD. Furthermore, it is anticipated that a total of 36 T-hangar stalls will be required by 2033. As such, two additional T-hangars, providing a combined total of 22 stalls (i.e., 2033 requirement minus existing) are recommended at IJD by the end of the forecast period. It is also recommended that the existing T-hangar be maintained or replaced to accommodate existing based aircraft.

3.3.1.2 Conventional Hangar Storage

As mentioned previously, Building #3 and Building #6 only temporarily store aircraft during maintenance operations. Building #4, however, is currently available for aircraft storage (10,000 square feet). For planning purposes, it is assumed that two future based turboprop aircraft included in the forecast will require conventional hangar storage space by 2023; resulting in a demand for 7,600 square feet of storage. Currently, Building #4 provides sufficient conventional hangar capacity to accommodate this projected demand.

According to the CAA, however, inquires have been made for potential new users (e.g., a light-sport aircraft manufacture) in leasing Building #4 for conventional space for their operations. Therefore, if this hangar is occupied by the light-sport aircraft manufacture, an additional 7,600 square feet of conventional hangar space may be warranted by 2023. Table 3-11 provides the anticipated conventional hangar space requirements for aircraft storage assuming Building #4 is occupied by this planning period.

Table 3-11 – Conventional Hangar Space Requirements

Aircraft Type	Approx. Space Requirement	Existing Hangar Area	Planning Period (Recommended Conventional Hangar Space)				
			2013	2018	2023	2028	2033
Turboprop	3,800 sq. ft.	10,000 sq. ft.	-	-	7,600 sq. ft.	7600 sq. ft.	7,600 sq. ft.

Source: CHA
Note: Assumes total of 2 based turboprop by 2023 and Building #4 at full capacity

3.3.2 Aircraft Parking & Apron Space

Aircraft aprons provide parking and tie-down positions for based and itinerant aircraft, as well as staging areas for aircraft stored in conventional hangars. As shown in Table 3-12, there are a total of 73 paved and 33 turf tie-down spaces at IJD. Approximately 80 percent of the based aircraft at IJD (i.e., 53 aircraft) currently utilize apron parking.

Table 3-12 – Apron and Tie-Down Space

Apron Area	Existing Number of Tie Dows	Approximate Size	Surface Type	Percent of Based Aircraft
Main Apron	46	200,000 sq. ft.	Asphalt	80%
	13	33,000 sq. ft.	Turf	
Terminal Apron	7	112,000 sq. ft.	Asphalt	-
North Apron	20	105,000 sq. ft.	Asphalt	-
	20	42,000 sq. ft.	Turf	

Source: CHA

3.3.2.1 Aircraft Parking Space

Due to the large number of based aircraft using tie-down parking at IJD, it is important to ensure adequate aircraft parking is available for both local and itinerant aircraft. This demand, however, is dependent upon the potential construction of additional T-hangars, which would reduce the number of based aircraft utilizing tie-down parking. Therefore, two tie-down parking scenarios are presented. For each scenario, the following assumptions were developed:

- **Peak period:** Examination of flight data at IJD indicates that the Airport experiences its peak activity during the weekend between the hours of 12:00 PM and 3:00 PM. According to the flight data, approximately 27 percent of total aircraft activity occurs within this time three-hour period. Therefore, tie-down parking space was calculated for 27 percent of the peak day arrivals.

- **Increasing percentage of itinerant aircraft activity:** As discussed in Chapter 2, it is projected that itinerant operations will increase from approximately 44 to 50 percent by the end of the forecast period. To calculate itinerant tie-down parking, the projected percentage of itinerant operations was applied to the peak day arrivals for each planning period.

Table 3-13 shows the anticipated parking requirements for the first tie-down parking scenario. Using the above assumptions, Scenario 1 also assumes that no additional T-hangars are constructed at IJD throughout the forecast period, resulting in a slight increase in demand for tie-downs.

Table 3-13 – Required Tie-Down Parking Scenario 1
(Without Construction of Additional T-Hangars)

Type of Activity/Aircraft	Existing Number of Tie Dows	Planning Period (Recommended Number of Aircraft Tie-Downs)				
		2013	2018	2023	2028	2033
Local (Based)	33 – Turf 73 – Paved	53	54	54	53	55
Itinerant (Visiting)						
Single-Engine Piston		17	18	19	20	21
Multi-Engine Piston		1	1	1	1	1
Turboprop		1	1	1	1	1
Jet		1	1	1	1	2
Total Number of Tie-Downs	**106**	**72**	**75**	**76**	**76**	**80**

Source: CHA

Table 3-14 shows the anticipated parking requirements for the second tie-down parking scenario. In addition to the assumptions applied in the first tie-down scenario, Scenario 2 assumes that the percentage of based aircraft using tie-downs will incrementally decrease as additional T-hangars are constructed and based aircraft shift to hangar storage.

Table 3-14 – Required Tie-Down Parking Scenario 2
(With Construction of Additional T-Hangars)

Type of Activity/Aircraft	Existing Number of Tie Dows	Planning Period (Recommended Number of Aircraft Tie-Downs)				
		2013	2018	2023	2028	2033
Local (Based)	33 – Turf 73 – Paved	53	49	44	38	34
Itinerant (Visiting)						
Single-Engine Piston		17	18	19	20	21
Multi-Engine Piston		1	2	2	2	2
Turboprop		1	1	1	1	2
Jet		1	1	1	1	2
Total Number of Tie-Downs	**106**	**72**	**70**	**66**	**61**	**59**

Source: CHA

Each tie-down scenario suggests that, with or without the construction of additional hangar space, IJD has a sufficient number of tie-downs to accommodate future based and itinerant aircraft.

3.3.2.2 Apron Space

To calculate recommended apron space, approximate apron space requirements were applied to each tie-down parking scenario. Space for aircraft fueling was included in each calculation.

Table 3-15 provides the anticipated apron space requirements if no additional T-hangar space is constructed. Without the construction of additional T-hangars, there is a slight increase in demand for apron space throughout the forecast period.

Table 3-15 – Apron Space Requirements Scenario 1
(Without Construction of Additional T-Hangars)

Type of Activity/Aircraft	Approximate Space Requirement	Existing Apron Space	Planning Period (Recommended Total Apron Hangar Space)				
			2013	2018	2023	2028	2033
Local (Based)	2,700		142,560	144,720	144,720	144,431	147,558
Itinerant (Visiting)							
Single-Engine Piston	2,700		45,900	48,600	51,300	54,000	56,700
Multi-Engine Piston	2,700	417,000*	1,789	2,700	2,700	2,700	2,700
Turboprop	5,400		5,400	5,400	5,400	5,400	5,400
Jet	7,500		7,500	7,500	7,500	7,500	15,000
Fueling Area	4,800		4,800	4,800	4,800	4,800	4,800
Total Apron Space		**417,000***	**207,949**	**213,720**	**216,420**	**218,831**	**232,158**

Source: CHA
Note: Figures are in square feet
*Paved apron area

Table 3-16 provides the anticipated apron space requirements if additional hangar space is constructed, as shown in Table 3-14. With the potential construction of additional T-hangars there is a slight decrease in demand for apron space as based aircraft shift to hangar storage.

Table 3-16 – Apron Space Requirements Scenario 2
(With Construction of Additional T-Hangars)

Type of Activity/Aircraft	Approximate Space Requirement	Existing Apron Space	Planning Period (Recommended Total Apron Hangar Space)				
			2013	2018	2023	2028	2033
Local (Based)	2,700		142,560	131,153	117,585	103,810	92,224
Itinerant (Visiting)							
Single-Engine Piston	2,700		45,900	48,600	51,300	54,000	56,700
Multi-Engine Piston	2,700	417,000*	1,789	2,700	2,700	2,700	2,700
Turboprop	5,400		5,400	5,400	5,400	5,400	5,400
Jet	7,500		7,500	7,500	7,500	7,500	15,000
Fueling Area	4,800		4,800	4,800	4,800	4,800	4,800
Total Apron Space		**417,000***	**207,949**	**200,153**	**189,285**	**178,210**	**176,824**

Source: CHA
Note: Figures are in square feet
*Paved apron area

As suggested by both tables, IJD has sufficient apron space to accommodate projected future aircraft activity regardless of additional hangar construction.

3.3.3 Airport Administration Space

The terminal building/hangar (Building #3) is located adjacent to the terminal ramp and consists of a 5,450 square foot central hangar and two end-units of office/lounge/shop space, each with an area of 2,180 square feet, located on the north and south ends of the building. The south end-unit is configured as office space and formally housed the Fixed Base Operator (FBO), Freedom Jets Aviation, which departed IJD in 2012. Since the departure of the FBO, the south end-unit has remained vacant. The terminal building/hangar is approaching 70 years in age.

Using guidance in FAA AC 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Non-hub Locations*, as well as standard industry practices, metrics were developed for calculating the recommended square footage for each functional area of the terminal building. Since there are no commercial enplanements at IJD, the sizing requirements were modified based on a "per passenger" basis assuming three passengers per each peak hour arrival. Table 3-17 identifies these planning requirements.

Table 3-17 –Terminal Building Space Requirements

Functional Area	Sq. Ft. per Peak Hour Passenger	Existing Terminal Building Area	Planning Period				
			2013	2018	2023	2028	2033
Lobby	15	4,000*	630	630	630	675	675
Admin Space	3		126	126	126	135	135
Restrooms	2		63	63	63	68	68
Concessions	5		210	210	210	225	225
Circulation, Storage, Etc.	25		1,050	1,050	1,050	1,125	1,125
Meeting Space	800		800	800	800	800	800
Total Terminal Space		**4,000***	**2,880**	**2,880**	**2,880**	**3,030**	**3,030**

Source: FAA AC 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Non-hub Locations; CHA*
*2012 IJD Business Plan
Note: Figures are in square feet
Meeting space remains constant

Although according to Table 3-17 IJD currently has sufficient terminal building space, the existing building formally used for FBO operations is approaching 70 years in age. Additionally, without the presence of a full-time FBO, the existing terminal building has remained vacant. As such, a replacement terminal building structure that provides limited capabilities and required staffing in order to provide adequate service to both based and itinerant customers may be warranted within the planning period.

3.3.4 Fuel Storage Requirements

As discussed Chapter 1, aircraft refueling is not currently available at IJD due to the recent removal of underground fuel storage tanks. The CAA intends to install two new 12,000 gallon aboveground fuel storage tanks in the same location in 2015. Plans include both 100LL and Jet-A fuel, along with a credit card reader for self-fueling. Based on discussion with the CAA, once installed, these tanks should provide sufficient capacity for fuel storage requirements throughout the planning period.

3.3.5 Airport Access

Airport Road, the public entrance drive to the Airport, is located adjacent to the Runway 36 approach end and is accessible via State Route 6. Airport Road provides access to the terminal and hangar areas. Currently, Airport Road drive provides sufficient capacity and public access to the Airport terminal area.

Source: Bing Maps

A private entrance drive to the Airport is located along the southeastern portion of the Airport and is also accessible via State Route 6. The private entrance contains a key-coded security gate and provides access to the north apron area. Although the private entrance is used primarily by airport personnel and private tenants, the security gate is located approximately 35 feet from the edge of State Route 6 and provides limited vehicle clearance area while waiting for the security gate to open and close. The private entrance provides sufficient capacity to the north apron area; however, additional area near the security gate is recommended to provide adequate vehicle clearance.

3.3.6 Vehicle Parking Requirements

Vehicle parking is provided near the entrance to the Airport for tenants, visitors, and employees. There are approximately 40 parking spaces in the lot adjacent to the terminal building/hangar, an additional 40 parking spaces behind the south T-hangar, 11 parking spaces near the maintenance building, and 19 parking spaces located north of Runway 9-27 that provide tenants access to the north apron and turf tie-downs.

Vehicle parking facilities are intended to provide space for design hour passengers/pilots, visitors, employees, etc. Consideration should also be made for off-peak passenger/pilots leaving a vehicle in the lot for more than the normal period. The requirement for vehicle parking was

calculated using a metric of 1.5 spaces for every peak day operation. Table 3-18 identified the future vehicle parking space requirement.

Table 3-18 –Vehicle Parking Space Requirements

Functional Area	Existing Parking Spaces	Planning Period (Number of Recommended Parking Spaces)				
		2013	2018	2023	2028	2033
Vehicle Parking Spaces	110	42	42	42	45	45

Source: CHA

Note: 19 spaces are located in north apron area and currently unavailable for public parking

This planning metric identifies a demand for a total of 45 vehicle parking spaces by 2033. With a total of 110, the current number of vehicle parking spaces at IJD should remain sufficient throughout the planning period.

3.3.7 Airport Maintenance Buildings

Aircraft maintenance is performed in both the central hangar of the terminal building and the conventional hangar adjacent to the T-hangar. It is anticipated the current space provided in these buildings will continue to remain sufficient. According to the CAA, the terminal building/central hangar is undergoing updates and renovation.

Airport maintenance equipment is stored in and minor airport maintenance is performed in the maintenance building, a Quonset hut style building, located in the southern portion of the terminal apron. This building is also nearing the end of its useful life and may require replacement within the planning period of a similarly sized (1,100 square feet) building.

3.4 Airspace Requirements

Federal Aviation Regulation (FAR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*, defines airspace surfaces associated with airports to determine obstructions to air navigation that may affect the safe and efficient use of existing or planned navigable airspace.

The dimensional standards of the FAR Part 77 airspace surfaces at an airport are determined by the AAC and instrument approach capability. At IJD, Runway 9-27 has an AAC of B and is defined as a "utility" runway (i.e., a runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight and less). Runway 18-36 has an AAC of A and is defined as a "visual" runway (i.e., a runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation). Table 3-19 lists the FAR Part 77 associated with Runway 9-27 and Runway 18-36.

Table 3-19 – FAR Part 77 Obstruction Identification Surfaces

Part 77 Airspace Surface	Runway 9-27	Runway 18-36
Width of Primary Surface & Approach Surface Width at Inner End	500’	250’
Radius of Horizontal Surface	5,000’	5,000’
Approach Surface Width at End	2,000’	1,250’
Approach Surface Length	5,000’	5,000’
Approach Slope	20:1	20:1

Source: FAR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*

The following discusses each runway at IJD along with existing airspace deficiencies. It is important to note that the IJD Airport Layout Plan (ALP) will provide a graphical depiction of all airspace obstructions.

3.4.1 Runway 9-27

As a utility runway, Runway 9-27 has a 20:1 Part 77 approach surface beginning 200 feet beyond the usable ends of the runway pavement. Recently, several acres of trees penetrating the Runway 9 approach surface were removed. However, approximately seven acres of trees remaining west of Runway 9 and south of the Willimantic Reservoir penetrate the Runway 9 approach surface. Additionally, due to the current displaced threshold, Runway 9 also has a 20:1 threshold siting surface (TSS). The TSS begins 200 feet beyond the displaced threshold and, therefore, provides additional approach clearance from obstructions. However, approximately five acres of trees still penetrate the 20:1 TSS. At a minimum, obstructions to the TSS are recommended to be lowered or removed.

The terrain beyond the Runway 27 end declines by approximately 10 feet. Adjacent to State Route 6, however, the terrain gradually increases to an elevation approximately 11 feet above the Runway 27 end. As a result, portions of the terrain located between the Runway 27 end and the north side access road penetration the Runway 27 Part 77 approach and transitional surfaces. Additionally, portions of State Route 6 and the north side access road along with approximately two acres of trees, located north and south of State Route 6, penetrate the approach surface.

3.4.2 Runway 18-36

As a visual runway, Runway 18-36 also has a 20:1 Part 77 approach surface beginning 200 feet beyond the usable ends of the runway pavement. As listed on Table 3-19, several of the dimensional standards for Runway 18-36 are less than those for Runway 9-27. Runway 36 also has a TSS beginning at the displaced threshold. Currently, a portion of Mark Drive (located south of the airport) penetrates the Part 77 approach surface by approximately four feet. In addition, several acres of trees located approximately a half-mile south of the airport currently

penetrate the Part 77 approach surface. It is important to note, however, that the TSS remains clear of the Runway 36 Part 77 penetrations.

There are currently only four trees located north of Runway 18-36 that penetrate the Runway 18 Part 77 approach surface by approximately 20 feet. It is recommended these trees are lowered or removed.

3.5 Airport Security

As discussed in Chapter 1, many GA airports have limited security procedures and rely heavily on the flying community to report suspicious or hazardous activity. As compared to other facilities, IJD is well equipped with security measures including: security cameras, perimeter fencing, and key card and key code activated security gates.

In *Security Guidelines for General Aviation Airports* (May 2004), the Transportation Security Administration (TSA) details suggested security guidelines for GA airports. The following includes a review of the existing security procedures at IJD as compared to the TSA's suggested guidelines, as well as the applicability of other TSA security programs. Overall, the Airport well exceeds the security facilities recommended by the TSA for most GA airports, but lacks specific/written procedures, identification systems, and other programs/committees. The TSA's recommended security enhancements are listed, where appropriate.

Table 3-20 – Suggested Airport Security Enhancements

Points/Suggested Guidelines				
≥ 45	25-44	15-24	0-14	Currently Provided at IJD
1) Fencing				Yes
2) Hangars (i.e., shelter)				Yes
3) CCTV				Yes
4) Intrusion Detection System (IDS)				Yes
5) Access Controls				Yes
6) Lighting System				Yes
7) Personnel ID System				Yes
8) Vehicle ID System				No
9) Challenge Procedures				No
10) Law Enforcement Officer (LEO) Support				Informal
11) Security Committee				No
12) Transient Pilot Sign-In/Out Procedures				No
13) Signs				Yes
14) Documented Security Procedures				No
15) Positive Passenger/Cargo/Baggage ID				No
16) All Aircraft Secured				Primary Locks
17) Community Watch Program				No
18) Contact List				Yes

Source: TSA *Security Guidelines for General Aviation Airports* (May 2004)

As shown, IJD currently provides many of the security enhancements recommended for a point value of 28 and below. It is important to note that IJD provides all security enhancement recommendations one through seven. These security enhancement recommendations are typically only required at airports that maintain an FAA commercial operating certificate (under FAR Part 139). While IJD does not have currently have security enhancements for all items recommended for a point value of 28 and below, IJD does provide a high level of security facilities that exceed the standard recommendations.

3.5.1 Airport Security Enhancements

Many of the security enhancement recommendations that IJD does not currently have in place are relatively inexpensive to implement and involve coordination with airport management, airport tenants, community members, and law enforcement; such as forming a security committee or creating documented security procedures.

It is also recommended that airport perimeter fencing is erected around the entire airport property boundary. Currently, the perimeter fencing is not located around portions of the north side of the Airport.

3.6 Airport Business and Development Potential

In May 2012, an Airport Business Plan was development for IJD to identify operational and economic development opportunities that assist the CAA with optimizing the overall benefits of the Airport. The Airport Business Plan defined the role of IJD as a public-use, publicly owned, GA airport along with a market area and potential leasing opportunities and constraints. Since its development, the CAA has actively pursued many of the recommendations suggested within the Airport Business Plan.

3.6.1.1 Additional Development Recommendations

The former FBO at IJD, Freedom Jets Aviation, provided air taxi and charter service at the Airport prior to their cessation in 2012. At that time, adequate demand for air taxi and charter service was present within the market area. Community stakeholders have expressed a continued desire for air service out of the Airport. Although IJD is designated as a GA airport and unable to support scheduled commercial air service, it is recommended that future air taxi and charter service is encouraged throughout the planning period.

3.7 Facility Requirements Summary

Facility	Recommendation
Runway 9-27	• Maintain runway width of 100 feet • Obtain 10 acres of avigation easement from the Town of Windham for Runway 9 Approach and Departure RPZ protection • Acquire 4 acres of property easement from the USACE for the RSA and ROFA near the Runway 27 end • Obtain 12 acres of avigation easement for Runway 27 RPZ protection • Repair eroded portion of the Mansfield Hallow Dam that penetrates the Runway 9-27 OFA • Clear wetland area that is located within the RSA beyond the Runway 27 end • Grade RSA beyond Runway 27 to maintain three percent longitudinal grade
Runway 18-36	• Maintain runway width of 75 feet • Obtain three acres of avigation easement for Runway 18 RPZ protection • Acquire 5 acres of property, including 15 residential dwellings, owned by the Stonegate Manor residential manufactured housing community for Runway 36 RPZ protection. • Acquire 2 acres of property located south of State Route 6, including one commercial building, for Runway 36 RPZ, RSA, and OFA protection • Clear mobile homes and commercial building of Runway 36 Approach and Departure RPZs • Clear trees located within Runway 36 RSA and OFA • Clear obstruction south of Runway 18-36 in order to activate MIRLs and allow nighttime operations
Taxiways	• Shift perimeter fencing south of Runway 9-27 so it is located outside of the TOFA, or request FAA Modification to Standards • Crack seal Taxiway “D” • Reseal Connector Taxiway “C” • Construct additional five feet to taxilane south of T-hangar • Remove portion of vehicle parking lot and airport service road located within taxilane TSA and TOFA

Facility	Recommendation
Aprons	• Crack seal Main Apron and North Apron
Navigational Aids	• Replace and readjust the Runway 27 PAPI and install PAPIs and REILs for both ends of Runway 9-27 with FAA ownership of the PAPIs
Hangars	• Construct two additional T-hangar units, providing a combined total of 22 T-hangar stalls by the end of the forecast period • Maintain existing T-hangar to accommodate existing based aircraft • If the conventional hangar is occupied, construct an additional 7,600 square feet of conventional hangar space by 2023
Terminal Building	• Consider replacement terminal building of at least 3,000 square feet
Airport Access	• Provide additional vehicle staging space near the private entrance
Maintenance Hangar	• Consider construction of replacement maintenance hangar
Security	• Consider implementation of security enhancements 5 – 18 listed on Table 3-20

Chapter 4
Environmental Overview

4 Environmental Overview

The following sections provide information on the existing environmental conditions and constraints within the Study Area for the Windham Airport (IJD) Master Plan Update. The various sections presented in this chapter were obtained from the environmental impact categories provided in Federal Aviation Administration (FAA) Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. The Study Area includes property owned by IJD and the immediate surrounding area. Agency correspondence is available as Appendix D of this MPU.

The information presented in the following sections was obtained from site visits, GIS data from Connecticut Environmental Conditions Online, and a review of available maps and reports, including the 1998 Airport Master Plan Update. The information is presented in the following sections:

- Air Quality
- Biotic Resources
- Compatible Land Use & Zoning
- Construction Impacts
- Cumulative Impacts
- DOT Section 4(f) Lands
- Endangered and Threatened Species
- Environmental Justice
- Farmland
- Floodplains
- Hazardous Materials and Solid Waste
- Historical and Archeological
- Induced Socioeconomic Impacts
- Light Emissions and Visual Effects
- Noise
- Social Impacts
- Water Quality
- Wetlands
- Wild and Scenic Rivers
- Wildlife Hazards

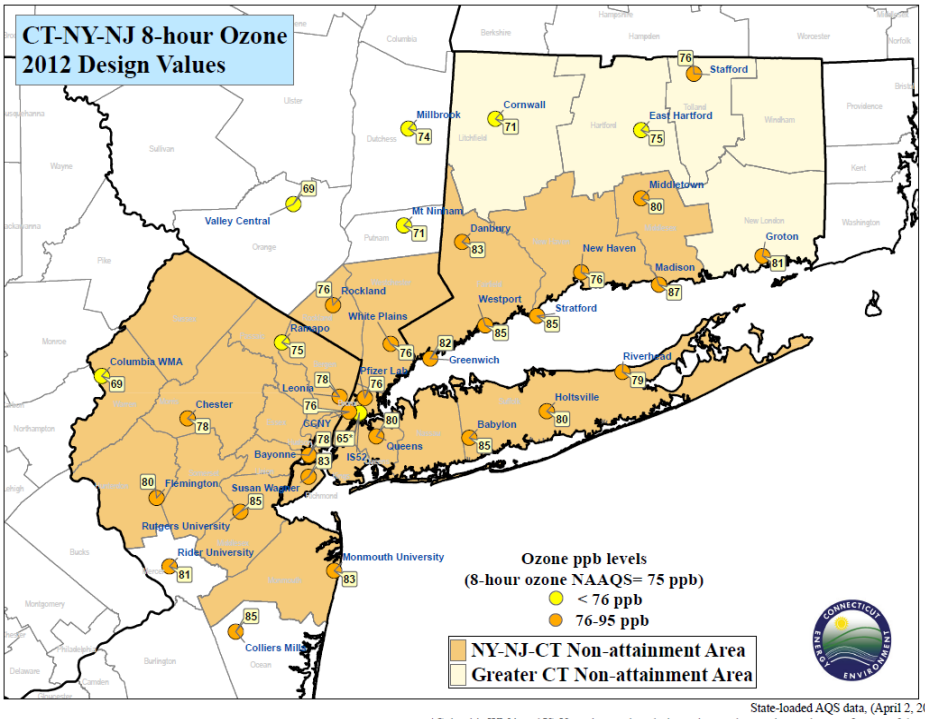
4.1 Air Quality

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for six "criteria air pollutants" (i.e., ozone (O3), carbon monoxide (CO), particulate matter (PM10 or PM2), sulfur dioxide (SO2), nitrogen dioxide (NO2), and lead(Pb)). The status of air quality within the state of Connecticut is provided one of two designations, attainment and non-attainment. When a State has been designated as attainment for an air pollutant, all regions of the State are in compliance with all standards. A non-attainment area is when one or more regions of a State that do not meet one or more of the standards for a pollutant.

According to the Connecticut Department of Energy & Environmental Protection (CTDEEP), Windham County is currently in attainment for all criteria air pollutants with the exception of 8-hour Ozone. Windham County is part of the 5-county Greater Connecticut Area and is classified as a marginal Nonattainment Area (Figure 4-1) and subject to planning and emission reduction requirements as specified in the Clean Air Act.

The 2008 standard, or attainment, of 8-hour Ozone is 0.075 ppm and takes a three-year average of the fourth highest daily maximum 8-hour average ozone concentrations measured at each monitor throughout the region over each year. Windham County has one air monitor located in Abington. According to the 2011 Annual Report on Air Quality in New England, only one of the four daily maximums exceeded the attainment concentrations indicated above at this monitoring station.

Figure 4-1 – CTDEEP Air Quality Map



4.2 Biotic Resources

Potential wildlife habitat on Airport property consists of the grassy areas located adjacent to the runways and taxiways and on the former Windham Dump site, asphalt surfaces, airport structures, small ponds, and a mature oak-pine forest located to the north of Runway 18-36. During the Wildlife Hazard Site Visit, various bird species were noted on the airfield including: crows (*Corvus brachyrhynchos*), wild turkey (*Meleagris gallopavo*), killdeer (*Charadrius vociferus*), American kestrel (*Falco sparverius*), gulls (*Larus* sp.), and various songbirds.

The grassy areas adjacent to the runways and taxiways are maintained by frequent mowing. The grass on the Dump site is mowed less frequently and although dominated by grass contains several herbaceous species. These grasslands are considered "Intensively Managed Habitat" by the Connecticut's Comprehensive Wildlife Conservation Strategy (CWCS), and are considered "Most Important Habitat" for grassland species; such as horned lark (*Eremophila alpestris*), northern harrier (*Circus cyaneus*), and vesper sparrow (*Pooecetes gramineus*). Grassy areas also attract large numbers of Canada geese (*Branta canadensis*), American crow, red-winged blackbirds (*Agelaius phoeniceus*) and European Starlings (*Sturnus vulgaris*), which require deterrence actions by the Airport, pursuant to FAA's Wildlife Hazard Mitigation Program.

Several natural wildlife and protected areas are located adjacent to IJD. These include: the Mansfield Hollow State Park and Wildlife Area, Willimantic Reservoir, Windham Atlantic White Cedar Bog, Natchaug River, and Natchaug State Forest (Figure 4-2). Due to the proximity of these areas to the airport, habitat diversity for various wildlife species is abundant.

Commercial and residential areas are also located within the vicinity of IJD that are attractants to wildlife species. These areas include: the Windham Recycling Center, Home Depot and Walmart. Birds such as gulls and crows are often drawn to these areas and will utilize IJD for feeding and loafing.

There are a few agricultural areas within the 5-mile separation distance, however they are relatively small fields (5-15 acres) surrounded by trees so provide a limited resource to species such as Canada Geese.

Figure 4-2 – CTDEEP Protected Open Space

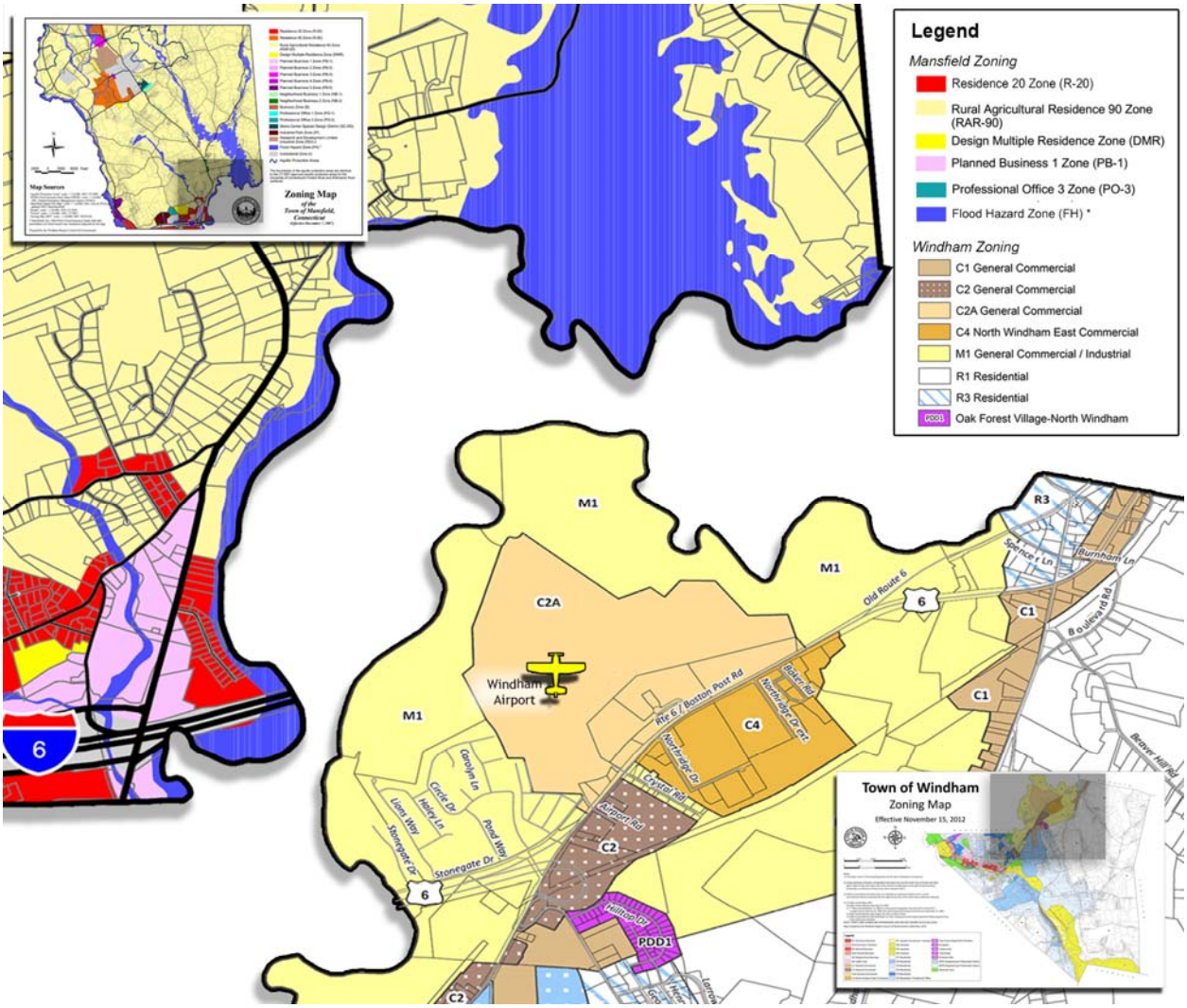
Symbol	Category	Description
	Federal	Federally owned land. Examples include Army Corps of Engineers property such as Mansfield Hollow or Thomaston Dam properties.
	Land Trust	Parcels owned by a land trust. Land trusts are generally private, non-profit entities that own land for preservation.
	Municipal	Municipally-owned parcels that include undeveloped open space parcels and parcels that are less than 50% developed in terms of buildings and facilities (ball fields, swimming pools, tennis courts, etc.).
	Private	Any privately owned lands (excluding land trusts) that are primarily open space, such as fish and game clubs and camps.
	State	State owned property such as parks and forests, flood control areas, and preserves. Primarily property owned by the Department of Environmental Protection.

Source: CTDEEP

4.3 Compatible Land Use & Zoning

According to FAA Order 1050.1E *Environmental Impacts: Policies and Procedures*, the compatibility of existing and planned land uses near an airport is generally associated with the extent of the airport's noise impacts. The land use categories discussed in this section were selected to be consistent with the requirements of the FAA regulations on noise and land use compatibility planning (14 CFR 150, referred to as Part 150). The residential category includes all single- and multi-family dwellings. The commercial/industrial category includes all businesses, offices, industrial uses, warehouse uses, utilities, and institutions that are not noise-sensitive. The open space/recreation category includes areas of vacant land, parks and recreational facilities, conservation land, watercourses, and wetlands. General land use is discussed for each municipality in the following sections. Figure 4-3 shows the general locations of the various land use categories within the Study Area.

Figure 4-3 – Towns of Windham and Mansfield Zoning



Source: Towns of Windham and Mansfield, CHA

4.3.1 Town of Windham

The majority of the Study Area within the Town of Windham includes commercial and industrial uses. These uses are primarily located south of the Airport, along State Route 6 (Boston Post Road). Open spaces are located to the north, east and west of IJD.

According to the Town of Windham Zoning Map, dated November 15, 2012, (Figure 4-3) IJD is zoned as General Commercial/Airport (CA2). Properties abutting the airport on the north, east, and west of the Airport are zoned as General Commercial/Industrial (M-1). The M-1 commercial/ industrial district allows light manufacturing. This zoning district is designed to encourage the maintenance and expansion of industry and to develop a more compatible relationship with surrounding residential areas.

Three Commercial Districts (C-1, C-2, and C-4) are located south of IJD, south of State Route 6. C-1 zones allow general commercial development where public utilities and infrastructure currently exist. Permitted structures in this area consist of business and professional offices, financial institutions, medical and dental clinics, indoor theaters and assembly halls, hotels and motels, restaurants and other food service establishments and self-storage. C-2 zones allow for general commercial development, oriented to vehicular transportation. Permitted structures could be used for professional services, such as banking, hair care, dry cleaning, day care, legal services, veterinary hospital, dog grooming, mobile food cart, indoor and outdoor recreational areas, civic club or lodge, places of worship, and municipal and other governmental uses. C-4 zoned areas are for retail/commercial development with flexibility allowing the zone to be responsive to market trends. Permitted uses are retail sales, restaurants including the sale of alcoholic beverages, financial services, multi-story hotels, and mixed use development with commercial use on the 1st floor and residential use on the 2nd floor.

To the southwest of IJD is a Planned Development District (PDD). This area has been identified as a tract of land that can be developed, redeveloped and improved consistent with the character of the Town and the long range improvements that are consistent with the Town's Comprehensive Plan of Development.

No residentially-zoned districts are located adjacent to IJD; three residential zones, however, are located approximately 2,000 feet to the south Airport, south of State Route 6 and commercial areas zoned as R-1, R-2, and R-3. Zone R-1 allows rural single family dwellings and agricultural uses that limit the need for major capital improvements with the minimum lot size of 2 acres. Zone R-2 is identified as moderate density residential development in rural areas where public facilities and infrastructure support the development. This zone restricts lot size to a minimum area of one-half acre unless not served by public sanitary sewers then the minimum area is 2 acres. Zone R-3 is similar to Zone R-2 with the exception of the accessibility of public facilities to any development.

4.3.2 Town of Mansfield

Land use to the north and west of IJD, within the Town of Mansfield, includes Flood Hazard (FH), Rural Agricultural Residence (RAR-90), Residence (R-20), Planned Business (PB-1), Designed Multiple Residence (DMR), and Professional Office (PO-3) Zones.

The FH Zone is directly associated with Mansfield Reservoir and Willimantic Reservoir. Permitted uses in these areas include recreational, agricultural (excluding caged poultry or livestock), parking areas, sand and gravel facilities, hydropower facilities and swimming pools.

Areas zoned to provide residential housing include RAR-90, R-20, and DMR. RAR-90 Zones allow for single- and two-family dwellings as well as community residences such as nursing homes, hospitals, childcare, mentally ill or group homes. Churches, garages, community centers, playgrounds, schools and libraries may occur in this zone. Zone R-20 is restricted to single-family dwellings, community residences, childcare facilities and State-licensed group day care homes typically with size restrictions limited by municipal services. Zone DMR provides for one-, two-, and multi-family dwellings.

The area Zoned as PB-1 is located within the Route 195/Route Area. This zone primarily consists of retail, banking and restaurant type businesses. The Professional Office Zones (PO-3) provides provisions for medical, legal, real estate, insurance, financial, engineering and other office uses of a similar nature.

4.4 Construction Impacts

Impacts relating to construction activities include construction noise, dust and noise from heavy equipment, traffic, disposal of construction debris and air and water pollution. State and Federal ordinances and regulations will be reviewed to determine the proper permits or certifications that will be required for each specific project.

4.5 Cumulative Impacts

Cumulative impacts consider past, present, and reasonably foreseeable actions, based on the fact that environmental impacts can accumulate over time or within a geographical area on the same resource. Federally sponsored projects, including FAA sponsored, are subject to the requirements of the National Environmental Policy Act (NEPA). Under NEPA, the FAA is required to assess a proposed action's direct and indirect impacts on a particular resource. Under various sections in this chapter, environmental resources and potential permitting or project coordination have been addressed.

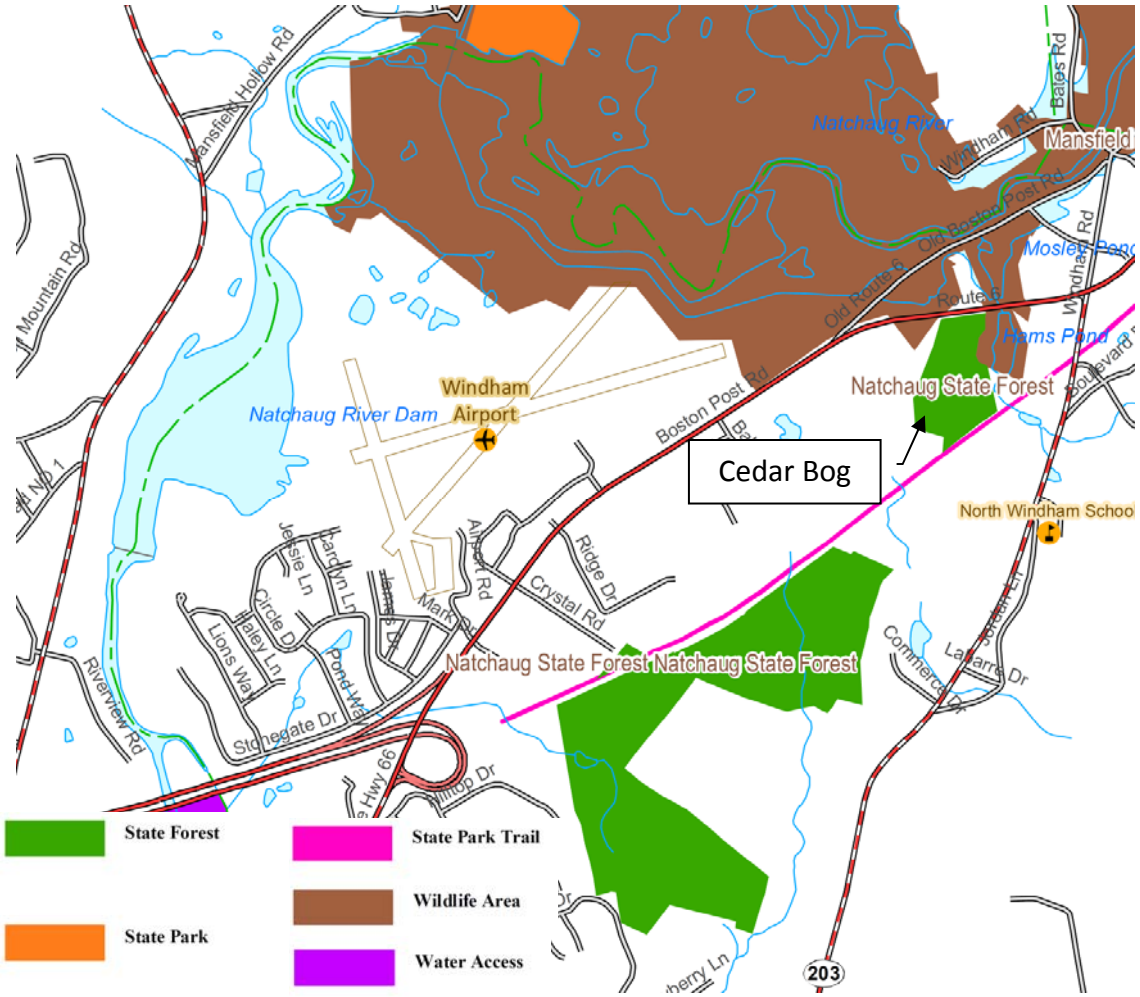
4.6 DOT Section 4(f) Lands

Section 4(f) of the Department of Transportation (DOT) Act requires the approval of the Secretary of Transportation for any project that impacts publicly owned land such as a public park, recreation area, or wildlife refuge of national, state, or local significance or a historic site of national, state, or local significance.

Public state forest, state park lands, and other protected spaces are numerable throughout the area the most dominant within the immediate area of the Airport are Mansfield Hollow State Park and Wildlife Area, Natchaug State Forest, Natchaug River, Shetucket River, Willimantic Reservoir, and Windham Atlantic White Cedar Bog. The airport is separated from Mansfield Reservoir by a

25-30 foot high flood control dike with a recreational trail along the top. Figure 4-4 shows the locations of public park, recreation area, or wildlife refuge property within the Study Area.

Figure 4-4 – CTDEEP Property Map



Source: CTDEEP

4.7 Federal and State Listed Endangered & Threatened Species

Endangered species are provided protection on both federal and state levels. The Federal Endangered Species Act of 1973 (16 USC 1531-1543, Sec. 2A) is the federal legislation that provides protection, while the State of Connecticut protects species through the Connecticut Endangered Species Act, passed in 1989. Under the Connecticut Endangered Species Act, Endangered, Threatened, and Species of Special Concern are defined as follows:

- **Endangered:** Any native species documented by biological research and inventory to be in danger of extirpation throughout all or a significant portion of its range within the state and to have no more than five occurrences in the state, and any species determined to be an "endangered species" pursuant to the federal Endangered Species Act.

- **Threatened:** Any native species documented by biological research and inventory to be likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range within the state and to have no more than nine occurrences in the state, and any species determined to be a "threatened species" pursuant to the federal Endangered Species Act, except for such species determined to be endangered by the Commissioner of the CTDEEP.

- **Species of Special Concern:** Any native plant species or any native non-harvested wildlife species documented by scientific research and inventory to have a naturally restricted range or habitat in the state, to be at a low population level, to be in such high demand by man that its regulated taking would be detrimental to the conservation of its population or has been extirpated from the state.

The U.S. Fish and Wildlife Service's (USFWS) federal list of threatened or endangered species was reviewed to determine if any such known species exist within the study area. In addition, an official species list was received on February 28, 2014 from the USFWS. As such, there are no federally listed threatened, endangered, or candidates species or critical habitats found within the study area.

To obtain information on rare, threatened, and endangered species that may be present within the Study Area, a request for review of the Natural Diversity Data Base (NDDB) was sent to the CTDEEP. A response from CTDEEP Wildlife Division, dated June 13, 2014, indicated that state listed endangered species and species of special concern have been documented within or in close proximity of the Airport. These include vertebrate and invertebrate species, and natural communities of conservation concern.

Vertebrates

Several grassland birds have been documented at the Airport including: grasshopper sparrow (*Ammodramus savannarum* – State endangered species), horned lark (*Eremophila alpestris* – State endangered species), savannah sparrow (*Passerculus sandwichensis* – State species of special conern), and eastern meadowlark (*Sturnella magna* –State species of special concern). These species are considered to be grassland-obligate birds requiring large open fields or agricultural areas for breeding, nesting and foraging.
The CTDEEP Wildlife Division recommends:

- Minimizing impacts to fields from May to August. Mowing before May 1st or after August 30th is preferable.

- Areas that require seeding or reseeding should utilize warm-season grass species.

The American kestrel (*Falco sparverius* – State species of special concern), has also been documented at the Airport. This species hunts over open areas and nests within tree cavities near field edges. Minimizing impacts to open grassy areas as well as cavity trees on the edges of open habitats are recommended by CTDEEP Wildlife Division.

The eastern hognose snake (*Heterdon platirhinos* – Species of special concern) is also documented to occur near the Airport. The following information was provided by CTDEEP:

"The eastern hognose snake is in decline due to loss of suitable habitat. It favors well drained sandy/gravelly soils along the edges of second growth forests. This species is dormant from November 1 to April 1. If work is planned in any eastern hognose snake habitat, the Wildlife Division recommends that a herpetologist familiar with the habitat requirements of this species conduct surveys…." and "the results of the investigation be forwarded to the Wildlife Division…"

Invertebrates and Natural Communities

The following state-listed invertebrates were identified by CTDEEP as being documented at Windham Airport: sleepy duskywing (*Erynnis brizo*- Threatened – host plant: *Quercus ilicifolia*), noctuid moth (*Zanclognatha martha*- Threatened – host plant: *Quercus* spp. and *Prunus* spp.), Apamea moth (*Apamea burgessi*- Species of Special Concern – host plant: unknown), Henry's elfin (*Callophrys henrici*- Species of Special Concern – host plant: *Ilex* spp., *Cercis canadensis, Rhamnus* spp. and *Frangula alnus*), Frosted elfin (*Callophrys irus*- Species of Special Concern – host plant: *Baptisia tinctoria* and *Lupinus perennis*), noctuid moth (*Chaetaglaea cerata*- Species of Special Concern – host plant: *Vaccinium* spp., *Quercus* spp., and *Prunus* spp.), Horace's duskywing (*Erynnis horatius*- Species of Special Concern – host plant: *Quercus* spp. (especially scrub oak)), noctuid moth (*Euchlaena madusaria* – Species of Special Concern - host plant: *Vaccinium angustifolium* and *Vaccinium pallidum),* noctuid moth (*Eucoptocnemis fimbriaris*- Species of Special Concern – host plant: unknown), noctuid moth (*Lepipolys perscripta*- Species of Special Concern – host plant: *Linaria* spp.), noctuid moth (*Schinia spinosae*- Species of Special Concern – host plant: *Polygonella* spp.), and noctuid moth (*Zale oblique*- Species of Special Concern – host plant: generalist feeder). CTDEEP indicates that all of these species have been negatively impacted by the loss of their associated plant species and habitats.

CTDEEP also identified three Natural Communities of Concern present within the immediate vicinity of the Airport, the Sand Barrens which consists of dry sandy deposits with woody or

grassy vegetation, Pitch Pine Woodlands which are open canopy woodlands dominated by pitch pine (*Pinus rigida*), and Acidic Atlantic White Cedar Swamps that are evergreen forested and/or shrub swamps dominated by Atlantic white cedar (*Chamaecyparis thyoides*) with stagnant or slow moving water; in topographicaly defined basins; on decomposed peats and mucks.

CTDEEP Wildlife Division recommends that a comprehensive botanical survey be conducted to identify the presence and distribution of plant communities, State-protected plant species, and larval host-plants for State-protected invertebrates. These surveys should be performed by a qualified botanist at least three times between the months of April and October and a report provided to CTDEEP.

4.8 Environmental Justice

Environmental justice ensures that no low-income or minority population bears a disproportionate burden of effects resulting from a Federal Action. Executive Order 12898, and U.S. Department of Transportation Order 5610.2 requires the FAA to analyze impacts on low-income and minority populations and to provide for meaningful public involvement.

The only residential area near the airport is the Stonegate Manor manufactured housing community located directly southwest of the airport. Other residential hubs are located northeast (Storrs) and southeast (Willimantic) of IJD.

While Chapter 3, *Facility Requirements Evaluation*, recommends voluntary acquisition of the residential property located within the Runway 36 Runway Protection Zone, future land acquisition would require compliance with FAA AC 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects.*

4.9 Farmland

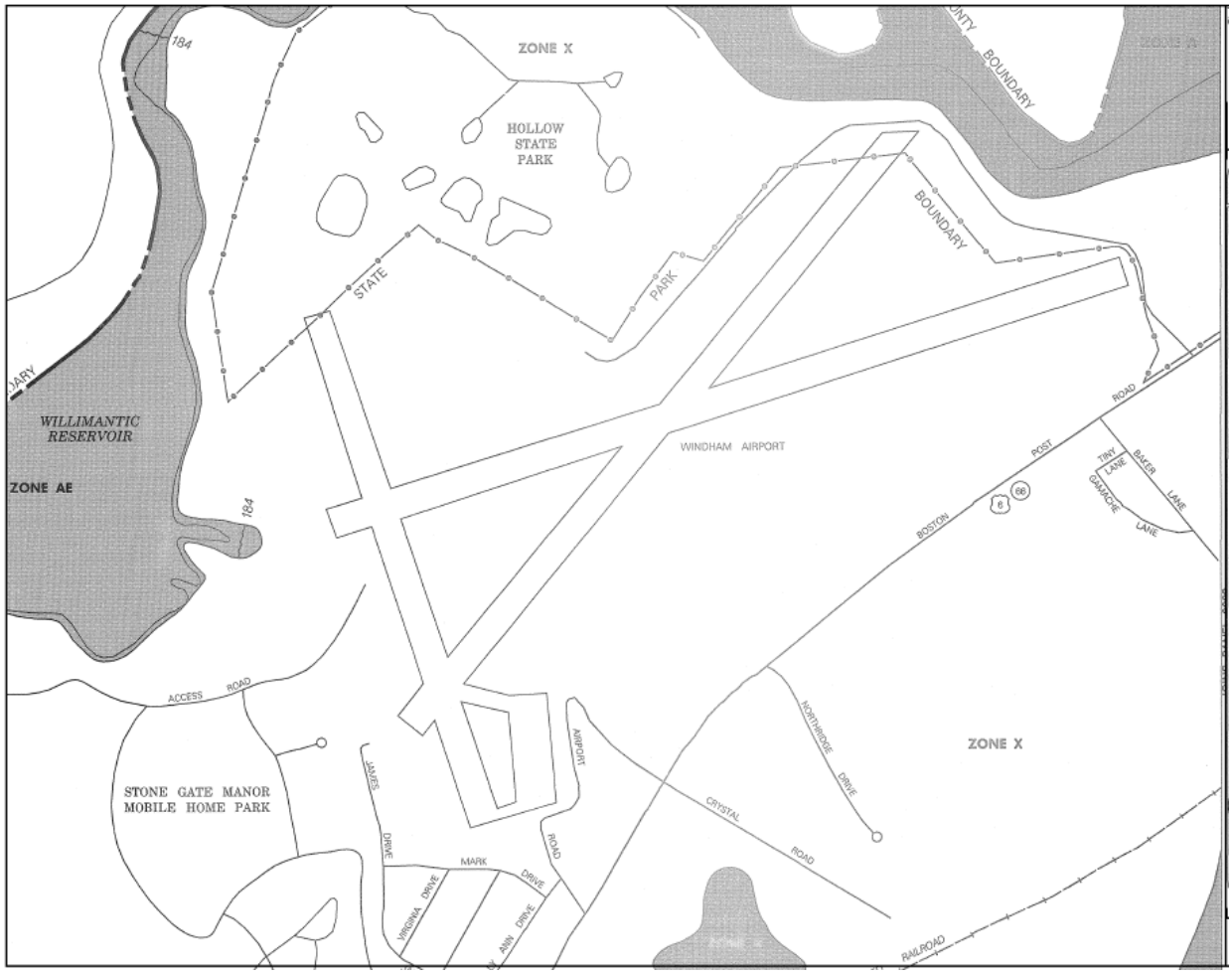
The Farmland Protection Policy Act (FPPA) regulates Federal actions that have the potential to convert farmland to non-agricultural uses.

The only area that is classified as having farmland soils of statewide importance is located on the old Windham Dump site. This area is not being used for agricultural purposes. Current land use within this area generally consists of open space and conservation land. The 2012 Windham Airport Business Plan identified this area as “not readily developable”.

4.10 Floodplains

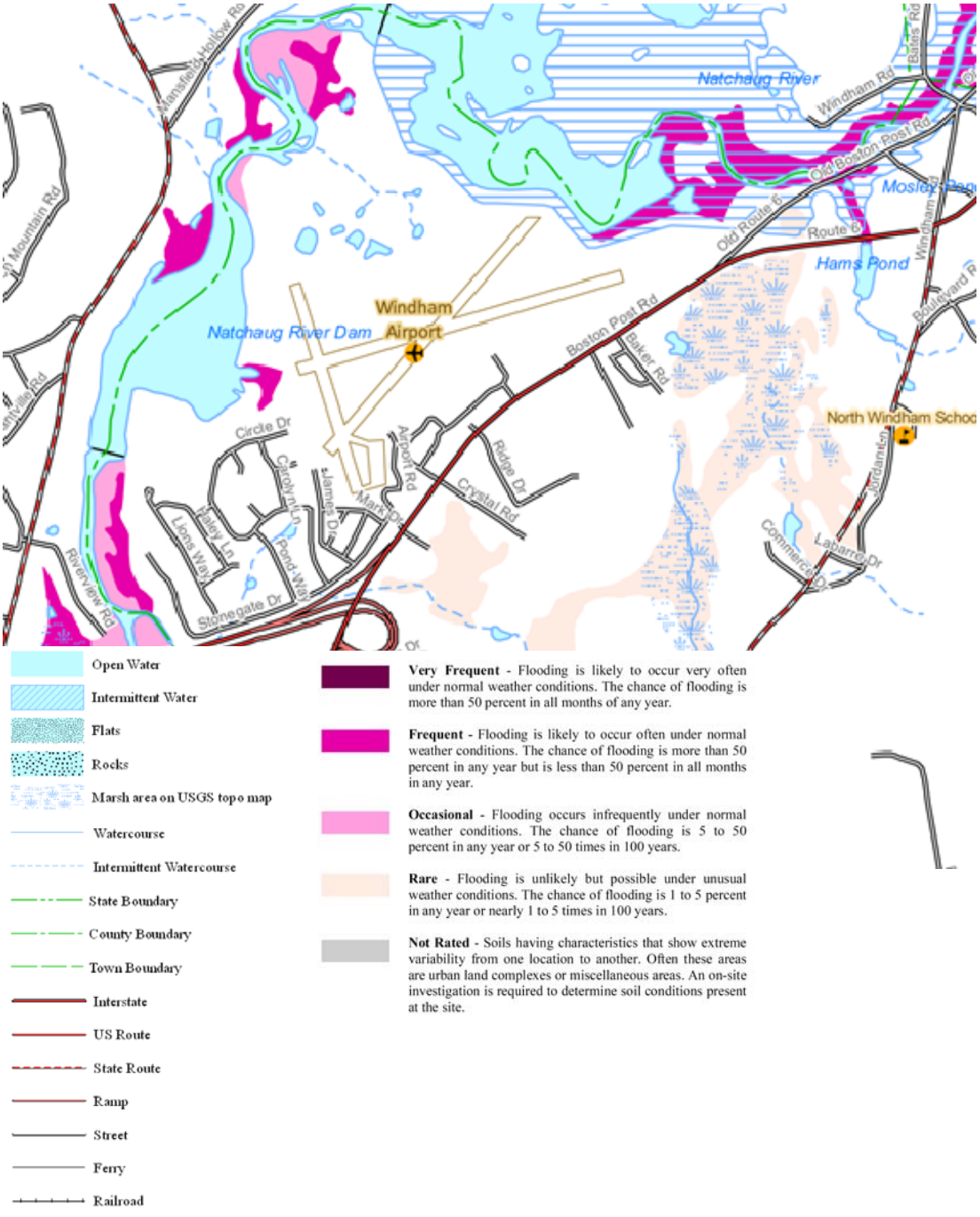
Flood Insurance Rate Maps (FIRMs) for Windham County were reviewed to determine the locations of floodplains within the Study Area. The most recent maps show that all of IJD is located in Zone X, which is an area determined to be outside of the 500 year floodplain. The FIRM also indicates that IJD is located in an area that is designated as being protected by a levee. This levee is part of the Mansfield Hollow Dam System, which provides protection against flooding from the Mansfield Hollow Lake. Figure 4-5 and Figure 4-6 show the locations of floodplain areas near IJD.

Figure 4-5 – FEMA Community Panel 090119 0001D, Revised November 6, 1998



Source: FEMA

Figure 4-6 – CTDEEP Soil Flooding Class



Source: CTDEEP

4.11 Hazardous Material and Solid Waste

Currently, fuel storage does not currently occur at the Airport. Two 10,000 gallon underground tanks were located at IJD, but have recently been removed (June 2013). It is anticipated that two new 10,000 gallon aboveground fuel storage tanks will be installed to replace those that were removed in 2014. The fuel tanks will hold 100LL and Jet-A fuel.

Other petroleum-based products that are located on site are associated with maintenance. These include airplane degreaser detergent, vehicle anti-freeze, lubricants, batteries, cleaning solvents, and paint. These materials are generally stored in small quantities inside airport facilities. Additionally, no documentation regarding the use or storage of pesticides and herbicides was found.

Trash receptacles and dumpsters for municipal solid waste are available throughout the Airport. Each airport tenant is responsible for ensuring proper disposal of personal MSW into a receptacle. Solid waste generated at the airport is stored in covered dumpsters that are regularly emptied by a licensed waste hauling sub-contractor. Lined, covered dumpsters are provided for the temporary storage of empty motor oil containers, used oil filters, and small quantities of spent spill clean-up materials. An Oil/Water Separator is installed to capture wash water generated from the routine cleaning of vehicles and equipment prior to discharging the wastewater to the sanitary sewer.

General structural and non-structural best management practices (BMPs) are implemented to minimize the release of spilled materials and any adverse impacts to human health and the environment. These include employee training in response activities, conduct routine inspections, use of general good housekeeping practices, and the implementation of storm water pollution prevention activities (refer to Section 4.19).

4.12 Historical and Archeological

No formal archaeological or historical surveys were conducted as part of this study. Information obtained from the previous Master Plan indicated that there are no buildings on the site that have been deemed eligible for the National or State Registers of Historic Places. It also determined that there were no known archaeological sites on the airport property itself. However, the Office of State Archaeology recommends that any specific areas proposed for land use changes are reviewed further for cultural resources management.

4.13 Induced Socioeconomic Impacts

Induced socioeconomic impacts are those that may result in changes to social or economic characteristics in the community such as shifts in patterns of population movement and growth, public service demands, changes in business and economic activities or other factors identified by the public. The Council on Environmental Quality (40 CFR Part 1500, Section 1508.27 requires Federal agencies to consider the intensity and context of a proposed action and the significance of the impact. Section 1508.8 address foreseeable impacts caused by an action that may be farther removed in space or time.

An Advisory Committee has been established as part of this study process. The Advisory Committee members include: stakeholders from the surrounding communities and local government agencies. The purpose of the Advisory Committee is to provide stakeholder insight on topics regarding the Master Plan Update that are relevant to the community and business development.

4.14 Light Emissions and Visual Effects

Runway lighting, marking and instrumentation allows for the safe operation of aircraft during nighttime hours and low visibility conditions. The Runway 27 approach is equipped with Runway End Identifier Lights (REILs) and a Precision Approach Path Indicator (PAPI) that provides identification of the runway approach end at night and during low visibility conditions. Both Runway 9-27 and Runway 18-36 have Medium Intensity Runway Lights (MIRLs). A lighted wind cone is located in the center of a circular area that provides pilots with general wind direction and speed. Light intensity levels associated with these the navigational facilities and other activities at IJD are relatively low compared to background levels in the area.

4.15 Noise

The FAA has adopted land use compatibility guidelines for preparing airport noise studies. According to federal regulations, a Day-Night Average Sound Level (DNL) below 65 decibels is considered to be compatible with all land uses. To determine existing and future DNL levels at IJD, aircraft activity presented in Chapter 2, *Forecasts of Aviation Demand* for years 2013 and 2033 were used with the FAA's Integrated Noise Model (INM) version 7.0 to develop DNL noise contours.

As depicted on Figure 1-2, the DNL 65 for the existing activity level (2013) is contained entirely within the existing airport property; located along just Runway 9-27 as it is the main runway. As such, the existing noise levels are compatible with the surrounding land uses. Additionally, Figure 1-2 depicts the noise contours with the forecast activity (2033). The DNL 65 is also anticipated to remain within the airport property limits.

2033 (Solid)

2013 (Dashed)

50 55 60

LEGEND

- Airport Property Line
- 55 2013 DNL Noise Contour
- 55 2033 DNL Noise Contour

Note: DNL 65 Noise Contour does not extend beyond the runway and is not depicted.

0 600

Scale in feet

Magnetic (2013) 14° W

CHA
2139 Silas Deane Highway, Suite 212 • Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

DRAFT

EXISTING & FUTURE NOISE CONTOURS

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: OCT. 2014

FIGURE 4-7

4.16 Social Impacts

Social impacts are the results of actions that may have an effect on the human environment, the health and safety of children, and socioeconomic welfare of the community. Under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, FAA must meet the requirements indicated in 40 CFR Part 24 if a proposed action involving FAA approval or funding would require the purchase of real property or displace people or business.

Executive Order 13045 directs Federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children. The only area where children may congregate for recreational purposes is the walking path that is along the top of the dike. There are no other recreation areas, such as parks nor are there any schools within close proximity of the Airport. Project activities are not anticipated to attribute to products or substances that a child is likely to touch or consume.

The primary land use within immediate vicinity of IJD consists of commercial and industrial use (see above Section 4.3). Potential acquisition of property located within the Runway Protection Zones would require compensation and relocation services per the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

4.17 Water Quality

4.17.1 Ground Water

The CTDEEP classifies types of groundwater along with their respective designated uses. Groundwater in the vicinity of IJD is designated by the CTDEEP as Class GAA which is defined as: existing or potential public supply of water suitable for drinking without treatment; baseflow for hydraulically-connected surface water bodies. Discharges are limited to: treated domestic sewage, certain agricultural wastes, certain water treatment wastewaters.

4.17.2 Surface Water

The federal Clean Water Act (CWA) and the Connecticut General Statutes establish water quality standards for all surface waters of the state. Surface waters on the Airport property consists of several small ponds north of Runway 9-27. Two of these ponds are used for stormwater runoff from the Airport and surrounding areas. There are no streams or other surface waters on the airport.

IJD lies within the Sawmill Brook – Natchaug River sub watershed which is part of the Shetucket watershed. Surface water resources within the vicinity of IJD include the Willimantic

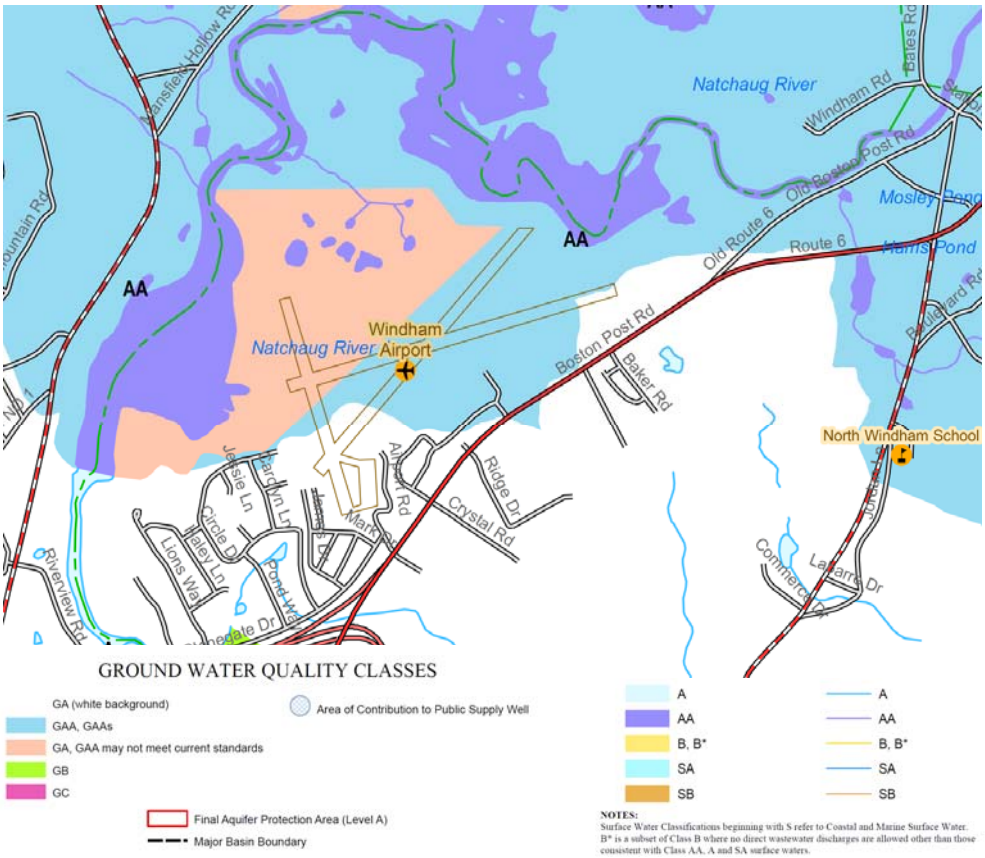
Reservoir, Mansfield Reservoir, and the Natchaug River. The Willimantic Reservoir and Mansfield Reservoir are both impoundments of the Natchaug River which flows south from the Airport. The northeastern portion of IJD is separated from the Mansfield Reservoir and protected from flooding by a 25-30 foot high flood control dike.

Surface water is drawn from the Willimantic Reservoir to provide drinking water for the Towns of Windham and Mansfield. Mansfield Reservoir serves as storage for the Willimantic Reservoir.

Willimantic and Mansfield Reservoirs are both classified by CTDEEP as Class AA surface waters. Designated uses for Class AA water bodies are: existing or proposed drinking water supplies; habitat for marine fish and aquatic life and wildlife; recreation; and water supply for industry and agriculture (CTDEEP, 2011).

The Natchaug River, east of the Airport where it flows into the Mansfield Reservoir, is also classified as Class AA. However, below the Willimantic Reservoir it is classified as Class A. The designated uses of this classification consist of surface waters designated for fish habitat and other aquatic life and wildlife; potential water supply; recreation; navigation; and water supply for industry and agriculture.

Figure 4-8 – CTDEEP Water Quality Classifications



Source: CTDEEP

The CWA requires each state to submit two surface water quality documents to the EPA every two years. Section 305(b) of the CWA requires the submittal of a report that describes the quality of surface waters and an analysis of the extent to which all such waters provide for the protection and propagation of a "balanced population of shellfish, fish, and wildlife and allow recreational activities in and on the water."

The second document is commonly referred to as the 303(d) List because it is required by Section 303(d) of the CWA. The 303(d) List includes all surface waters that are:

- Impaired or threatened by a pollutant or pollutants;
- Not expected to meet water quality standards within a reasonable time even after application of best available technology standards for point sources or best management practices for nonpoint sources; and
- Require development and implementation of a comprehensive water quality study, referred to as a Total Maximum Daily Load (TMDL) study that is designed to facilitate achievement of applicable water quality standards.

The 2010 303(d) List identifies the reach of the Natchaug River south west of Airport (3200-00-01) as being impaired for "recreation" by bacteria.

4.17.3 Storm Water

Available drainage plans indicate that the airport contains two drainage areas that are designated A and B (refer to Figure 4-8). Drainage Area A covers approximately 32 acres and includes the eastern portion of Runway 9-27, and associated taxiways and grassed infield areas. Storm water drainage from Area A discharges to a pond through a 30-inch pipe located in the northeast corner of the property. No airport buildings drain through this discharge point

Drainage Area B covers approximately 80 acres and includes the western portion of Runway 9-27, and the southern portion of area of Runway 18-36. It also encompasses taxiways and grassed infield area associated with the runways, and hangar areas and other airport facilities south of Runway 9-27. Storm water drainage from Area B discharges to a small pond through a 20-inch pipe located in the northern portion of the property.

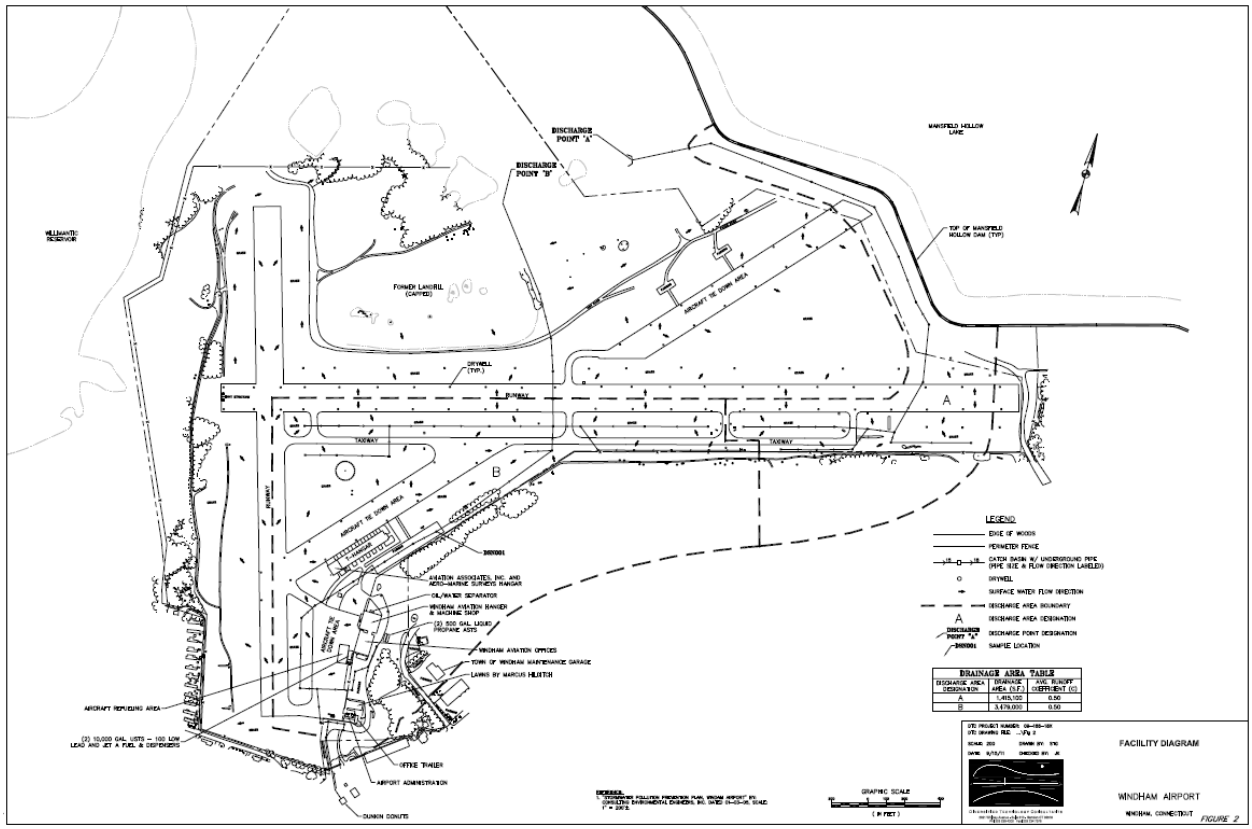
Storm water discharges from IJD are regulated by state statutes and are subject to the requirements of the state General Permit for the Discharge of Stormwater Associated with Industrial Activities permit (DEEP-WPED-GP-014). This general permit applies to all discharges from any conveyance which is used for collecting and conveying storm water, which is directly related to manufacturing, processing, or storage areas at an industrial facility. Airports are included in Sector G of the permit (Transportation and Public Works Facilities). The goal of

the permit is to eliminate or minimize exposure of potential water quality contaminants to storm water and subsequent discharge to surface water. Key elements of the permit include:

- Development and maintenance of a SWPPP
- Designation of a facility Pollution Prevention Team
- Annual training of personnel involved with activities that might expose contaminants to storm water
- Use of appropriate spill prevention and response actions
- Implementation of general good "housekeeping" activities and structural BMPs
- Conducting routine inspections of airport and tenant facilities
- Monitoring of storm water discharges.

IJD's current Industrial Storm water Permit (GSI000918) was authorized on August 24, 2013 and will expire on September 30, 2016. The current pollution prevention team is comprised of the Windham Airport Manager, Airport Maintenance Crew and Leaders, the Airport Fire Captain, and Airport Emergency Services personnel.

Figure 4-9 – SWPP Facility Diagram



Source: CAA SWPPP 2011

Storm water pollution prevention activities performed at IJD are listed in Table 2-1.

Table 4-1 – Storm Water Pollution Prevention Activities

Scheduled Task	Frequency
General Good Housekeeping	Daily
Routine Facility Inspections	Monthly
Comprehensive Site Compliance Evaluation	Quarterly
Visual Outfall Monitoring	Quarterly
General Monitoring	Annually (during the winter season)
Toxicity Sampling	Annually for the first two years
Employee Training	Annually

Source: CAA SWPPP 2011

In the event that future airport projects will disturb one or more acres of surface area, IJD will be required to apply for a General Permit for the Discharge of Storm water and Dewatering Wastewaters Associated with Construction Activities (DEEP-WPED-GP-015). Furthermore, significant changes to the total acreage of impermeable surfaces at IJD and/or changes to the storm water drainage system or structural BMPs would require updates to the current Industrial Permit SWPPP.

4.18 Wetlands

4.18.1 Regulatory Summary

Wetlands are federally protected under the Clean Water Act and activities resulting in impacts to them require a permit from the U.S. Army Corps of Engineers (ACOE) under Section 404 of that same Act. In Connecticut, tidal wetlands are protected under the Tidal Wetlands Act (CGS sections 22a-28 through 22a-35) and inland wetlands are protected under the Inland Wetlands and Watercourses Act (CGS sections 22a-36 through 22a-45). Any activities resulting in impacts to State Wetlands will require a permit from DEEP.

Wetlands within the Runway Safety Areas (RSA) and Object Free Areas (ROFA) were delineated on September 30 – October 2, 2013. Federally-regulated wetlands were delineated in accordance with the U.S. Army Corps of Engineers Wetland Delineation Manual (ACOE, 1987) and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (ACOE, 2009). State-regulated wetlands were delineated in accordance with the Connecticut Inland Wetlands and Watercourses Act (Sec. 22a-38, Definitions). A summary of the findings and status of wetlands is located in Appendix E. Wetlands located at the end of Runway 27, within ACOE property, were delineated and included

in the report. Wetlands located outside the RSA and ROFA, but on-airport property, were not field-delineated but were identified based on a review of available mapping (soils maps, National Wetland Inventory maps, and aerial photographs).

Federally-regulated wetlands are delineated using a three-parameter approach (e.g., soils, vegetation, and hydrology). The ACOE defines wetlands as, "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (ACOE, 1987).

State-regulated wetlands in Connecticut are delineated based on soils. The Connecticut Inland Wetlands and Watercourse Act defines wetlands as, "land, including submerged land, not regulated pursuant to Sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the Natural Resources Conservation Service of the United States Department of Agriculture."

The Connecticut Inland Wetlands and Watercourses Act define watercourses separately from wetlands. According to the Act, watercourses are defined as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through, or border upon this state or any portion thereof, not regulated pursuant to Sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (a) Evidence of scour or deposits of recent alluvium or detritus, (b) the presence of standing or flowing water for a longer duration than a particular storm incident, and (c) the presence of hydrophytic vegetation."

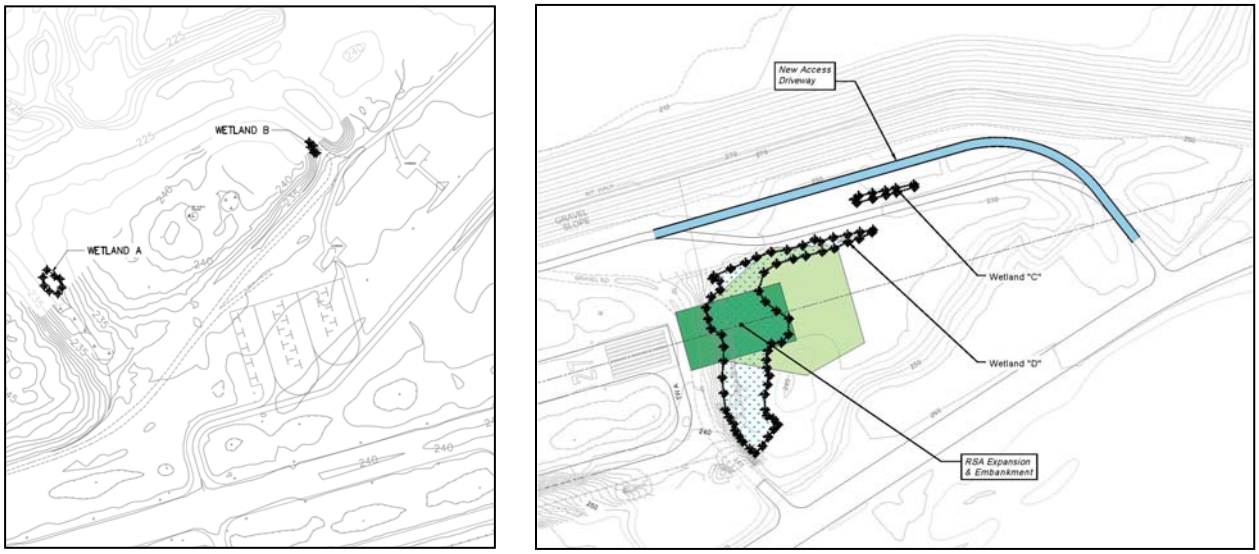
As improvement projects at IJD are proposed and designed, it is recommended that coordination with the ACOE and the CTDEEP occur to obtain their input regarding wetland impacts. Projects should be designed to avoid and minimize wetland impacts to the maximum extent practicable.

4.18.2 Wetland Resources

Two wetlands (Wetlands A and B) are located on airport property, north of Runway 9-27 along the base of the Former Windham Dump site. These wetlands appear to have been formed within drainage swales that over time have settled and allowed water to accumulate. Two additional wetlands (Wetland C and D) are located near the approach end of Runway 27. Figure 4-10 depicts the location of the wetlands.

Soils within the remaining portions of the Airport and USACE property east of Runway 9-27 do not meet the criteria of wetland soil and support the USDA mapped classification as Udorthrents-Urban Land Complex (Map Unit 306). This soil type is classified as well drained or moderately well drained and are not identified as floodplain soils.

Figure 4-10 – Wetland Location Map



4.18.2.1 Wetland A

Wetland A is a small open water ponded area located between the two portions of the Dump. The wetland contains open water and is surrounded by a mix of species, such as hard-stem bulrush (Schoenoplectus acutus), swamp smartweed (Persicaria hydropiperoides), three-way sedge (Dulichium arundinaceum), and woolgrass (Scirpus cyperinus). A stone lined ditch directs overflow from this area to upland areas north of the Runway 9-27 and eventually to the pond where stormwater is discharged. According to the federal classification system (Cowardin et. al.), the majority of Wetland A is classified as an artificial pond with an unconsolidated organic bottom (PUB4r). Functions and values provided by Wetland A include floodflow alteration, nutrient removal and wildlife habitat. Of these functions only wildlife habitat appear to be a principal function. The wetland is not within a floodzone and fertilizers are not applied to the adjacent vegetation resulting in added nutrients. The area of Wetland A within the JD Boundary is approximately 0.05 acres. Wetland A does not appear to have any direct connection to other wetlands.

4.18.2.2 Wetland B

Wetland B is classified as partially drained/ditched, seasonally flooded, palustrine emergent with vegetation being dominated by common reed (Phragmites australis) (PEM5). Similar to Wetland A it appears that this wetland area was created due to settling of the landfill cap and restricted

outflow. It appears that excess water from this area sheet flows across the gravel road and into small ponds located north of the wetland. The suitable functions and values of this wetland are Floodflow Alteration, Nutrient removal and Wildlife Habitat. Wildlife Habitat would be considered the only principle function and due the size of the wetland it would only provide very limited habitat. The area of Wetland B within the IJD boundary is approximately 0.005 acres.

4.18.2.3 Wetland C

Wetland C and Wetland D were delineated near the end of Runway 27. This area is owned by the USACE, but is within the RPZ. The area identified as Wetland C is located within a drainage channel. The primary source of water for Wetland C is runoff from surrounding upland areas. The vegetation within portions of this channel are predominantly FACW and OBL and hydrologic indicators are present however, the soils do not contain any hydric soil indicators nor are they considered a wetland or floodplain soil by the State of Connecticut. Although the area was flagged and labeled "Wetland" this area is not considered a wetland due to the lack of hydric soils, however it would be considered 'jurisdictional' due to the connection between wetlands/waters of the United States. The area of Wetland C within the JD Boundary is approximately 0.04 acres.

4.18.2.4 Wetland D

Wetland D consists of areas of emergent and scrub-shrub vegetation. Dominant vegetation in the emergent portion of the wetland consists of broadleaf cattail (Typha latifolia), upright sedge (Carex stricta), and purple loosestrife (Lythrum salicaria). According to the federal classification system (Cowardin et. al.), the emergent portion of Wetland D is classified as a temporarily flooded, partially drained/ditched emergent wetland with persistent vegetation (PEM1Ad). The classification for the scrub-shrub portion of the wetland would be a temporarily flooded, partially drained/ditched, broad-leaved deciduous wetland (PSS1Ad). This wetland is suitable in providing various functions and values including Groundwater Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, and Wildlife Habitat. However, the primary functions of this wetland are Groundwater discharge and Sediment/Toxicant Removal. This is due to the proximity of impervious surfaces that have the ability to drain into the wetland during storm events and the presence of a small spring observed at the base of the slope. The area of Wetland D within the JD Boundary is approximately 1.42 acres

Figure 4-10 also depicts an area for a potential future runway extension and/or associated Runway Safety grading. As depicted, a future extension and/or grading will impact Wetland D by approximately .5 to 1.0 acres, depending on the length of the extension. Chapter 5, *Development Alternatives* further discussed proposed concepts and potential environmental impacts.

4.18.3 Wetland Resources Not Delineated

The National Wetland Inventory Map was reviewed to determine the locations of wetland resources in the vicinity of IJD. There are several ponds located just north of Runway 9-27 within the forested area. From the topography maps it appears that during periods of high water flows, these ponds overflow into Willimantic Reservoir. These wetlands would be classified as palustrine forested.

Other waterbodies and watercourses in the vicinity of IJD include the Natchaug River, Willimantic Reservoir, and Mansfield Reservoir. These areas are regulated federally as waters of the U.S.

4.19 Wild and Scenic Rivers

In 1968, the US Congress passed the Federal Wild and Scenic Rivers Act (P.L. 90-542) in order to preserve "certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values". Currently, there are no river segments within the Study Area that are included in the federal Wild and Scenic Rivers Program.

4.20 Wildlife Hazards

A Wildlife Hazard Site Visit (WHSV) was conducted to determine bird and mammal species that occur within the airport environment and surrounding area that will create a hazard for air traffic at IJD. The WHSV was completed in September 30 - October 2, 2013 by an FAA Qualified Airport Wildlife Biologist. The intent of a WHSV is to provide an abbreviated analysis of the airport's wildlife hazards to support the Updated Master Plan and to determine if an Assessment is warranted. Additionally, the WHSV provides information that allows the Airport to include actions in this Master Plan that can mitigate potential hazards. During the three day survey a total of 39 bird, seven mammal, and two reptile species were observed. Table 4-2 lists species that are among the top 20 species ranked by FAA as being the most hazardous to aircraft.

Table 4-2 – Hazardous Wildlife Species Observed at IJD During WHSV*

Rank	Common Name	Scientific Name
(Birds)		
3	Turkey Vulture	*Cathartes aura*
5	Canada Goose	*Branta canadensis*
8	Bald Eagle	*Haliaeetus leucocephalus*
10	Double-crested Cormorant	*Phalacrocorax auritus*
12	Wild Turkey	*Meleagris gallopavo*
14	Mallard	*Anas platyrhynchos*
15	Osprey	*Pandion haliaetus*
16	Great Blue Heron	*Ardea herodias*
19	Great Egret	*Ardea alba*
20	Red-tailed Hawk	*Buteo jamaicensis*
(Mammals)		
2	White-tailed Deer	*Odocoileus virginianus*

*Dolbeer, R. A., S. E. Wright, J. Weller, and M. J. Begier. 2013. Wildlife Strikes to Civil Aircraft in the United States 1990-2012. U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Safety and Standards, Serial Report No. 19. Washington, D.C., U.S.A. 98 pages

American crows, black-capped chickadees, blue jays, Canada geese, European starlings, killdeer, savannah sparrows and wild turkeys were observed within the vicinity of the Airport. The majority of species observed during the site visit were as single birds, in pairs, or small flocks. Flocks of birds generally contain more than five individuals.

This survey captured only a small snapshot in time. Seasonal bird abundance and distribution will fluctuate during the various seasons and typically peak during the early spring and fall which coincides with bird migration.

Wildlife hazards posed by mammals at IJD are infrequent but still merit attention. Deer have full access to the runway and were observed north of Runway 9-27 foraging on the Dump adjacent to the forest. Domestic dogs and cats, gray squirrels and a beaver were observed during daylight surveys. Rabbits, skunks, coyotes and white-tailed deer were observed during nighttime surveys.

The WHSV determined that the wildlife populations associated with the Airport Operations Area (AOA) at IJD are a hazard to aircraft safety. The hazards identified can be reduced to an acceptable level providing the Connecticut Airport Authority implements the recommendations provided in WHSV report. The conclusions and recommendations were based on current airport operations, the bird and mammal populations that frequent the area and their habitat, and various wildlife control measures.

The recommendations, some of which will require coordination with other agencies such as CTDEEP and ACOE, were divided into four sections:

- **Habitat Modification** - Altering habitat is a way to reduce the amount of food, water, and cover available to target animals. Recommendations under habitat manipulation will have the most lasting effect on reducing the use of the airport by hazardous wildlife. The following recommendations were made:
    - Vegetation Management
        - Manage turf heights between the FAA recommended 6-12 inches
        - Remove or replace trees and shrubs that produce nuts or berries
    - Drainage and Wetlands
        - Inspect and maintain drainage structures
        - Reduce persistent vegetation within wetland areas
    - Reduction of Food Resources
        - Monitor worm and grub abundance
    - Debris and Trash Removal
        - Removal of debris within the airfield area and north of Runway 9-27
    - Perching Structures
        - Remove all unnecessary posts and structures on the airfield and broken down equipment located north of Runway 9-27
        - Remove all trees within 165 yards of the runway center line
        - Install Anti-Perching Devices on airport infrastructure where perching occurs
- **Exclusion** - When food, water or shelter cannot be removed by habitat modification, exclusion may work to keep hazardous wildlife away from the Airport. Exclusion involves the use of physical barriers to deny wildlife access to an area. The following are some suggestion exclusion methods that can be used at IJD.
    - Install a Wildlife Exclusion Fence
    - Culvert Covers
    - Deny access to Airport Structures
- **Repelling** - Due to the limited availability of airport personnel at IJD, there is no routine active dispersal to control hazardous wildlife. Personnel, however, from adjacent airports will respond to emergency situations. These responders should be equipped with the proper hazing and pyrotechnic equipment and should be properly trained on the effective

and proper use of the equipment. A multitude of techniques should be used to minimize hazardous wildlife becoming habituated to an individual technique.

- **Operations and Communication** - Operational Considerations provides ways to relay information between air traffic control and pilots. Recommends include:
    - PIREPs
    - UNICOM
    - NOTAMs
    - Flight Scheduling
    - Pilot Training

In addition to these recommendations administrative controls such as obtaining the proper permits to control wildlife, keeping a log of hazardous wildlife observations and control activities, strike reporting and implementing a zero tolerance policy should be conducted.

When applying recommendations, it must be understood that there are many actions that can be taken to decrease wildlife hazards. Actions taken will depend on the species, time of year, why wildlife is using the airfield, habitat characteristics on and around the airfield, and a host of other variables. A variety of methods are available for managing hazardous wildlife species found on and around IJD above and beyond those provided in the recommendations.

A detailed and comprehensive two-volume manual for the prevention and control of wildlife damage has been developed by the USDA in partnership with the University of Nebraska Cooperative Extension and the Great Plains Agricultural Council (Hygnstrom et al. 1994) and can be found by visiting the USDA website at this link. http://icwdm.org/handbook/index.asp. It is important to remember that creativity and persistence can greatly augment the duration and effectiveness of any wildlife hazard reduction measure.

Chapter 5
Development Alternatives

5 Development Alternatives

This chapter identifies and evaluates potential development alternatives for the Windham Airport (IJD) leading to a recommended plan. The alternatives have been designed to address the airport facility deficits identified in Chapter 3, *Facility Requirements Evaluation*, and are presented as follows:

- Development Factors
- Runway Alternatives
- Terminal Area Alternatives

The goal of this chapter is to identify a range of alternatives for airfield and landside development that are consistent with the Federal Aviation Administration (FAA) guidelines and standards and goals of IJD. The alternatives are based on a review of the Airport's needs as well as current environmental, physical, and financial constraints. Note that prior to the development of any airport project, an environmental analysis and permitting may be required.

5.1 Development Factors

Table 3-1 (located in Chapter 3) provides a summary of the airport activity forecasts, which have been used to estimate when activity levels will trigger the need for various improvements.

There are several factors that influence the evaluation of the alternatives and determine the final recommended development plan. These factors include:

- **Operational Efficiency and Safety:** Evaluation of how well the alternative functions from an airport operations and safety standpoint, along with compatibility with:
    - Town of Windham Plans – The Town's usage of property adjacent to IJD and future development for the community.
    - Mansfield Hallow Dam – The proximity of the dam adjacent to the airport property.
    - Adjacent Residential Development – The presence of a nearby residential manufactured housing community and compatibility with the Airport.
- **Compliance with FAA Design Standards:** Evaluation of consistence with FAA design standards.
- **Environmental Impacts:** The potential impact individual projects may have on the environment.
- **Construction and Maintenance Costs:** The cost of the project, funding availability and sources, and financing.

5.2 Runway Alternatives

Chapter 3 identified potential improvements recommended to meet the FAA design standards outlined in FAA Advisory Circular (AC) 150/5300-13A *Airport Design*, as well as potential future development opportunities within 20-year planning period. Additionally, the facility requirements evaluations indicated that there are minimal capacity restraints and the existing airfield is capable of satisfying the increasing activity demand throughout the 20-year planning period. Nevertheless, there are areas on the airfield that are currently non-compliant with existing FAA standards. Therefore, the following sections discuss in further detail runway alternative concepts to address compliance deficiencies while providing a roadmap for future development. The elements discussed in the runway alternatives include:

- Airspace obstructions and safety area compliance issues required to maintain the existing Runway 9-27 infrastructure
- Requirements for a potential extension of Runway 9-27 to 5,000 feet to adequately provide sufficient runway length for small- and mid-size jet activity if sufficient demand is realized
- Safety area compliance issues required to maintain the existing Runway 18-36 infrastructure

FAA compliance issues discussed in the following runway alternatives include, but are not limited to: Federal Aviation Regulation (FAR) Part 77 airspace surfaces and threshold siting surfaces (TSS) obstructions, environmental considerations, and compliance issues related to airfield safety areas [i.e., Runway Safety Area (RSA), Runway Object Free Area (ROFA), and Runway Protection Zone (RPZ)].

5.2.1 Runway 9-27

Runway 9-27 adequately accommodates the existing and future critical aircraft (i.e., King Air 200). As such, Runway Alternatives 1 and 2 present potential options to maintain the existing runway length. However, the Airport has previously experienced substantial activity by small- to mid-size turbojet aircraft that generally require runway lengths of at least 5,000 feet for unconstrained operation. Therefore, Runway Alternatives 3 and 4 present potential options to achieve a runway length of 5,000.

5.2.1.1 Runway Alternative 1 – *Runway Safety Area Grading*

Runway Alternative 1 (Figure 1-3) presents an option to maintain the existing runway length. Requirements include: RSA grading, north side access road realignment, and airspace compliance.

FAA Design Standards Considerations

As discussed in Chapter 3, the longitudinal grade for each RSA beyond the runway ends currently exceeds the maximum grade. Therefore, Runway Alternative 1 depicts filling and grading the RSA beyond each runway end, as shown in the highlighted areas on Figure 1-3. It is anticipated that approximately 90,000 cubic yards of fill would be required to grade the RSA beyond the west end of the runway, and approximately 30,000 cubic yards of fill beyond the east end of the runway.

Additionally, a portion of the north side access road is depicted to be realigned in order to remain clear of the ROFA. However, portions of this road and State Route 6 would continue to be located within the Runway 27 RPZ.

Airspace Considerations

Approximately seven acres of trees currently penetrate the Runway 9 Part 77 approach surface, and approximately five acres penetrate the TSS. At a minimum, it is recommended the trees penetrating the TSS are either lowered or removed.

Currently, terrain located east of the Runway 27 end (a 0.06 acre area and a 0.59 acre area) penetrates the Runway 27 Part 77 approach surface. It is recommended that this portion of the terrain is lowered and used for fill to accommodate the RSA grading requirements for the runway ends.

Additionally, portions of State Route 6 and the north side access road along with approximately two acres of trees, located north and south of State Route 6, penetrate the approach surface. It is recommended that obstruction lighting be installed on these objects. It is recommended that obstruction lighting be used to identify the roadway penetrations and the trees are lowered or removed.

Environmental Considerations

The Connecticut Airport Authority (CAA) recently cleared several acres of trees located west of Runway 9-27 (note that this clearing is not depicted on Figure 1-3). Therefore, the area depicted to be graded for RSA compliance currently contains minimal vegetation. Environmental impacts associated west of Runway 9-27 would mostly pertain to obstruction mitigation.

As discussed in Chapter 4, *Environmental Overview*, there is currently a 1.42 acre wetland area east of the Runway 27 end, within the area owned by the U.S. Army Corps of Engineers (USACE). To accommodate RSA grading on the west of the runway, approximately one acre of this wetland area would be impacted. It is recommended that the entire wetland area be removed and mitigated as wetlands are considered wildlife attractants. However, chapter 4 also discussed the presence of several grassland birds. Coordination with the USACE and CTDEEP should be conducted to identify mitigation options.

AIRPORT PROPERTY LINE

PROPOSED ROAD REALIGNMENT

WETLAND IMPACT AREA TO BE FILLED

RSA BEYOND RUNWAY ENDS TO BE GRADED

RSA BEYOND RUNWAY ENDS TO BE GRADED

LANDFILL (CLOSED)

RW 9-27 (4271'x100')

RW 18-36 (2799'x75')

RPZ

ROFA

RSA

RVZ

TW A

TW B

TW F

APPROACH RPZ

DEPARTURE RPZ

Boston Post Road

Industrial Park Dr

Northridge Dr

Crystal Road

Airport Rd

Circle Dr

Elizabeth La

Carolyn La

James Dr

Mark St

Virginia Dr

Wayne Dr

Stone Gate Dr

6

Magnetic (2013) 14° W

LEGEND

- Airport Property Line
- Existing Safety Areas and Runway Protection Zones (RPZ)
- Delineated Wetland
- NWI Wetland
- Additional Proposed Grading

0 600

Scale in feet

DRAFT

CHA
2139 Silas Deane Highway, Suite 212 • Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

RUNWAY ALTERNATIVE 1 GRADING FOR RSA COMPLIANCE

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: JUNE 2014

FIGURE 5-1

5.2.1.2 Runway Alternative 2 – *Declared Distances*

Runway Alternative 2 (Figure 5-2) depicts the use of declared distances to provide RSA and ROFA clearance within the boundaries of the existing airport property. Requirements include: pavement reconstruction, pavement marking and relighting, and north side access road realignment.

FAA Design Standards Considerations

According to FAA AC 150/5300-13A, declared distances represent the maximum distances available and suitable for meeting takeoff, rejected takeoff, and landing distances performance requirements for turbine powered aircraft. Declared distances may be used to obtain additional RSA and/or ROFA prior to the runway's threshold, and can result in a displaced threshold and limited or increased runway use.

It is important to note that the chevron portion of Runway 9-27 is depicted to be reconstructed as usable pavement and is factored into the following declared distances.

- **TORA & TODA:** The Takeoff Run Available (TORA) is defined as the length of runway declared available and suitable for satisfying takeoff run requirements. The Takeoff Distance Available (TODA) is defined as the TORA plus the length of any remaining runway or clearway beyond the departure end of the TORA available for satisfying takeoff distance requirements.

  Runway Alternative 2 depicts both ends of Runway 9-27 with 300 foot displaced thresholds. Therefore, the TORA and TODA extend the total length of the usable runway pavement and would both be approximately 4,350 feet.

- **ASDA:** The Accelerate Stop Distance Available (ASDA) extends the length of the runway plus the stopway (if any) declared available and suitable for satisfying accelerate-stop distance requirements for a rejected takeoff.

  This distance does not include the displaced threshold at the departure end of the runway. Therefore, the ASDA for both Runway 9 and Runway 27 would be approximately 4,050 feet (i.e., the TORA/TODA minus the 300 foot displaced threshold on the departure end of the runway).

- **LDA:** The Landing Distance Available (LDA) is defined as the length of runway declared available and suitable for satisfying landing distance requirements.

  Since aircraft cannot land on a displaced threshold, the LDA for both Runway 9 and Runway 27 would be approximately 3,750 feet (i.e., TORA/TODA minus 600 feet for the runway displacements).

With the use of the declared distances and 300 foot displaced thresholds on both runway ends, the location of the RSA and ROFA in this alternative would provide safety area clearance from required grading and incompatible objects; such as the declining terrain near the runway ends and the wetland area east end of the runway. Although the safety areas would be clear of incompatible objects, the wetland area would remain within portions of the approach and departure RPZs and adjacent to the runway.

Additionally, the north side access road is also depicted to remain outside of the ROFA, although portions of this road and State Route 6 would continue to be located within the Runway 27 RPZ.

Airspace Considerations

Runway Alternative 2 depicts reconstructing the chevron portion of Runway 9-27 as usable displaced runway pavement. As a result of this additional runway pavement in conjunction with declared distances, both the Part 77 approach surface and the TSS would correspondingly shift approximately 30 feet to the west.

Additionally, the Runway 27 Part 77 approach surface would continue to have similar obstructions as Alternative 1 since the physical end of the runway would not be affected. However, displacing the Runway 27 end results in a TSS located 200 feet from the displaced threshold, and, therefore, the Runway 27 TSS provides additional obstruction clearance. As such, the Runway 27 TSS would remain clear.

Environmental Considerations

With the use of declared distance, the RSA and ROFA would be clear of incompatible objects. As such, this alternative requires minimal environmental impacts and ground disturbance. The wetland area located east of Runway 9-27, within the area owned by the U.S. Army Corps of Engineers (USACE); however, would continue to be located in portions of the approach and departure RPZs. As wetlands are considered wildlife attractants, it is recommended that the entire wetland area be removed and mitigated as wetlands are considered wildlife attractants. However, chapter 4 also discussed the presence of several grassland birds. Coordination with the USACE and CTDEEP should be conducted to identify mitigation options.

PROPOSED ROAD REALIGNMENT

AIRPORT PROPERTY LINE

TORA, TODA 4350'

ASDA 4050'

LDA 3750'

LANDFILL (CLOSED)

RPZ

ROFA

RSA

RVZ

TW B

TW A

TW F

RW 9-27 (4271'x100')

RW 18-36 (2799'x75')

PROPOSED PAVEMENT EXTENSION

DEPARTURE RPZ

APPROACH RPZ

Boston Post Road

Circle Dr

Elizabeth La

Carolyn La

James Dr

Mark St

Virginia Dr

Wayne Dr

Stone Gate Dr

Airport Rd

Crystal Road

Northridge Dr

6

Magnetic (2013) 14.4° W

LEGEND

- Airport Property Line
- Existing Safety Areas and Runway Protection Zones (RPZ)
- Proposed Safety Areas and Runway Protection Zones (RPZ)
- Proposed Airfield Pavement
- Delineated Wetland
- NWI Wetland

0 600

Scale in feet

DRAFT

CHA
2139 Silas Deane Highway, Suite 212 • Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

RUNWAY ALTERNATIVE 2 DECLARED DISTANCES

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: JUNE 2014

FIGURE 5-2

5.2.1.3 Runway Alternative 3 – *Runway Extension to 5,000 Feet*

Runway Alternative 3 (Figure 5-3) depicts a 730 foot extension to the east in order to provide a total runway length of 5,000 feet. Requirements include: RSA and terrain grading, realignment of the north side access road and State Route 6, runway and taxiway extension, and airspace compliance.

FAA Design Standards Considerations

Similar to Runway Alternative 1, this alterative depicts grading of the RSA beyond the Runway 9 end for FAA compliance. However, Runway Alternative 3 depicts a 730 foot extension to the east to provide a total runway length of 5,000 feet. As a result of the previously discussed terrain relief east of the runway end, both cut and fill would be required to accommodate the runway and associated parallel taxiway extensions. Therefore, approximately 30,000 cubic yards of fill would be required for the declining terrain and approximately 4,000 cubic yards of cut would be required for the increasing terrain. It is recommended that any cut be used for fill to accommodate the RSA grading requirements for the runway ends.

Runway Alternative 3 further depicts a relocated portion of State Route 6 to provide both ROFA and RPZ clearance. It is important to note that any change to the existing alignment of State Route 6 would require additional analysis to determine potential the impacts to the roadway, and would require coordination with the Connecticut Department of Transportation's Office of Traffic.

As with Runway Alternatives 1 and 2, however, portions of the north side access road would continue to be located within the Runway 27 RPZ.

Airspace Considerations

With a total length of 5,000 feet, Runway 9-27 would be classified as a "non-utility" runway and, as such, each Part 77 approach surface would increase to a slope of 34:1. Although this increase results in a more restrictive approach slope, a similar number of trees as with Runway Alternatives 1 and 2 would penetrate the Part 77 approach surface and TSS associated with the Runway 9 approach end.

The additional runway length in conjunction with the change in approach slope for the Runway 27 approach end, however, would result in significant penetrations to the Part 77 surface. These penetrations would include approximately two acres of terrain and approximately 300 acres of trees. These areas are located in the both the area located between the runway and the Mansfield Hallow Dam and private property located north and south of State Route 6.

LEGEND

- Airport Property Line
- Existing Safety Areas and Runway Protection Zones (RPZ)
- Proposed Safety Areas and Runway Protection Zones (RPZ)
- Proposed Airfield Pavement
- Proposed Roads/Parking
- Delineated Wetland
- NWI Wetland
- Additional Proposed Grading

0 600
Scale in feet

CHA
2139 Silas Deane Highway, Suite 212 • Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

DRAFT

RUNWAY ALTERNATIVE 3 (730' EXTENSION)

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: JUNE 2014

FIGURE 5-3

File: V:\PROJECTS\ANY\K3\25874\CADD\FIGURES\25874-MC_5-03.DWG Saved: 6/13/2014 10:44:34 AM Plotted: 9/19/2013 12:18:26 PM User: Medina, Perry LastSavedBy: 976

Environmental Considerations

Environmental impacts associated with Runway Alterative 3 would likely require greater disturbance than the previously discussed alternatives. Potential impacts would include all listed impacts discussed in the first two runway alternatives including: roadway removal and reconstruction (i.e., relocation of State Route 6), wetland mitigation within the previously discussed wetlands located on the USACE property in addition to portions of the

Atlantic White Cedar Swamp located south of State Route 6, and restructuring of the Mansfield Hallow Dam to accommodate the runway extension. Chapter 4 also discussed the presence of several grassland birds. Coordination with the USACE and CTDEEP should be conducted to identify mitigation options.

5.2.1.4 Runway Alternative 4 – *Runway Extension with Declared Distances*

Runway Alternative 4 (Figure 5-4) depicts reconstruction the chevron portion of the runway along with a runway extension to the east and declared distances to achieve 5,000 feet. Requirements include: RSA and terrain grading, realignment of the north side access road, runway and taxiway extension, and airspace compliance.

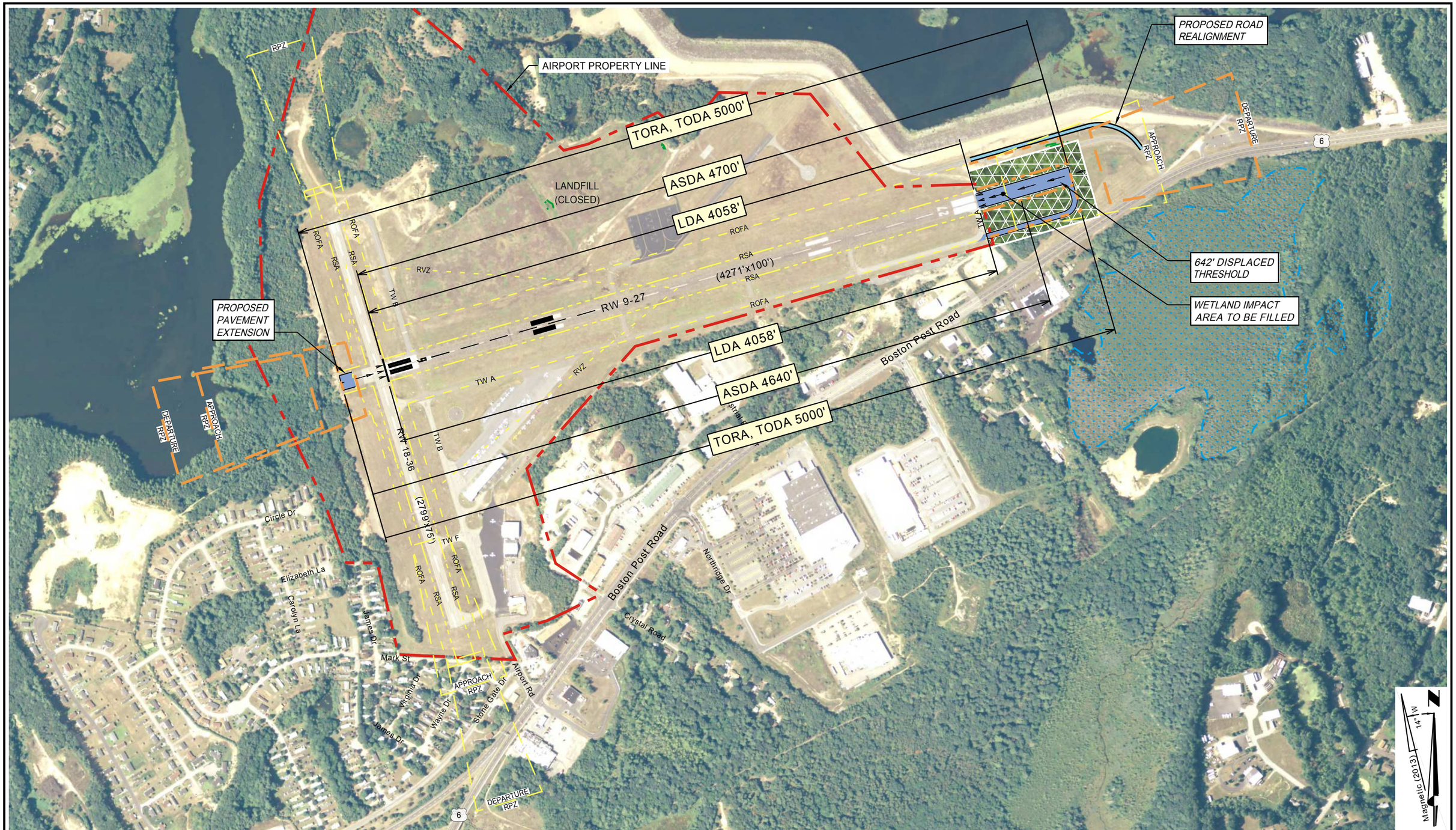
FAA Design Standards Considerations

As with Runway Alternative 2, the use of declared distances reduces the amount of fill and grading required for RSA compliance beyond each runway end. Therefore, fill and grading on the west end of the runway would be minimal and mostly required for reconstruction of the chevron area. However, similar to Runway Alterative 3, significant grading would be required on the east end of the runway to accommodate the depicted 642 foot runway extension and parallel taxiway to the east. As the RSA and ROFA would not encroach upon State Route 6, this alternative does not depict a proposed realignment of the roadway. Although north side access road realignment is also depicted to remain clear of the ROFA, portions of this road and State Route 6 would continue to be located within the Runway 27 approach and departure RPZs.

Airspace Considerations

Although this alternative depicts reconstructing the chevron portion of the runway, airspace obstructions for the Runway 9 approach end for this alternative would be similar to those discussed for Runway Alterative 3.

Additionally, obstructions for the Runway 27 Part 77 approach surface would also be similar to those discussed for Runway Alterative 3. However, since this runway extension is depicted as displaced, this runway end would have a TSS. The TSS would continue to contain the mentioned terrain and only approximately 20 acres of trees penetrating the surface.



LEGEND

- Airport Property Line
- Existing Safety Areas and Runway Protection Zones (RPZ)
- Proposed Safety Areas and Runway Protection Zones (RPZ)
- Proposed Airfield Pavement
- Proposed Roads/Parking
- Delineated Wetland
- NWI Wetland
- Additional Proposed Grading

0 600
Scale in feet

DRAFT

CHA
2139 Silas Deane Highway, Suite 212 • Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

RUNWAY ALTERNATIVE 4
(642' EXTENSION WITH DECLARED DISTANCES)

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: JUNE 2014

FIGURE 5-4

File: V:\PROJECTS\ANY\K3\25874\CADD\FIGURES\25874-MC_5-04.DWG Saved: 6/13/2014 10:43:30 AM Plotted: 9/19/2013 12:18:26 PM User: Medina, Perry LastSavedBy: 976

Environmental Considerations

Environmental impacts would be similar to those required for Runway Alterative 3. Potential impacts would include all listed impacts discussed in the first two runway alternatives along with the addition of wetland mitigation, and restructuring of the Mansfield Hallow Dam.

5.2.2 Runway 18-36

As Runway 18-36 serves as the crosswind runway, this runway is generally used by piston powered aircraft. Accordingly, its current length sufficiently accommodates the runway's fleet mix.

Runway Alternative 5 provides a potential concept to address the current safety area compliance issues by slighting reducing the current runway length. As a supplement option, Runway Alternative 6 effectively shifts the runway to the north to also address the safety compliance issue while preserving the existing runway length.

5.2.2.1 Runway Alternative 5 – *Relocated Threshold*

Runway Alternative 5 (Figure 5-5) examines relocation of the southern 99 feet of the Runway 36 displacement to shift the RSA and ROFA onto airport property. This relocation decreases the total length of Runway 18-36 to 2,710 feet. Requirements include: pavement reconstruction and pavement painting and relighting.

Design Standard Considerations

As described in Chapter 2, a public roadway (Mark Drive) and trees are located within a portion of the ROFA near the airport property line beyond the Runway 36 end. Relocating the southern 99 feet of the Runway 36 displacement would shift the RSA and ROFA onto airport property and ensure compatible land uses within the area. This option offers minimal cost and impact to the type of aircraft using the runway, and continues to provide full parallel taxiway connectivity.

Additionally, due to the relocated threshold, the departure RPZ would also shift 99 feet to the north. However, property acquisition within both the approach and departure RPZs would continue to be recommended.

Airspace Considerations

Currently, a portion of Mark Drive (located south of the airport) penetrates the Part 77 approach surface by approximately four feet. In addition, several acres of trees located approximately a half-mile south of the airport currently penetrate the Part 77 approach surface. Although relocating Runway 36 to the north by approximately 99 feet would correspondingly shift the approach surface, the Part 77 penetrations would remain. However, the TSS would continue to remain clear with our without a relocation.

AIRPORT PROPERTY LINE

LANDFILL (CLOSED)

RPZ

ROFA

RSA

RVZ

TW B

TW F

RW 9-27 (4271'x100')

RW 18-36 (2799'x75')

2700'

RELOCATED THRESHOLD

APPROACH RPZ

DEPARTURE RPZ

Boston Post Road

Industrial Park Dr

Circle Dr

Elizabeth La

Carolyn La

James Dr

Mark St

Virginia Dr

Wayne Dr

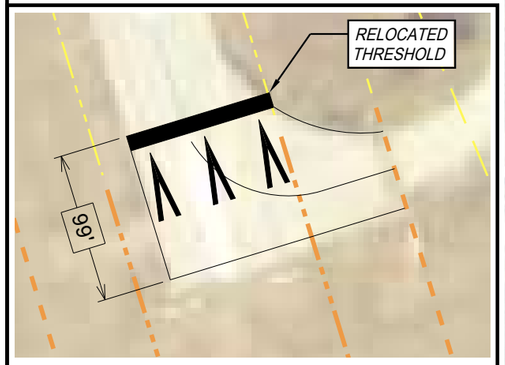
Stone Gate Dr

Airport Rd

Crystal Road

Northridge Dr

6



Runway 36 Relocated Threshold

NOT TO SCALE

Magnetic (2013) 14° W

LEGEND

- Airport Property Line
- Existing Safety Areas and Runway Protection Zones (RPZ)
- Proposed Safety Areas and Runway Protection Zones (RPZ)
- Delineated Wetland
- NWI Wetland

0 600

Scale in feet

CHA
2139 Silas Deane Highway, Suite 212 - Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

DRAFT

RUNWAY ALTERNATIVE 5 (99' RELOCATED THRESHOLD)

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: JUNE 2014

FIGURE 5-5

Environmental Considerations

Environmental considerations for Runway Alternative 4 would be minimal as any impacts would be associated with the existing runway pavement and tree lowering or removal. However, chapter 4 also discussed the presence of several grassland birds. Coordination with CTDEEP should be conducted to identify mitigation options.

5.2.2.2 Runway Alternative 6 – *Relocated Threshold & Runway Shift*

As an additional option to Runway Alternative 5, Runway Alternative 6, (Figure 5-6) examines shifting Runway 18-36 to the north to maintain the existing runway length. To accomplish this shift, this alternative depicts relocating the southern 99 feet of the Runway 36 displacement and constructing a 100 foot extension to the north to continue providing the current runway length.[4] Requirements include: pavement reconstruction, pavement painting and relighting, and a pavement extension.

Design Standard Considerations

Similar to Runway Alternative 4, relocating the Runway 36 displaced threshold by 99 feet effectively shifts the RSA and ROFA onto existing airport property, clearing the safety area of incompatible land uses. A 100 foot extension to the north would allow the runway to maintain its current length.

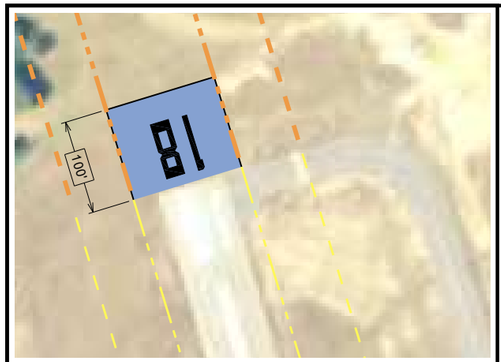
Airspace Considerations

Airspace compliance for Runway 36 would remain the same as discussed in Runway Alternative 6. However, trees located north of Runway 18-36 that currently penetrate the Runway 36 Part 77 approach surface would continue to be obstructions. Lowering or removal of these trees would be recommended.

Environmental Considerations

Environmental considerations for Runway Alternative 4 would be minimal as any impacts would be associated with the existing runway pavement and tree lowering or removal. However, the proposed north runway extension would involve some grading and excavation for the pavement.

[4] The current Runway 18-36 length is 2,799. An additional foot was added to the north side extension to round the length to 2,800 feet.



Runway 18 Extension
NOT TO SCALE

Runway 36 Relocated Threshold
NOT TO SCALE

LEGEND

- Airport Property Line
- Existing Safety Areas and Runway Protection Zones (RPZ)
- Proposed Safety Areas and Runway Protection Zones (RPZ)
- Delineated Wetland
- NWI Wetland

0 600
Scale in feet

CHA
2139 Silas Deane Highway, Suite 212 • Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

DRAFT

RUNWAY ALTERNATIVE 6 (RUNWAY SHIFT TO THE NORTH)

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: JUNE 2014

FIGURE 5-6

File: V:\PROJECTS\ANY\K3\25874\CADD\FIGURES\25874-MC_5-06.DWG Saved: 6/13/2014 9:23:49 AM Plotted: 9/19/2013 12:18:26 PM User: Medina, Perry LastSavedBy: 976

5.2.3 Recommended Runway Alternative

Although current activity at IJD does not currently warrant the need for additional runway length at this time, the runway alternatives presented provide a variety of potential options should demand be realized within the planning period.

Table 5-1 provides an evaluation of the runway alternatives based on the applicable influencing factors described in Section 5.1.

Table 5-1 – Runway Alternatives Summary

Alterative	Operational Efficiency & Safety	Compliance with FAA Design Standards	Environmental Impacts	Construction & Maintenance Costs
Runway 9-27				
1	Yes	Yes	Moderate	Moderate
2	Yes	Yes	Low	Moderate
3	Yes	Yes	Extensive	Extensive
4	Yes	Yes	Extensive	Extensive
Runway 18-36				
5	Yes	Yes	Low	Low
6	Yes	Yes	Low	Low

Runway Alternative 1 has been chosen as the recommended runway alternative for Runway 9-27 as it maintains the existing runway length while addressing FAA compliance issues. Runway Alternative 4 provides the preferred alternative should airport activity rebound within the planning period and sufficient demand be realized for a runway length of 5,000 feet.

Alternative 5 has been chosen as the recommended runway alternative for Runway 18-36 as it ensures safety area clearance with minimal associates costs. It is not anticipated the reduction in runway length will adversely affect the runway's capability. If demand warrants, additional length may be constructed to the north.

5.3 Terminal Area Alternatives

The airport terminal area serves as a transition point between the airside and landside functions of the airport and facilitates both aircraft and vehicle movement and pilot and passenger needs. Therefore, the airport terminal area alternatives contain elements for both airside and landside functions. The following terminal area alternatives offer future development options within the existing terminal area and the north side of the Airport. It is important to note that all development will be market driven based on the demands and needs of the airport. Additionally, priority for aviation development is given to all potential development areas. However, certain areas capable of facilitating non-aviation use are depicted where appropriate.

5.3.1 Existing Terminal Area

The existing IJD terminal area contains sufficient space to accommodate airport activity anticipated throughout the planning period. As such, Terminal Area Alternatives 1 and 2 depict potential development areas capable of accommodating this demand within the existing terminal area.

5.3.1.1 Terminal Area Alternative 1

Terminal Area Alternative 1 (Figure 5-7) depicts development within the existing terminal area.

Hangars

Adjacent to the existing 14-unit T-hangar (Building #7), two additional T-hangars are located in an open area that currently contains turf aircraft tie-downs. The additional T-hangars would provide a total of 22 new aircraft stalls. The proposed T-hangar located directly adjacent to Building #7 is similar in size, and would also accommodate 14 aircraft stalls using a nested T-hangar design. The second T-hangar would accommodate eight aircraft stalls using a clear span design. The size and location of the proposed T-hangars ensures clearance of the Runway Visibility Zone (RVZ) and the Runway 9-27 transitional surface. A Taxiway Design Group (TDG) I taxilane is shown alongside the proposed T-hangars. Therefore, the taxilane is 25 in width and has a Taxilane Safety Area (TSA) of 79 feet. To accommodate the TSA, the existing vehicle parking area located southeast of the T-hangars is shown to be shifted and expanded.

A 10,000 square foot conventional hangar is shown adjacent to the existing conventional hangar (Building #4) in an area that currently contains a portion of Airport Road. To provide vehicle access to the apron areas, a relocated roadway alongside the proposed conventional hangar connects to the main apron.

Support Facilities

Located near the main entrance to the Airport (via Airport Road), a proposed 3,000 square foot terminal building and an adjacent 1,200 square foot airport maintenance building are depicted. The current location contains the existing airport maintenance building and the airport security trailer. The existing airport maintenance building is a Quonset hut style building that has reached its useful life and in need of replacement. The security trailer is a temporary structure that contains equipment that can be moved into a permanent facility. The location of these buildings provides direct access to the airfield infrastructure along with vehicle connectivity.

The proposed terminal building could facilitate a new Fixed Based Operator (FBO) or accommodate an “FBO in a box” concept, which allows for continued airport service with minimal staffing requirements by use of a credit card access to the building. Security equipment currently stored in the trailer could be permanently transferred to this facility. The proposed airport maintenance building could be sized appropriately to accommodate airport maintenance equipment and movement. The two buildings could be either independent or conjoined.

Proposed Facilities	
No.	Description
1	Airport Maintenance Building
2	Terminal/FBO Building
3	Conventional Hangar (100'x100')
4	T-Hangar (Nested - 14 Unit)
5	T-Hangar (Clear Span - 8 Unit)

Magnetic (2013) W 14°

LEGEND

- New Airfield Pavement
- New Building
- Airport Property Line
- Roads/Parking
- Existing Building

0 200
Scale in feet

DRAFT

CHA
2139 Silas Deane Highway, Suite 212 - Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

TERMINAL AREA ALTERNATIVE 1

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: JUNE 2014

FIGURE 5-7

File: V:\PROJECTS\ANY\K3\25874\CADD\FIGURES\25874-MC_5-07.DWG Saved: 9/17/2014 11:25:32 AM User: Medina, Perry LastSavedBy: 976

5.3.2 Terminal Area Alternative 2

Similar to Terminal Area Alternative 1, Terminal Area Alterative 2 (Figure 5-8) depicts developing the existing terminal area.

Hangars

This alternative depicts the construction of four six-unit nested T-hangars located adjacent to Building #7. This configuration provides a total of 24 additional aircraft stalls, and allows for some remaining open space to the northeast (such as an area for turf aircraft tie-downs). Similar to Alternative 1, the size and location of the T-hangars ensures clearance of the RVZ and the Runway 9-27 transitional surface.

This alternative depicts a 10,000 square foot conventional hangar and a conjoined terminal building. If the existing terminal building (Building #3) continues to be used for pilot services, the area shown for the proposed terminal building could be used as an airport maintenance building. As with Alternative 1, this location provides direct access to the airfield infrastructure along with vehicle connectivity.

Support Facilities

Although a portion of the adjacent vehicle parking area would be removed to accommodate the proposed T-hangars, the existing parking area is shown to shift/expand in order to facilitate the widening of the existing taxilane to 25 feet, and ensure clearance of the TSA of 79 feet to comply with TDG I criteria.

5.3.3 North Side Area

The north side of the Airport also provides sufficient space to accommodate existing and anticipated activity along with the potential for aeronautical development. Therefore, Terminal Area Alternatives 3, 4, and 5 depict potential development areas capable of capable of accommodating this demand within the Airport's north side.

Terminal Area Alternative 3

Terminal Area Alternative 3 (Figure 5-9) depicts developing the north side of the Airport with hangar development located along Taxiway "C". An extension to Taxiway "D" is shown to provide additional connectivity between the proposed terminal area and Runway 9-27. Additionally, this alternative preserves the existing compass calibration pad and associated critical area. Since sufficient area is available on the north side, development to accommodate both the 20-year projected demand along with potential demand beyond 20 years is depicted.

Proposed Facilities	
No.	Description
1	Conventional Hangar (75'x75')
2	Terminal/FBO Building or Airport maintenance Building
3	T-Hangars (Nested - 6 Unit)

Magnetic (2013) W 14°

LEGEND

- New Airfield Pavement
- New Building
- Airport Property Line
- Roads/Parking
- Existing Building

0 200

Scale in feet

CHA
2139 Silas Deane Highway, Suite 212 · Rocky Hill, CT 06067-2336
Main: (860) 257-4557 · www.chacompanies.com

DRAFT

TERMINAL AREA ALTERNATIVE 2

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: JUNE 2014

FIGURE 5-8

File: V:\PROJECTS\ANY\K3\25874\CADD\FIGURES\25874-MC_5-08.DWG Saved: 9/17/2014 11:24:29 AM User: Medina, Perry LastSavedBy: 976

Proposed Facilities	
No.	Description
1	Terminal/FBO Building or Conventional Hangar
2	T-Hangar (Nested - 6 Unit)
3	Conventional Hangar (75'x75')

LEGEND

- New Airfield Pavement
- New Building
- Roads/Parking
- Airport Property Line

0 200

Scale in feet

CHA
2139 Silas Deane Highway, Suite 212 - Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

DRAFT

TERMINAL AREA ALTERNATIVE 3

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: JUNE 2014

FIGURE 5-9

File: V:\PROJECTS\ANY\K3\25874\CADD\FIGURES\25874-MC_5-09.DWG Saved: 9/17/2014 11:20:21 AM User: Medina, Perry LastSavedBy: 976

Hangars
This alternative depicts four six-unit T-hangars located along the north side of Taxiway "C". A Group I taxilane (25 feet in width) provides access to each T-hangar.

This alternative also depicts extending Taxiway "C" to accommodate four 5,600 square foot conventional hangars located along the northeastern portion of the taxiway.

Support Facilities
A 3,000 square foot terminal building is depicted north of the existing north apron. This building could be either in place of or in addition to a separate terminal building that serves the existing terminal area. It is assumed that sufficient space within the existing terminal is available for a replacement airport maintenance building.

Vehicle access to the north side is currently available via the north airport entrance. As discussed in Chapter 3, a portion of the north side access road is currently located within the Runway 9-27 OFA due to an eroded section of the adjacent Mansfield Hallow Dam. Therefore, this alternative depicts a proposed realignment of the access road, pending repair of the dam. It is important to note that an MOS from the FAA may be required in order to permit the relocated roadway within the Runway 27 RPZ.

5.3.4 Terminal Area Alternative 4

Similar to Terminal Area Alterative 3, Terminal Area Alternative 4 (Figure 5-10) depicts north side development along Taxiway "C". To accommodate additional expansion, the compass calibration pad and associated pavement would be removed. An extension to Taxiway "E" is shown to provide additional connectivity between the proposed terminal area and Runway 9-27. Depicted development accommodates the projected demand identified in Chapter 3, and also depicts areas reserved for potential development beyond 20 years.

Hangars
This alternative includes three 10-unit T-hangars providing a total of 30 additional aircraft stalls. The T-hangars located directly adjacent to Taxiway "C" would accommodate long-term aircraft storage while the area southeast of these hangars could be reserved for additional T-hangar development. A Group I taxilane (25 feet in width) is shown between the T-hangars.

Four 5,600 square foot conventional hangars are located along the north side of Taxiway "C". The construction of two of the hangars would accommodate the projected demand for conventional hangar space within the planning period. Additional area, however, is available along Taxiway "C" if demand for conventional hangar space is realized at a faster pace than projected.

Support Facilities

The north apron is depicted to be expanded to accommodate a 3,000 square foot terminal building. Like Alternative 3, this building could be either in place of or in addition to a building located within the existing terminal area. It is assumed that sufficient space within the existing terminal is available for a replacement airport maintenance building. A relocated access roadway to avoid the ROFA is also depicted.

5.3.5 Terminal Area Alternative 5

Terminal Area Alterative 5 (Figure 5-11) also depicts developing the north side of the Airport. This alternative, however, realigns Taxiway "C" perpendicular to Runway 9-27 to maximize the development of the area. An extended portion of Taxiway "D" is shown to provide additional connectivity between the proposed terminal area and Runway 9-27. Development to accommodate both long-term and development beyond 20 years is depicted.

Hangars

This alternative depicts five 10-unit T-hangars north the extended portion of Taxiway "C". A Group I taxilane (25 feet in width) is shown between the T-hangars. A Group II taxiway is located adjacent to the easternmost T-hangar that provides access to a conventional hangar campus.

Six 5,600 square foot conventional hangars are depicted north of the proposed T-hangars. If desired, buildings may be combined to form larger units.

Support Facilities

Similar to Terminal Area Alternative 4, the north apron is depicted to be expanded to accommodate a terminal building or larger conventional hangar.

An area located west of the potential development area is reserved for future aviation development. This area could potentially support additional hangar space or aviation related development, such as a light sport aircraft manufacturing facility.

A relocated access roadway to avoid the ROFA is also depicted.

5.3.6 Recommended Terminal Area Alternative

The presented terminal area alternatives provide a variety of growth scenarios that fulfill both short- and long-term development. Additionally, each alternative strived to maximize use of the existing airport environment while planning for potential growth beyond the 20-year planning horizon.

Proposed Facilities	
No.	Description
1	Terminal/FBO Building or Conventional Hangar
2	Conventional Hangar (75'x75')
3	T-Hangar (Nested - 10 Unit)

LEGEND

- New Airfield Pavement
- New Building
- Roads/Parking
- Airport Property Line

0 200
Scale in feet

DRAFT

CHA
2139 Silas Deane Highway, Suite 212 • Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

TERMINAL AREA ALTERNATIVE 5

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: JUNE 2014

FIGURE 5-11

File: V:\PROJECTS\ANYK3\25874\CADD\FIGURES\25874-MC_5-11.DWG Saved: 9/17/2014 11:22:11 AM User: Medina, Perry LastSavedBy: 976

Table 5-2 provides an evaluation of the terminal area alternatives based on the applicable influencing factors described in Section 5.1.

Table 5-2 – Terminal Area Alternatives Summary

Alterative	Operational Efficiency & Safety	Compliance with FAA Design Standards	Environmental Impacts	Construction & Maintenance Costs
1	Yes	Yes	Low	Low
2	Yes	Yes	Low	Low
3	Yes	Yes	Low	Low
4	Yes	Yes	Low	Moderate
5	Yes	Yes	Low	Extensive

Terminal Area 2 has been chosen as the recommended terminal alternative as it results in the least amount of construction and maintenance costs with proposed development within the existing terminal area. Although both Alternatives 1 and 2 depict development within the existing terminal area, Terminal Area Alternative 2 provides slightly greater space for additional development adjacent to proposed buildings.

It is important to note that each Terminal Area Alternative provides potential opportunities that may be selected if demand for such development is realized.

5.4 Recommended Development Plan

After examining airside and landside facility requirements and developing recommended alternatives to address each deficiency, Figure 5-12 depicts the recommended development plan for IJD. The recommended development plan contains all preferred development options discussed within this chapter. The following chapter, Chapter 6, *Implementation Plan*, will further discuss each item and present the Airport Capital Improvement Plan (ACIP) that is associated with the recommended future development at IJD. The ACIP provides a phasing plan for the projects proposed during the 20-year planning period.

POTENTIAL AVIGATION EASEMENT

PROPOSED FENCE LINE

PROPOSED PAVEMENT EXTENSION

RSA BEYOND RUNWAY ENDS TO BE GRADED

POTENTIAL AVIGATION EASEMENT

RELOCATED THRESHOLD

POTENTIAL VOLUNTARY ACQUISITION

POTENTIAL NON-AERONAUTICAL USE (8 ACRES)

PROPOSED ROAD REALIGNMENT

POTENTIAL AVIGATION EASEMENT

PROPOSED FENCE LINE

642' DISPLACED THRESHOLD (SEE NOTE 1)

WETLAND IMPACT AREA TO BE FILLED

AIRPORT PROPERTY LINE

EXISTING FENCE LINE

LANDFILL (CLOSED)

(BRL 20')

390'

(4271'x100')

RW 9-27

RW 18-36 (2799'x75')

TW A

TW B

TW C

TW D

TW E

TW F

RPZ

DEPARTURE RPZ

APPROACH RPZ

Boston Post Road

Industrial Park Dr

Circle Dr

Elizabeth Dr

Carolyn Ln

James Dr

Mark St

Virginia Dr

Wayne Dr

Stone Gate Dr

Airport Rd

Northridge Dr

Crystal Road

6

Magnetic (2013) 14° W

Note 1: Current activity levels do not warrant a runway extension. The depicted extension is provided in the event increased activity is realized.

Proposed Facilities	
No.	Description
1	Terminal/FBO Building or Conventional Hangar
2	T-Hangar (Nested - 6 Unit)
3	Fuel Farm
4	Terminal/FBO Building or Airport Maintenance Building
5	Conventional Hangar

0 600
Scale in feet

LEGEND

- Airport Property Line
- Existing Safety Areas and Runway Protection Zones (RPZ)
- Delineated Wetland
- NWI Wetland
- Additional Proposed Grading
- Potential Non-Aeronautical Use
- Proposed Airfield Pavement
- Proposed Roads/Parking
- Potential Avigation Easament
- Potential Voluntary Acquisition

CHA
2139 Silas Deane Highway, Suite 212 • Rocky Hill, CT 06067-2336
Main: (860) 257-4557 • www.chacompanies.com

DRAFT

RECOMMENDED DEVELOPMENT

Windham Aipport (IJD) Master Plan Update - Willimantic, Ct

PROJECT NO. 25874

DATE: 9-22-14

FIGURE -

Chapter 6
Implementation Plan

6 Implementation Plan

Chapter 5, *Development Alternatives* presented development alternatives and the recommended airport development plan (see Figure 5-12) for the Windham Airport (IJD). The plan contains recommendations for airside and landside development, which are further discussed in terms of three implementation phases during the 20-year planning period presented within the Airport Capital Improvement Plan (ACIP). This chapter also presents the Airport Layout Plan (ALP) that is associated with the recommended future development at IJD. The ALP illustrates the proposed future airport layout, and serves as the official development plan for the Airport.

6.1 Airport Capital Improvement Plan

The ACIP lists the recommended projects and associated cost estimates for the 20-year planning period. Grant-eligible projects at IJD may receive 95 percent federal funding, with the Connecticut Airport Authority (CAA) responsible for the remaining share. Grant-eligible capital projects include planning and environmental studies, runway and taxiway development and rehabilitation, airport lighting, security enhancements, aircraft parking aprons, obstruction removal, land acquisition, and navigational aids. Projects that are ineligible for funding include those that generate revenue and do not directly benefit the general public, such as hangars, fuel farms, and office buildings. A private entity or developer, such as a fixed base operator (FBO) or other corporation, may fund and construct grant-ineligible projects.

In addition to the proposed airport developments, the airport must also continually rehabilitate existing airfield facilities (e.g., pavement rehabilitation typically occurs every 20 years). As such, the ACIP includes these additional items. Although these items are not considered new capital developments, the associated costs can comprise the majority of an airport's annual capital investment.

Note that the ACIP does not constitute a commitment on behalf of the CAA or FAA to fund any of the projects. In addition, the ACIP does not imply that the projects would receive environmental approvals. Thus, the ACIP serves as a planning document that must remain flexible. The ACIP should undergo regular updates as project priorities and demands indicate. It should also be noted that the costs are planning level estimates and will need to be refined prior to obtaining a grant.

Table 6-1 provides the 20-year ACIP for HFD, organized into the following three phases:

- Phase I (0 to 5 years)
- Phase II (6 to 10 years)
- Phase III (11 to 20 years)

Table 6-1 – IJD Airport Capital Improvement Plan

Project	Estimated	Federal (90%)	CAA (10%)	Private/ Other
Short-Term (FY 2015 - 2019)				
Avigation Easements - Runway Protection Zones 9-27	$ 320,000	$ 288,000	$ 32,000	
Off-Airport Obstruction Removal (Trees)	$ 300,000	$ 270,000	$ 30,000	
Rehabilitate Runway 9-27, Install PAPI & REILs (Design)	$ 250,000	$ 225,000	$ 25,000	
Rehabilitate Runway 9-27 Install PAPI & REILs (Construct)	$ 3,000,000	$ 2,700,000	$ 300,000	
Runway 9-27 RSA Improvements/Access Road Realignment	$ 75,000	$ 67,500	$ 7,500	
Runway 18 RPZ Avigation Easement (3 Acres)	$ 60,000	$ 54,000	$ 6,000	
T-Hangar Construction 12-Bay (private)	$ 720,000			$ 720,000
Access Road & Parking Lot Reconstruction	$ 800,000		$ 800,000	
Total	**$ 5,525,000**	**$ 3,604,500**	**$ 1,200,500**	**$ 720,000**
Mid-Term (FY 2020 - 2024)				
Rehabilitate Taxiway B	$ 960,000	$ 864,000	$ 96,000	
Runway 36 RPZ Voluntary Property Acquisition (6 Acres - Mobile Homes)	$ 620,000	$ 558,000	$ 62,000	
Install Security/Wildlife Hazard Perimeter Fencing with Skirting	$ 940,000	$ 846,000	$ 94,000	
Rehabilitate Runway 18-36/RSA Improvements	$ 1,000,000	$ 900,000	$ 100,000	
T-Hangar Construction 12-Bay (private)	$ 720,000			$ 720,000
Rehabilitate Taxiway A	$ 1,700,000	$ 1,530,000	$ 170,000	
Rehabilitate Main Apron	$ 1,600,000	$ 1,440,000	$ 160,000	
Total	**$ 7,540,000**	**$ 6,138,000**	**$ 682,000**	**$ 720,000**
Long-Term (FY 2025 - 2035)				
Construct/Replace Terminal Building (Private)	$ 250,000			$ 250,000
Construct/Replace SRE Building	$ 125,000	$ 112,500	$ 12,500	
Rehabilitate North Apron	$ 870,000	$ 783,000	$ 87,000	
North Area Development (private)	TBD	TBD	TBD	TBD
Rehabilitate Runway 9-27	$ 3,250,000	$ 2,925,000	$ 325,000	
Rehabilitate Runway 18-36	$ 1,700,000	$ 1,530,000	$ 170,000	
Rehabilitate Taxiway A	$ 1,700,000	$ 1,530,000	$ 170,000	
Runway 9-27 Extension (5,000')*	$ 1,200,000	$ 1,080,000	$ 120,000	
Total	**$ 9,095,000**	**$ 7,960,500**	**$ 884,500**	**$ 250,000**
Grand Total	**$ 22,160,000**	**$ 17,703,000**	**$ 2,767,000**	**$ 1,690,000**
*Project not justified with current activity levels				

6.2 Airport Layout Plan

The ALP drawing set illustrates all development projects identified for IJD throughout the 20-year planning horizon. Upon approval by the FAA and the CAA, the ALP becomes the official document to be referenced for future development at the Airport. The FAA requires that the ALP be followed consistently regarding all new airport facilities. As such, keeping the drawings accurate and up to date is a high priority. FAA policy requires that the ALP be updated at least every five years. Although the ALP is the only drawing that is signed by the FAA, it is part of a larger drawing set that includes the sheets listed in Table 6-2. These ALP drawings can be found in Appendix C.

Table 6-2 – ALP Drawing Index

Sheet Title	Sheet No.
Title Sheet	ALP-0
Existing Airport Layout Plan	ALP-1
Future Airport Layout Plan	ALP-2
Runway 9-27 Inner Approach Surface Drawing	ALP-3
Runway 18-36 Inner Approach Surface Drawing	ALP-4
Terminal Area Plan	ALP-5
Airspace Drawing 1	ALP-6
Airspace Drawing 2	ALP-7
Land Use Plan	ALP-8
Property Map	ALP-9

6.2.1 Existing and Future ALP Sheets

The first sheet of the drawing set (ALP-1) illustrates the existing airport layout as it exists today. The drawing identifies key FAA airfield design standards (e.g., Runway Safety Areas, Object Free Areas, and Runway Protection Zones) and illustrates existing landside facilities. Key information, such as runway end elevations and runway-taxiway offsets, is also illustrated on ALP-1. The proposed ALP (ALP-2) includes all features of ALP-1, and illustrates each recommended facility for IJD. Several offices within the FAA review this drawing for consistency with airport design standards, flight procedures, surrounding airspace, and environmental requirements. ALP-5 displays the terminal area in greater detail.

Approval of ALP-2 represents the acceptance of the general location of future facilities. However, prior to the development phase of each project, the CAA is required to submit the final locations, heights, and exterior finish of each proposed structure for approval. ALP approval does not represent environmental clearance under the National Environmental Policy Act

(NEPA), or compliance with permit requirements. Such approvals must be obtained prior to development, and are not part of the ALP process.

It is also noted that ALP approval does not represent a commitment on behalf of the FAA, CAA, or others to fund or pursue the projects depicted. Rather, this Master Plan and associated ALP represent the first products of the planning and development process, and are intended to depict a broad and long-range view of the potential improvements to the Airport. The ALP drawings were prepared in accordance with FAA design standards for Airport Reference Code (ARC) B-II. Aircraft within ARC B-II include Cessna Citation Jet or Beech King Air.

The following publications were used during the drawing preparation:

- FAA Advisory Circular 150/5300-13A, *Airport Design*
- FAA Advisory Circular 150/5070-6B, *Airport Master Plans*
- Federal Aviation Regulations, Part 77, S*afe, Efficient Use, and Preservation of the Navigable Airspace*

6.2.2 Airport Airspace

The next two sheets of the ALP Drawing Set (ALP-3 and 4) illustrate the airspace requirements associated with Federal Aviation Regulations (FAR) Part 77. FAR Part 77.23 identifies a series of geometric planes (i.e., imaginary surfaces) that extend outward and upward from an airport's runways to define obstruction clearing requirements. These surfaces identify the maximum acceptable height of objects by defining three dimensional surfaces surrounding all sides of the airfield. When an object penetrates an imaginary surface, it is considered an airspace obstruction and may present a hazard to air navigation.

ALP-3 and 4, the Inner Approach Surface Drawings, provide greater detail regarding the close-in airspace obstructions, particularly to the inner portions of each FAR part 77 approach surface. For each obstruction, the height, penetration, ownership, and proposed action/disposition are indicated in the associated tables.

ALP-6 and 7, Airport Airspace Plan, illustrates the overall dimensions of the Part 77 surfaces, and highlights penetrations to the outer surfaces. As shown, there are some penetrations to the outer portions of the imaginary surfaces; including trees, utility poles, and buildings.

6.2.3 Land Use Plan & Property Map

ALP-8 and 9 depict the existing and proposed land uses within proximity to the airport along with associated land owners. More detailed information on the land use and zoning is located in Section 4.3 of Chapter 4, *Environmental Overview*.

Appendix A
Recycling Plan

1 Recycling Plan

Sustainability and green initiatives are being encouraged in a variety of areas as communities expand. The FAA has recently encouraged airport sustainability planning efforts to identify sustainability objectives that reduce environmental impacts, realize economic benefits, and improve community relations. Although the FAA is beginning to develop airport sustainability plans at several of the nation's commercial service airports, the FAA Modernization and Reform Act of 2012 requires all airport master plans to address potential recycling initiatives including: the feasibility of solid waste recycling at the airport, minimizing the generation of solid waste, operation and maintenance requirements, the review of waste management contracts, and the potential for cost savings or the generation of revenue of a recycling plan.

The following information will identify common types and sources of waste generated by General Aviation (GA) airports, current waste disposal procedures, and a recommended plan for implementing recycling initiatives at the Windham Airport (IJD).

1.1 Types and Sources of Waste at IJD

According to the 2013 FAA document *Recycling, Reuse, and Waste Reduction at Airports*, one of the key elements of developing a recycling plan is to identify the types and sources of waste at an airport. This varies depending upon the type of facility (e.g., GA or commercial service). A GA airport does not typically generate as much waste as that of a commercial service airport. Additionally, most waste generated by GA airport operations can be disposed of with normal trash collection.

The following, as defined in *Recycling, Reuse, and Waste Reduction at Airports*, present the types of waste typically generated by activity at IJD.

- **Municipal solid waste (MSW)** consists of everyday items that are used and then discarded, such as product packaging, clothing, bottles, food scraps, and newspapers. Every airport produces a certain amount of MSW. MSW at GA airports can usually be disposed of with normal trash collection.
- **Green waste** is a type of MSW that includes yard waste, such as grass clippings, leaves, small branches, and similar debris generated by landscape maintenance activities. On-airport mowing and tree clearing activity produces green waste.

- **Construction and demolition waste** is also generally categorized at MSW, but is a considered non-hazardous solid waste from land clearing, excavation, and/or the construction, demolition, renovation, or repair of structures, roads, and utilities. Although some special requirements may be placed on construction and demolition waste, such as tar, roofing materials, asbestos containing building materials, etc. Construction and demolition waste can be a major component of airport waste, especially during an airport improvement project. Airport improvement projects should identify proper disposal procedures for construction and demolition waste.
- **Hazardous waste** includes waste is that ignitable, corrosive, toxic, or reactive. Hazardous waste must be handled in accordance with federal regulations outlining proper treatment and disposal. According to the FAA, examples of hazardous waste often found at an airport include, but are not limited to: solvents, caustic parts washes, heavy metal paint waste and paint chips, waste fuels (e.g., sump fuels or tank sludge), unusable water condition chemicals, nickel cadmium, and waste pesticides. Airport and aircraft maintenance operations can generate hazardous waste.
- **Universal waste** is a type of hazardous waste that has less stringent regulations. According to the Environmental Protection Agency (EPA), if handled in a responsible method prior to legal recycling, these wastes are less heavily regulated. Examples of universal waste include, but are not limited to: batteries, aerosol cans, pesticides, mercury-containing devices (e.g., thermostats and thermometers), mercury-containing lighting (e.g., florescent bulbs), and electronic devices. Various items located throughout an airport and within an aircraft may generate universal waste.

1.2 Current Waste Disposal Procedures

1.2.1 Municipal Solid Waste

Trash receptacles for MSW are available throughout IJD. Each airport tenant is responsible for ensuring proper disposal of personal MSW into a receptacle. The airport maintenance contractor collects the MSW from each receptacle and ensures proper disposal from a contracted trash collector.

1.2.2 Green Waste

Green waste is also generated through mowing, landscaping and tree clearing activity. Currently, grass clippings at IJD are not collected during mowing operations. IJD also routinely performs tree trimming/removal to protect runway approach surface clearance. Although the trees and limbs from the activity can produce green waste, the removed vegetation is usually hauled off-site for mulch and/or compost.

1.2.3 Construction and Demolition Waste

The type of disposal for construction and demolition waste at IJD is dependent upon the type of associated activity. Recently, IJD performed apron pavement repair involving the milling of pavement. Excess millings from this project were recycled for portions of airport service roadways. This type of waste is generally generated from airport sponsored activity and, thus, can be properly disposed.

1.2.4 Hazardous and Universal Waste

Hazardous and universal waste is generated at the airport through airport and aircraft maintenance operations. According to the Connecticut Airport Authority (CAA), Sensenich Propeller Service and Windham Aircraft Repair have established procedures for the disposal of hazardous and universal waste that ensures collection and disposal separately from MSW. Both operators also have dedicated dumpsters for disposing of their MSW.

1.3 Recycling Plan Development

After review of the common types of waste, it is evident that there is a mix of both MSW and special waste generated by activity at IJD. Therefore, it is feasible to implement recycling procedures at the Airport. Like many GA airports, however, IJD does not have a formalized process for identifying, sorting, and collecting recyclable material. The following provides a recommended outline for the development of a recycling plan at IJD. Information provided in the FAA's *Recycling, Reuse, and Waste Reduction at Airports* and the EPA's *Developing and Implementing an Airport Recycling Program* was used to develop the outline.

- **Step 1 – Identify a Waste Collector:** Willimantic Waste Paper Company (WilliWaste) provides weekly trash and recycling pick-up for the Town of Windham. WilliWaste recycling service includes: paper recycling, scrap metal recycling, construction and demolition waste recycling, and specialty item recycling. These services are available for both residential and business customers.
- **Step 2 – Identify a Collection System:** WilliWaste provides single stream recycling, which allows all recyclables to be placed in a single receptacle. The material is then sorted at an off-site facility. It is important to note that weekly recycling pick-up is typically only intended for recyclable material associated with MSW. Special wastes, such as construction and demolition waste and hazardous and universal waste, must follow federal regulations for proper disposal and be coordinated with the waste collector.

- **Step 3 – Identify Location of Recycling Receptacles:** Since WilliWaste offers single stream recycling, only a single type of recycling receptacle is necessary. Although, multiple on-airport receptacles may be desired throughout the Airport. It is recommended that recycling receptacles be placed adjacent to trash receptacles and in common areas to ensure all airport tenants and visitors are aware that recycling is available at the Airport.
- **Step 4 – Educate Airport Tenants and Visitors:** Once recycling is available at IJD, it recommended that both tenants and visitors are informed. This can be accomplished through face-to-face meetings, newsletters, emails, and airport signage. Information should identify the location of recycling receptacles, types of recyclable material allowed to be placed in the receptacles, and the importance of recycling within the community.
- **Step 5 – Monitor and Refine the Plan:** It is important to monitor and, if necessary, refine the recycling plan. A periodic check of the trash receptacles prior to trash collection should be conducted to determine the level of sorting of MSW versus recyclable materials. If adjustment is necessary, consideration should be given to the placement of receptacles, collection times, or if additional receptacles may be necessary.

  A potential cost benefit of implement a recycling plan may be decreased waste within the trash receptacles and dumpsters and, thus, fewer required trash collections.

1.3.1 Recycling Plan Summary

As discussed, airports generate multiple types of waste. Fortunately, a large percentage of this waste is considered recyclable in one form or another. For construction and demolition waste and hazardous and universal waste, it is recommended that IJD continue to reuse or recycle material when practical or available. For MSW, it is recommended the aforementioned steps are implemented to establish a recycling program at the Airport. A recycling program can both enhance the overall community environmental and provide the airport potential cost saving by reducing trash collection.

Appendix B
Meeting Information

Agenda

Project: Windham Airport (IJD) Master Plan Update

Location: Windham Town Hall

Meeting: Advisory Committee #1

Date: November 13, 2013 – 5:00 p.m.

Topics:

- Introductions
  - Project Team
  - Advisory Committee Members
- Study Website
- Components of an Airport Master Plan
  - Narrative Report
  - Airport Layout Plan
- Airport Master Plan Study Process
- Tentative Project Schedule
- Airport Overview and Inventory
  - IJD Location and Surrounding Airports
  - Existing Conditions
  - FAA Design Standards
  - Representative Aircraft
  - Existing Airport Activity
  - Design Aircraft

CHA design/construction solutions

III Winners Circle, P.O. Box 5269 / Albany, NY 12205
PH 518.453.4500 // FX 518.458.1735
chacompanies.com

- Forecasts of Aviation Demand
    - Based Aircraft Forecasts
    - Operations Forecasts
    - Recommended Forecasts
- Key Study Issues
    - Airport Obstruction
    - Airport Fencing
    - Wildlife Hazard Assessment
    - Environmental Constraints
    - Runway Safety Area Compliance
    - North Side Development
    - Runway Protection Zone
- Next Steps
    - Environmental Overview
    - Facility Requirements Evaluation
    - Development Alternatives
    - Airport Capital Improvement Plan
    - Airport Layout Plan
- Miscellaneous
- Next Meeting
- Adjourn

III Winners Circle, P.O. Box 5269 / Albany, NY 12205
PH 518.453.4500 // FX 518.458.1735
chacompanies.com

Summary

Project: Windham Airport (IJD) Master Plan Update

Location: Windham Town Hall

Meeting: Advisory Committee #1

Date: November 13, 2013 – 5:00 p.m.

Summary:

The initial Advisory Committee (AC) meeting for the Windham Airport (IJD) Master Plan Update was held at the Windham Town Hall on November 13, 2013 at 5:00 p.m. The purpose of the AC is to provide stakeholder insight on topics regarding the IJD Master Plan Update that are relevant to the community and business development. A formal presentation outlining a tentative project schedule and components of the study, such as the existing airport infrastructure and a forecast of aviation activity, was presented during the AC meeting.

The following representatives were in attendance:

Attendee	Affiliation
• Andy Davis	Connecticut Department of Transportation
• Molly Parsons	Connecticut Department of Transportation
• Colin Goegel	Connecticut Airport Authority
• Barry Pallanck	Connecticut Airport Authority
• Kurt Sendlein	Connecticut Airport Authority
• Mark Paquette	Windham Council of Governments
• Christel Donahue	Town of Windham
• James Finger	Town of Windham
• Linda Painter	Town of Mansfield
• Susan Johnson	State Representative 49th House
• Thomas Peghiny	Flight Design
• Cathleen Eldridge	Stonegate Manor
• Charles Maric	University of Connecticut
• Paul McDonnell	CHA
• Adam French	CHA

The following is a summary of comments and questions discussed during the meeting:

- Comment/Question: What is meant by “airports compete for business”?
- Answer: Unlike some forms of public infrastructure (e.g., roadways, utility lines), many airports operate similar to businesses and compete for aircraft activity within a given area. Business activity includes fuel sales, aircraft storage fees, aircraft maintenance, etc.

III Winners Circle, P.O. Box 5269 / Albany, NY 12205
PH 518.453.4500 // FX 518.458.1735
chacompanies.com

- Comment/Question: What is the status of the proposed runway extension?
- Answer: The previous Fixed Based Operator (FBO), Freedom Jets, based several jet aircraft at IJD. At that time, there was a potential need for additional runway length at the airport. Since the departure of Freedom Jets in 2012, the airport has experienced a substantial decrease in jet activity eliminating the need for additional runway length at this time. The master plan can still conduct the planning for a runway extension, it is unlikely to be recommended in the short-term.

- Comment/Question: The local area could benefit from direct service to commercial service airports.
- Answer: IJD is designated as a "General Aviation" airport by the Federal Aviation Administration. As such, the airport is not equipped with the required infrastructure and security measures to support commercial air service. However, IJD is capable of accommodating charter and air taxi service; such as that provided by the former FBO, Freedom Jets. Unfortunately, the cost associated with charter and air taxi service often far exceeds that for commercial air service. This issue will be address in the study.

- Comment/Question: If the wetland area near the Runway 27 end is located in an FAA safety compliance area, assistance might be available to remove or relocate it.
- Answer: A portion of the Runway 27 Runway Safety Area is located within the wetland. Subsequent portions of the Master Plan will examine potential wetland mitigation options. Although the wetland may have been created by past roadway construction, CT DEEP will still consider them to be protected. Impacts to the wetland will be subject to permitting/mitigation.

- Comment/Question: With regard to land use compatibility within the Runway 36 Runway Protection Zone, what options are available for the residents located in Stonegate Manor?
- Answer: The Master Plan will examine the potential options for property acquisition, and associated relocation assistance. However, any proposed land acquisition would require several years to obtain planning, environmental, and funding approval. Residential compensation and relocation services are required with any public land acquisition program.

- Comment/Question: Does the Master Plan examine marketing strategies for IJD?
- Answer: This study does not examine marketing strategies for IJD. However, the previously completed IJD Business Plan outlined recommendations for potential development areas. The Business Plan recommendation will be incorporated into the master plan.

- Comment/Question: Can the closed landfill be reused?
- Answer: Unfortunately, this area cannot be reused for alternate uses.

- Comment/Question: Are there airports that are closing?
- Answer: Yes, some airports throughout the nation are closing. These airports mostly consist of privately-owned facilities that do not receive federal funding. In Connecticut, a few such airports have closed, and others are considered threatened, primarily due to financial concerns. Publicly-owned airports that receive federal grants are "obligated" to remain open for public use.

Agenda

Project: Windham Airport (IJD) Master Plan Update

Location: Windham Town Hall

Meeting: Advisory Committee #2

Date: April 3, 2014 – 5:00 p.m.

Topics:

- Introductions
    - Project Team
    - Advisory Committee Members
- Study Website
- Project Status
- Review of Existing Airport Conditions
    - FAA Design Standards
- Review of Forecast Airport Activity Growth
    - Forecast of Based Aircraft
    - Forecast of Aircraft Operations
- Facility Requirements Evaluation
    - Airside – Runway 9-27 & Runway 18-36
    - Landside – Hangars, Airport Buildings, Airport Access

CHA design/construction solutions

III Winners Circle, P.O. Box 5269 / Albany, NY 12205
PH 518.453.4500 // FX 518.458.1735
chacompanies.com

- Development Alternatives Analysis
  - Runway 9-27 Alternatives:
    - Alternative 1 – Publish Declare Distances to Clear Runway Safety Areas
    - Alternative 2 – Grade the Runway Safety Areas for FAA compliance
    - Alternative 3 - 730' Runway Extension to the West
    - Alternative 4 – 150' Runway Extension to the East & 635' Runway Extension to the West with Declared Distances
  - Runway 18-36 Alternatives:
    - Alternative 5 – Shorten Runway Length for Runway Object Free and Runway Safety Area compliance
    - Alternative 6 – Shift Runway to the North for Runway Object Free and Runway Safety Area compliance
  - Terminal Area Alternatives:
    - Alternative 1 – Existing Terminal Area
    - Alternative 2 – Existing Terminal Area
    - Alternative 3 – North Side Terminal Area
    - Alternative 4 – North Side Terminal Area
    - Alternative 5 – North Side Terminal Area
- Land Use & Zoning Analysis
- Wildlife Hazard Site Review
- Next Steps
- Adjourn

Summary

Project: Windham Airport (IJD) Master Plan Update

Location: Windham Town Hall

Meeting: Advisory Committee #2

Date: April 3, 2014 – 5:00 p.m.

Summary:

The second Advisory Committee (AC) meeting for the Windham Airport (IJD) Master Plan Update was held at the Windham Town Hall on April 3, 2014 at 5:00 p.m. The purpose of the AC is to provide stakeholder insight on topics regarding the IJD Master Plan Update that are relevant to the community and business development. The meeting presentation outlined the project schedule and components of the study, as well as the materials in the next Working Paper.

The following representatives were in attendance:

Attendee	Affiliation
• Melanie Zimyeski	Connecticut Department of Transportation
• Molly Parsons	Connecticut Department of Transportation
• Colin Goegel	Connecticut Airport Authority
• Barry Pallanck	Connecticut Airport Authority
• Kurt Sendlein	Connecticut Airport Authority
• Mark Paquette	Windham Council of Governments
• Christel Donahue	Town of Windham
• James Finger	Town of Windham
• Linda Painter	Town of Mansfield
• Susan Johnson	State Representative 49th House
• Will Burbage	Sensenich Propeller
• Cathleen Eldridge	Stonegate Manor
• Paul McDonnell	CHA
• Adam French	CHA

The following is a summary of comments and questions discussed during the meeting:

- Comment/Question: Why were wetlands located east of the Runway 27 end not an issue during construction of the north side service road?
- Answer: The area did not likely contain wetlands a few years ago. The wetlands have recently developed due to drainage and are growing in size. Additionally, the Master Plan will investigate potential wetland mitigation and repairs to the eroded portion of the Mansfield Hallow Dam.

III Winners Circle, P.O. Box 5269 / Albany, NY 12205
PH 518.453.4500 // FX 518.458.1735
chacompanies.com

- Comment/Question: Is there concern for an aircraft crashing into the reservoir and leaking contaminants?
- Answer: The potential for an air emergency exists. However, the reservoir is beyond the limits of the runway object free area and safety area. In addition, light aircraft do not hold substantially more fuel and oil than automobiles.

- Comment/Question: With regard to the Stonegate Manor property located within the Runway 36 Runway Protection Zones, the Town of Windham would not likely support eminent domain, but does support protection of the airport.
- Answer: The FAA has indicated they would support voluntary acquisition of the property, but it would be considered low priority. The CAA has concurred with this notion.

- Comment/Question: Would it be possible to provide airport access for business located along State Route 6?
- Answer: If the business is located outside of airport property, it would be considered a "through the fence" operation. The FAA does not recommend this type of operation as it detracts from potential airport revenue.

- Comment/Question: Does the closed landfill offer development potential?
- Answer: Unfortunately, this area does not support future development.

- Comment/Question: What are avigation easements and what purpose do they serve?
- Answer: Avigation, or air, easements provide the airport the ability to clear obstructions located within the airport's airspace, but without owning the property in fee. The Master Plan recommends obtaining avigation easements from the Town of Windham and the US Army Corps of Engineers for the runway protection zones and approach surfaces located off airport property.

- Comment/Question: Is there a need for the crosswind runway (Runway 18-36)?
- Answer: Although many larger aircraft cannot utilize Runway 18-36, the runway provides an added margin of safety for smaller aircraft. Additionally, a light sport aircraft builder has plans to begin operations at the airport, and has expressed interest the dual-runway system.

Agenda

Project: Windham Airport (IJD) Master Plan Update

Location: Windham Town Hall

Meeting: Advisory Committee #3

Date: September 23, 2014 – 5:00 p.m.

Topics:

- Introductions
    - Project Team
    - Advisory Committee Members
- Study Website
- Project Status & Schedule
- Review of Existing Airport Conditions
- Review of Forecast Airport Activity Growth
    - Forecast of Based Aircraft
    - Forecast of Aircraft Operations
- Review of Facility Requirements Evaluation
    - Airside – Runway 9-27 & Runway 18-36
    - Landside – Hangars, Airport Buildings, Airport Access
- Development Alternatives Analysis
    - Runway 9-27 Alternatives:
        - *Alternative 1 – Grade the Runway Safety Areas for FAA compliance*
        - Alternative 4 – Westerly Extension with Declared Distances (long range)
    - Runway 18-36 Alternatives:
        - *Alternative 5 – Relocate 100' of Runway to the South for Safety Area compliance*

CHA design/construction solutions

III Winners Circle, P.O. Box 5269 / Albany, NY 12205
PH 518.453.4500 // FX 518.458.1735
chacompanies.com

- Terminal Area Alternatives:
  - *Alternative 2 – Existing Terminal Area*
  - *Alternative 3 – North Side Terminal Area (as needed)*

- Overall Recommended Plan
- Airport Capital Improvement Plan
- Next Steps
  - Complete ACIP
  - Release ALP
  - Conduct Public Information Meeting (Date?)
  - Obtain FAA Approval
- Adjourn

III Winners Circle, P.O. Box 5269 / Albany, NY 12205
PH 518.453.4500 // FX 518.458.1735
chacompanies.com

Summary

Project: Windham Airport (IJD) Master Plan Update

Location: Windham Town Hall

Meeting: Advisory Committee #3

Date: September 23, 2014 – 5:00 p.m.

Summary:

The third Advisory Committee (AC) meeting for the Windham Airport (IJD) Master Plan Update was held at the Windham Town Hall on September 23, 2014 at 5:00 p.m. The purpose of the AC is to provide stakeholder insight on topics regarding the IJD Master Plan Update that are relevant to the community and business development, and solicit comments on the study. The meeting presentation outlined the project schedule and components of the study, as well as the materials for the draft Master Plan report.

The following representatives were in attendance:

Attendee	Affiliation
• Melanie Zimyeski	Connecticut Department of Transportation
• Molly Parsons	Connecticut Department of Transportation
• Colin Goegel	Connecticut Airport Authority
• Barry Pallanck	Connecticut Airport Authority
• Kurt Sendlein	Connecticut Airport Authority
• James Finger	Town of Windham
• Jim Hooper	Windham Water
• Diane Nadeau	Windham Chamber of Commerce
• Susan Johnson	State Representative 49th House
• Paul McDonnell	CHA
• Adam French	CHA

The following is a summary of comments and questions discussed during the meeting:

- Comment/Question: Will the future fuel tank interfere with the Windham Reservoir?
- Answer: Fuel tank/site design specifications include catch basins in the event of fuel leaks and spills. Furthermore, the future fuel tanks will be above-ground and double-walled for maintenance and monitoring.

- Comment/Question: How where the forecasts of aviation activity developed?
- Answer: The forecasts developed as part of Working Paper 1 incorporated historic aviation trends, several local and national industry trends, and socioeconomic data to determine a realistic forecast of activity specific for IJD.

III Winners Circle, P.O. Box 5269 / Albany, NY 12205
PH 518.453.4500 // FX 518.458.1735
chacompanies.com

- Comment/Question: Would proposed tree clearing near the Stonegate Mobile Home Community have the potential for increased noise impacts?
- Answer: Current activity level at IJD does not produce significant noise levels for FAA noise mitigation action. Furthermore, proposed removal of trees near this area would not increase noise levels within this area.

- Comment/Question: Can the wetland located west of Runway 9-27 be mitigated/relocated to the open north side area?
- Answer: The FAA does not allow the creation of wetlands on airport property as they are considered non-compatible land uses. CAA will be looking to fill the wetland and obtain the required permits as part of runway safety project.

- Comment/Question: Consider other venues for the Public Information Meeting.
- Answer: Several venues will be considered, including the Windham High School.

Summary

Project: Windham Airport (IJD) Master Plan Update

Location: Windham High School

Meeting: Public Information Meeting

Date: November 13, 2014 – 7:00 p.m.

Summary:

A public information meeting (PIM) for the Windham Airport (IJD) Master Plan Update was held at the Windham High School on November 13, 2014 at 7:00 p.m. The meeting presentation outlined the project schedule and components of the study, as well as the materials for the draft Master Plan report.

The following is a list of the PIM attendees:

Attendee	Affiliation
• James Finger	Town of Windham
• Christel Donahue	Town of Windham
• Tom DeViro	Town Council
• Karen Gilbransen	Windham Downtown
• Cathy & Steve Gudeahn	Windham Residents
• Joseph & Alice Gudeahn	Windham Residents
• Ed LeDoyt	Mansfield Property Owner
• Marla Charron	Windham Airport Tenant
• Cherrie Lewis	Windham Airport Tenant
• Dennis Oparowksi	Windham Airport Tenant
• George Lewis	Windham Aircraft Repair
• Michelle Firestone	The Chronicle Newspaper
• David Mieczynski	National Realty Advisors
• Kathleen Muller	Stonegate Manor
• Dawn Niles	Dem. Town Chair
• Lloyd Niles	Fire Chief Windham
• Diane Nadeau	Windham Chamber of Commerce
• Susan Johnson	State Representative 49th House
• Melanie Zimyeski	Connecticut Department of Transportation
• Molly Parsons	Connecticut Department of Transportation
• Colin Goegel	Connecticut Airport Authority
• Barry Pallanck	Connecticut Airport Authority
• Kurt Sendlein	Connecticut Airport Authority
• Paul McDonnell	CHA
• Adam French	CHA

III Winners Circle, P.O. Box 5269 / Albany, NY 12205
PH 518.453.4500 // FX 518.458.1735
chacompanies.com

The following is a summary of comments and questions discussed during the meeting:

- Comment/Question: What are aircraft operations and how are they counted?
- Answer: An aircraft operation is either an aircraft takeoff or landing. For non-towered airports, such as IJD, estimated aircraft operations from the Federal Aviation Administration's Terminal Area Forecast database were used as a baseline and projected forwarded for the 20-year planning period.

- Comment/Question: Is erosion control considered when removing tree obstructions?
- Answer: Yes, typically when trees are removed or lowered due to obstruction issues the stumps are left in place to protect the surrounding soil from erosion and natural decay.

- Comment/Question: What justification is required by the Federal Aviation Administration for the proposed runway extension?
- Answer: The Federal Aviation Administration requires at least 500 annual aircraft operations by an aircraft requiring the proposed runway length.

- Comment/Question: Was the fire department contacted?
- Answer: At this stage of the planning process, public safety departments were not specifically contacted; although input from all stakeholders is welcome. If/when a proposed project that would require additional input from specific safety departments is needed, proper coordination with public safety officials will be conducted.

- Comment/Question: Has potential solar farms been investigated?
- Answer: As part of the project's Energy Efficiency Assessment, a brief solar array investigation was conducted. A proposed location brief benefit/cost is documented in the report.

- Comment/Question: Can there be a "through-the-fence" operation?
- Answer: While the Federal Aviation Administration does not prohibit this type of operation, the Administration does not encourage it. Such an operation should be thoroughly vetted with the airport sponsor and the Federal Aviation Administration to determine benefits to the airport.

- Comment/Question: Will the cross-wind runway (Runway 18-36) be extended?
- Answer: This master plan study does not recommend the extension of Runway 18-36 as it was determined that enhancing the safety and capacity of the primary runway (Runway 9-27) would be most cost effective.

- Comment/Question: When will the new fuel facility be installed?
- Answer: Construction for the new self-serve fuel facility is currently underway. The construction timeline is dependent upon the weather, but anticipated to be complete by the spring at the latest. Both 100LL and Jet-A fuel will be available.

- Comment/Question: Why was this meeting not held at the airport?
- Answer: A public meeting venue must be a convenient location for all citizens and compliant with ADA requirements. Unfortunately, the Windham Airport cannot facilitate these needs.

- Comment/Question: The airport tenants were not properly notified of this meeting.
- Answer: While public advertisements were listed within local newspapers, it is acknowledged that specific notification to the pilot community should have occurred. An additional public information meeting has been requested.

Summary

Project: Windham Airport (IJD) Master Plan Update

Location: Windham Town Hall

Meeting: Public Information Meeting #2

Date: December 9, 2014 – 5:00 p.m.

Summary:

A second public information meeting (PIM) for the Windham Airport (IJD) Master Plan Update was held at the Windham Town Hall on December 9, 2014 at 5:00 p.m. The meeting presentation outlined the project schedule and components of the study, as well as the materials for the draft Master Plan report. The second meeting was requested by the Town and attendees of the first PIM in order to outreach to additional persons. The formal presentation was identical to the first meeting.

Approximately 30 persons were in attendance, including the following representatives of the Airport.

Attendee	Affiliation
• Kevin Dillon	Connecticut Airport Authority
• Bob Bruno	Connecticut Airport Authority
• Colin Goegel	Connecticut Airport Authority
• Barry Pallanck	Connecticut Airport Authority
• Kurt Sendlein	Connecticut Airport Authority
• Molly Parsons	Connecticut Department of Transportation
• Paul McDonnell	CHA (study consultant)

The following is a summary of comments and questions discussed during the meeting:

- Comment/Question: The photo of the airport provided on the website is of poor quality.
- Answer: This photo is only for reference purposes. However, a different aerial photo can be found on the project website's "Photo Gallery" page at www.windhamairportplan.org.

- Comment/Question: It is suggested that the airport provide a sign with some basic information, such has hours of operations, phone numbers to local taxi-service, airport manager, etc.
- Answer: The CAA will take this into consideration. Additionally, airport information can be found within the FAA Airport/Facility Directory or online at www.airnav.com/airport/KIJD.

III Winners Circle, P.O. Box 5269 / Albany, NY 12205
PH 518.453.4500 // FX 518.458.1735
chacompanies.com

- Comment/Question: Will the community be involved in future development?
- Answer: Other than for minor projects and maintenance activities, projects that involve new development or expansion required an opportunity for public review per the National Environmental Policy Act (NEPA) and State Environmental Policy Act (CEPA). Public outreach and comment periods are required, at a level appropriate for the size of the project. The next planned project at the airport includes additional tree obstruction removal. A public meeting for that project will be advertised and held.

- Comment/Question: From where does the project funding come?
- Answer: Projects for the airfield (runways, taxiways, lighting, etc.) are 90% FAA funded, with a 10% match by CAA. The ongoing airport fueling facility project is funded entirely by CAA. Hangars and related facilities are funded privately, and require a lease with the CAA. No funding is provided by the Town of Windham.

- Comment/Question: It was suggested that there are better uses of public funds than airport improvements/expansion, particularly for education.
- Answer: Airports listed within the National Plan of Integrated Airport Systems are eligible for federal funding. This funding originates from the federal Airport and Airways Trust Fund and can only be used for public airport and aviation projects. The trust fund's resources are generated from taxes on aviation fuel, airline tickets, and other airport activities. A description of airport economic benefits can be found at http://ctairports.org/GeneralAviationAirports/Windham/EconomicContribution.aspx

- Comment/Question: Are aircraft tenants required to provide the Town taxes or fees?
- Answer: In Connecticut, all based aircraft owners are required to pay an annual registration fee to the local town. Based aircraft owners at Windham Airport pay the registration fee directly to the Town of Windham, regardless of the home or business residency of the owner. There are no personal property taxes on aircraft in Connecticut.

- Comment/Question: The ACIP listed for the T-hangars may be too high. If it did cost that much, it would not be feasible to build as rents would not cover the construction costs.
- Answer: Hangars are not eligible for public funding, and thus, the size and cost of a specific hangar will be dictated by the developer and the corresponding needs. The listed cost is for example only, and is not determined by CAA.

- Comment/Question: Will the public be allowed to provide input for development using private funding?
- Answer: Yes, as this is a public airport any development would have to go through the NEPA/CEPA process, which includes public participation/notification.

- Comment/Question: Are there plans for to bring in an FBO?
- Answer: The CAA will be soliciting for an FBO/airport operators/service provides in the near future.

- Comment/Question: Is the north or south side area preferred for airport expansion?
- Answer: Should demand warrant expansion, it would be preferable to first develop the south side of the airport near the existing terminal/FBO building as there is existing utilities and infrastructure in place on the south side.

- Comment/Question: When will the new fuel facility be installed?
- Answer: Construction for the new self-serve fuel facility is currently underway. The construction timeline is dependent upon the weather, but anticipated to be complete by the spring of 2015. Both 100LL and Jet-A fuel will be available.

- Comment/Question: Locations on the north side of the airport provide habitat for grass land birds including endangered species. Development in that area would impact that habitat.
- Answer: No development is currently proposed for that location; however, the master plan does reserve that area for airport development, which would require an evaluation of the habitat and impacts.

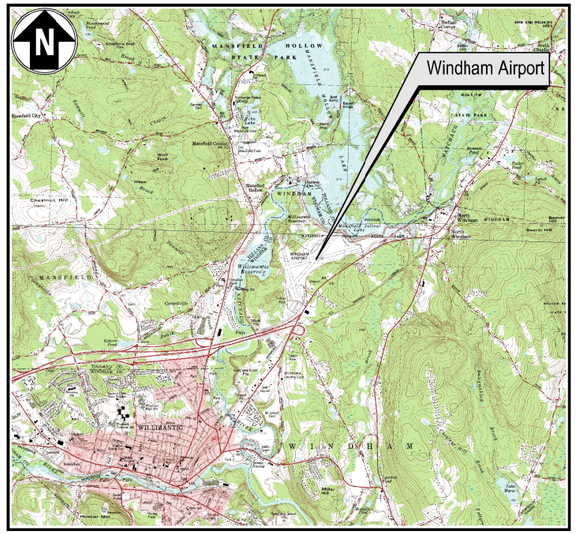
Appendix C
Airport Layout Plan

Windham Airport (IJD)

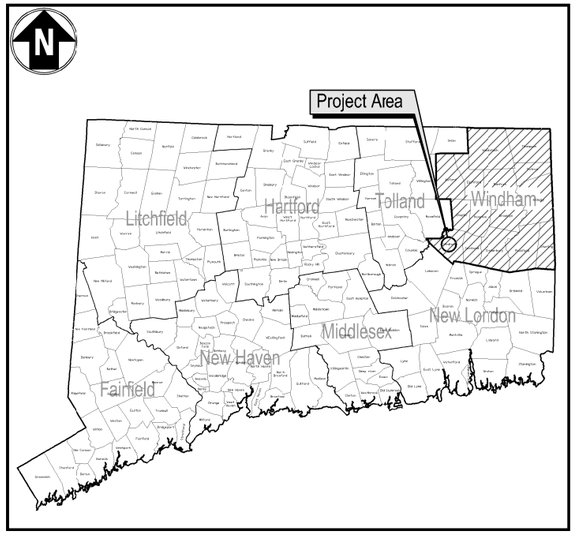
Windham, Connecticut

AIRPORT LAYOUT PLAN

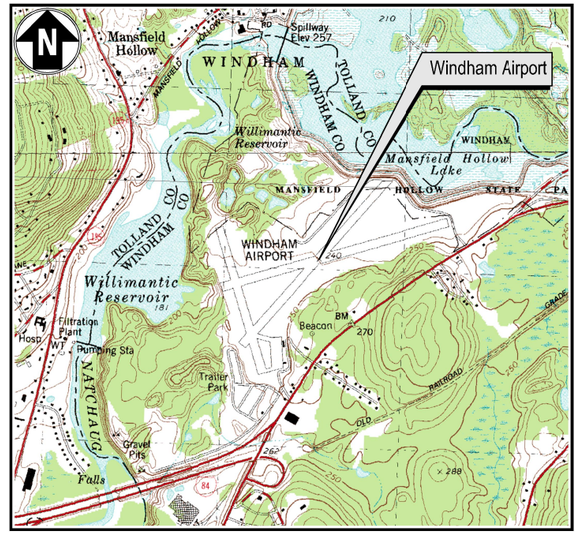
AIP No. 3-23-0021-11-2013



Location Map
NOT TO SCALE



State of Connecticut
NOT TO SCALE



Airport Vicinity Map
NOT TO SCALE

Prepared for:
Connecticut Airport Authority (CAA)

334 Ella Grasso Turnpike

Suite 160

Windsor Locks, CT 06096

Connecticut Department of Transportation

Bureau of Policy and Planning

2800 Berlin Turnpike

Newington, CT 06131

Drawing Index		
Drawing	Title	Revised
ALP-0	TITLE SHEET	
ALP-1	EXISTING AIRPORT LAYOYT PLAN	
ALP-2	AIRPORT LAYOUT PLAN	
ALP-3	TERMINAL AREA PLAN	
ALP-4	AIRSPACE DRAWING	
ALP-5	RWY 9 INNER PORTION OF THE APPROACH SUFACE	
ALP-6	RWY 27 INNER PORTION OF THE APPROACH SURFACE	
ALP-7	RWY 18 INNER PORTION OF THE APPROACH SURFACE	
ALP-8	RWY 36 INNER PORTION OF THE PROPOSED APPROACH SURFACE	
ALP-9	OBSTRUCTION DATA SHEET	
ALP-10	LAND USE PLAN	
ALP-11	AIRPORT PROPERTY MAP (EXHIBIT A)	

Prepared by:

CHA

2139 Silas Deane Highway, Suite 212 · Rocky Hill, CT 06067-2336
Main: (860) 257-4557 · www.chacompanies.com

April 2016

No.	Submittal / Revision	Appr'd	By	Date

CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

CHA
2139 Silas Deane Highway, Suite 212
Rocky Hill, CT 06067-2336
860.257.4557 · www.chacompanies.com

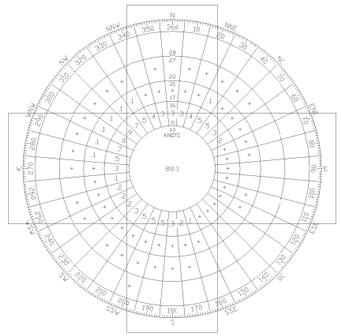
Designed: POM | Drawn: PM | Checked: AJF

WINDHAM AIRPORT (IJD)
AIRPORT MASTER PLAN UPDATE

TITLE SHEET

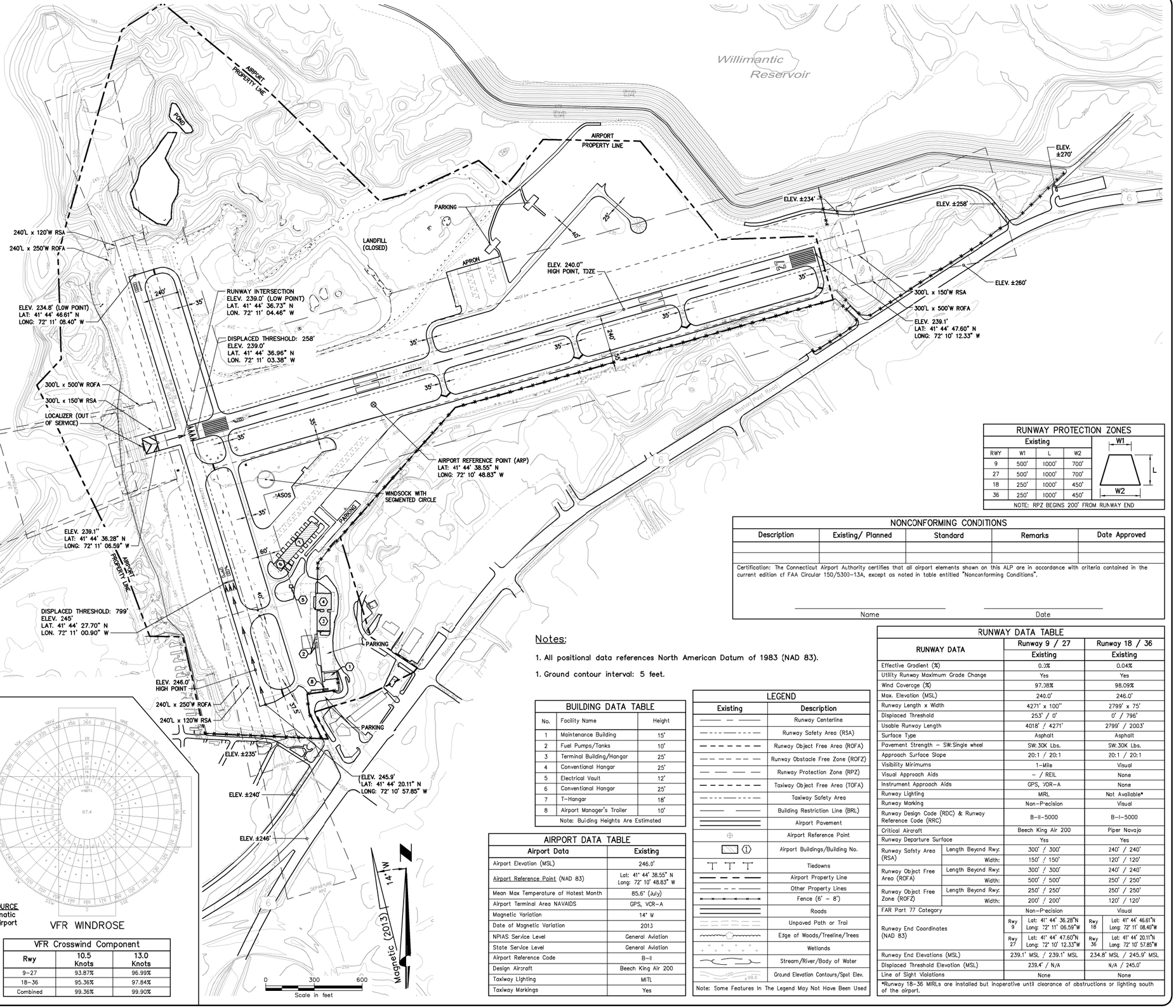
Issue Date: April 2016 | Project No.: 25874 | Scale: AS NOTED

ALP-0



ALL WEATHER WINDROSE

All-Weather Crosswind Component		
Rwy	10.5 Knots	13.0 Knots
9-27	94.12%	97.08%
18-36	95.85%	98.09%
Combined	99.42%	99.91%



RUNWAY PROTECTION ZONES				
Existing				
RWY	W1	L	W2	
9	500'	1000'	700'	
27	500'	1000'	700'	
18	250'	1000'	450'	
36	250'	1000'	450'	

NOTE: RPZ BEGINS 200' FROM RUNWAY END

NONCONFORMING CONDITIONS				
Description	Existing/ Planned	Standard	Remarks	Date Approved

Certification: The Connecticut Airport Authority certifies that all airport elements shown on this ALP are in accordance with criteria contained in the current edition of FAA Circular 150/5300-13A, except as noted in table entitled "Nonconforming Conditions".

Name Date

Notes:

1. All positional data references North American Datum of 1983 (NAD 83).
1. Ground contour interval: 5 feet.

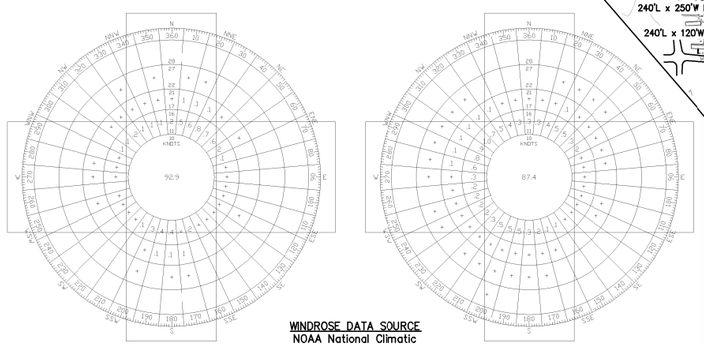
BUILDING DATA TABLE		
No.	Facility Name	Height
1	Maintenance Building	15'
2	Fuel Pumps/Tanks	10'
3	Terminal Building/Hangar	25'
4	Conventional Hangar	25'
5	Electrical Vault	12'
6	Conventional Hangar	25'
7	T-Hangar	18'
8	Airport Manager's Trailer	10'

Note: Buiding Heights Are Estimated

AIRPORT DATA TABLE	
Airport Data	Existing
Airport Elevation (MSL)	246.0'
Airport Reference Point (NAD 83)	Lat: 41° 44' 38.55" N Long: 72° 10' 48.83" W
Mean Max Temperature of Hotest Month	85.6° (July)
Airport Terminal Area NAVAIDS	GPS, VOR-A
Magnetic Variation	14° W
Date of Magnetic Variation	2013
NPIAS Service Level	General Aviation
State Service Level	General Aviation
Airport Reference Code	B-II
Design Aircraft	Beech King Air 200
Taxiway Lighting	MITL
Taxiway Markings	Yes

LEGEND	
Existing	Description
	Runway Centerline
	Runway Safety Area (RSA)
	Runway Object Free Area (ROFA)
	Runway Obstacle Free Zone (ROFZ)
	Runway Protection Zone (RPZ)
	Taxiway Object Free Area (TOFA)
	Taxiway Safety Area
	Building Restriction Line (BRL)
	Airport Pavement
	Airport Reference Point
1	Airport Buildings/Building No.
	Tiedowns
	Airport Property Line
	Other Property Lines
	Fence (6' - 8')
	Roads
	Unpaved Path or Trail
	Edge of Woods/Treeline/Trees
	Wetlands
	Stream/River/Body of Water
100 98.6	Ground Elevation Contours/Spot Elev.

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



IFR WINDROSE

WINDROSE DATA SOURCE
NOAA National Climatic Center, Windham Airport (2000-2009)

VFR WINDROSE

IFR Crosswind Component		
Rwy	10.5 Knots	13.0 Knots
9-27	94.98%	97.22%
18-36	98.89%	99.65%
Combined	99.73%	99.97%

VFR Crosswind Component		
Rwy	10.5 Knots	13.0 Knots
9-27	93.87%	96.99%
18-36	95.36%	97.84%
Combined	99.36%	99.90%

RUNWAY DATA TABLE			
RUNWAY DATA		Runway 9 / 27	Runway 18 / 36
		Existing	Existing
Effective Gradient (%)		0.3%	0.04%
Utility Runway Maximum Grade Change		Yes	Yes
Wind Coverage (%)		97.38%	98.09%
Max. Elevation (MSL)		240.0'	246.0'
Runway Length x Width		4271' x 100"	2799' x 75'
Displaced Threshold		253' / 0'	0' / 796'
Usable Runway Length		4018' / 4271'	2799' / 2003'
Surface Type		Asphalt	Asphalt
Pavement Strength - SW: Single wheel		SW: 30K Lbs.	SW: 30K Lbs.
Approach Surface Slope		20:1 / 20:1	20:1 / 20:1
Visibility Mirimums		1-Mile	Visual
Visual Approach Aids		- / REIL	None
Instrument Approach Aids		GPS, VOR-A	None
Runway Lighting		MIRL	Not Available*
Runway Marking		Non-Precision	Visual
Runway Design Code (RDC) & Runway Reference Code (RRC)		B-II-5000	B-I-5000
Critical Aircraft		Beech King Air 200	Piper Navajo
Runway Departure Surface		Yes	Yes
Runway Safety Area (RSA)	Length Beyond Rwy:	300' / 300'	240' / 240'
	Width:	150' / 150'	120' / 120'
Runway Object Free Area (ROFA)	Length Beyond Rwy:	300' / 300'	240' / 240'
	Width:	500' / 500'	250' / 250'
Runway Object Free Zone (ROFZ)	Length Beyond Rwy:	250' / 250'	250' / 250'
	Width:	200' / 200'	120' / 120'
FAR Part 77 Category		Non-Precision	Visual
Runway End Coordinates (NAD 83)	Rwy 9	Lat: 41° 44' 36.28"N Long: 72° 11' 06.59"W	Rwy 18 Lat: 41° 44' 46.61"N Long: 72° 11' 08.40"W
	Rwy 27	Lat: 41° 44' 47.60"N Long: 72° 10' 12.33"W	Rwy 36 Lat: 41° 44' 20.11"N Long: 72° 10' 57.85"W
Runway End Elevations (MSL)		239.1' MSL / 239.1' MSL	234.8' MSL / 245.9' MSL
Displaced Threshold Elevation (MSL)		239.4' / N/A	N/A / 245.0'
Line of Sight Violations		None	None

*Runway 18-36 MIRLs are installed but inoperative until clearance of obstructions or lighting south of the airport.

No.	Submittal / Revision	Appd	By	Date

CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

CHA
2139 Silas Deane Highway, Suite 212
Rocky Hill, CT 06067
860.257.4557 • www.chacompanies.com

Checked: AJF
Drawn: PM
Designed: POM

WINDHAM AIRPORT (IJD)
AIRPORT MASTER PLAN UPDATE
EXISTING AIRPORT LAYOUT PLAN

Scale: AS NOTED
Project No.: 25874
Issue Date: April 2016

ALP-1

File: V:\PROJECTS\ANY\K3\25874\CADD_ACAD\25874-ALP-01-EXALP.DWG
Saved: 4/12/2016 9:52:15 AM Plotted: 4/12/2016 10:19:00 AM User: Medina, Perry LastSavedBy: 976

BUILDING DATA TABLE		
Existing		
No.	Facility Name	Height
1	Maintenance Building	15'
2	Fuel Pumps/Tanks	10'
3	Terminal Building/Hangar	25'
4	Conventional Hangar	25'
5	Electrical Vault	12'
6	Conventional Hangar	25'
7	T-Hangar	18'
8	Airport Manager's Trailer	10'
Note: Building Heights Are Estimated		

FEDERAL AVIATION ADMINISTRATION

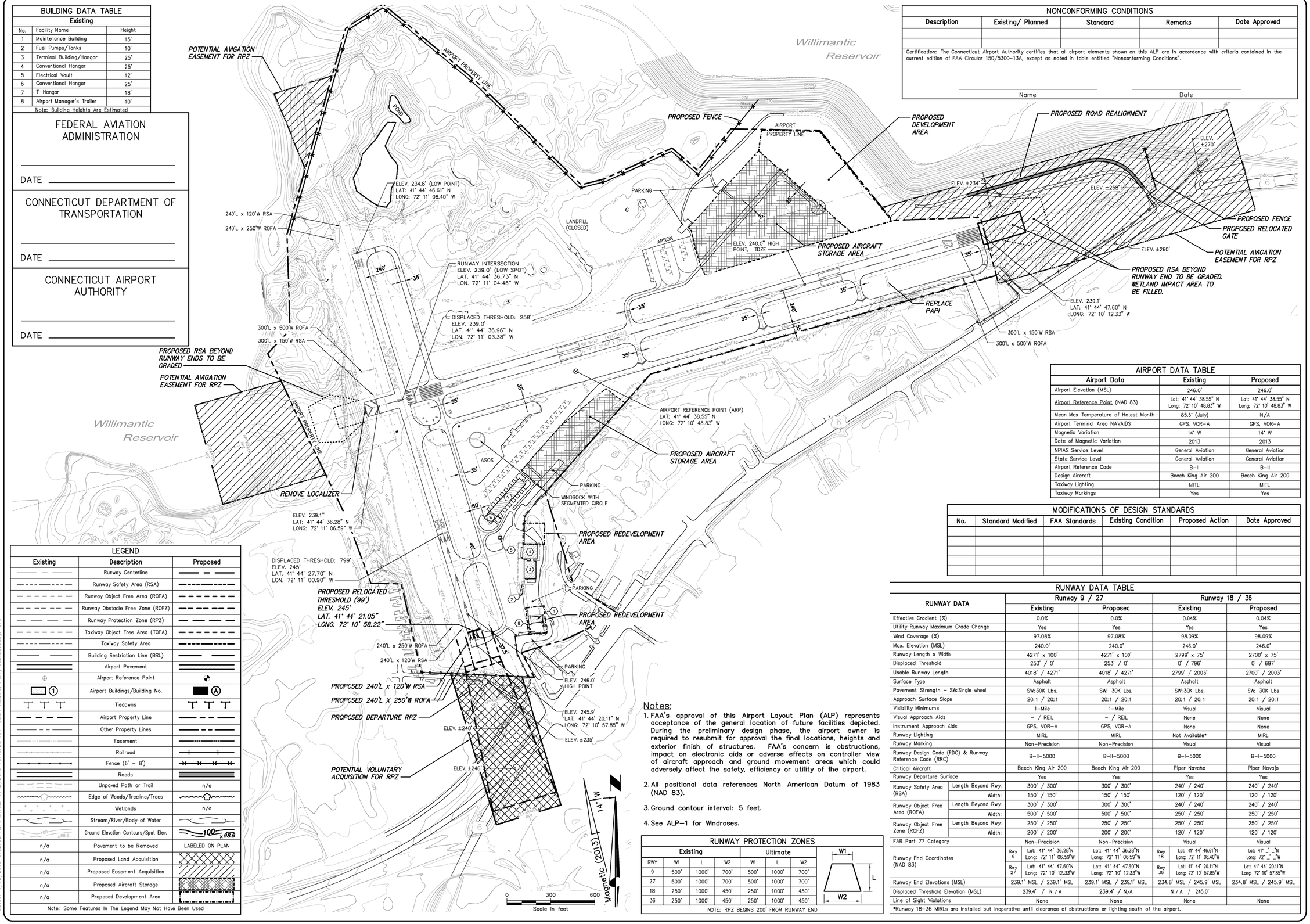
DATE _____

CONNECTICUT DEPARTMENT OF TRANSPORTATION

DATE _____

CONNECTICUT AIRPORT AUTHORITY

DATE _____



NONCONFORMING CONDITIONS				
Description	Existing/ Planned	Standard	Remarks	Date Approved

Certification: The Connecticut Airport Authority certifies that all airport elements shown on this ALP are in accordance with criteria contained in the current edition of FAA Circular 150/5300-13A, except as noted in table entitled "Nonconforming Conditions".

Name _____ Date _____

AIRPORT DATA TABLE		
Airport Data	Existing	Proposed
Airport Elevation (MSL)	246.0'	246.0'
Airport Reference Point (NAD 83)	Lat: 41° 44' 38.55" N Long: 72° 10' 48.83" W	Lat: 41° 44' 38.55" N Long: 72° 10' 48.83" W
Mean Max Temperature of Hotest Month	85.3° (July)	N/A
Airport Terminal Area NAVAIDS	GPS, VOR-A	GPS, VOR-A
Magnetic Variation	14° W	14° W
Date of Magnetic Variation	2013	2013
NPIAS Service Level	General Aviation	General Aviation
State Service Level	General Aviation	General Aviation
Airport Reference Code	B-II	B-II
Design Aircraft	Beech King Air 200	Beech King Air 200
Taxiwcy Lighting	MITL	MITL
Taxiwcy Markings	Yes	Yes

MODIFICATIONS OF DESIGN STANDARDS					
No.	Standard Modified	FAA Standards	Existing Condition	Proposed Action	Date Approved

LEGEND		
Existing	Description	Proposed
	Runway Centerline	
	Runway Safety Area (RSA)	
	Runway Object Free Area (ROFA)	
	Runway Obstacle Free Zone (ROFZ)	
	Runway Protection Zone (RPZ)	
	Taxiway Object Free Area (TOFA)	
	Taxiway Safety Area	
	Building Restriction Line (BRL)	
	Airport Pavement	
	Airpor: Reference Point	
①	Airport Buildings/Building No.	Ⓐ
	Tiedowns	
	Airport Property Line	
	Other Property Lines	
	Easement	
	Railroad	
	Fence (6' - 8')	
	Roads	
	Unpaved Path or Trail	n/a
	Edge of Woods/Treeline/Trees	n/a
	Wetlands	n/a
	Stream/River/Body of Water	
100 x98.6	Ground Elevction Contours/Spot Elev.	100 x98.6
n/a	Pavement to be Removed	LABELED ON PLAN
n/a	Proposed Land Acquisition	
n/a	Proposed Easement Acquisition	
n/a	Proposed Aircraft Storage	
n/a	Proposed Development Area	
Note: Some Features In The Legend May Not Have Been Used		

Notes:

1. FAA's approval of this Airport Layout Plan (ALP) represents acceptance of the general location of future facilities depicted. During the preliminary design phase, the airport owner is required to resubmit for approval the final locations, heights and exterior finish of structures. FAA's concern is obstructions, impact on electronic aids or adverse effects on controller view of aircraft approach and ground movement areas which could adversely affect the safety, efficiency or utility of the airport.
2. All positional data references North American Datum of 1983 (NAD 83).
3. Ground contour interval: 5 feet.
4. See ALP-1 for Windroses.

RUNWAY PROTECTION ZONES							
	Existing			Ultimate			
RWY	W1	L	W2	W1	L	W2	
9	500'	1000'	700'	500'	1000'	700'	
27	500'	1000'	700'	500'	1000'	700'	
18	250'	1000'	450'	250'	1000'	450'	
36	250'	1000'	450'	250'	1000'	450'	
NOTE: RPZ BEGINS 200' FROM RUNWAY END							

RUNWAY DATA TABLE						
RUNWAY DATA		Runway 9 / 27		Runway 18 / 36		
		Existing	Proposed	Existing	Proposed	
Effective Gradient (%)		0.0%	0.0%	0.04%	0.04%	
Utility Runway Maximum Grade Change		Yes	Yes	Yes	Yes	
Wind Coverage (%)		97.08%	97.08%	98.39%	98.09%	
Max. Elevation (MSL)		240.0'	240.0'	246.0'	246.0'	
Runway Length x Width		4271' x 100'	4271' x 100'	2799' x 75'	2700' x 75'	
Displaced Threshold		253' / 0'	253' / 0'	0' / 796'	0' / 697'	
Usable Runway Length		4018' / 4271'	4018' / 4271'	2799' / 2003'	2700' / 2003'	
Surface Type		Asphalt	Asphalt	Asphalt	Asphalt	
Pavement Strength - SW:Single wheel		SW:30K Lbs.	SW: 30K Lbs.	SW:30K Lbs.	SW: 30K Lbs	
Approach Surface Slope		20:1 / 20:1	20:1 / 20:1	20:1 / 20:1	20:1 / 20:1	
Visibility Minimums		1-Mile	1-Mile	Visual	Visual	
Visual Approach Aids		- / REIL	- / REIL	None	None	
Instrument Approach Aids		GPS, VOR-A	GPS, VOR-A	None	None	
Runway Lighting		MIRL	MIRL	Not Available*	MIRL	
Runway Marking		Non-Precision	Non-Precision	Visual	Visual	
Runway Design Code (RDC) & Runway Reference Code (RRC)		B-II-5000	B-II-5000	B-I-5000	B-I-5000	
Critical Aircraft		Beech King Air 200	Beech King Air 200	Piper Navaho	Piper Navajo	
Runway Departure Surface		Yes	Yes	Yes	Yes	
Runway Safety Area (RSA)	Length Beyond Rwy:	300' / 300'	300' / 300'	240' / 240'	240' / 240'	
	Width:	150' / 150'	150' / 150'	120' / 120'	120' / 120'	
Runway Object Free Area (ROFA)	Length Beyond Rwy:	300' / 300'	300' / 300'	240' / 240'	240' / 240'	
	Width:	500' / 500'	500' / 500'	250' / 250'	250' / 250'	
Runway Object Free Zone (ROFZ)	Length Beyond Rwy:	250' / 250'	250' / 250'	250' / 250'	250' / 250'	
	Width:	200' / 200'	200' / 200'	120' / 120'	120' / 120'	
FAR Part 77 Category		Non-Precision	Non-Precision	Visual	Visual	
Runway End Coordinates (NAD 83)	Rwy 9	Lat: 41° 44' 36.28"N Long: 72° 11' 06.59"W	Lat: 41° 44' 36.28"N Long: 72° 11' 06.59"W	Rwy 18 Lat: 41° 44' 46.61"N Long: 72° 11' 08.40"W	Lat: 41° _' _"N Long: 72° _' _"W	
	Rwy 27	Lat: 41° 44' 47.60"N Long: 72° 10' 12.33"W	Lat: 41° 44' 47.30"N Long: 72° 10' 12.33"W	Rwy 36 Lat: 41° 44' 20.11"N Long: 72° 10' 57.85"W	La:: 41° 44' 20.11"N Long: 72° 10' 57.85"W	
Runway End Elevations (MSL)		239.1' MSL / 239.1' MSL	239.1' MSL / 239.1' MSL	234.8' MSL / 245.9' MSL	234.8' MSL / 245.9' MSL	
Displaced Threshold Elevation (MSL)		239.4' / N / A	239.4' / N/A	N / A / 245.0'		
Line of Sight Violations		None	None	None	None	
*Runway 18-36 MIRLs are installed but inoperative until clearance of obstructions or lighting south of the airport.						

No.	Submittal / Revision	Appr'd	By	Date

CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

CHA
2139 Silas Deane Highway, Suite 212
Rocky Hill, CT 06067-2316
860.257.4557 • www.chacompanies.com

Designed: POM | Drawn: PM | Checked: AJF

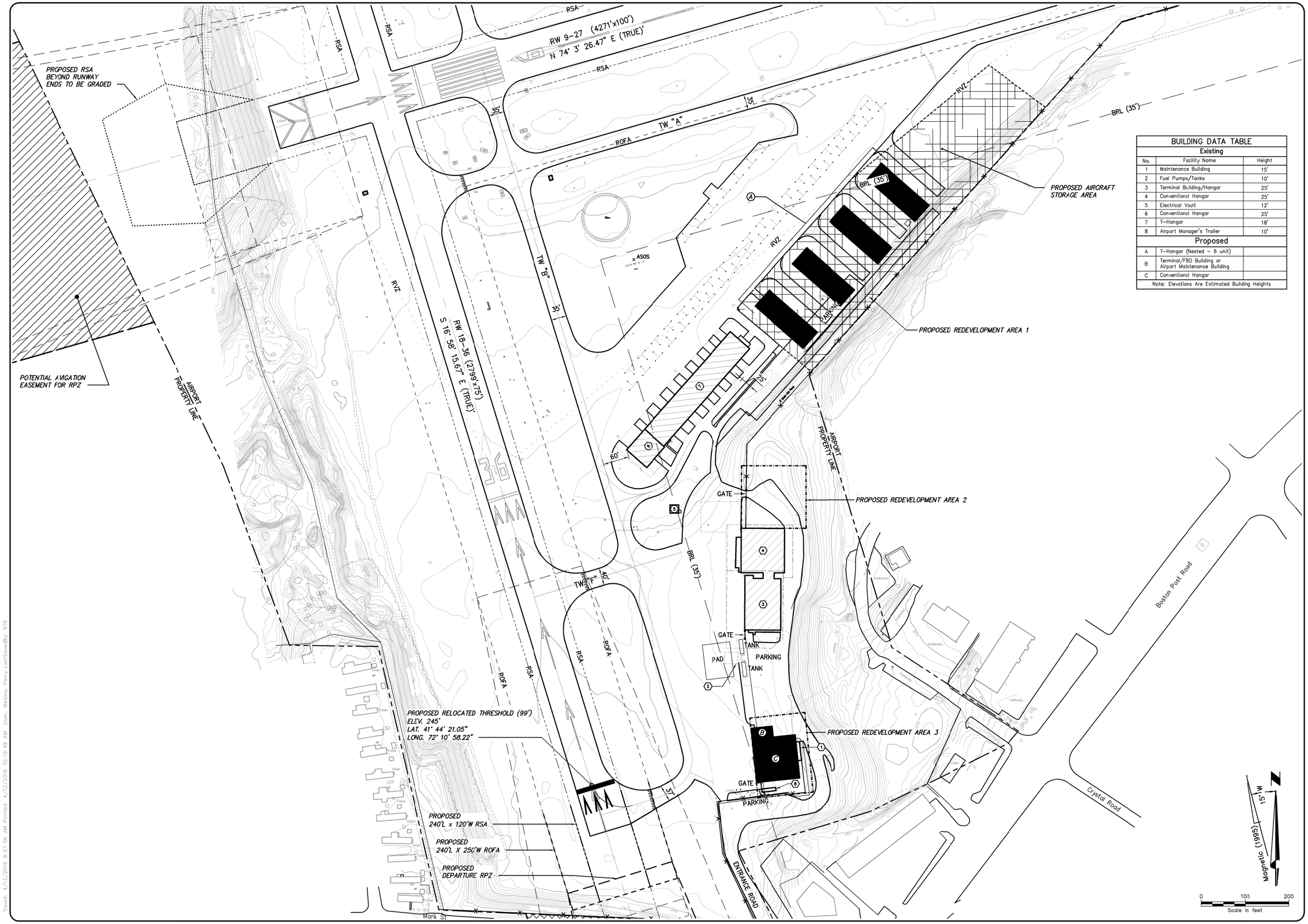
WINDHAM AIRPORT (JD)

AIRPORT MASTER PLAN UPDATE

AIRPORT LAYOUT PLAN

Issue Date: April 2016 | Project No.: 25874 | Scale: AS NOTED

ALP-2



BUILDING DATA TABLE		
Existing		
No.	Facility Name	Height
1	Maintenance Building	15'
2	Fuel Pumps/Tanks	10'
3	Terminal Building/Hangar	25'
4	Conventioncl Hangar	25'
5	Electrical Vault	12'
6	Conventioncl Hangar	25'
7	T-Hangar	18'
8	Airport Manager's Trailer	10'
Proposed		
A	T-Hangar (Nested - 6 unit)	
B	Terminal/FBO Building or Airport Maintenance Building	
C	Conventioncl Hangar	
Note: Elevations Are Estimated Building Heights		

No.	Submittal / Revision	Appr'd	By	Date

CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

CHA
2139 Silas Deane Highway, Suite 212
Rocky Hill, Connecticut 06067-2326
860.257.4557 • www.chacompanies.com

Designed: POM	Drawn: PM	Checked: AJF

WINDHAM AIRPORT (JUD)

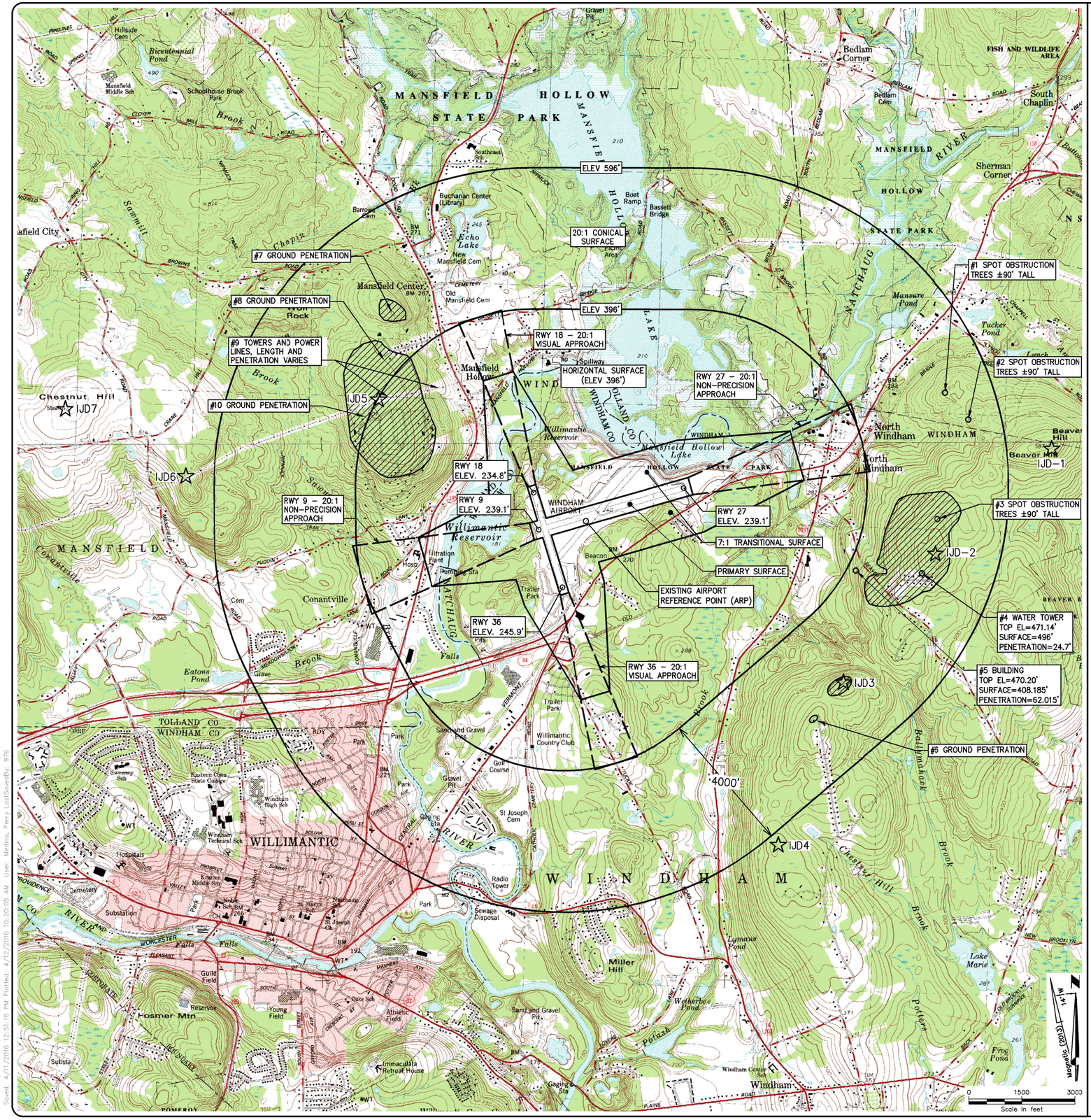
AIRPORT MASTER PLAN UPDATE

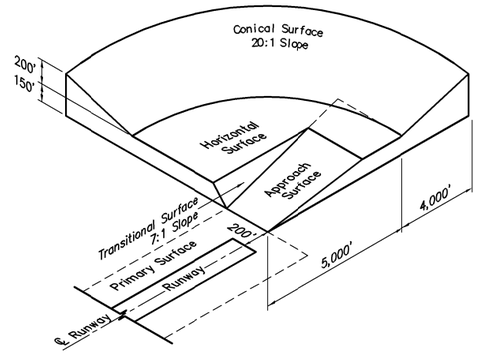
TERMINAL AREA PLAN

Issue Date: April 2016	Project No.: 25874	Scale: AS NOTED

ALP-3

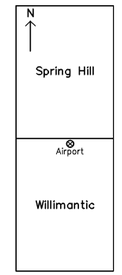
File: V:\PROJECTS\ANY\X3\25874\CADD_ACAD\25874-ALP-03-TERMINAL.DWG
Saved: 4/12/2016 9:57:56 AM Plotted: 4/12/2016 10:19:49 AM User: Medina, Perry LastSavedBy: 976





IMAGINARY SURFACES – ISOMETRIC VIEW

NOT TO SCALE



USGS QUAD MAPS USED

NOT TO SCALE

LEGEND

- APPROXIMATE LOCATION OF GROUND PENETRATION
- LOCATION OF PREVIOUS OBSTRUCTION BEACON SITE
- OBJECT PENETRATES SPECIFIED SURFACE

PROPOSED HORIZONTAL & CONICAL SURFACE OBSTRUCTION DATA TABLE

Number	Description	Top Elevation	Elevation of Surface	Penetration	Ownership	Proposed Action
1	Trees (±90' Tall)	±545'	530'	15'	Private	Install Beacon on IJD–1
2	Trees (±90' Tall)	±555'	550'	5'	Private	Install Beacon on IJD–1
3	Trees (±90' Tall)	±630'	500'	130'	Private	Install Beacon on IJD–1
4	Water Tower	471'	496'	25'	Private	Install Beacon on IJD–2
5	Building	470'	408'	62'	Private	Install Beacon on IJD–2
6	Ground	510'	508'	2'	Private	Install Beacon on IJD–3
7	Ground	500'	460'	40'	Private	Install Beacon on IJD–3
8	Ground	450'	420'	30'	Private	Install Beacon on IJD–5
9	Utility Towers & Power Lines	Varies	Varies	Varies	Private	Install Beacon on IJD–5
10	Ground	490'	400'	90'	Private	Install Beacon on IJD–5
IJD–1	Proposed Beacon Tower (±60' Tall)	±647'	N/A	N/A	Private	Install Beacon
IJD–2	Proposed Beacon Tower (±60' Tall)	±640'	505'	135'	Private	Install Beacon
IJD–3	Proposed Beacon Tower (±60' Tall)	±580'	500'	80'	Private	Install Beacon
IJD–4	Proposed Beacon Tower (±60' Tall)	±520'	N/A	N/A	Private	N/A
IJD–5	Utility Tower (±125' Tall)	±620'	396'	224'	Private	Install Beacon
IJD–6	Utility Tower (±125' Tall)	±655	N/A	N/A	Private	Install Beacon
IJD–7	Proposed Beacon Tower (±60' Tall)	±640'	N/A	N/A	Private	N/A

No.	Submittal / Revision	Appd	By	Date

CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

CHA
2139 Silas Deane Highway, Suite 212
Rocky Hill, CT 06067
860.257.4557 • www.chacompanies.com

Designed: POM | Drawn: PM | Checked: AJF

WINDHAM AIRPORT (IJD)
AIRPORT MASTER PLAN UPDATE

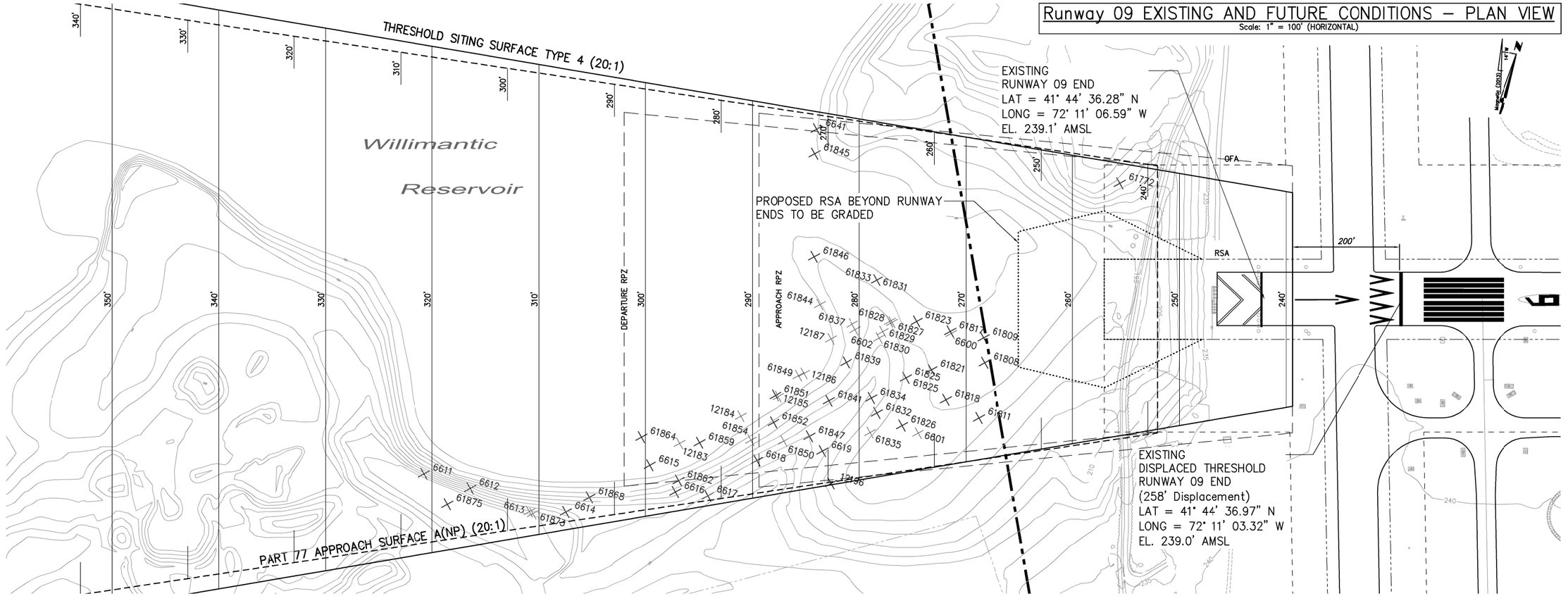
AIRSPACE DRAWING

Issue Date: April 2016 | Project No.: 25874 | Scale: AS NOTED

ALP-4

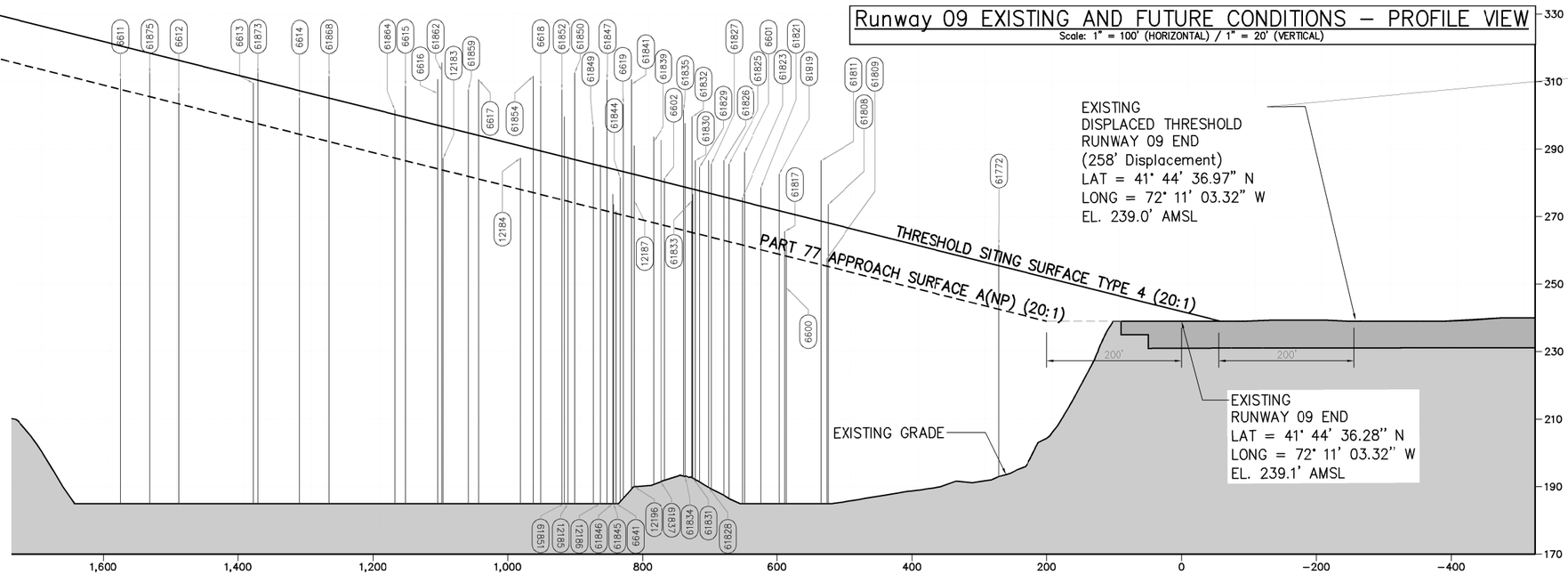
Runway 09 EXISTING AND FUTURE CONDITIONS – PLAN VIEW

Scale: 1" = 100' (HORIZONTAL)



Runway 09 EXISTING AND FUTURE CONDITIONS – PROFILE VIEW

Scale: 1" = 100' (HORIZONTAL) / 1" = 20' (VERTICAL)



0 HORIZONTAL SCALE 200
Scale in feet

0 VERTICAL SCALE 40
Scale in feet

NOTES

- OBSTRUCTION DATABASE SOURCES:
  - CAA OBSTRUCTION EVALUATION STUDY, JANUARY 2013
  - UDDF FILE VALIDATED BY NGS, SEPTEMBER 22, 2010
- "PART 77 APPROACH SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION REGULATION 14 CFR PART 77
  - PART 77 APPROACH SURFACE A(NP): UTILITY RUNWAY WITH NON-PRECISION INSTRUMENT APPROACH
- "THRESHOLD SITING SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 150/5300-13A TABLE 3-2
  - THRESHOLD SITING SURFACE TYPE 4: APPROACH END OF RUNWAY EXPECTED TO SUPPORT INSTRUMENT NIGHT OPERATIONS, SERVING APPROACH CATEGORY A AND B AIRCRAFT ONLY
- ALL OBSTRUCTIONS SHOWN ARE PENETRATIONS TO PART 77 APPROACH SURFACE AND/OR THRESHOLD SITING SURFACE

LEGEND

THRESHOLD SITING SURFACE (20:1) (TSS)	———
PART 77 INNER APPROACH SURFACE (20:1) (P77)	– – – – –
OBSTRUCTION PENETRATING TSS / P77 – PLAN	× 61875
OBSTRUCTIONS PENETRATING TSS/ P77 – PROFILE	282
RUNWAY SAFETY AREA (RSA)	———
RUNWAY OBJECT FREE AREA (OFA)	– – – – –
RUNWAY PROTECTION ZONE (RPZ)	— — — —
AIRPORT PROPERTY LINE	———

No.	Submittal / Revision	Appr'd	By	Date

CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

DY Consultants

CHA

2139 Silas Deane Highway, Suite 212 - Rocky Hill, CT 06067-2336
Main: (860) 257-4557 - www.chacompanies.com

Designed: OR | Drawn: WA | Checked: DV

WINDHAM AIRPORT (JD)

AIRPORT MASTER PLAN UPDATE

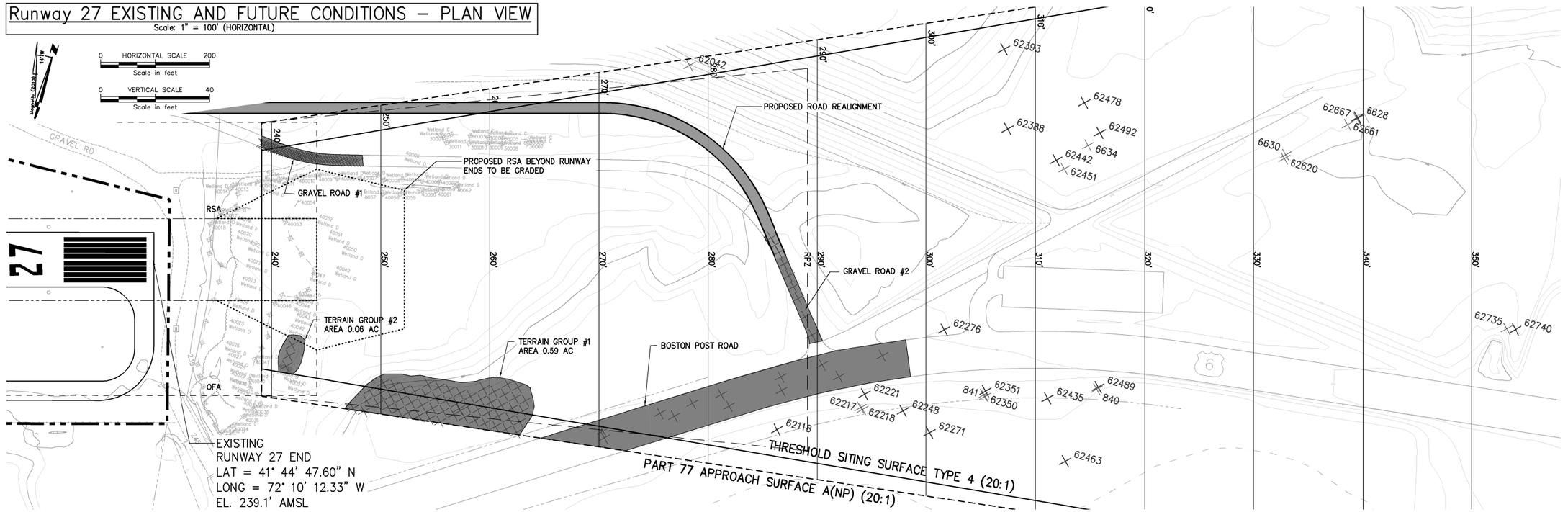
RUNWAY 9 INNER PORTION OF THE APPROACH SURFACE DRAWING

Issue Date: April 2016 | Project No.: 25874 | Scale: AS NOTED

ALP-5

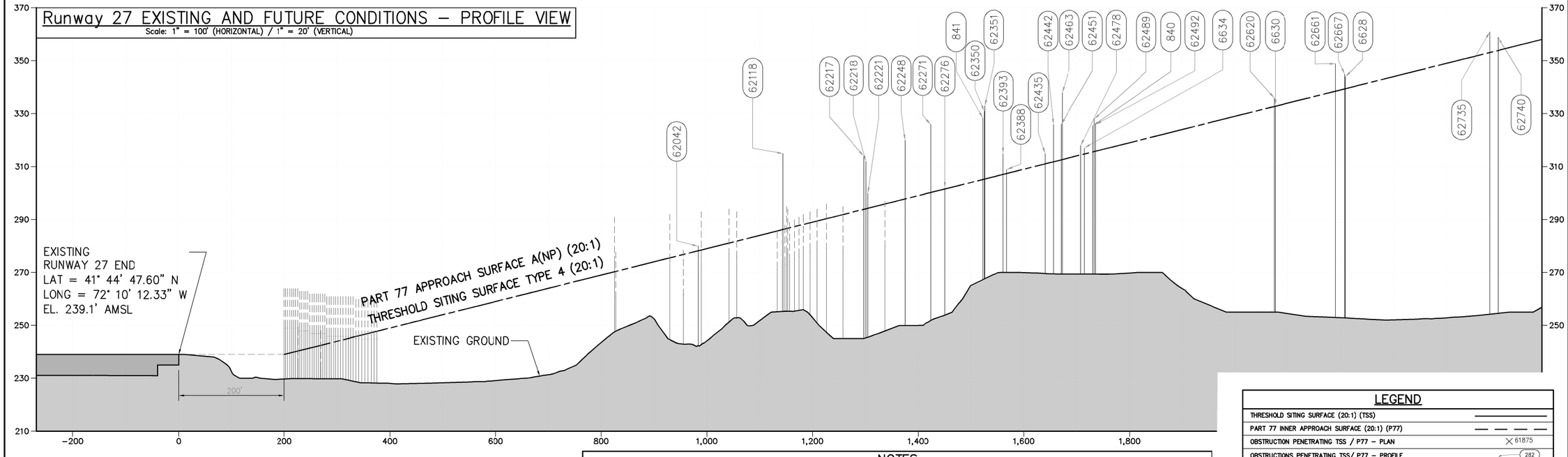
Runway 27 EXISTING AND FUTURE CONDITIONS – PLAN VIEW

Scale: 1" = 100' (HORIZONTAL)



Runway 27 EXISTING AND FUTURE CONDITIONS – PROFILE VIEW

Scale: 1" = 100' (HORIZONTAL) / 1" = 20' (VERTICAL)



NOTES

- OBSTRUCTION DATABASE SOURCES:
  - CAA OBSTRUCTION EVALUATION STUDY, JANUARY 2013
  - UDOF TILE VALIDATED BY NGS, SEPTEMBER 22, 2010
- "PART 77 APPROACH SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION REGULATION 14 CFR PART 77
  - PART 77 APPROACH SURFACE A(NP): UTILITY RUNWAY WITH NON–PRECISION INSTRUMENT APPROACH
- "THRESHOLD SITING SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 150/5300–13A TABLE 3–2
  - THRESHOLD SITING SURFACE TYPE 4: APPROACH END OF RUNWAY EXPECTED TO SUPPORT INSTRUMENT NIGHT OPERATIONS, SERVING APPROACH CATEGORY A AND B AIRCRAFT ONLY
- ALL OBSTRUCTIONS SHOWN ARE PENETRATIONS TO PART 77 APPROACH SURFACE AND/OR THRESHOLD SITING SURFACE
- ROADWAYS NEARBY THE AIRPORT ARE CONSIDERED OBSTRUCTIONS IF THEIR INCREASED HEIGHT FOR CLEARANCE OF THE VEHICLES IS GREATER THAN THE HEIGHT OF PART 77 APPROACH SURFACE AND/OR THRESHOLD SITING SURFACE. THE HEIGHTS OF THE ROADWAYS WERE INCREASED BY:
  - 17' FOR AN INTERSTATE HIGHWAY
  - 15' FOR ANY OTHER PUBLIC ROADWAY

LEGEND

THRESHOLD SITING SURFACE (20:1) (TSS)	
PART 77 INNER APPROACH SURFACE (20:1) (P77)	
OBSTRUCTION PENETRATING TSS / P77 – PLAN	× 61875
OBSTRUCTIONS PENETRATING TSS/ P77 – PROFILE	282
ROAD WITH ROAD CLEARANCE PENETRATING TSS/ P77 – PROFILE	
TERRAIN PENETRATING TSS / P77 – PLAN	
ROAD PENETRATING TSS / P77 – PLAN	
RUNWAY SAFETY AREA (RSA)	
RUNWAY OBJECT FREE AREA (OFA)	
RUNWAY PROTECTION ZONE (RPZ)	
AIRPORT PROPERTY LINE	

No.	Submittal / Revision	Appr'd	By	Date

CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

CHA
DY Consultants
2139 Silas Deane Highway, Suite 212 - Rocky Hill, CT 06067-2336
Main: (860) 257-4557 - www.chacompanies.com

Designed: OR | Drawn: WA | Checked: DV

WINDHAM AIRPORT (JD)

AIRPORT MASTER PLAN UPDATE

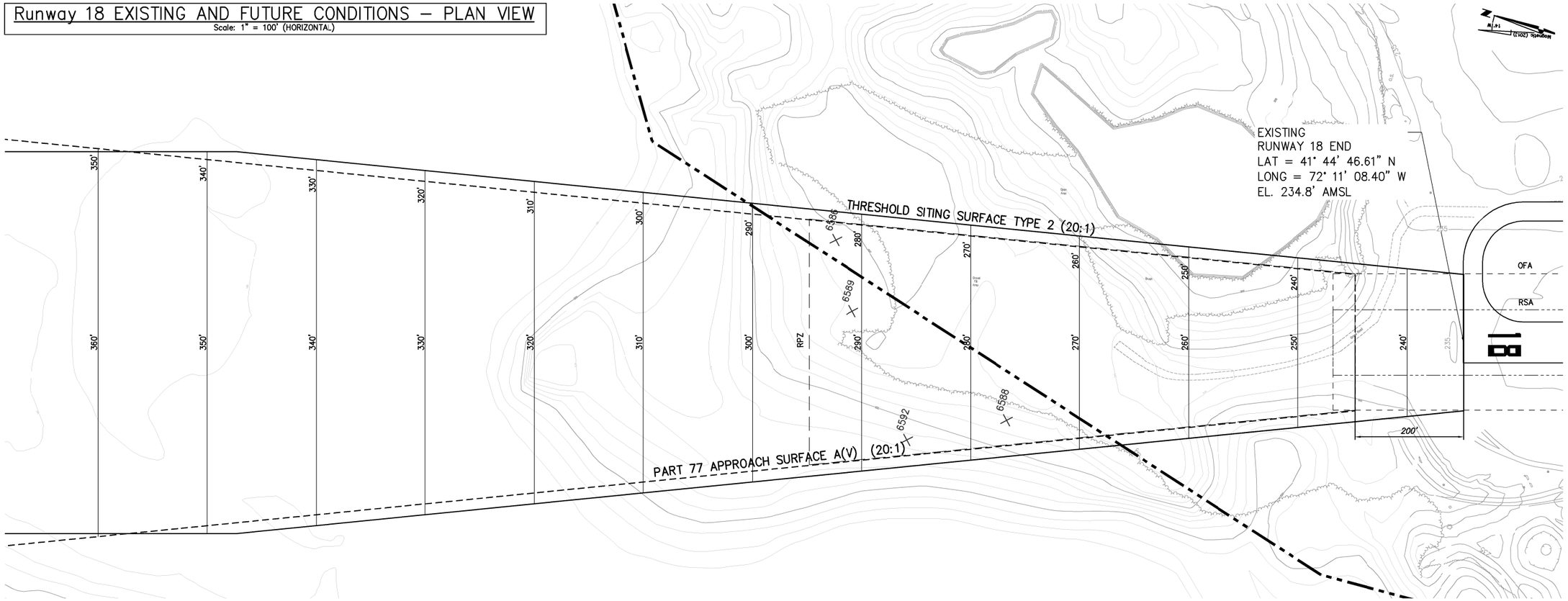
RUNWAY 27 INNER PORTION OF THE APPROACH SURFACE DRAWING

Issue Date: April 2016 | Project No.: 25874 | Scale: AS NOTED

ALP-6

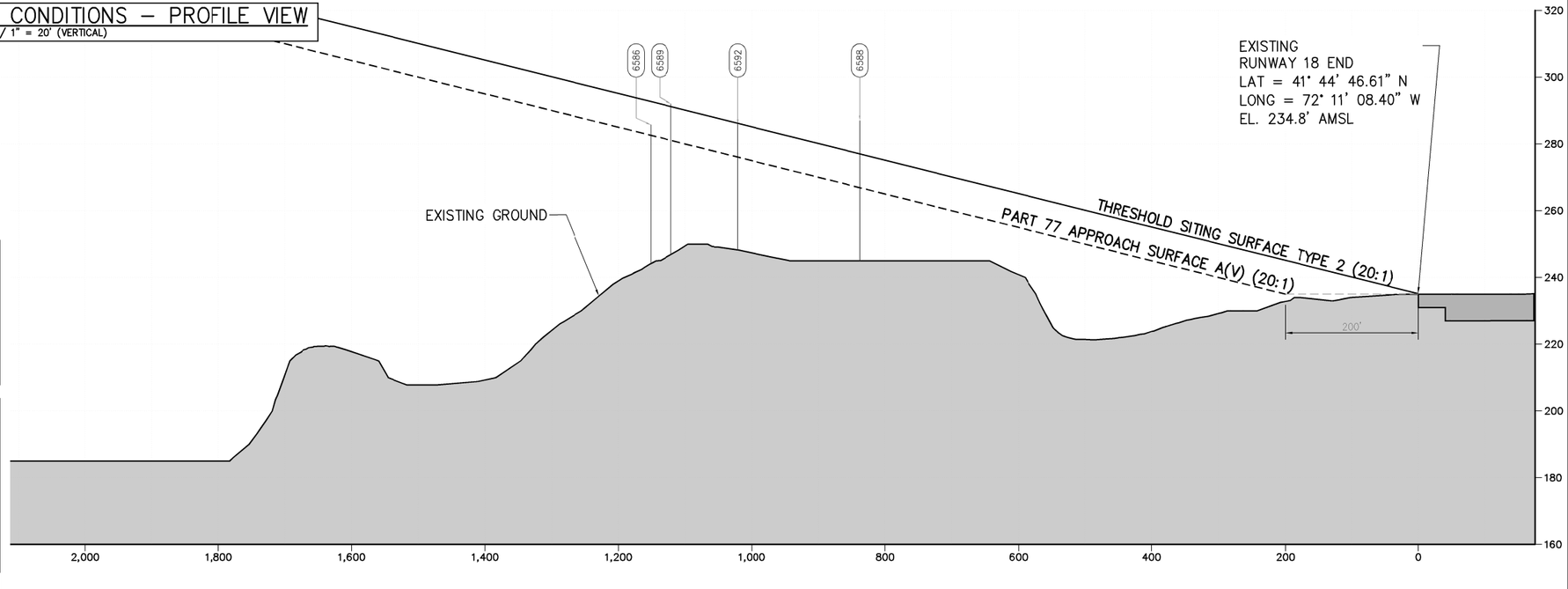
Runway 18 EXISTING AND FUTURE CONDITIONS – PLAN VIEW

Scale: 1" = 100' (HORIZONTAL)



Runway 18 EXISTING AND FUTURE CONDITIONS – PROFILE VIEW

Scale: 1" = 100' (HORIZONTAL) / 1" = 20' (VERTICAL)



0 HORIZONTAL SCALE 200
Scale in feet

0 VERTICAL SCALE 40
Scale in feet

NOTES

- OBSTRUCTION DATABASE SOURCES:
  - CAA OBSTRUCTION EVALUATION STUDY, JANUARY 2013
  - UDDF FILE VALIDATED BY NGS, SEPTEMBER 22, 2010
- "PART 77 APPROACH SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION REGULATION 14 CFR PART 77
  - PART 77 APPROACH SURFACE A(V): UTILITY RUNWAY WITH VISUAL APPROACH
- "THRESHOLD SITING SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 150/5300-13A TABLE 3-2
  - THRESHOLD SITING SURFACE TYPE 2: APPROACH END OF RUNWAY EXPECTED TO SERVE SMALL AIRPLANES WITH APPROACH SPEEDS OF 50 KNOTS OR MORE
- ALL OBSTRUCTIONS SHOWN ARE PENETRATIONS TO PART 77 APPROACH SURFACE AND/OR THRESHOLD SITING SURFACE

LEGEND

THRESHOLD SITING SURFACE (20:1) (TSS)	
PART 77 INNER APPROACH SURFACE (20:1) (P77)	
OBSTRUCTION PENETRATING TSS / P77 – PLAN	× 61875
OBSTRUCTIONS PENETRATING TSS/ P77 – PROFILE	282
RUNWAY SAFETY AREA (RSA)	
RUNWAY OBJECT FREE AREA (OFA)	
RUNWAY PROTECTION ZONE (RPZ)	
AIRPORT PROPERTY LINE	

No.	Submittal / Revision	Appr'd	By	Date

CAA
CONNECTICUT AIRPORT AUTHORITY
CONNECTICUT DEPARTMENT OF TRANSPORTATION

DY Consultants

CHA
Engineers
2139 Silas Deane Highway, Suite 212 - Rocky Hill, CT 06067-2336
Main: (860) 257-4557 - www.chaconnpanies.com

Designed: OR	Drawn: WA	Checked: DV

WINDHAM AIRPORT (JD)
AIRPORT MASTER PLAN UPDATE

RUNWAY 18 INNER PORTION OF THE APPROACH SURFACE DRAWING

Issue Date: April 2016 | Project No.: 25874 | Scale: AS NOTED

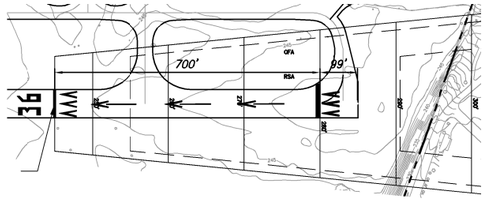
ALP-7

Runway 36 FUTURE CONDITIONS – PLAN VIEW

Scale: 1" = 100' (HORIZONTAL)

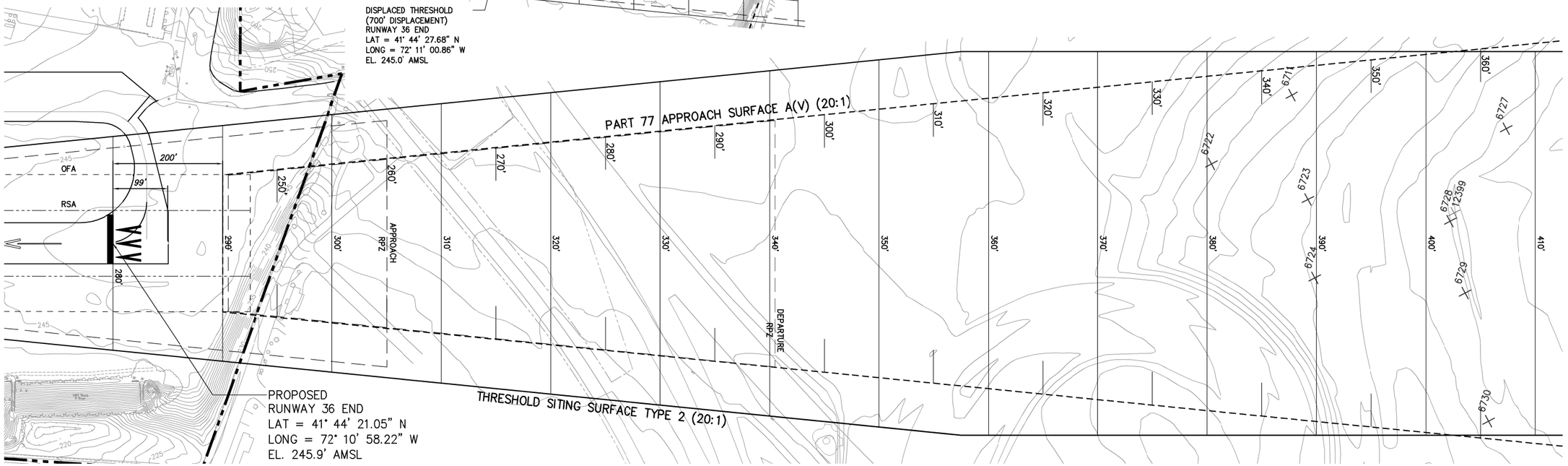
0 HORIZONTAL SCALE 200
Scale in feet

0 VERTICAL SCALE 40
Scale in feet



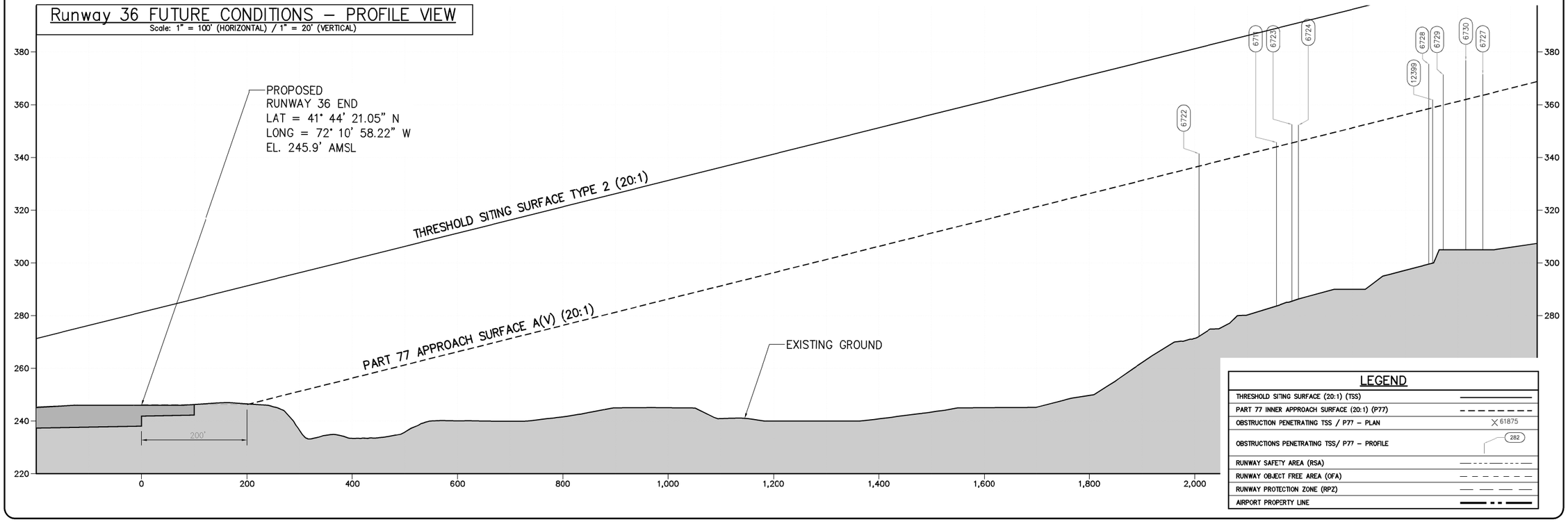
NOTES

- OBSTRUCTION DATABASE SOURCES:
  - CAA OBSTRUCTION EVALUATION STUDY, JANUARY 2013
  - UDDF FILE VALIDATED BY NGS, SEPTEMBER 22, 2010
- "PART 77 APPROACH SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION REGULATION 14 CFR PART 77
  - PART 77 APPROACH SURFACE A(V): UTILITY RUNWAY WITH VISUAL APPROACH
- "THRESHOLD SITING SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 150/5300-13A TABLE 3-2
  - THRESHOLD SITING SURFACE TYPE 2: APPROACH END OF RUNWAY EXPECTED TO SERVE SMALL AIRPLANES WITH APPROACH SPEEDS OF 50 KNOTS OR MORE
- ALL OBSTRUCTIONS SHOWN ARE PENETRATIONS TO PART 77 APPROACH SURFACE AND/OR THRESHOLD SITING SURFACE
- LAYOUT OF PROPOSED PLAN AND PROFILE PROVIDED BY CHA (REFER TO ALTERNATIVE 05 IN MASTER PLAN UPDATE)



Runway 36 FUTURE CONDITIONS – PROFILE VIEW

Scale: 1" = 100' (HORIZONTAL) / 1" = 20' (VERTICAL)



LEGEND

THRESHOLD SITING SURFACE (20:1) (TSS)	———
PART 77 INNER APPROACH SURFACE (20:1) (P77)	– – – – –
OBSTRUCTION PENETRATING TSS / P77 – PLAN	×61875
OBSTRUCTIONS PENETRATING TSS/ P77 – PROFILE	282
RUNWAY SAFETY AREA (RSA)	—— - —— - ——
RUNWAY OBJECT FREE AREA (OFA)	— — — — — —
RUNWAY PROTECTION ZONE (RPZ)	— — — — — —
AIRPORT PROPERTY LINE	——— · ———

No.	Submittal / Revision	App'd	By	Date

CAA
CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

DY Consultants

CHA
Drawing Copyright © 2016
2139 Silas Deane Highway, Suite 212 - Rocky Hill, CT 06067-2336
Main: (860) 257-4557 - www.chacompanies.com

Designed: OR | Drawn: WA | Checked: DV

WINDHAM AIRPORT (JJD)

AIRPORT MASTER PLAN UPDATE

RUNWAY 36 INNER PORTION OF THE PROPOSED APPROACH SURFACE DRAWING

Issue Date: April 2016 | Project No.: 25874 | Scale: AS NOTED

ALP-8

Runway 09 EXISTING AND FUTURE CONDITIONS – OBSTRUCTION DATA TABLE

Objects					*Part 77 Inner Approach Surface Slope = 20:1		**TSS Type 4 Surface Slope = 20:1	
Number	Description	Distance to End of the Runway	Offset from Runway Centerline	Elevation of Obstruction (AMSL)	Penetration of Part 77 Approach Surface	Proposed Action	Penetration of Threshold Siting Surface	Proposed Action
6600	Tree	586.41'	63.87'	262.36'	3.9'	REMOVE/TRIM/OL	NO PENETRATION (-9.26)	NO ACTION
6601	Tree	648.72'	250.31'	289.39'	27.9'	REMOVE/TRIM/OL	14.7'	REMOVE/TRIM/OL
6602	Tree	767.16'	56.71'	281.75'	14.3'	REMOVE/TRIM/OL	1.1'	REMOVE/TRIM/OL
6611	Tree	1574.07'	326.62'	311.31'	3.5'	REMOVE/TRIM/OL	NO PENETRATION (-9.7)	NO ACTION
6612	Tree	1488.41'	353.98'	306.98'	3.5'	REMOVE/TRIM/OL	NO PENETRATION (-9.74)	NO ACTION
6613	Tree	1377.31'	397.31'	309.97'	12.0'	REMOVE/TRIM/OL	NO PENETRATION (-1.2)	NO ACTION
6614	Tree	1308.17'	397.98'	305.64'	11.1'	REMOVE/TRIM/OL	NO PENETRATION (-2.07)	NO ACTION
6615	Tree	1151.34'	310.67'	309.14'	22.5'	REMOVE/TRIM/OL	9.3'	REMOVE/TRIM/OL
6616	Tree	1103.44'	360.78'	311.09'	26.8'	REMOVE/TRIM/OL	13.6'	REMOVE/TRIM/OL
6617	Tree	1042.80'	367.58'	310.96'	29.7'	REMOVE/TRIM/OL	16.5'	REMOVE/TRIM/OL
6618	Tree	951.15'	301.66'	309.11'	32.4'	REMOVE/TRIM/OL	19.2'	REMOVE/TRIM/OL
6619	Tree	828.66'	284.19'	303.86'	33.3'	REMOVE/TRIM/OL	20.1'	REMOVE/TRIM/OL
6641	Tree	839.25'	318.51'	271.91'	0.8'	REMOVE/TRIM/OL	NO PENETRATION (-12.35)	NO ACTION
12183	Tree	1095.43'	269.79'	287.67'	3.8'	REMOVE/TRIM/OL	NO PENETRATION (-9.4)	NO ACTION
12184	Tree	981.14'	218.81'	287.74'	9.6'	REMOVE/TRIM/OL	NO PENETRATION (-3.62)	NO ACTION
12185	Tree	911.00'	182.07'	287.45'	12.8'	REMOVE/TRIM/OL	NO PENETRATION (-0.4)	NO ACTION
12186	Tree	862.38'	138.76'	285.90'	13.7'	REMOVE/TRIM/OL	0.5'	REMOVE/TRIM/OL
12187	Tree	812.63'	74.05'	274.78'	5.0'	REMOVE/TRIM/OL	NO PENETRATION (-8.15)	NO ACTION
12196	Tree	812.49'	344.81'	291.37'	N/A	NO ACTION	8.4'	REMOVE/TRIM/OL
61772	Tree	271.19'	217.25'	262.00'	19.3'	REMOVE/TRIM/OL	6.1'	REMOVE/TRIM/OL
61808	Tree	524.57'	118.80'	274.00'	18.7'	REMOVE/TRIM/OL	5.5'	REMOVE/TRIM/OL
61809	Tree	526.49'	72.03'	258.00'	2.6'	REMOVE/TRIM/OL	NO PENETRATION (-10.62)	NO ACTION
61811	Tree	535.21'	221.96'	287.00'	31.1'	REMOVE/TRIM/OL	17.9'	REMOVE/TRIM/OL
61817	Tree	588.46'	60.02'	266.00'	7.5'	REMOVE/TRIM/OL	NO PENETRATION (-5.72)	NO ACTION
61818	Tree	596.59'	188.05'	283.00'	24.1'	REMOVE/TRIM/OL	10.9'	REMOVE/TRIM/OL
61821	Tree	623.52'	132.20'	279.00'	18.7'	REMOVE/TRIM/OL	5.5'	REMOVE/TRIM/OL
61823	Tree	651.72'	41.34'	276.00'	14.3'	REMOVE/TRIM/OL	1.1'	REMOVE/TRIM/OL
61825	Tree	671.75'	147.14'	286.00'	23.3'	REMOVE/TRIM/OL	10.1'	REMOVE/TRIM/OL
61826	Tree	679.32'	236.44'	287.00'	23.9'	REMOVE/TRIM/OL	10.7'	REMOVE/TRIM/OL
61827	Tree	697.88'	43.19'	286.00'	22.0'	REMOVE/TRIM/OL	8.8'	REMOVE/TRIM/OL
61828	Tree	701.99'	40.99'	287.00'	22.8'	REMOVE/TRIM/OL	9.6'	REMOVE/TRIM/OL
61829	Tree	715.27'	60.41'	285.00'	20.1'	REMOVE/TRIM/OL	6.9'	REMOVE/TRIM/OL
61830	Tree	721.72'	72.27'	287.00'	21.8'	REMOVE/TRIM/OL	8.6'	REMOVE/TRIM/OL
61831	Tree	725.41'	35.94'	277.00'	11.6'	REMOVE/TRIM/OL	NO PENETRATION (-1.57)	NO ACTION
61832	Tree	726.27'	212.86'	300.00'	34.6'	REMOVE/TRIM/OL	21.4'	REMOVE/TRIM/OL
61833	Tree	726.87'	36.34'	275.00'	9.6'	REMOVE/TRIM/OL	NO PENETRATION (-3.64)	NO ACTION
61834	Tree	736.54'	184.77'	298.00'	32.1'	REMOVE/TRIM/OL	18.9'	REMOVE/TRIM/OL
61835	Tree	738.78'	249.30'	302.00'	36.0'	REMOVE/TRIM/OL	22.8'	REMOVE/TRIM/OL
61837	Tree	772.77'	46.49'	293.00'	25.3'	REMOVE/TRIM/OL	12.1'	REMOVE/TRIM/OL
61839	Tree	784.03'	117.95'	294.00'	25.7'	REMOVE/TRIM/OL	12.5'	REMOVE/TRIM/OL
61841	Tree	816.63'	189.78'	311.00'	41.1'	REMOVE/TRIM/OL	27.9'	REMOVE/TRIM/OL
61844	Tree	833.33'	9.65'	282.00'	11.2'	REMOVE/TRIM/OL	NO PENETRATION (-1.97)	NO ACTION
61845	Tree	842.85'	272.51'	274.00'	2.8'	REMOVE/TRIM/OL	NO PENETRATION (-10.44)	NO ACTION
61846	Tree	843.91'	79.46'	277.00'	5.7'	REMOVE/TRIM/OL	NO PENETRATION (-7.5)	NO ACTION
61847	Tree	852.53'	256.48'	311.00'	39.3'	REMOVE/TRIM/OL	26.1'	REMOVE/TRIM/OL
61849	Tree	872.75'	142.62'	297.00'	24.3'	REMOVE/TRIM/OL	11.1'	REMOVE/TRIM/OL
61850	Tree	899.86'	265.36'	313.00'	38.9'	REMOVE/TRIM/OL	25.7'	REMOVE/TRIM/OL
61851	Tree	916.19'	179.90'	300.00'	25.1'	REMOVE/TRIM/OL	11.9'	REMOVE/TRIM/OL
61852	Tree	920.01'	230.32'	308.00'	32.9'	REMOVE/TRIM/OL	19.7'	REMOVE/TRIM/OL
61854	Tree	962.36'	263.71'	312.00'	34.8'	REMOVE/TRIM/OL	21.6'	REMOVE/TRIM/OL
61859	Tree	1058.14'	268.54'	308.00'	26.0'	REMOVE/TRIM/OL	12.8'	REMOVE/TRIM/OL
61862	Tree	1097.59'	339.51'	316.00'	32.0'	REMOVE/TRIM/OL	18.8'	REMOVE/TRIM/OL
61864	Tree	1167.00'	258.17'	302.00'	14.5'	REMOVE/TRIM/OL	1.3'	REMOVE/TRIM/OL
61868	Tree	1264.48'	370.76'	312.00'	19.7'	REMOVE/TRIM/OL	6.5'	REMOVE/TRIM/OL
61873	Tree	1370.52'	401.10'	317.00'	19.4'	REMOVE/TRIM/OL	6.2'	REMOVE/TRIM/OL
61875	Tree	1530.95'	383.72'	315.00'	9.4'	REMOVE/TRIM/OL	NO PENETRATION (-3.85)	NO ACTION

* Federal Aviation Regulation 14 CFR Part 77
** Federal Aviation Administration Advisory Circular AC 150/5300-13A - Table 3-2

RUNWAY 09–27 NOTES

- OBSTRUCTION DATABASE SOURCES:
  - * CAA OBSTRUCTION EVALUATION STUDY, JANUARY 2013
  - * UDDF FILE VALIDATED BY NGS, SEPTEMBER 22, 2010
- "PART 77 APPROACH SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION REGULATION 14 CFR PART 77
- "THRESHOLD SITING SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 150/5300-13A TABLE 3-2
- ALL OBSTRUCTIONS SHOWN ARE PENETRATIONS TO PART 77 APPROACH SURFACE AND/OR THRESHOLD SITING SURFACE
- THE "DISTANCE TO THE END OF THE RUNWAY" IS MEASURED ALONG THE EXTENDED RUNWAY CENTERLINE, TAKING THE RESPECTIVE RUNWAY ENDS AS THE REFERENCE POINTS. THE POSITIVE AXIS FOR THE DISTANCE EXTENDS AWAY FROM THE RUNWAY, WHILE THE NEGATIVE AXIS POINTS TOWARDS THE OTHER RUNWAY END.
- ANNOTATIONS "N/A" IN THE PENETRATION OF SURFACES COLUMNS REFER TO OBJECTS OUTSIDE OF THE FOOTPRINT OF THE SURFACE.

Runway 27 EXISTING AND FUTURE CONDITIONS

Objects					*Part 77 Inner Approach Surface Slope = 20:1		**TSS Type 4 Surface Slope = 20:1	
Number	Description	Distance to End of the Runway	Offset from Runway Centerline	Elevation of Obstruction (AMSL)	Penetration of Part 77 Approach Surface	Proposed Action	Penetration of Threshold Siting Surface	Proposed Action
840	Tree	1730.86'	237.15'	325.54'	9.9'	REMOVE/TRIM/OL	9.9'	REMOVE/TRIM/OL
841	Tree	1522.08'	248.01'	328.44'	23.2'	REMOVE/TRIM/OL	23.2'	REMOVE/TRIM/OL
6628	Tree	2207.79'	260.14'	344.01'	4.5'	REMOVE/TRIM/OL	4.5'	REMOVE/TRIM/OL
6630	Tree	2076.27'	191.86'	333.23'	0.3'	REMOVE/TRIM/OL	0.3'	REMOVE/TRIM/OL
6634	Tree	1715.01'	208.85'	317.17'	2.3'	REMOVE/TRIM/OL	2.3'	REMOVE/TRIM/OL
15989		469.06'	280.39'	264.20'	11.6'	GROUND WORK	N/A	NO ACTION
16002	Terrain Group #1	449.82'	274.90'	264.90'	13.3'	GROUND WORK	N/A	NO ACTION
16015		430.59'	269.40'	263.40'	12.8'	GROUND WORK	N/A	NO ACTION
16573		254.77'	156.78'	241.90'	0.1'	GROUND WORK	0.1'	GROUND WORK
16574	Terrain Group #2	249.27'	176.01'	242.00'	0.4'	GROUND WORK	0.4'	GROUND WORK
16575		243.78'	195.24'	241.90'	0.6'	GROUND WORK	0.6'	GROUND WORK
61963		335.82'	181.66'	245.00' + 15' Clearance	14.11'	FAA COORDINATION	14.11'	FAA COORDINATION
61965	Road - Gravel Road #1	341.20'	181.22'	245.00' + 15' Clearance	13.84'	FAA COORDINATION	13.84'	FAA COORDINATION
61966		346.85'	181.74'	245.00' + 15' Clearance	13.56'	FAA COORDINATION	13.56'	FAA COORDINATION
62030		930.10'	281.13'	275.00' + 17' Clearance	16.39'	FAA COORDINATION	16.39'	FAA COORDINATION
62040	Road - Boston Post Rd	989.45'	262.97'	276.00' + 17' Clearance	14.43'	FAA COORDINATION	14.43'	FAA COORDINATION
62064		1041.87'	247.09'	277.00' + 17' Clearance	12.81'	FAA COORDINATION	12.81'	FAA COORDINATION
62042	OL on Pole	983.75'	355.37'	280.00'	1.7'	FAA COORDINATION	N/A	NO ACTION
62118	Tree	1144.37'	311.35'	315.00'	28.7'	REMOVE/TRIM/OL	28.7'	REMOVE/TRIM/OL
62217	Tree	1297.26'	270.91'	314.00'	20.0'	REMOVE/TRIM/OL	20.0'	REMOVE/TRIM/OL
62218	Tree	1301.10'	274.08'	312.00'	17.8'	REMOVE/TRIM/OL	17.8'	REMOVE/TRIM/OL
62221	Pole	1304.78'	246.73'	300.00'	5.7'	REMOVE/OL	5.7'	REMOVE/OL
62248	Tree	1375.09'	276.81'	320.00'	22.1'	REMOVE/TRIM/OL	22.1'	REMOVE/TRIM/OL
62271	Tree	1424.54'	316.84'	326.00'	25.7'	REMOVE/TRIM/OL	25.7'	REMOVE/TRIM/OL
62276	Pole	1450.92'	128.76'	302.00'	0.4'	REMOVE/OL	0.4'	REMOVE/OL
62350	Tree	1524.91'	250.22'	331.00'	25.7'	REMOVE/TRIM/OL	25.7'	REMOVE/TRIM/OL
62351	Tree	1525.89'	241.03'	333.00'	27.6'	REMOVE/TRIM/OL	27.6'	REMOVE/TRIM/OL
62388	Tree	1567.48'	239.11'	309.00'	1.5'	REMOVE/TRIM/OL	1.5'	REMOVE/TRIM/OL
62393	Tree	1560.85'	384.90'	315.00'	7.9'	REMOVE/TRIM/OL	7.9'	REMOVE/TRIM/OL
62435	Tree	1640.32'	253.97'	315.00'	3.9'	REMOVE/TRIM/OL	3.9'	REMOVE/TRIM/OL
62442	Tree	1656.19'	181.85'	326.00'	14.1'	REMOVE/TRIM/OL	14.1'	REMOVE/TRIM/OL
62451	Tree	1670.73'	166.24'	326.00'	13.4'	REMOVE/TRIM/OL	13.4'	REMOVE/TRIM/OL
62463	Tree	1672.79'	369.13'	338.00'	25.3'	REMOVE/TRIM/OL	25.3'	REMOVE/TRIM/OL
62478	Tree	1708.31'	287.12'	318.00'	3.5'	REMOVE/TRIM/OL	3.5'	REMOVE/TRIM/OL
62489	Tree	1733.32'	233.63'	328.00'	12.2'	REMOVE/TRIM/OL	12.2'	REMOVE/TRIM/OL
62492	Tree	1736.26'	232.06'	326.00'	10.1'	REMOVE/TRIM/OL	10.1'	REMOVE/TRIM/OL
62620	Tree	2074.17'	185.28'	336.00'	3.2'	REMOVE/TRIM/OL	3.2'	REMOVE/TRIM/OL
62661	Tree	2189.60'	246.67'	349.00'	10.4'	REMOVE/TRIM/OL	10.4'	REMOVE/TRIM/OL
62667	Tree	2206.82'	257.63'	345.00'	5.6'	REMOVE/TRIM/OL	5.6'	REMOVE/TRIM/OL
62735	Tree	2481.48'	126.65'	361.00'	7.8'	REMOVE/TRIM/OL	7.8'	REMOVE/TRIM/OL
62740	Tree	2497.63'	128.00'	359.00'	5.0'	REMOVE/TRIM/OL	5.0'	REMOVE/TRIM/OL
62138		1182.95'	70.98'	277.00' + 15' Clearance	3.75'	FAA COORDINATION	3.75'	FAA COORDINATION
62153	Road - Gravel Road #2	1195.53'	104.95'	278.00' + 15' Clearance	4.12'	FAA COORDINATION	4.12'	FAA COORDINATION
62166		1208.38'	137.94'	279.00' + 15' Clearance	4.48'	FAA COORDINATION	4.48'	FAA COORDINATION

* Federal Aviation Regulation 14 CFR Part 77
** Federal Aviation Administration Advisory Circular AC 150/5300-13A - Table 3-2

Runway 18 EXISTING AND FUTURE CONDITIONS

Objects					*Part 77 Inner Approach Surface Slope = 20:1		**TSS Type 2 Surface Slope = 20:1	
Number	Description	Distance to End of the Runway	Offset from Runway Centerline	Elevation of Obstruction (AMSL)	Penetration of Part 77 Approach Surface	Proposed Action	Penetration of Threshold Siting Surface	Proposed Action
6586	Tree	1151.68'	188.13'	285.49'	3.1'	REMOVE/TRIM/OL	NO PENETRATION (-6.89)	NO ACTION
6588	Tree	837.97'	142.23'	286.80'	20.1'	REMOVE/TRIM/OL	10.1'	REMOVE/TRIM/OL
6589	Tree	1121.49'	57.80'	291.80'	10.9'	REMOVE/TRIM/OL	0.9'	REMOVE/TRIM/OL
6592	Tree	1021.34'	178.13'	285.67'	9.8'	REMOVE/TRIM/OL	NO PENETRATION (-0.2)	NO ACTION

* Feceral Aviation Regulation 14 CFR Part 77
** Federal Aviation Administration Advisory Circular AC 150/5300-13A - Table 3-2

RUNWAY 18–36 NOTES

- OBSTRUCTION DATABASE SOURCES:
  - * CAA OBSTRUCTION EVALUATION STUDY, JANUARY 2013
  - * UDDF FILE VALIDATED BY NGS, SEPTEMBER 22, 2010
- "PART 77 APPROACH SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION REGULATION 14 CFR PART 77
- "THRESHOLD SITING SURFACE" REFERS TO SURFACES DESCRIBED IN FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 150/5300-13A TABLE 3-2
- ALL OBSTRUCTIONS SHOWN ARE PENETRATIONS TO PART 77 APPROACH SURFACE AND/OR THRESHOLD SITING SURFACE
- THE "DISTANCE TO THE END OF THE RUNWAY" IS MEASURED ALONG THE EXTENDED RUNWAY CENTERLINE, TAKING THE RESPECTIVE RUNWAY ENDS AS THE REFERENCE POINTS. THE POSITIVE AXIS FOR THE DISTANCE EXTENDS AWAY FROM THE RUNWAY, WHILE THE NEGATIVE AXIS POINTS TOWARDS THE OTHER RUNWAY END.
- LAYOUT OF PROPOSED CONDITIONS PROVIDED BY CHA (REFER TO ALTERNATIVE 05 IN MASTER PLAN UPDATE)

Runway 36 FUTURE CONDITIONS

Objects					*Part 77 Inner Approach Surface Slope = 20:1		**TSS Type 2 Surface Slope = 20:1	
Number	Description	Distance to End of the Runway	Offset from Runway Centerline	Elevation of Obstruction (AMSL)	Penetration of Part 77 Approach Surface	Proposed Action	Penetration of Threshold Siting Surface	Proposed Action
5263	Tree	3183.30'	196.22'	406.19'	11.5'	REMOVE/TRIM/OL	NO PENETRATION (-32.98)	NO ACTION
5264	Tree	3077.98'	10.88'	400.00'	10.6'	REMOVE/TRIM/OL	NO PENETRATION (-33.9)	NO ACTION
5265	Tree	3266.24'	81.84'	415.10'	16.3'	REMOVE/TRIM/OL	NO PENETRATION (-28.21)	NO ACTION
5266	Tree	3245.56'	80.30'	401.89'	4.1'	REMOVE/TRIM/OL	NO PENETRATION (-40.39)	NO ACTION
6711	Tree	2154.56'	270.43'	344.43'	1.2'	REMOVE/TRIM/OL	NO PENETRATION (-43.3)	NO ACTION
6722	Tree	2007.83'	144.82'	340.17'	4.3'	REMOVE/TRIM/OL	NO PENETRATION (-40.22)	NO ACTION
6723	Tree	2184.59'	80.05'	351.22'	6.5'	REMOVE/TRIM/OL	NO PENETRATION (-38.01)	NO ACTION
6724	Tree	2196.90'	62.93'	350.97'	5.6'	REMOVE/TRIM/OL	NO PENETRATION (-38.88)	NO ACTION
6725	Tree	2719.02'	193.37'	381.62'	10.2'	REMOVE/TRIM/OL	NO PENETRATION (-34.33)	NO ACTION
6727	Tree	2546.08'	209.16'	370.25'	7.4'	REMOVE/TRIM/OL	NO PENETRATION (-37.05)	NO ACTION
6728	Tree	2444.52'	40.37'	374.09'	16.4'	REMOVE/TRIM/OL	NO PENETRATION (-28.14)	NO ACTION
6729	Tree	2471.76'	90.69'	370.11'	11.0'	REMOVE/TRIM/OL	NO PENETRATION (-33.48)	NO ACTION
6730	Tree	2514.24'	324.50'	375.49'	14.3'	REMOVE/TRIM/OL	NO PENETRATION (-30.22)	NO ACTION
6733	Tree	2948.29'	113.80'	393.61'	10.7'	REMOVE/TRIM/OL	NO PENETRATION (-33.8)	NO ACTION
6734	Tree	2848.74'	0.53'	389.24'	11.3'	REMOVE/TRIM/OL	NO PENETRATION (-33.2)	NO ACTION
6735	Tree	2839.38'	132.27'	391.90'	14.4'	REMOVE/TRIM/OL	NO PENETRATION (-30.06)	NO ACTION
6736	Tree	2976.18'	145.43'	394.52'	10.2'	REMOVE/TRIM/OL	NO PENETRATION (-34.28)	NO ACTION
6737	Tree	3101.72'	170.45'	395.14'	4.6'	REMOVE/TRIM/OL	NO PENETRATION (-39.95)	NO ACTION
12399	Tree	2451.81'	55.40'	360.57'	2.5'	REMOVE/TRIM/OL	NO PENETRATION (-42.02)	NO ACTION
12423	Tree	2684.23'	325.65'	373.98'	4.3'	REMOVE/TRIM/OL	NO PENETRATION (-40.23)	NO ACTION
12424	Tree	2677.53'	266.36'	371.26'	1.9'	REMOVE/TRIM/OL	NO PENETRATION (-42.62)	NO ACTION
12425	Tree	2718.22'	222.31'	371.64'	0.2'	REMOVE/TRIM/OL	NO PENETRATION (-44.28)	NO ACTION
12426	Tree	2792.20'	217.09'	377.71'	2.6'	REMOVE/TRIM/OL	NO PENETRATION (-41.9)	NO ACTION
12467	Tree	3202.62'	7.59'	396.88'	1.2'	REMOVE/TRIM/OL	NO PENETRATION (-43.25)	NO ACTION
12468	Tree	3176.27'	3.91'	396.06'	1.7'	REMOVE/TRIM/OL	NO PENETRATION (-42.76)	NO ACTION
12469	Tree	3136.54'	3.30'	393.78'	1.4'	REMOVE/TRIM/OL	NO PENETRATION (-43.05)	NO ACTION
12475	Tree	2851.03'	220.49'	379.76'	1.7'	REMOVE/TRIM/OL	NO PENETRATION (-42.79)	NO ACTION
12476	Tree	2971.49'	244.82'	385.76'	1.7'	REMOVE/TRIM/OL	NO PENETRATION (-42.82)	NO ACTION
12488	Tree	3008.34'	62.64'	387.71'	1.8'	REMOVE/TRIM/OL	NO PENETRATION (-42.7)	NO ACTION
12489	Tree	2981.67'	80.87'	386.64'	2.1'	REMOVE/TRIM/OL	NO PENETRATION (-42.44)	NO ACTION
12490	Tree	2912.88'	92.88'	383.90'	2.8'	REMOVE/TRIM/OL	NO PENETRATION (-41.75)	NO ACTION
12491	Tree	2901.96'	13.83'	384.97'	4.4'	REMOVE/TRIM/OL	NO PENETRATION (-40.13)	NO ACTION
62870	Tree	3275.51'	81.94'	418.00'	18.7'	REMOVE/TRIM/OL	NO PENETRATION (-25.78)	NO ACTION

* Federal Aviation Regulation 14 CFR Part 77
** Federal Aviation Administration Advisory Circular AC 150/5300-13A - Table 3-2

No.	Submittal / Revision	Appr'd	By	Date

CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

DY Consultants
CHA
2109 State Chaine Highway, Suite 212 - Rocky Hill, CT 06067-2106
Main: (860) 257-4557 - www.chacompanies.com

Designed: OR | Drawn: WA | Checked: DV

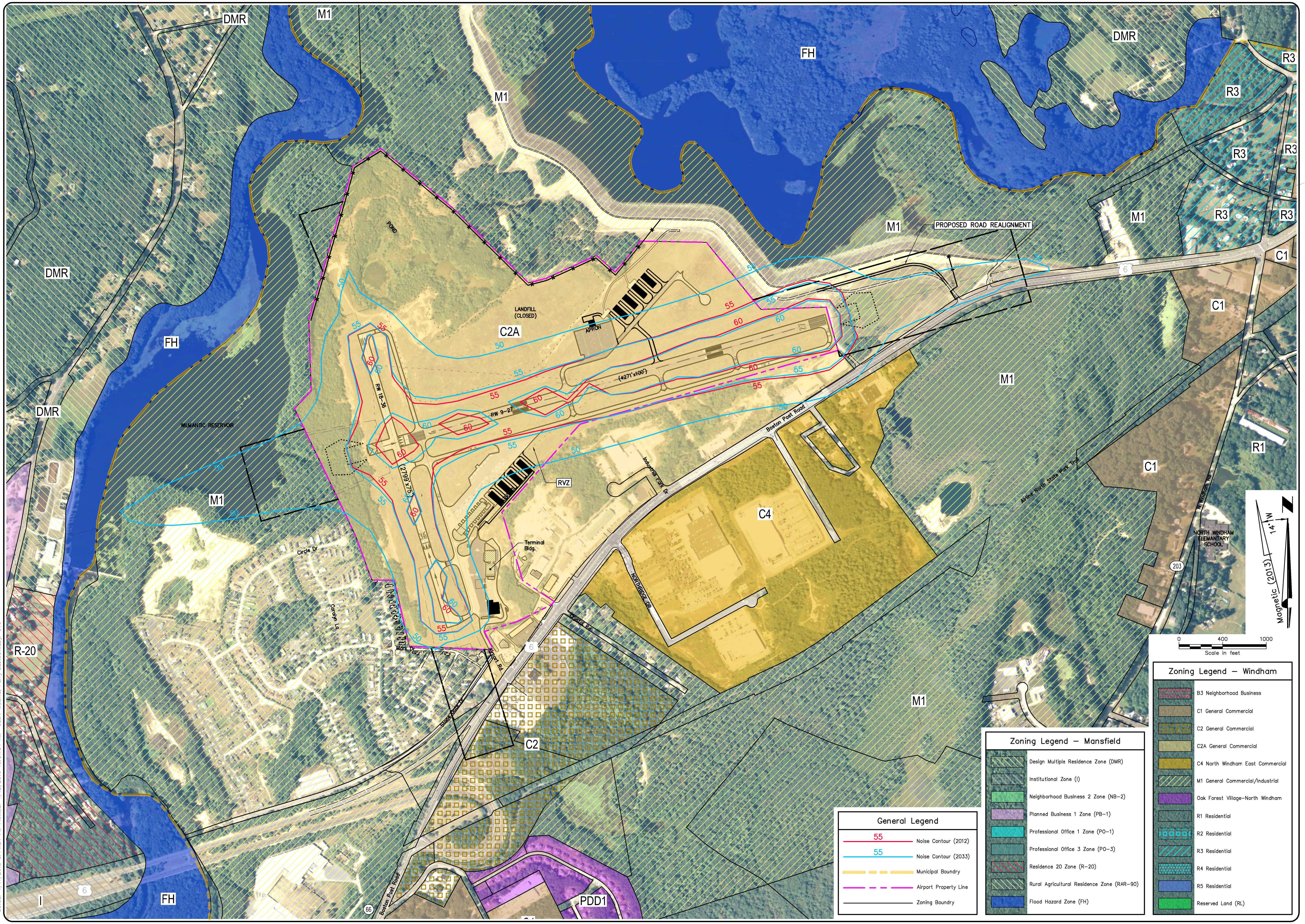
WINDHAM AIRPORT (JD)

AIRPORT MASTER PLAN UPDATE

OBSTRUCTION DATA SHEET
RUNWAY 27

Issue Date: April 2016 | Project No.: 25874 | Scale: AS NOTED

ALP-9



File: V:\PROJECTS\ANY\K3\25874\CADD_ACAD\25874-ALP-10_LANDUSE.DWG
Saved: 4/11/2016 3:14:24 PM Plotted: 4/12/2016 10:31:34 AM User: Medina, Perry LastSavedBy: 976

No.	Submittal / Revision	App'd	By	Date

CAA CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

CHA

2139 Silas Deane Highway, Suite 212
Rocky Hill, CT 06067-2336
860.257.4557 · www.chacompanies.com

Designed: POM Drawn: PM Checked: AJF

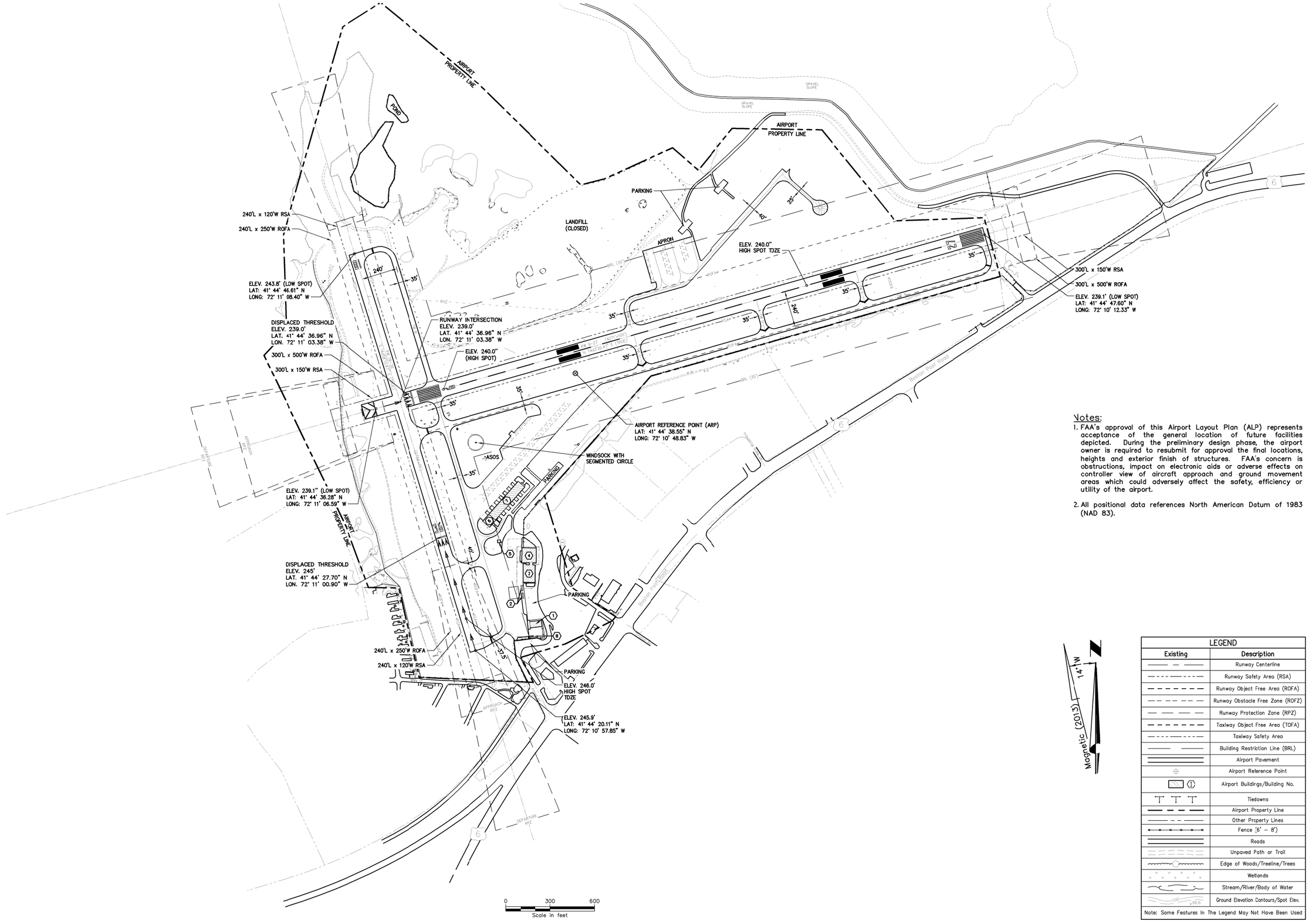
WINDHAM AIRPORT (IJD)

AIRPORT MASTER PLAN UPDATE

LAND USE PLAN

Issue Date: April 2016 Project No.: 25874 Scale: AS NOTED

ALP-10



Notes:

1. FAA's approval of this Airport Layout Plan (ALP) represents acceptance of the general location of future facilities depicted. During the preliminary design phase, the airport owner is required to resubmit for approval the final locations, heights and exterior finish of structures. FAA's concern is obstructions, impact on electronic aids or adverse effects on controller view of aircraft approach and ground movement areas which could adversely affect the safety, efficiency or utility of the airport.
2. All positional data references North American Datum of 1983 (NAD 83).

Magnetic (2013) 14° 1'W

LEGEND	
Existing	Description
	Runway Centerline
	Runway Safety Area (RSA)
	Runway Object Free Area (ROFA)
	Runway Obstacle Free Zone (ROFZ)
	Runway Protection Zone (RPZ)
	Taxiway Object Free Area (TOFA)
	Taxiway Safety Area
	Building Restriction Line (BRL)
	Airport Pavement
	Airport Reference Point
1	Airport Buildings/Building No.
	Tiedowns
	Airport Property Line
	Other Property Lines
	Fence (6' - 8')
	Roads
	Unpaved Path or Trail
	Edge of Woods/Treeline/Trees
	Wetlands
	Stream/River/Body of Water
100 95.6	Ground Elevation Contours/Spot Elev.
Note: Some Features In The Legend May Not Have Been Used	

No.	Submittal / Revision	Appvd	By	Date

CONNECTICUT AIRPORT AUTHORITY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

CHA
2139 Silas Deane Highway, Suite 212
Rocky Hill, Connecticut 06067
860.257.4557 • www.chacompanies.com

Designed: POM | Drawn: PM | Checked: AJF

WINDHAM AIRPORT (IJD)
AIRPORT MASTER PLAN UPDATE

AIRPORT PROPERTY MAP
(EXHIBIT A)

Issue Date: April 2016 | Project No.: 25874 | Scale: AS NOTED

ALP-11