



Dillant Hopkins Airport Master Plan Update

Keene, NH | June 2017 | SBG-08-12-2014

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1 INTRODUCTION

This document is an update to an AMPU completed in 2003 for Dillant-Hopkins Airport (EEN). The project is funded through the Airport Improvement Program (AIP) and a state block grant issued by the New Hampshire Department of Transportation (NHDOT). The state of New Hampshire, through its Department of Transportation – Bureau of Aeronautics (BOA), was selected by the Federal Aviation Administration’s (FAA) New England Region to be a member of the FAA’s Airport Block Grant Program in FY 2008. The state's inclusion into the Program enables NHDOT BOA to be an extension of FAA's New England Region. The Bureau provides input and decisions on project-related issues and questions, and the FAA provides input only upon request. The Bureau continues to utilize FAA regulations, guidance, and policies to implement projects within the Program.

1.1 TERMS AND ABBREVIATIONS

Words, abbreviations, and terms used in this report are contained in Appendix A.

1.2 PURPOSE

The goal of this Airport Master Plan Update (AMPU) is to revise the 2003 AMPU. This update presents guidelines for the development of Dillant-Hopkins Airport that considers all of these factors to meet the needs of the City of Keene, as well as the array of interrelated aircraft operators and businesses that are active in the region over the next 20-year period.

This AMPU includes the following elements.

- **Pre-Planning.** The pre-planning process (completed in 2014) included an initial needs determination, development of the study design, negotiation of consultant fee and contract, and a grant application. Ninety percent (90%) of the project costs were funded through a FAA Airport Improvement Program (AIP) grant with NHDOT, and the city of Keene participated with matching funds of 5% each.
- **Public Involvement.** The public participation program for this AMPU included the selection of a Planning Advisory Committee (PAC), a series of Public Information Meetings, a user survey, and publication of meeting notices and documents on the city’s website. Over the course of the study, the public involvement program encourages information sharing and collaboration among the PAC members. To further solicit public input, public information meetings were held at key points throughout the planning process. The intent of the survey and each public information meeting was to encourage advice, ideas, and feedback from the community so a mutually beneficial product can be delivered.
- **Existing Facilities.** The existing facilities inventory is a snapshot of the airport under current conditions. This analysis will provide an inventory of pertinent data for use in this AMPU.
- **Aviation Forecasts.** The aviation forecasts project where the airport should be regarding based aircraft, local and itinerant operations, and other pertinent issues and conditions in short (zero-five year), the middle (six-10 year), and the long (11-20 year) timeframes.

- **Facility Requirements.** The facility requirements include an assessment of the ability of the existing airport, both airside and landside, to support the forecasted demand. This information identifies the demand levels that will trigger the need for the facility and infrastructure changes.
- **Alternatives Development and Evaluation.** The alternatives element identifies options to meet projected airport requirements and configurations for each major component. It assesses the expected performance of each alternative against a broad range of evaluation criteria, including operational, environmental, and financial impacts. A recommended development alternative, referred to as the preferred option, will emerge from this process and will be further refined in subsequent tasks.
- **Environmental Considerations.** The environmental analysis will provide an understanding of the environmental requirements needed to move forward with each project in the recommended development program, including permitting requirements associated with the implementation of the preferred alternative. This element should aid in developing the purpose and need for successive environmental documents.
- **Airport Layout Plans.** The Airport Layout Plan (ALP) is one of the key products of an AMPU. The ALP set of drawings provides a graphic representation of the development plan for the airport. The primary drawing in this set is the ALP, which becomes the airport's official blueprint.
- **Implementation Schedule.** The implementation plan provides a summary description of the recommended improvements and associated costs. The timetable for implementation depends, in large part, on the levels of demand that trigger the need for improvements. These recommended facility improvements are presented for the three planning periods and give estimated costs of construction and likely funding sources. The recommended short-term improvements (zero-five years) typically become the airport's Capital Improvement Program (CIP) and are incorporated into the FAA and NHDOT's budgetary process.

1.3 FOCUS

As part of the scoping process, it was determined that three key areas require a direct focus of this AMPU. One area of interest is to analyze the need for possible additional hangar development and to provide sufficient space to accommodate additional T-hangars and conventional hangars. This emphasis coincides with the City's desire to evaluate economic sustainability for the airport. A second focus is to assess the crosswind runway orientation, length, and width as well as the runway's existing taxiway structure. A third focus is to determine the terminal building requirements that will be needed through the planning period. An ancillary focus of this AMPU is to align it with the vision of the City's Comprehensive Plan to the extent possible. This AMPU will include green initiatives that may be able to be implemented to achieve sustainable development principles as appropriate for the proposed projects.

(Note: Other goals and focus areas will be discussed at the PAC meeting to discuss the inventory of existing conditions and incorporated into the AMPU, as applicable.)

1.4 DELIVERABLES

The products of this planning process will include a technical report and the ALP set.

TECHNICAL REPORT

The technical report will involve five basic tasks.

1. Examine the airport as it exists today.
2. Forecast activity through a 20-year planning period.
3. Assesses what facilities may or may not be required during the next 20 years.
4. Analyze alternatives focusing on how to achieve future safety and development requirements.
5. Provide the airport and funding agencies with a plan that will implement the process in a fiscally conservative manner.

When complete, this document will contain eight chapters and five appendices.

REPORT CHAPTERS

1. Introduction
2. Inventory of Existing Conditions
3. Forecasts of Aviation Activity
4. Facility Requirements
5. Alternatives Analysis
6. ALP Set
7. Implementation Schedule
8. Recommendations

APPENDICES

- A. Glossary of Terms and Abbreviations
- B. Meeting Minutes
- C. Survey Results
- D. Airport Layout Plan
- E. Airport Development Program¹

1.5 MASTER PLAN DEVELOPMENT

The airport master plan update is prepared in a series of chapters, with each successive chapter building on previous work. Following this introductory chapter is Chapter 2, which is an inventory of existing conditions and activity. It lays the groundwork for the rest of the report by establishing a baseline from which the rest of the document builds upon. The Inventory of Existing Conditions (Chapter 2) is followed by the Forecasts of Aviation Activity, which projects “existing conditions” forward 20 years, in

¹ Developed separately by the airport and included in this report as a reference.

three stages, short-, intermediate-, and long-terms (discussed in detail in Chapter 3). Once the baseline and projected activity is established, the facility requirements (what the airport needs or does not need) is set for the 20-year planning period (again in three stages). With this knowledge, a series of alternatives are examined that suggest methods of achieving the airport's short, intermediate, and long-term needs.

The most critical part of the master plan is the selection of the preferred alternative. This decision by the city sets the stage for the rest of the master plan. The preferred alternative becomes the future airport layout and is the basis for Chapter 6 (Airport Layout Plan) and Chapter 7 (The Financial – Implementation Plan). The proposed Capital Improvement Plan in Chapter 7 is the result of the master planning process that began with an inventory of the airport. The report concludes with a series of recommendations for the city, including sustainability (green) ideas.

Figure 1-1 illustrates the process.



Figure 1-1. Master Plan Process

1.6 AIRPORT LAYOUT PLAN DRAWING SET

The ALP set graphically presents the airport's final vision of the airport.

The final plan set will consist of several sheets, where the ultimate ALP is considered the single most important document in the set. The ALP is used to determine the airport's CIP. Projects must be identified on the ALP to receive FAA and NHDOT funding.

1.7 REVIEW AND APPROVAL PROCESS

The recommendations contained in this airport AMPU represent the views, policies, and development plans of the city of Keene and does not necessarily represent the views of NHDOT or Stantec. Acceptance of the AMPU does not constitute a commitment on the part of the FAA or NHDOT to participate in any development depicted in the plan, nor does it indicate that that proposed development is environmentally acceptable by appropriate public law. NHDOT will review all elements of this AMPU to ensure that sound planning techniques have been applied and will approve two key elements, including the following:

1.8 AVIATION FORECASTS

The AMPU forecasts should be reviewed to ensure that the underlying assumptions and projected methodologies are appropriate. Inconsistencies between the AMPU forecast and FAA Terminal Area Forecasts must be resolved, and the forecast approved, before proceeding with subsequent planning work.

1.9 AIRPORT LAYOUT PLAN

All airport development at federal-obligated airports must be done in compliance with an FAA-approved ALP. Furthermore, proposed development must be shown on an approved ALP to be eligible for AIP funding. NHDOT approval of the ALP indicates that the existing facilities and proposed development depicted on the ALP conforms to the FAA airport design standards in effect at the time of approval or that an approved modification to standard has been issued. Such approval also indicates that NHDOT finds the proposed development to be safe and efficiency.

1.10 PUBLIC INVOLVEMENT

A component of this update is the public awareness process. Over the course of the study, the public participation program encouraged information sharing and collaboration among the city, users and tenants, resource agencies (such as NHDOT), elected and appointed public officials, residents, travelers, and the public. Collectively, these various groups formed the stakeholders who have an interest in the outcome of the study. This public involvement program provided the stakeholders with an early opportunity to comment before major decisions are made; provide adequate notice of [opportunities](#) for their participation, and provide for regular forums throughout the study.

1.10.1 Plan Goals

The purpose of the Public Outreach Program was to solicit wider interest in the AMPU update and to ensure the public, the residents and taxpayers of Keene were given a chance to weigh in on the project and the future of the airport.

1.10.2 Tools and Techniques

In preparing this AMPU update, Stantec (the consultant hired to develop the report) used a variety of forums, including the Planning Advisory Committee (PAC), including small group breakout sessions, and public information meetings. Also, the Internet was used to present information, announce meetings, and provide access to project documents.

1.10.3 Planning Advisory Committee (PAC)

A Planning Advisory Committee (PAC) was assembled by the city to assist throughout the planning process. The PAC consisted of 15 members who represent a broad constituency of airport stakeholders and who have been asked to volunteer their time to aid in the development of the AMPU. The PAC convened for six meetings (see Table 1-1) to review draft chapters (i.e. “working papers”) as developed by Stantec. Minutes of each session is contained in Appendix B. The same draft chapters provided to the PAC were posted to the project website.

MEETING DATE	TOPIC
April 13, 2015	Role of the Committee Handout & Meeting Guidelines and Ground Rules
August 10, 2015	Overview of airport planning process, existing facilities inventory, environmental overview, Visioning Session (collaboration and discussion between groups and establish critical ideas)
November 9, 2015	Presentation of Forecasts of Aviation Activity and Capacity v. Demand; review of the visioning process.
February 18, 2016	Stantec's evaluation of Facility Requirements and PAC discussion and ideas for the airport's future needs.
April 27, 2016	Presentation of Stantec's Alternatives
June 29, 2016	Stantec's alternative recommendations and PAC discussion and selection of the preferred alternative
August 31, 2016	PAC alternative debate and selection of the preferred alternative
May 4, 2017	PAC final draft review (minutes pending)
May 24, 2017	PAC acceptance of draft report (minutes pending)

1.10.4 Public Information Workshops

There were three Public Information Workshops (PIW) during the AMPU process, as well as a presentation to the City Council (see Table 1-2). The workshops were conducted in an open-house format where the public and airport stakeholders can visit with the Airport AMPU team (Stantec, PAC, city officials, and NHDOT) and ask any questions they may have related to the Airport AMPU. The intent was ensuring the public is engaged in the process and has time to discuss the project and the direction it is taking with the PAC, city officials and elected representatives. The workshops were scheduled in the early evening to allow those heading home from work to stop by or to allow others to come after the dinner hour. The date and time of the workshops were advertised in the Keene Sentinel and posted on City's Webpage under public notices, and on the Airport AMPU website. At each session, information handouts were made available by Stantec as well as comments sheets, which were collected after each session, reviewed and comments addressed.

DATE	TOPIC
March 16, 2016	The first PIW will provide the public with an overview of the airport and the AMPU project.
June 29, 2016	This second PIW was timed to offer the public an update on the project and to provide an overview of the alternatives presented to the PAC.
May 9, 2017	This third and final PIW will provide the public with a summary of the final draft report and ALP. It will be held in concert with a presentation to the city council. A major outcome of this PIW is to solicit the Council to approve the Plan and authorize the city manager to sign the ALP.

1.10.5 Public Input

Interested citizens and airport stakeholders were encouraged to provide comments and suggestions to the AMPU team. Comment sheets were given to the PAC and at the public information workshops. Citizens and airport stakeholders can also utilize the Comments feature on this AMPU website. Direct communication with the AMPU project managers via phone or email is also acceptable.

1.10.6 Project Survey

A public survey was prepared to solicit feedback from the community to provide information to the City, PAC, and Stantec. The Survey was designed so that collectively, we can 1) understand the community's attitude toward the airport, 2) what issues concern the community, and 3) where to place emphasis on the AMPU and ultimately the Airport Layout Plan.

A synopsis of the survey is contained in Appendix C.



2 INVENTORY OF EXISTING CONDITIONS

2.1 INTRODUCTION

This chapter is the first step in the master planning process. The Inventory of Existing Conditions involves gathering information about the airport and its environment, which includes not only an inventory of facilities and their conditions, but also activity, such as aircraft and operations, and the environmental conditions as they exist today. An inventory of current conditions is essential to the success of a master plan considering the information also provides a foundation for subsequent evaluations. This report provides a snapshot of Dillant-Hopkins Airport as it stands today and serves as a control for measuring changes.

The inventory of existing conditions for the Dillant-Hopkins Airport includes the following information:

- Airport ownership and management, the airport setting, and transportation access;
- Population and socio-economic information for the geographic area;
- Review of historical and current airport activity;
- Overview of the airport's airspace and obstructions;
- Descriptions of facilities and services provided at the airport including a general description of airside, landside, terminal, and support facilities;
- Summary of environmental conditions at the airport; and
- Financial overview including historical revenue and expense reports.

Keene has a long development history. When it comes to improving the airport, the airport's project history makes it clear that the surrounding community is intent on keeping EEN as an integral infrastructural component.

The information contained within these existing facilities inventory is current as of November 2016. An update will be gathered throughout the development of the master plan and will be included in subsequent sections of the report.

2.2 TERMS AND ABBREVIATIONS

Appendix A contains a list of terms and abbreviations common to the aviation industry, but possibly foreign to readers unfamiliar with airports and aircraft.

2.3 PHOTGRAMMETRIC DATA COLLECTION

Because the last Airport Master Plan was updated in 2003 new photogrammetric based mapping was needed and obtained for the airspace analysis completed as part of this update. The data was collected in March 2015. FAA Advisory Circular (AC) 150/5300-13A, Airport Design, and AC150/5070-6B, Airport Master Plans was used as the basis for developing the airport base map, ALP drawings, and airspace analysis. Because of the added costs involved, the data collected was not in accordance with AC

150/5300-16, AC 150/5300-17, or AC 150/5300-18 (series), nor was the data uploaded to the FAA Airport Geographic Information (AGIS) site.

2.4 AIRPORT CLASSIFICATION

The Dillant Hopkins Airport (EEN) is classified as a general aviation airport under the National Plan of Integrated Airports System (NPIAS). General aviation airports are public-use airports that do not have scheduled service or have less than 2,500 annual passenger boardings (49 USC 47102(8)). Approximately 88 percent of airports included in the NPIAS are general aviation. The Dillant Hopkins Airport is also categorized as a Regional Airport under the 2012 General Aviation Airport: A National Asset study. This study focuses on the Federal network of general aviation airports, heliports, and seaplane bases and divides them into four new categories based on existing activity levels and stated criteria: national, regional, local, and basic. Airports may move from one category to another over time as aviation activity levels change. The four categories and the number of airports in each group are listed in Table 2-1 and the NH system of airports is illustrated in Figure 2.1.

NATIONAL (84)	REGIONAL (467)	LOCAL (1,236)	BASIC (668)
Supports the national and state system by providing communities with access to national and international markets in multiple states and throughout the United States	Supports regional economies by connecting communities to statewide and interstate markets	Supplements local communities by providing access primarily to intrastate and some regional markets.	Supports general aviation activities such as emergency service, charter or critical passenger service, cargo operations, flight training, and personal flying.
Source: General Aviation Airports: A National Asset (2012) Federal Aviation Administration.			

2.5 LOCATION AND ACCESS

The airport is in the Town of Swanzey, NH, near the southwestern New Hampshire border with Vermont and Massachusetts. Two miles south of Central Square, the airport provides a gateway to southwestern New Hampshire for tourists, businesspeople, and aviation enthusiasts alike.

Airport Road bounds the airport to the north and west and Old Homestead Highway (State Route 32) to the south and east.

As illustrated in Figure 2-1, EEN is one of 24 public-use airports in the state and one of two airports in Cheshire County.

2.6 AIRPORT DESIGN STANDARDS

The FAA uses a set of airport ratings known as Airport Design Standards, which are used to size and locate airport facilities properly. There are three types of standards: Dimensional (e.g. required width and length of runways and taxiways); Clearance (e.g. required clearances between runways, taxiways, and other facilities); and operational (described below). These standards are identified and defined in FAA Advisory Circular (AC) 150/5300-13A, Airport Design.

- Airport Reference Code (ARC).** Airport Reference Codes (ARCs) relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate on a runway, taxiway, or taxilane at the airport. The ARC has two components relating to the design aircraft: aircraft approach category and airplane design group.
- Aircraft Approach Category (AAC).** Designated by a letter (A-E), this component relates to the operational characteristics of aircraft approach speed, with 'A' being the slowest and 'E' being the fastest.
- Airplane Design Group (ADG).** Designated by a Roman numeral (I-VI), the second component relates to the physical characteristics of airplane wingspan, with 'I' being the smallest and 'VI' being the largest.
- Taxiway Design Group (TDG).** TDG is a number designation between one and seven based on the aircraft's Main Gear Width (MGW) and the Cockpit to Main Gear Distance (CMG), where one is the smallest and seven is the largest or greatest distance between MGW and CMG.

The airport must provide a safe operating environment for aircraft. AC 5300-13A, Airport Design establishes protection areas around the runways to help ensure such an environment. These areas are:

- Runway Safety Areas (RSA).** The RSA is a prepared surface that surrounds the runway (and extends a specified distance beyond it) that is clear of obstructions. Keeping the RSA clear helps minimize damage to aircraft in the event of an accident. The RSAs at Dillant Hopkins Airport meet design standards.
- Runway Protection Zone (RPZ).** The RPZ is a trapezoidal area located off each runway end. The RPZ should be clear of obstructions to the greatest extent possible, to enhance the protection of people and property on the ground and provide an unobstructed approach surface. The RPZs at Dillant Hopkins Airport vary in size from 13.77 to 29.465 acres (see Figure 2-5 on the previous

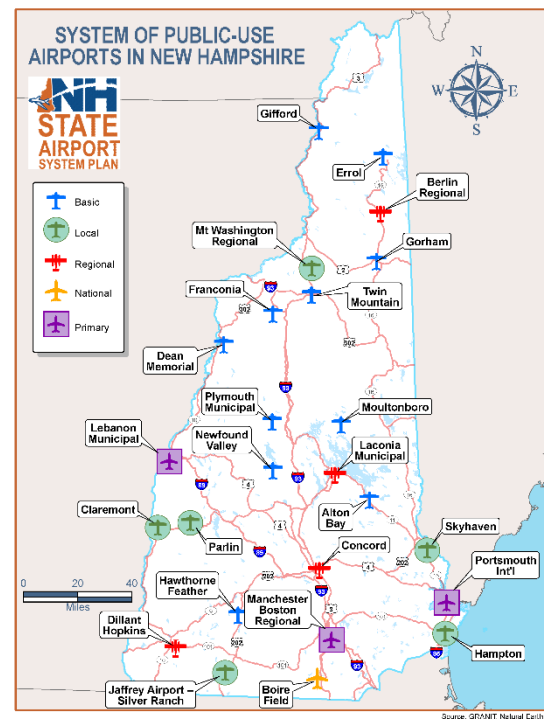


Figure 2-1. NH System of Public Use Airports

page). The Runway 2, 20 and Runway 14 RPZs are located completely on airport property. However, the Runway 14 RPZ lies partially off airport property. The Runway 14 RPZ lies across Old Homestead Highway and Wilson Pond. An examination of property ownership under the RPZ indicates that other than the highway, there is no incompatible activity in the Zone.

- **Object Free Area (OFA).** The OFA is a two-dimensional ground area surrounding the Runway that must be clear of parked aircraft and objects other than those whose location is fixed by function (objects essential for air navigation and aircraft ground maneuvering). The OFAs at Dillant Hopkins Airport meet design standards.
- **Runway Visual Zone (RVZ).** The RVZ is an area maintained free and clear of obstructions for providing an unobstructed view of aircraft arriving at/from the intersection of the two runways at EEN. This area is depicted on the Airport Layout Plan, and the size is a function of the distance from the runway threshold to the intersection point of the two runways. There are no issues with the RPZ at Dillant Hopkins Airport.

2.6.1 Design Aircraft

The design aircraft – also referred to as the critical aircraft – is the plane (or group of aircraft) with the largest wingspan and the fastest approach speed that conducts at least 500 annual operations at EEN. The ARC is an alphanumeric system that establishes minimum design standards for an airport. These measures include features such as runway and taxiway widths, safety area sizing, runway separation requirements, and parking areas, among other airport characteristics.

The design aircraft selected for the Airport and Runway 02-20 is the Bombardier Challenger 300 (Figure 2-2). The Challenger 300 is one of two aircraft operated by C&S Wholesale Grocers. The other is the Dassault Falcon 2000.

As noted in Table 2-2, both aircraft have similar operating characteristics and combined they exceed the minimum number of operations required for classification of the design aircraft. Therefore, given the design aircraft's wingspan and approach speed, the ARC for the airport and Runway 02-20 is C-II. The design aircraft for the crosswind runway, Runway 14-32 is a Beach King Air 200, which also has an ARC of B-II. Table 2-2 lists both the FAA design standards for ARCs of B-II as well as the existing conditions at the Dillant-Hopkins Airport.

2.7 NON-CONFORMING CONDITIONS

An evaluation of the federal design standards identified the following non-conforming condition at the airport.



Figure 2-2. Current Design Aircraft: Bombardier Challenger 300

Approach Speed = 122 kts
 Aircraft Approach Category = C
 Wingspan = 63'-10"
 Aircraft Design Group (ADG) = II
 Airport Reference Code (ARC) = C-II

- **Taxiway to Runway Separation.** The separation distance between Runway 02-20 and Taxiway 'A' should be 300 feet for Approach Category C standards with not lower than $\frac{3}{4}$ -statute-mile visibility minimums under existing conditions. However, if minimums become lower than $\frac{3}{4}$ statute mile after various obstructions are removed, the separation distance would need to be 400 feet. Currently, Taxiway 'A' is 500 feet from Runway 02-20. The taxiway is currently scheduled to be relocated to within FAA standards on the airport's CIP.
- **ASOS Location.** The ASOS does not have the required 500-foot clear zone. This issue is discussed later in section 2.9.2, Wind Coverage, on page 2.8).
- **Airspace Obstructions.** There are airspace obstructions to various imaginary surfaces on all four runway ends. Obstructions to Runway 2 and 20 have resulted in higher than necessary approach minimums to Runway 2 and the cancellation of night operations to Runway 20. This is discussed in more detail in section

Table 2-2. Runway Design Standards

AIRPORT STANDARD	CURRENT CONDITION		REQUIRED STANDARD	
Runway	2-20	14-32	2-20	14-32
Design Aircraft	Dassault Challenger 300	King Air 200	N/A	
Airport Reference Code	C-II	B-II	N/A	
Runway Width	100'	150'	100'	75'
Runway to Taxiway Centerline	240'	240'	400'	240'
Runway to Parking Apron	250'	250'	400'	250'
Approach Visibility Minimums	1 mile	Visual	N/A	
Runway Protection Zone (RPZ)	L: 1,000' IW: 500' OW: 700'	L: 1,000' IW: 500' OW: 700'	L: 1,000' IW: 500' OW: 700'	L: 1,000' IW: 500' OW: 700'
Runway Safety Area (RSA)	L: 300' W: 150'	L: 300' W: 150'	L: 300' W: 150'	L: 300' W: 150'
Object Free Area (OFA)	L: 300' W: 500'	L: 300' W: 500'	L: 300' W: 500'	L: 300' W: 500'
Obstacle Free Zone (OFZ)	L: 200' W: 400'	L: 200' W: 400'	L: 200' W: 400'	L: 200' W: 400'

Data Source: Airport Inspection; FAA Design Manual, AC 5300-13A
 Legend: L = Length; IW = Inner Width; OW = Outer Width

2.8 DESCRIPTION OF EXISTING FACILITIES

This section includes a description of the airport’s airside and landside features, including the runways and taxiways, as well as the quantity and type of hangars, aircraft parking aprons, fueling capabilities, and general aviation terminal facilities.

2.9 AIRSIDE FACILITIES

The airside facilities include areas of the airport that accommodate the movement of aircraft, such as runways and taxiways. Airside facilities also include navigation and communication equipment designed to facilitate aircraft operations, navigation aids, lighting systems, antennae, and so forth. Airport data is listed on Figure 2-3, which is the Airport Master Record.

2.9.1 Runways

Dillant-Hopkins Airport has two runways. Runway 02-20 is the primary runway and Runway 14-32 serves as the airport’s crosswind runway. Runway 02-20 is 6,201 feet long and 100 feet wide. The runway was reconstructed in 2014 and is in excellent condition.

Runway 14-32 is 4,001 feet long and 150 feet wide, but with a 1,100-foot displacement on the Runway 32 approach, resulting in 2,901 feet of available runway for landing aircraft. The pavement was overlaid around 1997 and is now in fair condition. However, this runway is currently scheduled for reconstruction in 2017. The crosswind runway features “visual” markings,

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION				AIRPORT MASTER RECORD		PRINT DATE: 8/24/2016 AFD EFF: 07/21/2016 FORM APPROVED OMB 2120-0015	
1 ASSOC CITY: KEENE		4 STATE: NH		LOC ID: EEN		FAA SITE NR: 13306*A	
2 AIRPORT NAME: DILLANT-HOPKINS		6 REGION/ADO: ANE/NONE		5 COUNTY: CHESHIRE NH			
3 CBD TO AIRPORT (NM): 02.5				7 SECT AERO CHT: NEW-YORK			
GENERAL				SERVICES		BASED AIRCRAFT	
10 OWNERSHIP: PUBLIC				> 70 FUEL: 100LL A		90 SINGLE ENG: 58	
> 11 OWNER: CITY OF KEENE				> 71 AIRFRAME RPRS: MAJOR		91 MULTI ENG: 7	
> 12 ADDRESS: 3 WASHINGTON ST				> 72 PWR PLANT RPRS: MAJOR		92 JET: 2	
> 13 PHONE NR: KEENE, NH 03431				> 73 BOTTLE OXYGEN: HIGH/LOW		TOTAL: 67	
> 14 MANAGER: JACK VOZMAK				> 74 BULK OXYGEN: HIGH/LOW		93 HELICOPTERS: 1	
> 15 ADDRESS: 80 AIRPORT RD				> 75 TSNT STORAGE: HGR, TIE		94 GLIDERS: 0	
> 16 PHONE NR: KEENE, NH 03431				> 76 OTHER SERVICES: CHTR, INSTR, RNTL, SALES		95 MILITARY: 0	
> 17 ATTENDANCE SCHEDULE: 603-357-9835						96 ULTRA-LIGHT: 0	
> 18 AIRPORT USE: PUBLIC				FACILITIES		OPERATIONS	
19 ARPT LAT: 42-53-54.2000N ESTIMATED				> 80 ARPT BCN: CG		100 AIR CARRIER: 0	
20 ARPT LONG: 072-16-14.8000W				> 81 ARPT LGT SKED: SEE RMK		102 AIR TAXI: 7,204	
21 ARPT ELEV: 488.0 SURVEYED				BCN LGT SKED: SS-SR		103 G A LOCAL: 31,053	
22 ACRES: 939				> 82 UNICOM: 123.000		104 G A ITRNT: 7,456	
> 23 RIGHT TRAFFIC: NO				> 83 WIND INDICATOR: YES-L		105 MILITARY: 3,314	
> 24 NON-COMM LANDING: YES				84 SEGMENTED CIRCL: YES		TOTAL: 48,027	
25 NPAS/IFED AGREEMENTS: NGYS				85 CONTROL TWR: NO		OPERATIONS FOR 12 MONTHS ENDING: 12/31/2015	
> 26 FAR 139 INDEX:				86 FSS: BANGOR			
				87 FSS ON ARPT: NO			
				88 FSS PHONE NR: 1-800-WX-BRIEF			
				89 TOLL FREE NR:			
RUNWAY DATA				0220 1432			
> 30 RUNWAY IDENT:				6,201 4,001			
> 31 LENGTH:				100 150			
> 32 WIDTH:				ASPH-E ASPH-F			
> 33 SURF TYPE-COND:				60.0 25.0			
> 34 SURF TREATMENT:				90 F/C/X/T			
> 35 GROSS WT: 8							
> 36 (IN THSDS) D							
> 37 2D							
> 38 2D/202							
> 39 PCN:							
LIGHTING/APCH AIDS				HIGH MED			
> 40 EDGE INTENSITY:				PIR - G / BSC - G BSC - F / BSC - F			
> 42 RWY MARK TYPE-COND:				PAL / PAL			
> 43 VGS:				39 / 50			
> 44 THR CROSSING HGT:				3.00 / 3.00			
> 45 VISUAL GLIDE ANGLE:							
> 46 CNTRLN-TDZ:							
> 47 RWY-RVY:							
> 48 REIL:				N /			
> 49 APCH LIGHTS:				MALSR /			
OBSTRUCTION DATA				PIR / B(V) A(V) / A(V)			
> 50 FAR 77 CATEGORY:				/ TREES TREES / TREE			
> 51 DISPLACED THR:				/ 111 52 / 33			
> 52 CTLO OBSTN:				/ 2,089 1,320 / 518			
> 53 OBSTN MARKED LGTD:				/ OB OB / 149R			
> 54 HGT ABOVE RWY END:				50.1 / 17.1 21.1 / 8.1			
> 55 DIST FROM RWY END:				N / N			
> 56 CNTRLN OFFSET:							
> 57 OBSTN CLNC SLOPE:							
> 58 CLOSE-IN OBSTN:							
DECLARED DISTANCES							
> 60 TAKE OFF RUN AVBL (TORA):							
> 61 TAKE OFF DIST AVBL (TODA):							
> 62 ACFT STOP DIST AVBL (ASDA):							
> 63 LNDG DIST AVBL (LDA):							
IMPORTANT! PLEASE ADVISE FSS IN ITEM 88 WHEN CHANGES OCCUR TO ITEMS PRECEDED BY *							
110 REMARKS							
A 024 LNDG FEE FOR ALL TURBINE POWERED AIRCRAFT.							
A 043 RWY 20 PAPI OTS INDEF.							
A 057 RWY 32 APCH RATIO 25:1 TO DSPLCD THLD.							
A 070 100 LL AVBL 24 HRS WITH CREDIT CARD. FOR JET FUEL AFT HRS CALL 603-357-7600.							
A 091 ACFT MALSR RY 02 & HRL RY 0200 & MRL RY 1432 - CTAF.							
A 110-001 WILDLIFE ON & INVOF ARPT.							
A 110-003 NOISE ABATEMENT PROCEDURES: WINDS BLO 8 KTS USE RY 02.							
A 110-004 COLD TEMPERATURE RESTRICTED AIRPORT. ALTITUDE CORRECTION REQUIRED AT OR BELOW -28C/-18F.							
111 INSPECTOR: (C)		112 LAST INSP: 05/24/2016		113 LAST INFO REQ:			

Figure 2-3. FAA Master Record (Source: GCR Associates, November 2016)



Figure 2-4. Runway 32 Displaced Threshold

which are also in fair condition¹. The approach end of Runway 32 includes a 1,100' displaced threshold. A displaced threshold is a threshold that has been moved further down the runway to mitigate obstructions to protected surfaces. Figure 2-4 depicts the displaced threshold for Runway 32. One of the main focuses of this master plan update is to analyze the orientation, length, and width of Runway 14-32 before the runway is reconstructed. Also, obstructions that cause the displacement will be analyzed as well.

The Existing Facilities Plan (a component of the ALP set) can be seen in Appendix D.

2.9.2 Wind Coverage

During development of this airport master plan and following the preparation of a windrose, it was discovered that the data provided by the FAA indicates the primary runway (2-20) has sufficient wind coverage for all Runway Design Codes (RDC) from RDC A-1 (10.5-knot crosswind) to E-VI (20 knots). However, as discussed below, this coverage conflicts considerably with data from two previous master plan studies. Also, the indicated coverage today conflicts significantly with observations from several local pilots, from students to seasoned corporate aviators.

Keene's Automatic Surface Observation System (ASOS) was installed in 1991. As shown in the photos (Figure 2-5) taken in 1998 (7 years after the installation), it was evident that the clearing around the ASOS did not meet the FAA standard of a 500-foot radius at the time the ASOS was installed (Figure 2-6). Instead, the cleared area to the east of the ASOS measures 340 feet from the ASOS, not the minimum 500 feet required. Moreover, within the critical 1,000-foot arc, 24% of the area is covered with vegetation that exceeds the height of the wind sensor. Figure 2-6 illustrates the same conditions in September 2014. It should be noted that the vast majority of trees and other obstructions within the 500 and 1,000-foot circles are off airport property; not controlled by the city of Keene.

FAA Order 6560.20b (Siting Criteria for Automated Weather Observing Systems) section 2.5 states in part that "Sheltering obstructions should be avoided by location choice or removed from the site if possible. Again, if difficult to achieve, a less desirable location may have to be selected; but, after installation, the sponsor(s) must demonstrate that accurate and reliable information is being provided. If the wind information is not correct and dependable, a resolution is required. Resolution may require that the sensors be relocated or turned off."

A satellite image review of the area around the ASOS wind tower shows that there is a very high likelihood that there are sheltering obstructions for about a 90-degree arc on the east side of the sensor and about a 140-degree arc of generally non-compliant vegetation (Figures 2-5 and 2-6). This obstruction is the result of tree growth on the east side of the airport and poor location. This less than optimum clearing can cause wind direction and velocity errors for wind coming from the opposite direction as the obstruction due to a barrier effect. It is very likely that the wind analysis suggests that these obstacles are causing inaccurate readings and have been interfering with accurate recordation for

¹ Runway markings are "precision", "non-precision", and "visual". See https://www.faa.gov/airports/southern/airport_safety/part139_cert/media/aso-airfield-standards-quick-reference.pdf.

decades, hence the reliance upon data from 1962-67 when the hilltops were clear of most trees. The only areas not affected by the trees would be the wind from the NNW and SSW. Winds from these sectors have unobstructed access to the wind sensors. Review of the wind rose shows that these are the only areas that have significant wind data and are therefore what are causing the recommendation of Runway 14-32.



Figure 2-5. ASOS Clear Zone 1998
(Source: Google Earth with Stantec analysis)

This topography to the east of the ASOS consists of rising terrain covered with tall trees with the potential to disrupt wind flow. The hilltop is at the approximate elevation of 820 feet MSL. From this point, the topography slopes downward toward the ASOS to an approximate elevation of 475 feet MSL. It is feasible and likely that winds originating from the east and moving east to west across Runway 02-20 will skim across the top of the forest that covers the mountainside. These winds will then flow downhill to within 300 feet of the ASOS at which point the downward sloping direction of the wind hitting the top of the trees closest to the ASOS would react similarly to a ski jump and creates a ripple effect that potentially distorts the wind data.

The 1991 and 2003 Airport Master Plans utilized wind data collected from 1962 through 1967 collected by trained airline weather observers, which was likely taken from or near the airport terminal building located 1-mile north-northwest of the ASOS site. This data represented that RW 02-20 had wind coverage of 88.12% of the time for a 12 -knot crosswind (Figure 2-8). This data is also the period when the tree growth was most likely lower than it is today.

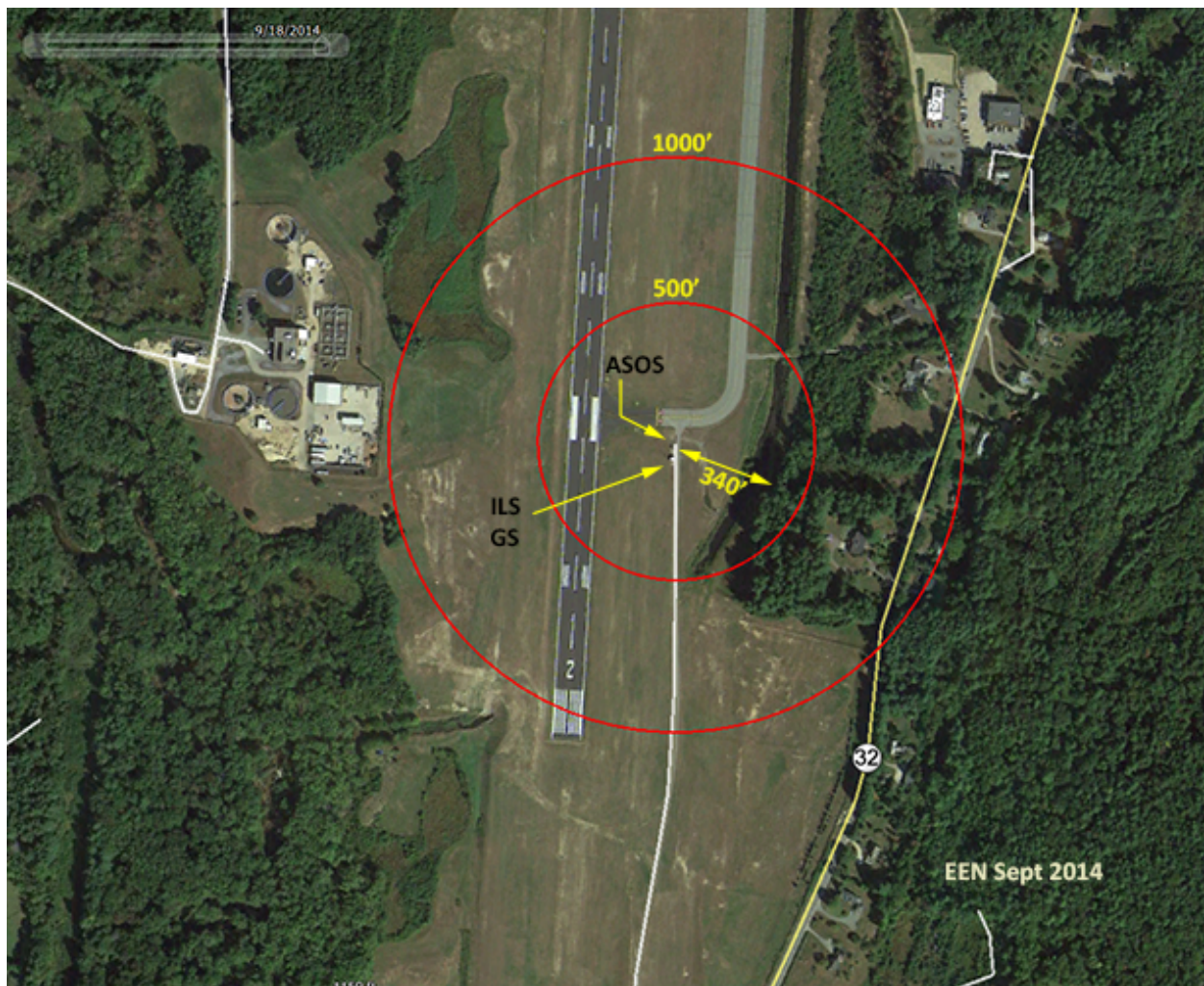


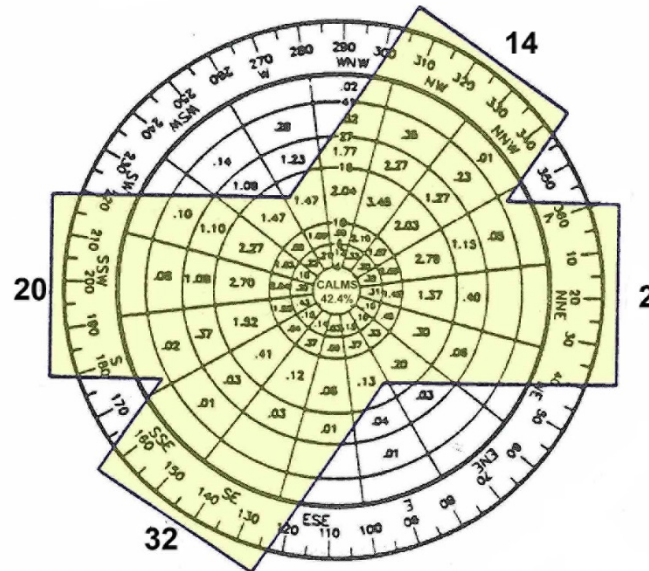
Figure 2-6. ASOS Clearing September 2014
(Source: Google Earth with Stantec analysis)

The 1981 Airport Master Plan used wind data collected between 1974 and 1978, possibly collected by airline weather observers but following 12-15 years of unmanaged tree growth. While this data represented that RW 02-20 had wind coverage over 95% of the time for a 12-knot crosswind, there is no rational, scientific explanation for this dramatic change if not for the tree growth. Corrupt data also

explains the anecdotal feedback received from local pilots about the need for a crosswind runway. Wind conditions remain as they have been from the 1940's to the present time. Data has changed due to the growth of the trees interfering with accurate recording.

Utilization of the 1962 through 1967 wind data in the 1991 Airport Master Plans adds credible support to the conclusion that prior planners also found the disparity in data concerning and erred on the side of safety. It is reasonable to infer that earlier planners felt that the wind data from the 1974-1978 period was likely inaccurate for a reason stated above. Therefore, the use of the 1962-1967 data remains appropriate and reasonable and represents the safest option for the airport and its users until the existing ASOS meets required obstruction clearance criteria or is relocated to a less obstructed location.

Subsequently, in September 2016, the FAA and NHDOT/BOA accepted the above wind analysis and recommendation to use the 1962-1967 data.



ALL WEATHER WINDROSE
 WIND COVERAGE FOR RWY 2-20 = 88.12% AT 12 KTS
 WIND COVERAGE FOR RWY 14-32 = 87.3% AT 12 KTS
 COMBINED WIND COVERAGE = 96.98% at 12 KTS
 OBSERVATIONS FROM SEPT 1962 - AUG 1967
 SOURCE: U.S. DEPT OF COMMERCE, WEATHER BUREAU

Figure 2-7. Windrose from 1991 Master Plan

2.9.3 Taxiways and Taxilanes

EEN hosts a total of six taxiways. Taxiway ‘S’ was built in 1990 and leads from the terminal parking apron to Runway 14-32, nearest to the approach end of Runway 14. Taxiway ‘R’ was reconstructed in 2014 as a part of the runway reconstruction project. Taxiway ‘R’ leads from the terminal parking apron to the approach end of Runway 20. Taxiway ‘L’ leads from the east aircraft parking apron to the approach

TAXIWAY	LENGTH	WIDTH	CONDITION	LIGHTING
A	4,645'	60'	Good / Fair	MITL and Reflectors
C	460'	60'	Good / Fair	MITL
L	1,330'	50'	Fair	Reflectors
R	750'	60'	Excellent	MITL
S	510'	35'	Good / Fair	MITL
T	280'	20'	Fair	MITL

MITL – Medium Intensity Taxiway Lights

end of Runway 32. The longest taxiway at EEN is Taxiway 'A.' This taxiway leads aircraft from the approach end of Runway 20 south to the approach end of Runway 02. Taxiway 'C' is a stub taxiway connecting from Taxiway 'A' to Runway 2-20. Taxiway 'T' leads from Taxiway 'A' to the T-hangers south of Runway 32. Table 2-3 lists each taxiway with their length and width.

2.9.4 Navigation Aids (NAVAID)

Navigational aids play a significant role in pilot and passenger safety. EEN employs some aids to air navigation such as runway lighting, taxiway lighting, a rotating beacon, windsock, and an instrument landing system (ILS) approach. A 36-inch-diameter standard rotating beacon atop a 51' tower is located adjacent to the western side of the terminal building. The beacon emits the standard white and green flashes that indicate a land-based civil airport². Both the tower and beacon are in good condition.

2.9.5 Runway Lighting and Marking

With one exception, both runways are marked and lighted per current standards. The sole exception is the High-Intensity Runway Lights (HIRL) on Runway 2-20. HIRLs are only required for runways with an instrument approach procedure with a Decision Height (DH) of 200 feet and a runway equipped with Runway Visual Range (RVR) sensors and an RVR measurement of 2,400 feet. The lowest DH at Dillant Hopkins Airport is for the Runway 2 Instrument Landing System (ILS) approach (see next section), which is 400 feet, and the runway is not (nor is it required) to have RVR sensors.

Table 2-4 lists the runway light and markings for the four runway ends.

RUNWAY	MARKINGS	EDGE LIGHTS	THRESHOLD LIGHTS	REIL	MALSR	TDZL	VGLS
02	Precision	HIRL	Yes	No	Yes	No	PAPI-4L (GS 3.0°)
20	Basic	HIRL	Yes	No	No	No	PAPI-4L (GS 3.0°)
14	Basic	MIRL	Yes	No	No	No	None
32	Basic	MIRL	Yes	No	No	No	None

Source: FAA Master Record (Form 5010-1)
 Definitions: HIRL – High Intensity Runway Lights; MIRL – Medium Intensity Runway Lights; REIL – Runway End Identifier Lights; MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights; TDZL – Touchdown Zone Lighting; VGLS – Visual Guidance Light System; PAPI – Precision Approach Lighting System; 4L – Four light system located on the left side of the runway; GS - Glideslope

² Rotating beacons of varying colors of white, green and amber mark civil land and seaplane airports as well as military fields.

2.9.6 Instrument Approaches

There are three instrument approach procedures at EEN, and all are published for Runway 02. The procedures at EEN include an ILS precision approach, a non-precision area navigation approach (RNAV), and a non-precision very high frequency (VHF) omnidirectional range (VOR) approach.

- ILS Approach.** An ILS is a ground-based instrument approach system that provides precision lateral and vertical guidance to an aircraft. This system uses a combination of radio signals and lighting arrays to enable a safe landing during poor weather conditions. The ILS precision approach allows for lesser weather and visibility minimums due to the vertical and horizontal guidance. The EEN procedure (Figure 2-9) has straight-in minimums of 1-mile visibility with a decision height (DH) of 859' MSL (400' AGL).
- Area Navigation Approach (RNAV).** Using the Global Position System (GPS), an RNAV approach provides horizontal guidance for the aircraft, which is not enough for the FAA to deem this type of approach as precision, thus raising the weather and visibility minimums for a pilot when attempting an RNAV non-precision approach on Runway 02. The EEN procedure (Figure 2-10) has minimums of 1-mile visibility and a Minimum Descent Altitude (MDA) of 884' MSL (400' AGL).
- VOR Approach.** VOR is a type of short-range radio navigation system for aircraft, enabling aircraft with a receiving unit to determine their position and stay on course by receiving radio transmissions from a network of fixed ground radio beacons. VORs are highly reliable, but they provide pilots no vertical or horizontal guidance to a runway. Therefore, the FAA considers this type of approach to be non-precision. The airport can anticipate eventual decommissioning of this procedure within the next 5-10 years as the FAA continues moving away from ground-based and toward an all satellite navigation system. Figure 2-11 (page 2.14) shows the current procedure.

2.9.7 Approach Light System (ALS)

An approach lighting system is installed on the approach end of a runway and consists of a series of lightbars, strobe lights, or a combination of the two that extends outward from the runway end. An ALS typically serves a runway with an instrument approach procedure in place. At EEN, Runway 02 has a medium intensity approach lighting system with runway alignment indicator lights (MALSR). The MALSR location is shown on the Existing Facilities Plan and Airport Layout Plan in Appendix D. A typical MALSR is illustrated in Figure 2-8.

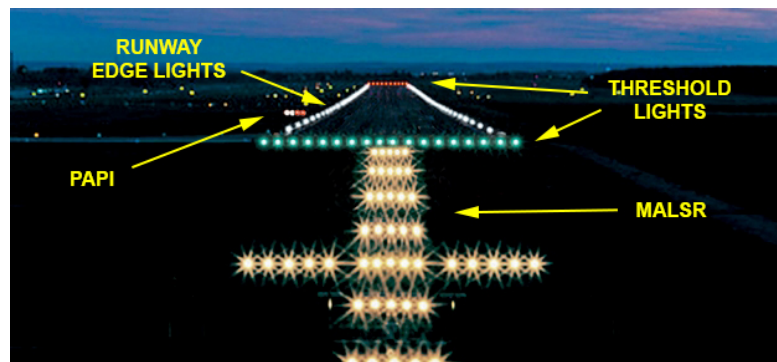


Figure 2-8. Typical Runway Lights with MALSR
(Note: Stock photo, not Dillant Hopkins Airport)

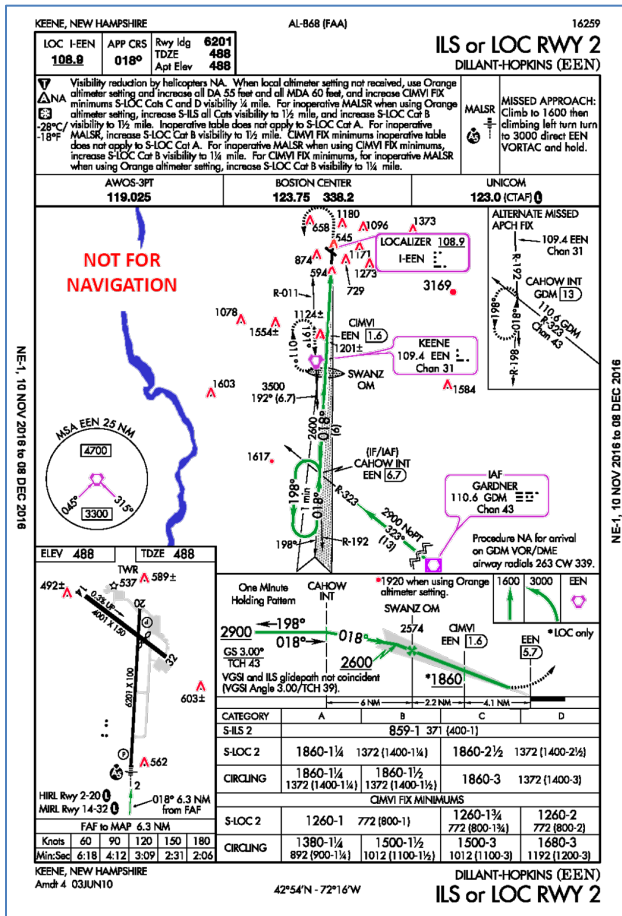


Figure 2-9. ILS RWY 02 Instrument Approach Procedure (Source: FAA, 12-02-2016).

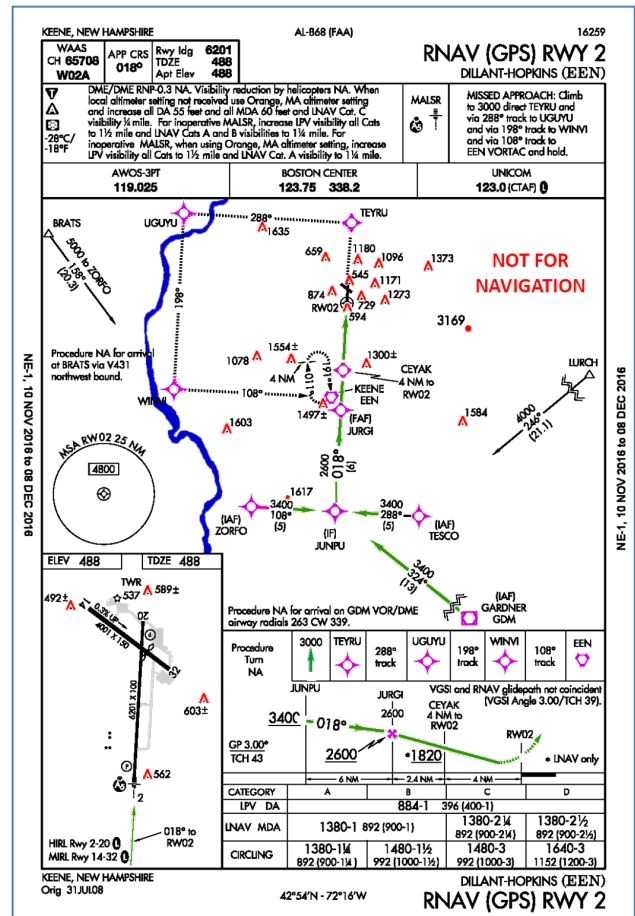


Figure 2-10. RNAV (GPS) RWY 02 Instrument Approach Procedure (Source: FAA, 12-02-2016).

2.10 LANDSIDE FACILITIES

Landside facilities are those that do not involve the active operation of aircraft during flight. These include ground vehicle access roads, parking aprons, hangars, and terminal facilities.

2.10.1 Hangars

EEN has a total of 10 conventional hangars on site. The airport also features a total of 52 T-hangar units housed in three buildings. The city owns 32 of the 52 units. The remaining 20 units are privately owned.

2.10.2 Aprons

The apron parking apron at EEN is separated into two sections: terminal apron and east apron (see Figure 2-12). The terminal apron is located directly in front of the terminal building and is used primarily for itinerant aircraft, as well as aircraft owned and operated by Monadnock Aviation, a Fixed Based Operation (FBO). This apron is approximately 136,500 square feet in size and consists of 13 small aircraft parking spaces, 10 of which are leased by the city to Monadnock Aviation.

The east apron, used primarily for based aircraft, is approximately 312,800 square feet. This apron has 38 small aircraft parking spaces within pavement tie downs.

2.11 TERMINAL BUILDING

The terminal building location and dimensions have remained unchanged since the 2003 Master Plan Update. However, businesses located in the terminal building have changed. Currently, the airport administration offices, Monadnock Aviation and The Flight Deck Café are in the terminal building. Figure 2-13 is an architectural drawing of the current layout.

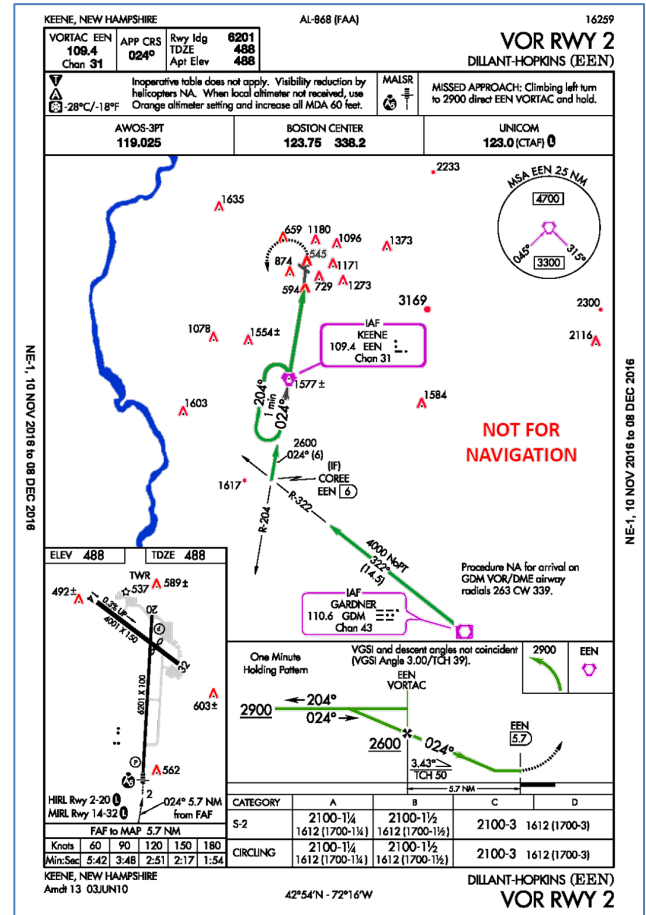


Figure 2-11. VOR RWY 02 Instrument Approach Procedure (Source: FAA, 12-02-2016)

Recently the terminal building has undergone several changes to both the interior and exterior. An outside patio and seating area were constructed in the summer of 2016 for the Café, and the main lobby underwent some cosmetic renovations that included removal of the old airline ticket counters and the addition of closed-circuit monitors that provide visitor information. Figure 2-14 is a photo taken in November 2016 of the renovated lobby (which is not entirely reflected in the Figure 2-13 drawing).



Figure 2-12. Aircraft Parking Aprons (Nov 2016)

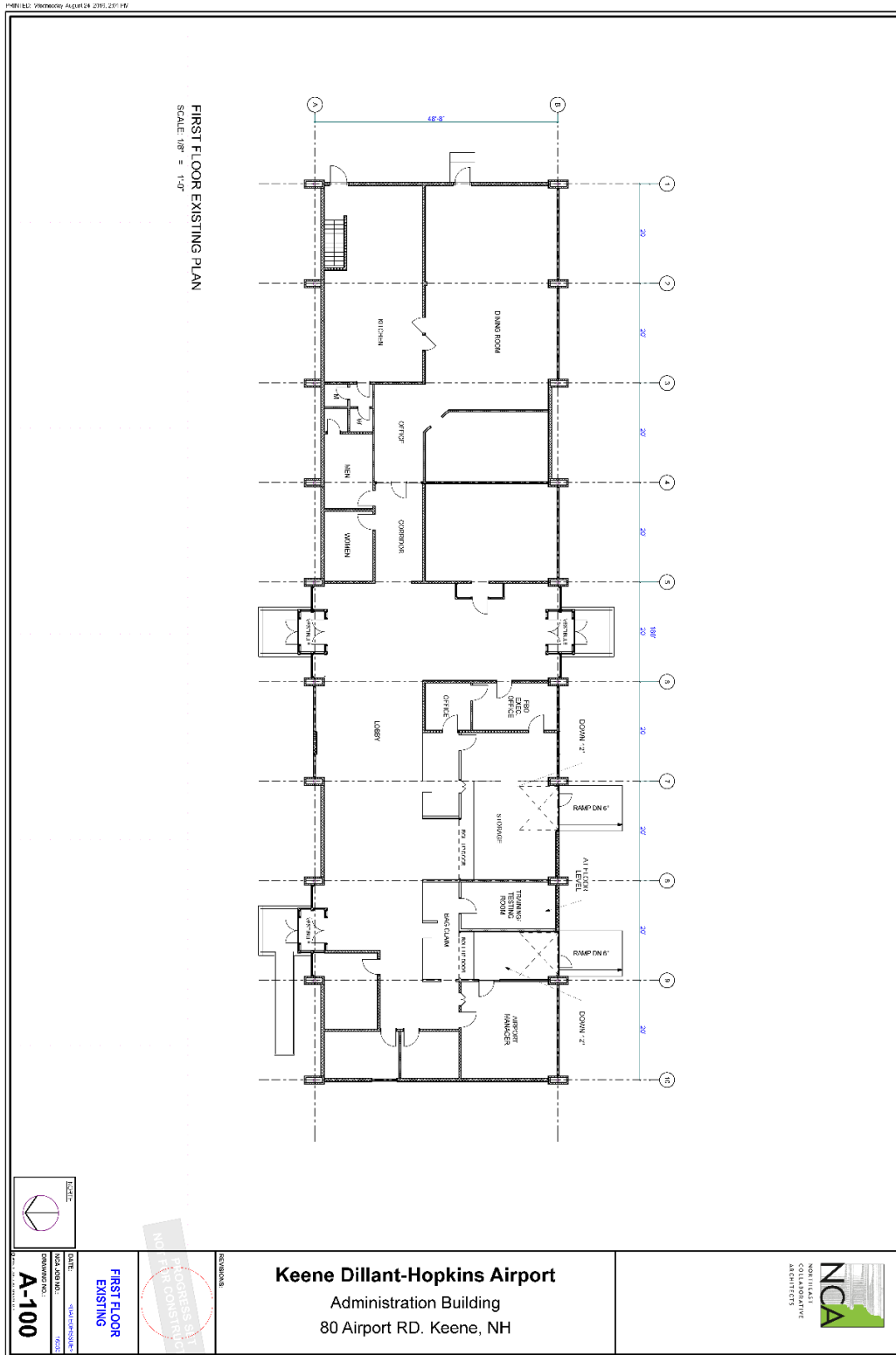


Figure 2-9. Airport Terminal Layout
 (Source: Northeast Collaborative Architects, July 2016)



Figure 2-14. Airport Terminal Lobby
(Source: Stantec, November 2016)

2.12 MISCELLANEOUS FACILITIES

2.12.1 Automobile Parking and Access

The Dillant-Hopkins Airport has approximately 78,400 square feet of automobile parking directly adjacent to the terminal building for airport users and visitors. There are an additional 13,600 square feet of automobile parking space adjacent to the terminal leased by the FBO. Thomas Transportation Services also use the Terminal lot, a Swanzey based company that provides transportation throughout New England to regional airports and other destinations.

2.12.2 Snow Removal Equipment (SRE)

A 60' x 80' SRE building was constructed to the west of the terminal building in 1998 solely to house the airport's snow removal equipment. In 2008, the airport purchased additional snow removal equipment including a carrier vehicle, a broom, and a displacement plow. The airport expanded its SRE building in 2009 by approximately 3,200 square feet to accommodate the additional equipment.

2.12.3 Fueling Facilities

There are two fueling facilities at EEN. One is owned by the city and leased to Monadnock Aviation. C&S Wholesaler Grocers owns and operates the second system for their private use. C&S's system consists of a 15,000-gallon fuel tank that dispenses Jet A fuel for their aircraft. Annually, C&S pumps approximately 304,000 gallons of Jet A. The company pays a fuel flowage fee to the city.

As the only full-service FBO at the airport, Monadnock Aviation utilizes two 10,000 gallon below-ground fuel tanks located in the northeast corner of the airfield. This service is available 24 hours a day, seven days a week via a self-service credit card machine. Monadnock Aviation pumps approximately 80,000 gallons of Jet A and 30,000 gallons of 100LL fuel annually. Figure 2-15 is a photo of the existing fuel farm. Its location can be seen in Figure 2-12 on page 2.15.



Figure 2-15. Existing Fuel Farm

2.13 FIXED BASE OPERATOR (FBO)

An FBO is a privately-owned business that provides services such as air taxi, flight instruction, aircraft refueling, aircraft rental, and aircraft maintenance and repair. Monadnock Aviation is the FBO at the Dillant-Hopkins Airport.

As the only full-service FBO at EEN, Monadnock Aviation offers customers Jet A and 100LL fuel services, a crew lounge, flight planning services, aircraft maintenance, aircraft rentals, charter flights, car rentals, and aviation training for prospective pilots. Monadnock Aviation uses two Piper Warriors and one Cessna 172 aircraft for flight training. Also, its flight training services include a flight simulator and ground school courses. The FBO's offices are in the terminal building.

2.14 AVIATION ACTIVITY

This section is divided into two parts: based aircraft and aircraft operations. This information is typically gathered for general aviation airports and serves as a benchmark for measuring growth at the airport.

2.14.1 Based Aircraft

The number of based aircraft at EEN had remained relatively constant since the previous master plan update in 2003 when there were a reported 85 based aircraft. Currently, the airport has 80 based aircraft located on the field. The aircraft type ranges from mid-sized corporate jets to single-engine aircraft.

2.14.2 Operations

In 2015 the airport reported 49,027 aircraft operations³. The process at many airports without an operating control tower is to estimate the number of operations, and this number was based on an estimate (circa 2014) by airport management. However, the actual number of takeoffs and landings are hard to estimate.

Aircraft operations counts are used as input for determining design criteria, and in some cases, funding at the nation's airports. They are also needed for developing the forecasts used to prepare airport master plans, aviation system plans, and environmental studies. Yet most airports don't have accurate activity records because they do not have an air traffic control tower, or because the tower does not operate 24 hours per day. Various techniques have therefore been used to obtain activity estimates at these facilities, including generic operations-per-based-aircraft ratios, guest logs, fuel sales, visual observation, electronic counters, acoustical counters, and video data capturing devices. However, no systematic review of these techniques has been undertaken. The research was needed to evaluate aircraft operations-counting estimation techniques and technologies and to develop guidance to assist airport practitioners in selecting and using the most appropriate methods given available resources, accuracy requirements, and airport layout.

The Airport Cooperative Research Program (ACRP) published a Synthesis of Airport Practices titled *Evaluating Methods for Counting Aircraft Operations at Non-Towered Airports*⁴. This report revealed that a variety of methods are being used across the country to count and estimate aircraft operations, and these methods vary in accuracy. These methods are:

- Count traffic year-round,
- Sample traffic and extrapolate annual operations,
- Multiply a predetermined number of operations per based aircraft by the total aircraft based at the airport,
- Perform regression analysis, and
- Ask the airport manager or personnel associated with the airport.

Each method had positive and negative results and short of physically counting traffic year-round, achieving 100% accuracy is not possible. This means we accept the current count of 49,027 or establish a new baseline number. Realistically, because this figure is "relatively" low compared to other general aviation airports, and because whether the number is 25,000 or 50,000, or higher, the impact moving forward in terms of future airport development and FAA/NHDOT funding is negligible at best. That is the future development of aircraft parking aprons, and hangars (the two components that are driven by this count) is based on existing conditions, not forecasts. The "if we build it they will come" approach does not work with FAA and NHDOT funding.

³ FAA Airport Master Record, Form 5010-1. See Figure 2.3, page 2.5.

⁴ Muia, M. J., & Johnson, M. E. (2015). *Evaluating methods for counting aircraft operations at non-towered airports*. Washington, D.C.: Transportation Research Board.

2.14.3 Operations per Based Aircraft

One method of tracking operations addressed is a method that compares the number of takeoffs and landings as a percentage of the number of based aircraft. This approach, known as operations per based aircraft (OPBA), is a simple equation calculated as operations over based aircraft. While fallible, it will give us a number to work with based on known activity instead of pure guesswork. This calculation can be used in future measurements and crosschecked in the future by using one or more of the other methods addressed in the Synthesis discussed in the previous section or other methods that currently exist or may be developed in the future.

OPBA acts as a check-and-balance piece of information to determine if data reported at non-towered airports is consistent with other airports. This OPBA will be used as the baseline data to be used when developing the airport's short-, intermediate-, and long-term forecasts.

Activity at EEN was evaluated using recommendations in FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS). Paragraph 3-2c states:

When forecast data of aircraft operations is not available, a satisfactory procedure is to forecast based aircraft using the statewide growth rate from the TAF and to develop activity statistics by estimating annual operations per based aircraft. A general guideline is 250 operations per based aircraft for rural general aviation airports with little itinerant traffic, 350 operations per based aircraft for busier general aviation airports with more itinerant traffic, and 450 operations per based aircraft for busy reliever airports. In unusual circumstances, such as a busy reliever airport with many itinerant operations, the number of operations per based aircraft may be as high as 750 operations per based aircraft. An effort should be made to refine such estimates by comparing them to activity levels at similar airports or by conducting an activity survey.

The Dillant Hopkins Airport is considered a busy general aviation airport because of the number of itinerant operations, an active flight school and at least one other business (C&S Wholesale Grocers) that uses the airport on a regular basis. Because of this, using 350 operations per based aircraft will provide a starting point by providing a more realistic estimate of activity at EEN.

With 80 based aircraft and using 350 operations per based aircraft (OBA), the annual aircraft operations at EEN is probably around 28,000. Another assumption is that the ratio of local to itinerant operations will remain at 22% and 78%. Again, it is important to note that 28,000 is based on one of the several methods studied; the number could be higher or lower, but for the purposes of this master plan update, 28,000 is used.

Table 2-5 lists the historic aircraft operations as reported over the years to the FAA. This chart also lists the estimated activity for 2016.

YEAR	AIRCRAFT	LOCAL OPERATIONS	ITINERANT OPERATIONS	TOTAL OPERATIONS ⁵
1990	67	13,200	46,800	60,000
1995	54	10,982	38,934	49,916
2000	54	11,945	42,349	54,294
2005	85	11,945	42,349	54,294
2010	78	10,786	38,241	49,027
2015	80	10,786	38,241	49,027
2016	80	6,160	21,840	28,000

Sources: FAA Terminal Area Forecasts (Through 2013); NH State Aviation System Plan; Airport Manager (Jan 2015). Current 2016 activity is calculated using the based aircraft to operations formula discussed earlier.
Note: Local – Itinerant Mix is based on assessment of 2015 activity as reported by the airport manager (June 2014)

2.14.4 Fleet Mix and Operations

The airport's fleet mix consists primarily of single engine piston aircraft (86%) with multi-engine piston at 10% and helicopter and jet activity rounding out the remaining 4%. Table 2-6 lists the existing fleet mix as well as estimated local and itinerant operations, which with one exception is based on the revised annual operations count of 28,000 takeoffs and landings. The sole exception is jet aircraft local operations, which accounts for a much smaller percentage than other aircraft activity.

CATEGORY	NUMBER	PERCENTAGE OF FLEET	LOCAL OPERATIONS	ITINERANT OPERATIONS	TOTAL OPERATIONS
Single Engine Reciprocating	69	88%	5,421	19,219	24,640
Multiengine Reciprocating	8	5%	308	1,092	1,400
Helicopter	1	2%	123	437	560
Jet	2	5%	100	1,300	1,400
Total	80	100%	5,952	22,048	28,000

Source: Stantec calculations

⁵ Operations data for 1990 through 2015 is from FAA and NHDOT records. Operations for 2016 are based on the Operations per Based Aircraft calculation discussed in this section.

2.14.5 Peak Hour Operations

Peak hour operations (PH) are calculated to help determine facility requirements such as transient aircraft parking and passenger and pilot facility spatial needs. The months of July and August are typically the busiest period at most general aviation airport in the northern latitudes.

The calculations for determining an airport's PH involve some standard planning guidelines. These guidelines suggest that 15 percent of all annual operations occur in the peak month (PM) and that the peak month's average day (PMAD) is 1/30 of the PM. The PH is assumed 20 percent of PMAD. Given this, the PH for EEN is 28 operations, which is calculated as follows:

$$\begin{aligned} \text{Peak Month (PM)} &= \text{Total Operations} * 15\% \\ \text{Peak Month/Average Day (PMAD)} &= \text{PM}/30 \\ \text{Peak Hour (PH)} &= \text{PMAD} * 20\% \\ &\text{thus,} \\ \text{PM} &= 28,000 * 15\% = 4,200 \\ \text{PMAD} &= 4,200/30 = 140 \\ \text{PH} &= 140 * 20\% = 28 \text{ operations per hour} \end{aligned}$$

2.15 REGIONAL SETTING AND LAND USE

This master plan study will examine the regional setting of the airport and the land use patterns around it. This is a critical task because the impact of airport planning decisions can extend well beyond the airport property line. This assessment will include, where appropriate, some factors involving the adjacent land uses as well as the airport's setting on other federal-obligated airports.

The Dillant-Hopkins Airport is located approximately two miles southeast from the city center of Keene, New Hampshire in Cheshire County. However, the airport itself is situated in the town of Swanzey, NH. The city of Keene is home to two institutes of higher learning: Keene State College and Antioch University New England. Keene State College is a full-service, four-year College and Antioch University New England offers Masters, Doctoral, and Certificate programs.

The airport terminal is located off Airport Road, which connects to Highway 32 (Old Homestead Highway). Main Street brings users directly into downtown Keene, the cultural hub of the city.

2.15.1 Service Area

FAA guidelines suggest that the definition of an airport's service area includes the area within a 30-minute drive from a general aviation airport. Figure 2-16 identifies the approximate 30-minute driving time for Keene. As shown, it becomes apparent that the only other public use airport within EEN's service area is the Jaffrey Municipal Airport in Jaffrey, NH.

Estimates indicate that approximately 50,000 people reside in the airport's service area. The population of Cheshire County is 76,723, or 5.8% of New Hampshire's population (1,327,000 residents). The people residing in Keene is approximately 23,000 inhabitants (11th largest in NH), which represents 30% of the county's population.

2.15.2 Socioeconomic Patterns

Socioeconomic characteristics such as demographic and economic conditions provide insights concerning an area's historic and future growth. This information also is used to understand the dynamics of growth within an airport's service area. This information is helpful when calculating the airport's forecasts.

2.15.2.1 Demographics

The state of New Hampshire has seen a steady population growth since 1990. per the 2010 census, the state has grown 15.7% from 1,109,252 residents to its current population of 1,326,813. Since 2010, Cheshire County has decreased in population by 1.3 percent, going from 77,117 to 76,399 residents over the course of four years. The city of Keene has seen its population remain constant over the past four to five years. Its population in 2010 was 23,409 residents as compared to the 2013 estimate of 23,419, an increase of 10 inhabitants. The City's median age is 34 years of age.

2.15.2.2 Economics

Within the city of Keene, there are numerous medium-sized businesses. Nine businesses in the city employ more than 100 employees, including C&S Wholesale Grocers, who use the Dillant-Hopkins Airport as their gateway to the country. The largest employer in the city is in the medical field, employing approximately 1,400 residents. Some other notable employers in the city (industry; employment) are Keene State College (education; 929), Keene School District (education; 800), Smith Industrial Medical Systems (healthcare supplies; 481), and the Markam Image Corporation (industrial; 400).

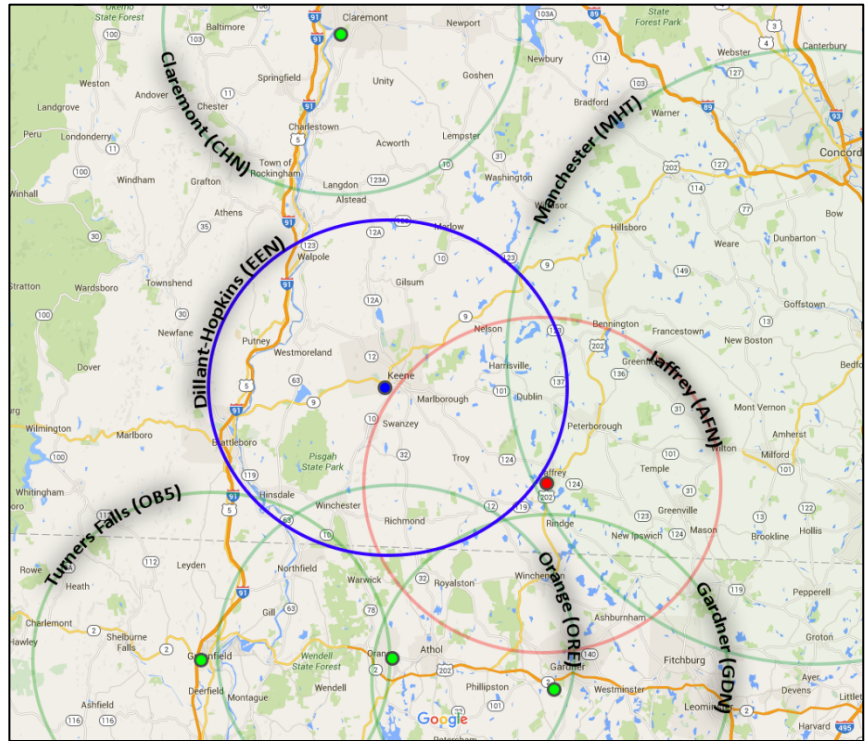


Figure 2-16. EEN's Approximate Service Area

To summarize, on a large scale, the state of New Hampshire and Cheshire County have increased in population since 1990. The city of Keene, however, has indeed increased in population, but at a significantly lesser rate than the state and county. This growth on all levels over a 30-year period bodes well for the Dillant-Hopkins Airport and its future impact in the community.

2.16 ENVIRONMENTAL OVERVIEW

The principal objective of an environmental overview is to document environmental conditions to be considered in the identification and analysis of airport development alternatives. Future alternatives will be prepared with the existing environmental conditions in mind and will consider available environmental data in the evaluation of each of the alternatives. Thus, this master plan may aid in the formation of the purpose and need statements in subsequent environmental documents.

2.16.1 Natural and Human Environment

This subsection summarizes the existing physical and human environments to be considered when planning improvement projects at Dillant-Hopkins Airport. The environmental resources identified on and within the immediate vicinity of airport property to be evaluated for potential impacts from future airport development outlined in the AMPU include wetlands, soils, land use, wildlife, and surface water.

The assessment of the natural environment near the Dillant-Hopkins Airport is an important first step when planning feasible alternatives for airport improvement projects. Natural resources may be protected by laws and regulations at the federal, state, and local levels and may require the acquisition of permits before completing land-altering activities. Many of these licenses contain conditions mandating the completion of construction per sequences and methods. Also, the natural environment of a site often dictates the location and layout of improvement projects because of the cost of construction, permitting, and mitigation can be prohibitive when the proposed development plan involves direct impacts to protected natural resources. Soil characteristics, rare species habitat, surface and subsurface hydrology, water bodies, wetlands, floodplains, and topography all affect the degree to which a parcel of land can be developed and/or how the development can proceed.

2.16.2 Wetlands

Dillant-Hopkins Airport was constructed in the floodplain of the Ashuelot River Watershed. The floodplain area of the property includes forested, emergent, scrub-shrub, and open-water wetlands. A large wetland complex is present in the western region of the airport property, which extends to the east bank of the Ashuelot River. The wetland complex covers approximately 435 acres of airport property.

This large wetland complex includes a wet meadow wetland that is associated with a drainage ditch along the edge of Runway 02-20. The wetland also extended outside of the edges of the ditch in several places. The northern portion of the wetland is a true marsh, as evidenced by areas of standing water and the presence of species more tolerant of ponding conditions. The wetland (Figure 2-17) is dominated by broad-leaved cattail (*Typha latifolia*), wool-grass (*Scirpus cyperinus*), tussock sedge (*Carex stricta*), fowl mannagrass (*Glyceria striata*), necklace sedge (*Carex projecta*), soft rush (*Juncus effusus*),

lurid sedge (*Carex lurida*), and bluejoint (*Calamagrostis canadensis*). Evidence of wetland hydrology includes areas of inundation, saturation at the soil surface, wetland drainage patterns, and water-stained leaves.



Figure 2-17. Typical Wetland Area on Airport
(Photo by Stantec)

Other prominent on-airport wetlands include a palustrine emergent (PEM) wetland associated with a perennial stream channel receiving flow from an 800-foot long culvert buried beneath the Runway 02 approach end (this culvert was extended in a 2014 RSA improvement project); see Figure 2-17. The stream meanders within the boundaries of the wetland. Historical evidence indicates that this wetland and stream may have been constructed to aid drainage during construction

of the airport. The stream is fed from Wilson Pond, where the

water level is controlled at the outlet from the pond. The stream has naturalized and has an ordinary high water mark with a direct connection to a natural stream channel to the west. Additionally, the stream, approximately 10 feet wide and three to four feet deep with primarily sand and silt substrate, is considered perennial. The floodplain wetland borders the stream with a herbaceous layer dominated by wool-grass, sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), lurid sedge, path rush (*Juncus tenuis*), river bulrush (*Bolboschoenus fluviatilis*), and bluejoint. Scattered shrubs of red-osier dogwood (*Cornus sericea*) and meadowsweet (*Spiraea alba* var. *latifolia*) are also present on the edges of the wetland. Soils in the wetland are loamy sand that exhibits a depleted matrix within six inches of the ground surface. Evidence of wetland hydrology includes wetland drainage patterns, inundation, saturation at the surface of the ground, and water-stained leaves. Beaver (*Castor canadensis*) activity has been observed downstream of this wetland area.

There is also a palustrine forested (PFO) and palustrine scrub-shrub (PSS) wetland located to the north of Airport Road. The wetland occurs in a depression and follows a clear break in topography on all sides. Wetland soils here are typically saturated to the surface and are characterized by a deep organic horizon with 36 inches of mucky peat. The forested portion of the wetland is dominated by larch (*Larix laricina*), black spruce (*Picea mariana*), and red maple (*Acer rubrum*) with highbush blueberry (*Vaccinium corymbosum*) dominating the outer shrub layer. The interior of the wetland can be described as a dwarf shrub bog and is dominated by shrubs and emergent vegetation. Black spruce, leatherleaf (*Chamaedaphne calyculata*), sheep-laurel (*Kalmia angustifolia*), common winterberry (*Ilex verticillata*) and bog-rosemary (*Andromeda polifolia*) are dominant in the shrub layer of the bog. The herbaceous

layer contains bog-rosemary, three seed sedge (*Carex trisperma*) purple pitcherplant (*Sarracenia purpurea*), and little cranberry (*Vaccinium oxycoccos*); the interior of this wetland is covered by peat moss (*Sphagnum* sp). The bog is used as a passive recreational site to observe wildlife and is valued as an educational tool for local students due to the classic plant species composition present and the successional stage of the bog.

2.16.3 Other Water Resources

As stated above, Dillant-Hopkins Airport is located within the Ashuelot River watershed, which is part of the larger Connecticut River watershed. The Ashuelot River watershed is part of the Silvio O. Conte National Fish and Wildlife Refuge. The refuge was created to conserve, protect, and enhance the diversity of species that exist within the Connecticut River watershed. Figure 2-18 – Connecticut River

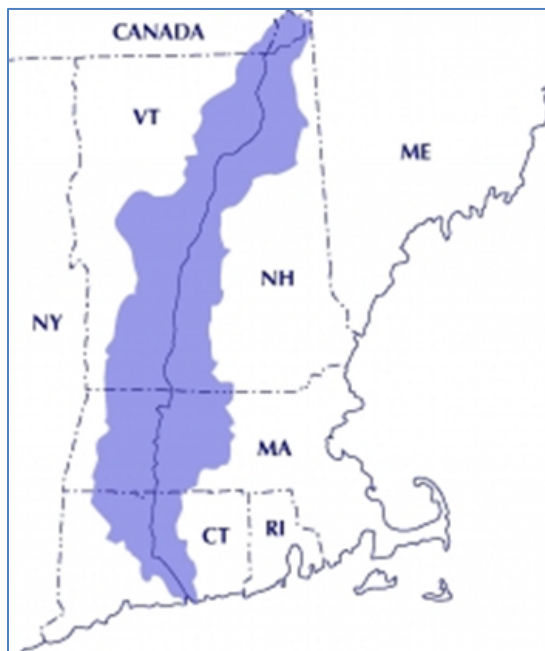


Figure 2-18. Connecticut River Watershed

Watershed shows the watershed map with state boundaries.

An aquifer occurs when the saturated, subsurface ground water zone has the potential to provide a substantial volume of groundwater via wells or springs. Stratified-drift aquifers, which consist mostly of sand or layers of sand and gravel and contain an available supply of water, underlay ten percent of the Lower Connecticut River Basin drainage area, namely in the towns of Keene, Swanzey, Winchester, Hinsdale, and Walpole. per the U.S. Geological Survey, roughly 25% of the land area in Keene and Swanzey is underlain by stratified drift aquifer, including the land beneath Dillant-Hopkins Airport. The zoning districts for the City of Keene include an Earth Excavation Overlay District, which limits earth excavation activities to regions. The Earth Excavation Overlay District does not contain any portion of land located within, over, or covering a stratified drift aquifer, or covering the wellhead

protection areas for the city, maintained municipal wells, and proposed future city municipal wells sites. The Town of Swanzey's Master Plan Update outlines measures to protect the integrity of aquifers that underlay the town as well. The protection of water resources will be discussed in further detail in a later section of this Master Plan Update for Dillant-Hopkins Airport.

The Ashuelot River flows in a southerly direction along the western edge of airport property. The South Branch of the Ashuelot River flows in a northerly direction toward the west region of the airport and drains into the Ashuelot River to the west of the Runway 02 end. Under the New Hampshire Rivers Management and Protection Program, the Ashuelot River was classified as a Designated River in 1993. This designation provides protection by the New Hampshire Department of Environmental Services (NHDES) for outstanding natural and cultural resources. Protected river resources include one of the

four most important refuges for the federally endangered dwarf wedge mussel and the oldest known evidence of man in New Hampshire.

Wilson Pond, 72 acres in size, is located east of the airport and NH Route 32. The pond is dam controlled and drains from its southern end through a manufactured canal constructed in the eastern region of airport property. The canal drains through a 6-foot culvert beneath Runway 02 before discharging into the South Branch of the Ashuelot River.

2.16.4 Soils

The soil types of the airport property were identified using the Web Soil Survey available through the Natural Resources Conservation Service website. Three primary soils comprise the airport soil profile. Areas adjacent to the runways are classified as Udorthents, which include excessively drained fill material used in construction. Areas near the ends of Runway 02-20 consist mainly of Caesar loamy sands, which are also excessively drained soils. Upland areas west of Runway 02-20 are mostly comprised of Saco mucky silt loam, a very poorly drained class of wetland soils.

2.16.5 Land Use

Dillant-Hopkins Airport is in the Town of Swanzey and is subject to Swanzey's zoning regulations. The Zoning Ordinance⁶, Town of Swanzey, New Hampshire included Dillant-Hopkins Airport in the Airport Zoning District. To the east of Runway 02-20 is an Industrial Park Zoning District. Adjacent areas to the airport are also regulated by Residential Zoning. To the north of the airport in the city of Keene, abutting zoning districts include Low-Density Residential, High-Density Residential, and Industrial. The Ashuelot River and the South Branch Ashuelot River, located west of the airfield, and Wilson Pond, located east of Route 32 are subject to the Swanzey Shoreland Protection District.

The Airport Zoning District is an overlay zone enacted in 1997 with the purpose of regulating and restricting the height to which structures and trees may be erected or allowed to grow, and to regulate and restrict the operation and discharge of smoke, steam, dust or other obstructions to visibility, electrical impulses and disturbances which interfere with radio aids or communication, and to regulate and restrict lighting as may be necessary to effectuate a safe approach to the airport.

The Overlay Zone (Figure 2-19) closely resembles the Part 77 surface shown in the Airspace Drawing in Appendix D, however, there are two noted areas (in red) where the Zone in Figure 2-18 does not agree with Part 77. The Part 77 Runway 2 approach surface is a 50:1 slope for the first 10,000 feet, then 40:1 for another 40,000 feet; whereas, the town's Plan shows the two slopes as 34:1 and 29½:1 respectively. Each zone on the Overlay Zone has height restriction criteria. In addition, the town has in place building permit and application requirements.

⁶ Zoning Ordinance, Town of Swanzey, New Hampshire, adopted September 8, 1947, as amended through March 8, 2016. Zoning maps and regulations are available at <http://www.town.swanzey.nh.us/>.

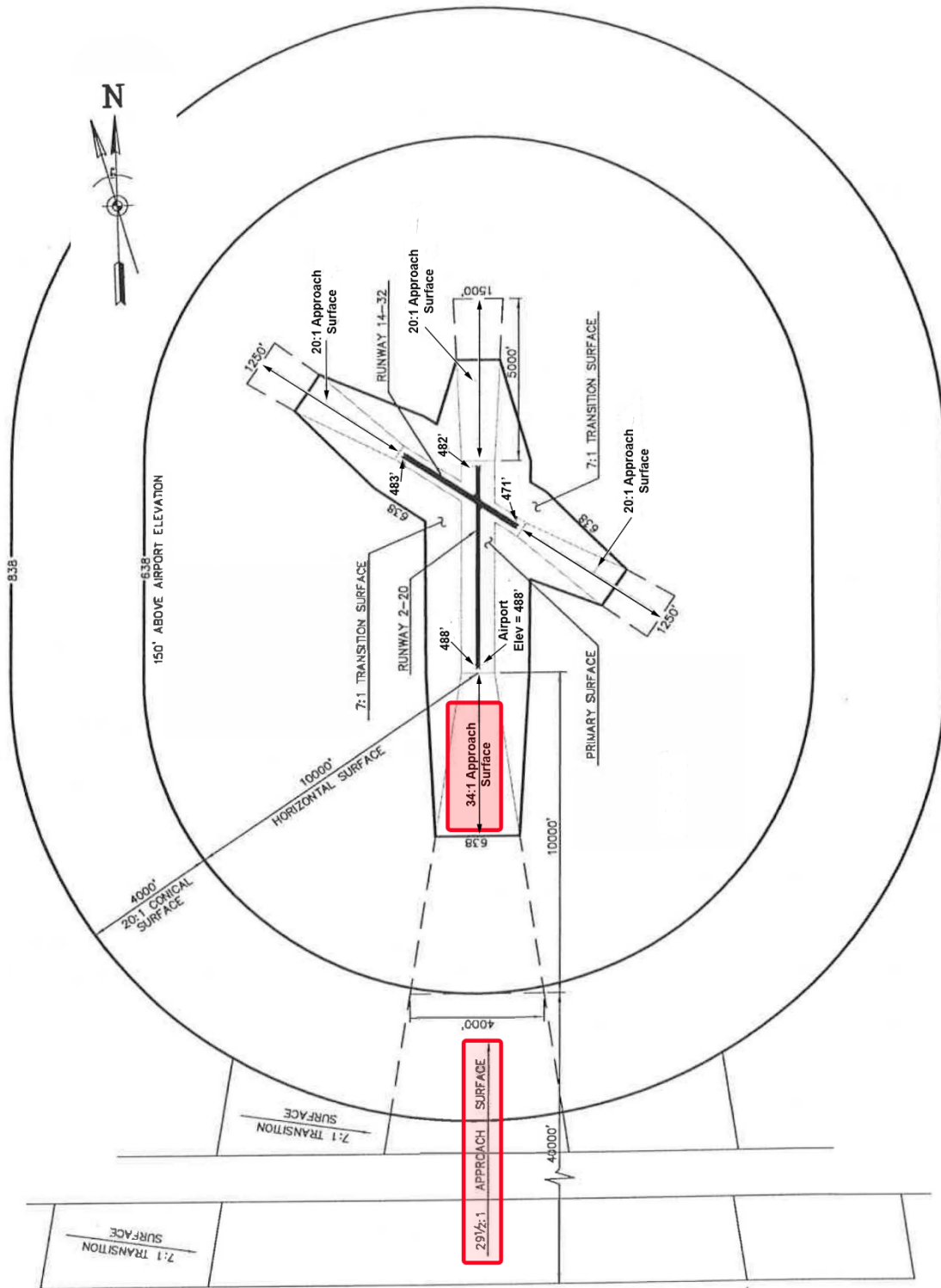


Figure 2-19. Town of Swanze Airport District Overlay Zone
 (Source: Town of Swanze) (enhanced for clarity)

2.16.6 Biotic Communities

The Environmental Conservation Online System, available through the U.S. Fish and Wildlife Service (USFWS) website, was utilized to identify the presence of federally listed endangered or threatened species in Cheshire County, New Hampshire. per the USFWS, the dwarf wedgemussel (*Alasmidonta heterodon*), found in the Ashuelot River, is listed as endangered. Figure 2-20, *Alasmidonta heterodon* depicts the endangered species. As of April 2, 2015, the northern long-eared bat (*Myotis septentrionalis*) is federally listed as a threatened species. Northern long-eared bats hibernate during the winter in caves and mines and roost during the summer in cavities of trees or structures such as barns and sheds. New Hampshire Fish and Game reports the known distribution of the northern long-eared bat in New Hampshire includes Cheshire County.



Figure 2-20. *Alasmidonta heterodon*

The 2013 Natural Heritage Inventory (NHI) of the New Hampshire Division of Forest and Lands was consulted to identify state listed species of flora and fauna within the vicinity of the airport. A silver maple-false nettle-sensitive fern floodplain forest is listed as a community of highest importance in Swanzey by the NHI. The floodplain forest occurs along medium-sized rivers in New Hampshire, including the Ashuelot. Silver maple dominates the canopy, and sensitive fern and false nettle are abundant in a diverse ground cover. The community includes riparian vernal pools and sand levees near the river bank.

Under the 2013 NHI, State listed endangered plant species in Swanzey include Carolina crane's-bill (*Geranium carolinianum*) and long-headed windflower (*Anemone cylindrica*). State listed bird species are as follows: grasshopper sparrow (*Ammodramus savannarum*) - threatened; horned lark (*Eremophila alpestris*) - particular concern; vesper sparrow (*Pooecetes gramineus*) - special concern.

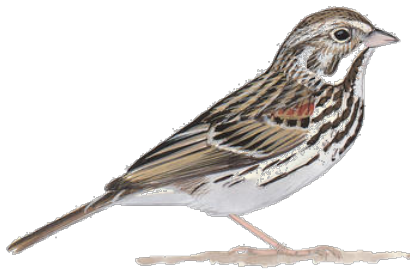


Figure 2-21. Grasshopper Sparrow

per New Hampshire Fish and Game (NHFG), grasshopper sparrows (Figure 2-21) use dry fields and sparse grasses for their habitat and are known to have utilized the grass fields at Dillant-Hopkins Airport for nesting. Breeding observations of the horned lark have also been recorded at Dillant-Hopkins Airport in sparsely vegetated open areas. The vesper sparrow uses dry, open grassy areas for breeding grounds. There is potential for vesper sparrows to inhabit the grass fields at Dillant-Hopkins Airport.

Other state listed vertebrates of particular interest include the wood turtle (*Glyptemys insculpta*) (Figure 2-22), northern leopard frog (*Rana pipiens*), and American eel (*Anguilla rostrata*). The habitat of the wood turtle during winter hibernation and spring and fall activities is slow moving streams and rivers. In the summer months, wood turtles use terrestrial fields, shrublands, and floodplains for habitat. The Ashuelot River and floodplain on airport property are ideal habitats for this species. NHFG reports the wood turtle as present in Swanzey and Keene. The northern leopard frog uses wet meadows or a field associated with river floodplains for summer habitat and is present in Swanzey and Keene. American eels spawn in the Atlantic Ocean and return to freshwater systems as adults. The American eel is known to be present upstream and downstream of the West Street Dam on the Ashuelot River in Keene. The NHI lists the dwarf wedge mussel as endangered at the federal level, as well as at the state level.



Figure 2-22. Wood Turtle

2.16.7 Obstruction Analysis

Developing this master plan also involved evaluating both on and off airport obstructions to surrounding airspace. As part of this analysis, we evaluated obstructions for four types of surfaces: the FAA Part 77, Terminal Instrument Procedures (TERPS), threshold siting, and PAPI surfaces.

- **FAR PART 77.** Refers to the United States Code, Title 14, Part 77. This federal statute defines the location and size of five different imaginary surfaces that encompass a runway and airport. In theory, Part 77 is used to assist communities in developing height restrictions and land use on and around an airport.
- **THRESHOLD SITING SURFACE.** This type of imaginary surface begins at the runway's delineated threshold and rises at a 20:1 ratio in the direction of the runway's approach path. This surface is analyzed to identify any obstructions to the runway's approach path directly to the runway threshold.
- **PAPI SURFACE.** As discussed earlier, a PAPI is a navigational aid to pilots when approaching a runway from the air. It provides pilots a visual glide slope which safely guides the pilot to the

desired runway at a predetermined angle of descent. In Keene’s case, the slope is 3.0°, the standard angle of descent for airports with significant jet traffic.

- **TERMINAL INSTRUMENT PROCEDURES.** These procedures are dedicated to prescribing the criteria for the formulation, review, approval, and the publishing of procedures for Instrument Flight Rules (IFR) operations. TERPS criteria specify the minimum measure of obstacle clearance that is considered by the FAA to supply a satisfactory level of vertical protection from obstructions and are predicated on normal aircraft operations.

Table 2-7 lists the imaginary surface(s) analyzed for each runway end. Also, the table identifies each runway end’s corresponding figure depicting the obstructions found during analysis.

RUNWAY END	SURFACE(S) ANALYZED	FIGURE	LEGEND
Runway 02	<ul style="list-style-type: none"> • TERPs ILS Final Approach • TERPs Visual Approach • Threshold Siting • Precision Approach Path Indicator 	Figure 2-23	
Runway 20	<ul style="list-style-type: none"> • TERPs Visual Approach • Threshold Siting • Precision Approach Path Indicator 	Figure 2-24	
Runway 14	<ul style="list-style-type: none"> • TERPs Visual Approach • Threshold Siting 	Figure 2-25	
Runway 32	<ul style="list-style-type: none"> • Displaced Threshold Siting 	Figure 2-26	

The analysis of all four runway ends used data collected in 2013. In the spring of 2017, the airport cleared a large section of trees in the Runway 20 approach surface on airport property (between Airport Road and the airport property line bounding the Edgewood residential area. This clearing is shown in the two images in Figure 2-24.

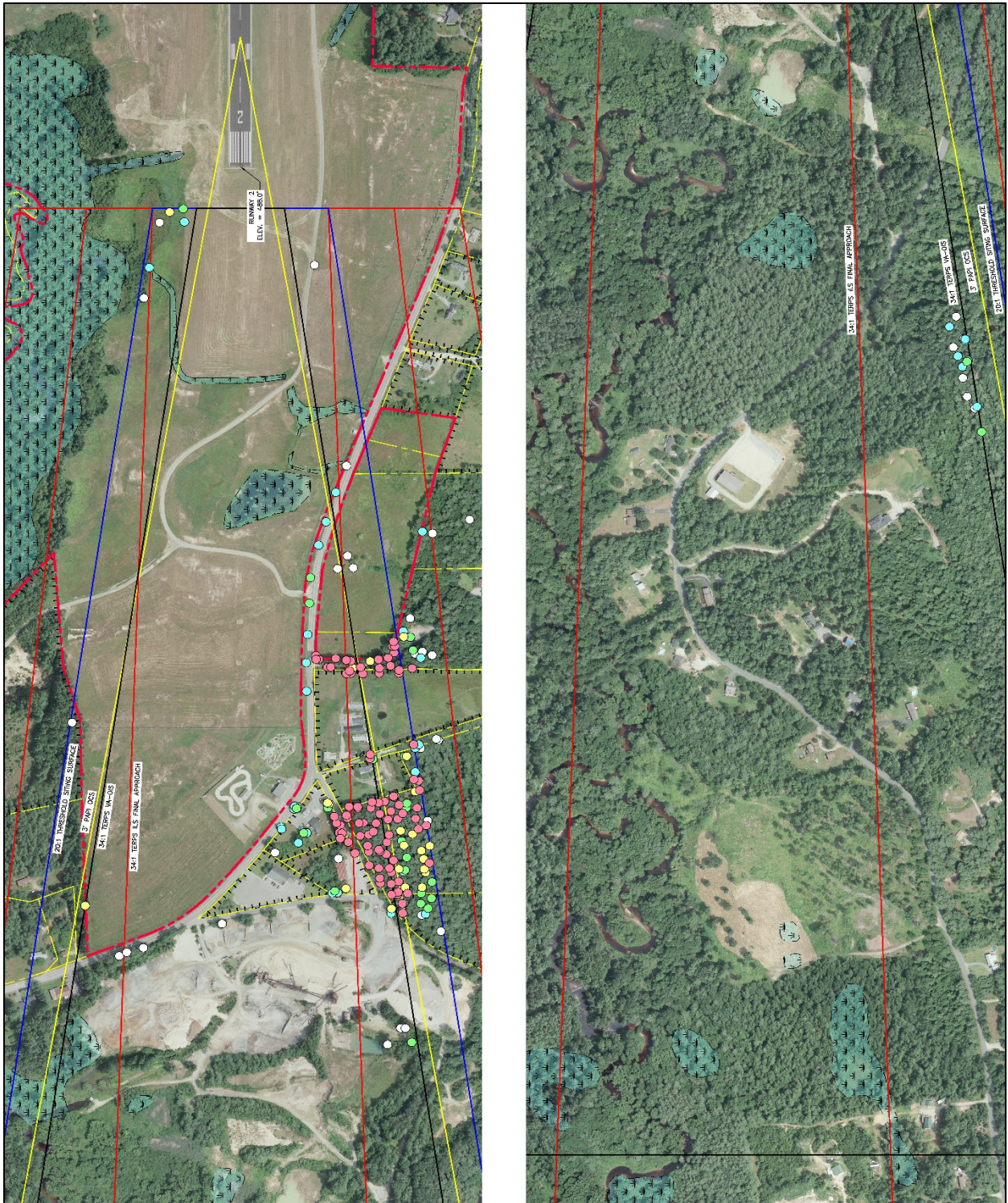


Figure 2-23. Composite Airspace Analysis Runway 02
Note: The right side is a continuation of the left graphic.



Figure 2-24. Composite Airspace Analysis Runway 20

Left Photo: Data from 2013 Aerial Survey
Right Photo: Results of tree clearing in April-May 2017

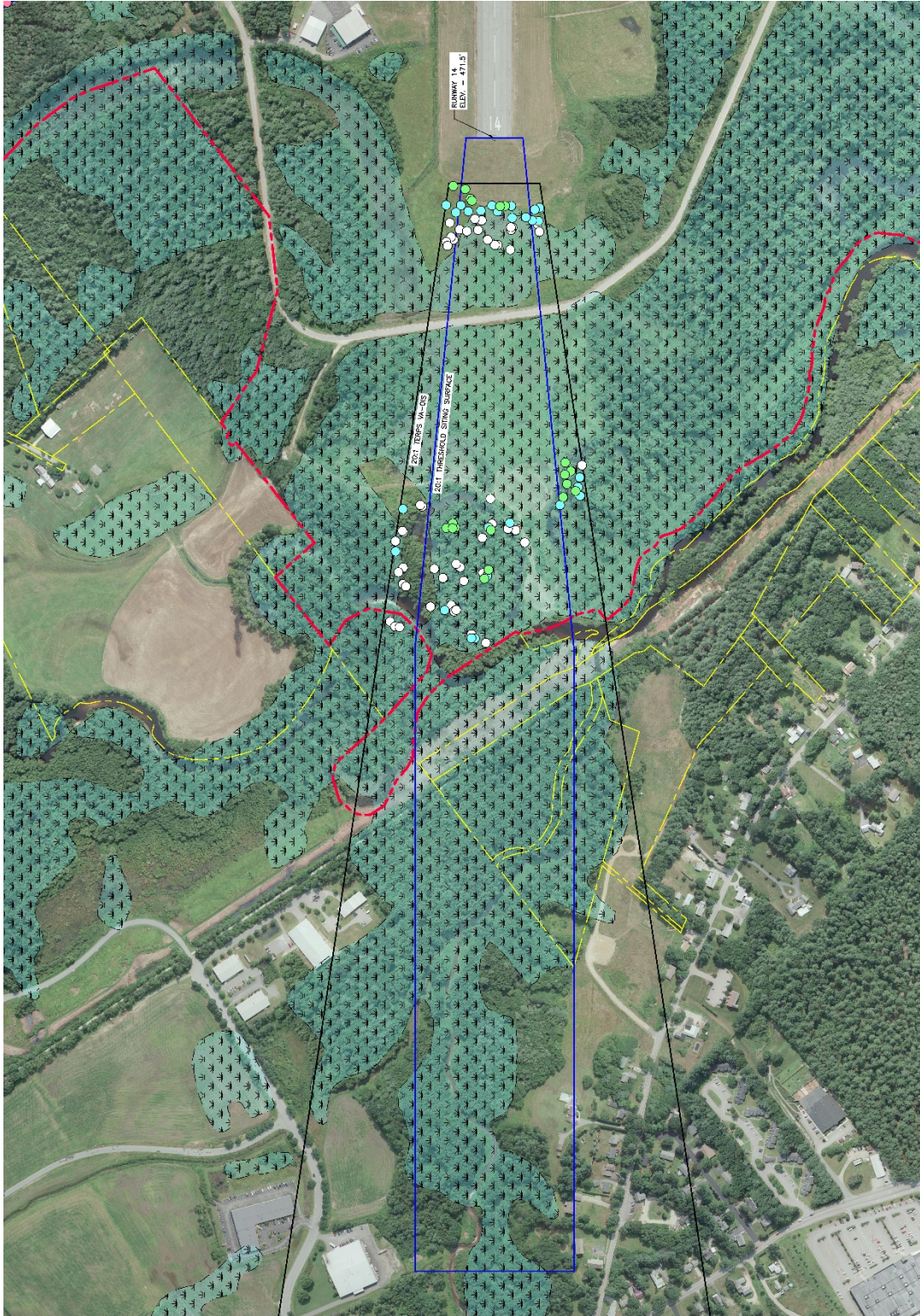


Figure 2-25. Composite Airspace Analysis Runway 14



Figure 2-26. Composite Airspace Analysis Runway 32

2.17 WILDLIFE & SECURITY FENCING

The airport is partially enclosed with chain link fencing, primarily between the terminal area and along Airport Road and Old Homestead Road. The fence makes use of existing buildings that act as barriers between the airports public and operational sides. There is no fencing on the airport's south and western sides, which are areas frequented by deer and other wildlife. There have been several deer and bird strikes over the years with the most recently occurring in May 2016. Fencing includes several gates for both vehicles and pedestrians, which are a combination of motorized (with electronic access and manual. Figure 2.26 is a photo of a section of fence near the Terminal Building. The Existing Facilities Plan (Figure 2.4, page 2.6) shows the location of the existing fence.



Figure 2-10. Typical Fencing at EEN
(Photo by Stantec, April 2016)

2.18 INVENTORY SUMMARY

Table 2-8 summarizes the quantity of aircraft and operations as well as other quantifiable data at EEN, and it along with other measurable and unquantifiable statistics provide the basis for the airport's forecasts, facility requirements, and other elements of this master plan. Some significant findings of our field investigations and preparation of the inventory section include the following assessment:

- Historical fact, the number of based aircraft at Keene has remained above national averages as compared to similarly-categorized airports.
- Single-engine aircraft dominate airport usage, accounting for many the takeoffs and landings at the airport.
- Aircraft operations were reassessed and reduced from the previously reported 49,000 to 28,000 annual takeoffs and landings.
- The population of the state, Cheshire County, and the city of Keene are consistent with each other in the fact that each has seen growth since 1990. The city of Keene, however, saw the lowest rate of growth.
- Obstructions to Part 77 surfaces are a concern vegetation, which will only continue to grow. As noted, most vegetation growth is located off airport property.

Table 2-8. Inventory Summary	
ELEMENT	MEASUREMENT
Runway 02-20	6,201' x 100'
Runway 14-32	4,001' x 150'
Critical Aircraft	Challenger 300
Runway Reference Code	Runway 02-20: C-II / Runway 14-32: B-II
Fleet Mix (Aircraft/Operations)	
<i>Single Engine Reciprocating</i>	69
<i>Multiengine Reciprocating</i>	8
<i>Jet</i>	2
<i>Helicopter</i>	1
<i>Total Based Aircraft</i>	80
Population of Service Area	50,000
Based Aircraft to Population	1:625
Operations	
<i>Local</i>	21,840 (78%)
<i>Itinerant</i>	6,160 (22%)
<i>Total</i>	28,000
Operations per Based Aircraft	350
Peak Operations	
<i>Peak-Month (PM)</i>	4,200
<i>Peak-Month/Average-Day (PMAD)</i>	140
<i>Peak-Month (PH)</i>	28
Hangar Space	T-Hangars: 52 / Conventional: 10
Apron Space	312,000 sq. ft.
Fuel Storage Tanks (gallons)	C&S Fuel: Jet A – 15,000 FBO Fuel: 100LL – 10,000 / Jet A – 10,000
Annual Fuel Sales, FBO (gallons)	100LL – 30,000/ Jet A – 80,000
Automobile Parking	66,000 sq. ft.



3 FORECASTS OF AVIATION ACTIVITY

3.1 INTRODUCTION

Chapter 3 projects the airport's existing activity forward 20-years, in three planning periods. Projecting future aviation activity at an airport is one of the most important and vital steps in the master planning process. All master plan recommendations for facility needs, both airside and landside, will be directly affected by the projected aviation activity levels presented in this chapter. To develop the most realistic forecasts possible, a solid understanding of current and historical airport operations, industry trends, and socioeconomic conditions within the Airport's primary service area (i.e. market area) is vital. These variables must be factored into a range of forecast scenarios that, together, will make up the master plan estimates.

Forecasts are developed using the methodology discussed in section 3.4 on the next page.

3.2 FAA APPROVAL

The forecasts were initially prepared in April 2016 and revised in November 2016 to reflect comments from the city and NHDOT/BOA. These projections provided the basis for projecting facility requirements, implementation planning, and other analyses as part of the master plan update. NHDOT approved these forecasts on February 3, 2017.¹

3.3 AIRPORT MASTER PLANNING PROCESS

As stated in FAA Advisory Circular (AC) 150/5070-5B, *Airport Master Plans*, dated January 27, 2015, forecasts are the basis for effective decision-making in airport planning. Further, FAA Order 5090.3C² states that forecasts should:

- Be realistic;
- Be based on the latest available data;
- Reflect current conditions at the Airport;
- Be supported by information in the study; and
- Provide adequate justification for airport planning and development.

The forecast analysis for EEN follows these basic guidelines. Other forecasts such as those in the last update, the FAA's Terminal Area Forecasts³, and the newly released NH State Airport Systems Plan⁴ (2015) were examined and compared against the current and historical activity. The historical aviation activity was then considered alongside other factors and trends that could affect demand. The intent is

¹ Email R.Hunt, NHDOT, dated 2/3/2017.

² FAA Order 5090.3C, Field Formation of the National Integrated Airports Systems (NPIAS)

³ Terminal Area Forecasts are the official FAA forecasts of aviation activity for U.S. airports.

⁴ New Hampshire State Airport Systems Plan. Prepared by McFarland Johnson and Louis Berger (February 2015).

to provide an updated set of aviation demand projections for the Airport that can be incorporated into the facility needs analysis of the Master Plan.

The forecast process consists of a series of necessary steps that can vary depending upon the issues addressed and the level of effort required to develop the estimates. These basic steps include a review of previous forecasts, determination of data needs, identification of data sources, a collection of that data, selection of projection methods, preparation of the estimates, and evaluation of documentation of the results. FAA guidelines (AC 5070-6B, *Airport Master Plans*) outline seven standard steps involved in the forecast process.

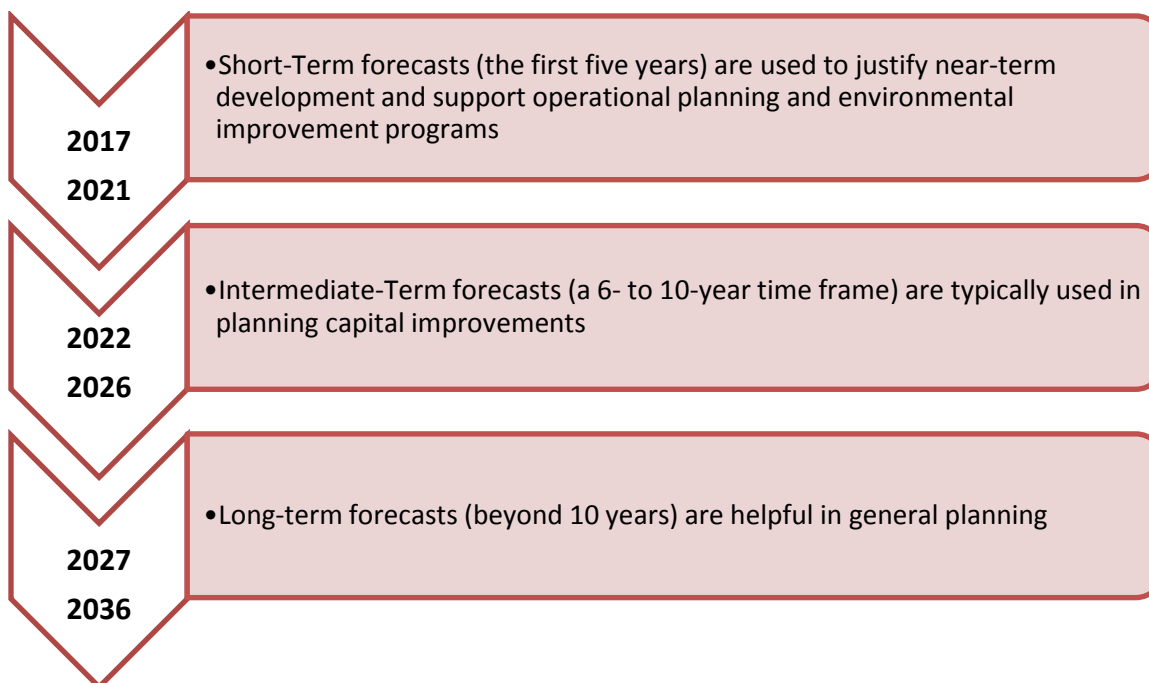
1. **Identify Aviation Activity Measures.** These are the aviation activities that would affect the capacity of airport facilities. For general aviation, this typically includes based aircraft and operations.
2. **Review Previous Airport Forecasts.** The previous forecasts include the FAA Terminal Area Forecast (TAF), any state or regional system plans, and previous master plans.
3. **Gather Data.** Determine what data are required to prepare the forecasts, identify data sources, and collect historical and forecasted data.
4. **Select Forecast Methods.** There are several appropriate methodologies and techniques available; in this study, a trend analysis of historic local, regional, and national data, compared to state and national projected activity, as well as professional judgment is used to determine future activity.
5. **Apply Forecast Methods and Evaluate Results.** Prepare the actual forecasts and assess for reasonableness.
6. **Summarize and Document Results.** Provide supporting text and tables to explain the rationale behind the projections.
7. **Compare Forecast Results with the TAF.** Follow guidance in FAA Order 5090.3C. In part, the Order indicates that forecasts should not vary significantly (more than 10%) from the TAF. When there is a variance greater than 10%, supporting documentation should be supplied to the FAA.

3.4 FORECASTING METHODOLOGY

Choosing the appropriate methodology is a critical component to developing forecasts which allow for adequate planning for future system needs. The approach used to develop forecasts for this Update involves the identification of historical relationships between national, regional, state, and local estimates, as available, as well as operational and based aircraft data. Demand projections for general aviation aircraft operations and based aircraft for this effort were primarily developed through an analysis of historical trends nationally, as well as statewide. This historical trending analysis, combined with growth rates from the FAA Aerospace Forecast for Fiscal Years 2015-2035 were the chosen methodology for this forecast effort.

Utilizing this information for a master plan forecast is an industry accepted practice and an appropriate level of effort for this system plan. Other methodologies commonly used to predict aviation activity (e.g., regression analysis) were not employed.

It is important to emphasize that aviation forecasting is not an “exact science,” so expert judgment and practical considerations ultimately influence the level of detail and effort required to establish a reasonable aviation forecast and the development of decisions that result from them. This forecasting effort is presented in standard five, ten, and 20-year increments. Historically, the general aviation industry has been highly cyclical, exhibiting strong growth during economic expansions and negative growth during economic uncertainty.



3.5 FACTORS INFLUENCING AVIATION ACTIVITY

Aviation activity is impacted by a range of local, regional, or national events, making it difficult to predict year-to-year fluctuations of activity or to forecast growth, particularly 20 years from now. Therefore, it is important to remember that estimates serve only as guidelines and planning must remain flexible enough to respond to a range of unexpected developments.

The following forecast analysis for Keene was produced following these basic guidelines:

- Existing estimates at the national and state level are examined and compared against current and historical activity at the airport.
- The historical aviation activity is then considered along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation demand projections for the Airport that will permit Keene officials to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

3.6 BASELINE FORECAST DATA

For this 20-year forecast, Dillant-Hopkins Airport data as of November 2016 served as the baseline or base year.

3.6.1 Operations

The number of existing aircraft operations is derived from an analysis performed during development of Chapter 2, Inventory of Existing Conditions (see paragraph 2.13.2, page 2.19). Table 3-1 breaks out operations by aircraft category.

3.6.2 Based Aircraft

Projections for the number of general aviation aircraft at the Airport are used for determining general aviation facility needs and anticipated operations, as well as projected revenue derived from fuel sales. Table 3-2 provides the breakdown of 2016 airport-based aircraft by category. Typical of many GA airports in the United States, most based aircraft at EEN are a single-engine piston type.

3.7 NATIONAL FORECASTS

As with baseline operations data, the forecast factors are collected from multiple sources and adjusted as necessary based on the airport, market, and industry conditions. The following are the primary sources of the national data used in this forecast:

- FAA Terminal Area Forecast (TAF) (as of December 2015); and
- FAA Aerospace Forecast, Fiscal Years (2015 – 2035)

3.7.1 Terminal Area Forecasts (TAF)

The TAF⁵ is the FAA's forecast of aviation activity for U.S. airports. FAA estimates are prepared for primary users of the National Airspace System; these categories include air carrier, air taxi/commuter, general aviation, and military. The TAF are prepared to meet the budget and planning needs of the FAA and provide information for use by state and local authorities, the aviation industry, and the public. Moreover, while the FAA does not encourage the sole use of the TAF as the airport's forecast, it is

AIRCRAFT CATEGORY	OPERATIONS	RATIO
Air Carrier	0	0%
Air Taxi	3,280	12%
General Aviation Local	6,160	22%
General Aviation Itinerant	17,030	61%
Military	1,530	5%
Total Operations	28,000	100%

Source: Stantec Analysis (see Section 2.13.3)

AIRCRAFT CATEGORY	COUNT	RATIO
Single Engine Piston	61	76.3%
Multi Engine Piston	6	7.5%
Turboprop	2	2.5%
Jet	2	2.5%
Rotorcraft	1	1.3%
Experimental	3	3.8%
Sport	5	6.3%
Total Based Aircraft	80	100%

Source: Master Record Form 5010-1 and EEN Management

⁵ FAA Terminal Area Forecasts (https://www.faa.gov/data_research/aviation/taf/)

standard practice to use the TAF for comparison purposes. However, because the historical reporting of aircraft operations was modified from 49,000 to 28,000 (the former being the same data reported in the TAF), consulting the TAF would not provide any data useful in the preparation of the EEN Forecasts. The change in total operations from 49,000 to 28,000 is discussed in Chapter 2 (see Paragraph 2.14.2, page 2.9).

3.7.2 FAA Aerospace Forecasts

The second set of FAA forecasts consulted were the FAA Aerospace Forecasts, FY 2015 - 2035⁶. These provide an overview of aviation industry trends and expected growth for the commercial passenger carrier, cargo carriers, and general aviation activity segments. National growth rates in enplanements, operations, fleet growth, and fleet mix for the general aviation fleet are provided over a 20-year forecast horizon. For Keene's forecast, the FAA Aerospace Forecasts were used as the basis for determining the growth of the general aviation fleet at EEN and its composition by type of aircraft (i.e. general aviation fleet mix).

Forecasts for Keene begin with an examination of the national scene historical and projected changes with the U.S. general aviation market, and specifically, the number of fleet aircraft, the fleet mix, and the number of estimated hours flown.

The 2015 Aerospace Forecasts predict that as the economy recovers from the worst economic downturn since World War II and the slowest expansion in recent history, aviation will continue to grow over the long run. However, this is more applicable to the commercial sector than to the struggling general aviation market. While commercial air travel and air cargo has seen a significant increase in passenger enplanements and goods moved, the general aviation end of the market has not been as productive. Still, while the recreational fleet has been in a slow decline for the past ten years due to fuel prices and the general economy, the high-end general aviation market (i.e. business jet fleets) has grown at a pace faster than the commercial market.

As noted in the Aerospace Forecasts, the general aviation market continues its recovery, with a focus on the high-end business-related sector. Continued concerns about safety, security, and flight delays involving commercial air travel keep business aviation attractive. In 2014, the turbojet sector recorded its first increase in deliveries by U.S. manufacturers since 2008. For the third year in a row, single-engine piston deliveries have increased but remain well below historical trends dating back to the period from circa 1970 –2000.

While it is slightly lower than predicted last year, the growth in business aviation demand over the long term also continues to expand regarding the number of aircraft, flight hours and passenger movement. As industry experts and prior year's survey results report that a significant portion of piston aircraft hours is also used for business purposes, the FAA predicts business usage of general aviation aircraft will expand at a faster rate than that for personal and recreational use. Increased demand for turboprop aircraft, which are popular and often used for business purposes, also contributes to increased turbine

⁶ FAA Aerospace Forecasts, 2015 – 2035 (https://www.faa.gov/data_research/aviation/taf/)

fleet and hours flown. As the fleet grows, the number of general aviation hours flown is projected to increase an average of 1.4% per year through 2035.

General aviation highlights from the 2015 – 2035 forecasts include four essential elements: Fuel sales, fleet aircraft, hours flow, and active pilots. Each is discussed in the following sections.

- National Fuel Sales Projections.** This data is an indicator of how much fuel the FAA forecasts in future sales to both turbine aircraft that use Jet A fuel, and piston aircraft that use 100LL (also referred to as Avgas). As noted in Table 3-3, jet fuel sales are expected to increase by 2.5% over the planning period. On the contrary, Avgas sales are projected to decrease approximately 0.1% throughout the same period. The latter is a function of both declining operating hours by recreational aircraft – the primary users of this type of fuel – and a transition from gasoline-based fuels to kerosene and plant-based fuels.
- National Fleet Aircraft Forecasts.** The number of aircraft in the active fleet⁷ will see a mixed change in the next 20 years. As indicated in Table 3-4 the number of piston aircraft (both single and multi-engine) will see a decline in the Average Annual Growth (AAG), while five of the other six categories will see an increase on average of 2.5% annually. Overall, the general aviation fleet is only expected to increase 0.4%. However, the fastest growing segment of general aviation, the sport aircraft category⁸ is projected to grow by over 4% during this same period.
- National Hours Flown Estimates.** Hours flown nearly mirrors changes in fleet aircraft, with positive changes in jet, helicopter, and sport aircraft as identified in Table 3-5. Of interest to EEN is the jet, helicopter (rotor) and sport aircraft categories, with a projected Average Annual Growth (AAG) of 2.8, 2.5, and 4.3% respectively. Jet traffic is significant because of its direct correlation to business traffic and the airports they utilize. Helicopters are growing in popularity in both the business and recreational ends of aviation. Light sport aircraft growth is attributed to the fact that this category offers a low entry cost of new aircraft into an aging GA fleet.
- National Active Pilots Predictions.** Unfortunately, the number of active pilots in the United States is expected to continue its 20-year decline. As noted in Table 3.6, the only areas where the number of pilots will show a significant increase are in the sport pilot and rotor (helicopter) ratings⁹. However, both are confident regarding growth in the general aviation market, including Keene.

Table 3-3. National Fuel Sales Projections

YEAR	AVGAS (100LL)	JET A
2015	198.3	1,407.5
2020	189.9	1,621.2
2025	187.9	1,825.6
2030	188.4	2,039.6
2035	193.8	2,306.4
Avg. Annual Growth	(0.1%)	2.5%

Millions of U.S. gallons
Source: FAA Aerospace Forecasts (2015 – 2035)

⁷ Aircraft flown at least one hour per year

⁸ Light Sport Aircraft (LSA) is a class of simple-to-fly aircraft that meets the following definition: Maximum gross takeoff weight: 1,320 lbs; Maximum stall speed: 51 mph; Maximum speed in level flight with maximum continuous power: 138 mph.

⁹ Pilot certification (commonly referred to as a pilot’s license) in the United States is typically required for an individual to act as a pilot of an aircraft. Pilots must also be “rated” to fly different classes of aircraft in certain conditions (single engine, multiengine, seaplane, instrument, helicopters, gliders, light sport, etc.).

Table 3-4. U.S. Fleet Forecasts (2015 2035)

YEAR	SE PISTON	ME PISTON	TP	JET	ROTOR	EXP	SPORT	TOTAL FLEET
2015	122,435	13,175	9,390	11,915	10,440	24,880	2,355	198,780
2020	117,770	12,920	9,315	13,115	12,195	26,795	3,170	199,410
2025	113,905	12,545	9,855	15,000	13,760	28,875	3,970	201,970
2030	110,635	12,230	11,155	17,565	15,360	30,975	4,705	206,680
2035	108,810	12,135	12,970	20,815	17,110	33,040	5,360	214,260
AAG	(0.6%)	(0.4%)	1.5%	2.8%	2.5%	1.4%	4.3%	0.4%

Source: FAA Aerospace Forecasts (2015 – 2035)

Legend: SE – Single-engine; ME – Multi-engine; TP – Turboprop; Rotor – Helicopter; Exp – Experimental; AAG – Average Annual Growth Rate

Table 3-5. Projected Hours Flown for U.S. Pilots (2015 - 2035)

YEAR	SE PISTON	ME PISTON	TP	JET	ROTOR	EXP	SPORT	TOTAL FLEET
2015	10,757	1,608	2,581	3,723	3,350	1,212	202	23,566
2020	9,847	1,537	2,618	4,475	4,047	1,416	283	24,355
2025	9,533	1,492	2,784	5,361	4,611	1,594	369	25,874
2030	9,375	1,498	3,152	6,322	5,180	1,759	453	27,869
2035	9,464	1,570	3,665	7,512	5,821	1,929	536	30,626
AAG	(0.5%)	(0.2%)	1.7%	3.6%	3.0%	2.4%	5.1%	1.4%

Source: FAA Aerospace Forecasts (2015 – 2035)

Legend: AAG – Average Annual Growth SE – Single-engine; ME – Multi-engine; TP – Turboprop; Rotor – Helicopter; Exp – Experimental

Table 3-6. Estimated Active U.S. Pilots (2015 - 2035)

YEAR	STUDENTS	REC	SPORT	PVT	COMM	ATP	ROTOR	GLIDER	TOTAL
2015	119,650	220	5,600	173,750	104,250	153,000	15,335	19,885	591,690
2020	118,250	220	7,700	171,950	105,550	154,300	16,440	19,815	594,225
2025	116,300	215	9,900	168,650	107,050	158,100	20,300	19,615	600,130
2030	114,350	210	12,450	165,900	109,700	162,900	23,010	19,730	608,250
2035	112,200	210	14,950	163,600	113,350	168,600	24,440	19,650	617,000
AAG	(0.3%)	(0.2%)	5.2%	(0.3%)	0.4%	0.5%	2.2%	(0.1%)	0.2%

Source: FAA Aerospace Forecasts (2015 – 2035)

Legend: AAG – Average Annual Growth; REC – Recreational; PVT – Private; COMM – Commercial; ATP – Airline Transport Pilot

3.7.3 FAA Aerospace Forecast Summary

The FAA Aerospace Forecast for the period 2015-2035 indicates that while economic uncertainties still affect the business jet market, recovery is expected to continue, with a stable outlook in the long-term. This outlook is because of the overall higher corporate profits and the growth of worldwide GDP¹⁰ and the continued concerns about safety, security, and commercial flight delays that keep business aviation attractive. Industry expert predictions and general aviation survey results also suggest that business use of general aviation aircraft expand at a faster pace than that for personal and recreational use.

3.8 NEW HAMPSHIRE STATE AIRPORT SYSTEM PLAN

In 2015, the New Hampshire Department of Transportation prepared an update of the New Hampshire State Airport System Plan (NHSASP). The System Plan provided the state with a valuable tool to monitor the ability of the airports to meet performance measures identified through the aviation system planning process. The NHSASP provides the guide to maintain and develop the system of airports in New Hampshire. A major factor in the development of a state airport system plan was the projection of aviation demand at both the local and state level. The market projections provide insight into how aviation activity is anticipated to change over time and the changes expected at EEN.

3.8.1 NHSASP Findings

There are some conclusions in the NHSASP that may affect Keene, including a decline in based aircraft, and the stability of the number of pilots to the ratio of aircraft to the state's population.

- Since 2004 the total number of based aircraft in NH has declined while New England saw growth in based aircraft from 2003 until 2009.
- From 2000 to 2007 the ratio of actual aircraft to population was stable, with some fluctuation from year to year, particularly the decline in the two years following the 2001 recession.
- NH was shown to have the highest ratio of actual aircraft to the population of the New England states; the study showed a declining trend for New Hampshire over an 11-year period (2000-2010).
- Excluding the data for CT, the combined average aircraft utilization for the other five New England states except 2002, showed a declining long-term trend with values significantly below those for the U.S.¹¹
- The historical data collected for the study shows a decline in based aircraft and operations data at many of the airports inventoried in New Hampshire.

¹⁰ Gross Domestic Product (GDP) is the broadest quantitative measure of a nation's total economic activity. More specifically, GDP represents the monetary value of all goods and services produced within a nation's geographic borders over a specified period.

¹¹ The long-term trend in average aircraft utilization for the New England region is less clear because of the effects of data anomalies and particularly high average utilization in Connecticut for a period of years.

3.8.2 Dillant Hopkins NHSASP Activity Forecasts

Table 3-7 lists the past and NHSASP forecasts for based aircraft, operations, and operations per based aircraft (OPBA). The forecast indicates an 11% decline in operations and a 10% loss of based aircraft.

3.9 SOCIOECONOMIC TRENDS AFFECTING AVIATION DEMAND AT DILLANT HOPKINS AIRPORT

This section examines local trends, which will then be compared to national trends to assess the direction Keene may be headed. General aviation airports are typically influenced to a lesser extent by domestic and regional trends and more by the local population, per capita income, employment, airport prominence, and market-based factors such as the availability of flight training, aircraft maintenance, and hangars for rent. Moreover, some airports like Dillant Hopkins Airport are influenced to some degree by local business activity, such as the demand for air cargo operations, or local businesses with their fleet of aircraft, or those that depend on charter aircraft (air taxi) to transport goods and people. Airports that offer superior facilities, more services, and competitive costs will attract greater passenger levels and activity. Finally, an airport's prominence (i.e. location and size of the market) has the potential to drive aviation business as well.

Table 3-7. NHSASP Operations & Aircraft Forecasts for EEN

YEAR	OPERATIONS	BASED AIRCRAFT	OPBA
2005	54,294	59	920
2007	54,294	66	823
2009	49,027	67	732
2011	49,027	68	721
2013	45,712	57	802
2023	44,312	55	806
2033	43,520	54	806

Source: New Hampshire State Aviation Systems Plan (2015)

On a regional scale, the factors that have the greatest impact on growth prospects of an airport are its service area's socioeconomic characteristics. Market area population growth or decline has the potential to influence an airport's aviation demand directly. Per capita income is a reliable indicator of a community's discretionary income and ability to afford travel. Consequently, a clear understanding of local demographic trends and economic forces is essential for developing an accurate aviation activity forecast.

3.9.1 Dillant Hopkins Airport Service Area

The Dillant Hopkins Airport service addressed in Chapter 2 (page 2.23), consists of an area that roughly covers about 570 square miles. For general aviation airports, this is the area where the average driving time to and from an airport to any point within that area is about 30 minutes¹². Figure 2-16 presented earlier on page 2.23, illustrates the Keene service area as compared to six airports around the Dillant

¹² The area is expanded to about 60 minutes for a commercial service area.

Hopkins Airport. These airports are listed in Table 3-8 along with data about each airport as it pertains to its marketing risk to EEN.¹³

Marketing risk refers to the airport's potential capture of both the number of aircraft based at an airport and itinerant aircraft operations. The based aircraft risk refers to airport facilities and their attraction to aircraft owners regarding amenities such as hangar and apron parking opportunities, instrument approach procedures, fuel availability and similar quality of services offered and facilities. Itinerant operational risks involve the ability of the airport to provide services such as fuel, runway length, approach procedures and minimums¹⁴, food, lodging, rental cars, courtesy cars, reasonable prices, and a superior FBO that provides service beyond essential services, such as hangar parking and deicing service. That is, the more attractive the airport, the more likely it is that people will use it, and therefore, less risky.

Table 3-8. Airports near EEN Service Area

ID	AIRPORT	DISTANCE (MILES – TIME)	NPIAS ROLE	RWY	BA	FBO	FUEL	IAP	RISK
EEN	Dillant-Hopkins	0 – 0:0	GA	6,201	80	5	AG – J	400-1	N/A
AFN	Jaffrey – Silver Range	18 – 0:29	GA	2,982	17	1	AG	800-1	2
ORE	Orange Municipal	28 – 0:48	GA	5,000	43	1	AG-J	400-1	2
OB5	Turners Falls	32 – 0:49	GA	3,200	32	2	AG	1200-1¼	0
GDM	Gardner Municipal	33 – 0:48	GA	3,000	16	1	AG	900-1	0
CHN	Claremont Municipal	42 – 0:59	GA	3,098	23	1	AG	1000-1¼	0
MHT	Manchester	56 – 1:21	CS	9,250	60	5	AG-J	300-¾	0

Source: Airnav.com, Google Maps, FAA Master Record

Legend

ROLE	NPIAS Role either GA – General Aviation or CS – Commercial Service
NPIAS	Airport is part of NPIAS and potential federal funding through AIP and adherence to FAA design standards
RWY	The length of longest runway. Longer runways support a larger array of aircraft
BA	The number of Based Aircraft. More aircraft suggests increased airport support and a higher revenue stream
FBO	FBO Services (subjective ranking based on available services from 0 (none) to 5 (full service, including maintenance, full-service fuel, flight training, hangars, etc.).
Fuel	Type of fuel available (AG – Aviation Gas; J – Jet)
IAP	Instrument approach procedure minimums (altitude AGL - visibility). Lower minimums increases airport's viability
RISK	Consultant's assessment of potential market risk to EEN (0 – 5, with 0 being no risk and 5 being a major risk)

¹³ The marketing risk is a subjective ranking based on an assessment by Stantec Consulting Services.

¹⁴ Minimums refer to how close and how low an aircraft can fly before the pilot must see the runway environment and then complete the landing in visual conditions. In terms of minimums, lower and closer is better.

Of the six airports (besides EEN) listed in Table 3-8, only three have a service area that overlaps EEN's. These are Jaffrey Airport – Silver Ranch (AFN), Orange Municipal (ORE), and Manchester (MHT). However, as noted, the risk from all three is small. While Jaffrey is only 18 miles and 29 minutes from Keene, its short runway (less than 3,000 feet), limited FBO services, and no jet fuel, with somewhat high instrument approach minimums would attract far fewer aircraft than EEN. Jaffrey would also not attract business jet traffic because of the relatively short runway length. Orange Municipal provides a higher level of service in terms of amenities provided over Jaffrey, with a 5,000-foot-long runway, minimums as low as Dillant Hopkins Airport and both aviation gas and jet fuel. However the ORE FBO offers limited services (no maintenance and no flight training), and the airport is on the outer fringes of EEN's service area. Manchester, while a much larger facility that offers commercial airline service, with two long instrument runways and excellent FBO services, is also not considered a risk to EEN. And even though MHT has a 60-minute service area (typical of a commercial service airport), it is far enough away from EEN to offer no marketing risk because of the driving time between the two airports. The other three airports: Turners Falls (OB5), Gardner Municipal (GDM), and Claremont Municipal (CHN) are on the outer fringes of EEN's service area and are included for comparison purposes. These three (OB5, GDM, and CHN) are not a marketing risk to EEN because of their distance and level of service provided.

3.9.2 Population

The historical and projected populations and similar average annual growth rates (AAGR) for the city of Keene, Cheshire County, the state of New Hampshire, and the United States for years 1960 through 2015 (historical) and 2020 through 2035 (projected) are shown in Table 3-9. For the years 1960 through 2015, the population in the city of Keene and Cheshire County rose 32.9 and 77.9%. The state of New Hampshire and the United States grew 119.3% and 79.4% throughout the same period. Projections for the period 2020 through 2035 indicate that the city, county, and state are all forecast to increase by 3.9%, 4.2%, and 15.1%. The U.S. population is projected to increase approximately 15%. Figure 3-3 illustrates the relative change in population between all four populations. Moreover, Figure 3-4 shows how the rate of change in population in all four areas has and will continue to slow over the next 20 years. The important takeaway is the similarities in projected population variations in the state and county as compared to the United States. While the city's expected growth rate is somewhat flat, the airport's service area, which is mostly contained within Cheshire County, has a projected change in a population of the United States. This fact is discussed later in the chapter when this data is compared national aviation forecasts to regional and local projections.

Table 3-9. Historical and Projected Population (1960 - 2035)

YEAR	KEENE	CHESHIRE COUNTY	NEW HAMPSHIRE	UNITED STATES
1960	17,562	43,342	606,921	179,323,175
1970	20,467	52,364	737,681	203,211,926
1980	21,449	62,116	920,610	226,545,805
1990	22,430	70,121	1,109,117	248,709,873
2000	22,563	73,825	1,235,550	281,421,906
2010	23,409	77,117	1,316,256	308,745,538
2015	23,332	77,128	1,330,836	321,729,000
2020	23,531	78,052	1,359,836	334,503,000
2025	23,842	79,085	1,388,884	347,335,000
2030	24,076	79,861	1,412,041	359,402,000
2035	24,233	80,381	1,425,357	370,338,000

Note: AAGR – Average Annual Growth Rate
 Sources: United States Census Bureau; NH Office of Energy and Planning

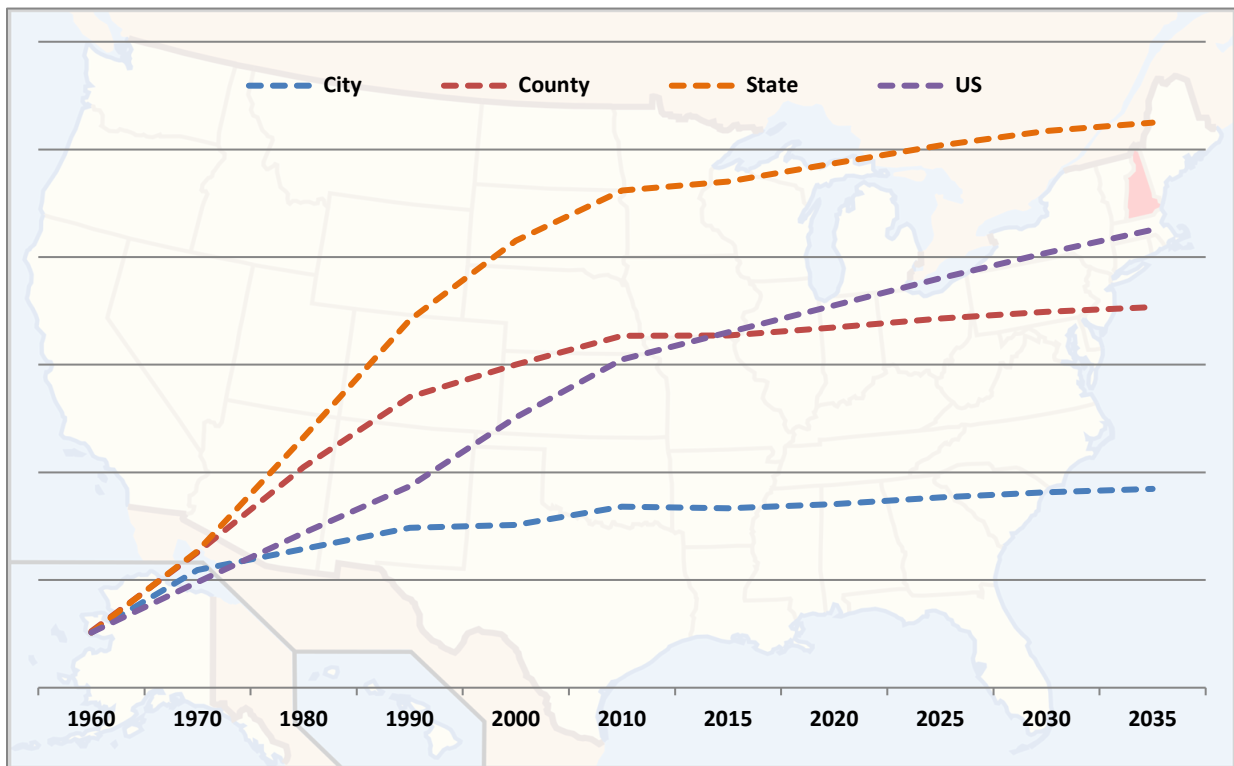
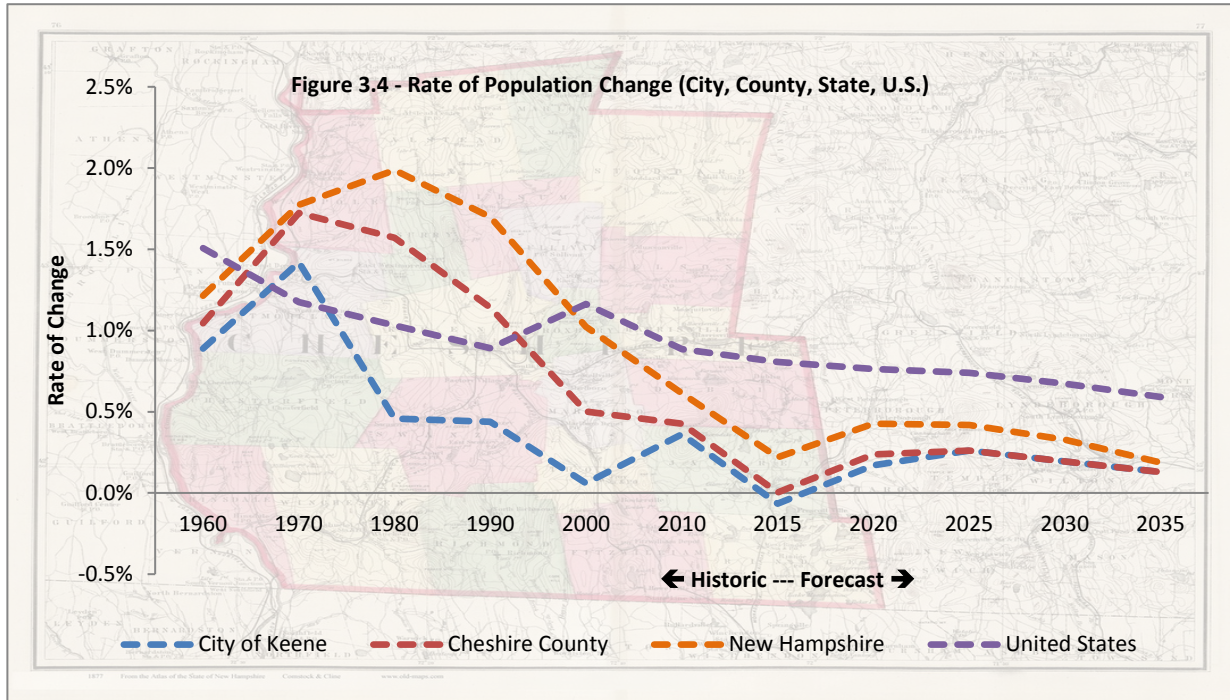


Figure 3.3 – Change in Population Comparison between the City, County, State, and US



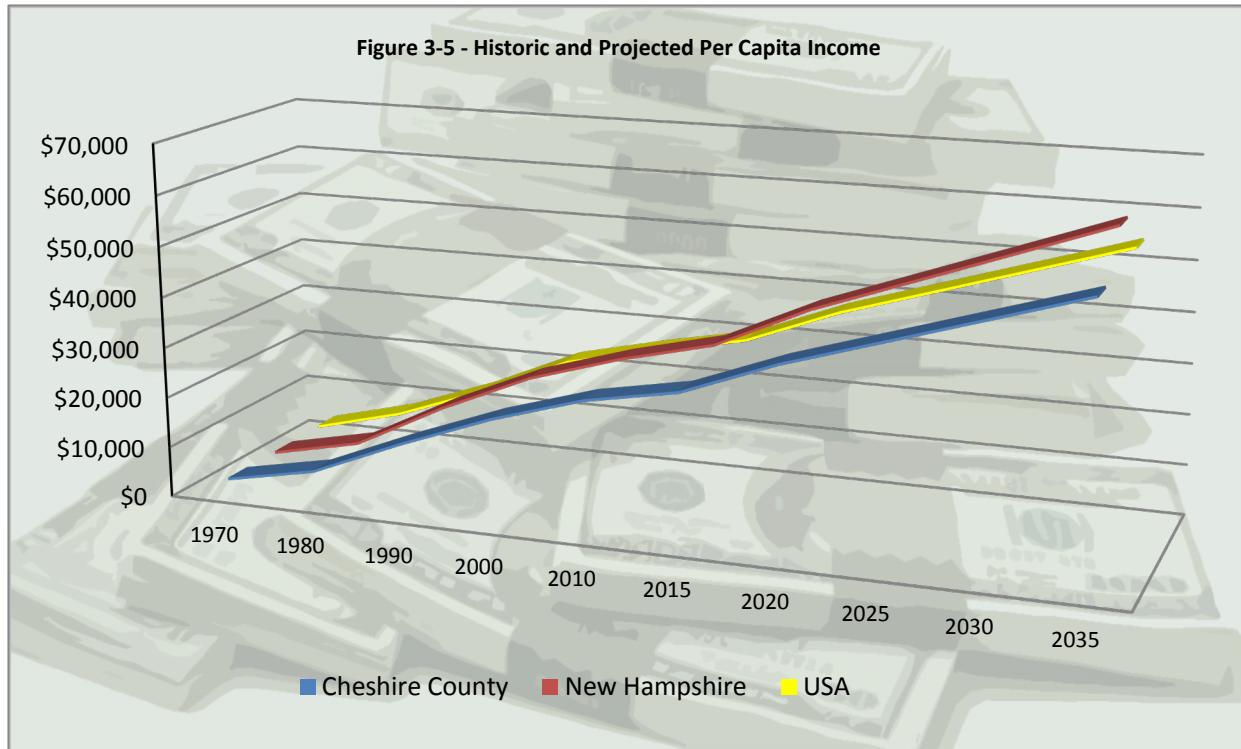
3.9.3 Per Capita Personal Income

Per capita personal income (PCPI), also known as income per person, is the mean income of the individuals in an economic unit such as a country or city. It is calculated by taking a measure of all sources of income taken together (such as GDP or gross national income) and dividing it by the total population. Like demographic trends, we examined PCPI as a measure of the airport’s service area against the same pattern nationwide.

In 2014, New Hampshire had a per capita annual personal income (PCPI) of \$52,773. This PCPI ranked 9th in the United States and was 115% of the national average, \$46,049. The 2014 PCPI reflected an increase of 4.4% from 2013. The 2013-2014 national change was 3.6%. In 2004, the PCPI of New Hampshire was \$38,390 and ranked 6th highest in the United States. The 2004-2014 compound annual growth rate of PCPI was 3.2%. The compound annual growth rate for the nation was 3.0%.¹⁵

¹⁵ Bureau of Economic Analysis, US Department of Commerce.

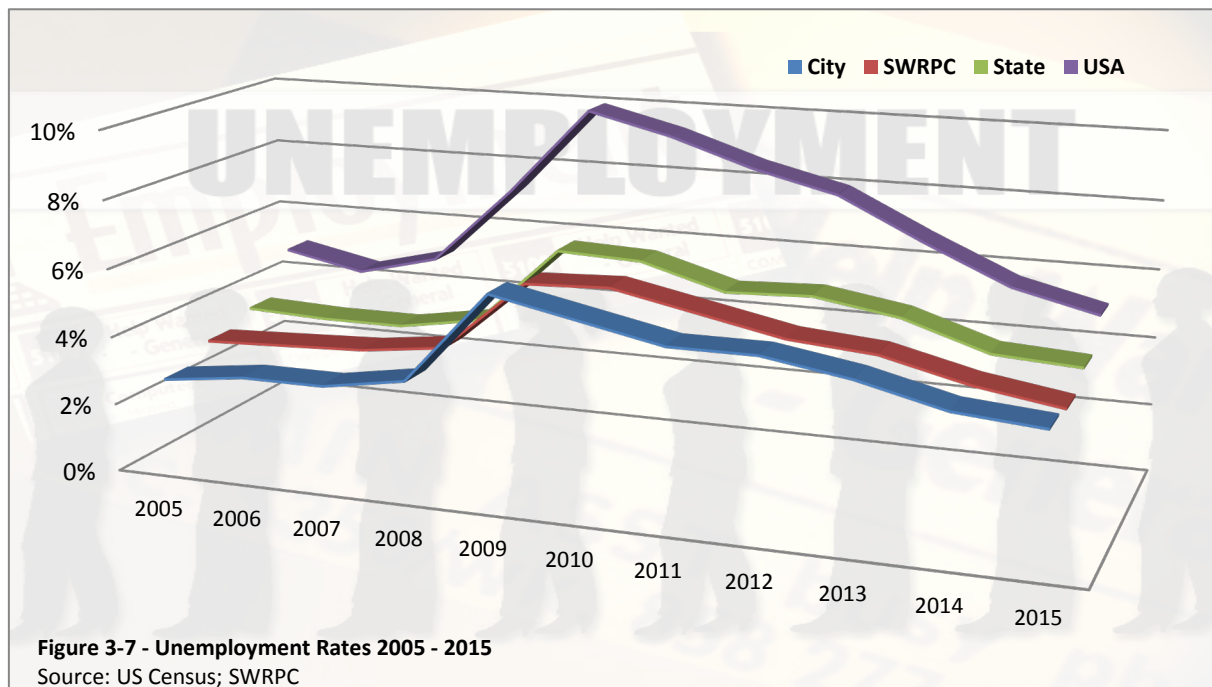
Figure 3-5 shows the historic Per Capita Income in Cheshire County, the state, and the US from 1970 through 2014. This data is extrapolated through a linear trend line out to 2025.



3.9.4 Unemployment

The third demographic measurement examined is a comparison of the historical unemployment rates in the region as compared to the United States; again for evaluating how the service area relates to the state and nation. As Figure 3-7 illustrates, the city, planning region and state have all fared much better than the United States. In this analysis, instead of including county data, information from the New Hampshire Southwest Region Planning Commission (SWRPC) because it more clearly defines employment conditions in the state.

New Hampshire is divided into nine Planning Regions ranging from the North Country that covers about half of the state regarding land mass, but less than 10% of the total state's population, to the more populated regions in the south. As a matter of record, most of New Hampshire's population is concentrated in the southeast corner of the state, encompassing the Central, Southern, Nashua, Strafford, and Rockingham regions¹⁶. Geographic features such as lakes, mountains, and the proximity to Massachusetts have a significant effect on industry and professional growth and the composition of the labor force in each region. Regarding population in the area we are most concerned about, the Southwest Planning region is projected to have an employment growth rate of 4.8%, which, along with the North Country region, is the lowest of the nine planning regions.



3.9.5 Local Characteristics – Forecasting Intangible Assets

The local flavor of the aviation and surrounding community can and often does have an impact on the growth of any industry, including aviation. Some airports apply little to no effort of maintaining it to high standards or promoting its future. In these rare cases, no matter how bright the future of the region might be, the airport's development in terms of increased activity and revenue production will stagnate. Some airports simply do not have the room to grow, regardless of how well the facility is maintained or promoted. Moreover, for those airports with a community that is actively engaged, who recognize the value the airport brings to the community, concepts around airport improvements, sustainability, and

¹⁶ New Hampshire has nine regional planning commissions that include Central New Hampshire, Lakes Region, Nashua, North Country, Rockingham, Southern New Hampshire, Southwest, Strafford, and Upper Valley Lake Sunapee. Refer to <http://www.nharpc.org/about-us> for additional information.

usability are more likely to come to fruition. Thus the hidden and sometimes overlooked asset is the community.

In reviewing the Dillant-Hopkins Airport several signs that suggest the airport might grow faster than the community.

- Full-time airport management position and a dedicated airport maintenance staff
- Attitude toward making the airport a vital component of the community's and region's transportation network
- Excellent instrument approach procedures and low minimums
- Well maintained facility
- Availability of land for continued development of hangars and other facilities
- Favorable hangar and land lease rates
- Restaurant facility (building and equipment are city owned)
- A history of a well-run and productive fixed base operator (FBO)
- The availability of flight training, aircraft maintenance, and similar services
- Local businesses that use and depend on the airport for transportation services
- A neutral to positive public image, with some concerns related to safety improvements (tree removal) adjacent to private residences
- No environmental issues or impacts that would limit growth
- Ample buffer between the airport and large part of the surrounding community that limit noise complaints

3.9.6 Socioeconomic Conditions Summary

Three elements were examined in the previous sections: population, income, and employment. Regarding population, the projected changes in the state will outpace the nation, but the county and city will not keep pace with both the state and U.S. Economically, the region will see a similar growth in per capita income, the state and county realizing similar positive changes in income. While no projections were made regarding unemployment, when considering the positive estimates in per capita income, the data suggest that unemployment continues to mirror the historical trends. At the same time, when examining the airport's intangible assets, the Dillant Hopkins Airport is a facility that should meet or exceed national growth patterns.

While some segments of general aviation have been in a steady decline, such as the number of new pilots in training and the number of hours flown (which closely parallels operations), others have seen a positive change in the past 10-20 years, and indications are that this trend will continue. Also, as the U.S. commercial air service market continues its expansion, there are no new airports planned for the system, which means people and aircraft are compressed into the same number of airports. As the U.S. air transportation market grows, demand for air services will spread out into the smaller markets. For those who can afford it, charter activity and the use of private aircraft will fill the void for those who elect not to travel to commercial services airports in the region (Manchester, Boston-Logan, et cetera).

While some aviation segments, notably sales and activity in light sport and experimental aircraft will do quite well because of their relatively low entry costs, the traditional reciprocating general aviation fleet,

with higher ownership costs will continue a slow decline in both the numbers of aircraft and similar flight activity. While we see no indication that commercial air service will return to EEN, demand for the light sport, experimental, helicopter, and most notably jet activity will all match national trends; that is, a growth rate that closely matches the FAA's Aerospace Forecasts, is a reasonable expectation.

3.10 DILLANT HOPKINS AIRPORT FORECASTS

This section considers the information provided in the previous sections, providing a general forecast of aviation activity at the Dillant-Hopkins Airport. The original FAA TAF data, current activity at Keene, local socioeconomic conditions, the NHSASP, and the FAA Aerospace Forecasts are brought together to form the forecasts for the Airport.

Four projections were made for the Dillant Hopkins Airport: based aircraft, operations, fuel sales, and the Airport Reference Code (ARC). Each forecast is based on a comparison of national trends from the FAA Aerospace Forecasts against the regional and local historical trends and projected growth as discussed in this chapter.

Table 3-10 lists the national and anticipated Dillant Hopkins Airport growth rates and are reviewed in each of the next three paragraphs. This data is used to project the number and type of aircraft that will operate at EEN, the number of aircraft operations, and estimated future fuel sales.

Table 3-10. Projected Rate of Change at EEN

ACTIVITY	FAA PROJECTED NATIONWIDE ANNUAL CHANGE ¹⁷	PROJECTED EEN CHANGE ¹⁸	
		ANNUAL CHANGE	20-YEAR CHANGE
Based Aircraft			
<i>Single-engine (piston)</i>	(0.6%)	0.69%	13.8%
<i>Multi-engine (piston)</i>	(0.4%)		
<i>Turboprop</i>	1.5%		
<i>Jet</i>	2.8%		
<i>Helicopter</i>	2.5%		
<i>Other (Sport, Experimental)</i>	3.2%		
Operations			
<i>Single-engine (piston)</i>	(0.5%)	0.18%	3.7%
<i>Multi-engine (piston)</i>	(0.2%)		
<i>Turboprop</i>	1.7%		
<i>Jet</i>	3.6%		
<i>Helicopter</i>	3.0%		
<i>Other (Sport, Experimental)</i>	3.3%		
Fuel Sales			
<i>Aviation Gas</i>	(0.1%)	-0.02%	-0.33%
<i>Jet Fuel</i>	2.5%	3.2%	64%
<i>Aggregate</i>	2.4%	2.3%	46.7%

3.10.1 Based Aircraft

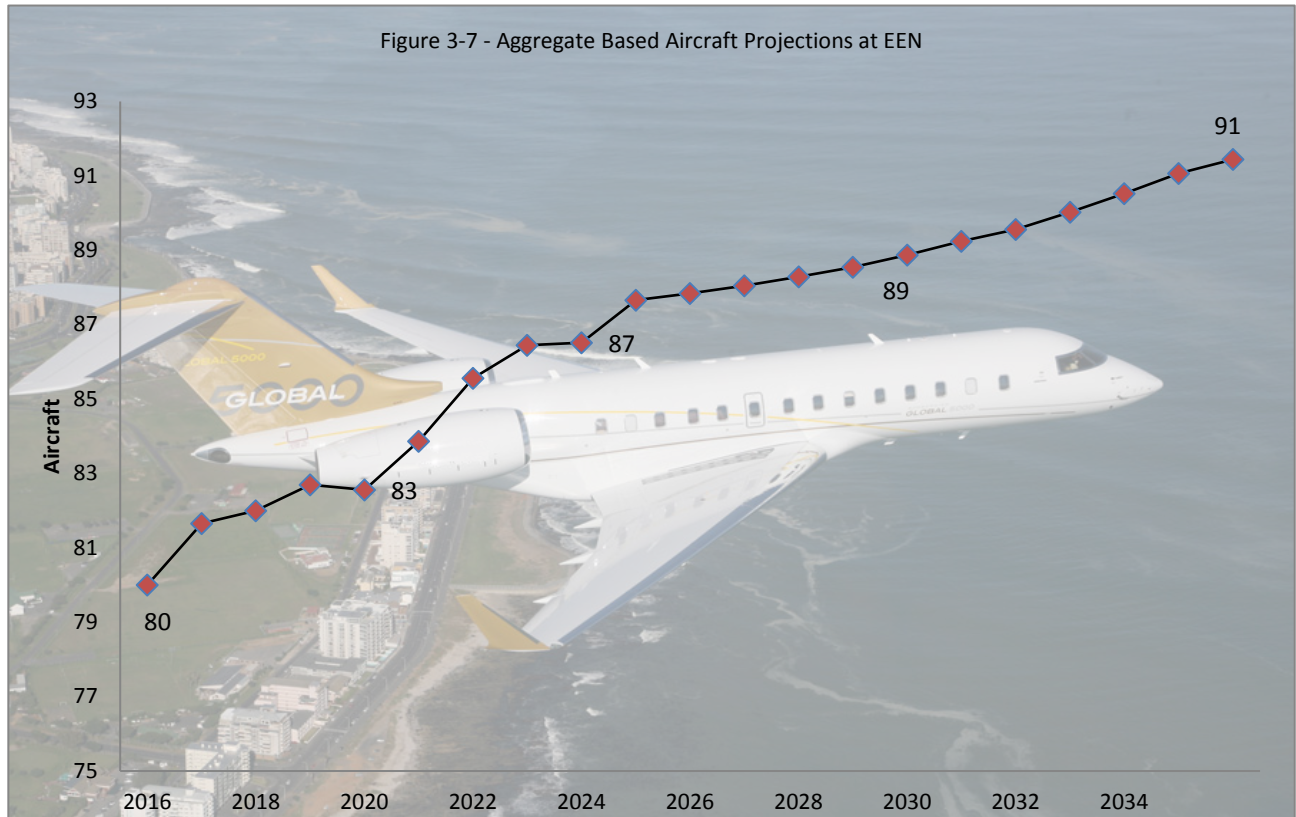
On average, the number of based aircraft will increase at about 0.69% per year or 13.75% over the next two decades. This is consistent with the national trends as compared to the mix of based aircraft at EEN. The principle change in this small growth rate is because of the predominance of both single and multiengine piston aircraft, which account for nearly 84% of all based aircraft at EEN (see Table 3-2, page 3.4). When the national projections are weighed against the airport's fleet mix, the higher percentage of aircraft in these two categories of aircraft mutes the growth of the overall number of projected based aircraft.

As illustrated in Figure 3-7, based on an annual net increase rate of 0.69%, the number of based aircraft at Dillant Hopkins Airport is projected to increase by 11 total aircraft over the next 20 years (see Figure

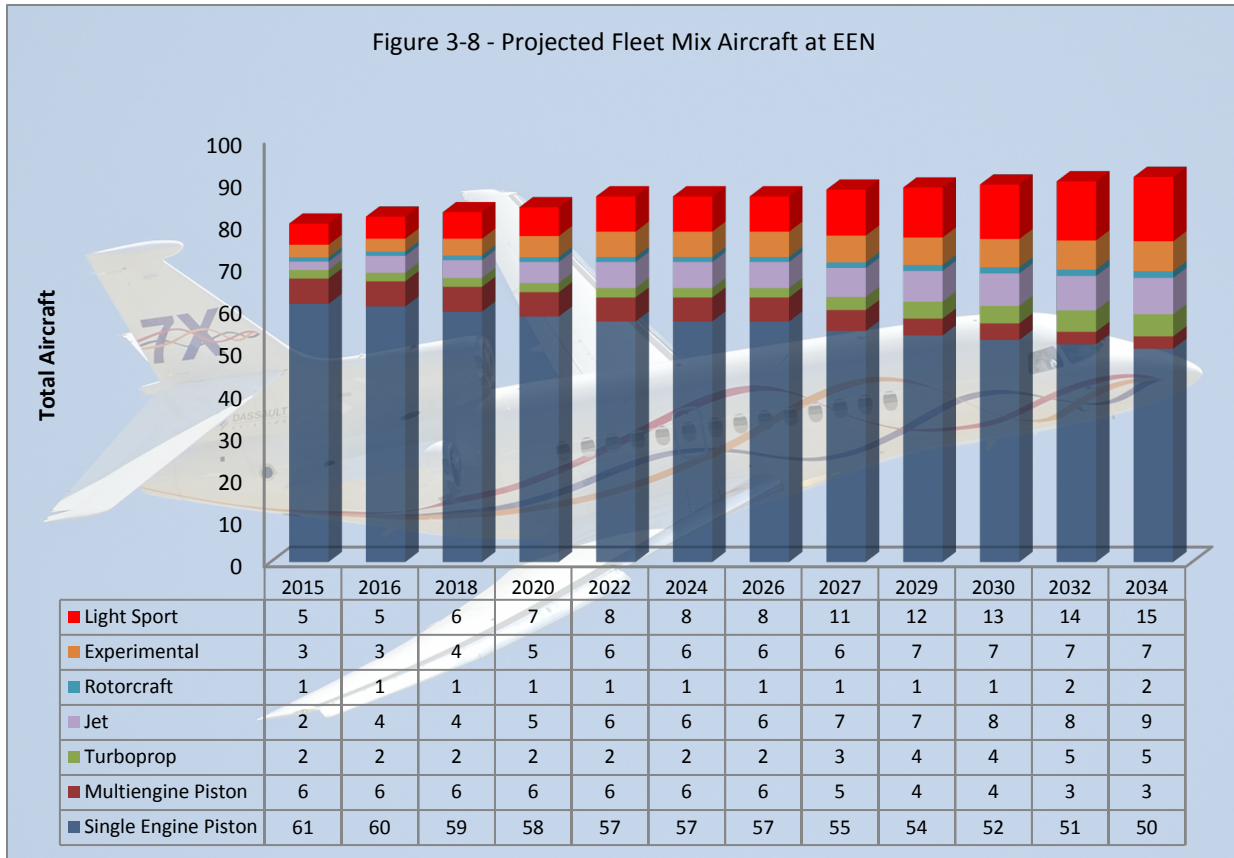
¹⁷ FAA Aerospace Forecasts (2015-2035)

¹⁸ Considering socioeconomic factors, FAA TAFs, and FAA Aerospace Forecasts

3-7). While the number of single and multiengine piston aircraft will decrease, the other categories of aircraft will increase.



The fleet mix forecast further assesses growth in the number of based aircraft by breaking it out into various aircraft categories. This analysis, which is presented in Figure 3-8, uses the FAA Aerospace Forecasts discussed earlier and adjusted the growth rate of individual aircraft categories accordingly. While the overall number of based aircraft will only increase by 11 airplanes, the fleet mix composition will change appreciably. As noted in the figure that follows, while the number of single-engine piston aircraft will decline from the present count of 61 to 50 aircraft by 2035; the number of light sport, experimental, and jet aircraft (plus others) will increase, resulting in about 90 based aircraft 20 years from now.



3.10.2 Operations

Like based aircraft, the number of aircraft takeoffs and landings will also increase at a slower degree than the national rate. Again, the reason for this slow growth is because the higher proportion of activities today at EEN comes from the single engine piston group of airplanes (the highest percentage of aircraft that currently use the airport). Operations at EEN will increase at the rate of 0.18% per year, or 3.65% over the next two decades.

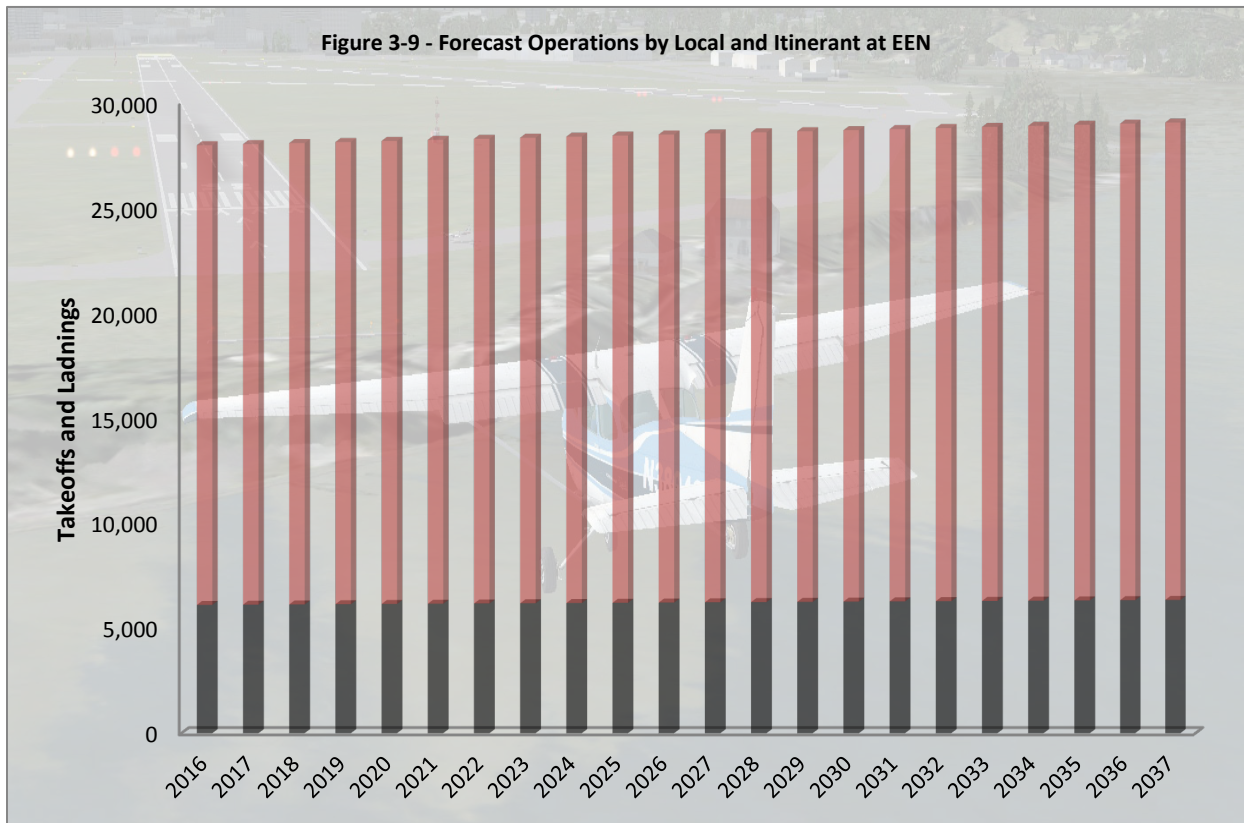
Using the current number of based aircraft (80) and the 2016 operations count of 28,000 operations¹⁹, the Operations Per Based Aircraft (OPBA) is 350 (OPBA = 80 aircraft x 350 = 28,000). However, looking forward, the OPBA will not remain constant. If it did, the number of takeoffs and landings at EEN would reach 31,500 by the year 2036. However, the projected increase of 0.18% operations per year (3.6% over 20 years) is realistic because of national trends toward fewer operations of the types of aircraft that predominantly use the Dillant Hopkins Airport. Using the projected 3.6% increase would result in about 1,000 additional operations per year by 2036 for 29,000 total takeoffs and landings. While this seems like a small increase, it is consistent with general aviation trends in the United States. For this

¹⁹ See Chapter 2, Paragraph 2.13.2, Operations, page 2.19.

reason, the OPBA at EEN will also decrease at a rate of about 0.35% per year, or 7% over the 20-year planning period, resulting in an OPBA of 323 by the year 2036.

For planning purposes, the ratio of local versus itinerant operations will remain the same as today, with 22% of all operations remaining in the local area²⁰, with the remaining 78% itinerant activity. This change means that in twenty years, 6,380 annual operations will stay in the local area and the remaining 22,600 annual takeoffs and landings will be by itinerant aircraft.

Figure 3-9 provides a breakdown of the projected changes per year between 2016 and 2036 for both local and itinerant operations.



3.10.3 Fuel Sales

Aviation gas sales at the Dillant Hopkins Airport will exceed the national trend which projects a 2.5% annual increase in jet fuel sales and a negative 0.1% annual decline in AvGas (see *National Fuel Sales*

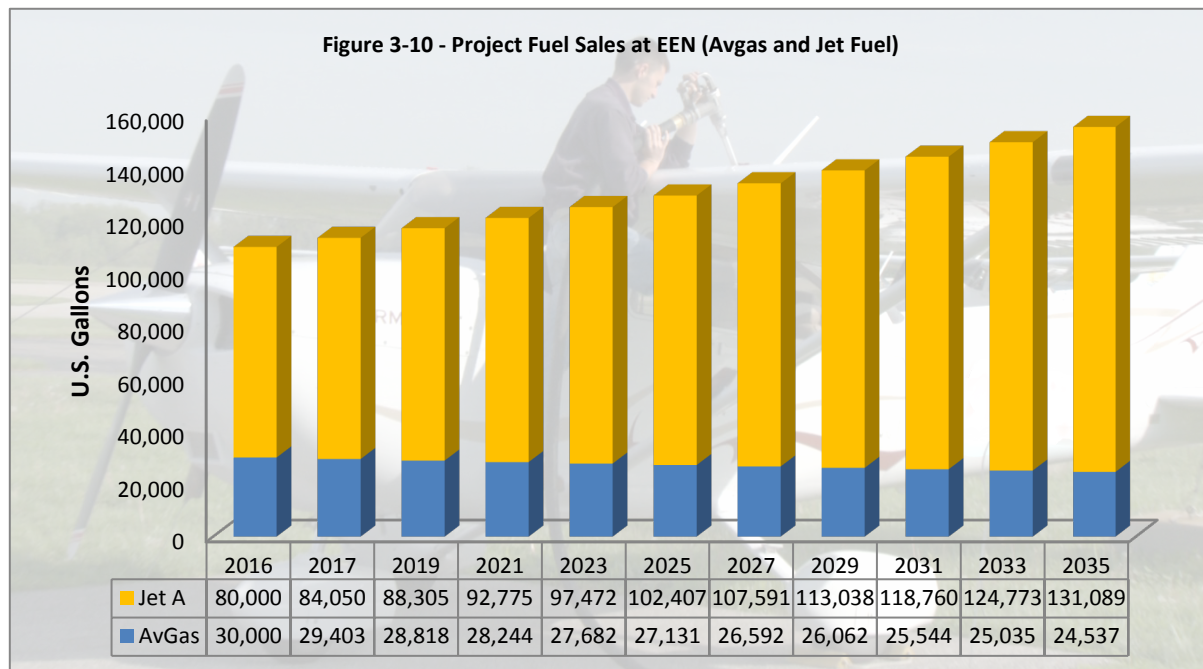
²⁰ A local operation is performed by an aircraft that takes off from EEN and returns without landing at another airport. These are usually by pilots conducting practice takeoffs and landings. Itinerant operations are conducted by aircraft that either depart EEN for another airport, or land at EEN after departing a different facility.

Projections, page 3.6). AvGas²¹ sales will drop because the conventional aircraft that use this type of fuel are flying fewer hours. Also, some reciprocating engine aircraft are transitioning to kerosene-based fuels (Jet A). Conversely, Jet fuel sales at EEN will see a strong trend toward higher sales. Unlike aviation gas that will mostly remain flat, jet fuel sales will increase at about 3.2% per year because of the projected increase in jet activity at the Dillant Hopkins Airport. Accumulatively, fuel sales at EEN will grow at an annual rate of 2.3%, or over 47% in the next two decades.

If the airport continues to have an active flight school and continues to sell fuel at competitive market prices, avgas sales will not decline at the national rate, but rather will remain flat, with a slight decrease over 20 years (-0.33%). Based on this assumption, EEN will see avgas sales decline from the current 30,000 gallons per year to about 29,900 gallons (virtually no change).

Jet A sales will closely mirror national trends as well, but if the airport continues to see heavy jet activity, jet fuel will continue to be in high demand. Jet fuel sales will increase by about 3.2% per year or nearly 64% by the year 2036. Sales in gallons (excluding C&S Wholesale Grocers) will increase from the current 80,000 gallons to about 156,000 gallons by the end of the 20-year planning period.

Figure 3-10 shows the project fuel sales for both avgas and Jet A through the 20-year planning period.²²



²¹ AvGas refers today to the traditional 100LL fuel (100 octane low-lead) and its replacement fuel (see sidebar on page 3.23).

²² These calculations do not include C&S Wholesale Grocer’s fuel usage.

3.10.4 Design Aircraft & Reference Code

As discussed in Chapter 2 (see Design Aircraft, page 2.4), the existing design aircraft for EEN are the Bombardier Challenger 300 for Runway 2-20 and the Beech King Air 200 for Runway 14-32. The Challenger has an ARC of C-II and the King Air is a B-II aircraft. The higher code (C-II) establishes the airport code.

Looking forward, C&S Wholesale Grocers has plans to upgrade its fleet within the next five years by replacing their existing jets (Challenger 300 and Dassault Falcon 2000) with the Dassault Falcon 7X and the Bombardier Global 5000. Both aircraft are slightly larger and heavier than the current design aircraft, the Challenger 300, with a wingspan in the Aircraft Design Group (ADG) II category. Both the Falcon and Global are in the Aircraft Approach Category (AAC) group “C,” meaning they have an Airport Reference Code (ARC) of C-II. If C&S Wholesale Grocers carries through with its plans to replace the current fleet, the future Airport Reference Code for Runway 2-20 will remain C-II.

Runway 14-32, the shorter crosswind runway, serves aircraft mostly in visual weather conditions, with an occasional circling approach from Runway 2. While the runway does not have any instrument approach procedures, pilots can perform a “circling” maneuver after executing an instrument approach to Runway 2. This situation means the pilot starts the approach to Runway 2, but because of wind conditions, terminates the approach to Runway 2 and circles and lands on Runway 14 or 32, depending on wind direction. This procedure can occur in weather conditions with visibility as low as 1-1/4 miles²³. The aircraft that use Runway 14-32 most of the time are typically smaller recreational aircraft that are less tolerant of crosswind conditions. These include aircraft like the high wing Cessna 172 Skyhawk and low wing Piper Warrior, both of which are in the FAA’s design group A-I. Larger aircraft like the Beechcraft King Air 200 do use the runway on a regular basis in adequate numbers to justify an ARC of B-II.

AVGAS CHANGES

For those following the industry, there has been an initiative for several years to get the lead out of avgas (100LL).

The Piston Aviation Fuel Initiative, or PAFI, is a joint industry-government partnership to test and approve an unleaded avgas suitable for the existing fleet of piston aircraft. PAFI develop a new ASTM (American Society for Testing and Materials) specification for refining it and to address the business case for deploying it into the field. Note that the emphasis here is to come up with a 100-octane fuel that the approximately 230,000 piston-engine aircraft worldwide (about 170,000 of which are U.S.-registered) can safely use without modification.

As of this writing, the industry has narrowed the replacement fuel down and is still on track to implement the changeover in 2018. For EEN, at some point the airport (or FBO) should make the switch from 100LL to the new fuel.

²³ Visual conditions are a minimum of 3 statute miles; any condition with a lower visibility is considered instrument conditions. An aircraft executing a circling procedure is considered operating under instrument conditions.

3.11 SUMMARY

The Airport will remain a general aviation airport in support of recreational and business aviation. The population, per capita income and employment levels in the service area will reflect changes in both national and state demographics. And the Airport's level of activity will also emulate that of the U.S. regarding the number of based aircraft, fleet mix, and operations. These projections are used in subsequent sections of this Plan in developing the Airport's facility needs as well as alternatives to meet those needs. Table 3-11 summarizes the findings of this chapter.

Table 3-11. Dillant Hopkins Airport Forecast Summary				
ELEMENT	EXISTING 2016	SHORT TERM (2017 – 2021)	MEDIUM TERM (2022 – 2026)	LONG TERM (2027 – 2036)
Design Aircraft				
<i>Runway 2-20</i>	Challenger 300	Challenger 300	Falcon 7X	Falcon 7X
<i>Runway 14-32</i>	King Air 200	King Air 200	King Air 200	King Air 200
Runway 2-20 Reference Code	C-II	C-II	C-II	C-II
Runway 14-32 Reference Code	B-II	B-II	B-II	B-II
Airport Reference Code	C-II	C-II	C-II	C-II
Runway 2-20 Taxiway Design Code	1B	1B	2	2
Runway 14-32 Taxiway Design Code	2	2	2	2
Based Aircraft Fleet Mix				
<i>Single-engine (piston)²⁴</i>	69	70	72	72
<i>Multi-engine (piston)</i>	6	6	5	2
<i>Turboprop</i>	2	2	3	6
<i>Jet</i>	2	5	7	9
<i>Helicopter</i>	1	1	1	2
<i>Total</i>	80	84	88	91
Operations (per year)				
<i>Local</i>	6,160	6,200	6,300	6,400
<i>Itinerant</i>	21,840	22,100	22,200	22,700
<i>Total</i>	28,000	28,300	28,500	29,100
<i>OPBA</i>	350	337	324	323
Aviation Fuel Sales (gallons per year)				
<i>Avgas</i>	30,000	30,000	29,700	29,400
<i>Jet</i>	80,000	90,500	102,400	131,000
<i>Total</i>	110,000	120,500	132,100	160,400



²⁴ Includes light sport and experimental aircraft.

4 FACILITY REQUIREMENTS

4.1 INTRODUCTION

This chapter takes the forecasts developed in Chapter 3 and assesses the types of facilities the airport will need looking forward 20-years. This includes runways, taxiways, parking aprons, hangars, and ancillary facilities that support airport activity.

To properly plan the Dillant Hopkins Airport it is necessary to translate forecast aviation demand into the types and quantities of facilities that can adequately serve the identified need. This chapter uses the results of the estimates presented in Chapter Three, as well as established planning criteria, to determine the airside (i.e., runway, taxiways, navigational aids, marking and lighting) and landside (i.e., hangars, aircraft parking apron, terminal and automobile parking) facility requirements.

The objective of this effort is to identify, in general terms, the adequacy of the existing airport facilities and outline what new facilities may be needed, and when these may be necessary to accommodate forecast demands. Having established these facility requirements, alternatives for providing these facilities will be evaluated in Chapter Five - Alternatives to determine the most cost-effective and efficient means for implementation. The airside and landside capacity needs are determined by comparing the capacity of the existing facilities to forecasted demand for them. In cases where demand exceeds capacity, additional facilities are recommended. Conversely, if capacity exceeds demand, ways of managing the excess will be discussed. The timeframe for assessing development needs usually involves the three forecast periods: short (0-5 years); intermediate (6-10 years); and long-term (years 11-20).

4.2 PLANNING HORIZONS

An updated set of aviation demand forecasts for the Airport was prepared and presented in Chapter Three. These activity projections include annual operations, based aircraft, fleet mix, the critical design aircraft and the Airport Reference Code (ARC). With this information, components of the airfield and landside system can be evaluated to determine their capacity to accommodate future demand.

Cost-effective, efficient, and orderly development of an airport should rely more on actual demand at an airport than on a time-based forecast figure. To develop a master plan update that is demand-based rather than time-based, a series of planning horizon milestones have been established that take into consideration the reasonable range of aviation demand projections. The planning horizons are the Short Term (approximately years 1-5), the Intermediate Term (years 6-10), and the Long Term (years 11-20). Table 4.1 lists the planning horizon milestones for each aviation activity category.

Short-Term
2017-2021

Intermediate-Term
2022-2026

Long-Term
2027 - 2036

Table 4-1. Activity Forecasts

MEASUREMENT	CURRENT	SHORT-TERM	INTERMEDIATE-TERM	LONG-TERM
Based Aircraft				
<i>Single Engine Piston</i>	61	58	55	50
<i>Multiengine Piston</i>	6	6	5	2
<i>Turboprop</i>	2	2	3	6
<i>Jet</i>	2	5	7	9
<i>Rotorcraft</i>	1	1	1	2
<i>Other</i>	5	12	16	23
<i>Total Based Aircraft</i>	80	84	83	91
Aircraft Operations				
<i>Local</i>	6,160	6,200	6,300	6,400
<i>Itinerant</i>	21,840	22,100	22,200	22,700
<i>Total</i>	28,000	28,300	28,500	29,100
<i>OPBA</i>	350	337	324	323
Design Aircraft				
<i>Runway 2-20</i>	Challenger 300	Challenger 300	Falcon 7X	Falcon 7X
<i>Runway 14-32</i>	Beech King Air 200	Beech King Air 200	Beech King Air 200	Beech King Air 200
Airport Reference Code				
<i>Runway 2-20</i>	C-II	C-II	C-II	C-II
<i>Runway 14-32</i>	B-II	B-II	B-II	B-II

It is important to consider that the actual activity at the Airport may be higher or lower than what the annualized forecast portrays. By planning per event milestones, the resultant plan can accommodate unexpected shifts or changes in the area's aviation demand. It is critical to the project to accommodate these changes so that airport officials can respond to sudden changes in a timely fashion.

The primary reason for utilizing milestones is it allows airport management the flexibility to make decisions and develop facilities per need generated by actual demand levels. The demand-based schedule provides flexibility in development, as development programs can be slowed or expedited per

demand at any given time over the planning period. The resultant plan provides airport officials with a financially responsible and needs-based program.

4.3 RUNWAY REQUIREMENTS

The existing runways at Dillant-Hopkins Airport are examined on dimensional criteria, length, width, and pavement design strength.

4.3.1 DESIGN AIRCRAFT & ARC REQUIREMENTS

As discussed in Chapter 2, FAA guidance on dimensional standards is based on the ARC. This guidance includes both existing and future classifications. As also noted in Chapter 2, the current design aircraft is the Bombardier Challenger 300 (a midsize business jet) for Runway 2-20 and the Beechcraft King 200 (a small 12,500-pound twin-engine turboprop aircraft) for Runway 14-32. Based on these aircraft, the ARC for Runway 2-20 is C-II and B-II on Runway 14-32. Forecasts indicate that while the design aircraft for Runway 2-20 will change in the next five to seven years to the Dassault Falcon 7X, the ARC will remain unchanged (C-II for Runway 2-20 and B-II for Runway 14-32).

Sizing an airport's infrastructure is one of the most critical decisions made in the planning process. Under sizing creates the potential for safety issues, whereas over sizing wastes resources (land and money). The goal of every master planning effort is to 'right-size' the airport to balance future demand with the airport's infrastructure and resources.

Changing an airport's reference code is a difficult decision, one that should not be taken lightly, particularly for the primary runway. Regardless of the existing and future design aircraft, given the number of jet operations at EEN, both current and forecast, we believe it would be prudent to keep Runway 2-20 classified as a C-II runway. This process allows for the opportunity to accommodate group II aircraft of various approach speed ranges, with the understanding that any number of small and large aircraft can and will continue to use the airport, ranging from the smallest aircraft "A" through larger aircraft "C," and even an occasional "D" category aircraft.

Runway 14-32 is another issue that should be addressed. The current design code for the crosswind runway is B-II, however as noted, this runway today is used primarily by smaller aircraft in the A-I group. While some larger aircraft, in the size group of a King Air 200 or Cessna 402 do occasionally use this runway, most operations are by smaller recreational aircraft departing and landing on Runway 32 when gusty northwest wind conditions make using the primary runway more challenging for less experienced pilots. Also, through observation, some pilots will depart Runway 14 because it is a short taxi distance from the main aircraft parking apron. While it may be tempting to reduce this runways infrastructure to A-I standards, we believe keeping it a B-II runway makes sense. Like the longer Runway 2-20, sizing the infrastructure to ensure a safe operating environment is paramount.

Therefore, the recommended design code for Runway 2-20 is C-II and B-II for Runway 14-32.

4.3.2 RUNWAY DESIGN STANDARDS

The FAA published Advisory Circular (AC) 150/5300-13A, Airport Design, to guide airport planning and design. The AC provides guidance on various design elements of an airport intended to maintain or

improve safety at airports. The design standards include airport details such as runways, taxiways, safety areas, and separation distances. Per AC 5300-13A, “airport planning should consider both the present and potential aviation needs and demand associated with the airport.” Consideration should be given to planning runway and taxiway locations that will meet future separation requirements even if the width, strength, and length must increase later. Such decisions should be supported by the aviation demand forecasts and coordinated with the FAA and shown on the Airport Layout Plan (ALP).

The AC notes that the Airport Reference Code (ARC) is used for planning and design (of the entire airport) only and does not limit the aircraft that may be able to operate safely at the airport. The ARC applies to the entire airport. Moreover, until Change 1 was published, the FAA further refined the ARC for runways using a Runway Design Code (RDC) as, “A code signifying the design standards to which the runway is to be built.” However, with the publication of Change 1 in February 2014, the RDC was replaced by two new codes; the Approach Reference Code (APRC) and Departure Reference Code (DPRC). The APRC is a code signifying the current operational capabilities of a runway and associated parallel taxiway about landing operations. Whereas, the DPRC is a code meaning the current operational capabilities of a runway about takeoff operations. The APRC and DPRC are meant to “describe the current operational capabilities of a runway and adjacent taxiways. In contrast, the RDC was based on planned development and had no functional application.”

The APRC is composed of three components: The Approach Aircraft Category (AAC) and Aircraft Design Group (ADG), and visibility minimums while the DPRC consists of the AAC and ADG without the visibility minimums component. Furthermore, the DPRC “represents those aircraft that can take off from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions with no special operational procedures necessary.” The question by now is, what does this mean and how does this apply to EEN? The short answer is that the ARC, APRC, DPRC, AAC, ADG and other contractions probably mean little to the average person reading this master plan, but to the FAA, NHDOT/BOA, and planners preparing this master plan update, they say plenty. These various codes are what we used to ensure the airport meets current safety design standards today, and that is moving forward, the airport will be planned to meet proposed changes.

With the existing and future design aircraft selected, the next step is to assess the recommended design standards for each runway. These measures include the runway layout (length, width, crosswind component et al.), and the size and separation distances of some criteria include runway safety areas, runway protection zones, object free areas and other FAA design standards. Table 4.2 is a design matrix that lists each of the critical elements, their size, and where applicable, the distance between elements (runways to taxiways, runways to buildings and other similar FAA design standards).

Table 4-2. Existing and Future Design Standards

DESIGN STANDARD	RUNWAY 14-32 B-II	RUNWAY 02-20 C-II
Applied Approach Visibility (see notes)	1-1/4 mile	1 mile
Runway Design		
<i>Width</i>	75'	100'
<i>Crosswind Component (knots)</i>	13 knots	16 knots
Runway Protection		
Runway Safety Area		
<i>Length Beyond Departure End</i>	300'	1000'
<i>Length before Threshold</i>	300'	600'
<i>Width</i>	150'	500'
Runway Object Free Area (OFA)		
<i>Length Beyond Runway End</i>	300'	1000'
<i>Length before Threshold</i>	300'	600'
<i>Width</i>	500'	800'
Runway Object Free Area (OFA)		
<i>Length</i>	200'	200'
<i>Width</i>	250'	400'
Precision Obstacle Free Zone (POFZ)		
<i>Length</i>	N/A	N/A
<i>Width</i>	N/A	N/A
Approach Runway Protection Zone (RPZ)		
<i>Length</i>	1,000'	1,700'
<i>Inner Width</i>	500'	500'
<i>Outer Width</i>	700'	1,010'
<i>Area</i>	13.77 acres	29.465 acres
Departure Runway Protection Zone		
<i>Length</i>	1,000'	1,700'
<i>Inner Width</i>	500'	500'
<i>Outer Width</i>	700'	1,010'
<i>Area</i>	13.77 acres	29.465 acres
Runway Separation		
<i>Holding Position</i>	200'	250'
<i>Parallel Taxiway/Taxilane Centerline</i>	240'	300'
<i>Aircraft Parking Area</i>	250'	400'
Source: FAA AC 5300-13A, Airport Design. Notes: Applied approach visibility is based on the lowest minimums to each runway. Circling minimums apply to Runway 14-32.		

4.3.3 RUNWAY WIDTH, LENGTH, AND ORIENTATION ANALYSIS

This section evaluates the recommended width, length, and orientation of the two runways at Keene.

The required runway width is a function of the ARC and instrument approach visibility minimums. The higher the ARC and the lower the visibility, the wider the runway should be. Runway length is a function of the design aircraft operating performance. Runway orientation is a function of the wind, airspace restrictions, environmental factors, such as noise, and obstructions. Of the three (width, length, and orientation), the latter is the most challenging and expensive to change once a runway is constructed.

4.3.3.1 Runway 14-32

Runway 14-32, the airport’s crosswind runway is 4,001 feet long by 150 feet wide and is oriented southeast-northwest (142° – 322° magnetic). The runway also has a 1,100-foot displacement on the 32 end because of obstructions in the Part 77 approach surface (see Figure 2-25, page 2.34). The displacement ensures adequate obstacle clearance for landing aircraft and has no impact on departing aircraft on Runway 32, and departing and arriving aircraft on Runway 14.

4.3.3.2 Orientation

One element of this study was to examine the orientation of Runway 14-32 for assessing whether a reorientation would be operational advantages. As noted earlier, Runway 14-32, the airport’s crosswind runway is oriented southeast-northwest (142° – 322° magnetic). In examining the runway layout, we note that the orientation would appear to be satisfactory. That is, the approach and departure corridors take aircraft initially over a wooded area northwest of the runway and Wilson Pond on the southeast side. Wind alignment appears to be acceptable, however, as noted in Chapter 2, data from the airport’s ASOS is uncertain (see Paragraph 2.8.2, page 2.6). Table 4-3 lists the wind coverage for all four runways independent of each other, as well as all runways combined. While individually, no single runway has minimum FAA coverage of 95%, combined the airport has adequate coverage in the conditions listed.

RUNWAY	CROSSWIND	IFR	VFR	ALL	CALMS
02	16 KTS	87.1%	72.1%	73.9%	N/A
20	16 KTS	85.2%	70.7%	72.5%	N/A
14	13 KTS	85.6%	64.7%	67.2%	N/A
32	13 KTS	86.4%	76.8%	78.0%	N/A
ALL	13 KTS	99.5%	98.5%	99.6%	N/A
ALL	16 KTS	100%	99.9%	99.9%	N/A

Source: FAA Airport GIS
 Station: KEEN AWOS Station 726165
 Period: 2006 – 2015
 N/A – Not available

Any realignment of the runway, when design elements, such as safety areas and runway protection zones are considered, would create more problems than it solves. For example, realigning the runway clockwise or counterclockwise would interfere with existing hangars and possibly private property. Regarding planning, there appears to be no justification to realign this runway.

4.3.3.3 Width

Based on the previous, current and forecast ARC, the required width for Runway 14-32 is 75 feet or half of its current width of 150 feet.

4.3.3.4 Length

Airplanes today operate on a broad range of runway lengths. Various factors, in turn, govern the suitability of the runway length. Most notably airport elevation above mean sea level, temperature, wind velocity, airplane operating weights, takeoff and landing flap settings, runway surface condition (dry or wet), effective runway gradient, the presence of obstructions near the airport, and, if any, locally imposed noise abatement restrictions or other prohibitions. Of these factors, individual ones have an operational impact on available runway lengths. That is, for a given runway the suitable length provided by the airport authority may not be entirely suitable for all types of airplane operations.

Runway length is a function of the operational demand for the airport’s (or runway) design aircraft. For Runway 14-32, the design aircraft is the Beechcraft King Air 200. However, because Runway 14-32 serves as a secondary runway to the longer primary runway, 2-20, other factors must be considered. In the past, the FAA suggested that a crosswind or secondary runway should be 80% of the length of the airport’s primary runway¹. This 80% rule would indicate a secondary runway length of 4,960 feet. However, the rationale has changed instead of a more detailed analysis. Today, planners rely on calculations based on the types of aircraft that use the runway². One such method is the use of a runway length curve like the graph shown in Figure 4-1. Applying the conditions for EEN (Average High Temperature in Keene (July) = 82°F³, and Airport Elevation = 488 feet, the recommended length of Runway 14-32 is 4,100 feet.

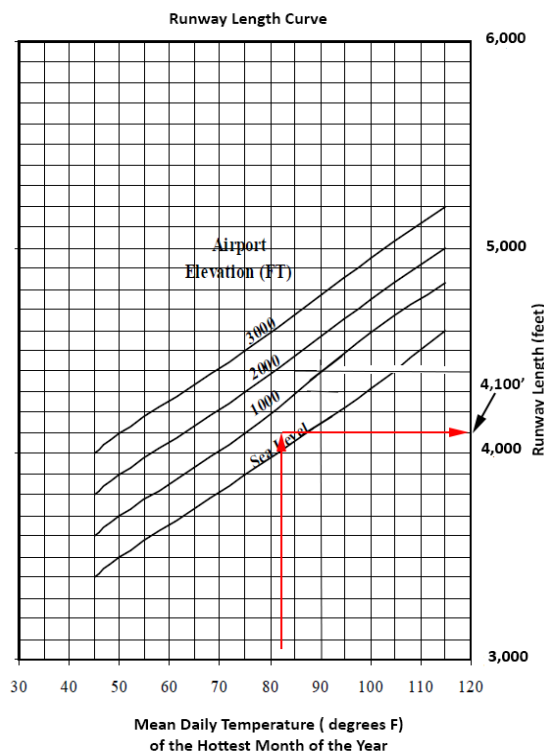


Figure 4-1. Runway Length Curve
 (Source: FAA AC 5325-4B, Runway Length Requirements for Airport Design, July 2005).

¹ FAA AC 150/5325-4A, Runway Length Requirements for Airport Design (March 1991).

² FAA AC 150/5325-4B, Runway Length Requirements for Airport Design (July 2005).

³ US Climate Data (<http://www.usclimatedata.com/climate/keene/new-hampshire/united-states/usnh0119>)

While Runway 14-32 is currently 4,001 feet long, it does have a 1,100-foot displacement on the Runway 32 end, reducing the available length for landing aircraft to 2,901 feet. Therefore, the recommended length of Runway 14-32 is 4,100 feet for all operations.

4.3.4 RUNWAY 2-20

Runway 2-20, the airport's primary runway is 6,201 feet long and 100 feet wide and is oriented approximately north-south (018° - 198° magnetic).

4.3.4.1 Width

Based on the previous, current and proposed ARC, the required runway width is 100' for Runway 2-20. This width should be maintained.

4.3.4.2 Runway Length

The length of Runway 2-20 is critical given the types of aircraft that use it on a regular basis. The current design aircraft is the Challenger 300, which is forecast to change to the Falcon X in the next five to seven years.

The required length for Runway 2-20 was determined based on an analysis using aircraft performance data based on the types of aircraft currently based at the airport as well as the aircraft that utilize the airport. This analysis takes into consideration the same conditions addressed earlier in paragraph 4.3.3.4 (page 4.7). The Bombardier Challenger 300, Falcon 7X, Global 500, as well as the several other larger corporate jets that use the airport on a regular basis, as well as the future design aircraft, the Bombardier Global 700 are included in this analysis. Figure 4-2 identifies approximate runway length requirements for various jet aircraft that use the airport. As noted, most of the existing aircraft that use EEN can operate from the primary runway during the conditions noted. Aircraft that exceed the available runway length of 6,201 feet can elect to operate at a reduced payload, or during conditions more favorable, such as cooler temperatures, or an increased headwind.

The analysis indicates that the existing runway length meets existing and projected demand.

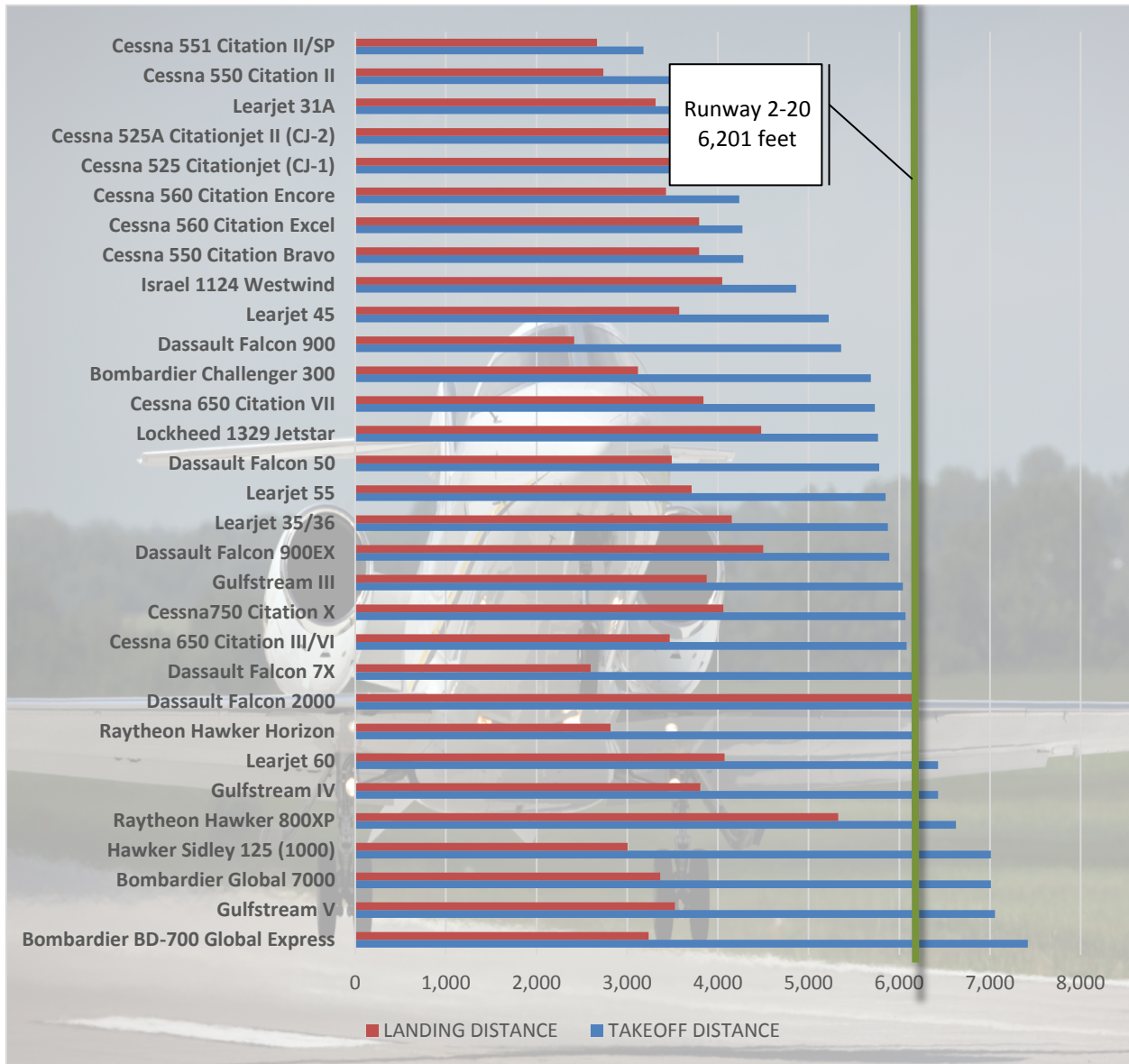


Figure 4-2. Runway Length Requirements for Typical Jet Operations at EEN

4.3.5 TAXIWAY REQUIREMENTS

There is a total of six taxiways at the airport, including a parallel taxiway along Runway 2-20 designated as Taxiway ‘A’. This taxiway varies in distance from the runway centerline. The section between the crosswind runway and the approach end of Runway 20 is 400 feet; whereas the section between the crosswind runway and the approach end of Runway 2 is 510 feet, centerline to centerline. Design standards for a C-II runway require a minimum of 400 feet (see Table 4-2, page 4.5). Also, the taxiway does not extend to the Runway 2 threshold. The 2003 Airport Master Plan Update identified extending

the taxiway approximately 800' to the Runway 2 end and moving the taxiway closer to the runway to meet existing separation standards.

To maximize available land for development of property to the east of the taxiway, the taxiway should be reconstructed to current and planned design standards. The taxiway should be 50 feet wide and located 300 feet centerline to centerline. Also, by moving the taxiway closer to the runway, extending the pavement the full length of the runway would be more practical because it would avoid a drainage ditch east of the runway near the approach end of Runway 2.

4.4 LANDSIDE CAPACITY & REQUIREMENTS

This section addresses landside capacity and recommended changes to meet future demand. This discussion includes parking aprons and hangars, terminal building space, automobile parking, and miscellaneous storage and facilities.

4.4.1 AIRCRAFT STORAGE

Before aircraft storage requirements are addressed, an assumption must be made concerning the ratio of aircraft stored in hangars and those parked in the tie downs. The current mix is 78 percent in hangars (62 aircraft) and 22 percent on aprons (18 aircraft). This ratio is like other general aviation airports within the region, where there are generally more aircraft parked in hangars than out in the open. It is anticipated that the mix will remain the same with 80 percent parked in hangars and 20 percent parked on apron areas throughout the 20-year planning period.

4.4.2 APRONS AND TIE DOWNS

As identified in Chapter 2, the airport has two aprons covering about 15,000 square yards with tie down space for 41 aircraft. The itinerant apron, located directly in front of the terminal covers about 5,000 square yards and has 13 aircraft tie down spots (for smaller general aviation aircraft) and room for two or three larger aircraft (with no tie down anchor spots). The based aircraft apron is in the main hangar area near the existing fueling terminal. This area has two tie-down rows; one is 5,200 square yards with 21 tie down spots; the second is about 5,000 square yards with 17 tie down spots for a total of 38 available marked tie-down spaces.

Tables 4-4, 4-5, and 4-6 present standard calculations used to determine itinerant, based, and entire apron space for the no growth, low growth, and high growth scenarios.

Table 4-4. Itinerant Aircraft Parking Requirements

PARAMETER	PLANNING PERIODS			
	EXISTING	SHORT-TERM (2017-2021)	INTERMEDIATE - TERM (2021-2026)	LONG-TERM (2027-2036)
Total Annual Itinerant Operations	21,840	22,100	22,200	22,700
Busiest Month Operations (20% Annual)	4,368	4,420	4,440	4,540
Average Day, Busiest Month (1/30th)	146	147	148	151
Itinerant Parking Demand (15% of the Busiest Day)	22	22	22	23
FBO Demand	4	4	4	4
Total Itinerant Demand	26	26	26	27
Existing Capacity (Itinerant Ramp)	13	13	13	13
Surplus (Deficit)	(13)	(13)	(13)	(14)

Source: Stantec Analysis

Table 4-5. Based Aircraft Parking Requirements

PARAMETER	PLANNING PERIOD			
	EXISTING	SHORT-TERM (2017-2021)	INTERMEDIATE - TERM (2021-2026)	LONG-TERM (2027-2036)
Based Aircraft	80	84	88	91
Percent Parked on Aprons	22%	21%	20%	20%
Based Aircraft Parking Demand	18	18	18	18
Existing Capacity (Based Aircraft Ramp)	38	38	38	38
Surplus (Deficit)	20	20	20	20

Source: Stantec Analysis

Table 4-6. Total Aircraft Parking Requirements

PARAMETER	PLANNING PERIOD			
	EXISTING	SHORT-TERM (2017-2021)	INTERMEDIATE - TERM (2021-2026)	LONG-TERM (2027-2036)
Itinerant Demand	26	26	26	27
Based Aircraft Demand	20	20	20	20
Total Demand	46	46	46	47
Existing Capacity	51	51	51	51
Surplus (Deficit)	5	5	5	4

Source: Stantec Analysis

As noted in Table 4-4, the airport currently has 13 marked tied down spaces on the itinerant ramp outside the terminal building, but with demand slightly more aircraft during the busiest periods of the year/month/day. This analysis is based on several assumptions.

1. The airport's operation count of 28,000 takeoffs and landings is correct.
2. The percentage of itinerant versus local operations (40%/60%) is accurate.
3. Demand for the terminal building space from the FBO, flight training, and the restaurant does exceed projected activity. That is the number of aircraft spaces required by the FBO for routine activity, such flight training, or the number of visiting pilots that will use the restaurant or conduct other internal business does not exceed projected activity.

A change in any of these three assumptions will alter the balance resulting in an increase or decrease in demand.

Based aircraft activity is less critical because there's considerable surplus of space on that side of the airport. As noted in Table 4-5, there 38 existing marked tie down spaces, but demand today and as forecast through the next 20 years will not exceed capacity. This assessment is also based on two primary assumptions.

1. The based aircraft count of 80 is accurate or within a reasonable percentage of that number (say plus or minus 10%).
2. Hangar demand will continue to be in the 80% range of total based aircraft.

Like itinerant demand, any changes in the data presented will alter the calculations. However, unlike itinerant demand, there is ample capacity to meet existing and forecast demand for based aircraft parking.

Because there's an imbalance between itinerant and based aircraft parking capacity and demand, additional spaces should be constructed near the terminal. This assessment applies now that the restaurant is open and at this point, appears to be doing exceptionally well. This business alone will drive demand for parking higher than anticipated.

4.4.3 HANGAR REQUIREMENTS

At the end of 2016, there were 62 aircraft parked in hangars, which accounts for 78 percent of the total based aircraft. It is projected that the ratio of based aircraft parked in hangars will remain similar throughout the planning period with approximately 80% parked in hangars. Table 4-7 identifies the estimate for hangar space required to meet forecast demand. As calculated, and assuming the number of based aircraft increases as shown, and demand meets expectations, the airport will have a need for 11 additional hangar spaces by the year 2036. A hangar space can be a single hangar or a large hangar that holds more than one aircraft.

Table 4-7. Hangar Space Requirements

PARAMETER	PLANNING PERIOD			
	EXISTING	2017-2021	2021-2026	2027-2036
Based Aircraft	80	84	88	91
Percent in Hangars	78%	79%	80%	80%
Based Aircraft Hangar Demand	62	66	70	73
Existing Hangar Space	62	62	62	62
Surplus (Deficit)	0	(4)	(8)	(11)

Source: Stantec Analysis

4.5 TERMINAL BUILDING REQUIREMENTS

The airport terminal is an 11, 400 square foot single story concrete block building located on the airport's northern end, sandwiched between the approach end of Runway 20 and 14. The terminal is, of course, a throwback to the era when Keene received commercial airline service. Based on this earlier need, the building, in addition to administrative space and a large restaurant, has airline counter space, a spacious lobby, and the ancillary facilities required to service airline traffic (baggage servicing, claim areas, etc.). In addition to the restaurant, airport manager's office space, and the airline counter area, the airport also uses two rooms for the Fixed Based Operator (one for business and the second one serves as an FBO business office).

The reality is that the Keene airport will probably not see the return of commercial airline service. However, this does not mean the airport should demolish the building and reconstruct the interior just because there's no immediate need for an airline service counter and behind the scene space.

The current manager's space is ample and clearly meets the needs of the small staff. There's sufficient room for routine business transactions including a reasonably sized conference table and a large adjoining storage room.

The restaurant occupies about one-third of the building (about 4,400 square feet). This area appears large enough for a typical airport restaurant, with a large food preparation area, a bar, and seating area. Also, there are plans to expand the facility outside with a small deck area and separate entrance directly to the restaurant. Moreover, the FBO, Monadnock Aviation occupies about 500 to 600 square feet.

The former airline counter and serving area cover about 1,500 square feet, and the remaining space includes about 1,500 square feet of lobby and utilities.

A small but significant focus of this master plan is to decide the best use of the building. An architect was brought on as part of this project to offer a high-level assessment of the building and to help develop some basic plans for its future use. Also, some emergency efficiency ideas will be promoted and included in the next chapter of this report, the Alternatives.

4.5.1 AUTOMOBILE PARKING REQUIREMENTS

Vehicle parking space is a function of both internal and external demand. Internal demand involves the number of employees requiring parking space, which in the case of Keene would include airport management, the FBO, and restaurant staffing. External includes visitors to the airport for both pleasure and business and would include meetings with the administration, as well as FBO Thomas Transportation, and restaurant customers. In all three cases, visitors will arrive by car or airplane.

The airport currently has 158 parking spaces adjacent to the terminal building. Note: this does not include parking around private and public hangars, nor does it include parking around C&S Wholesale Grocers. For planning purposes, only vehicle parking demand placed on the airport terminal area is included in the calculations. Table 4-8 lists the approximate demand placed on the terminal building. However, these calculations are based on existing demand and likely growth changes over the next two decades. Any additional demand placed on the terminal area, such as the addition of a transportation center will invariably change these calculations. But with a surplus of 75 spaces, the vehicle parking lot has sufficient room for additional demand.

FACILITY/REQUIREMENT	EMPLOYEES	AVERAGE DAILY PEAK VISITOR DEMAND	TOTAL
Airport Management	2	3	5
FBO	3	6	9
Restaurant	6	35	41
Thomas Transportation	0	25	25
Miscellaneous	1	2	3
Total	12	71	83
		Existing Spaces	158
		Surplus	75

4.5.2 MISCELLANEOUS REQUIREMENTS

In addition to the facility infrastructure needs addressed earlier, there are two additional upgrades/improvements the airport should consider moving forward. The first is the additional of a new instrument approach procedure to a runway other than Runway 2 (see paragraph 2.8.6, Instrument Approaches, page 2.13). And the second is the additional of new visual navigation aids.

4.5.2.1 Instrument Approach Procedures

The existing instrument approach procedures are aligned only to Runway 2, which is adequate when the wind favors this end of the airport. However, if the wind is aligned with another runway, pilots must either circle and land on another runway or if the wind exceeds the pilot or aircraft capabilities, divert to another airport. The circling procedure is a type of instrument operation where the pilot begins the approach to Runway 2, but then after acquiring the airport visually begins a circling maneuver to align with one of the other three runway ends (depending on wind direction). This maneuver, particularly at

night, and in inclement weather is possibly one of the more dangerous maneuvers for a pilot to fly because the aircraft is low (about 900 feet above the ground) and slow (in landing configuration). The way to minimize this is through the development of a procedure to one or more of the other three runway ends. To assess the feasibility of this procedure, each of the other three runway ends were examined.

Runway 14 is not used enough to justify the cost of an expensive survey, and the hill east of Runway 32 eliminate this end because it would result in minimums as high, if not higher than the current circling minimums. Developing an instrument approach to Runway 20 would seem like a viable option because the runway is used on a regular basis when the wind is from the southeast – south – and southwest, and the terrain to the east seems relatively clear of natural obstructions. However, after conducting a preliminary airspace analysis, it was discovered that there are ground obstructions just east of the runway threshold, in the area between Airport Road and the airport property line.

The existing Part 77 approach surface to Runway 20 is based on a visual runway with a 20:1 surface slope (5 degrees). However, to develop an instrument approach to Runway 20, the surface must be based on either precision or non-precision surface set at either 50:1 (2 degrees) or 34:1 (3 degrees). Both were examined, and ground obstructions were noted in terrain just east of Airport Road. Figure 4-3 shows the impacts associated with a non-precision 34:1 slope. As mentioned, a small hill, which does not penetrate the existing Part 77 20:1 visual approach surface, does stick up into the protected airspace of a 34:1 slope. A 50:1 slope only amplifies the impact. For this reason and because the non-precision

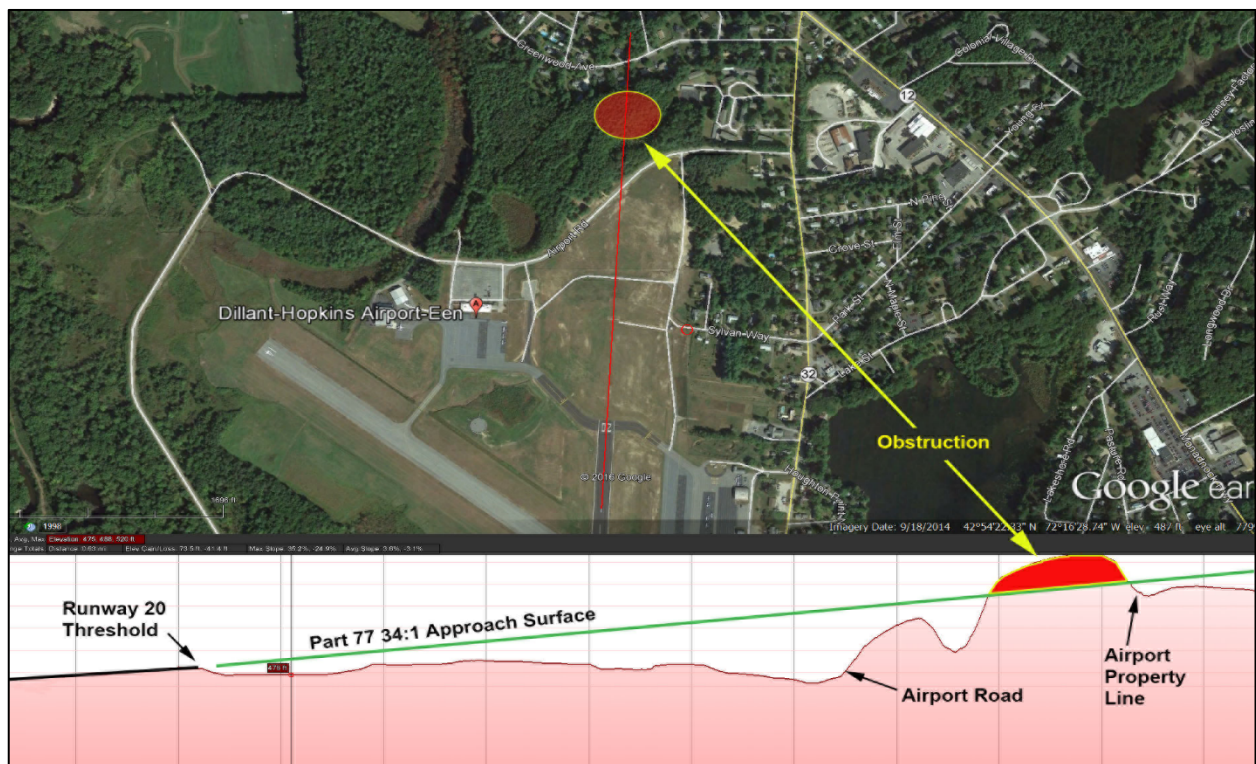


Figure 4-3. Impact of 34:1 Part 77 Approach Surface to Runway 20

34:1 approach slope is both wider and longer, it would increase the area, both on and off property (besides the hill just discussed) with trees that would penetrate the protected airspace. Another concern is the language in future aviation easements. In addition, the current zoning map defines the Runway 20 approach surface as visual with a 20:1 slope.⁴ Any decision to implement an instrument approach to this runway end would require a change to the zoning language in advance of implementation. Thus, given the tenuous nature of community relations, developing an instrument approach to Runway 20 must be carefully weighed with a balance between flight safety, airport development, and community relations.

4.5.2.2 Airport Lighting Improvements

Existing airfield lighting includes runway edge and threshold lights on both runways (HIRL on Runway 2-20 and MIRL on Runway 14-32), an approach lighting system to Runway 2 (MALSR), and PAPI on Runway 2 and 20 (see Figure 2-3, page 2.6 and Table 2-4, page 2.13). Looking forward, additional lights and an upgrade to existing lights are justified given the level of activity at the airport, including a high number of jet operations. Also, current technology includes LED lights for most applications at general aviation airports, which can offer significant electricity cost savings. Because aircraft on an instrument approach can circle and land on Runways 14, 20 or 32, the installation of REILS and PAPI would add measurably to the safety of aircraft landing on any of these runways at night and during inclement weather. The following recommended changes are suggested.

Runway 2-20

- Replace incandescent HIRL with MIRL LED lights.⁵
- Replace incandescent MALSR with LED lights

Runway 20

- Install REILs

Runway 14-32

- Replace incandescent MIRL with LED lights
- Install PAPI
- Install REIL

Taxiways

- Replace incandescent medium intensity taxiway edge lights with LED lights

4.6 SUMMARY

The Dillant Hopkins Airport is in excellent shape, and except for obstructions in the airport's protected airspace, complies all FAA safety design standards. The Runway 2-20 parallel taxiway could be moved closer to the runway and should be extended full length, a project that would enhance safety by

⁴ City of Keene, Code of Ordinances, Section. 14-265 – Dillant Hopkins Airport Approach Plan.

⁵ While Runway 2-20 is current equipped with High Intensity Runway Lights (HIRL), design standards only require Medium Intensity Runway Lights (MIRL), which are less expensive to install and to operate. In addition, at present, the FAA will not fund HIRL LED lights, however, the consensus in the industry is it's only a matter of time until the use of AIP funds for this type of lights is approved. The lights should be replaced the next time the runway is reconstructed.

eliminating the need for aircraft to taxi on the runway. Moving the taxiway closer to the runway would open space for future development. However, the cost of moving the taxiway probably does not outweigh any benefits derived from this costly project.

Runway 14-32 should be shortened and constructed to 75 feet in width. This reduction in width would save considerably on construction and maintenance costs.

The aircraft parking area should be examined for efficiency. Currently, the itinerant apron is too small, and the based aircraft apron is too large. While this may not seem to be a major concern, visiting pilots on busy days are required to park a considerable distance from their most likely destination: the terminal building.

Table 4-9 is a summation of the facility requirements discussed in this chapter. It is important to note that a “facility requirement” does not necessarily mean it is achievable. Financial, environmental, and physical constraints may negate the need for new or replacement facilities. This is addressed in more detail in Chapter 5 (Alternatives) with the selection of a preferred alternative, and Chapter 7 (Financial – Implementation Plans).

The following legend is applicable.

- E Existing (no change required)
- R Recommended
- NA..... Not Applicable
- NR..... Not Required
- PAPI..... Precision Approach Path Indicator Lights
- REIL..... Runway End Identifier Lights
- MALSR Medium Intensity Approach Lights with Sequence Flashers

Table 4-4-9. Facility Requirements Summary

AIRPORT ASSET	PLANNING PERIOD			
	EXISTING	SHORT-TERM (2017-2021)	INTERMEDIATE - TERM (2021-2026)	LONG-TERM (2027-2036)
Runway Length & Width				
<i>Runway 2-20</i>	6,201' x 100'			
<i>Runway 14-32</i>	4,960' x 75'			
Runway Surface	Asphalt	Asphalt	Asphalt	Asphalt
Runway Lighting				
<i>Runway 2-20</i>	HIRL	HIRL	HIRL	MIRL
<i>Runway 14-32</i>	MIRL	MIRL	MIRL	MIRL
PAPI				
<i>Runway 2</i>	NR	NR	NR	NR
<i>Runway 20</i>	E	E	E	E
<i>Runway 14</i>	R	R	R	R
<i>Runway 32</i>	R	R	R	R
REIL				
<i>Runway 2</i>	NR	NR	NR	NR
<i>Runway 20</i>	E	E	E	E
<i>Runway 14</i>	R	R	R	R
<i>Runway 32</i>	R	R	R	R
Hangar Spaces	62	66	70	73
Apron Space				
<i>Itinerant Apron – Existing (Demand)</i>	13 (26)	26	26	27
<i>Based Aircraft Apron – Existing (Demand)</i>	38 (20)	20	20	20



5 ALTERNATIVES ANALYSIS

5.1 INTRODUCTION

The Alternative Analysis Chapter uses conclusions and findings from Chapter 4, Facility Requirements that identify and evaluate a series of options for the airport. The underlying objective is to meet the identified needs for safety and capacity. The key elements of this process are the identification of ways to address recognized facility needs; an evaluation of the alternatives such that stakeholders gain a thorough understanding of the strengths, weaknesses, and other implications of each; and selection of the preferred alternative.

5.2 ASSUMPTIONS

It is important to address several key assumptions and project needs that were developed in earlier parts of this study before any alternatives can be analyzed. First, the airport will remain a general aviation airport during the 20-year planning period. While this does not rule out the possible return of commercial service, nothing to date indicates the need for commercial service at EEN.¹ Second, the existing type of aircraft using the airport are not expected to change significantly throughout the planning period, and the current mix of operations is forecasted to remain primarily single engine aircraft. However, the airport will see increasing use of business class jet aircraft.

5.3 FACILITY REQUIREMENTS

Only those facilities identified as requiring capacity and safety improvements are evaluated in this section. The evaluation includes development of alternatives as well as an operational performance assessment, and best planning tenets based on FAA airport planning and design guidelines. Also, environmental factors that may influence these proposed changes, and an order of magnitude economic assessment are included. The proposed requirements are summarized below and addressed in detail in subsequent paragraphs.

5.3.1 RUNWAY 14-32 REQUIREMENTS

- Narrow Runway 14-32 to ARC B-II standards of 75 feet
- Lengthen the Runway through an extension and shift of the Runway 32 threshold displacement to maximizing usable runway.
- Develop a full-length parallel taxiway for Runway 14-32
- Add visual glideslope guidance to both runway ends

5.3.2 RUNWAY 2-20 REQUIREMENTS

- Extend the existing Runway 2-20 parallel taxiway to the full length of the runway
- Mitigate obstructions through lighting, marking or removal
- Reactive Runway 20 PAPI²

¹ Assumption of the consultant based on the location and level of service of other commercial service airports in the region.

² Requires mitigation of obstruction in the Runway 20 PAPI Obstacle Clearance Surface.

5.3.3 OTHER AIRPORT REQUIREMENTS

- Increase airport wildlife fencing to encompass the entire airport
- Increase the size of the itinerant aircraft parking apron
- Identify additional space for future hangar development
- Replace or Identify a suitable location for a new aircraft fuel farm

5.4 ALTERNATIVES EVALUATION

Each recommended improvement/upgrade includes a written and graphic description as well as an assessment of costs, safety, and environmental issues. The magnitude of order costs is provided based on similar recent projects in New England. Safety Environmental issues, if any, are evaluated using a rating scale and where applicable, a brief assessment as well as any existing permitting requirements.

5.4.1 RUNWAY 14-32 ANALYSIS

This section addressed alternatives for Runway 14-32 that include reducing the width, reconstructing the runway, adding a partial parallel taxiway, and in the long-term, extending both the runway and taxiway.

The runway is due for reconstruction and as part of this project the required runway width was assessed. The current width of 150 feet is too wide given the purpose, use, and FAA design code of the runway. Runway 14-32 has an existing and future design code of B-II meaning, among other things, the FAA design standards require a runway width of 75 feet. Achieving this narrower runway will necessitate the removal of an equal amount of pavement (75 feet), and there are several possible ways this can be attained.

One option is to keep the center 75 feet of the runway and remove 37.5 feet from both sides. The second method is to keep either the southern or northern side of the runway and remove the outer 75 feet. An examination of the airport, runway orientation, and layout, as well as airspace, indicates that from a planning perspective, a cost-benefit analysis suggests that it makes little difference which part of the runway is retained. There are advantages and disadvantages to each of the three options.

Option 1: Keep the southern half of the runway. This alternative would reconstruct the south side of the runway and remove the northern half. The advantage to this option is that it allows for a larger future apron in the terminal area. The disadvantage is it adds to the amount of taxiway pavement required to connect the existing taxiway to the existing apron. In addition, a new survey would be needed to redefine the runway thresholds, and the point where the crosswind runway connects to the primary runway (2-20) may create an engineering design concern because the new Runway 14-32 crown would not match the existing Runway 2-20 profile.

Option 2: Keep the northern half of the runway. Opposite of Option 1, this alternative reconstructs the north side of the runway and removes the southern side. There are no notable advantages to this option. However, the disadvantage includes a smaller future terminal apron footprint and like Option 1, engineering issues concerning matching the crosswind and primary runway profile at the intersection will require additional design and construction efforts. A new runway survey would be necessary that

identifies the location and elevation of the revised runway thresholds. In addition, when the future taxiway is constructed, Option 2 would minimize wetland impacts and possible mitigation.

Option 3: Keep the center portion of the runway. This option from an engineering standpoint makes the most sense for all the reasons addressed earlier in Options 1 and 2. The existing crown and profile of both runways would remain unchanged, and no new survey of the runway ends would be required.

It is important to note that regardless of which option the airport pursues, narrowing the runway eliminates about 315,000 square feet of pavement, or between 4,000 and 4,500 cubic yards of old asphalt (108,000 to 135,000 cubic feet). This reduction in pavement reduces the airport's impervious pavement footprint.

5.4.2 RUNWAY 14-32 ALTERNATIVE 1 – NARROW RUNWAY AND RECONSTRUCT TO 75 FEET

Alternative 1 (Figure 5.1) examines the process of removing the southern half of the runway (left side as seen from the Runway 32 end) and reconstructing the remaining half. The existing Runway 32 displacement remains unchanged, but the pavement from the Runway 32 end to the displaced threshold is also narrowed, reconstructed, restriped and new runway edge lights are installed. The edge lights closest to the terminal building could remain because the new ones would go in the same location, however, replacing all runway lights at the same time is a more reasonable approach because it offers the opportunity to install LED lights, which provides a level of sustainability (see Chapter 8). Regardless of which option (see Paragraph 5.4.1) the airport elected, the process from a planning perspective is essentially the same.

Cost

This alternative is estimated to cost \$2,000,000 (rounded).

● Pavement Removal/Reclaim/Construction	\$1,177,847
● New Runway Edge Lights	\$248,000
● Pavement Markings/Removal	\$16,000
● Total Construction Cost	\$1,441,847
● Permitting	\$25,000
● Engineering/Design	\$288,400
● Contingency (10%)	\$173,022
● Total	\$1,928,269

Safety

This alternative has no direct impact on safety. While a narrower runway does limit the amount of available pavement in the case of an aircraft loss of control, adequate runway safety area on both side of the runway limits the problem. This option also meets FAA design standards.

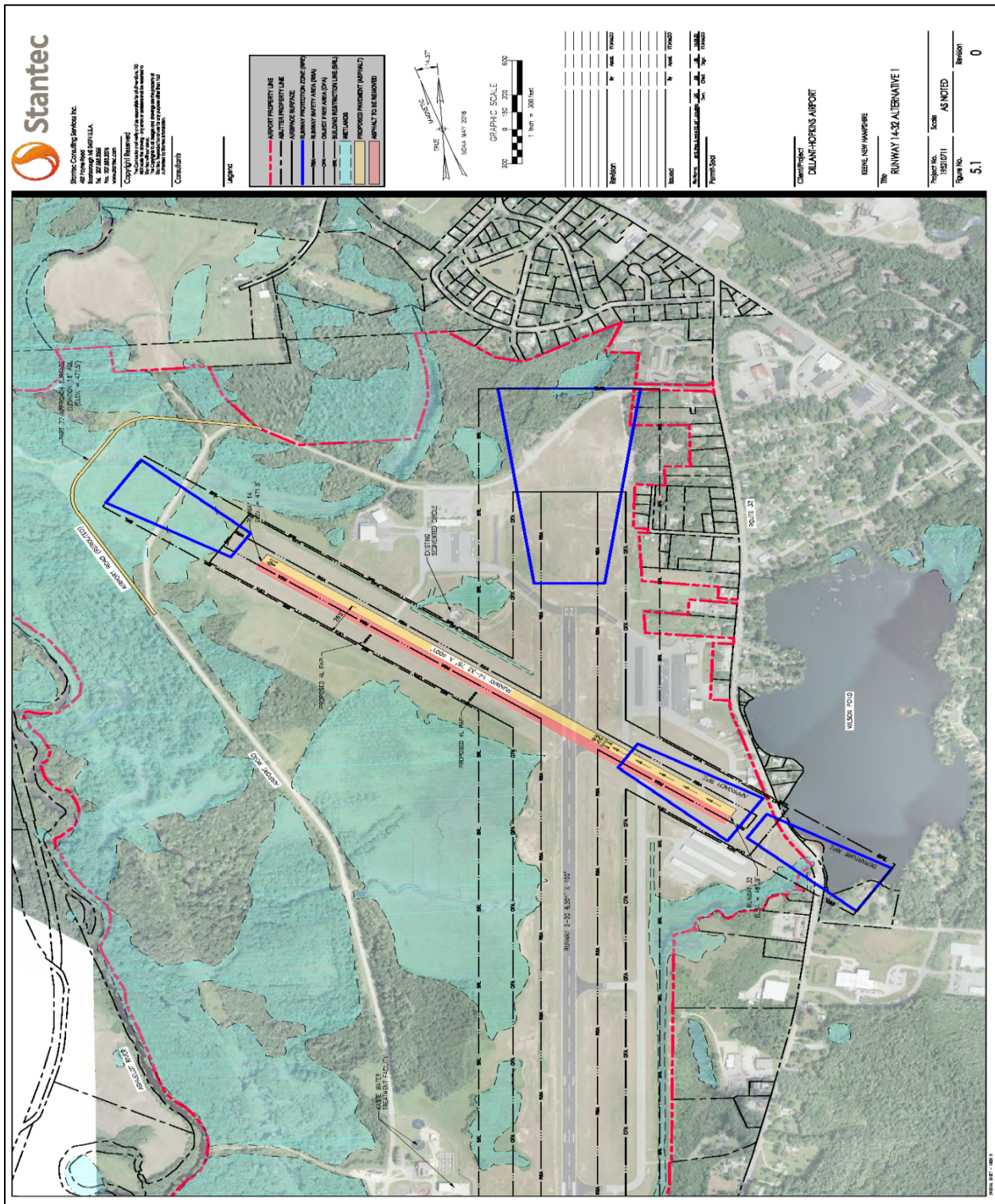


Figure 5-1. Runway 14-32 Reconstruction to 75' in Width

Environmental Impacts

Reducing the present amount of impervious surface is a benefit to the surrounding environment; this will cause a decrease in the amount surface area for Stormwater runoff.

Impact to Capacity and Viability

This option maintains the airport's current overall capacity to service the aviation community. It also decreases snow removal time and maintenance costs.

5.4.3 RUNWAY 14-32 ALTERNATIVE 2 – CONSTRUCT PARALLEL TAXIWAY

Parallel taxiways serve two purposes: capacity and safety. Capacity is not an issue on Runway 14-32; however, maintaining a safe operating environment at any airport in any environment is essential. The use of a runway as a taxiway should be avoided. When pilots are forced to use a runway as a taxiway, they are required to back taxi to the approach end or exit point of a runway, which increases their exposure to aircraft taking off or landing. Poor infrastructure design has contributed to the quantity and severity of previous runway incursions. Good airport design can directly reduce the potential for runway incursions while maintaining operating efficiency and airport capacity.

The last master plan update recommended the construction of a full-length parallel taxiway along Runway 14-32 (similar to Runway 2-20). Also, the current Planning Advisory Committee recommended retaining this concept. Consistent with this, the design on the current ALP (November 2003) is included in this alternatives analysis. A second design is also included, one that extends this taxiway along the proposed runway extension. In both cases, the taxiway is designed based on ARC B-II standards meaning it is 35 feet wide and separated from the runway (centerline to centerline) by 240 feet.

Alternative 2 (Figure 5.2, page 5.6) adds a 35-foot-wide parallel taxiway along the runway's terminal side. This new taxiway intersects and keeps the existing stub taxiways (directly across from the terminal apron). Also, the existing Taxiway "I" near the end of Runway 32 remains unchanged. A separate section of new taxiway extends across Runway 2-20 (to Taxiway "I"). Also, a new stub taxiway is added to the approach end of Runway 14, which includes a small aircraft run-up area.

Cost

The cost of this alternative only (parallel taxiway) is estimated to cost \$2,200,000.

• Construction (3,023 LF of taxiway).....	\$908,333
• Taxiway Lighting and Signs	\$198,400
• Subtotal	\$1,106,733
• Permitting.....	\$750,000
• Engineering/Design	\$166,010
• Contingency (10%).....	\$127,274
• Total.....	\$2,150,017

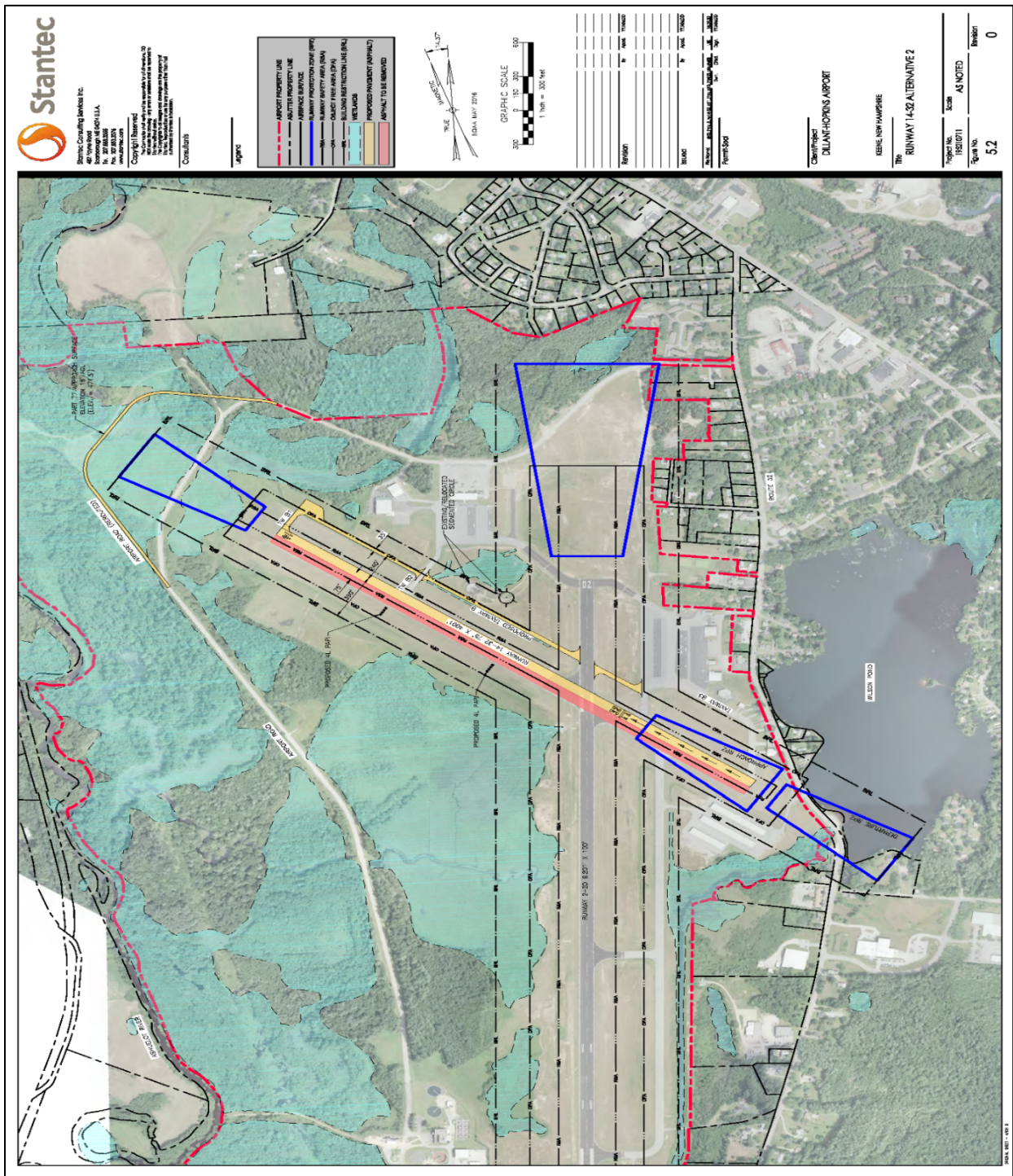


Figure 5-2. Runway 14-32 Parallel Taxiway

Safety

A parallel taxiway would provide important safety benefits by simplifying operations, reducing pilot workload, and minimizing the risk of a runway incursion. It keeps aircraft off runways until they are ready for takeoff and allows landing aircraft to exit the critical operating surface. Even a narrower runway will maintain adequate safety areas per FAA design standards.

Environmental Impacts

The increased efficiency of ground operations would reduce taxi time resulting in reduced fuel consumption and reduce greenhouse gas emissions. Negative impacts will include minor development in wetlands. The impacts can be mitigated with either in lieu payments, creation, restoration, and/or preservation of wetlands.

Impact to Capacity and Viability

A taxiway will decrease potential runway incursions while increasing the airport's ability to accommodate more air traffic on Runway 14-32 in all weather conditions. In general, it increases the overall efficiency of the airport.

5.4.4 RUNWAY 14-32 ALTERNATIVE 3 - EXTEND RUNWAY 14-32

The existing crosswind runway is 4,001 feet long, which includes a 1,100-foot displacement on the Runway 32 end, resulting in an available landing length on Runway 32 of 2,901 feet. All other operations can use the full length of the runway (4,001 feet). The optimum length of a crosswind runway is 80% of the length of the primary runway, which means Runway 14-32 should have a sufficient usable length of 4,160 feet (.8 x 5,201 feet). Some additional pavement can be obtained by moving the displacement back toward Route 32, obtaining the additional pavement needed to meet the 80% rule is to extend Runway 32 to the northwest. An example of why the extra runway is necessary was presented in Chapter 4 (see Paragraph 4.3.3.4, page 4.7).

This alternative (Figure 5.3) would extend the Runway 32 to the northwest 1,000 feet, resulting in a runway length that is approximately 5,001 feet. The current safety area would remain at 150 feet wide and extend 300 feet beyond the new runway end. This extension would provide aircraft landing on Runway 32 and depart Runway 14 with 3,901 feet of pavement. Aircraft departing Runway 32 and landing on Runway 14 would have 5,001 feet of pavement.

This alternative must consider the following:

- **Obstructions.** The Part 77 approach surface would move a distance equal to the runway extension. The Part 77 primary and approach surfaces also move outward 1,000 feet. The Part 77 approach surface is a 20:1 slope that begins 200 feet from the end of the runway. This alternative results in 48 acres of additional obstructions (in addition to existing obstacles noted in Chapter 2). Most of the new obstructions are on the airport (46 acres) with about two acres off airport.
- **Airport Drive.** Airport Road is located approximately 780 feet from the runway centerline and 580 feet from the end of Part 77 Primary Surface. Extending the runway 1,000 feet would require rerouting the paved road about 2,900 feet around the new safety area and at a distance that would place the Part 77 approach surface at least 15 feet above the roadway. The Part 77 approach surface must pass over a public road at 20:1 slope starting 200 feet from the end of the runway. The minimum distance from the

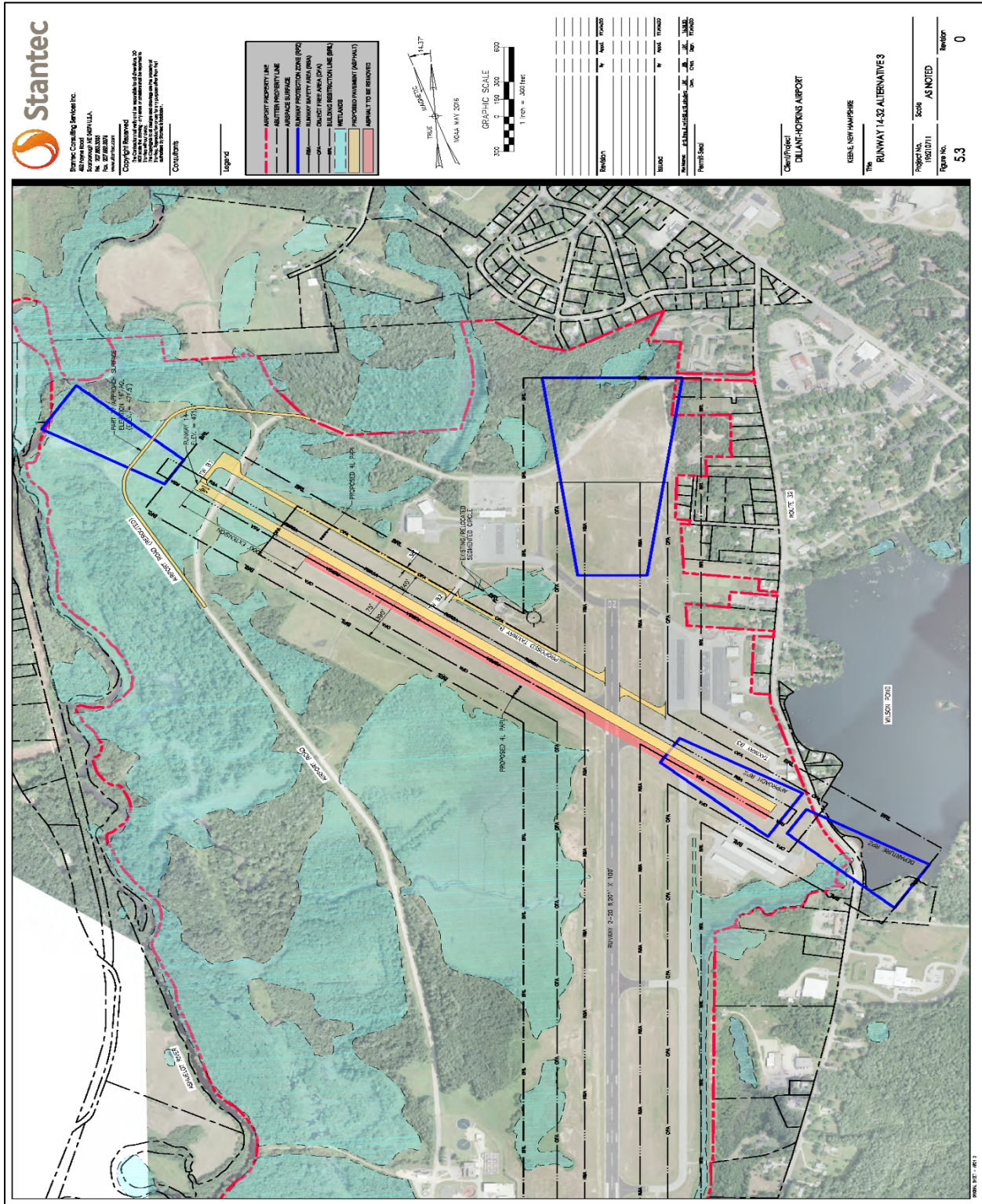


Figure 5-3. Runway 14-32 Extension

end of the runway extension to the center of the road would be 470 feet. At this distance, and considering the height of the terrain at the point where the relocated road would be as compared to the new runway threshold, the Part 77 approach surface would pass 16 feet over the new roadway; one foot higher than the minimum allowable height.

- **City Forced Sewage Main.** The city of Keen’s main forced sewage line runs parallel to Airport Drive (on the runway side). Any extension that would require excavation in this area must give very careful consideration to this because of the cost and more importantly, impact on city operations.

Cost

The cost of extending the runway and parallel taxiway 1,000 feet to the northwest would be approximate \$2.9 million, excluding of the cost to relocate the forced main sewage line.

- Construction (1,000 feet of runway and taxiway) \$1,418,653
- Taxiway Lighting and Signs \$142,600
- Removal of runway and taxiway markings \$5,175
- Obstruction Removal \$50,000
- Subtotal..... \$1,616,428
- Engineering/Design..... \$234,964
- Permitting Fees \$750,000
- Contingency (10%) \$260,139
- **Total..... \$2,861,531**

Safety

This alternative has a direct impact on safety by providing both arriving and departing aircraft a longer runway surface for operating on.

Environmental Impacts

This alternative will involve vegetation removal, filling, and paving in wetlands. There will however be an increase in impervious surface by 30,000 square feet (0.7 acres).

Impact to Capacity and Viability

This option has a direct bearing on the airport’s ability to serve the needs of the aviation community. The longer a runway, the more aircraft it can conceivably support.

5.4.5 RUNWAY 14-32 ALTERNATIVE 3 – RELOCATE RUNWAY 32 DISPLACED THRESHOLD

To maximize the usable length of Runway 14-32, an examination of the current Runway 32 displacement indicates that the displacement can be reduced to approximately 700 feet. The present 1,100-foot displacement is based on vegetative obstructions in the threshold siting surface. Figure 2-25 (page 2.34) shows the current obstacles, which covers an area of approximately 2.9 acres. A second analysis was performed to determine the shortest possible displacement possible without impacting ground penetrations. This study examined shifting the threshold siting surface to the northeast until natural terrain was encountered. As illustrated in Figure 5-4, this assessment did increase the number of vegetative obstructions from the current 2.9 to 9.4 acres but also increases the available landing distance on Runway 32 by 400 feet (shifts the displaced threshold from 1,100 to 700 feet).

Safety

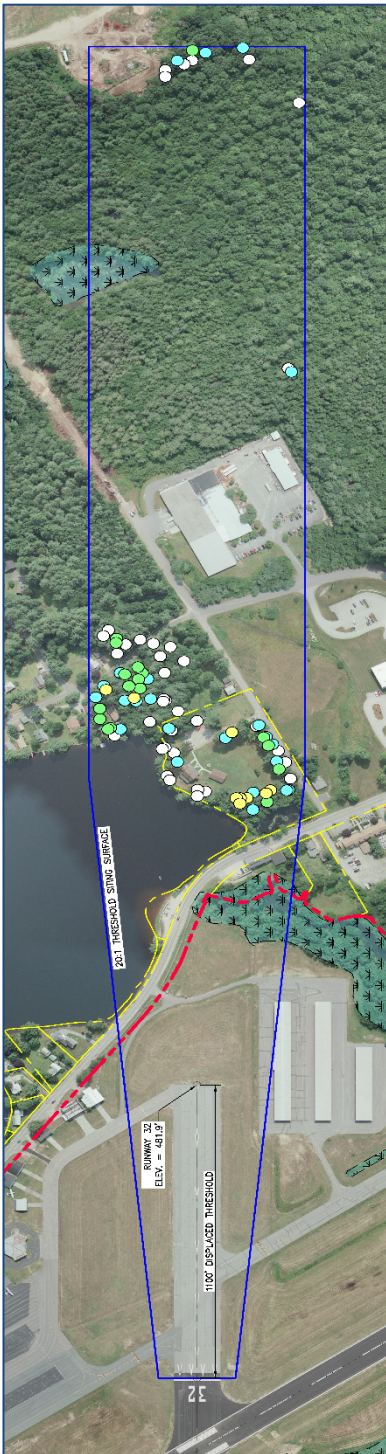
Any increase in usable runway invariably improves safety, which applies when strong crosswind conditions offer aircraft that could otherwise not use Runway 32 and option during strong Runway 2-20 crosswind conditions.

Environmental Impacts

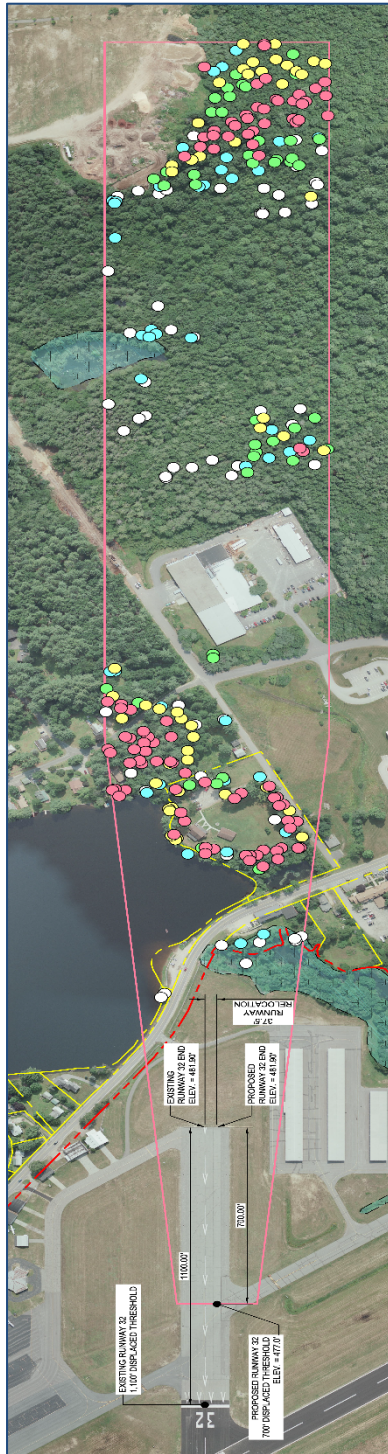
Some adverse effects to the stormwater system may occur but can easily be mitigated by stormwater management plan/BMPs during construction.

Capacity and Viability

This alternative has a neutral effect on capacity, but does make the airport more viable by offering a longer runway during strong crosswind conditions. The added 400 feet of landing pavement increases the availability of the airport to aircraft that would otherwise land on the primary runway in strong crosswind conditions.



Existing Conditions



Proposed Conditions

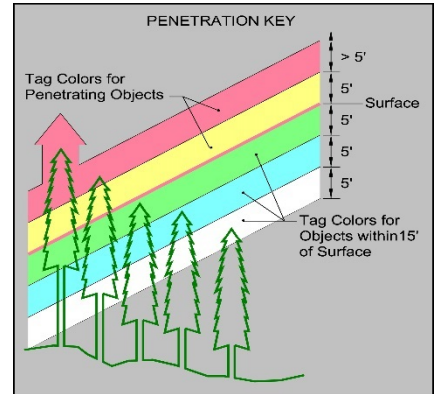


Figure 5-4.. Runway 32 Threshold Siting Surface Obstructions

5.4.6 RUNWAY 2-20

5.4.6.1 Runway 2-20 Alternative 1 - Parallel Taxiway Extension

Like the proposed Runway 14-32 parallel taxiway, this project is a carryover from the last master plan where existing Taxiway A is extended the full length of the runway (an additional 1,025 feet of pavement), connecting to the approach end of Runway 2. This taxiway would be constructed to ARC C-II standards (35 feet wide, but unlike the existing Taxiway A, which is 511 feet from the runway (centerline to centerline), the new section would be set back 300 feet from the runway. The total linear length of this extension, including the stub taxiway at the end, is 1,390 feet. This project does have some significant infrastructure issues. The ILS localizer antenna and support building, as well as the airport's weather station (AWOS) all, lie directly in line with the proposed taxiway. To ensure a clear Taxiway Safety Area and Taxiway Object Free Area, everything must be moved to the opposite side of the runway. Figure 5.5 shows this design concept.

Cost

This alternative is estimated to cost \$1,100,000 to add the new taxiway and move the navigation aids.

- Construction \$234,857
- Taxiway Edge Lights..... \$94,520
- Pavement Markings..... \$7,000
- Construction Subtotal \$336,376
- Relocate PAPI \$50,000
- Relocate ILS Glideslope \$400,000
- Relocate ASOS \$50,000
- Navaid Relocation Subtotal \$500,000
- Engineering/Design \$125,456
- Contingency (10%) \$96,183
- Permitting..... \$40,000
- **Total..... \$1,098,016**

Safety

This alternative has a direct impact on safety by reducing the amount of time an aircraft must remain on the runway before takeoff and in some cases, eliminates the need for an airplane landing on Runway 20 from making an 180-degree turn on the runway and taxiing back to the stub taxiway.

Environmental Impacts

The increased efficiency of ground operations would reduce taxi time resulting in reduced fuel consumption and reduce greenhouse gas emissions. Negative impacts will include minor development in wetlands. The impacts can be mitigated with either in lieu payments, creation, restoration, and/or preservation of wetlands.

Impact to Capacity and Viability

A parallel taxiway will decrease potential runway incursions while increasing the airport’s ability to accommodate more air traffic on Runway 14-32 in all weather conditions. In general, it increases the overall efficiency of the airport.

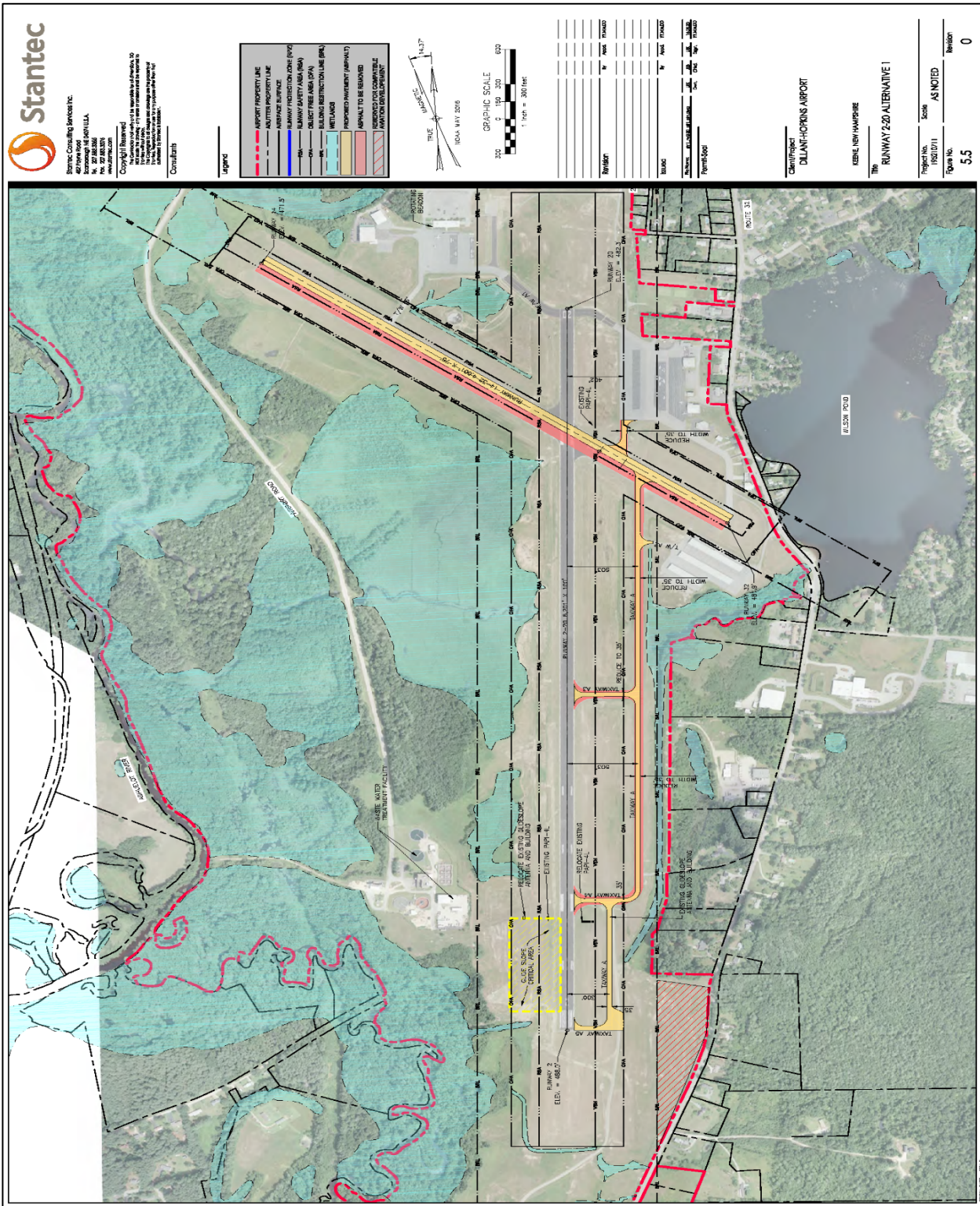


Figure 5-5. Taxiway "A" Alternative 1

5.4.6.2 Runway 2-20 Alternative 2 - New Full Length Parallel Taxiway

This concept (Figure 5.6) reduces the width and relocates a major section of the existing Taxiway A. The current parallel taxiway, which consists of two parts (one north and one south of Runway 14-32), does not meet current FAA design standards. In both cases the taxiway is much further from the runway than it should be, and a major portion of the taxiway is wider than required (50 feet vs. 35 feet). Neither issue justifies narrowing or moving the taxiway, however, moving the taxiway closer to the runway does open some additional land available for development. The amount of new land is questionable and probably does not justify the cost of this project. Moving the taxiway closer to the runway opens some additional land between the taxiway and Route 32, but the amount gained is negligible because of Part 77 height restrictions.³

Cost

The cost of constructing a replacement for Taxiway A and extending it to the approach end of Runway 2, including the cost of relocating three navigation aids, is \$2,700,000 (rounded).

• Construction	\$1,102,755
• Taxiway Edge Lights.....	\$434,000
• Pavement Markings.....	\$28,000
• Construction Subtotal.....	\$1,564,755
• Relocate PAPI	\$50,000
• Relocate ILS Glideslope	\$400,000
• Relocate ASOS	\$50,000
• Navaid Relocation Subtotal	\$500,000
• Engineering/Design (15%)	\$309,713
• Contingency (10%).....	\$237,447
• Permitting.....	\$45,000
• Total.....	\$2,656,915

Safety

Other than extending the taxiway to the end of Runway 2, this project adds no safety benefits to the airport.

Environmental Impacts

Some adverse effects to the stormwater system may occur but can be mitigated by stormwater management plan/BMPs during construction.

Impact to Capacity and Viability

Unlike adding a new taxiway, moving an existing taxiway closer to the runway has no direct influence on the airport's ability to increase its usefulness or viability.

³ The Part 77 transitional surface starts 500 feet from the runway centerline and slopes upward and outward at a 7 to 1 (7:1) slope, which leaves little room for development under the surface.

5.4.7 TERMINAL AREA PARKING ALTERNATIVE

The terminal area parking apron (Figure 5.7) covers an area (exclusive of the taxilane) of approximately 8,200 square yards with the capacity to hold 15-19 aircraft, depending on size. There are marked tie down spaces for 13 small aircraft (with a wingspan up to 40 feet) and additional ramp space to hold perhaps a half-dozen small aircraft, or one or two larger aircraft (those too big to fit into one of the marked spots). The large aircraft parking area (shown in blue in the figure), covers approximately 3,400 square yards. With a 35-foot-wide taxilane and 115-foot-wide taxilane object free area, these 15-19 spots are the full capacity of the apron. However, the area now used to park and service large aircraft has a very limited capacity and with some aircraft, such as a Gulfstream V (96 feet long with a 93-foot wingspan), maneuvering and parking an aircraft this size in the limited space available is a daunting challenge for aircraft operators and the FBO. As illustrated, the G-V takes up about one-half of the open area for large aircraft parking, which leaves little space for other aircraft.

Facility Requirements discussion (Chapter 4) indicate that during peak activity, the itinerant apron exceeds its current capacity. Forecasts also project the need for at least four additional spaces in the next 20 years. This demand may fluctuate and outside factors, such as the long term success of the newly reopened restaurant may affect these numbers. If this restaurant is successful, like many in New England, demand, particularly on weekends will quickly exceed the capacity of the current apron by as much as a factor of 50%. Tracking this information will be helpful in CIP and planning for future projects. It is reasonable, now, for the airport to plan to need 8-10 additional spaces for small recreational aircraft (wingspan in the 40+ foot range) as well as hardstands⁴ for one or two larger corporate jets.

The airport has ample space to expand the itinerant apron in its current location by adding pavement and tie downs in the area between the existing apron and the idle taxilane as illustrated in the graphic above. Figure 5.7 shows one such plan, which doubles the current number of tie downs and increases the area now used for large aircraft parking and the existing taxilane. This method removes nine tie-down spots but adds 19 new places for a net gain of 10 parking spaces. The additional parking spaces will add needed parking space for itinerant aircraft as well as the FBO and its flight training program. One drawback to this concept is that it overlays an area recently paved as a taxilane to a future hangar, and maintains access to the future hangar area.

Cost

This alternative is estimated to cost \$1.6 million (rounded).

• Construction (New Apron & Tie Downs)	\$917,405
• Reconstruct Existing Apron	\$285,312
• Pavement Markings & Removal	\$5,000
• Construction Subtotal.....	\$1,207,717
• Engineering/Design	\$200,000
• Permitting.....	\$25,000
• Contingency (10%).....	\$143,272
• Total	\$1,575,989

⁴ A hardstand is a reinforced section of pavement (usually concrete) where large aircraft are parked. It eliminates the tendency for heavy aircraft to sink into softer asphalt when parked for extended periods, particularly in warm weather.

Safety

This alternative has no impact on safety.

Environmental Impacts

Potential adverse effects due to stormwater may occur but can be mitigated by stormwater management plan and BMPs during construction.

Impact to Capacity and Viability

This option has a direct bearing on the airport's ability to serve the needs of the aviation community by increasing the number of available itinerant parking spaces (as well as additional space for the FBO). It also provides increased availability and access to airport and local business; and economic impact.

5.4.8 EXPAND AIRPORT WILDLIFE FENCE

The airport is only partially enclosed by a fence, which is an 8-foot high chain link with 3-strand barbwire covers approximately one-fourth of the airport. The fence runs primarily along a small portion of Airport Drive and along the property line the runs along Old Homestead Highway (Route 32) parallel to Runway 2-20. Airport property west, southwest, and south is not enclosed with any fencing and is the likely avenue for wildlife encroachment, primarily deer.

Two options are proposed that will complete the airport's enclosure, and each option involves the installation of a 10-foot high chain link fence with 3-barbwire strands. A 10-foot-high fence is considered the minimum necessary to restrict deer from jumping over it.

5.4.8.1 Airport Fence Alternative 1 - Follow Part 77 Primary Surface

Alternative 1 (Figure 5-8, page 5-19) covers the minimum area necessary around the airport's far side. It remains clear of the runway object free areas and below the Part 77 transitional surfaces. However, this route does encroach through wetlands and requires significant vegetation removal. The total length of Alternative 1 is 17,800 linear feet.

Cost

This alternative is estimated to cost \$1.2 million (rounded).

• Construction	\$979,000
• Vegetation Removal	\$25,000
• Engineering/Design	\$75,000
• Total Construction	\$1,079,000
• Permitting.....	\$30,000
• Contingency.....	\$100,000
• Total	\$1,209,000

Safety

This alternative has a direct impact on safety by reducing the possibility of wildlife encroachment on the airport and aircraft – animal incursions.

Environmental Impacts

This project impacts wetlands through both construction disturbances and the removal of vegetation along the fence line.

Impact to Capacity and Viability

Installation of a wildlife fence decreases the threat, vulnerability, and consequences of wildlife incursions.

5.4.8.2 Airport Fence Alternative 2 – Follow Airport Road

Alternative 2 (Figure 5.9) expands the fence line around the airport’s far side by limiting the amount of vegetation and wetland impacts. It also remains clear of the runway object free areas and below the Part 77 transitional surfaces. The total length of Alternative 2 is 16,400 linear feet.

Cost

This alternative is estimated to cost \$1.2 million (rounded).

- Construction \$902,000
- Vegetation Removal \$25,000
- Total Construction Cost..... \$927,000
- Permitting..... \$25,000
- Engineering/Design \$75,000
- Contingency (10%)..... \$102,700
- **Total****\$1,129,700**

Safety

This alternative has a direct impact on safety by reducing the possibility of wildlife encroachment on the airport and aircraft – animal incursions.

Environmental Impacts

Minor and temporary impacts will be incurred through construction impacts and vegetation removal.

Impact to Capacity and Viability

Installation of a wildlife fence decreases the threat, vulnerability, and consequences of wildlife incursions.

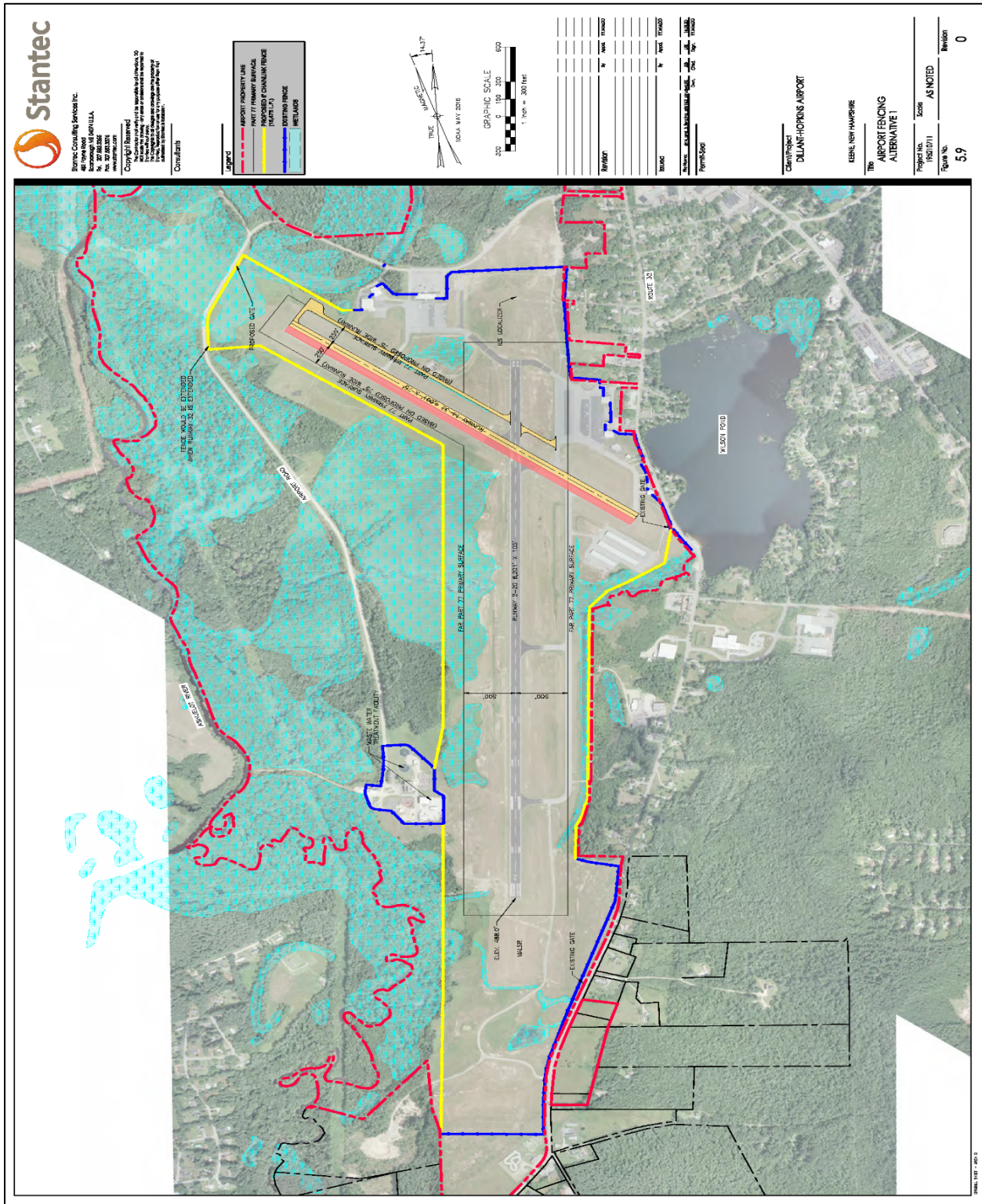


Figure 5-8. Wildlife Fence Alternative 1

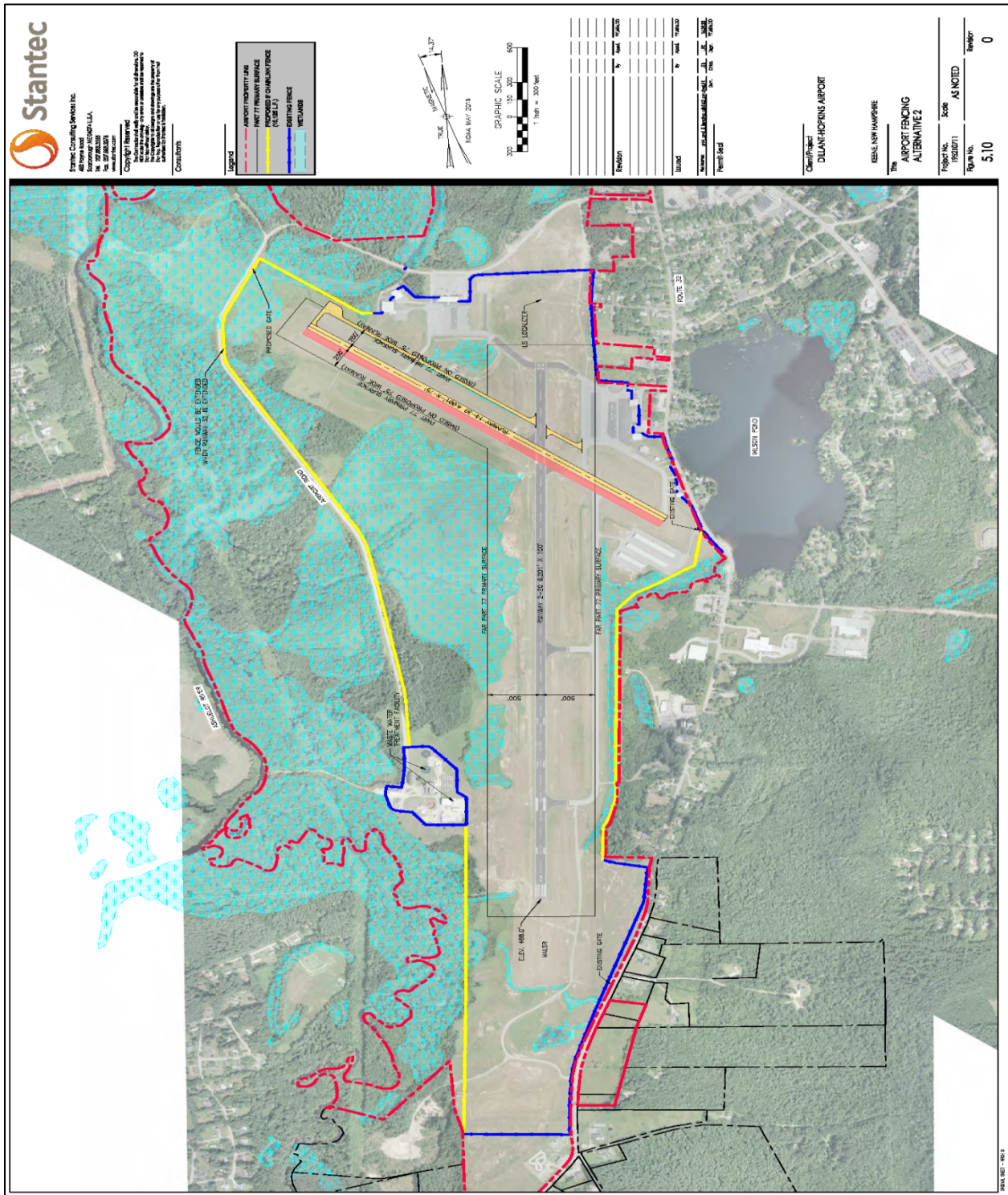


Figure 5-9. Wildlife Fencing Alternative 2

5.4.9 REPLACE OR RECONSTRUCT FUEL FARM

The airports existing fuel farm consists of two underground storage tanks and an old pump and computer management system. Also, the farm is located on the airport’s east side out of sight of the FBO who manages the system. Ideally, the fuel farm should be located as close as possible to the operator. Also, the system should be upgraded to above ground storage tanks with a new pump and computer management system. Two options are offered. One replaces the current farm in the same location. The second develops a new system closer to the terminal building, FBO, and itinerant aircraft.

5.4.9.1 Fuel Farm Alternative 1 – Replace Existing System

This alternative replaces the existing system through the design and construction of a new system at the current location.

Cost

This alternative is estimated to cost \$500,000 (rounded).

- Construction (replace system) \$300,000
- Total Construction Cost..... \$300,000
- Permitting..... \$10,000
- Engineering/Design \$75,000
- Contingency (10%)..... \$38,500
- **Total****\$423,500**

Safety

This alternative has a direct impact on safety by providing a modern fuel system with improved storage tanks.

Environmental Impacts

Some adverse effects to the stormwater system may occur but can be mitigated by stormwater management plan/BMPs during construction.

Impact to Capacity and Viability

This project has a direct impact on the airport’s ability to service the aviation public through the installation of a self-service system with credit card processing and 24-hour access. It also reduces labor requirements in managing and monitor the system.

5.4.9.2 Fuel Farm Alternative 2 – Construct New System

This alternative proposes the construction of a new fuel farm in the terminal area (see Figure 5.6 (page 5.17). The concept would include a newly paved ramp set back beyond the taxilane object free area, along with two new 12,000-gallon above ground tanks, pumps and a computer controlled monitor and processing system.

Cost

This alternative is estimated to cost \$750,000 (rounded).

- Construction (replace system)\$300,000
- Construction (new pavement)\$235,000
- Total Construction Cost.....\$535,000
- Permitting.....\$20,000
- Engineering/Design\$105,000
- Contingency (10%).....\$66,000
- **Total****\$726,000**

Safety

This alternative has a direct impact on safety by providing a modern fuel system with improved storage tanks.

Environmental Impacts

Some adverse effects to the stormwater system may occur but can be mitigated by stormwater management plan/BMPs during construction.

Impact to Capacity and Viability

This project has a direct impact on the airport's ability to service the aviation public through the installation of a self-service system with credit card processing and 24-hour access. It also reduces labor requirements in managing and monitor the system.

5.5 SUMMARY

This chapter addressed alternatives as a means of meeting the airport's long-term development needs both airside and landside. Three Runway 14-32 alternatives were discussed that include narrowing and reconstructing the runway as well as adding a parallel taxiway, and a third option recommending a 1,000-foot extension to both the runway and taxiway.

Two possibilities that extend Taxiway A along the full length of Runway 2-20, that connect the taxiway to the approach end of Runway 2 were discussed. One option extends the existing taxiway by approximately 1,010 feet, but retains and narrows a significant portion of the current Taxiway from 50 to 35 feet; a width consistent with FAA design standards. The second Taxiway A alternative constructs an entirely new taxiway from the Runway 14-32 intersection to the approach end of Runway 2.

The terminal area is redesigned to expand parking for both large and small aircraft while retaining access to a lot reserved for construction of a future hangar. The plan adds ten new small aircraft parking tie-downs and doubles the size of the large aircraft parking area. This plan also shows a proposed new fuel farm, with both avgas and jet fuel capabilities.

Historical and most recent deer strikes at the airport indicate the need to increase fencing along areas, primarily the west side of the airport that is heavily wooded and the probable source of deer that migrate to the airport operating areas. Two alternatives are presented. Option 1 adds wildlife fencing around the backside of both runways, located as close as possible and just outside the Part 77 Primary surface and just below the Part 77 transitional surfaces (a 7:1 slope). This alternative does have significant wetland impacts. The second fence option runs along Airport Road and avoids all wetlands.

In both cases, the fence would be 10 feet high with three strands of barbwire. Also, both alternatives would connect to existing fence.

Several areas on the airport were identified for future aviation and non-aviation development. These areas are shown on the Airport Layout Plan – Ultimate Conditions in Appendix D.

Each of the options is summarized in Table 5.1 which includes the estimated cost of each option, plus the level of permitting required for each one.

INFRASTRUCTURE	BASIC CONCEPT	ESTIMATED COST	PERMITS REQUIRED (see list below)
Runway 14-32	Narrow and Reconstruct	\$1,928,269	A, B
Runway 14-32	Construct Parallel Taxiway	\$2,150,017	A, B, C, D
Runway 14-32	Extend Runway and Taxiway	\$2,861,531	A, B, C, D
Runway 14-32	Shorten Displaced Threshold	\$MKT	B, C
Runway 2-20	Extend Taxiway A	\$1,098,016	A, B
Runway 2-20	Extend Taxiway A, Narrow Existing Taxiway	\$2,656,915	A, B
Terminal Area	Expand and Modify Parking Apron	\$1,575,989	A, B
Wildlife Fence	Alternative 1 – Follow Runway Primary Surface	\$1,209,000	B, D
Wildlife Fence	Alternative 2 – Follow Airport Road	\$1,129,700	B, D
Fuel Farm	Replace existing facility	\$423,500	A, E, F
Fuel Farm	Construct new facility in terminal area	\$726,000	A, E, F, G

- A. **USEPA NPDES** General Permit for Construction = US Environmental Protection Agency, National Pollution Discharge Elimination System. This permit is required when construction activities disturb one or more acres. It addresses stormwater discharges from construction activities.
- B. **NHDES** Alteration of Terrain Permit = New Hampshire Department of Environmental Services. This permit is required when a project proposes to disturb more than 100,000 square feet in NH. It addresses the protection of surface water quality by controlling soil erosion and managing stormwater runoff from development activities.
- C. **USACOE** Programmatic General Permit (PGP) = US Army Corps of Engineers. This permit expedites review of minimal impact work in coastal and inland waters and wetlands within the State of New Hampshire. The PGP eliminates the need to apply for separate approval from the Corps for most minor, non-controversial work in New Hampshire when that work is authorized by the New Hampshire Department of Environmental Services (DES) Wetlands Bureau.
- D. **NHDES** Minor Impact Project Wetlands Permit = A Minor Impact Project has wetland fill threshold of 3,000-20,000 square feet.

- E. **NHDES** Application for the Construction of New and Substantially Modified Aboveground Petroleum Storage (AST) Systems
- F. **NHDES** Registration of Aboveground Petroleum

Spill Prevention Control & Countermeasures Plan (SPCC) is required but is not a permit.

5.6 ENVIRONMENTAL FACTORS

Each conceptual alternative was screened to determine its potential effect on existing environmental and community resources. The environmental impact categories considered for this screening are listed in Table 5.2 (page 5.14) and are further identified in FAA Order 1050.1F. A more detailed discussion follows the table.

5.6.1 ENVIRONMENTAL DISCUSSION

To protect against any federal action—including FAA sponsored improvement projects—contributing to significant environmental impacts, AIP-eligible projects are subject to review by National Environmental Protection Act (NEPA) guidelines. NEPA review requires a thorough assessment of the resource categories presented in Table 5.2. The level of NEPA review varies based on the expected degree of impact. A project is considered within the context of an Environmental Impact Statement (EIS) when it is determined, usually, during the project scoping process, that significant unavoidable impacts are expected to result from implementing a proposed development. An Environmental Assessment (EA) is prepared when results are expected but are not anticipated to be significant. The least rigorous level of NEPA review is the Categorical Exclusion (CatEx), developed for those projects with limited environmental impacts (these projects can typically be constructed without compensatory mitigation associated with regulatory permits). The CatEx process typically includes a statement prepared by the project sponsor which provides a project description, a description of potential impacts and regulatory requirements, and documentation siting criteria (from FAA Order 1050.1F Environmental Impacts: Policies and Procedures) in support of the CatEx. It is expected that the short-term planning projects proposed for development at the airport will be categorically excluded from more comprehensive NEPA review.

Table 5.2 list each of the environmental impact categories and each column list the alternatives discussed earlier in this chapter. The rating scale scores the impact of each project ranging (see the bottom of the table) where the project would have a significant impact that could not be mitigated (the whole scale is listed at the end of the table). The table also indicated whether the project would trigger the need for an Environmental Assessment (EA), or if the project might be Categorically Excluded (CatEx).

ENVIRONMENTAL FACTORS	ALTERNATIVES (SEE TABLE 5.1, PAGE 5.23)								
	Narrow & Reconstruct Rwy 14-32	Construct Rwy 14-32 Parallel Taxiway	Extend Rwy 14-32 Parallel Taxiway	Extend and Narrow Taxiway A	Construct New Taxiway A	Expand Terminal Apron	Construct Wildlife Fence (Alt 1)	Construct Wildlife Fence (Alt 2)	Construct New Fuel Farm
Air Quality	1	1	2	2	2	2	2	2	2
Biological Resources	1	1	4	2	2	2	3	3	2
Climate	1	1	2	2	2	2	2	2	3
Coastal Resources	2	2	2	2	2	2	2	2	2
DOT Act	2	2	2	2	2	2	2	2	2
Farmlands	2	2	2	2	2	2	2	2	2
Hazardous Materials	2	2	2	2	2	2	2	2	2
Historical Resources	2	2	2	2	2	2	2	2	2
Land Use	2	2	2	2	2	2	2	2	2
Natural Resources & Energy Supply	2	2	3	3	3	3	2	2	3
Noise/Compatible Land Use	1	1	3	2	2	2	2	2	2
Socioeconomics	2	2	2	2	2	2	2	2	2
Visual Effects	2	2	3	2	2	2	2	2	2
Water Resources	2	2	4	2	2	2	3	3	2
Total Score	24	24	35	29	29	29	30	30	30
EA Required (Yes/No)	No	No	Yes	No	No	No	Yes	No	No
CatEx (Yes/No)	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes

Rating Scale

1. Benefits/Protects environmental and community resources
2. No effects
3. Some adverse consequences that can be easily mitigated
4. Negative effects that could potentially delay or compromise alternative implementation
5. Significant impacts that cannot be mitigated

5.7 PREFERRED DEVELOPMENT STRATEGY

The airport master plan for Dillant Hopkins Airport (EEN) has progressed through a systemic and logical process with a goal of formulating a recommended 20-year development plan. The process began with an evaluation of existing and future operational demand which aided in creating an assessment of future facility needs. Those needs were then used to develop alternative airport plans to meet projected needs. Each of those steps in the planning process has included the development of draft working papers which were presented and discussed at previous Planning Advisory Committee (PAC) meetings.

The PAC is comprised of several constituencies with an investment or interest in Dillant Hopkins Airport. Included in the PAC were representatives from the airport administrative staff, City of Keene, the town of Swanzey representatives, New Hampshire Department of Transportation, airport businesses, and local associations. This diverse group has provided appreciated input into the recommended plan.

In the previous sections of this chapter, several development alternatives were analyzed to explore options for the future growth and development of Dillant Hopkins Airport. The development options have been refined into a single recommended concept for the master plan. This section describes, in narrative form, the recommended direction for the future use and development of Dillant Hopkins Airport. Chapter 6 presents the program graphically in what is referred to as the Airport Layout Plan (ALP).

The recommended concept provides the ability to meet the diverse needs of the array of airport operators, including airport business managers, general aviation, both local and itinerant users, and the military. The goal of this plan is to ensure that the airport can continue to serve, and even improve, in the primary role of serving as the State of New Hampshire and the Monadnock Region's aviation needs. The plan has also been specifically tailored to support existing and future growth of all forms of potential aviation activity as the demand materializes.

The recommended master plan concept, as shown in Chapter Six, presents a long-term configuration for the airport which preserves and enhances the role of the airport while meeting FAA design standards. The phased implementation of the recommended development concept will be presented in Chapter 7 - Implantation and Financial Plan. The following subsections describe the key details of the suggested master plan concept.

The FAA classifies Dillant Hopkins Airport as a general aviation airport, as designated in the National Plan of Integrated Airport Systems (NPIAS). NPIAS airports are considered essential to the national aviation infrastructure and, as such, are eligible for development grant funding from the FAA. NPIAS classifies EEN as a Regional Airport which should be designed Regional Airports accommodate a range of activities and aircraft, from recreational use and flight training to more sophisticated corporate aviation activities. General Aviation Regional Airports are also typically located proximate to more populated areas, providing an alternative to larger airports for access to economic centers desired by existing business and recreational travelers. The recommended plan developed in this study process supports the national and state classifications, as well as the associated goals and objectives of each.

5.8 PREFERRED ALTERNATIVE

There were nine different concepts for the airport to consider in selecting a preferred alternative. The preferred alternative has been chosen based on a layout that best meets the demand for facilities in all aspects of aviation. Key elements of the preferred alternative are discussed below. Airport plans that illustrate the preferred option are in Chapter 6 and the financial analysis and implementation plans follow in Chapter 7.

5.8.1 RUNWAY 14-32

Runway 14-32 will undergo several important design changes that include reducing the runway width from 150 to 75 feet, which is consistent with FAA design criteria for a Group B runway. Other suggested changes include extending the usable runway length by 800 feet through a combination of new runway construction and reducing the actual 1,100 runway displacement by another 400 feet and adding a partial parallel taxiway.

5.8.1.1 Reduce Runway 14-32 width to 75 feet

As noted in Paragraph 5.4.2, page 5.3, the reduction in width can be accomplished by removing either the northern 75 feet, the southern 75 feet, or retaining the center 75 feet by removing 37.5 from each side. As noted in Paragraph 5.4.2 (page 5.3), from a planning perspective, there's essentially no cost-benefit to any of the three possibilities. From an engineering viewpoint, some aspects of construction would occur regardless if the Runway 14-32 centerline is shifted or if it remains in its current center location.

It appears that the construction costs associated with shifting the runway centerline would tend to be higher than those costs associated with the runway centerline remaining in the center location. Adjustments and modifications to the Runway 14-32 storm water drainage system will be necessary even if the runway centerline remains in its current location. However, the effects of the adjustments and modifications will be magnified by shifting the runway closer to the drainage structures on the southerly side and moving it further away from the drainage structures on the northerly side.

The Runway 14-32 sections of the runway intersection pavement were designed and reconstructed in 2014 at 150' wide based on the Runway 14-32 centerline being in the center location. To relocate the runway centerline southerly or northerly 37.5' would abandon the 2014 design centerline profile and result in shifting of the runway centerline profile through the intersection along a centerline profile that is not optimum for landing and departing aircraft movements.

Designing and reconstructing the runway where the crosswind runway intersects the primary runway is important because of the requirement to match the crown of the profile of both runways. Shifting the Runway 14-32 centerline north or south would change the profile and create added costs for both design and construction. Also, a modification of the runway threshold, which would occur if the runway centerline is moved, adds additional cost because of the need for an expensive survey. Therefore, the best cost-benefit option from a planning and engineering perspective is to retain the middle 75 feet of Runway 14-32.

5.8.1.2 Extend Runway 32

This extension involves adding 400 feet of new pavement to the northeast end of Runway 32, which is the maximum distance possible with impacting Airport Road or the city's forced main sewage line. The extension is possible if the new runway end elevation is kept at the same height as the existing Runway 14 threshold (471.5'). This elevation is necessary for compliance with Part 77, which requires a minimum of 15' clearance of the Approach surface over the center of a public road (Airport Road). By maintaining the existing runway end elevation, the Part 77 20:1 surface would pass over Airport Road by 15.5'. This elevation must be confirmed during the runway extension design phase and may result in a slight change in the future runway threshold location and elevation.

5.8.1.3 Relocate Runway 32 Displacement

The existing Runway 32 displacement of 1,100' can be shortened by 400 feet by removing 9.4 acres of vegetative obstructions in the Runway 32 threshold siting surface. As noted earlier in Chapter 2 (see Obstruction Analysis, paragraph 2.15.7, page 2.29) some trees penetrate the approach surface on private property east of Route 32, Old Homestead Highway, and the Hill, south of Safford Drive.

5.8.1.4 Construct Partial Parallel Taxiway

Construction a partial full-length parallel taxiway for Runway 14-32 is a carryover project from the last master plan update and is part of the current ALP, with some slight modifications. The proposed taxiway would connect the existing and proposed Runway 14 thresholds and run parallel to Runway 14-32 up to the present Taxiway A. This new taxiway would be constructed to ARC B-II standards (35' in width and separated from the runway by 240').

5.8.2 TAXIWAY A

Two options were presented earlier for Taxiway A, the Runway 2-20 partial parallel taxiway. The airport selected Alternative A. This option keeps the existing taxiway and adds additional pavement that would extend it the full length of the runway to the approach end of Runway 2. The existing pavement would remain in the same location; however, the width would be reduced from 50' to 35' consistent with ARC C-II standards. The separation between the taxiway and runway would remain unchanged. However, the proposed new section of taxiway would be constructed 300' from the runway centerline (and at 35' in width). This design would result in a slight dogleg turn and would require the relocation of the ILS glideslope antenna and shelter to the opposite side of the runway.

5.8.3 TERMINAL PARKING AND APRON

The alternative presented earlier was adopted with some modifications to the size. The airport would like to see an expansion of the proposed apron to include the area between the existing apron and proposed taxiway. While this additional apron space is not required to meet forecasted long-term demand, allocating this area now on the ALP. The concept of this proposed development is to provide increased parking and maneuvering space for the larger jet aircraft that frequent EEN, while increasing the number of itinerant aircraft parking spaces consistent with forecast demand. At the same time, the larger apron will provide a taxilane for proposed new hangar development south of the terminal building and adequate space for the proposed new fueling area (addressed in the next section). Aprons and associated taxilanes should be designed for the critical design aircraft and the combination of

aircraft to be using the facility, which ranges from Aircraft Design Groups A through C. Because this is an itinerant apron, it should be designed for easy access by the aircraft under power. The Apron design should consider the effects of jet blast and allow extra room for safe maneuvering. Tiedown aprons at general aviation airports usually are designed to accommodate aircraft in Airplane Design Groups (ADGs) I and II. Some tiedown stands should be provided for larger twin engine aircraft as needed to handle the demand.

Because this area is reserved for transient aircraft, wheel chocks are used rather than tiedown anchors. Although part of the apron should have tie down anchors for aircraft that will remain longer periods (overnight, weekends, et cetera).

5.8.4 REPLACE AND RELOCATE AIRCRAFT FUEL FARM

Construction of a new fuel farm in the terminal area is the preferred alternative. This new system would replace the existing fueling area located on the airport's south side near the based aircraft apron. Two new fuel tanks with a capacity of between 10,000 and 12,000-gallons, as well as separate pumping systems for both jet fuel and aviation gas are required. The general concept of moving the system to the Airport Terminal apron area is to provide the FBO greater access to the system and the ability to visually see every aircraft that approaches and uses the system, a safety feature that is not currently available.

5.8.5 INSTALL WILDLIFE FENCE

Two options were presented earlier that would complete the enclosure of the airport with wildlife fencing. The airport has opted to go with Alternative 2, the option that connects with the existing fence in the terminal area and follows Airport Road to the sewage treatment plan where it connects with the plants existing fencing and then continues around the south end of Runway 2-20 reconnecting with the existing fence near Old Homestead Highway. This plan would add approximately 16,400 linear feet of fence. The fence would be 10-feet high with 3-strands of barbwire as well as a ground deterrent that would prevent burrowing animals from breaching the fence. The deterrent would be in the form of a buried section of fence or fence that lies flat on the ground on the outside of the run.



6 AIRPORT LAYOUT PLAN

6.1 INTRODUCTION

The Airport Layout Plan (ALP) is a drawing used to depict current and future airport facilities graphically. The term Airport Layout Plan refers to a single drawing or a set of drawings.

A complete ALP drawing set was produced in conformance with FAA Advisory Circular (AC) 150/5070-6B, Airport Master Plans, including Change 1 and FAA Standard Operating Procedure (SOP) 2.00, Standard Procedures for FAA Review and Approval of Airport Layout Plans (ALPs). A total of 9 drawings constitutes the full ALP set. The original set of ALP drawings was produced at 24" x 36" size¹, with a smaller-size included in Appendix D.

The ALP has been prepared in accordance with generally accepted planning practices and with FAA guidance.

- FAA Advisory Circular 150/5300-13A, Airport Design
- FAA Advisory Circular 150/5070-6B, Airport Master Plans
- Federal Aviation Regulations, Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace
- Standard Procedure for FAA Review and Approval of Airport Layout Plans

The basis of the ALP is the existing airport layout, revised to illustrate the proposed facilities and design standards. These facilities are based on the recommended alternative in Chapter 5 and have been refined per additional comments received from the City of Keene and the FAA. The ALP serves as the official document detailing the City's proposed development for the Airport. This drawing is signed by the Airport Sponsor (City) and NHDOT (with a copy provided to the FAA). Projects that are eligible for federal grant funding must be shown on the ALP to be considered for federal and state funding in the future. The ALP Drawing is provided in Appendix D. Narrative descriptions of each drawing in the ALP are provided below.

6.2 OVERVIEW

The ALP serves as a critical planning tool that represents both existing facilities and planned development for an airport. Sponsors of airport development carried out at federally obligated airports must accomplish the improvement by an FAA-approved ALP.

The ALP is a plan for an airport that shows:

- Boundaries and proposed additions to all areas owned or controlled by the sponsor for airport purposes
- The location and nature of existing and proposed airport facilities and structures
- The site on the airport of current and proposed non-aviation areas and improvements thereon.

¹ Full size plans are maintained at the airport, city hall, NHDOT and Stantec Consulting Services.

6.3 KEEPING THE ALP CURRENT

ALP becomes “out-of-date” when it:

- Does not adequately provide for future needs;
- Does not conform to current airport design standards;
- Does not accurately reflect existing features; or
- Does not reflect airport and critical land use changes which may affect the navigable airspace or the ability of the airport to expand.

6.4 DILLANT HOPKINS ALP DRAWINGS

The EEN ALP consists of the following 11 drawings.

6.4.1 Cover Sheet (Sheet 1 of 11)

The cover sheet bounds the ALP Drawing Set and includes the following information.

- Airport name and location
- NHDOT State Block Grant Number
- Location and Vicinity Map
- Wind Rose Data for All Weather, IFR and VFR conditions.
- Name of the Airport Sponsor
- Preparer Information
- Sheet Index
- Date Prepared

6.4.2 DATA TABLES PLAN (SHEET 2 OF 11)

The Data Sheet contains primary airport and runway data tables. Tables note the existing and proposed conditions.

6.4.3 EXISTING FACILITIES PLAN (SHEET 3 OF 11)

The Existing Facilities Plan is provided as both a reference document to identify existing facilities (including the runway, taxiway, buildings, aprons, and other structures) and a presentation document to determine a beginning point for this study.

This sheet is prepared at a scale of 1 inch = 400 feet.²

6.4.4 AIRPORT LAYOUT PLAN (SHEET 4 OF 11)

The Airport Layout Plan is the graphical presentation of the recommended airport-improvement projects for Plymouth Municipal Airport. The ALP is a pictorial representation and summarization of the efforts made in this planning process. The previous chapters supply the basis for the Airport’s future airport layout as shown in the drawing set.

² The scale for this and all other drawings is applicable to the full size sheets only and not the 11” x 17” sheets in Appendix D.

Descriptions of the improvements and costs over the next 20 years are included in Chapter Seven, the Implementation, and Financial Plans. The long-term concept, as selected by the City in consultation with the Planning Advisory Committee, was the basis for determining the proposed improvements at the Airport. The ALP is a development guide that presents the technical improvements possible. The timing of development depends on when it is needed and can be funded. The Concept, as detailed on the ALP, includes – but is not limited to – the following items:

- Reduction in Runway 14-32 width from 150 to 75 feet, with retention of the center 75 feet of the runway. The north and east side of the runway will be removed and the material reclaimed as part of this or another project.
- Runway 14-32, 400-foot extension
- The shift in the Runway 32 displaced threshold by approximately 400 feet.
- The additional of a new parallel taxiway for Runway 14-32
- Reduction in width of Taxiway A from 50 to 35 feet per FAA design standards
- Extension of Taxiway A from the current southern end to the approach end of Runway 2
- Expansion of the Airport's Terminal Apron
- Allocation of space for additional hangar development
- Identification of land available for both aeronautical and compatible uses
- Identification of space for a potential solar farm
- Relocation of the airport's fuel farm from the based aircraft apron to the terminal apron

All recommended airport improvements shown on this Plan are representative and may be modified as necessary to meet the needs of the community and airport users or the future design requirements of the FAA or NHDOT.

This sheet is prepared at a scale of 1 inch = 400 feet.

6.4.5 TERMINAL PLAN (SHEET 5 OF 11)

The Terminal Plan focuses on the aviation service facilities by just providing a larger view sheet concentrates on the airport's terminal area, including parking aprons. This drawing is divided into the airport's two terminal areas: based aircraft and itinerant.

This sheet is prepared at a scale of 1" = 100'.

6.4.6 RUNWAY PLAN AND PROFILE SHEETS

The Runway Plan and Profile sheets are large scale plan views of inner portions of approaches for each runway. Each drawing shows the Part 77 approach surface to the approximate limit of the RPZ area. For this project, two sheets, one for each runway were prepared (as noted below). Each drawing shows both runway ends in a split drawing. Each uses an aerial photo for the base map and are made at a scale of Horizontal 1" = 200'; vertical 1" = 20'.

6.4.6.1 Runway 2 Plan and Profile (Sheet 6 of 11)

Runway 2 is a precision runway, meaning a precision approach (ILS) provides both lateral and vertical guidance to visibility minimums of 1-1/4 miles and a decision height of 400 feet AGL. The Part 77 approach surface has an inner width of 1,000 feet, an outer width of 16,000 feet, and a length of 50,000

feet. The slope is 50:1 for the first 10,000 feet and then 40:1 for the remaining 40,000 feet. The RPZ has an inner width of 500 feet, an outer width of 1,010 feet, and a length of 1,700 feet. The RPZ covers an area of 29.465 acres.

6.4.6.2 Runway 20 Plan and Profile (Sheet 7 of 11)

Runway 20 is a visual runway, with no instrument approach procedure. The Part 77 approach surface has an inner width of 1,000 feet³, an outer width of 1,500 feet, and a length of 5,000 feet. The slope is 20:1 for the entire 5,000-foot-long surface. The RPZ is the same size as Runway 2, with an inner width of 500 feet, an outer width of 1,010 feet, and a length of 1,700 feet. The RPZ covers an area of 29.465 acres.

6.4.6.3 Runway 14-32 Plan & Profile (Sheet 8 of 11)

Runway 14-32 is a visual runway, with no instrument approach procedure to either end. The size of the RPZ is the same on both ends, with an inner width of 500 feet, an outer width of 1,010 feet, and a length of 1,700 feet. The RPZ covers an area of 13.77 acres.

Runway 14 and 32 have a Part 77 approach surface with an inner width of 500 feet, an outer width of 1,500 feet, and a length of 5,000 feet. The slope is 20:1 for the entire 5,000-foot-long surface.

6.4.7 AIRPORT AIRSPACE PLAN (SHEET 9 OF 11)

The Airport Airspace drawing is a plan view of all FAR Part 77 surfaces, based on ultimate runway lengths. This drawing uses a scale of 1" = 1,500', with a USGS topographic map as the base. Obstructions obtained from both the aerial analysis completed as part of this Update and well and an evaluation of penetrating ground contours from the USGS map are shown.

The Part 77 surfaces presented are based on the ultimate runway ends, which includes the proposed 400-foot runway extension and shift in the displaced threshold for Runway 14-32. The Part 77 approach surface dimensions used in this drawing are as follows:

- Primary Surface width is 1,000' for Runway 2-20 = 1,000' and 250' for Runway 14-32;
- Approach Surface size and slope as noted in paragraph 6.7.6;
- Transitional Surfaces extend outward and upward at a 7:1 slope from the sides of the primary and approach surfaces, which project through and extend beyond the limits of the conical surface, for 5,000 feet;
- A horizontal surface is a horizontal plane 150 feet above the established airport elevation (488 feet), the perimeter of which is constructed by swinging arcs of 5,000 feet for Runway ends 14, 20 and 32, and 10,000 feet for Runway 2; and
- The Conical Surface extends outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet,

³ Normally, a visual runway would have an inner width of 500 feet, however, because the reciprocal end, Runway 2 is a precision runway, the same inner width of 1,000 feet is maintained for the entire runway.

6.4.8 AIRPORT LAND USE PLAN (SHEET 10 OF 11)

The Land Use Plan depicts existing on and off-airport land use. This plan includes all land uses on and around the airport (business, industrial park, special lake protection, residential, and rural/agricultural districts). Noise contours for 60, 65 and 70 DNL are included⁴. Other applications identified include schools, parks, and hospitals. The scale is 1' = 400', with an aerial photo is used as the base map.

6.4.9 AIRPORT PROPERTY MAP - EXHIBIT A (SHEET 11 OF 11)

The Exhibit 'A' property map is a snapshot of the inventory of parcels that make up dedicated airport property as recognized by the FAA. The Exhibit 'An' indicates how the owner acquired the land, the funding source for the land and whether the land was Federal surplus land or Government Property previously conveyed to the airport. The exhibit must also indicate other detached parcels owned by the Airport Sponsor that are dedicated to airport purposes.

Note: This map was not prepared nor was it updated as part of this project. It is included for reference purposes only.



⁴ Noise contour data was obtained as part of an Environmental Assessment (Phase II) underway concurrent with this Plan update.

7 FINANCIAL AND IMPLEMENTATION PLAN

7.1 INTRODUCTION

The analyses completed in the preceding chapters evaluated development needs at Dillant Hopkins Airport over the next 20 years based on forecast activity and operational efficiency. The next step is to apply fundamental economic, financial, and management rationale to each development item so that the feasibility of each item in the plan can be assessed. The presentation of the capital improvement program (CIP) has been organized into three sections. First, the Airport's capital program needs are recognized by various categories ranging from enhancing safety to satisfying demand. Second, the Airport development schedule and project cost estimates are presented in narrative and graphic form. Third, capital improvement funding sources on the federal, state, and local levels are identified and discussed. The CIP is developed following Federal Aviation Administration (FAA) guidelines for Master Plans and primarily identifies those projects that are likely eligible for FAA and/or NHDOT/BOA grant funding. Other aviation projects that are not programmed to receive federal and/or state funding participation are also presented.

7.2 AIRPORT DEVELOPMENT NEEDS

This section provides an analysis regarding the associated development needs of projects included in the CIP. While some projects will be demand-based, safety or rehabilitation will dictate other requirements.

Each development need is categorized per this schedule. The appropriate category or categories, included are presented in Table 7-1. The proposed projects can be classified as follows:

- **Safety/Security (SS)** – these are capital needs considered necessary for operational security and protection of aircraft and/or people and property on the ground near the Airport.
- **Environmental (EN)** – these are capital needs which are identified to enable the Airport to operate in an environmentally acceptable manner.
- **Maintenance (MN)** – these are capital needs required to maintain the existing infra- structure at the Airport.
- **Efficiency (EF)** – these are capital requirements intended to optimize aircraft ground operations or users of landside facilities.
- **Demand (DM)** – these are capital needs required to accommodate levels of aviation demand. The implementation of these projects should only occur when demand for these requirements are verified.
- **Opportunities (OP)** – these are capital requirements intended to take advantage of possibilities afforded by the Airport setting. Typically, this will involve improvements to property designed for lease to aviation or non-aviation related development.

Table 7-1. Airport Capital Improvement Plan

PROJECT NUMBER	YEAR	PROJECT NAME	PROJECT CATEGORY	FEDERAL FUNDING	STATE FUNDING	LOCAL SHARE	COST ESTIMATES
SHORT-TERM PROJECTS (2017-2021)							
	2017	Obstruction Removal - City Property Runway 20 Approach Surface	SS	\$0	\$0	\$0	\$0
	2017	Runway 14-32 Design/Reconstruction/Rehabilitation	MN	\$3,891,600	\$216,200	\$216,200	\$4,324,000
	2018	Acquire Avigation Easements for RWY 20 Approach Clearance	SS	\$-	\$-	\$-	TBD
	2019	Design/Obstruction Removal (Phase II) - Private Property Runway 20 Approach	SS	\$-	\$-	\$-	TBD
	2019	Acquire Avigation Easements for RWY 2 Approach Clearance Surface	SS	\$-	\$-	\$-	TBD
	2020	Environmental/Design/Obstruction Removal - Runway 20 Approach Surface	SS	\$0	\$0	\$0	
	2020	Environmental Assessment for Wildlife Fence	EN	\$67,500	\$3,750	\$3,750	\$75,000
	2021	Design/Construction Wildlife Fence	SS	\$1,016,730	\$56,485	\$56,485	\$1,129,700
	2021	Relocate ASOS	EF	\$150,000	\$0	\$0	\$250,000
	2021	Terminal Building Enhancements	EF			\$350,000	\$350,000
Short-Term Project Subtotal Costs				\$5,125,830	\$276,435	\$626,435	\$6,128,700
INTERMEDIATE-TERM PROJECTS (2022-2026)							
	2022	Design/Construction of Expanded Aircraft Parking Apron	DM	\$1,418,400	\$78,800	\$78,800	\$1,576,000
	2025	Design/Construction of Aircraft Fuel Farm & Removal of Old System	DM	\$653,400	\$36,300	\$36,300	\$726,000
	2026	Airport Master Plan and ALP Update	MN	\$315,000	\$17,500	\$17,500	\$350,000
Intermediate-Term Project Subtotal Costs				\$2,386,800	\$132,600	\$132,600	\$2,652,000
LONG-TERM PROJECTS (2027-2036)							
	2027	Design/Extend Taxiway A and Reconstruct Existing Taxiways to 35 feet	EF	\$1,440,000	\$80,000	\$80,000	\$1,600,000
	2028	Environmental Assessment for Easements and Runway 32 Extension	EN	\$180,000	\$10,000	\$10,000	\$200,000
	2029	Design/Obstruction Removal - Private Property Runway 32 Approach	EF	\$-	\$-	\$-	TBD
	2030	Design/Construction - Runway 32 Extension and Runway Threshold Relocation	EF	\$2,214,000	\$123,000	\$123,000	\$2,460,000
	2034	Design/Construction - Runway 2-20 Reconstruction/Rehabilitation	MN	\$4,500,000	\$250,000	\$250,000	\$5,000,000
Long-Term Project Subtotal Costs				\$8,334,000	\$463,000	\$463,000	\$9,260,000
Airport Capital Improvement Costs				\$15,846,630	\$872,035	\$1,222,035	\$18,040,700
Percentage of Funding Source Costs				88%	5%	7%	

Project Category Legend:

SS – Safety/Security

MN – Maintenance

EN – Environmental

EF - Efficiency

DM - Demand

7.3 AIRPORT DEVELOPMENT

With the recommended Master Plan concept developed and specific needs and improvements for the Airport having been established, the next step is to determine a realistic implementation timeline and associated costs for the plan. Planning periods are grouped into short term (current – 5 years), intermediate term (6 – 10 years), and long-term (11 – 20 years). Table 7-2 summarizes key activity milestones for the three planning horizons. A key aspect of this Master Plan is the use of demand-based planning milestones. Many projects should be considered based on actual demand levels. As short-term horizon activity levels are reached, it will then be time to program for the intermediate term based on the next event milestones. Similarly, when the intermediate term milestones are reached, it will be a chance to schedule for the long term activity signs. Some of the development items included in the recommended concept will need to follow these demand indicators. For example, the plan includes new itinerant apron development, which is tied to itinerant aircraft activity. Based aircraft necessitating the need for additional hangar development and the need to accommodate growth in overall Airport activity will be the primary indicator for these projects. If based aircraft growth occurs as expected, additional hangars should be constructed to meet the demand. If growth slows or does not take place as forecasted, some projects may be delayed. Thus, capital expenditures are planned to be made on an as-needed basis, which leads to a more responsible use of capital assets.

	Base Year (2016)	Short-Term (2017-2021)	Intermediate-Term (2022-2026)	Long-Term (2027-2036)
Based Aircraft				
<i>Single Engine Piston</i>	69	70	72	72
<i>Multi-engine Piston</i>	6	6	5	2
<i>Turboprop</i>	2	2	3	6
<i>Jet</i>	2	5	7	9
<i>Helicopter</i>	1	1	1	2
Total Based Aircraft	80	84	88	91
Aircraft Operations				
<i>Itinerant</i>	21,840	22,100	22,200	22,700
<i>Local</i>	6,160	6,200	6,300	6,400
Total Annual Operations	28,000	28,300	28,500	29,100
Source: Stantec Consulting Services				

At Dillant Hopkins Airport, hangars are either privately owned by tenants, which then have land lease contracts or belonging to the city of Keene and leased to tenants. Because of economic realities, few airports are constructing new hangars on their own, instead relying on private developers. In some

cases, private developers can keep construction costs lower, which in turn lowers the monthly fee necessary to amortize the cost of development. To the greatest extent possible, private development of all hangar types should be supported and promoted by the City. The CIP for the Airport assumes that the potential for future hangars would most likely be constructed through public/private partnerships. This assumption does not preclude the possibility of the Airport building new hangars. Ultimately, the city of Keene will determine, based on demand and the needs of a potential developer, whether to self-fund hangar construction or to rely on private developers.

Not all projects identified are necessary to meet projected demand. Other projects are needed to enhance the safety and efficiency of the Airport, maintain existing pavement infrastructure, or to address FAA design standards.

Since a Master Plan is a conceptual document, implementation of the capital projects should only be undertaken after further refinement of their design and costs through architectural and engineering analyses. Moreover, some projects may require additional infrastructure improvements (i.e., drainage improvements, an extension of utilities, etc.) that may increase the estimated cost of the project or increase the timeline for completion.

Once a list of significant projects was identified and refined, project-specific cost estimates were developed. The cost estimates include design, engineering, construction administration, and contingencies that may arise on the project. Capital costs presented here should be viewed as estimates subject to further refinement during the design process. Nevertheless, they are considered sufficient for planning purposes. Cost estimates for several projects included in the CIP were provided by the Airport's Engineer, Stantec Consulting Services. Easement acquisition costs are not provided because of the wide disparity in land costs, actual easement area required, and the need to keep these costs private to the extent possible. Cost estimates for each of the development projects in the CIP are based on present-day construction, design, and administration costs. Adjustments will need to be applied over time as construction costs or capital equipment costs change. The sidebar on the next page provides one possible method of determining future costs.

Table 7-1 (page 7-2) is the proposed 20-year CIP for Dillant Hopkins Airport. An estimate of FAA and NHDOT/BOA funding eligibility has been included, although actual funding is not guaranteed. For those projects that would be eligible for federal funding, FAA's Airport Improvement Program (AIP) provides 90 percent of the total project cost. The federal eligibility breakdown is based on the Airport's FAA designation (general aviation). The remaining amount would be equally shared between the NHDOT/BOA and the city of Keene at 5 percent each. Other projects in the CIP are funded solely through local funding.

CALCULATING FUTURE COSTS

Construction, engineering, and other costs listed in this chapter are based on 2016 dollars. These costs will rise in the future, possibly by as much as 2-5% per year. To compute current cost estimates or revisions in the future, refer to the Construction Cost Index (CCI) of *Engineering News Record (ENR)*. As an example (see formula below), a \$100,000 project in 2016, with a CCI of 206.2, would cost \$114,355 in the year 2022 with a (presumed) CCI of 235.8.

$$2016 \text{ project cost} * 2022 \text{ CCI} / 2016 \text{ CCI} = \text{future project cost}$$

$$\$100,000 * 235.8 = 23,580,000 / 206.2 = \$114,355$$

Thus, a \$100,000 project in 2016 could cost 14% more in 2022.

As detailed in the CIP, most projects listed are eligible for both federal and state funding. Naturally, demand and justification for these projects must be provided by a grant being issued by the FAA and/or NHDOT/BOA.

The FAA and NHDOT/BOA each utilize a priority ranking system to help objectively evaluate potential airport projects. Projects are weighted toward safety, infra-structure preservation, meeting design standards, and capacity enhancement. The FAA will participate in the highest priority projects before considering lower priority projects, even if a lower priority project is seen as a more urgent need for the local sponsor. Nonetheless, the project should remain a priority for the Airport, and funding support should continue to be requested in subsequent years.

Some projects identified in the CIP will require environmental documentation. The level of documentation necessary for each project must be determined in consultation with the FAA and NHDOT/BOA. There are three major levels of environmental review to be considered under the National Environmental Policy Act (NEPA) that include categorical exclusions (CatEx), Environmental Assessments (EA), and Environmental Impact Statements (EIS). Each level requires more time to complete and more detailed information. Guidance on what level of documentation is needed for a project is provided in FAA Order 1050.1F, Environmental Impacts: Policies and Procedures. The Environmental Overview presented in Chapter Five addresses NEPA and offered an evaluation of potential environmental impacts for Dillant Hopkins Airport. The following sections will describe in greater detail the projects identified for the airport over the next 20 years.

The short term projects are subdivided into yearly increments and refer to the federal fiscal year (FY) (October – September). Local priorities group the intermediate and long terms projects per both need and the financial means of paying the city's share. While the CIP shows the priority ranking of the projects, the list should be evaluated and revised on a regular basis.

7.3.1 SHORT-TERM PROGRAM (2017-2021)

The short term planning period is the only planning horizon separated into single years. This is to allow the ACIP to be coordinated with the five-year planning cycle of the FAA and NHDOT/BOA. If any of these projects cannot be funded in the timeframe indicated, the city should consider the project for the following year. Plans called out during this timeframe are very specific regarding actual design and construction. Two projects in the first five years may also be addressed in a CatEx or an EA. As such, some projects are initially put through an environmental and/or design phase and then followed up with actual construction. The short term program considers some projects over the five-year planning period as presented earlier in Table 7-1 (page 7.2). The following provides a detailed breakdown of each project within FY 2017 through 2021. The Plan's CIP includes FY 2017 projects to be consistent with the current ACIP submitted to the FAA, resulting in a total of six years included within the short term program.

7.3.1.1 FY 2017 Projects

- **Remove Obstructions Runway 20 Approach.** This project is currently underway and is 100% funded by the city. It involves clearing trees on city-owned land east of Airport Road under the Runway 20 approach surface. Cost Estimate: This project is managed under a logging agreement that should net the city revenue. Funding Sources: Not applicable.
- **Reconstruct and Narrow Runway 14-32.** This project has been programmed for several years and is now in the final design phase and is expected to enter the bid phase in the late winter of

2017. It involves narrowing the runway from 150 to 75 feet and reconstructing the remaining surface through the removal of existing asphalt and repaving. The project includes new runway edge lights. Cost Estimate: \$4,324,000. This figure includes \$412,000 for design and \$3,912,000 for construction. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.

7.3.1.2 FY 2018 Projects

- Acquire Avigation Easements in the Runway 20 Approach.** This removal of trees on private property under the Runway 20 approach surface begins with the acquisition of property rights. In this case, property rights would most likely be in the form of an avigation easement for several, if not all the 31 parcels involved. Cost estimate: TBD based upon coordination with the city and property owners. Typical costs include consultant fees of identifying and processing the easement and federal/state grant applications as well as meetings and discussion with landowners, and city and property owner’s legal counsel, and of course, the actual price paid to the landowner for the right to trim or cut trees. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.

NOTE

THE DATA USED IN THE AIRSPACE ANALYSIS IN THIS MASTER PLAN UPDATE WAS COLLECTED IN 2013 AND MAY NOT ACCURATELY REFLECT FUTURE CONDITIONS. BEFORE UNDERTAKING ANY OBSTRUCTION REMOVAL PROJECT, PARTICULARLY OFF AIRPORT ON PRIVATE LAND, AN AIRSPACE ANALYSIS IS HIGHLY RECOMMENDED AND SHOULD INCLUDE THE COLLECTION OF NEW OBSTRUCTION DATA.

7.3.1.3 FY 2019 Projects

- Remove Obstructions Runway 20 Approach Surface.** This project involves the engineering design and then removal or topping of trees in private property under the Runway 20 approach surface. Cost estimate: TBD based on individual trees and their location. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.
- Environmental Assessment.** An EA will be required before obtaining property rights for the proposed avigation easement project listed next. Estimated Cost: \$100,000. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.
- Acquire Avigation Easements in the Runway 2 Approach.** This removal of trees on private property under the Runway 2 approach surface begins with the acquisition of property rights. In this case, property rights would most likely be in the form of an avigation easement for several parcels (number to be determined). This project cannot move forward until the EA (previous project) is complete, and a FONSI is issued by the FAA. Cost estimate: TBD based upon coordination with the city and property owners. Typical costs include consultant fees of identifying and processing the easement and federal/state grant applications as well as meetings and discussion with landowners, and city and property owner’s legal counsel, and of course, the actual price paid to the landowner for the right to trim or cut trees. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.

7.3.1.4 FY 2020 Projects

- Remove Obstructions in the Runway 2 Approach Surface.** This project involves the engineering design and removal of obstacles in the Part 77 Approach Surface to Runway 2. Cost estimate:

TBD based on individual trees and their location. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent. See Side Note on page 7.6.

7.3.1.5 FY 2021 Projects

- **Install Wildlife Fence.** This project involves the engineering design and construction of 16,400 linear feet of an 8 to 10-foot-high chain-link fence along with a 4 to 5-foot skirt attached to the bottom of the fence.¹ The new fence would tie in with existing airport fencing and fencing around the city's waste water treatment plan. This project is predicated on the FAA issuance of a FONSI (see FY 2020 EA Project). Estimated Cost: \$1,130,000. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.
- **Relocate ASOS.** The Automatic Surface Observation System (ASOS) was never installed in the correct location. The ASOS requires a 500-foot clear radius around the unit with no objects higher than the anemometer, which is about 30 feet high. However, in the initial inventory phase of this project, and subsequent inspections, it was determined that the ASOS has about 200 feet of obstacle free area. This deficiency has led to an incorrect wind flow over the system, which is distorting the wind data, rendering this part of the system invalid. Estimated cost: \$250,000. Funding Sources: This should be a 100% FAA funding project through an account other than the Airport Improvement Program.

7.3.1.6 Short Term ACIP Summary

The short term ACIP includes projects that enhance the overall safety, efficiency, and maintenance of the airfield while also implementing landside improvements. The total investment necessary for the short term ACIP is approximate \$6 million. About \$5.3 million is programmed for federal/state funding assistance. The remaining \$600,000 is to be provided through local sources of money.

7.3.2 INTERMEDIATE-TERM PROGRAM (2022 – 2026)

The intermediate term covers the period 6 through 10 years and includes ten projects. These projects are listed in Table 7-1 (page 7.2). Planning new projects beyond the short-term timeframe can be challenging. Due to the fluid nature of funding availability and the possibility of changing priorities, these projects have been grouped together into a single project list and not prioritized by year. Further evaluation of these projects should occur during this planning horizon to determine their order of importance based on airport safety, demand, and efficiency.

- **Expand Itinerant Aircraft Parking Apron.** This project involves the engineering design and construction of a larger aircraft parking apron in front of the terminal building. The expansion includes the addition of numerous new aircraft parking spaces, with tie-down pads, markings, and a 35' wide taxilane through the apron for hangar access. Estimated Cost: \$1.6 million. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.

¹ The FAA recommends a 10-foot fence with 3-strand barbed wire outriggers. In some cases, an airport may be able to use an 8-foot fence with 3-strand barbed-wire outriggers, depending on the amount of deer activity in a local area. The skirt of fencing material, attached to the bottom of the fence and buried at a 45-degree angle on the outside of the fence, is ideal to prevent animals from digging under the fence and reduce the chance of washouts. Refer to FAA Certification Alert 16-03 dated 08/03/2016.

- **Construct New Aircraft Fuel Farm.** This project replaces the existing fuel farm located in the based aircraft parking area and has proven over the years to be a problematic location for the system operators. Also, the system and its in-ground tanks are approaching 30 years since first installed and will be ready for replacement in the next 5-8 years. The project would include the addition of a support pad and aircraft parking apron along with two 10-12K above ground tanks (one each for AvGas and Jet Fuel), along with a pumping system and computer controlled pump station. The system should be designed for 100% self-service fueling. Estimated Cost: \$726,000. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.
- **Airport Master Plan and ALP Update.** While the ALP should always be kept up to date, reviewing and updating the master plan on a regular basis is considered good management of the airport because of the naturally changing environment at both the airport and transportation trends in general. Periodic reviews and updates to the Plan (at least every 7-10 years) ensure compliance with current FAA and state design standards. Also, because many master plan updates include a thorough airspace analysis, this becomes an excellent time to conduct a detailed review of the area around the airport to ensure new obstructions have not developed. Estimated Cost: \$350,000. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.

7.3.2.1 Intermediate Term ACIP Summary

Projects included in the intermediate term continue to improve the overall security and effectiveness of the airfield as well as expand landside service areas. The total investment necessary for the intermediate term ACIP is approximate \$2.7 million. About \$2.5 million is programmed for federal/state funding assistance. The remaining \$135,000 is to be provided through local sources of financing.

7.3.3 LONG-TERM PROGRAM (2027 – 2036)

The long term covers the period 11 through 20 years. This planning horizon includes six projects for the timeframe as listed in Table 7-1 (page 7.2). The following section includes a description of each project.

- **Reconstruct, and Extend Taxiway A.** Extending Taxiway “A” to the approach end of Runway 2 has been in the planning stage for many years but has been delayed for several reasons, primarily higher priority infrastructure needs. However, the need to extend the airport’s main taxiway the full length of the primary runway remains a top priority. This project should be combined with a future taxiway reconstruction, which would include narrowing the taxiway from the existing 50 feet to the required design width of 35 feet. Estimated Cost: \$1.6 million. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.
- **Environmental Assessment.** An EA will be required before obtaining property rights for the proposed avigation easement project listed next. Estimated Cost: \$100,000. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.
- **Acquire Avigation Easements in the Runway 32 Approach.** This removal of trees on private property under the Runway 32 approach surface begins with the acquisition of property rights. In this case, property rights would most likely be in the form of an avigation easement for several parcels (number to be determined). This project cannot move forward until the EA (previous project) is complete, and a FONSI is issued by the FAA. Cost estimate: TBD based upon coordination with the city and property owners. Typical costs include consultant fees of

identifying and processing the easement and federal/state grant applications as well as meetings and discussion with landowners, and city and property owner's legal counsel, and of course, the actual price paid to the landowner for the right to trim or cut trees. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.

- **Remove Obstructions in the Runway 32 Approach Surface.** This project involves the engineering design and removal of obstacles in the Part 77 Approach Surface to Runway 32, which is necessary before the runway threshold can be relocated closer to the real end of the runway. Cost estimate: TBD based on individual trees and their location. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent. See Note page 7.6.
- **Extend Runway 32 and Shift Runway Displaced Threshold.** Two steps should be taken to achieve the optimum crosswind runway length of 80% of the primary runway length. With an actual usable length of 4,001 feet, Runway 14-32 is approximately 65% of the length of Runway 2-20 (6,201 feet). The two steps involve extending the runway by 400 feet and shifting the currently relocated threshold back 400 feet. This additional combined length of 800 would bring the runway within 71% of the primary runway length, which is the maximum amount that can be reasonably achieved. Estimated Cost: \$2.5 million. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.
- **Runway 2-20 Reconstruction/Rehabilitation.** The airport's primary runway was reconstructed in 2014 and should have a usable lifespan of 20 years. Thus for financial planning, the city should anticipate repeating this project somewhere in the 2034-2036 timeframe. Estimated Cost: \$4.0 million. Funding Sources: FAA – 90 percent / NHDOT/BOA – 5 percent / Local – 5 percent.

7.3.3.1 Long Term ACIP Summary

The total costs associated with the long-term program are estimated at \$9.3 million. Of this amount, approximately \$8.1 million could be eligible for federal/state funding, and the local share is projected at \$463,000.

7.4 CAPITAL IMPROVEMENT SUMMARY

The CIP presented in this chapter is intended as a road map of airport improvements to help guide the city of Keene, the Airport, the FAA, and NHDOT/BOA. The plan as presented will contribute to accommodate increases in forecast demand at Dillant Hopkins Airport over the next 20 years and beyond. The first five years of the CIP are separated into yearly installments, and the intermediate and long-term projects are grouped together respectively. The sequence of projects may change due to the availability of funds or changing priorities. Nonetheless, this is a comprehensive list of capital projects the airport should consider in the next 20 years. The total 20-year CIP proposes approximately \$18 million in airport development needs. Of this amount, roughly \$15.8 million could be eligible for federal/state funding assistance. The local funding estimate for the proposed 20-year CIP is \$1.2million.

7.5 CAPITAL IMPROVEMENT FUNDING SOURCES

There are generally four sources of funds used to finance airport development which include:

- \$ Airport cash flow;
- \$ Revenue and general obligation bonds;

- § Federal/state/local grants; and
- § Passenger facility charges (PFCs), which are reserved for commercial service airports.

Access to these sources of financing varies widely among airports, with some large airports maintaining substantial cash reserves and the smaller commercial service and general aviation airports often requiring subsidies from local governments to fund operating expenses and finance modest improvements. Financing capital improvements at the Airport will not rely solely on the financial resources of the City. Capital improvement funding is available through various grant-in-aid programs on both the federal and state levels. Historically, Dillant Hopkins Airport has received federal and state grants. While some years more funds could be available, the CIP was developed with project phasing to remain realistic and within the range of anticipated grant assistance. The following discussion outlines key sources of funding potentially available for capital improvements at the Airport.

7.5.1 Federal Grants

Through federal legislation over the years, various grant-in-aid programs have been established to develop and maintain a system of public use airports across the United States. The purpose of this system and its federally based funding is to support national defense and to promote interstate commerce. The most recent legislation affecting federal funding was enacted on February 17, 2012, and is titled the FAA Modernization and Reform Act of 2012². The FAA is currently operating under an extension, H.R.636, the FAA Extension, Safety, and Security Act of 2016. The Act extends the agency's authority and provides funding at current levels through September 2017. It also includes some important safety and security additions including the development of a cybersecurity framework to reduce cybersecurity risks to the national airspace system, a pilot project to detect and mitigate illegal operation of unmanned aircraft around airports and other critical infrastructure, as well as changes to the hiring process for air traffic controllers.

Funding for AIP-eligible projects is undertaken through a cost-sharing arrangement in which the FAA provides up to 90 percent of the cost. In exchange for this level of funding, the airport sponsor is required to meet various grant assurances, including maintaining the improvement for its useful life, usually 20 years. As discussed earlier in this chapter, the FAA provides up to 90 percent of the cost of eligible projects for Dillant Hopkins Airport. An additional five percent of AIP-eligible project costs can be funded through the NHDOT/BOA. The source for AIP funds is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Aviation Trust Fund also finances the operation of the FAA. User fees fund the Trust Fund, including taxes on airline tickets, aviation fuel, and various aircraft parts.

7.5.2 Non-Primary Entitlement Funds

The passage of the Wendell H. Ford Aviation Investment and Reform Act for 21st Century (AIR-21)³, introduced a new funding source for general aviation airports, Non-primary entitlement. The subsequent AIP re-authorizations, Vision 100 Century of Aviation Reauthorization Act⁴, and the FAA Modernization and Reform Act of 2012 retained Non-Primary Entitlement funding with changes. Non-primary entitlement funds are specifically for general aviation airports listed in the latest published

² Public Law 112-095.

³ Public Law 106-181.

⁴ Public Law 108-176.

National Plan of Integrated Airports (NPIAS) that show needed airfield development. General aviation airports with an identified need are eligible to receive the lesser value of 20% of the 5-year cost of their current NPIAS value or, \$150,000 annually. A funding condition of Non-Primary Entitlement is that Congress must appropriate \$3.2 billion or more for non-primary entitlement funds to existing in that fiscal year.

7.5.3 Discretionary Funds

The remaining AIP funds are distributed by the FAA based on the priority of the project for which they have requested federal assistance through discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority from airports across the country are given preference in funding. High priority projects include those related to meeting design standards, capacity improvements, and other safety enhancements.

Under the AIP program, examples of eligible development projects include the airfield, public aprons, and access roads. Additional buildings and structures may qualify if the function of the structure is to serve airport operations in a non-revenue generating capacity, such as maintenance facilities. Some revenue-enhancing structures, such as tee-hangars and fuel farms, may be eligible if all airfield improvements have been made; however, the priority ranking of these facilities is very low. At Dillant Hopkins Airport, funding for these types of projects is unlikely in the near term due to higher-priority projects being recognized. This is one reason the fuel farm is proposed for the intermediate-term after safety related and high priority maintenance projects have been completed.

Whereas entitlement monies are guaranteed on an annual basis, discretionary funds are not assured. If the combination of entitlement, discretionary, and airport sponsor match does not provide enough capital for planned development, projects may be delayed.

7.5.4 FAA Facilities and Equipment Program

The Airway Facilities Division of the FAA administers the Facilities and Equipment (F&E) Program. This program provides funding for the installation and maintenance of various navigational aids and equipment of the national airspace system. Under the F&E program, funding is provided for FAA airport traffic control towers (ATCTs), en route navigational aids, on-airport navigational aids, and approach lighting systems.

While F&E still installs and maintains some navigational aids, on-airport facilities at general aviation airports have not been a priority. Therefore, airports often request funding assistance for navigational aids through AIP and then maintain the equipment on their own.

7.5.5 Project Priority

Because the demand for AIP funds exceeds the availability, the FAA bases the distribution of limited AIP funds on current national priorities and objectives. Projects that rate a high priority will receive higher consideration for funding over those projects with lower priority ratings. Each fiscal year, the FAA apportions AIP funds into major entitlement categories such as enplanements, non-primary, and state apportionment funds. The FAA distributes the remaining funds to a discretionary fund. Set-aside projects (Airport noise and the Military Airport Program) receive first attention from this distribution. The funds that remain after the set-asides are discretionary funds the FAA distributes based on a national prioritization system. The FAA distributes discretionary funds to projects that best carry out the

purpose of the AIP, with the highest priority given to safety, security, reconstruction, capacity, and standards.

7.5.6 AIP Grant Obligations

When Sponsors receive Federal assistance, they also accept certain obligations and conditions associated with that support. Sponsor may incur these obligations by contract or by restrictive covenants within property deeds. These generally involve one of the following:

- Agreements issued under Federal grant programs
- Instruments of approved property transfers
- Deeds of conveyance

Airport owners and operators who accept a Federal grant are obligated to maintain and operate their facility in a safe and efficient manner. Acceptance of the subsidy also invokes certain conditions and assurances for which the sponsor must comply. These terms and guarantees become binding contractual obligations between the sponsor and the United States.

Obligations may span different grant development programs. The FAA has administered three such development agendas:

- Federal Airport Aid Program (FAAP)
- Airport Development Aid Program (ADAP)
- Airport Improvement Program (AIP)

Airport owners should be aware that obligations incurred under each program or conveyance document can vary. The following list identifies some of the general responsibilities of an airport owner. This list is not inclusive of all such incurred Federal obligations.

- Prohibition on Exclusive Rights
- Utilization of Airport Revenue
- Proper Maintenance and Operation of Airport Facilities
- Protection of Approaches
- Maintaining Good Title of airport property
- Compatible Land Use
- Availability of Fair and Reasonable Terms without unjust discrimination
- Adherence to the approved Airport Layout Plan
- Sale or Disposal of Federally acquired property
- Preserving Rights and Powers
- Maintaining acceptable accounting and record keeping systems
- Compliance with Civil Rights requirements
- Compliance with Disadvantaged Business Enterprise (DBE) requirements

The FAA encourages airport owners to thoroughly review and understand each executed agreement and conveyance document to verify the obligations they have accepted. The Administration also help Airport owners to establish a central point for record keeping purposes that permit readily available reference to their obligations. Annual reviews of all such agreements will significantly aid Sponsor efforts in complying with their Federal obligations.

7.5.7 State of New Hampshire Block Grant Program

The State of New Hampshire, through its Department of Transportation Bureau of Aeronautics (BOA), was selected by the Federal Aviation Administration's New England Region to be a member of FAA's Airport Block Grant Program (Program) in FY 2008. This Program has been in existence in the United States since Congress authorized the pilot program in 1990.

The Bureau's relationship with FAA is as strong as ever. The state's inclusion into the Program enables the Bureau to be an extension of FAA's New England Region. Because of the Bureau's working relationships with the aviation community in NH, the Bureau has a better understanding of local issues and needs that are used to help determine project and funding priorities. By giving the state the funding assistance, the FAA gives the Bureau the flexibility to redistribute these funds for non-primary airport improvements based, in part, on local needs.

- The Bureau manages the Airport Improvement Program (AIP) grants for all non-primary NPIAS airports and the statewide program, which includes Dillant Hopkins Airport.
- The Bureau provides input and decisions on project-related issues and questions instead of the FAA.
- The FAA works with the Bureau as a backup to assist the Bureau.
- The FAA is one of the Bureau's many technical resources.
- The Program airports coordinate all project-related issues with the Bureau. FAA provides input only upon request.
- The Bureau continues to operate its non-Airport Block Grant Program funding programs.
- The Program allows the Bureau to allocate non-primary entitlement and state general aviation apportionment funds to meet local needs. FAA continues to control the distribution of discretionary funds to non-primary NPIAS airports.
- The Bureau continues to utilize FAA regulations, guidance, and policies to implement projects within the Program such as Airport Capital Improvement Program; Project Scoping Meetings; Grant Applications; Grant Offers; Grant Reimbursement Requests.

7.5.8 Local Funding

The balance of project costs, after consideration has been given to other sources of financing described above, must be funded through local resources. Dillant Hopkins Airport is owned and operated by the city of Keene.

Airport revenues are generated by airport operations through the collection of various rates and charges. Funds collected by the airport are to be used specifically to help fund the operation and

maintenance of the airport and for additions or improvements to airport facilities. All general aviation airports should establish standard base rates for various leases.

All rental rates should be set to adjust to a standard index such as the consumer price index (CPI) to assure that fair and equitable rates continue to be charged into the future. Many factors will impact what the standard lease rate should be for a facility or ground parcel. For example, land leases for aviation-related facilities should have a different lease rate than for non-aviation leases. When airports own hangars, a separate facility lease rate should be added to the ground rent. The lease rate for any individual parcel or hangar can vary due to the availability of utilities, condition, location, and other factors. Nonetheless, standard lease rates should fall within an acceptable range.

There are several alternatives for local financing options for future development at the airport, including airport revenues, direct funding (subsidizing) from the City, issuing bonds, and leasehold financing. These strategies could be used to fund the local matching share or complete the project if grant funding cannot be arranged.

There are several bonding options available, including general obligation bonds, limited obligation bonds, and revenue bonds. General obligation bonds are a common form of bond which is issued by voter approval and secured by the full faith and credit of the city, and future tax revenues are pledged to retire the debt. As instruments of credit and because the community secures the bonds, general obligation bonds reduce the available debt level of the community. Due to the community pledge to secure and pay general obligation bonds, they are the most reliable type of bond and are generally issued at lower interest rates and carry lower costs of issuance. The primary disadvantage of general obligation bonds is that they require voter approval and are subject to statutory debt limits. This requires that they are used for projects that have broad support among the electorate, and that they are reserved for projects that have the highest public priorities.

In contrast to general obligation bonds, limited obligation bonds (sometimes referred to as self-liquidating bonds) are secured by revenues from a local source. While neither general fund revenues nor the taxing power of the local community is pledged to pay the debt service, these sources may be required to retire the debt if pledged revenues are insufficient to make interest and principal payments on the bonds. These bonds still carry the full faith and credit pledge of the local community and are considered, for financial analysis, as part of the debt burden of the local community. The overall debt burden of the local community is a factor in determining interest rates on bonds.

There are several types of revenue bonds, but in general, they are a form of bond which is payable solely from the revenue derived from the operation of a facility that was constructed or acquired with the proceeds of the bonds. For example, a lease revenue bond is secured with the income from a lease assigned to the repayment of the bonds. Revenue bonds have become a common form of financing airport improvements. Revenue bonds present the opportunity to provide those improvements without direct burden to the taxpayer. Revenue bonds generally carry a higher interest rate because they lack the guarantees of general and limited obligation bonds.

Leasehold financing refers to a developer or tenant financing improvements under a long-term ground lease. The obvious advantage of such an arrangement is that it relieves the community of all responsibility for raising the capital funds for improvements. However, the private development of facilities on a ground lease, particularly on property owned by a government agency, produces a unique set of concerns.

It is harder to obtain private financing as only the improvements and the right to continue the lease can be claimed in the event of a default. Ground leases frequently provide for the reversion of improvements to the lessor at the end of the lease term, which reduces their potential value to a lender taking possession. Also, companies that want to own their property as a matter of financial policy may not locate where land is only available for lease. It is also acceptable for the airport to enter some form of public/private partnership for various airport projects. Typically, this would be limited to hangar construction, but there are some examples where a private developer constructs, for instance, a taxiway, then deeds it to the airport for ongoing maintenance. When entering any such arrangement, the airport must be sure that the private developer does not gain an economic advantage over other airport tenants.

7.6 MASTER PLAN IMPLEMENTATION

To implement the recommendations in this Plan, it is key to recognize that planning is a continuous process and does not end with approval of this document. The airport should implement measures that allow them to track various demand indicators, such as based aircraft, hangar demand, and operations. The issues that this Master Plan will remain valid for some years. The primary goal is for the Airport to serve the air transportation needs of the region best while continuing to be economically self-sufficient.

The actual need for facilities is best established by airport activity levels rather than a specified date. For example, projections have been made as to when additional hangars may be needed at the Airport. The timeframe in which the development is necessary may be substantially different. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need to accelerate development. Although every effort has been made in this planning process to estimate when facility development may be necessary conservatively, aviation demand will dictate the timing of facility improvements.

The value of a master plan is keeping the issues and objectives at the forefront of managers and decision-makers. In addition to adjustments in aviation demand, when to undertake the improvements recommended in this Plan will impact how long the plan remains valid. The format of this program reduces the need for regular and costly updates by just adjusting the timing of project implementation. Updating can be done by the manager, thereby improving the plan's effectiveness.

In summary, the planning process requires the City to consistently monitor the progress of Dillant Hopkins Airport regarding aircraft operations and based aircraft. Analysis of aviation demand is critical to the timing and need for new Airport facilities.



8 RECOMMENDATIONS

8.1 INTRODUCTION

This chapter provides recommendations on how to implement the findings of this master plan and how the airport can enhance the CIP through sustainability. Although this is not a Sustainable Master Plan as defined by the FAA, some “green” initiatives are discussed. And because of its importance in airport planning, a review of the environmental process is included in this chapter. This chapter also offers the city some suggestions on how to implement this plan and how to manage the overall planning process moving forward.

8.2 MASTER PLAN IMPLEMENTATION

In implementing the Master Plan recommendations, it is key to recognize that planning is a continuous process and does not end with approval of this document. The airport should implement measures that allow the tracking of various demand indicators, such as based aircraft, hangar and aircraft parking apron demand, and operations. The issues that this Master Plan is based on will remain valid for a number of years.

The primary goal is for the Airport to serve the air transportation needs of the region best while continuing to be economically self-sufficient. The actual need for facilities is best established by airport activity levels rather than a specified date. For example, projections indicate when additional hangars or a larger parking apron may be necessary at the Airport. The timeframe in which the development is required may be substantially different. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need to accelerate development.

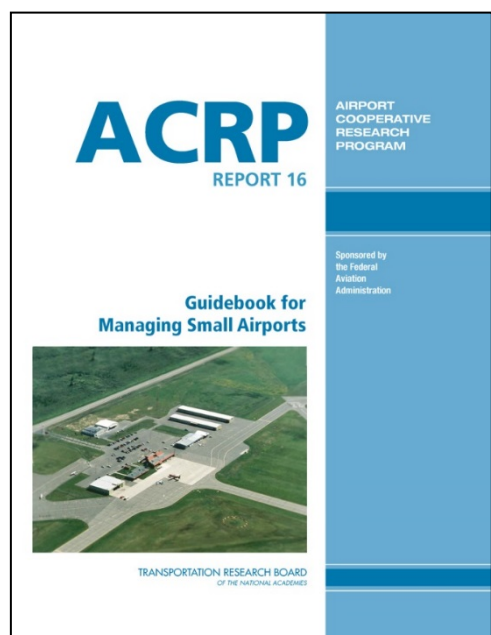
Although every effort has been made in this master planning process to estimate when facility development may be necessary, aviation demand will dictate the timing of facility improvements. The value of a Master Plan is keeping the issues and objectives at the forefront of managers and decision-makers. In addition to adjustments in aviation demand, when to undertake the improvements recommended in this Master Plan will impact how long the plan remains valid. The format of this program reduces the need for regular and costly updates by adjusting the timing of project implementation. Updating can be done by the manager, thereby improving the plan’s effectiveness. In summary, the planning process requires the city to consistently monitor the progress of the Dillant Hopkins Airport regarding aircraft operations and based aircraft. Analysis of aviation demand is critical to the timing and need for new Airport facilities.

8.3 SUGGESTIONS

Findings in this master plan, particularly in Chapter 5, Alternative Analysis, provide opportunities for development of the airport in a controlled manner that will allow the city to expand the facility as demand dictates. Hangars and their associated land-leases are the greatest sources of revenue for the airport. The airport and its proximity to tourism-related activities allow travelers the opportunity to arrive by air. Hence, the city should make sure visitors to the region, particularly those arriving by

aircraft, are informed of the on-airport development opportunities. It is true that promoting the airport and increasing revenue for general aviation airports is not a simple task. However, the city might consider several possibilities, including the following:

1. The city should ensure land lease rates remain competitive, have an inflation escalator clause, and are consistent with FAA policies on their term lengths. This report indicates that the airport will need about a dozen new hangars in the next 20 years. The airport has ample room for hangar growth, with each one having land-lease and property tax revenue potential.
2. Ensure that the City of Keene and Town of Swanzey planning and zoning activities consider the airport. It is essential that all development on and around the airport (within 3-4 miles) comply with federal statutes by requiring developers to file Form 7460-1, Notice of Proposed Construction, or Alteration.¹ Also, the city should consider placing Avigation² easements over all new development lots on private property near the airport, if applicable, to protect the airport's long-term viability. The placement of an Avigation easement ensures that property owners fully understand the proximity of the airport to their property and sets up clear expectations as to any (minor) inconveniences that will be caused by aircraft noise and other related consequences of aircraft and airport operations.
3. Ensure that the goal of the airport, its manager, the city, and airport committee work to foster aviation development, encourage aviation activities, and generate revenue to help the airport be financially self-sustaining.
4. There are four primary planning documents for airports: (1) an airport strategic (development) plan; (2) an airport business plan; (3) an airport master plan; and (4) an airport layout plan. With the completion of this document and the associated airport layout plan, the last two documents are now complete and current. And the airport recently completed a development plan that is included as Appendix E in this report. The airport should now focus on a business plan. It is therefore recommended that you begin the process of developing it by obtaining a copy of ACRP Report 16, *Guidebook for Developing General Aviation Airport Business Plans*.



¹ 14 CFR Part 77,

² See Appendix A.

5. The Master Plan Advisory Committee recommends petitioning the FAA for a change in airport status from a Regional to a National Airport as proposed in the NH State Aviation Systems Plan.³ The AAC is against seeking National status at this time.⁴
6. Develop a policy that supports sustainability. This can be part of the airport's strategic plan (discussed above) or a standalone process and is discussed in greater detail later in this chapter.
7. Plan! Many of the development projects addressed in Chapter 7 have one or more permitting requirements that must be addressed early in the process, often before or in concert with project design. Also, because the FAA fiscal year does not coincide with the city's financial planning well in advance of the project is paramount.
8. Meet regularly with the NHDOT/BOA and on-call consultant to ensure project timing and cost estimates remain synchronized with the FAA and NHDOT as well as the city/airport budget.
9. Revise the city's zoning regulations to reflect the impact of aircraft operations accurately. Current zoning regulations provide broad height restrictions across the board with no consideration to the runway approach surfaces and other imaginary surfaces. The City of Keene's code should be rewritten like the Town of Swanzey's.
10. Revise the 2003 Transportation Plan and 2010 Comprehensive Plan to include a better integration of the airport. The Comprehensive Plan does recognize the opportunities to expand both aviation and non-aviation businesses at the airport and to market the facility for more commercial purposes. Current management recognizes these opportunities exist and is moving forward with an alignment of the goals of Comprehensive Plan and the vision and ideas presented in this master plan. The Transportation Plan is heavily focused on automobile use with little consideration to the airport. This Plan should recognize the exceptional opportunities at the Dillant Hopkins Airport, including the multimodal opportunities that exist within this community and region.
11. Retain the services of an "on-call" aviation consultant. Currently, the city hires consultants for projects, such as this master plan and an EA under development, as well as a runway design project. However, once these projects are complete, the city does not have a professional firm available to answer questions related to planning, environmental, and design services. NHDOT/BOA can assist with this process.

8.4 ENVIRONMENTAL REVIEW

The environmental review process begins unofficially in the planning stages when development is first proposed as a way of managing an airport's development. The airport develops a Master Plan to document proposed development projects and justify the proposed development through the technical, economic, and environmental investigation of concepts and alternatives. One element of the Master

³ NH State Airport Systems Plan, February 2015, paragraph 7.2.22, page 7-27.

⁴ City of Keene, Airport Advisory Committee, meeting minutes, January 20, 2017.

Plan is an updated set of Airport Layout Plan (ALP) drawings showing all planned future development. At the earliest planning stages, the airport formulates the rationale or justification for the proposed development project, which will later form the basis for the statement of “purpose and need” required by NEPA.

Once a proposed development project is identified, the airport (in consultation with the FAA)⁵ should determine whether the proposed construction project constitutes a major federal action subject to NEPA, or whether it is a Categorical Exclusion from NEPA because it is not expected to have a significant adverse effect on the environment. If the FAA grants a Categorical Exclusion (CATEX) for the proposed development, the NEPA process effectively ends. The FAA has determined that some development activities are typically CATEX (i.e., not subject to NEPA) if the project does not involve “extraordinary circumstances.” These typical Categorical Exclusions include construction of new buildings, replacement of existing terminal facilities, construction of new airport access roads, improvement of existing runway surfaces, and installation of airfield lighting; several of which are part of the airport’s 20-year development program. Also, the FAA’s conditional approval of a revised ALP depicting significant future development is typically a CATEX, since NEPA review will be required later before the proposed development is undertaken.

Any AIP-funded development project will involve some level of environmental review (which may simply be a determination that the project’s anticipated environmental impacts are so insignificant as to qualify for a CATEX from NEPA). However, the airport’s consideration of the three components of an environmental review (environmental impacts, alternatives, and mitigation measures) begins long before AIP funds are devoted to a project. In the planning stage, when the airport first identifies its needs and considers development solutions, it formulates a preliminary statement of “purpose and need” that shapes the analysis of impacts, alternatives, and mitigation. The purpose and need may be refined as a project advances through the NEPA process (to reflect additional planning data and environmental data), and certainly the environmental review will have an increased level of detail as the airport sponsor moves from requesting a CATEX, to preparing an EA, to assisting the FAA in preparation of an EIS. The NEPA process often includes the help of an airport consultant experienced in the airport planning, design, and NEPA process.

Most importantly, the airport must keep in mind that, regardless of who takes the lead role in the environmental review, the airport will always ultimately get the FAA’s approval for any significant airport development project. Therefore, effective coordination of the process with the FAA is essential at all stages of development planning and environmental review. Consultation with the FAA should begin when the airport first identifies a proposed development project to address its preliminary formulation of “purpose and need.” The FAA may be able to suggest modifications (e.g., to the statement of purpose and need), alternatives to the proposed development project, or mitigation measures that will make the project more likely to withstand environmental review. For example, the FAA may be able to suggest changes that will make the project less likely to require an EIS (e.g., by introducing mitigation measures to reduce environmental impacts below significance thresholds) or

⁵ Coordination with the FAA always begins with and includes NHDOT/BOA throughout the NEPA process, as well as all other airport related programs.

more liable to qualify for streamlined environmental review (e.g., by reframing the purpose and need to focus on aviation safety or security).

8.5 SUSTAINABILITY

Over the last several years' airports have introduced green initiatives to improve the overall viability of their airports. Drivers could include financial viability, staffing considerations, or other social or environmental factors. In developing this section, it was observed what a significant compilation of sustainability practices from larger airports is, but a less robust description of initiatives for smaller airports. This section briefly focuses on drivers and outcomes of green initiatives undertaken at small commercial and general aviation airports.

Sustainability is a complex concept. The most often quoted definition comes from the UN Brundtland Commission: "Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs."⁶

The Airports Council International – North America (ACI-NA) takes a more pragmatic view focused on aviation: "Airport sustainability, in effect, is a holistic approach to managing an airport so as to ensure the integrity of the Economic Viability, Operational Efficiency, Natural Resource Conservation and Social Responsibility (EONS) of the airport".⁷

The EONS model defines "pay-back" through proven business practices that pay benefits to our customers, our employees, our neighborhood, our essential point, and our industry. Using the ACI-NA's broadened definition of sustainability, sustainability also should address operational efficiency to include

- operating costs (e.g., airport infrastructure, information technology, fleet management),
- maintenance costs,
- component renewal costs,
- life-cycle costs (e.g., debt service, component restoration, and O&M), and
- ability to holistically tradeoff priorities in the life cycle.

In 2010, the FAA issued interim guidance on sustainability plans, which stated, "airport sustainability is a broad term that encompasses a wide variety of practices applicable to planning, design, building and operating airport facilities."⁸ Given the wide diversity and unique challenges of individual airports, the Sustainable Aviation Guidance Alliance (SAGA) recommends that each airport develops its own definition and approach to sustainability.⁹

⁶ The United Nations Economic Commission for Europe (UNECE), Sustainability Development – Concept and Action.

⁷ Airports Council International–North America (ACI-NA), Airport Sustainability: A Holistic Approach to Effective Airport management, ACI-NA, Washington, D.C., n.d.

⁸ Black, E., "Airport Sustainable Master Plan Pilot Program," FAA, Washington, D.C., May 27, 2010 [Online]. Available: http://www.faa.gov/airports/environmental/sustainability/media/interim_guidance_sustainable_master_plan_pilot.pdf [accessed Dec. 3, 2014].

⁹ Sustainable Aviation Guidance Alliance (SAGA) Sustainability Database (2009) [Online]. Available:

Like other industry sectors, airports view sustainability as a process of continuous improvement, not an end goal. When embraced as a process of continuous improvement, sustainability initiatives can contribute to almost every facet of airport operations and thus can serve to facilitate future growth. However, limited financial and human resources often constrain sustainability efforts at small airports. For this reason, like some larger airports, small airports are pursuing sustainability activities in several ways, including incorporating sustainability principles into a master plan (sustainable master plan); developing a formal, stand-alone sustainability plan (sustainable management plan); and implementing sustainability actions on an ad hoc basis. Because this Master Plan update was not developed as a “sustainable” plan, the application of “green” practices should be developed through the airport committee, working in concert, perhaps with the cities’ Climate Protection Committee.

The Dillant Hopkins Airport is encouraged to visit the Sustainable Aviation Guidance Alliance website. This interactive site allows users to explore and share sustainability information. While geared toward airports, this site is useful for all industries to learn about sustainability, exchange ideas and experiences, search for practices based on custom information, and efficiently plan, implement, and monitor sustainability activities.¹⁰

A survey conducted a study funded by the Transportation Research Board (TRB) and the Airport Cooperative Research Program (ACRP) found certain consistencies among the respondent airports.¹¹ Sustainability initiatives adopted by smaller airports, regardless of the existence of a formal sustainability plan, included the following that may apply to the Dillant Hopkins Airport:

- Lighting upgrades, including LED lights
- Solar and geothermal energy systems
- Recycling of municipal and construction waste
- Electric/Diesel Utility Vehicles and Terminal Retrofit
- Land and Natural Resource Management
- In-Kind Contributions/Community Outreach.

Certainly, smaller airports (including Dillant Hopkins Airport) have only a fraction of the resources (funds, staff, facilities) that larger airports have. However, this need not prohibit EEN from pursuing sustainable initiatives. Smaller airports have been quite innovative in their approach to sustainability, allowing for low-cost solutions to be implemented.

<http://www.airportsustainability.org/database> [accessed Dec. 3, 2014].

¹⁰ <http://www.Airportsustainability.Org/>

¹¹ Airport Cooperative Research Program (ACRP), Synthesis 69, Airport Sustainability Practices – Drivers and Outcomes for Small Commercial and General Aviation Airports. [On-line] <http://www.trb.org/Main/Blurbs/174223.aspx>.

Many sustainable initiatives are scalable and can be made more appropriate for smaller airports with adjustments to project scope. Small airports should view sustainability as a process and not an end goal". The focus is not on the number or scale of sustainable projects implemented but rather on the transformed thought processes that lead staff to "think sustainable" in all business decisions. This could undoubtedly lead Dillant Hopkins Airport to initiate some sustainable initiatives, but the success of the airport's efforts need not be equated to the number of projects completed. For airport staff overwhelmed at the prospect of being more sustainable, a pilot program could be considered. Rather than a risky all-or-nothing approach, it can be useful to focus on one initiative, gain experience with the process, and learn from that project before initiating additional projects.

Each sustainable initiative needs a champion. This person will be the "driver" for the project, bring stakeholders together through the formation of an advisory council, develop the steering committee, and oversee the creation of implementation teams, moving from strategy to action (see Figure 8-1).

The Sustainable Aviation Guidance Alliance (SAGA) presents one possible comprehensive approach to the development and implementation of sustainable initiatives. The process offers several steps starting with a champion and sustainability team (see Figure 8-2).



Figure 8-1. Various Roles from Strategy to Action

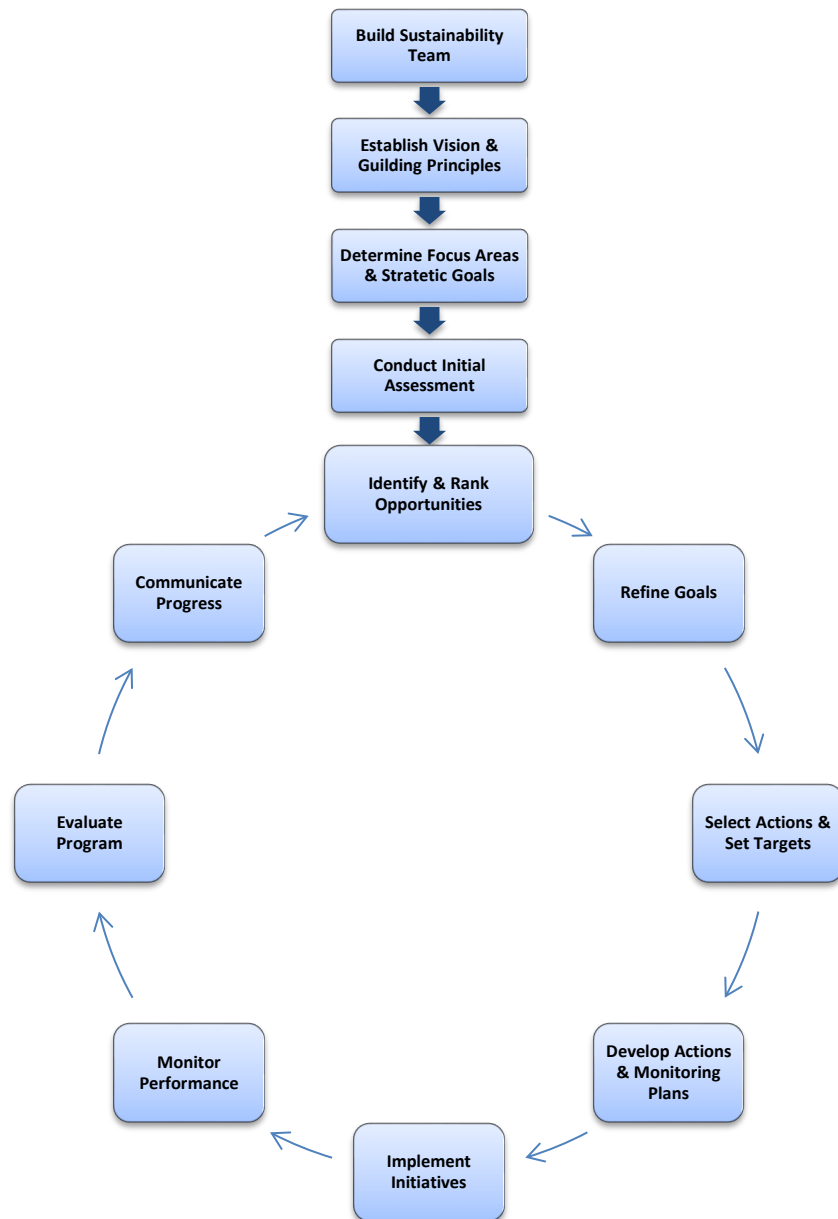


Figure 8-2. SAGA Approach

8.6 SUSTAINABLE CONSIDERATIONS

In addition to the survey results, the following includes more in-depth information on sustainability initiatives possible at Dillant Hopkins Airport with case examples offered for consideration. The approaches to sustainability vary with airport size, location, priorities, and management, and each of the case examples provides a window into real-life issues, situations, and solutions.

8.6.1 Lighting Upgrades, Including LED Lights

Example: Centennial Airport, Denver, Colorado

Type Facility: General Aviation Airport

Benefit: Energy Conservation

Centennial Airport, located in Denver, Colorado, is owned and operated by the Arapahoe County Public Airport Authority. This airport, to reduce electricity usage and associated costs, increase the life of bulbs, reduce maintenance costs and pavement downtime, and benefit the environment, has transitioned all internally illuminated airfield signage from incandescent to LED and replaced all taxiway lighting with LED (Table 8-1). The airport is now in the process of transitioning runway lighting to LED. Although the airport also supports tenant sustainability initiatives and has transitioned to a more energy-efficient fleet of vehicles, the move toward LED lighting is the airport's most significant sustainable project to date.

Table 8-1. Lighting Upgrade Considerations

INITIATIVE	DRIVERS	OUTCOMES	METRICS	BARRIERS	LESSONS LEARNED
LED Airfield Lighting	Reduce electricity usage and associated costs, increase the life of bulbs, lower maintenance costs and pavement downtime, and benefit the environment	Lower electricity use, removal of regulator no longer needed, reduced maintenance hours	Utility bills, personnel hours, pavement closure time	Use of LED in cold area, persuading FAA to approve installation of LED without supplemental heaters	Include learning that LED is significantly brighter than incandescent or quartz lamps. If part of the airfield is LED and part is not, pilots will notice the difference, possibly to the point of confusion.

Assistant airport director Lori Hinton explained that the airport worked closely with the FAA Airport District Office to include LED lighting in appropriate projects already in the Airport Capital Improvement Plan. Concern was expressed by FAA that LED lights on the airfield would need supplemental heater coils in Denver's winter climate. However, Hinton was concerned that the electricity required to power the heater coils would negate any energy savings produced by the LED lights. Airport staff persuaded the FAA to allow a small test area of LED lights on the airfield without supplemental heater coils. The test revealed that the lights would perform well, even during winter conditions, without additional heater coils. The FAA agreed and allowed the airport to include the LED lighting in their grant application for two taxiway projects.

Hinton explained that LED lighting produced such positive benefits in electricity usage that the airport has been able to remove an old regulator from the airfield electrical vault. As with the experiences of other airports undertaking sustainable projects, Centennial Airport was able to use in-house electricians to upgrade all of the internally illuminated airfield signs to LED, which reduced the overall cost of the project. Lessons learned, according to Hinton, include determining that LED is significantly brighter than

incandescent or quartz lamps, and if part of the airfield is LED and part is not, pilots will notice the difference, possibly to the point of confusion. Her final encouragement to other small airports considering a transition to LED was “Not only is it good for the environment, but it is actually going to save the airport money.”

The lower operating costs of LED airfield lighting have been confirmed through reduced maintenance costs and reductions in energy use. Together, these can offset the present higher costs of installing LED airfield lighting fixtures within a few years. It is likely that the majority of economic savings comes from reduced maintenance costs.¹²

Opportunities at Dillant Hopkins Airport

The inclusion of LED lighting at Dillant Hopkins Airport is both realistic and eligible for federal and state grants on a shared cost basis. LED runway edge and taxiway edge lights should be included, at a minimum, with every reconstruction/rehabilitation project, beginning with the Runway 14-32 project slated for 2017. As each pavement in either built (parallel taxiway for the crosswind runway) or rehabbed, LED lights should be included in the project design and construction. One issue that should be considered is the current ban on federal funding of High-Intensity Runway Edge Lights (HIRL), which Dillant Hopkins Airport has installed on Runway 2-20. While the future of this prohibition is uncertain, the airport can consider changing to Medium Intensity Lights (MIRL), which are AIP approved. Changing from HIRL to MIRL at EEN will have no operational impact on the airport because the runway has approach visibility minimums of 1 statute mile, and even if the minimums were lowered to $\frac{3}{4}$ miles, MIRLs are acceptable.¹³

The airport’s Medium Approach Light System with Runway Alignment Indicator Lights (MALSR) system is another opportunity for energy savings. On a national level, the FAA has evaluated MALSR for replacement of the current incandescent lamps with LED lamps, and it has been determined that it will be extremely beneficial to do this substitution.

8.6.2 Solar and Geothermal Energy Systems

Example: Lakeland Linder Regional Airport, Lakeland, Florida

Type Facility: General Aviation Reliever Airport

Benefit: Energy Conservation/Renewable Energy

The Lakeland Linder Regional Airport, located in and owned and operated by the City of Lakeland, Florida, is a reliever airport. The airport staff discussed the possibility of generating renewable energy on available airport property to reduce utility costs (Table 8-2). Through a public–private partnership between the City of Lakeland and Sun Edison, the local utility company, the plan was for the airport to make 40 acres available for the solar field. Sun Edison would pay for the construction of the solar field, and the City of Lakeland would purchase the electricity for a long-term fixed rate over the next 25 years.

¹² Airport Cooperative Research Program (ACRP), Impacts on Practices No. 025: Using Airfield LED Lighting to Save Energy and Costs, November 2016. [Online] http://onlinepubs.trb.org/onlinepubs/acrp/acrp_iop_025.pdf.

¹³ AC 150/5300-13A, Airport Design, Table 3-4, page 90.

In exchange for airport land, the airport would receive energy credits at a rate of \$0.02/kWh. This agreement would generate nearly \$250,000 annually for the airport with no cost associated with planning or construction.¹⁴

Table 8-2. Solar and Geothermal Energy Systems Considerations

INITIATIVE	DRIVERS	OUTCOMES	METRICS	BARRIERS	LESSONS LEARNED
Solar Field	Reduce utility costs, utilize airport land	Reduce electricity costs	Utility costs	Environmental concerns, glare potential, funding	Beneficial public-private partnerships: renewable energy can substantially improve bottom line

As part of the design of the solar field, the FAA required a glare analysis to ensure that the PV panels would not negatively affect pilot visibility with a reflective glare. The glare analysis showed that the PV panels would absorb nearly two-thirds of all light reaching the panels. Technology has allowed the manufacture of PV panels with an antireflective coating, further reducing any reflective glare from the panels. The actual glare to be produced by the panels would be like that provided by green vegetation.

More than 18,000 solar panels were installed, creating the first on-airport solar field of this size in the FAA southern region. The solar field generates more than 9 million kWh of solar electricity per year. It also makes more than \$250,000 in energy credits annually, nearly eliminating the airport's electricity costs. Lessons learned, shared by Brett Fay, operations supervisor, and Gene Conrad, airport director, include:

- Even when a project is inherently environmentally friendly, there can be unintended environmental impacts associated with the construction.
- Public-private partnerships can make large-scale sustainable projects affordable.
- Consider airport land that may not be beneficial for aviation use but could be used for renewable energy projects.

Closer to home, some airports in New England have installed or are in the design and permitting phase of installing solar panels on the airport. In 2012, the Manchester-Boston Regional Airport completed a Solar Photovoltaic (PV) Project that included the purchase and installation of approximately 42,000 square feet of canopied Solar PV panels mounted on the top floor of the parking garage. The solar canopies do not impact parking availability and provide partial coverage for vehicles parked on level 6 (the roof). The project provides up to 525kW of power and is expected to generate nearly 650,000 kWh of electricity annually. This system is more than 5 times larger than any other Solar PV project in the

¹⁴ Revenue generated on an airport must remain with the airport.

State of New Hampshire and will save MHT approximately \$100,000.00 in electric utility costs this year and more than \$2,000,000.00 over the 25-year life of the project.

In a public-private partnership (3P) initiative, the City of Sanford, Maine approved the lease of 390 acres of city-owned property at Sanford-Seacoast Regional Airport for the construction of a utility-scale solar project. When completed, the project, which will be built by Ranger Solar of Yarmouth, Maine, will be the largest solar project in Maine and the largest solar project on an airport in the United States, with 303,716 solar panels providing up to 78 MW of energy.

- The project is slated to begin Phase I of construction in 2017 and could provide enough electricity to power 20,000 homes.
- The project will provide approximately \$97.5 million of new taxable investment to the local community and create around 94 Construction jobs and 10 full-time operational positions.
- Payments for the lease of Airport land during the operations period of the project will enable the airport to become a profit center for operations and capital replacement, as it will now be financially self-sufficient, requiring no taxpayer money. And power from the Sanford Solar Project has the potential to be the least expensive solar power in New England and will provide clean, domestically-produced energy and long-term stable energy prices.
- The Project will be funded by private investment without relying on city services or state subsidies for the development work.
- The lease of airport land for the project will provide \$273,000 of income per year to the airport for the first five years, increasing every five years after that.
- The project will provide economic benefit to all Sanford taxpayers through a reduction of net property taxation. The solar panels will be considered personal property and do not qualify for State tax breaks for businesses, so Sanford will receive an increase in tax revenues from the project. With an estimated construction value of \$97.5 million, the project will provide new tax revenues valued at \$2 million/year, reducing the mil rate by an estimated 3.68%.
- The potential for the use of tax increment financing with associated power purchase agreements means Sanford will be able to provide an energy cost advantage for business growth and attraction.

A different plan under development by the Rhode Island Airport Commission (RIAC), who paired with SolarCity and Stantec to design, permitted and construct solar energy systems at four Rhode Island airports: T.F. Green, North Central, Newport, and Quonset State Airports. The photovoltaic systems will provide a combined output of 16 megawatts of electricity. The goal of this undertaking is to utilize regions of airport property not committed to aviation development to generate renewable, clean energy. Use of solar photovoltaic arrays will decrease the demand for and reliance on electricity generated by fossil-fuel power plants while contributing to each airport's environmental and economic sustainability. The solar developments have been designed in support of the State of Rhode Island Office of Energy Resource's mission to direct the State toward a "secure, cost-efficient, and sustainable energy future."

Opportunities at Dillant Hopkins Airport

For the Dillant Hopkins Airport, this master plan has identified and reserved for possible future development, a 14.5-acre section of land west of Runway 2-20 and east of the city's water treatment plan (see Ultimate Airport Layout Plan in Appendix D). This area can be expanded. However, wetland impacts will invariably alter the permitting process and may offset any benefits derived from the solar farm. The design and cost benefits to be determined.

8.6.3 Recycling of Municipal and Construction Waste

Example: San Bernardino International Airport

Type Facility: General Aviation Reliever Airport

Benefit: Materials Use and Solid Waste Reduction/Recycling

The San Bernardino International Airport, which is classified by the FAA as a reliever airport, is located in southern California on approximately 1,800 acres of land. Although this airport has pursued several sustainable initiatives, this case example focuses on the airport's recycling efforts (Table 8-3). First, during past runway and taxiway rehabilitation and repaving, the airport retained removed concrete, crushed it, and stored it on airport property to use as a base for other projects. Airport manager Liliana Valle says the crushed concrete also can be sold if not needed by the airport. Second, the airport owns and operates the fixed-base operations (FBO), including the FBO fuel farm. Fuel is pumped daily for quality checks; if the removed fuel is not contaminated, it is placed in a vessel for additional filtering and ultimately returned to fuel storage. Third, with a good deal of heavy aircraft maintenance being performed on the field by various tenants, a request to defuel (remove fuel) an aircraft occurs regularly. In the instances when an aircraft operator does not want the fuel returned to the aircraft, the airport can have the fuel recertified for future use.

Table 8-3. Recycling of Municipal and Construction Waste Considerations

INITIATIVE	DRIVERS	OUTCOMES	METRICS	BARRIERS	LESSONS LEARNED
Recycling	Benefit the environment and remove waste from airport	Waste removed; environmental benefits; some revenue generated	Costs	Coordination; state compliance	Piggyback on existing municipal programs/resources

This recertification requires sending a sample of the fuel to the analytical laboratory that tests fuel, a process that may take 1 to 2 weeks. Fourth, the airport regularly recycles hazardous waste, including used motor oil. Through competitive quotes received through a solicitation for recycling services, the airport has entered into a contract with a local hazardous waste recovery company to remove and properly recycle or dispose of hazardous water generated at the airport, including waste produced by airport tenants. Depending on the waste, the company may remove it free of charge or for a minimal

fee. The airport may even generate some revenue from the waste removal process. Also, airport-generated waste, such as large appliances, can be sold to a recycling company.

When asked to share words of wisdom with other small airports, Valle stated, “Most small airports are part of a city or county that has resources that may be made available to the airport. Most small airports could ‘piggyback’ on these existing programs.”

Opportunities at Dillant Hopkins Airport

For Dillant Hopkins Airport, the recycling of construction material is a definite benefit that the airport can adopt this year (2017) with the planned reconstruction of Runway 14-32 and the removal of about half of the existing runway pavement. With the pending reconstruction (and narrowing) of Runway 14-32, a considerable amount of asphalt will be removed that will not be required for this project. This material should either be sold as a means of offsetting the city’s local AIP share or retained for future projects, such as the expansion of the aircraft parking apron or extension of Taxiway A.

Fuel recycling has some potential benefits at Dillant Hopkins Airport. However, the relatively small volume of fuel sales would probably make this a benefit neutral project. However, if the city has other similar programs, piggybacking might be worth the effort involved in collecting and transporting excess fuel.

8.6.4 Electric/Diesel Utility Vehicles and Terminal Retrofit

Example: Monroe County Airport, Bloomington, Indiana

Type Facility: General Aviation Airport

Benefit: Economic Vitality/Operational Efficiency; Air Quality Enhancement; Energy Conservation; Buildings/Facilities

The staff of the Monroe County Airport, located in Bloomington, Indiana, was exploring ways in which to be more environmentally friendly. Because the airport had a small budget for sustainable initiatives, it was important to consider efforts that were affordable yet created the intended environmental impact. Airport staff decided upon three actions (Table 8-4). First, the airport purchased one electric golf cart and two small, diesel-powered utility vehicles. With a desire to “go green” and minimize fossil fuel use (thus saving money on fuel), this was an easily supported initiative. Whereas airport maintenance personnel once used full-size, gasoline-powered, pickup trucks, they now carry out many of the same tasks using the smaller and more efficient, diesel-powered utility vehicles and electric-powered golf cart. Although the pickup truck remains in the airport’s fleet and is used to travel to the store for supplies, for example, maintenance personnel mostly use the new vehicles in their daily work. As Amy Gharst, airport administrative assistant, explained, “With the new vehicles, maintenance personnel can load up the weed eater, chainsaw, and other tools to repair fences, apply pesticides and fertilizer, and in general, maintain the airfield and terminal as they did before, yet we have reduced our fuel use and had a positive impact on the environment.”

Table 8-4. Electric/Diesel Utility Vehicles and Terminal Retrofit Considerations

INITIATIVE	DRIVERS	OUTCOMES	METRICS	BARRIERS	LESSONS LEARNED
Electric and diesel utility vehicles	Reduce fuel costs, benefit the environment	Environmental benefits, reduced fuel costs, and high utilization of new vehicles	Fuel costs, maintenance personnel comments	Determining which initiative to pursue, considering budget	Utility of these vehicles is superb
Terminal retrofit Reduce HVAC	Reduce HVAC demands, enhance aesthetics	Reduced HVAC demands through lower utility costs, enhanced aesthetics	Utility costs, patron comments	Cost–benefit of project	Benefits can be greater than costs; think outside the box.

The second initiative pursued by the Monroe County Airport was replacing the water heater that supplies hot water to the food and beverage concessionaire with an energy-efficient, on-demand, tankless water heater. Previously, the gas water heater was located in a supply closet behind the men’s restroom. The concessionaire had to turn on the faucet and wait some time with the water running before hot water traveled the distance from the water heater to the concessionaire’s kitchen. The tankless water heater has been installed in the concessionaire’s kitchen, providing instant, on-demand hot water. This initiative has significantly reduced water use as well as natural gas use because it is no longer necessary to keep many gallons of water hot at all times.

The third initiative was more expensive than the previous two but allowed the airport to retain the 1965-era terminal building while transitioning the building to a more energy-efficient facility. The terminal building had been constructed with walls of concrete block, which were visible in the terminal; the walls were painted. To enhance the energy efficiency of this older building, the airport manager decided to install insulation and drywall on the interior of the concrete block walls. This not only enhanced the energy efficiency of the building, resulting in reduced heating, ventilation, and air conditioning (HVAC) costs but also improved the aesthetics of the space.

In general, as Gharst explained, “While costs of a sustainable project may initially discourage a small airport from pursuing such a project, there are viable initiatives that can actually reduce airport costs and enhance the essential point, all the while benefiting the environment.” The staff of small airports must be willing to think creatively and consider that each initiative, regardless of how insignificant it may appear, can have a positive impact on the environment and the airport’s bottom line.

Opportunities at Dillant Hopkins Airport

The Airport should examine the costs and benefits of purchasing an electric vehicle to use for routine airport inspections and travels around the airport. The airport's existing vehicles are ¾ ton gasoline powered pickup trucks with high fuel consumption rates. An electric-powered golf cart or utility vehicle, such as the John Deere TE 4x2 Electric cart (right) costs around \$11,000 retail (less through a municipal purchase) would be a perfect choice.



The terminal building is another example of an excellent opportunity to “green up” the airport through a sustainability project that could be implemented over several years. A component of this master plan was a table top evaluation of include a review of options for green terminal building renovations, including the feasibility of having a geothermal building. The existing terminal layout was discussed in Chapter 2. Findings from an independent architect suggested several changes, many cosmetic, but some are directly related to sustainability, primarily the need to fully assess the building's insulation, which in some areas is insufficient given the southern New Hampshire climate. While adding a geothermal heating system might be an excellent future project, without significant changes in the building's windows and insulation, any HVAC upgrades may be a waste of money. To quote the architect, “The most heat loss in a building is through the roof. Without significant upgrades to the roof system, increasing the energy efficiency of the building is not possible.”¹⁵ This is not to say that the airport should not pursue some “green” initiatives, but must consider other more urgent changes to the structure of the building, or consider a new terminal building.

Internal changes included some minor modifications to interior walls and the reassignment of office space. In some case, the airport has already made many cosmetic changes as noted in Chapter 2 (again, see section 2.11, page 2.15-2.17).

The architect's full report, including one, suggested a change to the terminal building floor plan can be found at the end of this chapter (page 8.23).

8.6.5 Land and Natural Resources Management

Example: Ocean County Airport, Toms River, New Jersey

Type Facility: General Aviation Airport

Benefit: Land and Natural Resources Management; Land/Property Use

Ocean County Airport, located in Toms River, New Jersey, is owned and operated by Ocean County. The airport is uniquely located within the Pinelands National Reserve, a 1.1-million-acre environmentally protected region established by Congress through the passage of the National Parks and Recreation Act of 1978. The Pinelands National Reserve is the first national reserve in the nation. The airport was built

¹⁵ Northeast Collaborative Architects letter dated August 24, 2016.

in the 1960s. Roughly two-thirds of the airport's 822 acres are within a Preservation Area District that has stringent environmental controls; the remainder of the airport is located within a Forest Area District, which is the second-most strictly regulated environment. Thus, airport staff must exert special effort to ensure the facility is environmentally sensitive in all it does, including day-to-day operations and capital improvements (Table 8-5). This requirement is like the demands of the National Environmental Policy Act of 1969.

Table 8-5. Land and Natural Resources Management Considerations

INITIATIVE	DRIVERS	OUTCOMES	METRICS	BARRIERS	LESSONS LEARNED
Plant/animal accommodation	Pineland Commission requirement	Sickle-leaf golden aster transplanted, snake dens constructed	Transplant success rate; new snake dens occupied	Expense of transplanting and building snake dens; environmental approvals; environmental restrictions	Know who significant stakeholders are, open communication.
Trees in approach surface	Obstruction clearing	Obstructions removed, with little ground disturbance	Obstructions in approach surface	Expense of pruning tree crowns rather than clear cutting where trees can be used	Know who significant stakeholders are, open communication.

In 2012, a Memorandum of Understanding between the Pinelands Commission and Ocean County restricted all future land use and development to the extent proposed in the airport's original master plan from the 1960s. All other areas of the airport are not to be disturbed.

Because of these restrictions, when a new 3,599-ft crosswind runway (part of the 1960s Master Plan) was proposed, the approval process before ground could be disturbed took 5 years. Also, once the project was approved, there were significant environmental constraints. Because the Pinelands National Reserve is home to dozens of rare plant and animal species, as well as the Kirkwood-Cohansey aquifer system, which contains an estimated 17 trillion gallons of water, careful planning was required by airport staff regarding the project.

First, the airport had to consider the sickle-leaved golden aster, a sensitive plant species with slender, curved, sickle-like leaves and a yellow flower. Because of a number of plants that would be destroyed in the process of constructing the new runway, the airport had to perform a relocation project. An environmental consultant was employed to transplant these plants to parts of the airport that would not be disturbed in the future. The project enjoyed an 80% transplant success rate. Second, the airport had to consider the snakes of the Pine Barrens, approximately 20 species of snakes that inhabit the Pinelands. Because of the extensive ground disturbances and a number of snake dens that would be

destroyed in the process of excavation and construction, the airport had to build snake dens to replace the lost habitat. The New Jersey Pinelands Commission oversaw these restoration projects.

Opportunities at Dillant Hopkins Airport

There are two opportunities for consideration. First, examine land management prospects in the large wetland track of land on the airport's west side. There are about 70 acres of wetlands in this part of the airport that could be set aside as a protected area, perhaps placed in a conservation easement. The second involves forestry management practices, which are already underway and should be continued as part of the tree clearing process required to provide clear airspace surfaces around the airport.

8.6.6 In-Kind Contributions/Community Outreach

Example: Piggott Municipal Airport, Piggott, Arkansas

Type Facility: General Aviation Airport

Benefit: Socioeconomic Benefits and Community Outreach/Involvement; Economic Vitality

Some airports are implementing innovative sustainable initiatives. In Piggott, Arkansas, the Piggott Municipal Airport has pursued sustainable initiatives as many airports have, but this airport has contributed its 10% or 5% match in an unusual way—with in-kind contributions (Table 8-6). The use of contributions in kind has been received warmly by those overseeing projects funded by the Arkansas Department of Aeronautics, and it appears that FAA would also consider contributions in kind for FAA-funded projects.

Jeff Puckett, Piggott Municipal Airport manager, described how, in building a new airport access road and parking area, the airport secured a state grant to fund a significant portion of the project. Rather than provide matching funds in the form of cash, the airport petitioned the Arkansas Department of Aeronautics to accept in-kind contributions in the form of donated heavy equipment to be operated by airport volunteers, namely Airport Board members. With approval granted, the airport was able to secure heavy equipment from a local equipment rental company that always provides strong community support. Several board members volunteered their time, with one driving the heavy equipment to remove the area and level the base. A contractor then poured the road and parking area pavement and finished the work with striping and such. The equipment rental company provided a simple donation, with a receipt for the cost of equipment, but was not financially reimbursed.

Per Office of Management and Budget (OMB) Circular A-110 Section 215.23 Cost Sharing or Matching, "All contributions, including cash and third party in-kind, shall be accepted as part of the recipient's cost sharing or matching when such contributions meet all of the following criteria:

1. Are verifiable from the recipient's records.
2. Are not included as contributions for any other federally-assisted project or program.
3. Are necessary and reasonable for proper and efficient accomplishment of project or program objectives.
4. Are allowable under the applicable cost principles.
5. Are not paid by the Federal Government under another award, except where authorized by

2. A federal statute to be used for cost sharing or matching.
6. Are provided for in the approved budget when required by the Federal awarding agency.
7. Conform to other provisions of this Circular, as applicable.

Table 8-6. In-Kind Contributions/Community Outreach Considerations

INITIATIVE	DRIVERS	OUTCOMES	METRICS	BARRIERS	LESSONS LEARNED
In-kind contributions	Lower cost, ensure timely project completion, allow community to support	Less costly, timely completion, allowed for community support	Project cost; completion date; goodwill	Expertise and willingness of volunteers, granting authority acceptance of in-kind contributions	Insist on professionals; partner with granting authority early.

OMB Circular A-110 Section 215.23 Cost Sharing or Matching also states:

Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be counted as cost sharing or matching if the service is an integral and necessary part of an approved project or program. Rates for volunteer services shall be consistent with those paid for similar work in the recipient's organization. In those instances, in which the required skills are not found in the recipient organization, rates shall be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.

Airport manager Puckett encouraged other airports considering in-kind contributions to:

- Partner with the granting authority early to determine if contributions in kind will be accepted.
- Be careful with volunteers; they may not be skilled professionals and could be well-meaning
- but cause cost overruns by creating problems that a contractor must correct.

Opportunities at Dillant Hopkins Airport

There are several future projects at the airport that could take advantage of this sustainability opportunity. In-kind contributions have been used at some airports in New England, including the Steven A Bean Municipal Airport in Rangeley, ME and Greenville Municipal Airport (Greenville, ME). In both cases, local volunteers and business people donate time and material to help construct a runway (Rangeley) and a small terminal building (Greenville). Opportunities at Dillant Hopkins Airport might include future terminal building renovations, apron expansions, and hangar development.

8.6.7 Develop and Maintain a Waste Management Plan

To address recycling and waste management at airports, FAA in April 2013 released *Recycling, Reuse and Waste Reduction at Airports: A Synthesis Document*. The agency states: Over the past several years, the Federal Aviation Administration (FAA) has been encouraging airport sponsors to incorporate sustainability in airport planning, design, and operations. In our continuing efforts to assist airport sponsors in integrating sustainability into airport planning, design, and operations, the FAA has decided to guide airports in two key focus areas: programs to encourage recycling, reduction, and reuse of materials, and programs to help airports to reduce their energy consumption.



The FAA’s *Recycling, Reuse and Waste Reduction at Airports* presents guidance in establishing a municipal solid waste recycling program and a construction and demolition waste program, with many case examples of actual airport practices in these areas. In September 2014, FAA issued a memorandum to guide airports in preparing recycling, reuse, and waste reduction plans as an element of a master plan or master plan update, within a sustainability planning document, or as a stand-alone document. It also is important to note the Airport Improvement Plan (AIP) eligibility of these efforts.¹⁶

8.7 SUSTAINABLE GUIDELINES AND RESOURCES

Several resources were used in the development of this chapter and are offered as further sources of information for the city, airport management, the airport committee, the city’s Climate Protection Committee, future ad hoc committees and individuals interested in promoting a sustainable Dillant Hopkins Airport.

For airports with a desire to pursue sustainability initiatives, it can be confusing to determine which set of guidelines to adopt. Rather than “reinventing the wheel,” airports should adapt existing guidelines to guide their sustainability efforts. Even if planning to utilize only airport-specific guidance, the airport staff will realize there are several significant sources of airport sustainability advice available.

8.7.1 FAA Report on the Sustainable Master Plans

The airport sustainability planning pilot program led the FAA to publish, in December 2012, a *Report on the Sustainable Master Plan Pilot Program and Lessons Learned*. This report presents lessons learned from airports participating in the pilot program. To encourage participation in sustainability planning efforts, airports should “(a) involve staff from all areas in brainstorming, (b) meet regularly to obtain feedback, (c) gain airport board approval of the sustainability mission statement, (d) describe rationale and benefits of sustainability early in the process, and (e) publish annual sustainability reports”.

¹⁶ Federal Aviation Administration (FAA), Memorandum—ACTION: Guidance on Airport Recycling, Reuse and Waste Reduction Plans, FAA, Washington, D.C., 2014 [Online]. Available: <http://www.faa.gov/airports/environmental/media/airport-recycling-reuse-waste-reduction-plans-guidance.pdf>.

8.7.2 ACRP Report 119

ACRP Report 119, *Prototype Airport Sustainability Rating System—Characteristics, Viability, And Implementation Options*, presents a prototype airport sustainability rating system. The system is designed to gauge airport sustainability performance via a Decision Tool; this rating system is intended to assist airports in evaluating and selecting best practices for airport sustainability. The report proposes eight categories of sustainability initiatives, further divided into 50 sustainability activities. The eight principal topics include energy and climate, transportation, economic performance, design and materials, engagement and leadership, natural resources, water and waste, air quality and human well-being.

8.7.3 ACRP Report 43

Published in 2011, ACRP Report 43, *Guidebook of Practices for Improving Environmental Performance at Small Airports*, although not the most current of available guidance, is especially useful for its focus on environmental initiatives at small airports. Although environmental performance is one aspect of sustainability, the report categorizes environmental initiatives into the following areas:

- Air Quality
- Emergency Planning and Response, to include spill prevention, pesticides, underground storage tanks, and hazardous materials transport
- Noise
- Planning and Development, to include fish, wildlife, and plants
- Waste Management
- Water Resources
- Energy Efficiency and Renewable Energy.

The lengthy report does present a comprehensive inventory of sustainable practices that small airports may pursue, which provides the staff of small airports great ideas of feasible, sustainable initiatives. For those seeking ideas as to the various types of sustainable initiative, this report is a highly useful resource.

8.7.4 ACRP Report 80

Prepared in 2012, ACRP Report 80, *Guidebook for Incorporating Sustainability into Traditional Airport Projects*, describes sustainability, its benefits, and identifies different applications in traditional airport construction and everyday maintenance projects. An accompanying CD-ROM provides an Airport Sustainability Assessment Tool (ASAT) that complements the guidebook and can be used to: assist the user in identifying sustainability initiatives that might be most applicable to an airport project, given certain criteria that the user sets; obtain more information about strategies; and learn about sustainability initiatives that have been implemented at other airports through case studies. The guidebook and the CD-ROM will be useful to environmental managers, planners, and consultants interested in adopting sustainability strategies and initiatives into their next airport project.

8.7.5 GRI Sustainability Reporting Guidelines

In 2011, The Global Reporting Initiative (GRI) published the Sustainability Reporting Guidelines & Airport Operators Sector Supplement to provide airport-specific guidance on sustainability. This resource is designed to aid airport operators in producing sustainability reports. Although not small airport focused, this resource is beneficial for the staff of small airports in developing a sustainability report.

8.7.6 Advisory Circular 150/5050-8

Issued in 2007, AC 150/5050-8, *Environmental Management Systems for Airport Sponsors*, promotes the concept and guides the development of Environmental Management Systems (EMS). Although specifically intended for large and medium hub public use airports¹⁷, this AC provides guidance of benefit to all airports. This AC guides airport sponsors in developing an EMS. Per the AC, an EMS must satisfy one of the recognized standards if an airport sponsor is seeking.

8.7.7 ISO 14000

The International Organization for Standardization (ISO), headquartered in Geneva, Switzerland, is composed of 160 national standards institutes whose role is to provide standards for “all three dimensions of sustainable development: economic, environmental, and societal.

Specifically, as these rules apply to airports, ISO 14001 has been developed. ISO 14001 is the world’s most recognized framework for environmental management systems (EMS). ISO 14001 also contains a systematic checklist for organizations to use in assessing their environmental performance. This list can serve as a useful roadmap for an airport in developing an EMS.

8.7.8 Sustainable Aviation Resource Guide

Produced by the SAGA, the Sustainable Aviation Resource Guide has been prepared to guide airports in the development of a sustainability program. Per SAGA, the guide is intended to serve as a comprehensive resource of options for airport operators to use in evaluating and selecting the sustainable practices that may be applicable within the unique circumstances of each airport. SAGA is quick to point out, however, that every sustainability program will be unique and that an airport operator should modify and scale this approach based on its operating environment and resources.

Every sustainability program will be unique and that an airport operator should modify and scale this approach based on its operating environment and resources.

8.7.9 ACRP Synthesis 21

ACRP Synthesis 21, *Airport Energy Efficiency and Cost Reduction* provides guidelines on planning specifically for energy efficiency. This planning is necessary to determine the scope of the project, the

¹⁷ A classification of commercial service airports based on the percentage of passenger movements as compared to all US commercial service airports.

cost of the project, funding sources, and potential payback or rebates. There are three areas of consideration.

- Ways to identify energy efficiency projects
- Strategies to plan energy efficiency projects
- Sources of funding for planning programs

8.8 SUSTAINABILITY CONCLUSION

Sustainability in all its forms, including economic viability, operational efficiency, natural resource conservation, and social responsibility (EONS), is being pursued by three of five small airports in the United States, per the Transportation Research Board (TRB)¹⁸. Although most sustainable initiatives reported are in the category of natural resource conservation, airports are also reporting unexpected benefits in the areas of economic viability, operational efficiency, and social responsibility.

Most small airports appear to be pursuing sustainability only in the “environmental” sense, possibly owing to a belief that sustainability exists only in the environmental sense. The staff at 45% of airports are not familiar with the concept of the triple essential points (environmental stewardship, economic growth, social responsibility). However, as ACRP Synthesis 69 has shown, environmental or natural resource conservation is but one leg of the four-legged EONS approach to sustainability. Numerous initiatives are being pursued by small airports in these other areas as well as other initiatives.

8.9 NCA REPORT AND FLOORPLAN

What follows is a copy of the Northeast Collaborative Architects report and proposed floorplan for the Dillant Hopkins Airport Terminal.

¹⁸ Airport Cooperative Research Program (ACRP) Synthesis 69: Airport Sustainability Practices— Drivers and Outcomes for Small Commercial and General Aviation Airports, a Synthesis of Airport Practice.



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MEMORANDUM

DATE: August 24, 2016

TO: Ervin Deck
EC: Jack Wozmak

FROM: Ray GIolitto

RE: Dillant-Hopkins Airport Administration Building

This memo and accompanying floor plans illustrate the existing conditions and proposed upgrades to the existing Dillant-Hopkins Airport Administration Building based on my conversations and emails with Jack Wozmak. Your review and comment is expected and appreciated. My understanding of the desired renovations are as follows:

1. The restaurant has been leased and no renovations are required for that area.
2. Existing toilet rooms will be renovated as funds permit by the City of Keene.
3. Existing rooms have been labeled for new functions with a note for raising the floor in the proposed FBO Administration area.
4. Existing counters and low walls have been removed and a new counter is shown for the FBO Administration for ticket sales and other reception activities for FBO customers.
5. Signage would be installed on the Lobby side of the counter noting the various rental companies, PSI Training Center, etc.

Exterior Envelope Upgrades:

As requested, we have reviewed the existing building envelope. Without a major expenditure of funds, upgrading is very limited. We offer the following comments:

1. The existing windows are wood frame with 5/8" insulating glass. Replacement of the windows with thermally broken aluminum window system with minimum 1" insulating glass is the only way to increase the energy efficiency of the window system.
2. Exterior walls are Formbloc with minimal insulation. Our estimate is that the exterior wall R-value is approximately 5. Constructing new interior walls with insulation around the entire perimeter is the recommended solution for increased energy efficiency. A study of the dew point location would have to be undertaken to ensure that condensation within the revised exterior wall would not cause a problem.

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3. Roof: The existing roof has approximately 1-1/2" of insulation. The structure is steel columns with open web steel joists. There is a 4' overhang around the entire building. As shown on the section drawing below, the overhang structure is an extended top chord of the open web joist with 1-1/2" insulation inside the entire overhang.

Since the interior volume of the overhang is open to the inside of the building, the minimal insulation is not providing much protection from air movement, either thermal or from air leakage, to the inside spaces through the suspended ceiling. The solution to close off the overhang by extending the existing exterior wall up to the roof deck, as shown, would be expensive.

The minimal insulation on the roof and overhang permits the heat in the building to rise to the underside of the roof and melt the snow on the roof. A thorough structural analysis would have to be done to determine how much more insulation would be able to be added to the roof to increase the R-value and resulting added snow load before a major upgrade to the structure would be necessary.

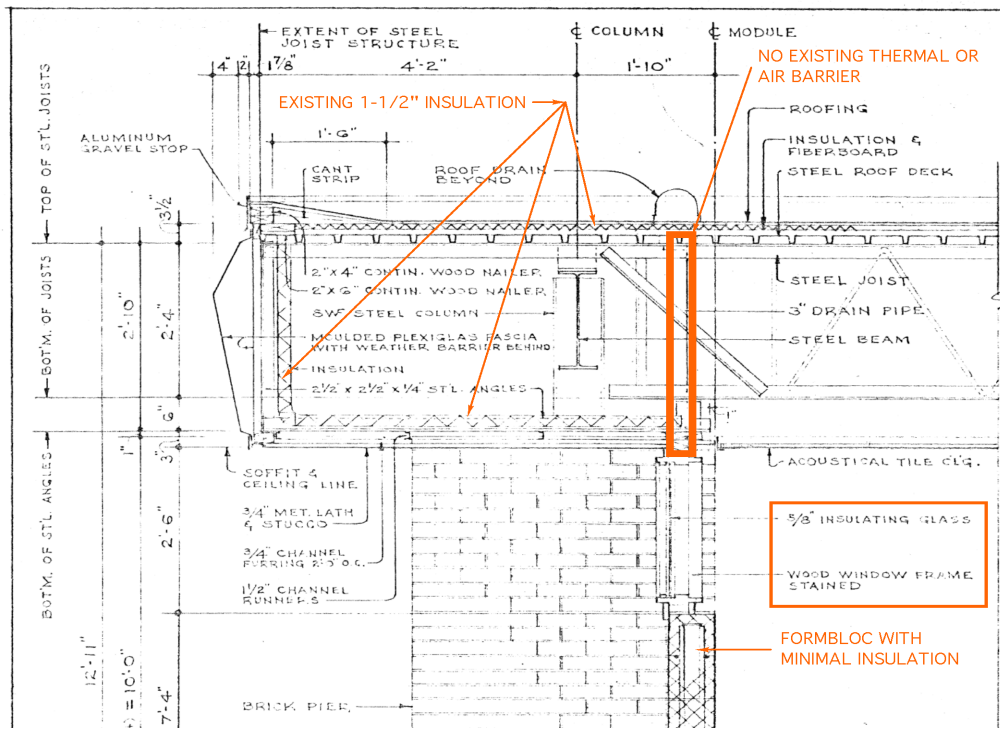
It is also doubtful, without a thorough structural analysis, that the extended top chord supporting the overhang would be able to support enough insulation to make a difference due to the resulting added snow load.

The most heat loss in a building is through the roof. Without major upgrades to the roof system, increasing the energy efficiency of the building is not possible.

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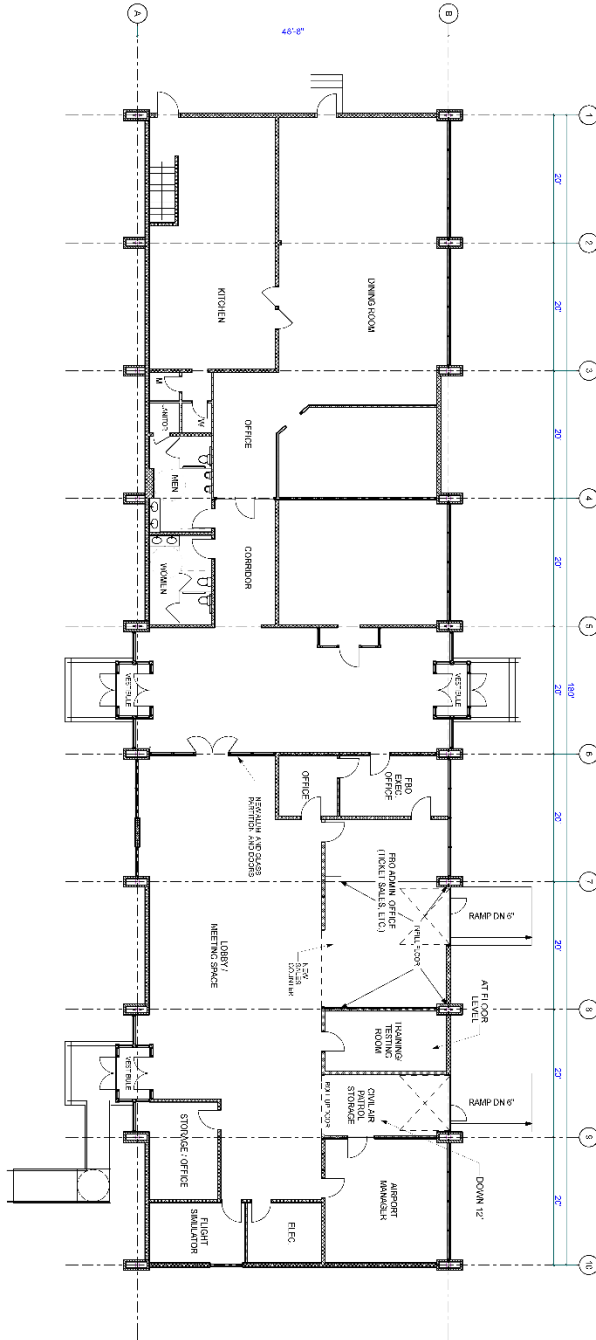
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PROPOSED FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"



	PROJECT
A-102	DATE
	SCALE
	NO. JOB NO.
	DRAWING NO.

PROPOSED FIRST FLOOR PLAN

PROGRESS 84%
NO. FOR CONSTRUCTION

REVISIONS

Keene Dillant-Hopkins Airport
Administration Building
80 Airport RD. Keene, NH



Appendix A. TERMS AND ABBREVIATIONS

The following terms and abbreviations are used in the master plan update. Definitions are from several different sources including, but not limited to CFR Title 14, Part 1; FAA AC 5300-13A, Airport Design; FAA AC 5070-6B, Airport Master Plans; City of Keene Code of Ordinances, Chapter 14, Aviation; Town of Swanzey Zoning Ordinance; and the Transportation Research Board.

TERM – ABBREVIATION	DEFINITION
<i>AAC</i>	Aircraft Approach Category
<i>Above Mean Sea Level (AMSL)</i>	AMSL refers to the elevation (on the ground) or altitude (in the air) of any object, about the average sea level datum.
<i>AC</i>	Advisory Circular
<i>ACI-NA</i>	Airports Council International – North America
<i>ACRP</i>	Airport Cooperative Research Program
<i>ADG</i>	Airplane Design Group
<i>Advisory Circular (AC)</i>	The FAA establishes policies, guidelines, and standards for the safe and efficient development of the national airspace system. The FAA conveys such standards and guidance to the public through the FAA Advisory Circular system. Unless incorporated by regulation or binding agreement, standards and guidance presented in an Advisory Circular are generally non-regulatory in nature.
<i>Aeronautical Activities</i>	Aeronautical activities mean any activity which involves, makes possible, or is required for the operation of aircraft or which contributes to or is required for the safety of such operations. The term "commercial aeronautical activities" means any activity by any person intended to result in profit or compensation of any kind, including barter; the term "noncommercial aeronautical activities" means any activity by anyone which is intended for his own benefit without the intent of obtaining profit.
<i>AGL</i>	Above Ground Level
<i>AIP</i>	Airport Improvement Program

TERM – ABBREVIATION	DEFINITION
<i>Air Taxi</i>	An air taxi is a for-hire passenger or cargo aircraft that operates on an on-demand basis. In the United States, air taxi and air charter operations are governed by Part 135 of the Federal Aviation Regulations (FAR), unlike the larger scheduled air carriers that are regulated by more stringent standards of FAR Part 121.
<i>Air Taxi Operation</i>	Aircraft operations by aircraft other than those classified as an airline operation that uses three-letter company designators or the prefix “TANGO” or “Lifeguard.”
<i>Air Traffic</i>	Air traffic means aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.
<i>Air Transportation</i>	Air transportation means interstate, overseas, or foreign air transportation or the transportation of mail by aircraft.
<i>Aircraft</i>	Aircraft means a device that is used or intended to be used for flight in the air.
<i>Aircraft Approach Category (AAC)</i>	<p>A grouping of aircraft based on 1.3 times their stall speed in their landing configuration at the certificated maximum flap setting and maximum landing weight at standard atmospheric conditions. The categories are:</p> <ul style="list-style-type: none"> • Category A: Speed less than 91 knots • Category B: Speed 91 knots or more but less than 121 knots. • Category C: Speed 121 knots or more but less than 141 knots. • Category D: Speed 141 knots or more but less than 166 knots. • Category E: Speed 166 knots or more.
<i>Airplane</i>	Airplane means an engine-driven fixed-wing aircraft heavier than air that is supported in flight by the dynamic reaction of the air against its wings.
<i>Airplane Design Group (ADG)</i>	<p>A grouping of airplanes based on wingspan or tail height. Where an airplane is in two categories, the most demanding category should be used. The groups are as follows:</p> <ul style="list-style-type: none"> • Group I: Up to but not including 49 feet wingspan or tail height up to but not including 20 feet • Group II: 49 feet up to but not including 79 feet wingspan • Group III: 79 feet up to but not including 118 feet wingspan or tail height from 30 up to but not including 45 feet

TERM – ABBREVIATION	DEFINITION
	<ul style="list-style-type: none"> ● Group IV: 118 feet up to but not including 171 feet wingspan or tail height from 45 up to but not including 60 feet ● Group V: 171 feet up to but not including 214 feet wingspan or tail height from 60 up to but not including 66 feet ● Group VI: 214 feet up to but not including 262 feet wingspan
<i>Airport</i>	<p>Airport means the land and developments thereon, either held in fee simple or as leasehold, either occupied by tenants or fee holders, which are controlled, operated and maintained by either the owner, its tenants and/or those to whom title shall also include but not necessarily be limited to all runways, taxiways, rights-of-way, control towers, ramps, aprons, aircraft and vehicle parking areas, storage areas of all kinds and descriptions, improvements, utilities, facilities or other real property, necessary or convenient or desirable for the landing, takeoff, accommodation and servicing of aircraft of all types.</p>
<i>Airport Manager</i>	<p>Airport manager means the person duly authorized and appointed by the city manager to administer and supervise the operation and maintenance of the airport, referred to as the "manager."</p>
<i>Airport District</i>	<p>A zoning district in the town of Swanzey. The Airport Zoning District is established to regulate and restrict the height of structures and objects of natural growth and otherwise governing the use of property near the Dillant Hopkins Airport by creating airport approach zones and other restricted areas and establishing the boundaries thereof.</p>
<i>Airport Elevation</i>	<p>The highest point on an airport's usable runway expressed in feet above mean sea level (MSL).</p>
<i>Airport Hazard</i>	<p>As defined in the town of Swanzey Zoning Ordinance means any structure, tree, smoke, steam, dust, or other substance which obstructs the aerial approaches to the airport, or impairs the reasonable visibility on or in the vicinity thereof, any electrical impulses or disturbance which interfere with radio aids or communications, and lights which might result in glare in the vision of pilots of aircraft or be confused with airport lights.</p>
<i>Airport Improvement Program (AIP)</i>	<p>The Airport Improvement Program is a United States federal grant program that provides funds to airports to help improve safety and efficiency. Improvement projects relate to runways, taxiways, ramps, lighting, signage, weather stations, NAVAIDs, land acquisition, and some areas of planning. The</p>

TERM – ABBREVIATION	DEFINITION
	program was established under the Airport and Airway Improvement Act of 1982.
<i>Airport Layout Plan</i>	An airport layout plan is a scaled drawing of existing and proposed land and facilities necessary for the operation and development of an airport. All airport carried out at a Federally obligated airport must be done by an FAA-approved ALP. The FAA-approved ALP, to the extent practicable, should conform to the FAA airport design standards existing at the time of its approval.
<i>Airport Noise</i>	When evaluating proposed airport projects, airport noise is often the most controversial environmental impact FAA examines. Airport development actions that change airport runway configurations, aircraft operations and/or movements, aircraft types using the airport, or aircraft flight characteristics may affect existing and future noise levels. FAA’s noise analysis primarily focuses on how proposed airport actions would change the cumulative noise exposure of individuals to aircraft noise in areas surrounding the airport.
<i>Airport Operations Count</i>	The statistic maintained by the control tower. It is the number of arrivals and departures from the airport. Specifically, one airport operation count is taken for each land and takeoff, while two airport operation counts; i.e., one landing and one takeoff, are made for each low approach below traffic pattern altitude, stop and go, or touch and go operation.
<i>Airport Reference Code (ARC)</i>	The ARC is a coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. The airport reference code has two components relating to the airport design aircraft. The first element, depicted by a letter, is the aircraft approach category and relates to aircraft approach speed (operational characteristic). The second element represented by a Roman numeral is the airplane design group and refers to airplane wingspan or tail height (physical characteristics), whichever is the most restrictive. Generally, runways standards are related to aircraft approach speed, airplane wingspan, and designated or planned approach visibility minimums. Taxiway and taxilane standards are related to airplane design group.
<i>Airport Reference Point (ARP)</i>	The latitude and longitude of the approximate center of the airport.
<i>Airport Sponsor</i>	A sponsor is any public agency or private owner of a public-use airport, as defined in the Airport and Airway Improvement Act of 1982 (AAIA), codified

TERM – ABBREVIATION	DEFINITION
	at 49 U.S.C. § 47102(24). In short, the sponsor is the entity legally responsible for the airport.
<i>Airport Zone</i>	As defined in the town of Swanzey Zoning Ordinance, the Airport Zone is an overlay zone of the airport, and that portion of the Town of Swanzey that lies within the airport approach plan as shown on the attached map entitled, "Airport Approach Plan. "
<i>Airside</i>	The aircraft operational side of an airport, including runways, taxiways, aircraft aprons, and their supporting infrastructure.
<i>Airspace</i>	The world's navigable airspace is divided into three-dimensional segments, each of which is assigned to class. Most nations adhere to the classification specified by the International Civil Aviation Organization (ICAO).
<i>ALP</i>	Airport Layout Plan
<i>AMPU</i>	Airport Master Plan Update
<i>AMSL</i>	Above Mean Sea Level
<i>Approach Minimum</i>	<p>Pilots may not operate an aircraft at any airport below the authorized MDA or continue an approach below the authorized DA/DH unless:</p> <p>The aircraft is continuously in a position from which a descent to a landing on the intended runway can be made at an average descent rate using normal maneuvers;</p> <p>The flight visibility is not less than that prescribed for the approach procedure being used; and</p> <p>At least one of the following visual references for the intended runway is visible and identifiable to the pilot:</p> <ul style="list-style-type: none"> ● Approach light system ● Threshold ● Threshold Markings ● Threshold lights ● Runway end identifier lights (REIL) ● Visual approach slope indicator (VASI) ● Touchdown zone or touchdown zone markings ● Touchdown zone lights ● Runway or runway markings ● Runway lights

TERM – ABBREVIATION	DEFINITION
<i>Approach Procedure</i>	See Instrument Approach Procedure
<i>Apron</i>	The airport or apron or ramp is part of an airport. It is usually the area where aircraft are parked, unloaded, or loaded, refueled, or boarded. Although the use of the apron is covered by regulations, such as lighting on vehicles, it is typically more accessible to users than the runway or taxiway. However, the apron is not usually open to the public, and a license may be required to gain access.
<i>ARC</i>	See Airport Reference Code
<i>Area Navigation (RNAV)</i>	Area navigation (RNAV) is a method of navigation that permits aircraft operations on any desired flight path.
<i>ARP</i>	Airport Reference Point
<i>ASOS</i>	Automatic Surface Observation System
<i>Automatic Surface Observation System (ASOS)</i>	Automated weather reporting systems consisting of various sensors, a processor, a computer-generated voice subsystem, and a transmitter to broadcast weather data. Note: ASOS and AWOS are the same basic systems, just developed for different Federal agencies.
<i>Avigation Easement</i>	<p>An avigation easement is a property right acquired from a landowner which protects the use of airspace above a specified height and imposes limitations on use of the land subject to the easement. Generally, uses that attract birds or interfere with pilot visibility and instrumentation are prohibited.</p> <p>As defined in the town of Swanzey Zoning Ordinance means the right of the airport owner and its employees and agents to enter upon private property to make modifications to airport hazards. No such avigation easement shall be valid or enforceable unless it is duly recorded in the Cheshire County Registry of Deeds.</p>
<i>AWOS</i>	Automatic Weather Observation System
<i>Based Aircraft</i>	An aircraft that is “operational & airworthy”; one that is typically based at a given facility for most the year.
<i>Biotic Communities</i>	For purposes of this Appendix, the term “biotic communities” means various types of flora (plants) and fauna (fish, birds, reptiles, amphibians, marine mammals, coral reefs, etc.) in an area. The term also means rivers, lakes,

TERM – ABBREVIATION	DEFINITION
	wetlands, forests, upland communities, and other habitat types supporting flora and aquatic and avian fauna.
<i>BOA</i>	Bureau of Aeronautics
<i>BRL</i>	Building Restriction Line
<i>Building Restriction Line (BRL)</i>	The BRL is a line that identifies suitable building area locations on airports. The line represents an arbitrary elevation, selected by the planner. Thus, objects may be inside the line (closer to the runway) and still permitted, if they do not exceed.
<i>Business District</i>	A zoning district in the town of Swanzey. This district is intended to provide for the development of commercial uses that are oriented to the traveling public or are traffic generators of such size as to be more properly located on a highly accessible highway network.
<i>Category</i>	As used in the certification of aircraft, means a grouping of aircraft based upon intended use or operating limitations. Examples include transport, normal, utility, acrobatic, limited, restricted, and provisional.
<i>CFR</i>	Code of Federal Regulations
<i>Circling Approach</i>	<p>A circling approach is a maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or is not desirable, and only after ATC authorization has been obtained and the pilot has established and maintains required visual reference to the airport. A circle-to-land maneuver is an alternative to a straight-in landing. It is a movement used when a runway is not aligned within 30 degrees of the final approach course of the instrument approach procedure or the final approach. It requires 400 feet (or more) of descent per nautical mile and therefore requires some visual maneuvering of the aircraft near the airport after the instrument portion of the approach is completed to align the aircraft with the runway for landing.</p> <p>It is very common for a circle-to-land maneuver to be executed during a straight-in approach to a different runway, e.g., an ILS approach to one runway, followed by a low-altitude transition, ending in a landing on another (not necessarily parallel) runway. This way, approach procedures to one runway can be used to land on any runway at the airport, as the other runways might lack instrument procedures or their approaches cannot be</p>

TERM – ABBREVIATION	DEFINITION
	used for other reasons (traffic considerations, navigation aids being out of service, etc.).
	Circling to land is considered more difficult and less safe than a straight-in landing, especially under instrument meteorological conditions because the aircraft is at a low altitude and must remain within a short distance from the airport to be assured of obstacle clearance (often within a couple of miles, even for faster aircraft). The pilot must always maintain visual contact with the airport. A loss of visual contact requires execution of a missed approach procedure.
<i>Civil Aircraft</i>	Civil aircraft means aircraft other than public aircraft.
<i>Class</i>	As used in the certification of aircraft, means a broad grouping of aircraft having similar characteristics of propulsion, flight, or landing. Examples include airplane, rotorcraft, glider, balloon, landplane, and seaplane.
<i>Code of Federal Regulations (CFR)</i>	The Code of Federal Regulations (CFR) is the codification of the general and permanent rules and regulations (sometimes called administrative law) published in the Federal Register by the executive departments and agencies of the Federal Government of the United States. The CFR is published by the Office of the Federal Register, an agency of the National Archives and Records Administration.
<i>Commercial Activity</i>	Commercial activity means any activity conducted at, on, or from the airport by any person intended to result in profit or compensation in any form, including barter to the party conducting such activity.
<i>Commercial Airport</i>	Commercial Service Airports are publicly owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service.
<i>Commercial Operator (or operation)</i>	Commercial operator means a person who, for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property, other than as an air carrier or foreign air carrier or under the authority of Part 375 of this title. Where it is doubtful that an operation is for “compensation or hire”, the test applied is whether the carriage by air is merely incidental to the person’s other business or is a major enterprise for profit.
<i>Common Traffic Advisory Frequency (CTAF)</i>	Common Traffic Advisory Frequency (CTAF), is the name given to the radio frequency used for air-to-air communication at U.S., non-towered airports. Many towered airports close their towers overnight, but keeping the airport

TERM – ABBREVIATION	DEFINITION
	<p>opened during periods when activity is minimal. CTAF is often referred to as the UNICOM frequency. Pilots use the standard frequency to coordinate their arrivals and departures safely, giving position reports and acknowledging other aircraft in the airfield traffic pattern. In many locations, smaller airports use pilot-controlled lighting systems when it is uneconomical or inconvenient to have automated systems or staff to turn on the taxiway and runway lights. Two current CTAF allocations are UNICOM, a licensed non-government base station that provides air-to-ground communications (and vice versa) and may also serve as a CTAF when in operation, and MULTICOM, a frequency allocation (without a physical base station) that is reserved as a CTAF for airports without other facilities.</p>
<i>Commuter Aircraft</i>	<p>A small aircraft designed to fly between 35 and 100 passengers from point to point on short-haul flights. The regional airline divisions of the larger international airlines typically operate these classes of airliners. The regional jet (RJ) aircraft of the same class that has become the aircraft of choice for most domestic operations.</p>
<i>Compatible Land Use</i>	<p>What the compatibility of existing and planned land uses near an airport is usually associated with the extent of potential aircraft noise impacts from the airport, as well as safety concerns with the land under airport imaginary surfaces. Most land uses occurring adjacent to and within the bounds of airport property involve aviation and commercial activities and are considered compatible with airport operations. Rural residential, agricultural, and industrial (landfill) development comprise the primary land uses adjacent to airport property. Rural residential and agricultural land uses are typically regarded as compatible with standard general aviation operations.</p>
<i>Construction Impacts</i>	<p>Airport construction may cause various environmental effects primarily due to dust, aircraft, and heavy equipment emissions, storm water runoff containing sediment and/or spilled or leaking petroleum products and noise. In most cases, these effects are subject to Federal, State, or local ordinances or regulations. While the long-term impacts of the proposed action are usually greater than construction impacts, sometimes construction may also cause significant short-term effects. Descriptions of the many construction impacts associated with airport activities are often covered in the descriptions of other environmental impact categories.</p>

TERM – ABBREVIATION	DEFINITION
<i>Critical Design Airplane</i>	The aircraft (or family grouping of airplanes) with the longest wingspan and fastest approach speed that conducts at least 500 or more annual itinerant operations at the airport.
<i>CTAF</i>	See Common Traffic Advisory Frequency
<i>DA</i>	Decision Altitude
<i>DA</i>	Decision Altitude
<i>Decision Altitude (DA)</i>	A specified altitude in the precision approach, charted in feet MSL, at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.
<i>Decision Height (DH)</i>	Decision Height or Decision Altitude. They are used for Precision Approaches (ILS) to denote the altitude which, upon reaching during the final approach, if the runway environment is not visual a missed approach must be conducted.
<i>Declared Distances</i>	<p>The distances the airport owner reports available for the airplane's takeoff run, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:</p> <p>Takeoff-run available (TORA). The runway length declared available and suitable for the ground run of an airplane taking off;</p> <p>Take off distance available (TODA). The TORA plus the length of any remaining runway or clearway (CWY) beyond the far end of the TORA;</p> <p>Accelerate-stop distance available (ASDA). The runway plus stop way (SWY) length declared available and suitable for the acceleration and deceleration of an airplane aborting a takeoff; and</p> <p>Landing distance available (LDA). The runway length declared available and appropriate for a landing airplane.</p>
<i>Design Aircraft/Airplane</i>	See Critical Design Airplane
<i>DH</i>	Decision Height
<i>Displaced Threshold</i>	A displaced threshold is located at a point on the runway other than the designated beginning of the runway.

TERM – ABBREVIATION	DEFINITION
<i>Distance Measuring Equipment (DME)</i>	Distance Measuring Equipment (DME) is a radio navigation technology that measures distance by timing the propagation delay of VHF or UHF radio signals. Aircraft use DME to determine their distance from a land-based transponder by sending and receiving pulse pairs - two pulses of fixed duration and separation. The ground stations are typically collocated with VORs. DME in an aircraft shows the pilot, by an instrument panel indication, the number of nautical miles between the aircraft and a ground station or waypoint.
<i>DME</i>	Distance Measuring Equipment
<i>EEN</i>	FAA identifier for Dillant-Hopkins Airport
<i>Enplanements</i>	See passenger boardings
<i>EONS</i>	Economic viability, Operational efficiency, Natural Resource Conservation, and Social responsibility
<i>F&E</i>	Facilities and Equipment is a FAA program that provides funding for the installation and maintenance of various navigational aids and equipment of the national airspace system.
<i>FAF</i>	Final Approach Fix
<i>FAR</i>	Federal Aviation Regulation
<i>FAR Part 77</i>	Part 77, Objects Affecting Navigable Airspace. Part 77 establishes standards for determining obstructions in navigable airspace. It sets forth the requirements for notice to the Administrator of certain proposed construction or alteration. It provides for aeronautical studies of obstructions to air navigation, to determine their effect on the safe and efficient use of airspace. It provides for public hearings on the dangerous effect of proposed construction or alteration on air navigation. And it provides for establishing antenna farm areas.
<i>FAR Part 91</i>	FAR Part 91, General Operating, and Flight Rules. Among other applications, this part prescribes rules governing the operation of aircraft (other than moored balloons, kites, unmanned rockets, and unmanned free balloons).

TERM – ABBREVIATION	DEFINITION
<i>Farmland</i>	Important farmlands include all pasturelands, croplands, and forests (even if zoned for development) considered to be prime, unique, or statewide or locally important lands.
<i>FBO</i>	Fixed Base Operator or Operation
<i>Federal Aviation Regulation (FAR)</i>	The FARs are published in Chapter 1 of Title 14 of the CFR.
<i>Final Approach</i>	Part of an instrument approach procedure in which alignment and descent for landing are accomplished.
<i>Final Approach Fix (FAF)</i>	The fix from which the IFR final approach to an airport is executed, and which identifies the beginning of the final approach segment. An FAF is designated on government charts by a Maltese cross symbol for non-precision approaches, and a lightning bolt symbol for precision approaches.
<i>Fixed Base Operator (FBO)</i>	In the aviation industry, a fixed base operator (also known as fixed base of operation), or FBO, is a service center at an airport that may be a private enterprise or may be a department of the municipality that the airport serves. At a minimum, most FBOs offer aircraft fuel, oil, and parking, along with access to washrooms and telephones. Some FBOs provide additional aircraft services such as hangar (indoor) storage, maintenance, aircraft charter or rental, flight training, deicing, and ground services such as towing and baggage handling. FBOs may also offer services not directly related to the aircraft, such as rental cars, lounges, and hotel reservations.
<i>Fixed by Function Navigation Aid</i>	An air navigation aid (NAVAID) that must be positioned in a location to provide an essential benefit for civil aviation is set by function. An example is a runway light, which must by its nature be located along the edge of the runway.
<i>Fixed Wing Aircraft</i>	A fixed-wing aircraft is a heavier-than-air craft whose lift is generated not by wing motion about the aircraft, but by forward movement through the air. The term is used to distinguish from rotary-wing aircraft (rotorcraft), where the movement of the wing surfaces about the aircraft generates lift.
<i>Fleet Mix</i>	Fleet mix is the breakout of aircraft categories (single engine, multiengine, etc.).
<i>Floodplains</i>	To meet Executive Order 11988, Floodplains, and the U.S. Department of Transportation (DOT) Order 5650.2, Floodplain Management and Protection,

TERM – ABBREVIATION	DEFINITION
	all airport development actions must avoid the floodplain if a practicable alternative exists. If no feasible alternative exists, actions in a floodplain must be designed to minimize adverse impact to the floodplain’s natural and beneficial values. The design must also minimize the potential risks of flood-related property loss and effects on human safety, health, and welfare.
<i>Frangible Navigation Aid</i>	A navigational aid (NAVAID) which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater weight, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft. The term NAVAID includes electrical and visual air navigational aids, lights, signs, and associated supporting equipment.
<i>Full-Service FBO</i>	Full service fixed base operator means any individual or entity who leases or owns a permanent structure which provides aviation services, as provided in division 2, subdivision II, of this article pertaining to standards and procedures for full service fixed base operators, and who has entered into an operating rights agreement with the city.
<i>GA</i>	General Aviation
<i>General Aviation</i>	General aviation refers to all flights other than military and scheduled airline flights, both private and commercial. General aviation flights range from gliders and powered parachutes to large, non-scheduled cargo jet flights. Thus, most the world's air traffic falls into this category, and most of the world's airports serve general aviation exclusively.
<i>General Aviation Airport</i>	General Aviation Airports are public-use airports that do not have scheduled service or have less than 2,500 annual passenger boardings. Approximately 88 percent of airports included in the NPIAS are general aviation
<i>General Aviation Operation</i>	Civil aircraft operations not classified as an air carrier or air taxi.
<i>Geographic Information System (GIS)</i>	A geographic information system (GIS), also known as a geographical information system, is an information system for capturing, storing, analyzing, managing and presenting data that is spatially referenced (linked to location). In the strictest sense, it is any information system capable of integrating, storing, editing, analyzing, sharing, and displaying geographically-referenced information. In a more generic sense, GIS applications are tools that allow users to create interactive queries (user-created searches), analyze

TERM – ABBREVIATION	DEFINITION
	spatial information, edit data, maps, and present the results of all these operations.
<i>GIS</i>	Geographic Information System
<i>Glideslope (GS)</i>	Part of the ILS that projects a radio beam upward at an angle of approximately 3° from the approach end of an instrument runway. The glideslope provides vertical guidance to aircraft on the final approach course for the aircraft to follow when making an ILS approach along the localizer path.
<i>Global Navigation Satellite Systems (GNSS)</i>	Satellite navigation systems that provide autonomous geo-spatial positioning with global coverage. It allows small electronic receivers to determine their location (longitude, latitude, and altitude) to within a few meters using time signals transmitted along a line of sight by radio from satellites.
<i>Global Positioning System</i>	A space-based radio navigation system consisting of a constellation of satellites and a network of ground stations used for monitoring and control. A minimum of 24 GPS satellites orbits the Earth at an altitude of approximately 11,000 miles providing users with accurate information on position, velocity, and time anywhere in the world and in all weather conditions.
<i>Global Positioning System (GPS)</i>	A navigation system that uses satellite rather than ground-based transmitters for location information.
<i>GPA</i>	Glidepath Angle
<i>GPS</i>	Global Positioning System
<i>GQS</i>	Glidepath Qualification Surface
<i>GS</i>	Glideslope
<i>Hardstand</i>	A hardstand is a reinforced section of pavement (usually concrete) where large aircraft are parked. It eliminates the tendency for heavy aircraft to sink into softer asphalt when parked for extended periods, particularly in warm weather.
<i>HATH</i>	Height Above Threshold

TERM – ABBREVIATION	DEFINITION
<i>Hazard to Air Navigation</i>	An object which, because of an aeronautical study under 14 CFR part 77, the FAA determines will have a substantial adverse effect on the safe and efficient use of navigable airspace by aircraft, the operation of air navigation facilities, or existing or potential airport capacity.
<i>Helicopter</i>	See Rotorcraft
<i>HIRL</i>	High-Intensity Runway Lights
<i>Holding</i>	A predetermined maneuver that keeps aircraft within a specified airspace while awaiting further clearance from ATC.
<i>IAP</i>	Instrument Approach Procedure
<i>IFR</i>	Instrument Flight Rules
<i>ILS</i>	Instrument Landing System
<i>ILS Approach</i>	A precision instrument approach that uses the Instrument Landing System (ILS) as the electronic means of navigation.
<i>IMC</i>	Instrument Meteorological Conditions
<i>Industrial Park District</i>	A zoning district in the town of Swanzev. The intent of this District is to allow industrial activity in a park like setting, where municipal water, sewer, fire protection and electrical power may be accessible. It is the intent of this District, by requiring minimum building size, to preclude small business and office operations (allowed in other zones) unless they are grouped together in the same building. This district also excludes service operations and retail sales activities except those that are clearly accessory to the permitted use.
<i>Initial Approach Fix (IAF)</i>	The fix depicted on IAP charts where the instrument approach procedure (IAP) begins unless otherwise authorized by ATC.
<i>Instrument Approach</i>	A set of regulations and procedures for flying aircraft whereby navigation and obstacle clearance is maintained regarding aircraft instruments only, while separation from other aircraft is provided by Air Traffic Control. IFR is an alternative to visual flight rules (VFR), where the pilot is ultimately responsible for navigation, obstacle clearance and traffic separation using the see-and-avoid concept. The vast majority of commercial traffic (any flight for hire) and all scheduled air carriers operate exclusively under IFR (even on clear days). Commercial aircraft providing sightseeing flights, aerial

TERM – ABBREVIATION	DEFINITION
	photography, or lift services for parachute jumping usually operate under VFR.
<i>Instrument Approach Procedure (IAP)</i>	A series of predetermined maneuvers for the orderly transfer of an aircraft under IFR from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. There are three types of IAPs: precision approach (PA), approach with vertical guidance (APV), and non-precision approach (NPA).
<i>Instrument Flight Rules (IFR)</i>	Instrument Flight Rules (IFR) are standards and regulations established by the FAA to govern flight under conditions in which flight by outside visual reference is not safe. IFR flight depends upon flying by reference to instruments and navigation is accomplished by reference to electronic signals. It is also a term used by pilots and air traffic controllers to indicate the type of flight plan an aircraft is flying, such as an IFR or VFR flight plan.
<i>Instrument Meteorological Conditions (IMC)</i>	Instrument meteorological conditions (IMC) is an aviation flight category that describes weather conditions that require pilots to fly primarily by reference to instruments, and therefore under Instrument Flight Rules (IFR), rather than by outside visual references under Visual Flight Rules (VFR). Typically, this means flying in cloud or bad weather.
<i>Instrument Takeoff</i>	Using the instruments rather than external visual cues to maintain runway heading and execute a safe takeoff.
<i>Intermediate-Term</i>	The sixth through tenth year of an airport planning period.
<i>Itinerant Operation</i>	Operations not classified as “local” operations. See local operation.
<i>KEEN</i>	International identifier for Dillant Hopkins Airport
<i>KIAS</i>	Knots indicated airspeed
<i>Landside</i>	The part of the airport exclusive of aircraft operating areas (runways, taxiways, aircraft aprons/ramps). Landside includes the terminal building, hangars, other buildings, and structures not on the airport’s airside, automobile parking areas, access roads, etc.
<i>Large Aircraft</i>	Large aircraft means aircraft of more than 12,500 pounds, maximum certificated takeoff weight.

TERM – ABBREVIATION	DEFINITION
<i>LED</i>	Light Emitting Diode
<i>Light Emissions</i>	Airport-related lighting facilities and activities could visually affect surrounding residents and other nearby light-sensitive areas such as homes, parks, or recreational areas.
<i>LIRL</i>	Low-Intensity Runway Lights
<i>LNAV</i>	Localizer Performance with Vertical
<i>Local Operation</i>	Aircraft operations remaining in the local traffic pattern, simulated instrument approaches at the airport, including military and civil operations, and operations to or from the airport and a practice area within a 20-mile radius of the tower.
<i>Localizer (LOC)</i>	The portion of an ILS that gives left/right guidance information down the centerline of the instrument runway for final approach.
<i>Localizer Approach</i>	A non-precision instrument approach procedure using only localizer component of the ILS.
<i>Long-Term</i>	The eleventh through the twentieth year of an airport planning period
<i>LP</i>	Localizer Performance
<i>LPV</i>	Localizer Performance with Vertical Navigation
<i>Mean Sea Level (MSL)</i>	The height of the sea surface midway between its average high and low water positions
<i>Medium Intensity Approach Light System with Runway Alignment Indicator Lights (MALSR)</i>	Medium-intensity approach light system with Runway Alignment Indicator Lights. See also Approach Lighting System.
<i>MGTOW</i>	Maximum Gross Takeoff Weight
<i>Military Operation</i>	Aircraft operations by all classes of military aircraft.

TERM – ABBREVIATION	DEFINITION
<i>Minimum Altitude</i>	An altitude depicted on an instrument approach chart with the height value underscored. Aircraft are required to maintain altitude at or above the represented value.
<i>Minimum descent altitude (MDA)</i>	The lowest altitude (in feet MSL) to which descent is authorized on final approach, or during circle-to-land maneuvering in execution of a non-precision approach.
<i>Minimums</i>	Minimums refer to two components of an instrument approach procedure, one is altitude, and the other is visibility. Every instrument approach has one or more sets of minimums. Regarding altitude, there is the Decision Height/Decision Altitude (DH/DA) and Minimum Descent Altitude (MDA), and both refer to the lowest altitude the pilot can fly while on an instrument approach to acquiring the runway environment visually. DH or DA is the height of a specified altitude or height (A/H) in a precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established. The MDA is the lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glideslope is provided. Visibility minimums is the lowest distance (in statute miles) that a pilot can be from the
<i>MIRL</i>	Medium Intensity Runway Lights
<i>Missed Approach Point (MAP)</i>	A point prescribed in each instrument approach at which a missed approach procedure shall be executed if the required visual reference has not been established.
<i>Modification to Standards</i>	Modification to standards means any change to FAA design standards other than dimensional standards for runway safety areas. Unique local conditions may require modification to airport design standards for an airport. An amendment to an airport design rule related to new construction, reconstruction, expansion, or upgrade on an airport that received Federal aid requires FAA approval.
<i>Movement Area</i>	The maneuvering area, maneuvering area, or movement area is the part of the airport used by aircraft for landing and takeoff that does not include the airport ramp. The rest of the airport is considered the non-movement area. Movement Areas are defined areas on the airport or airfields, which are controlled by the control tower, e.g. permission, must be obtained to access

TERM – ABBREVIATION	DEFINITION
	these areas. At non-towered airports (EEN), access to movement areas is monitored by the airport sponsor.
<i>MSL</i>	Mean Sea Level
<i>National Airspace System (NAS)</i>	The standard network of United States airspace—air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information, and services; rules, regulations and procedures, technical information; and labor and material.
<i>National Plan of Integrated Airport Systems (NPIAS)</i>	The National Plan of Integrated Airport Systems (NPIAS) is an inventory of U.S. aviation infrastructure assets. It is developed and maintained by the Federal Aviation Administration (FAA). Its purposes are to identify all the airports in the U.S. that are considered significant components of the national aviation infrastructure network. Airports in the NPIAS are eligible for Federal grants from the Airport Improvement Program.
<i>Natural Resources and Energy Supply</i>	Airport development actions have the potential to change energy requirements or use consumable natural resources. To comply with the Council on Environmental Quality (CEQ) regulations the Federal Aviation Administration (FAA) must evaluate potential impacts on supplies of energy and natural resources needed to build and maintain airports.
<i>Nautical Mile (NM)</i>	A nautical mile is a unit of measurement defined as exactly 1,852 meters (about 6,076.1 feet or 1.1508 statute miles)
<i>NAVAID</i>	Navigation Aid
<i>Navigation Aid (NAVAID)</i>	A navigational aid (also known as an aid to navigation or navaid) is any sort of marker, which aids the traveler in navigation; the term is most commonly used to refer to nautical or aviation travel. Includes electrical and visual air navigational aids, lights, signs, and associated supporting equipment.
<i>NHDEP</i>	New Hampshire Department of Environmental Protection
<i>NHDOT</i>	New Hampshire Department of Transportation
<i>Night</i>	Night means the time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time.

TERM – ABBREVIATION	DEFINITION
<i>Night Operation</i>	For the purposes of noise analysis, a night operation occurs during the period between 10 pm and 7 am. See also Airport Operation.
<i>NM</i>	Nautical Mile
<i>Nonconforming Use</i>	Nonconforming use means any structure, tree, or use of land which does not conform to a regulation prescribed in this article or any amendment thereto as of the effective date of such regulation.
<i>Nonconforming Use</i>	As defined in the town of Swanzey Zoning Ordinance means any structure, tree or use of land which does not conform to a regulation prescribed under this section or any amendment thereto as of the effective date of such regulations or amendments.
<i>Non-Movement Area</i>	See Movement Area
<i>Non-Precision Approach (NPA)</i>	An NPA is a method that provides the pilot with horizontal (lateral) guidance along the extended runway centerline. Examples at EEN include the VOR and RNAV Runway 2 approaches (see paragraph 2.8.6, Instrument Approaches, page 2.13).
<i>Non-Primary Entitlement (NPE)</i>	Non-primary entitlement funds are specifically for general aviation airports listed in the latest published National Plan of Integrated Airports (NPIAS) that show needed airfield development. General aviation airports with an identified need are eligible to receive the lesser value of the following: 20% of the 5-year cost of their current NPIAS value or, \$150,000 annually. The Dillant Hopkins Airport is part of NPIAS and is eligible for NPE funds.
<i>NPE</i>	Non-Primary Entitlement
<i>NPIAS</i>	National Plan of Integrated Airport Systems
<i>O&M</i>	Operations and Maintenance
<i>Object</i>	Includes, but is not limited to above ground structures, NAVAIDs, people, equipment, vehicles, natural growth, terrain, and parked aircraft.
<i>Object Free Area (OFA)</i>	An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that should be in the OFA for air navigation or aircraft ground maneuvering purposes.

TERM – ABBREVIATION	DEFINITION
<i>Obstacle Clearance Surface (OCS)</i>	An inclined obstacle evaluation surface associated with a glide path (glideslope).
<i>Obstacle Free Zone (OFZ)</i>	The OFZ is the airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline. It is required to be clear of all objects, except for frangible visual NAVAIDs that should be in the OFZ because of their function, to provide clearance protection for aircraft landing or taking off from the runway, and for missed approaches. The OFZ is sub-divided as follows: Runway OFZ. The airspace above a surface centered on the runway centerline. Inner-approach OFZ. The airspace above a surface centered on the extended runway centerline. It applies to runways with an approach lighting system. Inner-transitional OFZ. The airspace above the surfaces located on the outer edges of the runway OFZ and the inner-approach OFZ. It applies to runways with approach visibility minimums lower than 3/4-statute mile.
<i>Obstruction to Air Navigation</i>	An object of greater height than any of the heights or surfaces presented in Subpart C of Code of Federal Regulation (14 CFR), Part 77. (Obstructions to air navigation are presumed to be hazards to air navigation until a FAA study has determined otherwise.)
<i>OCS</i>	Obstacle Clearance Surface
<i>OIS</i>	Obstacle Identification Surface
<i>Operation</i>	A takeoff or landing of an aircraft.
<i>Operator</i>	Operator means any person who has applied for and received written permission to engage in a commercial activity, on or from the airport and has entered into and executed the required lease/operating agreement. An operator shall in all cases be a tenant.
<i>Overlay District (Zone)</i>	Overlay districts are supplemental zoning districts that are placed over underlying zoning districts and identify special provisions for the given area. These overlay districts can be created to add requirements to an area (e.g., additional environmental protections) or to provide greater flexibility in an area (e.g., allowance of more uses or increased density).
<i>Owner</i>	Owner means the city and its inhabitants, acting through its duly appointed city manager.

TERM – ABBREVIATION	DEFINITION
<i>PAPI</i>	Precision Approach Path Indicator
<i>Passenger Boardings</i>	Passenger boardings refer to revenue passenger boardings on an aircraft in service in air commerce whether or not in scheduled service. Also referred to as enplanements.
<i>PCL</i>	Pilot Controlled Lighting
<i>Pilot Controlled Lighting (PCL)</i>	Pilot Controlled Lighting (PCL), also known as Aircraft Radio Control of Aerodrome Lighting (ARCAL) or Pilot Activated Lighting (PAL), is a system which allows aircraft pilots to control the lighting of an airport or airfield's approach lights, runway edge lights, and taxiways via radio. PCL systems are most common at non-towered or little-used airfields where it is neither economical to turn on the runways all night, nor to provide staff to turn the runway lighting on and off. PCL enables pilots to control the lighting only when required, saving electricity and reducing light pollution.
<i>Piston Aircraft</i>	An aircraft powered by one or more piston engines (regardless of fuel type).
<i>Plan View</i>	The overhead view of an approach procedure on an instrument approach chart. The plan view depicts the routes that guide the pilot from the en route segments to the IAF.
<i>Precision Approach (PA)</i>	A PA is a procedure that provides the pilot with vertical (glideslope) and horizontal (lateral) guidance along the extended runway centerline and predetermined approach angle. Examples at EEN is the ILS Runway 2 approach (see paragraph 2.8.6, Instrument Approaches, page 2.13).
<i>Precision Approach Path Indicator (PAPI)</i>	The precision approach path indicator (PAPI) uses light units like the VASI but is installed in a single row of either two or four light units. These systems have an effective visual range of about 5 miles during the day and up to 20 miles at night. The row of light units is usually installed on the left side of the runway, and the glide path indications are as depicted. Each box of lights is equipped with an optical apparatus that splits light output into two segments, red and white. Depending on the angle of approach, the lights will appear either red or white to the pilot. Ideally, the total of lights will change from white to half red, moving in succession from right to left side. The pilot will have reached the standard glide path (usually 3 degrees) when there is an even split in red and white lights. If an aircraft is beneath the glide path, red lights will outnumber white; if an airplane is above the glide path, additional white lights are visible.

TERM – ABBREVIATION	DEFINITION
<i>Profile View</i>	Side view of an IAP chart illustrating the vertical approach path altitudes, headings, distances, and fixes.
<i>Public Aircraft</i>	An aircraft operated by or on behalf of the United States Government, a State, the District of Columbia, a territory or possession of the United States, or a political subdivision of one of these governments, but only when operated under the conditions specified by 49 USC 40125(b), 40125(c), or 40125(d).
<i>Ramp</i>	See Apron
<i>RCO</i>	Remote Communications Outlet
<i>REIL</i>	Runway End Identifier Lights
<i>Reliever Airport</i>	Reliever Airports are airports designated by the FAA to relieve congestion at Commercial Service Airports and to provide improved general aviation access to the overall community.
<i>Remote Communications Outlet (RCO)</i>	A Remote Communications Outlets (RCO) is a remote aviation band radio transceiver, established to extend to communication capabilities of Flight Service Stations (FSS).
<i>Residence District</i>	A zoning district in the town of Swanzey. This district encompasses the more highly developed sections of town. It provides the transitional areas between the outlying rural and more densely developed business districts. Commercial facilities and essential services are convenient, and semi-public facilities such as churches and clubs are readily available to the residents of the district.
<i>ROFA</i>	Runway Object Free Area
<i>Rotating Beacon</i>	A rotating beacon is a light system used to assist pilots in finding an airport, particularly those flying in IMC or VFR at night. Additionally, the rotating beacon provides information about the type of airport using a set of color filters. Beacons for civil land airports emit a white and green light that appears as a flash.
<i>RPZ</i>	Runway Protection Zone
<i>RSA</i>	Runway Safety Area

TERM – ABBREVIATION	DEFINITION
<i>Runway</i>	A runway is a strip of land on an airport, on which aircraft can take off and land. Runways may be a fabricated surface (often asphalt, concrete, or a mixture of both) or a natural surface (grass, dirt, or gravel).
<i>Runway Blast Pad</i>	A runway blast pad is a surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.
<i>Runway Edge Lights</i>	Runway Edge Lights are used to outline the edges of runways during periods of darkness or restricted visibility conditions. These light systems are classified according to the intensity they are capable of producing: High-Intensity Runway Lights (HIRL) Medium Intensity Runway Lights (MIRL) Low-Intensity Runway Lights (LIRL) The HIRL and MIRL systems have variable intensity controls, whereas the LIRLs normally have one intensity setting. Runway Edge Lights are white, except on instrument runways where yellow replaces white on the last 2,000 feet or half the runway length, whichever is less, to form a caution zone for landings. The lights marking the ends of the runway emit red light toward the runway to indicate the end of the runway to a departing aircraft and emit green outward from the runway end to indicate the threshold to landing aircraft.
<i>Runway End Identifier Lights (REIL)</i>	<p>The Runway End Identifier Lights (REIL) system provides rapid and positive identification of the end of the runway. The system consists of two synchronized, unidirectional flashing lights. The lights are positioned on each corner of the runway landing threshold, facing the approach area and aimed at an angle of 10 to 15 degrees.</p> <p>REIL is useful for identification of a runway surrounded by a preponderance of another lighting system; identification of a runway which lacks contrast with surrounding terrain; and identification of a runway during reduced visibility. The REIL provides three intensity settings and has an approximate range of three miles in daylight and twenty miles at night. The REIL can be controlled by the air traffic control tower, remotely by the pilot, by automatically sensing the electrical current through the runway edge lights, or manually from the control cabinet. They are pilot controlled at EEN.</p>
<i>Runway Protection Zone (RPZ)</i>	An area off the runway end to enhance the protection of people and property on the ground.
<i>Runway Safety Area (RSA)</i>	A runway safety area (RSA) or runway end safety area (RESA) is defined as "the surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway."

TERM – ABBREVIATION	DEFINITION
<i>Runway Visibility Range (RVR)</i>	The instrumentally derived horizontal distance a pilot should be able to see down the runway from the approach end, based on either the sighting of high-intensity runway lights or the visual contrast of other objects.
<i>Runway Visibility Value (RVV)</i>	The visibility determined for a runway by a transmissometer.
<i>Runway Visual Range (RVR)</i>	Runway Visual Range measures visibility, background luminance, and runway light intensity to determine the distance a pilot should be able to see down the runway.
<i>Rural/ Agricultural District</i>	A zoning district in the town of Swanzey. This district is designed to accommodate residences and agricultural uses in what is commonly recognized as being a rural atmosphere. The property included within this district will generally be agriculture and forestry, low-density housing, open space protection, water supply protection, and recreation. This district is the potential future growth area for the town and is carefully controlled with monitoring, planning, and re-zoning to prevent scattered and premature development.
<i>RVR</i>	Runway Visual Range
<i>RVV</i>	Runway Visibility Value
<i>SAGA</i>	Sustainable Aviation Guidance Alliance
<i>Shoreland Protection District</i>	A zoning district in the town of Swanzey. The Shoreland Protection District is hereby established as an overlay district which is superimposed over the existing conventional zoning. The uses permitted in the underlying districts shall be allowed if they meet the minimum standards promulgated by the State of New Hampshire Comprehensive Shoreland Protection Act, RSA 483-B (as amended). Pursuant to authority granted by RSA 674:14, this Shoreland Protection District is adopted by the Town of Swanzey to protect the public waters of the Town further. (Replaces Special Lake Protection District March 14, 1995.)
<i>Short-Term</i>	The first five years of an airport planning period
<i>Small Aircraft</i>	Small aircraft means aircraft of 12,500 pounds or less, maximum certificated takeoff weight.

TERM – ABBREVIATION	DEFINITION
<i>Social Impacts</i>	Social impacts are those associated with the relocation of any business or residence, those that alter surface-transportation patterns, divide, or disrupt established communities, disrupt orderly planned development, or create an appreciable change in employment.
<i>Solid Waste*</i>	Construction, renovation, or demolition of most airside projects produces debris (e.g., dirt, concrete, asphalt) that must be properly disposed of. Also, new or renovated terminal, cargo, or maintenance facilities may involve construction, renovation, or demolition that produces other types of solid waste (bricks, steel, wood, gypsum, glass). Therefore, airport sponsors should follow Federal, state, or local regulations that address solid waste. Doing so reduces the environmental effects of airport-related construction or operation.
<i>Sponsor</i>	See Airport Sponsor
<i>SRE</i>	Snow Removal Equipment
<i>Statute Mile (SM)</i>	A statute mile is a unit of linear measure equal to 5,280 feet, or 1,760 yards (approximately 1.609 kilometers).
<i>Stopway</i>	A defined rectangular surface beyond the end of a runway prepared or suitable for use instead of runway to support an airplane, without causing structural damage to the aircraft, during an aborted takeoff.
<i>Structure</i>	Structure means any object constructed or installed by man, including such objects although regulated or licensed by other provisions of law.
<i>TAF</i>	Terminal Area Forecasts. For the purposes of this study, TAF refers to the projections prepared by the FAA for airport planning purposes and not the aviation weather reports by the same term.
<i>Taxilane</i>	The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.
<i>Taxiway</i>	A taxiway is a path on an airport connecting runways with ramps, hangars, terminals and other facilities. They mostly have a hard surface such as asphalt or concrete, although smaller airports sometimes use gravel or grass.
<i>Taxiway Safety Area</i>	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TERM – ABBREVIATION	DEFINITION
<i>TCH</i>	Threshold Crossing Height
<i>Tenant</i>	Tenant means any person who has applied for and received written permission to establish a leasehold or other right at the airport, whether for commercial activity or not.
<i>Terminal Area</i>	Depicts airspace around major airports; typically associated with Class B and Class C airspace.
<i>Terminal Area Forecasts (TAF)</i>	The official forecast of aviation activity at FAA facilities. These estimates are prepared to meet the budget and planning needs of FAA and provide information for use by state and local authorities, the aviation industry, and the public.
<i>Terminal Procedures</i>	See Instrument Approach Procedure
<i>Threatened and Endangered Species</i>	To satisfy the Endangered Species Act of 1973, the Federal Aviation Administration (FAA) must determine if a proposed action under its purview would affect a Federally listed species or habitat critical to that species (critical habitat). For purposes of this Chapter, the following definitions apply Major construction activity; Endangered species; Threatened species; Candidate species; and, Critical habitat.
<i>Threshold</i>	The threshold is the beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced. See also Displaced Threshold.
<i>Threshold Lights</i>	Threshold lights mark the ends of the runway emit red light toward the runway to indicate the end of the runway to a departing aircraft and emit green outward from the runway end to indicate the threshold to landing aircraft.
<i>Title 14 of the Code of Federal Regulations (14 CFR)</i>	The federal aviation regulations governing the operation of aircraft, airways, and aviators.
<i>Traffic Pattern</i>	Traffic pattern means the traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from, an airport.
<i>TRB</i>	Transportation Research Board

TERM – ABBREVIATION	DEFINITION
<i>Tree</i>	Tree means any object of natural growth.
<i>USDOT § 4(f)</i>	Section 4(f) of the Department of Transportation Act requires the Secretary of Transportation investigate all alternatives before affecting any publicly owned lands designated as public parks, recreation areas, wildlife, or waterfowl refuges of national, state, or local significance, or land having national, state, or local historical significance.
<i>VAGL</i>	Visual Approach Guidance Lights
<i>VASI</i>	Visual Approach Slope Indicator
<i>Very High Frequency (VHF)</i>	A band of radio frequencies falling between 30 and 300 MHz
<i>VFR</i>	Visual Flight Rules
<i>VGSI</i>	Visual Glideslope Indicators (VGSI) is a system of lights so arranged to provide visual descent guidance information during the approach to a runway. There are several VGSI systems; the most common are VASI and its replacement PAPI.
<i>VHF</i>	Very High Frequency
<i>VIS</i>	Visibility
<i>Visual Approach</i>	An approach based on the pilot's perception of the correct alignment with the runway centerline and glideslope with no reference to navigational equipment.
<i>Visual Approach Slope Indicator (VASI)</i>	A visual aid of lights arranged to provide descent guidance information during the approach to the runway. A pilot on the correct glide slope will see red lights over white lights. See PAPI.
<i>Visual Descent Point (VDP)</i>	A defined point on the final approach course of a non-precision straight-in approach procedure, from which descent from the MDA to the runway touchdown point may be commenced, provided the runway environment is clearly visible to the pilot.
<i>Visual Flight Rules (VFR)</i>	Visual flight rules (VFR) are a set of regulations under which a pilot operates an aircraft in weather conditions generally clear enough to allow the pilot to see where the aircraft is going. Specifically, the weather

TERM – ABBREVIATION	DEFINITION
	must be better than basic VFR weather minima, i.e. in visual meteorological conditions (VMC), as specified in the rules of the relevant aviation authority. The pilot must be able to operate the aircraft with visual reference to the ground, and by visually avoiding obstructions and other aircraft.
<i>Visual Meteorological Conditions (VMC)</i>	The weather conditions required for flight under VFR are known as visual meteorological conditions (VMC). IMC and VMC are mutually exclusive. In fact, instrument weather conditions are defined as less than the minima specified for visual weather conditions.
<i>Visual Runway</i>	A runway without an existing or planned straight-in instrument approach procedure.
<i>VMC</i>	Visual Meteorological Conditions
<i>VNAV</i>	Vertical Navigation
<i>VOR</i>	VHF Omni Directional Radio Range (VOR) is a type of short-range radio navigation system for aircraft, enabling aircraft with a receiving unit to determine their position and stay on course by receiving radio signals transmitted by a network of fixed ground radio beacons. It uses frequencies in the very high frequency (VHF) band from 108 to 117.95 MHz. Developed in the United States beginning in 1937 and deployed by 1946, VOR is the standard air navigational system in the world, used by both commercial and general aviation. By 2000 there were about 3,000 VOR stations around the world including 1,033 in the US, reduced to 967 by 2013 with more stations being decommissioned with the widespread adoption of GPS.
<i>Water Quality</i>	Construction often causes sediment-laden runoff to enter waterways. Biological and chemical breakdown of deicing chemicals in airport runoff can cause severe dissolved oxygen demands on receiving waters. Operations or maintenance are other activities that may affect water quality. Airport-related water quality impacts can occur from both point and non-point sources at airports. If not adequately controlled, the resultant water quality impacts may adversely affect animal, plant, or human populations.
<i>Wetlands</i>	Executive Order 11990, Protection of Wetlands, sets the standard for a Federal agency action involving any wetland. The U.S. Department of Transportation (DOT) developed and issued DOT Order 5660.1A, Preservation of the Nation's Wetlands to provide more guidance to DOT agencies

TERM – ABBREVIATION	DEFINITION
	regarding their actions in wetlands. The DOT Order governs the Federal Aviation Administration’s (FAA’s) actions.
<i>Wide Area Augmentation System (WAAS)</i>	A differential global positioning system (DGPS) that improves the accuracy of the system by determining position error from the GPS satellites, then transmitting the error, or corrective factors, to the airborne GPS receiver.
<i>Wild & Scenic Rivers</i>	Those rivers have remarkable scenic, recreational, geologic, fish, wildlife, historical, or cultural values. Federal land management agencies in the Departments of the Interior and Agriculture manage the Wild and Scenic Rivers Act (Act).

APPENDIX B. MEETING MINUTES

The following are minutes from the Planning Advisory Committee and client/consultant meetings conducted as part of this project.

Table B-1. PAC and Client Meeting Dates

MEETING DATE	TOPIC
April 17, 2015	Role of the PAC & Meeting Guidelines and Ground Rules
August 10, 2015	PAC Overview of airport planning process, existing facilities inventory, environmental overview, Visioning Session (collaboration and discussion between groups and establish critical ideas)
November 30, 2015	PAC Presentation of Forecasts of Aviation Activity and Capacity v. Demand; review of the visioning process.
February 18, 2016	Stantec's evaluation of Facility Requirements and PAC discussion and ideas for the airport's future needs.
April 27, 2016	PAC Presentation of Stantec's Alternatives
June 8, 2016	Stantec's alternative recommendations and PAC discussion and selection of the preferred alternative
August 31, 2016	PAC alternative discussion and selection of the preferred alternative
November 4, 2016	Stantec and city discussion on preferred alternative
May 4, 2017*	PAC final draft review
May 24, 2017*	PAC acceptance of draft report and forwarding to the Keene City Council

* Draft minutes were not approved by the PAC because of the timing of project closeout for publication.

City of Keene
New Hampshire

AIRPORT MASTER PLAN STUDY ADVISORY COMMITTEE -MEETING MINUTES

April 17, 2015 4:00 PM

Heberton Hall

Members Present:

Michele M. Welsh

Janis Manwaring

Robert Bergevin

Ed Mattern

Ann Shedd

Jack Dugan

Joseph Briggs

Phil Suter

William Summers

Rhett Lamb, Planning Director

Staff Present:

Kendall Lane, Mayor

Elizabeth Bendel

Tom Mullins, City Attorney

Rebecca Landry, IT Director

Others Present:

Janice Bland-

Senior Aviation Planner, Stantec

Jason Gass-

Aviation Planner, Stantec

Carol Niewola-Senior Aviation
Planner, NHDOT

1. Call to order:

Roll Call was conducted

2. Introduction:

Mayor Lane welcomed the Committee and advised that this body was established to complete an update for the Master Plan for the Dillant-Hopkins Airport in Keene, NH. Mayor Lane turned over information to the City Attorney.

3. Advisory- Board and Committees Training:

Attorney Mullins handed a packet to the Committee in reference to the Rules of Procedure, Running and Effective Meeting, Conflicts of Interest, and the Right-to-Know Law.

Attorney Mullins stated that once an individual is on a Committee for Keene, they become a public entity under New Hampshire Law. He continued, stating that New Hampshire's Right-to-

Know Law allows the meeting to be transparent for the public. Attorney Mullins stated that there will be public notice of meetings within 24 hours. He continued, stating that the public is allowed to come to the meeting however participation requires a different type of meeting. Attorney Mullins stated that during a Public Hearing the public is allowed to speak. Attorney Mullins stated that this Committee is not a Judicial Body but a Legislative and Advisory Body that reports to the City Council. He continued, stating that the Committee must be careful of conversation via email. Attorney Mullins stated that there will be email from Administrative Staff but it is important for Committee members to avoid communication amongst the Committee itself. He continued, stating that once a quorum is established via email in reference to a Committee matter, the law has been violated.

Attorney Mullins stated that if legal advice is necessary, the Committee is allowed to obtain this advice. He continued, stating that the Rules and Procedures will need to be accepted in the next meeting. Attorney Mullins stated that it is important for the members to understand that a quorum must be present in order to have a meeting. He continued stating that there are 13 members in this Committee and a quorum will include seven members. Attorney Mullins stated that it is important to be respectful of each other and the Chair will maintain this order allowing one person to speak at a time. He stated that this is to ensure fairness and clarity for the minute taker and the public.

Attorney Mullins stated that an agenda will be given out each month. He continued, stating that under the New Business section, a new topic cannot be discussed at that meeting. He stated that the Committee members and the public have a right to prepare for that topic in advance. Attorney Mullins asked the Committee members to read over the Rules of Procedures for the next meeting along with procedures for running a meeting.

Attorney Mullins stated that motions are made and passed by a two-third vote. Attorney Mullins stated that Conflict of Interest is also a factor to be aware of although this Committee will not have to worry about this. He stated that Conflict of Interest occurs when there is pecuniary interest or financial interest. Attorney Mullins stated that the Committee will vote if a member may have a Conflict of Interest and if confirmed, the member will not be part of the discussion or vote.

Attorney Mullins stated that if there are future questions then members should ask through the Chair.

4. Approval of Chair/Vice Chair:

Tabled to next meeting.

5. Overview History:

Mr. Mattern stated that the last Master Plan for the airport was completed in 2003 and it is required by the Federal Aviation Administration, (FAA) to complete a Master Plan on a ten year cycle. He continued, stating that FAA Master Plans are straight forward with information and less on implementation. Mr. Mattern stated that when a chance arose to create a new plan, Dillant- Hopkins Airport wanted to focus on something more functional. Mr. Mattern stated that

the Keene Comprehensive Master Plan is a great example. He continued, stating that the City Council was engaged in this plan and the goal of the Airport's Master Plan is to create a plan similar that allows goals and activities to reach towards this layout.

Mr. Mattern stated that the focus is to get public input. He continued, stating that this plan plays a role in the economic wellbeing of the region and there is value for the community to put effort into this process. Mr. Mattern stated that one way to get suggestions and information from the public is Mind Mixer.

Rebecca Landry approached the committee. She stated that Mind Mixer is a tool for citizen engagement. Ms. Landry stated that the goal is to receive information from the public and engage the community. She continued, stating that the role of public information meetings are still important however. Ms. Landry stated that Mind Mixer is an online tool allowing people to use existing tools like Facebook, Twitter or just an email. She continued, stating that individuals can learn about projects or participate in surveys. She stated that the link is:

Keene.mindmixer.com. Ms. Landry stated that the latest was a survey on the Pumpkin Festival. She continued stating that the Idea Generator is the most popular tool and allows the public to come up with ideas while self-regulating possible negative remarks. She continued, stating that favorable and creative ideas will rise to the top and negative ideas will not saturate the system. Ms. Landry stated that Mind Mixer can be used to help the Committee generate ideas or ask specific questions.

Mr. Mattern stated phrasing the questions are very important in order for this tool to be helpful. Carol Niewola of New Hampshire DOT approached that Committee. She stated that New Hampshire DOT has a program that is managed through FAA called the Airport State Block Grant Program. She continued, stating that airports which are not commercial use are eligible for this program. Ms. Niewola stated that this grant has been accessible to the Dillant- Hopkins Airport but they were waiting for the appropriate time to start the project. She stated that it will be interesting to see how all of the plans throughout the state will merge together.

6. Stantec Presentation:

Ms. Janice Bland approached that Committee and stated that 90% of the Master Plan is being funded by the Federal Aviation Association with the remaining 10% split evenly through the NHDOT and the City of Keene. She stated that the next meeting will provide Committee members with a more detailed schedule for the Master Plan. Ms. Bland stated that the Scoping Process is finished with the City of Keene and the NHDOT. She continued, stating that some of the goals that came from this process including evaluating the terminal building, hangar requirements at the airport, and the orientation and dimensions of the crosswind runway.

Mr. Jason Gass approached the Committee and stated that the Master Plan is a fairly straightforward process. He continued, stating that after the scoping process, an inventory of existing conditions at the airport will be conducted. He continued, stating that a site visit will determine the condition of the airport. Mr. Gass stated that in addition to the site visit- historical data, the New Hampshire State Aviation System Plan and fuel sales will be analyzed in order to

establish forecasts. He continued, stating that forecasts are flexible and will showcase what the airport may look like in twenty years..

Mr. Mattern stated that the forecasting may not be straightforward to the Committee and would like to make sure that everyone understands. He continued, stating that the goal is to come up with favorable alternatives.

Councilor Manwaring asked when the public input comes into play. Ms. Bland stated that this will be discussed later in the meeting. Ms. Ann Shedd stated that the State Aviation System Plan identified that the Dillant- Hopkins Airport is predicted to be a national airport rather than regional in the future. She continued, stating that the expectations of a national airport is much different than regional. Ms. Niewola stated that the airport is already filling the role of a national airport without being called a national airport. She continued, stating that FAA undertook a study to better define general aviation airports. She continued, stating that the only national aviation airport is in Nashua. Ms. Niewola stated that FAA does not want airports to be as isolated as Keene currently is and there is a potential for Keene's airport to grow. She continued, stating that if the airport wants to become a national airport in the future, there will be little change necessary. Ms. Niewola stated that she does not envision the study being driven here and the local need is what will drive the Master Plan.

Mr. Gass stated that alternatives will be based on the forecast. Mr. Gass stated that according to the discussed scope, there will be up to five alternatives evaluated. He continued, stating that they will be separate but the committee can mix them if necessary. Mr. Gass stated that the goal is to have a preferred alternative by the third Committee Meeting but it is up to the Committee on the time line. He continued, stating that once alternatives are determined, an Airport Layout Set will be created. Mr. Gass stated that the fourth meeting will be the final time for input from the Committee. He continued, stating that Stantec will then provide a Final Master Plan and Airport Layout Set to be approved by the city and NHDOT.

Mr. Mattern stated that the Committee may not be able to complete these steps in the time allowed and it is possible to have extra meetings. He continued, stating that the schedule is open for discussion. Mr. Mattern asked Mr. Lamb to give information about the Comprehensive Master Plan for Keene. Mr. Lamb stated that the plan was created by a Committee and then the community was approached with a draft. He stated that public engagement was obtained through two strategies. He continued, stating that the Committee reached out to the community by having small group sessions around the city. He continued, stating that these were all in a short period of time and they met twice. Mr. Lamb stated that this approach had upwards of 2,000 people. He continued stating that some people will not talk in a large crowd. Mr. Lamb stated that another approach is to have workshops where smaller groups are formed inside the meeting. He continued, stating that it involves higher participation and involves a more intensive approach to getting individuals to come.

Mr. Gass stated that it is important to get as much public participation as possible. Councilor Manwaring stated that workshops are beneficial and very effective. She continued, stating that many of the Committee Members have connections that can be tapped. Ms. Shedd stated that it is

important to also reach out the representatives of Swanzey. Councilor Manwaring stated that there is also controversy with tree removal and conservation groups should be involved.

Mr. Bergevin stated that pilots should also be notified and have input into the plan. He continued, stating that it is a great airport and it should be kept that way. Mr. Mattern stated that Stantec will also be setting up a Facebook page to have additional ways to connect to the public. He continued, stating that there was discussion to have a large meeting with smaller breakout groups. Councilor Manwaring stated that Mind Mixer is useful right after a meeting like this. Mr. Mattern stated that airport users are easier to get a hold and those that may not use the airport still have a say in the process.

Mr. Suter stated that if the purpose is to get as many people involved as possible, it can be done with the connections of these Committee Members. Mr. Lamb stated that it is important to have an idea of what we are going to ask the public and to have a goal in mind. He continued, stating that if the driving factor is alternatives then a list should be given to the public. Mr. Lamb stated that goals need to be set. Ms. Shedd stated that aligning these goals with the City's values and goals are also important. She continued, stating that for instance the Ashuelot River is a factor and guidelines need to be reviewed.

Mr. Welsh stated that the layout of the schedule seems to have two places where public input is needed. He continued, stating that a public session should occur in October and prior to the third meeting in November. Ms. Bland stated that the public meetings are not on the schedule because the Committee should decide this. Mr. Gass stated that this meeting is where a time frame of public involvement be addressed. Ms. Bendel stated that she is struggling to answer this question without knowing what the Committee wants from the public. Mr. Gass stated that the public will have comments to this process and it is hard to predict what the public may request for information. Mr. Mattern stated that it is not fair to ask this question because the Committee does not know what is entailed in an Airport Master Plan. He continued, stating that it is available on the City of Keene's website and the Committee should review this from plan from 2003. He continued, stating that by reviewing this plan, the Committee may be able to start future conversations. Mr. Gass stated that it is important to allow the Committee to review this information before the public.

Mr. Suter stated that the community from this region are great at coming up with ideas and thinking big. Councilor Manwaring asked if the Committee is able to dream big. Mr. Lamb stated that if it is important to have the public's opinion then it will fit very differently on the schedule. He continued, stating that in this case the public meeting should come soon. Mr. Gass stated that this aligns with individual public workshops as well. Mr. Welsh asked how firm the schedule is at this time. Ms. Bland stated that the schedule can be changed as needed. Mr. Gass stated that the recommendations still need to abide by regulations and protocols. Mr. Mattern stated that the ultimate goal is to have something that is functional. Councilor Manwaring stated that the Committee should meet again in another month so everyone can review information.

Ms. Niewola asked what information would be needed for the next meeting. Councilor Manwaring stated that she would like to know what the Master Plan involves. Mr. Lamb stated

that understanding the prior Master Plan is a great start and will provide evidence for limitations. Ms. Bland stated that Stantec could collect data so the Committee can have an inventory of existing airport facilities. Ms. Bland stated that this meeting is just to get acquainted and begin the discussion. She continued, stating that the next meeting is anticipated to be in July.

Mr. Mattern suggested the committee members come for a tour of the property in order to understand the process at the airport. Mr. Suter suggested having the meeting at the airport. Mr. Mattern agreed and stated that there is space available. Mr. Welsh stated that reviewing the previous Master Plan and visiting the airport will bring more confidence to the Committee and allow the Committee to decide what public input is needed.

Ms. Shedd stated that in addition to the 2003 Master Plan it would be helpful to see the predicted actuals. Ms. Bland asked what time works best to meet. Councilor Manwaring suggested 3:00 PM. Ms. Bland stated that an assessment of existing conditions of the airport can be completed in a month. She continued, stating that documents will be sent one week in advance of the next meeting. Councilor Manwaring suggested May 11, 2015 for the meeting. Ms. Bland requested the meeting need to be after May 18, 2015 in order to obtain necessary data. Ms. Bland stated that she will send out a Doodle Poll to determine the next meeting.

7. Adjournment

Meeting adjourned at 5:40 PM.

Respectfully submitted by:

Lana Bluege, Minute taker

April 17, 2015

City of Keene
New Hampshire

AIRPORT MASTER PLAN STUDY
AD-HOC ADVISORY COMMITTEE
MEETING MINUTES

Monday, August 10, 2015

3:00 PM

Dillant-Hopkins Airport

Members Present:

Michael Welsh, Chair
Janis Manwaring, Councilor
Elizabeth Bendel, Vice-Chair
Robert Bergevin
Bill Hutwelker
Kenneth Colby
Phil Suter
Rhett Lamb, Planning Director
Bill Summers

Staff Present:

Ed Mattern, Airport Director

Others Present:

Members Not Present:

Jack Dugan
Joseph Briggs

1) Call to Order, Welcome/Introductions- Ed Mattern, Airport Director

Mr. Mattern called meeting to order at 3:07 PM. He noted this is the third meeting of the Committee, and offered to do the airport tour again for those that may have missed it or would like to do it again. Introductions were made all around; including guests from NHDOT Rita Hunt and Carol Niewola, and Stantec staff. Mr. Mattern continued today will be trying to incorporate the vision for the airport; where to focus and what we should be doing. All ideas are welcome for consideration.

2) Approval of Chair -

Mr. Mattern passed on the Mayor's desire that Mike Welsh be elected to Chair this Committee.

Councilor Manwaring nominated Mike Welsh as Chair. Mr. Colby seconded the motion which carried unanimously. Mr. Welsh accepted the position.

Councilor Manwaring nominated Elizabeth Bendel as Vice-Chair. Mr. Bergevin seconded the

motion which carried unanimously. Ms. Bendel accepted the position.

Mr. Mattern turned the meeting over to Chair Welsh.

3) Approval of Minutes -

Councilor Manwaring made a motion to adopt the minutes of April 13, 2015 as submitted. Mr. Mattern noted he had already added the missing names to the Members Present section. Mr. Colby seconded the motion which carried unanimously.

Mr. Colby made a motion to adopt the minutes of May 21, 2015 as submitted. Mr. Hutwelker seconded the motion which carried unanimously.

Discussion ensued regarding the City Attorney's comments (from the April 13, 2015 minutes) regarding email correspondence after a quorum is established (with email). Mr. Lamb explained the strong recommendation to not do it (group communication via emails); go through City staff or the City Attorney. Mr. Lamb clarified what this means for Chair Welsh. Mr. Lamb also clarified "New Business" is where you identify things to be added to the next agenda. No changes were made to either set of minutes.

4) Enact Committee Role/Responsibilities –

Mr. Mattern explained all Committee's within the City of Keene are required to adopt the Rules of Procedure per RSA 91-A. He also noted the City Attorney did address the adoption of rules at the first meeting. Mr. Mattern continued he did enclose the Rules of Procedure in today's meeting packet.

Councilor Manwaring made a motion to adopt the Rules of Procedure. Mr. Colby seconded the motion which carried unanimously.

5) Airport Master Plan Update Current Status - Stantec

1. Airport Master Planning Process- Janice Bland, Senior Aviation Planner
Overview of Airport Master Planning Process:

Ms. Bland distributed copies of a workbook that provided information on what Stantec has prepared so far; which includes an Introduction and the Existing Facilities Inventory. A set of plans was distributed at the start of the meeting. Ms. Bland pointed out the wetlands figures had been corrected. Ms. Bland displayed a flowchart for her discussion.

Ms. Bland started with a recap of the planning process starting with where we are to date.

- Completed: Study design which included the scoping process.
- Workbooks with data collection efforts submitted after first Committee meeting.
- Airport tour conducted (second Committee meeting).

Ms. Bland addressed the next steps noting part of today's meeting will include a visioning session. She continued today's Master Plan update will just be brief overview of the planning process and the data submitted so far for the Committee's consideration. The next steps will be:

- Complete forecasts for a 20-year time period broken down into short, intermediate, and long-term timeframes.
- Establish focus items to move forward with the forecasts (very important). This should be an outcome of the visioning session.
- Complete a capacity versus demand analysis from the forecasts. This determines what facilities may be needed at the airport in the future. Anticipated completion date is September.
- At the September Committee meeting discuss scheduling the first public information meeting.
- A space is provided for a Mindmixer in October.

After the October meetings move forward with the facilities needs assessment.

- Prepare up to five different alternatives from the facilities needs assessment. This information will be presented to the Committee sometime in December.
- Present Committee findings of preferred alternative to City Council and hold a second public information meeting (January 2016 timeframe).
- A space is provided for another Mindmixer if needed in February 2016.

After the preferred alternative is locked in we can move forward with the Airport Layout Plan. This is a critical sheet required by any/all of the funding sources. Ms. Bland explained the Implementation Schedule is a breakdown of proposed improvement projects and there will also be a schedule of anticipated financial costs for all of the projects. The financial schedule is broken down into short, intermediate, and long-term and all the different funding sources.

- In March 2016 conduct 5th Advisory Committee meeting to be followed by another public information meeting.
- After these meetings finalize the Master Plan Update and the Airport Layout Plan.

Mr. Mattern commented he wanted to ensure people understand the work of this group and the additional information about what we have the option of doing, and how we'll pursue it; where this lies within your flowchart. As an example he referred to the forecasts; noting they can happen independent of anything this group might advise. He further explained we can do things parallel, but at some point they do intersect and that will determine the path from that point on. Ms. Bland agreed adding we have an opportunity after each meeting to make adjustments to the material based on the meeting.

2. Existing Facilities Inventory- Airside/landside Overview- Janice Bland, Senior Aviation Planner

Referring to the airport tour Ms. Bland suggested most of those present were familiar with the basic structure of the airport. There are two runways at the airport with the primary runway designated 2/20, and the crosswinds runway 14/32. Ms. Bland continued there are also many taxiways that provide access from the runway ends to the apron/fueling areas. The airport has two aprons (terminal apron and east apron). Ms. Bland noted there were a couple of focus items determined during the scoping process; one deals with the hangar development.

- Focus item: Identify whether additional hangars may be needed; also the building

requirements.

Ms. Bland went on to say we are utilizing a sub-consultant (Northeast Collaborative Architects) to assist in completing a study of the terminal building and some of the older hangars for potential renovation. These efforts will be ongoing throughout the process.

Referring to the crosswind runway, Ms. Bland noted at this time it is pavement and in good condition. As this is scheduled for re-construction; part of the Master Plan was to address the crosswind runway, and evaluate the length, width, and orientation before spending any money to re-construct the runway. She continued through this process those three items have already been determined to require further study.

Ms. Bland noted another item that is included in the Inventory of Existing Conditions has to do with the activity at the airport.

- There are 80 based aircraft at the airport (aircraft that considers Keene its home).
- There are approximately 49,000 operations at the airport. Local operations (starting from Keene) are 78%. Itinerant operations (starting from outside of Keene) make up the other 22 %.

Navigational aids are another item included in the Inventory. Suggesting it is not necessary to list all these aids at this time, Ms. Bland noted there are visual aids that pilots use to approach the airport in a safe manner. Runway 2 has the only instrument approach.

Ms. Bland noted an Environmental Inventory was also included, and Gregg Cohen will present that overview.

Environmental Overview – Gregg Cohen, Senior Environmental Analyst

Mr. Cohen referred to earlier work noting the basic layout of the land. The airport is bound by Edgewood Avenue to the north, Route 32 to the east and south, and the Ashuelot River to the west. Much of the acreage of the airfield is mowed turf with some on- airport wetlands and pockets.

- Large drainage area associated with Wilson Pond which drains under Runway 2.
- There is a vast wetlands system to the west which includes forested wetlands, scrub/shrub wetlands, and virgin wetlands.
- There is a fairly unique bog (mature spruce bog) to the north of the Airport Road which is used by Antioch University.

Mr. Cohen reported the forested habitat consists mainly of mature coniferous forests to the north and southwest.

Mr. Cohen commented at this stage of the game we like to address what the adjacent land uses are.

- Residential to the north.
- Industrial to the northeast and the southeast (gravel pits).
- There are commercial uses in the area as well.
- The Keene Wastewater Facility is located west of Runway 2.

Mr. Cohen noted some of the flora and wildlife species have been identified.

- Dwarf Wedge Mussel which is an endangered species historically has been observed.
- The Grasshopper Sparrow has also historically been observed.
- Recently the Northern Long-eared bat has also been observed which has also recently been added to the endangered species list.

Mr. Cohen noted at this stage of the project we just present an overview of what we know is here. Later in the document as the alternatives emerge we will do a more comprehensive analysis of what the potential impacts on species utilizing the airport will be. He advised we will also be contacting all the environmental agencies for the most updated data and their recommendations. Mr. Cohen continued recently when runway 2/20 was rehabilitated we conducted a Phase 1 Archeological Survey (no impacts found). Mr. Cohen advised the real nuts and bolts of the environmental review comes a bit later in this process.

Mr. Lamb asked Mr. Cohen if the review included a study of surface/sub-surface geology. Mr. Cohen replied it can. If there was a notable aquifer in the area we would include it.

Ms. Bendel asked 1) who designated the wetlands, and 2) how long ago. Mr. Cohen replied the wetlands were delineated by our NH Licensed staff, and the delineation is good for 3-5 years. As projects are defined we will go out and delineate the adjacent wetlands to see what the impacts might be. This comment helped to answer Ms. Bendel's third question. Mr. Cohen made reference to a report prepared by Stantec a decade ago to cite examples. Mr. Mattern clarified the purpose and findings of that report for Ms. Bendel. There was a brief discussion regarding the wet soil survey.

Carol Niewola, of NHDOT asked Ms. Bland if it would be helpful to discuss design aircraft and how that will affect future decisions in the Master Plan. Ms. Bland explained as we move forward the design aircraft governs some of the dimensions which is important in looking at future design projects. The airport has been broken down into two different reference categories.

- The primary runway has been designated as a C-2 category. This represents the approach speed and wingspan of the aircraft considered to be the most demanding aircraft utilizing the airport 500 operations per year or greater (Bombardier Challenger 300).
- The crosswinds runway was designated as a B-2 category. A smaller aircraft was deemed appropriate (Cessna Citation 2). The entire airport has been designated as a B-2 category.

Ms. Niewola continued larger/smaller aircraft can still use the airport; we are just not going to build to that standard.

Mr. Cohen agreed with Chair Welsh's assessment; it's not the projects themselves that trigger the environmental investigations, it is the alternatives that we develop. Mr. Cohen further noted the environmental analyses may also influence how popular/practicable an alternative is. The level of federal review is outlined in the Master Plan.

6) Visioning Process- Mike Welsh/Ervin Deck

Chair Welsh noted that visioning is something we've done before in Keene, citing the

Comprehensive Master Plan work from 5 or 6 years ago. He also noted this turned out to be a very useful exercise; it provided information guiding the people writing more specific alternatives.

Ervin Deck, of Stantec noted his experience doing Master Plans. He commented this is your airport; this has to be your plan and your vision. Stantec's job is to take your vision, put it on paper, put it in a plan set well enough for the City to be willing to sign it, and NHDOT is willing to sign it. This is where we want to go from this point on. After this exercise today we want to leave with another small handful of items that you want us to focus on. He also pointed out due to the federal funding source we have to follow their rules; how we get there and the vision of the airport is yours. Three additional items to focus on were determined last year.

- What to do with the crosswind runway?
- Hangars
- Buildings

Mr. Deck continued this group will hopefully come up with some additional items you want to focus on. He suggested the Committee come up with 3 to 4 more items. Mr. Deck explained how the process the breakout sessions would follow.

7) Breakout Sessions-

Two groups were formed consisting of Committee members, NHDOT representatives, and Stantec staff. The breakout session began at 4:00 PM and concluded at 4:50 PM.

8) Group Discussion/Priority Setting –

The meeting reconvened with the two groups having 3 panels of ideas which were displayed for all to see. After some discussion Chair Welsh suggested the Committee let Stantec use items from the right and left panels to move into the center panel (this panel had 5 items). Mr. Deck indicated he needed more specifics from the Committee. The center panel ideas completed the sentence “in the future the Keene Municipal Airport will be”.

- A compelling place to do business.
- A regional transportation hub.
- A center for STEM and aviation education.
- Financially and environmentally sustainable.
- A place for community events.

As the other group took a different approach Chair Welsh reiterated their findings could be subsets of the 5 from the center panel and recommended the voting with dots not take place today.

Discussion continued, Councilor Manwaring noted her concerns. Ms. Bland reviewed the two remaining panels for the Committee.

Following additional discussion, Chair Welsh reiterated the idea of using the center panel (5 items) and moving the appropriate items there from the other two lists as subsets, and adding items if needed. Mr. Mattern clarified Chair Welsh's suggestion for the group. Mr. Lamb suggested a putting up a survey monkey that would allow Committee members to vote on their 4 or 5 items. This would also capture the opinions of those not present today. Ms. Bland clarified Stantec and Mr. Mattern will create the draft list, send it out to the Committee to ensure everyone

agrees, and then create a survey monkey for voting. Committee members were in agreement. Ms. Bland indicated this would happen within the next week or two. The survey will be kept open for one week. Ms. Bland will also send out a Doodle poll for scheduling the next meeting (late September). Ms. Bland reiterated the forecast (capacity versus demand) will also be completed at that time for discussion. She suggested the Committee give some thought to public outreach for discussion at the next meeting. The survey results will also be on the agenda for discussion.

9) Next Steps- Stantec

This was discussed earlier in Ms. Bland's presentation.

10) Adjournment- There being no further business before the Committee Chair Welsh adjourned the meeting at 5:09 PM.

Respectfully submitted,
Mary Lou Sheats-Hall, Minute-taker
August 12, 2015

City of Keene
New Hampshire

Airport Master Plan Update Committee
MEETING MINUTES

Monday, November 30, 2015

3:00 pm

Airport Conference Room

Members Present:

Clark Dexter
Robert Bergevin
Bill Hutwelker
Jan Manwaring
Beth Bendel
Steve Hooper
Bill Summers
Phil Suter
Rod Thompson

Staff Present:

Rebecca Landry
Med Kopczynski
Ed Mattern
Rhett Lamb
Mike M.

Others Present:

Members Not Present:

Mike Welsh
Joseph Briggs
Jack Dugan
Ann Shedd

Beth Bendel opened the meeting with introductions

Med Kopczynski stated getting a feel for Airport Master Plan is key to future expectations of Committee vs. Stantec to get best Master Plan for Airport.

Master Plan funded and suits FAA interests – public outreach may need more emphasis; there may be problems with outreach.

The Master Plan scope was distributed to the Committee.

Referring to trees, Bob Bergevin said the goal is to keep the airport safe for pilots and people. The Keene people are disagreeable but they don't understand the safety aspect.

Ed Mattern said the Master Plan is not specific to the obstruction clearing project. The obstruction project is running its course separately.

Jan Manwaring referred to Committee visioning – she didn't see connections made by the consultant and said there is a disconnect between visioning and the scope of Master Plan?

Beth Bendel asked what was needed? Med Kopczynski stated that there is potential to be an economic engine and the Committee can be important for this. Stantec may not have the same awareness as the Committee. The FAA standard things i.e., placement of specific items (run way, etc.) at the airport. There should be more of an effort on the economic aspect and the relationship with Swanzey.

Ed Mattern stated that we will meet FAA regulations but struggle to add more than typical – push the envelope further; early on Stantec had a person but now has no one who can do more planning. Beth Bendel asked if the contract allows for this expanded scope? Ed Mattern said to a certain extent; there is economic but this group can go further.

Bob Bergevin asked how much was going to Stantec? Rebecca Landry responded, \$237,000.

Bob Bergevin asked if the City sit down with Stantec? Med Kopczynski replied yes, this week. He stated that he believes there is room in the contract.

Rebecca Landry:
Comp to Leb

Jan Manwaring stated that the Airport can be perceived as another expense. A Master Plan can help the public to understand the Airport better and get them to buy into it.

Med stated that marketing can help. Phil Suter said support from the Chamber of Commerce could help with economic development, and not at the exclusion of safety. The Committee should shoot for high standards. Precedents are available.

Med said he wants conversation with Stantec to be consistent with the Committee's interests.

Phil Suter stated the Airport is an asset but something more is possible.

Beth Bendel talked about activity at the airport and that we should emphasize the current activity that the airport provides today.

Med stated that we need to do a better job to tell the story. Jan Manwaring asked if this happens at AHC? Bob Bergevin said it used to be.

Med stated that it is function of the AAC by ordinance and there is a marketing committee reporting to AAC.

Rod Thompson said the AAC is a council of educated aircraft people. The AAC doesn't have the opportunity to introduce new business respond and they respond to the Director only. Not idea generating. There are ideas that we should follow and need to bring people to the airport. AAC's hands are tied and no opportunity for new ideas. Med was invited to next AAC meeting which could help with marketing at the airport.

Jan Manwaring said the AAC should be recognized in the Master Plan.

Med asked if there is more regarding visioning for Stantec to add?

Phil Suter said the subcategories may need more work to reflect Committee's interests.

Rhett Lamb:
Replacement for Mike. Manger's choice.

Med will e-mail results of Stantec meeting.

City of Keene
New Hampshire

AIRPORT MASTER PLAN STUDY ADVISORY COMMITTEE
MEETING MINUTES

Thursday, February 18, 2016

2:00 PM

Keene Airport

Members Present

James P. Duffy, Chair
Kenneth Colby
Janis Manwaring
Elizabeth Bendel
Joseph Briggs
Robert Bergevin
Phil Suter
Williams Summers
Dr. Ann Shedd
Rhett Lamb
W. William Hutwelker, III

Staff Present

Rebecca Landry, Asst. City, Manager/IT Director
Mike Moriarty, Airport

Others Present

Rita Hunt, DOT
Carol Niewola, DOT
Art Dexter, Chair AAC

Erwin Deck, Stantec

Members Not Present

Jack Dugan

1. Introductions

a. Welcome new member and PAC Chair – Jim Duffy

Mr. James Duffy called the meeting to order and indicated Mayor Lane had asked him to act as Chairman for this Body. Mr. Duffy asked those present to introduce themselves first.

b. New Stantec Project Manager

Ervin Deck, Stantec Project Manager was the first speaker who stated he had requested staff to schedule this meeting to refocus on what the real purpose of this project is. He stated the first part of this project has not gone as smoothly as it should. He indicated his company has decided to reallocate work and restart this process with a new person.

2. Approve Meeting Minutes

a. November 9, 2015

b. November 30, 2015

November 30 – Dr. Shedd stated she was not marked as “Member Not Present”
A motion was made by Phil Suter to accept the November 9 and November 30, 2015 as amended.
The motion was seconded by Jan Manwaring and was unanimously approved.

3. Airport Master Plan Update – Stantec

a. Project Review

- **Inventory**
- **Forecasts**
- **Demand/Capacity**

Mr. Deck stated the Airport Master Plan is developed based on FAA Guidelines. He noted this is not just a marketing plan but is also a technical report which would help the city envision what the airport could look like 20 years from now. He stated they would look at things like how many runways are needed, how long and wide should they be, what types of taxiways, what the cost for these different options are. Mr. Deck stated ultimately they will look at different options for the

airport and the city will come up with a preferred alternative which will ultimately go on the airport layout plan.

Mr. Deck stated so far they have done an inventory, a forecast has been prepared which has not yet been approved by the FAA and is what is left to be completed is the facility requirements. He stated he would be formulating his list of the facility requirements for the Committee to go over for the next meeting.

Mr. Deck then explained the documents he circulated to the group. The first is the scope of work and how that is distributed. Five of the six items listed here have been completed, what is still ongoing is processing invoices and grant reimbursement requests. Mr. Deck stated they invoice the city on a regular basis when there are enough charges that have built up and also prepare grant reimbursements that go to NHDOT. Mr. Deck then talked about public outreach – they have already conducted three official meetings and added this meeting today is not part of their scope of work but felt it was prudent to conduct this meeting. There are three more planning committee meetings scheduled. One will be in a month to go over the facility requirements, the second would be to go over the alternatives and the third would be to go over the financial plan.

Mr. Deck stated there were also four public information meetings which were part of the scope of work. However, none of them have yet been completed and felt at least one of those should have already been conducted early on in the process so the public is aware as to what is happening and what the process is. He suggested the first public meeting to take place three weeks from today.

Mr. Deck noted to a correction - language should read “*before the PAC selects the preferred alternative*”. He added there will be alternatives he would like to provide to the public so they can also provide feedback. He indicated there are draft papers the committee has already received and added once all seven chapters have been completed, he would take all the comments he has received from the state, the city, reconcile them, make those changes to the seven chapters and then provide the committee another draft to look over. He added he would like to meet with the public one more time when this draft is completed.

Mr. Deck stated it has been determined there is a link off the city’s website to the airport page and there are already documents which have been uploaded. Staff has also set up Facebook page. Ms. Landry noted there are number of people who have created airport Facebook pages, the one which is official is the one sanctioned by the city referred to as the Keene Airport and there is a link off the city’s website. There will also be a survey which will be done. Mr. Deck indicated he has met with staff and the Airport Marketing Committee and has come up with some questions for the survey.

Mr. Deck said during the last few PAC meetings there were some breakout sessions. He noted the tools which are going to be used have already been addressed. Mr. Deck reminded the public meetings are not public hearings but the city can always schedule a public hearing which is not required by FAA standards. What is important is to make sure the public is involved.

This body has met three times so far. Today’s meeting is a project overview.

Mr. Deck stated he would like to schedule a first public meeting in about three weeks as mentioned earlier. Information regarding this meeting would be done through the Sentinel, the city’s website, the city has an email list which could be used, broadcast and the planning committee could also help get the word out. Mr. Deck stated he sees the first workshop being in two phases; there will be display boards. The first 30-40 minutes would be in the form of an open house, then a 15-20 minute presentation from Mr. Deck, he asked the committee to be present to answer questions from the public. He felt the first meeting should be held at the airport.

Mr. Suter asked how the survey component would fit into this. Mr. Deck stated his plan was to have papers copies available for the first meeting and the survey by that time would also be available online. Mr. Suter stated the Chamber of Commerce was willing to do any type of publicity which needs to be done.

Mr. Lamb noted three weeks from now will be the week of March 7 and noted Monday and Tuesday of that week would be the best days. It was noted Swanzey has town elections on that Tuesday. Someone proposed Wednesday the 16 – Ms. Bendel indicated the Civil Air Patrol (CAP) meets every Wednesday at 6:30 pm in the lobby which lasts for about 1.5 hours. Ms. Landry asked whether both could happen on the same night. Ms. Bendel stated it would depend on what is on their schedule. Ms. Bendel felt the CAP might be flexible in rescheduling their night.

It was decided the first public workshop will be on Wednesday, March 16 at 6pm. Mr. Lamb suggested the presentation by Mr. Deck be scheduled for 6:30 pm. Mr. Suter suggested speaking roles for other committee members. Mr. Lamb stated that Mr. Duffy as the Chair should open the workshop and then hand it over to Mr. Deck because this is first and foremost a committee public workshop. The Mayor and City were suggested as speakers. Councilor Manwaring suggested someone from the Airport Advisory Commission (AAC) as a speaker. Mr. Duffy suggested someone from the Town of Swanzey.

Dr. Shedd suggested for the displays a correlation between the Airport Master Plan and the Comprehensive Master Plan goals.

As a summary, Mr. Lamb stated staff will reach out to the Mayor's office, City Manager's office and to the Town of Swanzey about doing an introduction. This will be followed by an introduction, then a brief address by Mr. Deck and a wrap up by Mr. Duffy. Councilor Manwaring added a speaking role be given to someone from the AAC as well.

Mr. Deck talked about the public comment sheet he would like to make available electronically and asked whether this is something IT could look at. He stated it is important for this committee to be able to contact him with questions and comments.

Mr. Deck then went over the survey questions. Dr. Shedd as a representative of the conservation community she has concern about the wording of question 10 – *either protect the natural environment or support the airport growth*. She felt there are a number of airports that do both and hoped it could be reworded. Mr. Duffy suggested the following language “...*natural environment is as important as accommodating...*” Dr. Shedd felt this was a big improvement.

Mr. Suter talked about expanding the very first question and expanding the first part of that question, something like “*are you aware there is an airport*”. He felt if a good portion say they don't, this would be important for the committee to know or “*how would you characterize your knowledge of the airport*”, “*in your lifetime what has taken you to the airport*”.

Ms. Shedd referred to question 12 “*I dislike the airport*” she felt this choice of words are not the information the committee is looking for and suggested a more neutral way to ask this question. She suggested perhaps the term “*appreciate*”. We have an airport and disliking it isn't going to affect the fact we have an airport. Ms. Bendel referred to the same question “... *take steps to reduce its impact*” Ms. Bendel felt this was very strong language. Mr. Duffy felt he would look at this question as an observed question regardless of what the words were but some might not. Councilor Manwaring suggested “*I don't understand the importance of the airport to the City of Keene*”. It was indicated having an airport in this area is an important part of the economic infrastructure of the region. He felt this was looking at it in a different perspective than planes taking off and landing. Ms.

Landry suggested summarizing both of the last two questions into one. Mr. Lamb stated staff could work on question 12. It was asked who would utilize this data once it is collected. Mr. Deck stated there would be a cutoff date of about 45 days, then compile the data bring it back to this group and his plan is to also include the results in the appendix of the airport master plan.

It was asked about how many responses Mr. Deck would expect from this survey. Mr. Deck stated if he gets back 100 responses he would be very satisfied. Ms. Bendel asked whether terminals could be added in the airport lobby so people who visit the airport could take the survey. Ms. Landry stated she could look into this and give it some thought. Dr. Shedd asked whether each responder could be given a unique identifier so the same person doesn't answer the survey multiple times. Mr. Deck stated he hasn't checked survey monkey to see if there is a restriction that could be placed.

Mr. Deck went on with the survey and stated questions 13-17 go over key impacts, question 18 is a follow-up to 12, question 19 talks about how the airport could improve. Mr. Deck talked about the different airports that have restaurants and noted some of these airports attract customers who are not airport customers or pilots and felt there was a potential to have a successful restaurant in an airport. Questions 20-22 came out of the airport marketing survey. Carol Niewola of NHDOT referred to question 21 and suggested adding an "other" with a short explanation, such as a golf course, playground, farm stand etc. Mr. Duffy felt this was a great idea.

Question 23 talks about how to get information out to customers. Mr. Deck asked how the city's twitter account is working. Ms. Landry stated it would depend on how disciplined someone could be about monitoring this account. Question 24 came out of the airport marketing survey. Ms. Niewola asked whether intermodal connection, industrial park, or a UPS drop off location which could be added in as an option here. Mr. Lamb stated the question is whether the public would be aware that this is something which could be possible at an airport and felt the question needs to be revised to say "*non-airport activities*". Mr. Duffy referred to a study a consulting company did for the airport a while ago and felt the public might not be aware of this study. It was discussed about adding in a sentence in the survey which talks about this study and that it indicated commercial flight are not feasible in this region. Ms. Bendel cautioned the reference to this study as it was done a few years ago, the methodologies used may or may not still be accurate which indicate commercial airline service will never happen in Keene which is not necessarily correct. Mr. Deck asked what kind of charter activity this airport sees. Ms. Bendel stated they have a rather robust charter service.

Mr. Andrew Bohannon referred to the last page of the flyer, bullet 1, "*...located 2 miles south from Central Square in the Town of Swanzey*" he felt this language might need to be reworded.

There is reference to Green River Aviation which needs to be deleted.

Mr. Deck then talked about how to get the public involved. He suggested some sort of article in the Keene Sentinel about the airport master plan, something on the city website and on Facebook, the Chamber of Commerce and from the Town of Swanzey. He also suggested the committee spread the word and felt this would be a good way to get the word out.

Mr. Deck then went over the contact information that is outlined. He reiterated the next date for the meeting is March 16 at 6 pm. He also asked members of the committee to contact him with questions. Ms. Landry cautioned Mr. Deck about emailing the entire group which could be construed as forming a quorum. She suggested emailing Mr. Lamb and then those emails could be properly forwarded.

Ms. Shedd referred to the November 19 meeting which had questions that required responses. One of those questions referred to current operations and one of the numbers given was 54,294 operations

per year and noted this number is calculated on based air craft and FAA multiplier. She indicated the former Airport Director had stated he would figure out the margin of error. Mr. Deck felt this number was an over estimate by a margin of about two or three. Ms. Shedd stated in the forecast numbers it was more like \$49,000. Mr. Deck stated he would look at the forecast and get back to the committee. Mr. Deck stated at a towered airport air traffic controllers keep a pretty detailed count of flights coming in and taking off but smaller airports use clickers. He stated he looks at this data and then look at the based aircraft and then does a based aircraft operations count. For each based aircraft the typical operations count is about 300-400 per aircraft.

Ms. Landry asked Ms. Niewola what the significance of this number for the FAA was. Ms. Niewola stated this number helps with airport improvement grants, how well projects will compete against other projects at other airports. The higher the based aircraft count the higher a project will rank. Not all projects are calculated equally, safety and security rank very high. Ms. Niewola stated the FAA recognizes at a general aviation airport the operational counts are not always accurate as they are at towered airports and realize they could be ballpark estimates. However, having a number is good for marketing and can play a variety of roles. Airport with flight schools have higher numbers.

Ms. Shedd noted the prior minutes had indicated 126 operations per day. Ms. Shedd also talked about the forecast as it pertained to no growth, low growth and high growth scenario. The high growth this year saw an exponential growth and when questioned what could be causing this, staff had indicated they would get back to the committee but not response has yet been given. Particularly because fuel prices are low and may not remain as such and wasn't sure whether this has been taken into the calculation. Mr. Deck stated when he does a forecast he usually looks at the national forecast and then looks at the local community and looks at what their growth has been. Mr. Deck stated this is something he will look at before they meet again for the public hearing. Ms. Shedd she would like to have these figures before they have to talk to the public.

4. Schedule

a. Set next PAC meeting

April 27 is the next date set for the committee meeting at 3 pm.

5. Adjourn

Meeting adjourned at 3:40 PM.

Reviewed by Rhett Lamb, Planning Director
Edits, Lee Langella, Planning Dept.

City of Keene
New Hampshire

AIRPORT MASTER PLAN STUDY ADVISORY COMMITTEE
MEETING MINUTES

Wednesday, April 27, 2016

3:00 PM

Airport Terminal Building

Board Members Present

James P. Duffy, Chair
Janis Manwaring, Councilor
Elizabeth Bendel, Vice-Chair
Robert Bergevin
Bill Hutwelker
Kenneth Colby
Joseph Briggs
Phil Suter
Rhett Lamb, Planning Director

Staff Present

Jack Wozmak, Airport Manager

Others Present

Ervin Deck, Stantec
Carol Niewola, NH DOT

Board Members Not Present

Clark Dexter
Bill Summers
Ann Shedd
Jack Dugan

1. Roll Call

Chair Duffy called the meeting to order at 3:05 PM and conducted a roll call.

2. Approve Meeting Minutes-February 18, 2016

Councilor Manwaring made the motion to accept the February 18th minutes which the following corrections. She noted that on pg. 5 it reads, “49,000 dollars” and should just read, “49,000”. Ms. Bendel seconded the motion which carried unanimously.

3. Airport Master Plan Update-Stantec

a. Review project schedule

Mr. Deck noted that the next PAC meeting will focus on possible alternatives. He noted that after the forum the plan will go before the City Council in early September. Mr. Lamb stated that he and Mr. Deck will come up with a schedule for the next meetings and create a timeline of events.

b. Revised forecast

Mr. Deck stated that changes were made to the forecast and noted that he did not agree with some of the assessments when he took over the project. Mr. Deck stated that he started from scratch and the numbers have changed considerably. Mr. Deck noted that he looked at the design of the airport in great detail as well as facility requirements. He continued, stating that he will work towards staying on the same schedule as previously discussed. Mr. Deck noted that the document which was emailed last night had an error in reference to apron space for the airport and will be edited.

Mr. Deck noted that a key point to review is the type of airplane being used at the facility and then fit the airport to these needs. He continued, noting that the approach speed of the airplanes must be

reviewed as well. Mr. Deck stated that each aircraft has a designed speed and falls under a specific design approach and so the Committee must look at the fastest and biggest airplanes that use the airport at least 500 times a year. The approach speed and type of airplane will determine the runway requirements for both the main and side runway. He noted that a majority of the aircraft can use the crosswind runway. Mr. Deck noted that the city is in the process of reconstructing the runway and one of the tasks for Stantec was to make a recommendation on the width which is currently 150 feet wide, the length which is currently 4,000 feet and the threshold width is 2,900 feet. Mr. Deck questioned what the optimum orientation is for the runway.

Mr. Deck noted that there is no reason to reorient or move the crosswind runway. He stated that it is very expensive and unnecessary. Mr. Deck stated that most seasoned pilots can handle cross winds as they come but warned that it is the biggest cause of accidents which is why a cross wind runway is so important. Mr. Deck suggested the design of the crosswind runway decrease in size. He noted that the runway should never fall below a B2 standard in case a larger aircraft comes in.

Mr. Deck stated that he had asked Mr. Briggs about the C&S' aircraft choices in the future and noted that there is a good possibility that C&S will upgrade to a Falcon 7x and a Global 5000; which are considerably larger. Mr. Deck noted that the crosswind runway can decrease from a C2 to B2 and can also be narrowed down. Ms. Bendel stated that the runway is already a B2. Mr. Wozmak stated that a B2 is 75 feet and A1 is 60 feet and he would not want to go any smaller than the current runway due to larger planes coming to the facility.

Ms. Bendel stated that the crosswind runway should not be shortened and it is often used. Mr. Wozmak stated that he does not want to limit the airport's resources. Ms. Niewola stated that if the Committee and Facility make a case against the forecast to DOT it is important to think if the case is defensible. She suggested the Committee give reasoning in terms of the crosswind runway being utilized and that it should be 80% of the primary runway and the activity from the primary runway cannot handle the crosswind. Mr. Deck noted that 80% is about 4,000 feet. Mr. Suter asked if the current configuration is defensible. Ms. Niewola stated that the runway is currently wider than it has to be at 150 feet and could be 75 feet. Mr. Deck noted that the problem is the displacement.

Mr. Deck noted national trends and stated that single engine aircraft were typically being used but will have a negative growth rate. He noted that there will be a change to gas as well in the next 5 years. He stated that jet aircraft and light sport aircraft will have a positive growth. He noted that New England is mirroring national trends. Mr. Deck stated that you will see a decline in the single engine models. He noted that helicopter and jet sales will continue to grow as well as commercial aircraft.

Mr. Deck noted that the forecast for Keene has less than a 1% growth annually with about a 14% growth in the next 20 years. He noted that this is consistent with the other airports in the area. Mr. Deck noted that fuel sales have stabilized in the past year to a reasonable price and sales will decrease minimally in the future. Mr. Deck noted that jet fuel will increase. He stated that these numbers are for the airport only and does not calculate C&S.

Mr. Deck referred to the graph in the packet and noted that this refers to the trend in aircraft to the facility hitting about 90,000 in 20 years. He noted that the light sport aircraft will see the highest growth rate and single engine aircraft will have the biggest decline. Mr. Deck noted that operations will stay at 49,000 with a marginal increase in operations. Mr. Deck noted that some alternatives are to look at the fuel capacity for the airports and whether upgrades are recommended to handle the influx.

Ms. Bendel noted that there is a mistake in the packet and the main runway is actually 6,201 feet and not 5,001 as stated. She noted that she does not agree with the assessment of parking and will speak to Mr. Deck offline.

Mr. Deck noted that a slightly different version was emailed out in terms of facility requirements. He continued, stating that facility requirements are based off of the design aircraft and noted that the reference codes will stay the same. Mr. Deck stated that that the 6,201 feet is long enough as the main runway and runway 14/32 should not be shortened but narrowed. He continued, stating that the runway will keep the existing length and an orientation change is not necessary.

Ms. Niewola asked if the center line of runway 14/32 can shift away from the terminal area as the runway is narrowed. Mr. Deck stated that he will look into the change but is not sure it would make a difference. Ms. Niewola asked about wind coverage on the main runway. Mr. Deck stated that there is significant wind coverage on the main runway. He noted that the coverage for the main runway is currently 92 ½ %. Mr. Deck explained why the wind coverage is necessary. He continued, stating that FAA recommends 95%. If the number is under 95% an additional runway would be necessary. He noted that the airport does have significant coverage but many pilots would disagree.

Ms. Niewola stated that on pg. 28 of the document provides graphics to explain the wind coverage. She noted that a wind summary is necessary for each runway with the crosswind component. Ms. Niewola stated that the 92 ½ % is only during calm winds. Mr. Deck stated that he believes the crosswind runway is sufficient with the combination of both large and small aircraft. Mr. Deck stated that he will look into the calculations again. Ms. Niewola stated that the 92 ½ % is prior to crosswind calculations. Mr. Wozmak stated that a number is necessary to justify the crosswind runway.

Mr. Deck stated that in terms of apron space capacity there are 13 marked spaces but need about 16 or 17 spaces on peak days. He noted that on the other side of the parking lot only about 1/3 of the spots are being used. Mr. Deck stated that the apron needs to be resized at some point for the larger jets. He noted that hangers are currently full and wondered if there is a waiting list. Mr. Wozmak stated that he believes there is a waiting list and at full capacity. Mr. Deck stated that about 72 spaces are going to be necessary over the next 20 years. Mr. Wozmak stated that the t-hangers are frequently used at about one a week.

Mr. Deck noted that about 67% of the terminal building is being used. Mr. Deck noted that an architect can come in and make recommendations in terms of efficiency for the building's use in addition to green initiatives. Mr. Wozmak requested a meeting with the architect.

Mr. Deck stated that about 20% of the parking lot is used. He noted that about 50 out of 150 of the spots are used on a typical day. Mr. Wozmak stated that he will get information from Thomas transportation in terms of use.

Mr. Deck noted that he will fine-tune operation as well as look into center line movement and wind coverage. Mr. Briggs asked if the runway can be lengthened. Mr. Deck stated that the length can be extended. Mr. Briggs noted that there are situations that make it very difficult to land. He noted that 5,000 feet is best for any jet. Mr. Briggs stated that it was mentioned for the crosswind runway to be 80% of the main runway which would be 5,000 feet. Mr. Briggs noted that a jet cannot use a 3,000 foot runway. Mr. Deck noted that he will review possibilities.

Mr. Deck noted that one alternative is to move the taxiway in to 300 feet. Mr. Wozmak asked if the taxiway can be extended since it may be moved in. Mr. Deck noted that an extension could happen in phases.

c. Survey results

Mr. Deck stated that final survey was compiled from Committee Member's suggestions and he was hoping for 100 responses but only 37 responses were received. Mr. Deck noted that the survey was available for 37 days after the public meeting. He continued, noting that the informational meeting had a good turnout and was surprised by the number of surveys received. Mr. Deck noted that a significant amount of data was obtained from the surveys and the answers have not been altered in any way. He noted that there was a solid effort to advertise the survey to the public but most people do not have a huge investment in the details of the airport and which is why there was little feedback. Mr. Deck noted that most of the responses were neutral. He continued, noting that the facility requirements chapter has been edited as well and include aircraft categorization and utilization.

Mr. Deck stated that the survey will affect the Master Plan. He continued, stating that the cross wind assessment does not show that any major changes need to occur to the airport. Mr. Deck stated that there is no demand for a longer runway or extra parking but more hangers are necessary. Mr. Deck noted that there is no direct correlation between the survey and the airport's needs. He continued, stating that he did not get a strong sense of how the community feels about the airport.

Mr. Suter stated that the survey should not be discarded and it is a failure on the Committee's part to not advertise to the public appropriately or provide suitable questions. He continued, stating that people may not care about the airport in reference to technical details but they do care about the actual lot and the area. Chair Duffy suggested an additional promotion for the survey. Mr. Lamb stated that there is no deadline for the survey and it is a reasonable request to keep it available for the public. He continued, noting that the survey included non-technical questions as well to get a sense of how the public would like the airport to look. Mr. Lamb noted that Ms. Shedd contacted him about the survey and she found it difficult to find the link online. Mr. Lamb suggested Committee Members ask peers and friends to answer the survey. Mr. Deck agreed that there is no problem in leaving the survey open until the next public meeting. Councilor Manwaring noted that many people do not visit the facility since the restaurant closed down.

Mr. Wozmak stated that it is important to question the overall goal of the survey. He continued, stating that the airport is clearly moving towards larger jets and hangers and noted that there will be an increase in frequency of planes as well as corporate activity. He noted that the airport needs to identify market needs and ultimately increase economic viability of the airport. Mr. Wozmak continued stating that he does not expect the public to understand the economic development needs of the airport and noted that the survey should be in response to a proposed plan. He noted that projections of the airport have been very stable. Mr. Wozmak questioned the value in the survey and its weight on future decisions.

Chair Duffy noted that the survey allows for the public to give feedback buy in to the process. He noted that the survey did provide information on the public's interest in the airport. Mr. Deck asked how the survey would fit into the Airport's Master Plan. Mr. Lamb noted that the Committee can get a sense of general awareness and perception of the airport and then choose elements to use from the survey. He continued, noting that as a public body it is important to reach out to the public and inform them on the next set of decisions. Mr. Lamb noted that the city wanted to go beyond typical airport planning with the survey and public opinion.

Mr. Lamb noted that he will send out a link for the survey to the Committee Members. Mr. Deck noted that he will also recirculate this link.

Aircraft Operations:

Mr. Deck noted that the airport has roughly 49,000 aircraft flying in and out of the airport a year. He noted that the number seems high but it is not in his purview to decide the number. Mr. Deck noted that changing the number does not affect funding opportunities for an airport of this size. Mr. Deck addressed the packet and gave examples of other airports and their capacity. He stated that he looked at data from 20 airports in New England with both towered and non-towered data analysis. Mr. Deck noted that of the 20 airports, Keene ranked the 4th highest in terms of operations and 9th highest in terms of based aircraft. He noted that the numbers can be thrown off if the airport has a flight training program which is why each airport must be reviewed independently. Mr. Deck stated that non-towered bases have substantially higher aircraft rates due to data being collected manually and is not as accurate.

Mr. Deck stated that Springfield, VT has the lowest ranking for operations and uses technology to record operations data. He noted that about ten of the airports in Vermont have this technology which allows for very accurate data. Mr. Deck stated that the 20 airports have very different numbers and there is no mandatory method for each airport. He stated that the numbers ultimately do not matter and it is up to the Committee if they want to change the 49,000 number for the Keene Dillant-Hopkins Airport.

Mr. Wozmak stated that there is no point in changing the number just to have another arbitrary number. He noted that if the number is changed it needs to be based on sufficient data. Mr. Briggs inquired about how the numbers came to be. Mr. Deck stated that the number come from the FAA.

Mr. Deck noted that changing the number will not have a significant impact. He noted that the operations you want to capture in terms of parking use would be those that utilize the restaurant, the bathroom and go into town. Overall consensus of the Committee is to leave the number at 49,000.

d. Next step-Preparation of alternatives

4. Schedule

a. Next PAC Meeting

To be determined.

b. Next public information meeting

To be determined.

Public:

Mr. Rod Thomson of Keene suggested a back taxi for airplanes coming in. Mr. Deck suggested a turn off at the end of the runway.

5. Adjournment

Chair Duffy adjourned the meeting at 4:48 PM.

Respectfully submitted by:

Lana Bluege, Minute-taker

April 27, 2016

Reviewed by Rhett Lamb, ACM/Planning Director

City of Keene
New Hampshire

AIRPORT MASTER PLAN STUDY ADVISORY COMMITTEE
MEETING MINUTES

Wednesday, June 8, 2016

3:00 PM

Airport Terminal Building

Members Present:

James P. Duffy, Chair
Janis Manwaring, Councilor
Dr. Ann Shedd
Phil Suter
Rhett Lamb, Planning Director
Jack Dugan
Clark Dexter

Staff Present:

Jack Wozmak, Airport Manager

Members Not Present:

Elizabeth Bendel, Vice Chair
Robert Bergevin
Bill Hultwelker
Kenneth Colby
Joseph Briggs
Bill Summers

Others Present:

Ervin Deck, Stantec
Carol Niewola, NH DOT
Robert Berjevick
Mike Moriarity

1) INTRODUCTIONS

Chair Duffy called the meeting to order at 3:10 PM and conducted roll call.

2) APPROVE MEETING MINUTES – April 27, 2016

Councilor Manwaring made the motion to accept the April 27, 2016 minutes, which was seconded by Dr. Shedd with the following correction. On page two it reads, “Mr. Deck referred to the graph in the packet and noted that this refers to the trend in aircraft to the facility hitting about 90,000 in 20 years.” This should read, “Mr. Deck referred to the graph in the packet and noted that this refers to the trend and based aircraft at the facility might be 91 in 20 years.” The motion was carried unanimously.

3) REVIEW PROJECT SCHEDULE

Chair Duffy introduced Mr. Ervin Deck from Stantec. Mr. Deck recounted that at the last meeting they discussed facility requirements and from that he has drafted an alternatives analysis. He indicated that project completion will accelerate in the next few weeks as it is currently 75% done. The research and leg work just need to be put together. The next step is a public information meeting.

Chair Duffy asked for questions. Mr. Rhett Lamb, Planning Director, asked about the next steps. Mr. Deck replied that they will choose a date today for the public information meeting in the upcoming weeks. After the public meeting, the AMP Committee will meet again to make decisions about the future of the airport. He indicated that he will explain various choices today and the PHC will need to make recommendations to the City of Keene as to what the future of the airport should be, Mr. Deck will not attend that meeting. Once those steps are complete, Mr. Deck can move forward with the Master Plan which will lead to an airport plan and then a financial plan.

There were no other questions on this agenda item.

4) AIRPORT MASTER PLAN UPDATE – Stantec

Chair Duffy noted a change in the agenda. The item, “Selection of Preferred Alternative (PAC Action),” was moved from agenda item four to agenda item five to ensure public involvement.

a. Alternatives Analysis

Mr. Deck provided the Committee with a packet of maps which reflected the larger maps he was displaying. He said at the last meeting the Committee talked about the facility requirements and decided on possible alternatives. The first concern is how to reduce the width of the crosswind runway from 150 feet to 75 feet. Additionally, there is a need to add a parallel taxiway consistent with the current airport layout plan. They also discussed the need to lengthen the crosswind runway to comply with FAA standards. The crosswind runway should be 80% of the length of the primary runway and therefore requires an approximately 1,000 foot extension to be compliant.

Mr. Deck indicated they also discussed how to extend the parallel taxiway Alpha of the main runway to approach runway 2-20. He primarily looked at aircraft parking and storage and noted the lack of sufficient aircraft parking, especially during peak hours. He spoke with the Fixed-Base Operator (FBO) about their needs in order to operate at maximum capacity.

Mr. Deck said the question of how to expand now remains. Overall there is sufficient aircraft parking, but it is imbalanced. There is enough space for based aircraft but not for visiting aircraft, which will be critical especially with the new airport restaurant. The FBO reported difficulty with parking large aircraft and Mr. Deck referred to a near scale graphic which demonstrated those large aircraft challenges. He also noted the need to maintain a clear path for C&S.

Mr. Deck also mentioned that the fuel farm is old and underground. He said it should be upgraded to above ground in the near future but the question is where. He also noted the recent deer encounters and the need for fencing he discussed with Mr. Jack Wozmak, Airport Manager.

To discuss the issue of crosswind runway orientation, Mr. Deck referred to Figure 5.1, Runway 14-32 Alternative 1. Mr. Deck said the runway is oriented the way it is for a reason and cannot be moved without impacting other areas. Instead it should be reduced in width. The best time to do this is now, because the runway is due for reconstruction. The FAA will not pay to reconstruct it at 150 feet because the standard is 75 feet. He thinks the best option is to remove the left side and reconstruct the right side to 75 feet which will free up pavement for a parallel taxiway. The cost of this reconstruction is \$2 million and includes removing pervious surface, reconstructing the runway, new striping, and new taxiway edge lights. He said the lights do not necessarily have to be changed but it is usually done at the same time as construction and closer lights are necessary when narrowing a runway. That cost includes permitting, engineering, and 10% contingency on total value.

Mr. Mike Moriarty asked if that \$2 million figure is for the runway at the current length or with the 1,000 foot addition. Mr. Deck replied that no pavement would be added and the runway length addition would maintain the 75 foot width.

Ms. Niewola asked if there is an advantage to sliding the center line of runway 14-32 to the south for protected airspace and hangar development. Mr. Deck replied that there would be no airspace gain from that. Mr. Moriarty replied that the north side of runway 14-32 is developable property and moving the runway south would increase developable property. Mr. Deck said it would increase the developable property slightly but it would take away from safety areas and add cost to the taxiway construction.

Mr. Lamb inquired if the distance to the south they were discussing was 75 feet. Ms. Niewola responded that it would be 37.5 feet to the south. She added that every inch is important unless airport safety is affected; the runway protection zone, approaches etc. must meet standards and have to be considered. Mr. Deck said the movement would not affect runway approaches and an assessment of moving it south can be done but the gain would only be 37.5 feet. Mr. Moriarty suggested it may be enough space for tie downs. Mr. Deck replied that it would only be enough for one or two. He said a later graphic would show how limited that space would be.

Mr. Lamb inquired where the 37.5 foot figure came from when discussing reducing it from 150 feet to 75 feet. Mr. Deck referred to Figure 5.1 and the center line of the runway displayed in yellow. He said that line would shift either left or right 37.5 feet. Mr. Moriarty added they are taking the whole runway and moving it south to shrink the width to 75 feet. Ms. Niewola added that the FAA will only pay for a 75 foot construction.

Mr. Moriarty recounted that last time the runway was reconstructed they maintained the location of the center line and reconstructed the shoulders. Ms. Niewola asked if it is possible to keep the center line where it is, reduce to 75 feet, and keep the shoulders, would it be less expensive. Mr. Moriarty replied that in that case drainage would need to be addressed. The existing drainage could remain and the catch basins could be relocated to get rid of them and grade to allow natural drainage. He said there are already canals on both sides so it could be less expensive. If the current pipes are still good, the catch basins could just be moved. Based on his experience, if piping is a problem, natural drainage would be fine.

Mr. Deck asked why catch basins are a problem. Mr. Moriarty replied that if the runway is moved, the catch basins will be farther from the runway. Catch basins can be moved but not if the system is in disrepair. Therefore, the current pipe and drainage systems will need to be inspected and a decision made. Parallel to the runway to the north and south are drainage ditches so natural draining is a possibility.

Ms. Niewola commented that she is looking for justification for a future project from the Master Plan so as the airport moves forward over the next 20 years; this plan can be used as demand occurs. She suggested including in the Master Plan a list of pros and cons for each alternative presented so that the best options can be chosen in the future. She said the details of the analysis are not as important as knowing the benefits and drawbacks of each alternative so the airport can reach an informed decision. She believes the comments and concerns being addressed during this meeting could contribute to such a list.

Mr. Deck welcomed questions before moving to Figure 5.2, Runway 14-32 Alternative 2. He said no matter which direction the center line of the crosswind runway is moved, this figure displays the addition of a parallel taxiway. He said the taxiway is a minor addition to the current Master Plan. This alternative retains the existing taxiway and extends it to runway 14-32. This will add aircraft run up area off the taxiway. The taxiway would be built to the B2 design code which calls for 240 feet between the centerline of the runway and the center line of the taxiway. The taxiway proposed is 35 feet wide. He said edge lights are not mandatory on the taxiway but are included in the cost. He noted that on the Figures, taxiway labels are written based on current standards and nomenclature. The cost of the taxiway shown in Figure 5.2 is \$2.1-\$2.2 million and the cost would be the same no matter what direction the runway center line is moved.

Mr. Moriarty commented that the taxiway would be on a drainage ditch which would have to be moved. He said this is motivation to move the runway south. Mr. Deck replied that no matter which direction the runway is moved, the taxiway will be over a drainage ditch. Ms. Niewola commented that this is a good thing to add to the pro/con list.

Mr. Lamb referenced pages three and four in the document provided. On page three it states that the taxiway is a safety improvement, but on page four it says the taxiway has no impact on safety. Mr. Deck replied that the safety discussion on page four is incorrect and it does have some impact on safety. A parallel taxiway has two purposes, to increase capacity for larger airports or to safely keep aircraft off the runway until ready to take off. This is particularly important for airports with long runways and long taxi time. He will correct that error in the document.

Mr. Deck referred to the marked segmented circles on Figure 5.2. He said these are usually 60-100 foot circles with a windsock in the middle and are airport requirements. These would have to be moved to accommodate the taxiway but it would be a minor expense and would remain close to the current locations.

Mr. Deck welcomed questions before continuing to Figure 5.3, Runway 14-32 Alternative 3. He said the most extensive alternative is the approximately 1,000 foot extension of the runway. Figure 5.3 assumes the runway width would be 75 feet, no matter which direction it is moved. It also assumes that the parallel taxiway would be included and extended at the same time or in phases.

While it is not shown on the map, Mr. Deck noted that this extension would not impact the displaced threshold. He noted problems this extension such as the proximity to woods and wetlands. The runway can only be extended in one direction and everything such as safety areas, object free areas, approach surfaces, etc. goes with it. With such an extension, new safety areas would have to be built. This extension would cross the existing Airport Drive which would have to be moved far enough to be clear of safe and object free areas. He recounted the requirement of Part 77 surfaces around an airport, with an approach surface starting 200 feet from the end of the runway at a 20-1 slope. He indicated these are marked by blue trapezoids on Figure 5.3. This area must be at least 15 feet from the road so it will be pertinent to keep the road as close as possible to minimize cost and impact. What would actually be done to the road will have to be addressed in the future.

Mr. Deck stated that the impacts of obstructions, not shown on Figure 5.3, are in the handout. He indicated adding the 1,000 foot extension will require 48 additional acres and will extend off airport property so new land will have to be acquired and obstructions cleared. Primarily, the relocation of Airport Drive will impact wetlands. Mr. Moriarty added that it would also require shutting down the waste water plant because there is a 24 inch sewer drain under Airport Drive which would require a bypass, an extensive project. Mr. Deck asked how deep that sewer drain is. Mr. Moriarty said it was not deep enough to be avoided and would still have to be accessible. The end of the proposed runway would be over the sewer.

Mr. Deck said the sewer drain would not be as serious a concern as the environmental mitigation costs. Dr. Shedd noted that she was on the AMP Committee because of her background on conservation issues. She directed the Committee to Figure 5.4. Some of the 48 acres of land proposed for airport development are recognized as an exemplary community of Silver Maple Floodplain Forest by the National Heritage Bureau with presence of False Nettle and Sensitive Fern. She also noted Keene's history of flooding and pointed out that the transition zone in Figure 5.4 includes the confluence of Ash Brook, which drains most of West Keene, and the Ashuelot River. There is a lot of flood storage in that 48 acres and she believes building a dyke across it, like Airport Drive already is, would be a significant permitting issue.

Mr. Deck indicated that the original cost estimate was off by a great deal. He had a senior engineer review it and the cost has doubled, not including the waste water treatment line. The project will cost at least \$5 million for the 1,000 foot runway extension, mostly due to mitigation costs.

Dr. Shedd asked about the discussion of wind coverage from the last meeting to determine if it was in range to justify the crosswind runway. She also questioned if 95% of the time aircraft can use runway 2-20, and there are only four turbine aircraft at this time which may increase to five or six, would it be better to divert aircraft to Nashua or Lebanon and send them a vehicle in that 5% of the time they cannot land on runway 2-20. Mr. Deck replied that it was a good question. Mr. Duffy said they would return to the wind coverage issue at a later date.

Mr. Deck stated that he is still investigating the wind analysis and no decision has been made. He said the turbine aircraft Dr. Shedd referred to are just based aircraft. He is not making a recommendation unless asked. He stated the expense and challenges are high for 1,000 feet of runway.

Mr. Lamb added that while the cost of the sewer main may be slight in relation to other costs, he does not think it should be minimized. Mr. Deck replied that he is not minimizing it. Mr. Lamb added that moving it and interim solutions to moving it will be massive. Mr. Moriarty said that would be a \$1 million project. Mr. Lamb said it would be significant percentage of the project. Ms. Niewola commented that as the project moves forward and is ALP eligible, the FAA would pay 90%, the NH DOT would pay 5%, and the City would pay the remainder, so it is a lot of money. Mr. Lamb added that the sewer pipe is also the last pipe that drains the entire City of Keene so it is critical. Mr. Deck also noted he is not aware if that sewer drain can be under the runway. Mr. Wozmak commented that it would be a profound impediment to have it under the runway. Ms. Niewola added that this conversation is bringing challenges to light, and that is a good thing. Mr. Deck said he had not considered the water main.

Mr. Clark Dexter asked if there are advantages to adding length to the other end of runway 14-32. Mr. Deck replied no, there is still a displaced threshold so the landing distance would not change, the road would still be there, and safety areas cannot be on a public highway. Not much space would be gained, only approximately 150 feet.

Mr. Duffy stated the wind data is incomplete so the topic will be addressed later. Mr. Deck asked Mr. Moriarty if he could obtain the waste water force main location details, Mr. Moriarty agreed.

Mr. Deck continued to Figure 5.5, Runway 2-20 Alternative 1, for a full length taxiway along the main runway. This alternative is carried over from the last Master Plan and Mr. Deck stated he believes it is a worthwhile project. This alternative would add approximately 1,000 feet of taxiway to the run-up area and aircraft would taxi in a different direction. He indicated that the C2 taxiway center line should be 300 feet from the runway and it is currently 503 feet away. This plan would narrow the existing taxiway from 50 feet to 35 feet. Mr. Deck suggested only doing this when the taxiway is due for major reconstruction. He added the narrowing could be done during the next construction phase which would save cost. He stated a drawback to this alternative is movement of many navigation systems – ILS Glide Slope, Pappy, and AWOS. The estimated cost, including estimates for moving the navigation aids is \$1.1 million and includes reconstruction to narrow the taxiway.

Ms. Niewola noted that Runway 2-20 Alternative 1 does not include the cost of reconstruction to narrow the runway. Mr. Deck agreed and said he would add the reconstruction costs.

Mr. Moriarty asked if the taxiway is extended, will there still be a need for taxiway Delta-N. Mr. Deck replied that he would keep it because it is extra space, not an obstruction, and aircraft could still use it.

Mr. Moriarty asked if taxiways must have 90 degree turns. Ms. Niewola replied that it is highly encouraged. She said New England is known for terrain and wetland issues, so sometimes they cannot be 90 degrees, but when possible, that is the standard for safety.

Mr. Moriarty stated he believes the reason for that “jog” is the end of the drainage canal which is a six foot culvert that goes 600 feet under the runway. He thinks, because of safety area issues, it would be easier to extend the pipe and fill in the drainage ditch to allow the taxiway to be straight. He questioned if that could also allow the FAA equipment to stay in place or provide more room for it. Mr. Deck replied that it would not provide significant space.

Ms. Niewola commented that the runway was relocated to its current location from 100 feet east by Wilson Pond 20 years ago, which is why it does not meet current standards. In Alternative 1, the taxiway is only extended. In Alternative 2, the taxiway is extended and moved to the standard location because it was not shifted with the runway 20 years ago. Therefore, when taxiway Alpha is ready for reconstruction, the intention is to move it west which could result in more development space for hangars or tie downs and distance from the drainage pipe and other safety areas.

Chair Duffy informed the Committee there was only one hour left and Mr. Deck indicated that would be sufficient time.

Mr. Deck referred back to Mr. Moriarty and clarified if he was suggesting another alternative that deals with the drainage issue. Mr. Deck stated a challenge to such an alternative is getting the FAA to pay for it if they do not see it as necessary. He said he could include it as a sub-alternative. It could avoid moving the ILS but he would have to review based on proximity to the glide slope and other critical areas around the antennae.

Mr. Deck continued to figure 5.6, Runway 2-20 Alternative 2. This alternative would bring the taxiway to compliance with 2016 design standards, 300 feet from the runway. Mr. Deck stated this alternative would have similar problems as Alternative 1 with regard to moving the navigation aids. He believes it is a lot of money to spend to meet an unnecessary design standard. There is no rule saying it cannot be more than 300 feet away and although it is due for reconstruction, bringing it closer is expensive, \$2.7 million.

Mr. Wozmak said they looked into putting hangars there but there is not enough space for two hangars back to back while maintaining sufficient distance from the taxiway. Mr. Deck stated the distance is insufficient for hangars.

Mr. Deck referred back to Figure 5.5 to point out a piece of land, not mentioned in the document, with easy access to the road and far enough from the building restriction line. That property could provide space for T-Hangars or Conventional Hangars.

Mr. Deck continued on to Figure 5.8, Airside Apron/Hangar Alternative, which shows a split view of the terminal area. At the last meeting there was a discussion about need for more small aircraft tie downs. He worked on a design that maximized use area. He indicated he spoke with Ms. Elizabeth Bendel following the last meeting and she provided ideas. He also noted the City is looking to developing hangars which must be considered. He indicated a proposed location for a new fueling system that would be more accessible but would still have the problem of delivery trucks on the apron.

Mr. Deck explained Figure 5.8 as one possible alternative. It would involve expanding the parking area to the maximum limit which is the main runway object free area. He indicated this would allow more tie downs which will likely meet the peak demand. He pointed out a “taxiway to nowhere” which would be paved over in this alternative and could provide space for hangars with access to the taxiway.

This alternative also eliminates the main tie down in front of the building and frees space for large aircraft parking. Ms. Bendel had expressed the problem of limited space for large aircraft. Mr. Deck provided the Committee with a graphic which displayed the impact of a large Gulfstream V which

frequently land at the airport. There is not enough space to accommodate two of these aircraft. This alternative would double the area to accommodate such large aircraft and can also be used for smaller jets. Ms. Bendel also had expressed a desire to move tie downs closer, which can be discussed at a later date if this alternative moves forward. Mr. Deck stated they cannot get much closer to the runway.

Mr. Deck said this alternative includes land set aside for development indicated in red. He stated that activity at the airport must be compatible with aviation development and cannot pose a hazard for aircraft. This land was set aside for long-term use in case the need for an expansion arises because it is easily accessible from the runway and roadway. He also indicated space on the far side of the parking lot reserved for future car parking expansion. He indicated many possible locations were reviewed for a new fueling system, and there is not a lot of room for it. The proposed area provides sufficient space for the needs of a fuel farm and to meet safety restrictions. He noted another possible location that would eliminate the possibility of a future parking expansion.

Mr. Moriarty notes that in the proposed location for the apron expansion, there are two large leach fields underneath. He also indicated a prime location for large hangar development is where the parking expansion would be because of its proximity to the ramp. Mr. Deck replied that the leach fields will be easy to overcome. He also said while the parking expansion area is ideal for a large hangar, the need for aircraft parking must be considered.

Ms. Niewola commented that the design seems patchwork and questioned things like snow removal and transient aircraft confusion. She questioned if they could reconfigure what is designated for hangar development and the fuel farm as an apron. She said the apron could come out to the new parallel taxiway as opposed to the terminal ramp, with the SRE building accessing the runway via the corporate ramp. She also suggested moving the fuel farm parallel to the C&S taxiway. More smooth continuous pavement could facilitate more aircraft parking and other capacity issues. Mr. Deck replied he looked at alternatives but was concerned with the space C&S requires. He would need to know the demands for their larger aircraft.

Mr. Moriarty asked if it is possible to add to the south of the existing ramp and expand the drainage to unused area. Mr. Deck said there is room to work there. Ms. Niewola suggested that all these options be added to considerations for future apron development.

Mr. Deck stated that typically, unless there is a specific short-term three to five year idea, they designate space as “reserved for future development” and return to the Master Plan when ready to see what was considered for that space. He said this is not a final design, there are open areas from the last Master Plan for hangar development and extension, but wetlands must be considered. He added that aircraft must be able to get to and from the hangar without crossing the runway.

Mr. Jack Dugan asked for a definition of “compatible aviation development.” Mr. Deck said the FAA provides a list of things compatible. Mr. Wozmak asked for a copy of that list and Mr. Deck said he will put it in the Master Plan.

Ms. Niewola said there may be a space for something like mini golf. Councilor Manwaring, Mr. Moriarty, and Mr. Lamb said there already is one that continues to fail. Chair Duffy said there are also go carts but it is better designed for mini golf.

Mr. Deck mentioned options such as dog pounds and dog parks. He addressed Mr. Wozmak and stated that areas identified at the airport not suitable for aviation can be reserved for compatible aviation development, not necessarily hangars. He said now is the time to identify those and make sure they are compatible. He said Ms. Niewola could go to the ALP and as long as it has not been identified for aviation development it can be designated for other use in the ALP.

Dr. Shedd pointed out the proposed development area across the road from the terminal is part of a wetlands complex including a Red Maple swamp, Oxbow, a peat bog, and a lot of migration. She said this could be a development concern. Mr. Deck said he will ask Greg Culling to speak with Dr. Shedd about this. Dr. Shedd said this particular area is outside the obstruction project primary approach and is unsure if it is in the transition zone of the main runway.

Mr. Deck continued to Figure 5.9, Airport Fencing Alternative 1. He pointed out the blue lines which demonstrate where there is already fencing on airport property. The current fence is eight feet tall with three-strand barbed wire over it. He indicated two reasons to enclose the entire property with fence: 1. Security, which is not required; 2. To keep wildlife out. For wildlife such as deer, a minimum 10 foot tall fence with three-strand barbed wire is suggested. Mr. Deck indicated some airports also place material under fences to deter burrowing animals, which is expensive and complicated. He stated the primary concern here is deer.

Mr. Deck stated the first fence alternative, marked on Figure 5.9 in yellow, would disturb wetlands. This option would also obstruct approach surfaces and be too far from the main runway which will no longer be as wide. He said it is ideal for the fence to be as close to the main runway as possible. He advised taking advantage of the existing fence as much as possible and that this alternative could have major wetland impacts and requires a much longer run than Alternative 2 will show.

Mr. Wozmak asked if it could begin where the sewer line is and run fence along the road. Mr. Deck replied that Alternative 2 will show that option. He indicated Alternative 1 is estimated at \$1.2-\$1.3 million for 16,500 feet of linear fence, with no gates, and is expensive with costs to wetland.

Mr. Deck continued to Figure 5.10, Airport Fencing Alternative 2. He indicated in this alternative, the fence would follow the inside of the road. This alternative would require some tree clearing. The area is mostly dry uplands but there could be wetland issues in a few areas. He indicated this alternative requires less fencing, approximately 15,000 linear feet. There would not be as many wetland impacts but the price is approximately the same; the difference between the two alternatives is wetland impact. He added that some say it is possible to run fence through wetland without disturbance. This alternative is **ALP** eligible for funding but is restricted because the fence cannot get much closer to the runway.

Ms. Niewola added a consideration that the airport is responsible for maintaining the fence for 20 years before FAA money can be used again for it. She indicated a fence through wetland is hard to maintain and if it were destroyed, the FAA would not replace it.

Dr. Shedd noted the recent unfortunate events with wildlife at the airport. She asked Ms. Niewola if she knows how many vehicle-wildlife incidents there are in NH each year. Ms. Niewola did not know. Dr. Shedd indicated she believes the airport fence is a large investment for a small number of incidents, when not even all highways are fenced in the state for a higher number of incidents. Ms. Niewola responded that the FAA has taken the position with regard to aircraft-wildlife incidents that all life is valuable, human and wildlife, so that may mean fences are necessary.

Mr. Wozmak stated the airport is different than a stretch of highway. He indicated that Mr. Moriarty chases deer, turkey, and coyotes away often. Wildlife density at the airport is nearly constant.

Mr. Robert Berjevick of Keene asked the Committee to speak more loudly and address the whole table.

Mr. Deck asked the Committee if they had enough information to begin making decisions and asked if there is additional information they would like to see. He indicated a date needs to be set for the next

public information meeting and he would like to establish that and the next AMP Committee meeting date.

b. Next Steps

- i. **Update Alternative Chapter**
- ii. **Develop ALP Set (Stantec)**
- iii. **Prepare Financial and Implementation Plans (Stantec)**

5) SCHEDULE

Mr. Deck stated he just wanted to make sure the Committee had enough information to move forward because he is not planning to be present at the next PAC meeting. Mr. Lamb asked if he would leave the presentation boards behind. Mr. Deck said he would leave them but to let him know if they are written on because he will want to use them at the public information meeting in addition to PowerPoint.

a. Set a date for next Public Information Meeting – Time and Location TBD

Mr. Suter asked what type of presentation format the next public information meeting would be. Mr. Deck replied they would walk through the Master Plan from the beginning because many things have arisen that were not addressed at the last meeting. They will present the inventory, forecast, facility requirements, the different alternatives proposed, and the next steps. Mr. Suter asked if decisions about the alternatives will be made by then. Mr. Deck replied no, the meeting is to obtain public input before making decisions.

Mr. Suter said the information provided at the meeting had been very helpful. He asked Mr. Deck if these are things, in his professional judgment, he would consider to improve the airport. Mr. Deck replied that the Master Plan brought them to this process and the alternatives presented are ways to achieve what the airport wants and forecasts in the future.

Mr. Suter questioned the best way to frame this information for the public so it is clear to those unfamiliar with the technical details. Chair Duffy pointed out the list of pros and cons brought up by Ms. Niewola and Mr. Moriarty today are good to have on record to make clear to the public. Chair Duffy said these are concrete issues that can be presented clearly to the public so they know what the Committee is working with and the various limitations. Mr. Suter said he hopes the information will be clear to the public but is concerned because they are analyzing a performing asset in the region. Chair Duffy indicated the airport is performing better than it used to. Mr. Suter said that is an important point to make to the public along with the goal to be even better in the future. He hopes they portray this plan as an effort to make the airport a more complete and compelling asset for the region in the future with regard to both general aviation and economic development possibilities.

Dr. Shedd commented that the public meeting should present not just economics but also how the airport is performing. Currently there is no specific equipment at the airport to measure performance. She stated she has heard from Keene citizens that they believe the airport is a “business,” but are unaware of the airport volume. She said they need to inform the public that the Committee is considering available technologies to measure traffic as opposed to calculated estimates going forward. She stated she knows FAA money covers a wide range of traffic volume at the airport but she thinks the public wants a more precise measurement of that volume. She does not believe the Keene airport has as high of operations as Hartford or Nashua, as some estimates project.

Mr. Deck asked if Dr. Shedd was referring to a system of counting aircraft operations. Dr. Shedd replied there is no such system at the Keene airport and there has been resistance to such a system. Mr. Deck suggested other measures and Dr. Shedd replied that those are still calculations. Mr. Deck mentioned

options like tracking fuel sales. Dr. Shedd commented that Ms. Bendel and C&S likely know how many flights run through the airport. She said there is resistance to knowing how much business is happening at the airport and she believes citizens are frustrated by that. Chair Duffy stated he hopes those frustrated citizens come to the meeting.

Mr. Wozmak asked how they could determine airport activity with more precision. He said there are a lot of flights without flight plans and sometimes planes just pass through for gas, etc. He said the discussion is about a more precise monitoring point, camera or motion detector, to help count activity; measuring activity is not easy which is why calculations are used. He said they need a better way of tracking but there are many variables involved.

Mr. Moriarty commented he understands that people want to know the true numbers to justify airport actions. He said no matter what those numbers are, the airport will remain. He said grants and operations make a difference but he thinks people want to hear there is less activity so the airport will be shut down. He understands the public do not understand what is going on because they are not versed in the language used. He stated the airport figures are calculated the same way any small non-towered airport is. The calculated estimates are not always accurate but that is the standard they have to go by. He indicated that even the new measurement technologies can be similarly inaccurate. He also indicated newer technologies are expensive and the set-up of the airport could cause measurement technologies to mistake aircraft with other airport operations. Without a tower, there will always be inaccuracies. He does not like feeling the public want to hear there are minimal operations to say the airport is not worth it.

Mr. Lamb replied he does not think anyone is saying that, people just want to better understand what is happening at the airport. The main point is how the airport communicates with the public. A lot of brainstorming took place but Mr. Lamb does not know how that will be incorporated in the Master Plan. He believes the plan needs to be broader, with aviation at the center, but also a plan for the future and not just a log of airport activity. He said it would not be a traditional Master Plan but somehow these things should be incorporated.

Mr. Berjevick stated his thoughts are different. He said he began flying 32-33 years ago, has been on the Airport Advisory Committee since it began, and has seen positive changes. While numbers are important, he is more concerned with the safety of those flights being counted. Mr. Berjevick wants the airport to be safe again because it is not as safe as it used to be. While bringing in more business is important, the safety of the pilots and passengers needs to be a priority.

Chair Duffy indicated the original public survey was of 35-40 people. While the baseline may change for the next meeting, the majority of people have a positive opinion of the airport despite not being aware of or educated about what happens at the airport. He thinks it is important to remember the largely positive views of the airport even if only a small portion of the population is represented.

The Committee agreed on Wednesday, June 29, 2016 at 6:30 PM for the next public information meeting. Mr. Lamb will confirm a location with projector capability and send confirmed details to the Committee within one week. The City should advertise on the main page of the website. Mr. Deck said he would follow-up with Mr. Lamb within one week to clarify language to be used in advertisement.

A date for the next AMP meeting will be determined on the night of the public meeting; the plan is for early to mid-July.

b. Selection of Preferred Alternative (PAC Action)

To be determined.

c. Set date for next PAC Meeting

To be determined.

6) ADJOURN

Chair Duffy adjourned the meeting at 5:01 PM.

Respectfully submitted by,
Katie Kibler, Minute Taker
June 14, 2016

City of Keene
New Hampshire

AIRPORT MASTER PLAN STUDY ADVISORY COMMITTEE
MEETING MINUTES

Wednesday, August 17, 2016

3:00 PM

Dillant-Hopkins Airport Terminal

Members Present:

James P. Duffy, Chair
Jan Manwaring, Councilor
Jack Dugan
Bill Hutwelker
Robert Bergevin
Kenneth Colby
Phil Suter
Dr. Ann Shedd

Staff Present:

Jack Wozmak, Airport Manager
Rhett Lamb, Planning Director

Members Not Present:

Joseph Briggs
Elizabeth Bendel, Vice Chair
Bill Summers

1) Call to Order

Chair Duffy called the meeting to order at 3:06 PM and explained that the Stantec consultant would not be present at the meeting. He also noted that Dr. Shedd provided copies of the Committee mission statement to refer to.

2) Approve Meeting Minutes- June 8, 2016

Mr. Suter made a motion to approve the minutes of June 8, 2016, which was seconded by Mr. Bergevin and carried unanimously.

3) Airport Layout Plan Alternatives-Review attached draft of Chapter 5 and Recommendations

Mr. Wozmak noted that he met with Mr. Lamb and Mr. Duffy about the alternatives and included a memo in the meeting packet with his recommendations regarding the Airport Layout Plan alternatives. Mr. Wozmak provided the following recommendations:

- With regard to the Runway 14-32 Analysis section on page 20 in the second paragraph, line four, should be clear regarding runway width. FAA standards establish that 75 feet is currently the acceptable maximum width for this category runway for purposes of federal reimbursement/support.
- With regard to Safety, on page 22 the entire paragraph should be replaced with the following: "This alternative has a direct impact on safety by reducing the amount of time an aircraft must remain on the runway prior to takeoff."

- With regard to Environmental Impacts on page 22, the paragraph should be replaced with something like the following: “Some changes to the storm water system may occur but can easily be mitigated by a storm water management plan with Best Practices (BMPs) during construction.”
- With regard to Impact to Capacity and/or Viability on page 22, the paragraph should be replaced with something like the following: “This option has a direct impact on the airport’s ability to safely serve the needs of the aviation community. A parallel taxiway reduces the likelihood of runway incursions and facilitates the orderly flow of traffic in and out of the airport.”
- With regard to the Runway 14-32 Alternative –Extend Runway 14-32 with Full Length Parallel Taxiway on page 22, the final sentence in the first paragraph should be replaced to reflect that 20 years ago, the displacement was half what it is today. Hence, it is as much the trees that have caused the displacement as it is the hill. In order to move toward achieving a cross-wind runway that is 80% of the primary runway, the Committee should move toward a plan that opens the way to cut the trees off the east end of 32, either by permission, easement, or purchase of the identified property. In combination with this, the Committee should abandon the concept to extending the end of 14 by 1,000 feet and limit any expansion in that area to the length in feet to remain within the FAA setbacks and avoid the impact on Aviation Drive which has the sewer force-main therein. If the displacement at 32 can be mitigated by 50% and the runway can be extended at 14 by, say 500 feet, the runway will then be as close as practicable to the 80% goal. It will also be dramatically less expensive. Mr. Wozmak explained how the displaced threshold was moved 20 years ago and what needs to take place for the crosswind runway to reach the 80% goal. He acknowledged that the 80% goal may not be possible in this Master Plan but perhaps in the next. He does not know if there are easements on trees at the Swanzey end of the runway 32 but recently received a list of all easements and will check. He does not believe that an 80% crosswind runway will have any appreciable impact on the adjacent homes. Councilor Manwaring questioned if keeping the crosswind runway as it is currently affects the airport ability to receive federal funding. Mr. Wozmak replied no.
- With regard to Runway 2-20 Alternative 2 – Parallel Taxiway Extension on page 24, Mr. Wozmak is in favor of this alternative. He does not believe there is an adequate cost/benefit scenario regarding the relocation of the entire taxiway. He noted this is the only way to maintain an accident free environment without a control tower.
- With regard to Runway 2-20 Alternative 1 – New Full length Taxiway on page 26, Mr. Wozmak does not think this is the best alternative. Related to this section in Safety, the explanation should mirror the earlier language: “This alternative has a direct impact on safety by reducing the amount of time an aircraft must remain on the runway prior to takeoff,” or words to that effect.
- With regard to Environmental Impacts on page 26, the paragraph should be replaced with something like the following: “Some changes to the storm water system may occur but can easily be mitigated by a storm water management plan with Best Practices (BMPs) during construction.
- With regard to the Terminal Area Parking Alternative on page 26 and the diagram showing the Gulfstream V, Mr. Wozmak recommended rotating the image 45 degrees to the east to reflect the normal parking pattern of such jets. He noted that having been Airport Manager for nearly five months, it is clear to him that expanding the terminal area aircraft parking is essential. On a very regular basis, the airport reaches capacity for jet parking and the tie-down area for smaller planes is consistently running at 50-90%, especially on weekends.

- With regard to the Terminal Area Parking Alternative on page 28, there should be recognition of the fact that an expanded aircraft parking area reduces the likelihood of plane crash or other incursions as the density of parked aircraft increases, which it clearly is.
- With regard to Airport Fence Alternative 2 – Follow Airport Road on page 29, Mr. Wozmak supports this alternative (having the fence follow Airport Road) as this will mitigate the wetlands issue and it will also be easier to modify fence sections in response to airside development efforts. Dr. Shedd noted that this alternative may still have some wetland impacts. Mr. Wozmak replied that some of those wetlands are accommodated by culverts and further analysis will be needed.
- With regard to Replace or Reconstruct Fuel Farm on page 30, Mr. Wozmak indicated it is clear to him that the fuel farm will need replacement. He believes it makes balanced sense to move the fuel farm closer to the terminal building/FBO. He also believes the master plan should identify the need for a fuel truck for Avgas as a companion to the truck for Jet Fuel.
- With regard to Summary on page 31, Mr. Wozmak recommends abandoning all reference to a 1,000 foot extension of runway 14. All references to this should be deleted in favor of a combination of moderate extension and tree cutting. The Summary will need to be revised in general to reflect the final decisions reached.

Chair Duffy welcomed questions for Mr. Wozmak.

Mr. Bergevin asked if the plan is to build a permanent fuel farm and where it would be located. Mr. Wozmak referred to figure 5.8 in the master plan draft which displays the possible location in grey between the apron and the C&S hangar.

Mr. Suter asked, with regard to narrowing the runway 75 feet, if there is any merit to keeping the current width for potential future use. Mr. Wozmak replied no because the sort of aircraft that requires a 150 foot runway width would not be able to land at this airport and the FAA will not pay for more than 75 feet.

Mr. Lamb noted that if there is consensus around Mr. Wozmak's proposed changes they will be recommended to Stantec.

Dr. Shedd indicated there are other recommendations the Committee has talked about in the past that are not addressed in this plan. She asked if they will be incorporated into this document or a separate plan. Chair Duffy noted that what he was looking for at this meeting was a motion to accept or amend chapter five. Councilor Manwaring stated she was uncomfortable moving forward with a motion because some important things the Committee has discussed are not included. Mr. Lamb noted that these additional recommendations for things like economic development strategies, green development, and more will not be included in the airport layout plan. The City plans to find a place for those recommendations. This plan is specific to runway and taxiway safety and security. He envisions a future discussion about what else should be added in.

Chair Duffy suggested voting on chapter five knowing there is more to discuss later. Mr. Suter said he envisions the City having an overarching plan and within that will be the Stantec layout plan plus all other recommendations. Councilor Manwaring noted that in the beginning the Committee had certain ideas and she feels that Stantec was not interested in some of those ideas. She said to her, a master plan is a document to base the next 10 years on and if things they have discussed as important are not included, it is not a document she is in favor of; she said otherwise

it is just a means to federal money. She noted she was willing to vote on chapter five alone if a meeting is planned to discuss these other matters.

Dr. Shedd indicated that over the last more than a year since this Committee began, they have focused on airport safety, economic sustainability of the airport, and FAA requirements for further grants. She believes a true master plan should include a business plan and Mr. Wozmak had indicated that process is occurring. She noted that two years ago the NHDOT recommended that Keene be designated a national airport. At the public information session she received feedback that this has never been discussed at City Council. She feels it is backwards to build a facility plan without the City having decided what it wants the airport to be in 20 years. She agreed with Mr. Wozmak's analysis of the proposed alternatives but does not think that is all that should be in the plan. Chair Duffy indicated that is not all there will be to the plan; they have just been tasked with reviewing the layout plan at this meeting.

Mr. Suter made a motion to incorporate the suggestions of Mr. Wozmak into chapter five with the understanding that other issues outside the scope of chapter five will be discussed at a future meeting. The motion was seconded by Mr. Bergevin.

Mr. Hutwelker questioned if this motion means they are moving forward with the recommendations suggested by Mr. Wozmak and eliminating the rest. Mr. Lamb replied that they will need to check with Stantec to see if the unselected alternatives will be removed from the final document.

Mr. Bergevin questioned the amount of distance they may be able to gain on the crosswind runway. Mr. Wozmak replied that the current runway is 2,901 feet. He said adding 500-800 feet is conceivable and that extending it up to 3,400 feet would be ideal to accommodate most jets. Mr. Bergevin asked how far the crosswind is from runway 20 to the north. Mr. Wozmak replied approximately 1,000 feet.

Dr. Shedd questioned the status of Stantec's analysis on wind coverage. Mr. Wozmak indicated they continue to work on the wind analysis with help from the FAA. The issue was with the wind measuring equipment incorrectly measuring wind speeds for several decades because of tree growth too close to the equipment. With the incorrect data, the crosswind runway would not be eligible for FAA funding. They referred to 1962-1967 data which supports the need for a crosswind runway. Dr. Shedd questioned if they are relying on 50 year old data. Mr. Wozmak replied yes because it is more accurate than what is currently being measured. The long term plan is to move the weather equipment during the taxiway extension.

The motion to incorporate the suggestions of Mr. Wozmak into chapter five with the understanding that other issues outside the scope of chapter five will be discussed at a future meeting carried unanimously.

4) Schedule

Mr. Lamb noted that Stantec is due to present to City Council and there will still be one more public information session to review the final plan. Mr. Lamb will acquire an outline of next steps from Mr. Deck.

The next meeting is scheduled for August 31 at 3:00 PM.

5) Adjourn

Hearing no further business, Chair Duffy adjourned the meeting at 4:18 PM.

Respectfully submitted by,
Katie Kibler, Minute Taker

City of Keene
New Hampshire

AIRPORT MASTER PLAN UPDATE COMMITTEE
MEETING MINUTES

Wednesday, August 31, 2016

3:00 PM

Dillant-Hopkins Airport Terminal

Members Present:

James P. Duffy, Chair
Phil Suter
Bill Hutwelker
Elizabeth Bendel, Vice Chair
Dr. Ann Shedd
Jan Manwaring, Councilor

Staff Present:

Rhett Lamb, Planning Director

Members Not Present:

Jack Dugan
Robert Bergevin
Kenneth Colby
Joseph Briggs
Bill Summers

Chair James Duffy called the meeting to order. He recognized ACM/Planning Director, Rhett Lamb who said that this meeting was to follow up on the meeting of August 17, 2016 at which time the Committee reviewed and voted on the Airport Layout Plan proposed by the consultant, Stantec. He said that the meeting was to address those items that might be included as recommendations in the Airport Master Plan Update that are not directly related to the Airport Layout Plan. He said these could include items from the Visioning Process of earlier in 2016, green or sustainability projects and general economic development at the airport.

It was suggested that the potential for non-aviation development should be discussed and that the number of developable acres should be known. Mr. Lamb said that there was a report assessing presence of wetlands, and identifying development sites that was completed some years ago. He said he would look for that report and share it with the Committee.

Another suggestion was made that the airport should be or continue to be a staging area for Eversource when they need to respond to emergency situations.

There was general agreement that the airport has value to the City and the region beyond its immediate airport purpose. The committee used the items identified in the Visioning process to organize the discussion:

- A compelling place to do business
- A Regional Transportation Hub
- A center for STEM & Aviation Education
- Financially and Environmentally Sustainable
- A place for community events
- An airport with improved marketing and public relations

Ideas generated by the Committee are as follows:

A compelling place to do business

- Access to utilities including Broadband
- A virtual conference center and hub for meetings using technology to link to remote locations
- A first class conference center for face-to-face meetings
- Develop clear marketing objectives and a marketing strategy and program that applies to all objectives – aviation and non-aviation
- Commitment to the type of airport manager that reflects broad spectrum of goals not just aviation
- Consider example of Pease Airport Development Authority

Regional Transportation Hub

- Work with local and regional organizations to develop and become part of a regional transportation plan
- Create connections to existing transportation systems
- Park and Ride
- Connection to Amtrak
- Connection to Manchester Airport
- Overnight parking
- Connect with organizations that are already working on this issue including Southwest Region Planning Commission, and Monadnock Area Sustainable Transportation (MAST).

STEM & Aviation Education

- Significant education is already happening through Monadnock Aviation – opportunity to expand
- Include both aviation and non-aviation related education and testing
- Connect with River Valley College and Career Centers at high schools and middle schools
- Be ready for big opportunities such as State funded aircraft mechanic training program

Financially and Environmentally Sustainable

- Airport should pay for itself
- Sustainability should be viewed as a balance among economy/environment/social equity
- Consider carbon offset for CO² emissions
- Implement Solar, PV, geothermal, energy conservation
- Evaluate sustainable alternatives vegetation management (mowing, trees)
- Establish a goal statement in general about financial and environmental sustainability as a priority
- Link to regional green economy initiative through area organizations including Hannah Grimes Center for Entrepreneurship
- Become a green economy innovation hub

A Place for Community events

- Balloon festivals
- Young Eagles program
- Youth programs – flights
- Old aircraft
- Flight exhibitions
- Air National Guard outreach from Pease Airport
- WWII Bombers

Non- aviation

- Car shows
- Open houses
- Music
- Movies

An Airport with Improved Marketing and Public Relations

It was understood by the Committee that this item would be the subject of discussion at a future meeting.

Chair Duffy Adjourned the meeting at 4:30 pm.

Project Status Meeting

EEN Master Plan / 195210711

Date/Time: November 4, 2016 / 1:00 PM
 Place: Keene City Hall
 Next Meeting: Early January 2017
 Attendees: Ervin Deck, Rhett Lamb, Jack Wozmac
 Absentees: Absentees
 Distribution: Attendees

1. **Webpage Status.** Webpage established for the master plan update is not current.
Action: Stantec will provide the city with examples for action as appropriate by the city.
2. **Project Survey.** What to do with the information? General agreement that the survey was of little value to the project.
Action: Include overview in the report and add consolidated survey results in an appendix.
3. **Project Status.** Stantec needs city's preferred alternatives so that Stantec can finalize remaining draft chapters, which include a write up on the preferred alternative (Chapter 5), the Airport Layout Plan (drawings and written report, Chapter 6), and Chapter 7, Implementation, and Financial Plans. The city wants to see a discussion on the "softer side" of things as discussed in the minutes from the last PAC meeting. Jack needs a placeholder for the airport's marketing and business plans.
Action: Stantec will add a "Recommendations" chapter (Chapter 8) that will include discussion of things such as sustainability and green initiatives.
Action: Jack will provide Stantec with marketing and business plans for inclusion in the master plan.
4. **Schedule.** A schedule to complete the master plan was discussed and agreed upon by both the city and Stantec.

Milestone	Date
Draft ALP and Draft Report.....	Nov 30, 2016
Public Information Meeting & PAC Meeting.....	1 st week in Jan 2017
Final PAC (vote on Plan and submit recommendations to city council	3 rd week in Jan 2017
Stantec presentation to city council	1 st week in Feb 2017
Plan to PLD or MSFI	2 nd week in Feb 2017
City Council vote to approve plan (authorization to sign)	3 rd week in Feb 2017
Submit final ALP and Technical Report to the city and NHDOT.....	End of March 2017

5. Preferred Alternative. The City selected the following as the preferred alternatives for inclusion in the ALP and Technical Report.

- **Runway 14-32**
 - Reduce in width to 75 feet by retaining the southern side of the runway.
 - Extend Runway 32 between 300 and 500 feet to the maximum distance possible without moving Airport Road
 - Shorten displaced threshold to the longest extent possible by reducing vegetation in the Runway 32 approach surface.
 - Develop full-length parallel taxiway along north side of the runway
- **Taxiway C (Runway 2-20 parallel)**
 - Retain existing footprint and if necessary, reduce the width to 35 feet consistent with Taxiway Design Group Two (TDG-2), which meets the design standard for the existing and forecasted aircraft.
 - Develop taxiway extension to approach end of Runway 2 to TDG-2 width standards at 300' runway to taxiway separation.
 - For funding purposes, the extension is recommended at the same time the existing taxiway is reconstructed.
- **Aircraft Parking Apron**
 - Expand on the proposed apron expansion (Figure 5.8 in the draft master plan) up to the proposed parallel taxiway along Runway 14-32.
- **Fencing**
 - Use Airport Fencing Alternative 2 (Figure 5.10) as modified, which is a shift in the fence between Airport Road and the Approach end of Runway 14. Move this section of fence closer to Airport Road.
- **Miscellaneous**
 - Define areas reserved for future hangar and other aviation development
 - Reserve an area around the water treatment plan for a possible future solar farm

6. Operations. Jack and Erv to continue the discussion on how many operations the airport has.

Action: Erv – resubmit earlier memo to Jack on aircraft operations

The meeting adjourned at 2:30 PM

The preceding is a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.



November 4, 2016
Project Status Meeting
Page 3 of 3

Stantec Consulting Services Inc.

A handwritten signature in blue ink that reads "Ervin C. Deck". The signature is fluid and cursive.

Ervin Deck
Senior Aviation Planner
Phone: (207) 887-3828
Cell: (207) 205-2380
ervin.deck@stantec.com

City of Keene
New Hampshire

AD HOC AIRPORT MASTER PLAN COMMITTEE
MEETING MINUTES

Thursday, May 4, 2017

3:00 PM

Dillant Hopkins Airport Terminal

Members Present:

George Hansel, Chair
Jan Manwaring, Councilor
Dr. Ann Shedd
Kenneth Colby
Bob Bergevin
Beth Bendel, FBO
Phil Suter (Arrived Late)
Bill Hutwelker (Arrived Late)

Staff Present:

Jack Wozmak, Airport Manager
Rhett Lamb, Planning Director

Members Not Present:

Jack Dugan
William Summers

1) Call to Order

Chair Hansel called the meeting to order at 3:04 PM. Mr. Lamb conducted roll call and welcomed members of the Airport Advisory Committee (AAC): Clark Dexter, Fred Happ, and Peter Delaney.

2) Approval of Minutes – August 31, 2016

Mr. Bergevin made a motion to accept the minutes of August 31, 2016, which was seconded by Councilor Manwaring and carried unanimously.

3) Draft Master Plan Update

Chair Hansel welcomed Ervin Deck of Stantec to summarize the final Airport Master Plan (AMP) and Airport Layout Plan (ALP) and answer any remaining questions about the recommendations therein.

The greatest change since the last meeting is estimated number of aircraft operations at the airport. There was concern from the public about the inaccuracy of the estimates in the AMP. While these numbers are an estimate and cannot be actively and accurately counted, Mr. Deck agreed the reported estimate seemed too high. After speaking with Mr. Wozmak he conducted a preliminary study and compared the estimate to other New England airports, particularly those with towers, which have more accurate counts. He compared numbers from these airports to Keene based on aircraft at the airport, the flight training center, and fuel sales. Based on these findings, Mr. Deck and Mr. Wozmak agreed to adjust the estimated aircraft activity at the airport from 49,000 to 28,000 operations. This is still an estimate but Mr. Deck feels it is a more reliable and accurate starting point that before.

Mr. Deck reported the design aircraft for the airport has been finalized as the Falcon 7X. The design aircraft is the largest in terms of wingspan and fastest in approach speed; this is what the

FAA looks at when establishing design and visibility standards for the airport. The Falcon 7X is large but not enough to change the airports design standards, so runways and taxiways do not have to be widened and setbacks do not to be further than they are now.

Mr. Deck continued that the ALP is what the City and State representatives will sign off on for the future of the airport. Anything not on that plan will not be funded by the Federal or State governments. The ALP outlines what areas at the airport are reserved for what uses; not necessarily exact places and sizes but areas must stay consistent with that plan.

Mr. Deck summarized the recommendations in the AMP and the ALP:

1. Runway 220
 - a. Dimensions remain the same – 6,201 feet long and 100 feet wide.
2. Crosswind Runway
 - a. Extend current length from 4,100 to 4,960 feet
 - i. Based on maximum distance the runway can be extended toward Airport Road without impacting the road (560 feet) and clearing obstructions to shift the runway displacement to the maximum (400 feet).
 - b. This runway is currently in preconstruction to be narrowed from 150 feet to 75 feet, the design standard. Based on engineer recommendations, 37.5 feet will be removed from each side, maintaining the center 75 feet and staying consistent with the current runway design.
 - c. Any construction to extend the length of this runway is a long-term investment
3. Taxiways
 - a. Taxiway Alpha, which feeds the main runway, is currently 50 feet and the design standard is 35 feet. To save money narrowing this taxiway should wait until it is due for reconstruction, at which time the outer edges will be removed; the same will occur for the sub-taxiways that feed Alpha.
 - b. Taxiway extension to approach the end of Runway 2: Right now, it is unsafe for aircraft to reach that location in bad weather. There was talk of bringing the taxiway closer to the runway (300 feet from runway center, the design standard) but this is economically impractical and there would be no land gains because that land cannot be used for anything else.
4. Apron Development
 - a. The airport aprons are currently imbalanced.
 - i. Itinerant Aircraft Apron – currently parking for 13 smaller aircraft and one larger; primarily used by FBO aircraft and visiting aircraft. This apron is too small.
 1. Short-term recommendation: extend apron toward main runway to double small aircraft tie-downs and maintain taxiway between them for access to proposed hangar development. Cannot occur until safety issues are addressed; could be expanded incrementally based on demand; wetlands there will require an environmental assessment.
 - ii. Based Aircraft Apron – three times larger than the Itinerant Apron and is usually only filled to 1/3 capacity. This apron is larger than a based aircraft apron needs to be.
 1. Recommendation: keep this apron the same size.
5. Other Development Projects
 - a. Aviation Development Space

- i. Whatever is developed in these spaces marked on the ALP must be aviation development; non-aviation development would require FAA approval.
 - ii. Some of these spaces were on the previous AMP for hangar development.
 - iii. More than enough development space to meet the airports long-term needs.
 - b. ASOS Weather Station
 - i. Studies of historic data showed that the ASOS was not accurately reporting wind speeds that make the Crosswind Runway necessary. The ASOS was not built in a proper location (500 feet of ground surface) and needs to be moved.
 - ii. Recommendation: move ASOS to the field beyond the end of the runway, close enough to the airport, road, and power but far enough to accurately report weather data. Should be paid for by the National Weather Service.
 - iii. A safety compliance that must be completed in the short term before other projects can be implemented.
 - c. Fuel System
 - i. Currently located in the Based Aircraft Apron with underground tanks that need to be replaced in the short-term. When time to replace, the recommendation is to move the fuel system to the aircraft apron outside the airport terminal when it is due for reconstruction and replace with above-ground tanks. This will place the fuel system within eyesight of the FBO so it can be better monitored.
 - d. Wildlife Fencing
 - i. Recommendation: fencing to follow Airport Road and tie into the Water Treatment fence system; 10 foot high fence with barbed wire and in-ground trenching to keep burrowing animals out.

Airport Master Plan implementation costs:

1. Short-Term 2016-2021: **\$6.1 million** (FAA- \$5 million, State- \$276,000, City - \$626,000)
 - a. Reconstruction of Crosswind Runway, removal of obstructions from both runway's approach surfaces, relocation of ASOS, and wildlife fencing.
2. Mid-Term 2022-2026: **\$2.65 million** (FAA - \$2.4 million, State & City - \$133,000 each)
 - a. Itinerant Apron extension and relocation of fuel system.
3. Long-Term 2027-2031: **\$9.3 million** (the current FAA 90% contribution could change by this time)
 - a. Extend Taxiway Alpha, extension of Runway 32 and clearing of obstructions for that extension.

Additional Recommendations in the AMP:

1. Implement the AMP
2. Keep rates and fees competitive though consistent review
3. Careful decision of when to transfer to no-lead fuel (the new standard as of 2018)
4. Review of Keene and Swanzey zoning to ensure compatibility with the airport; some are currently incompatible simply due to language in the codes
5. Be aware of zoning requests near the airport, which require a Federal 76-40 Form Request. With this the FAA can alert the airport; the Keene and Swanzey Planning

- Departments should be aware and not accept or issue building permits until that form is filed. This prevents something incompatible or obstructions near the airport.
6. Develop a Strategic Plan for the airport
 7. Work to have the airport better incorporated in the Keene Comprehensive Master Plan
 8. Develop a Sustainability Policy (Some initial ideas suggested in Chapter 8 of the AMP)
 - a. Lighting upgrades (already begun with LED lights on runways)
 - i. Transition with infrastructure reconstruction
 - ii. Because visibility is not currently less than ¾ mile, high intensity lights are not allowed
 - b. Solar
 - i. 14.5 acres available next to the Waste Water facility with no wetland impacts
 - ii. 3.5-4 acres at the far end of the runway near the old go-cart track
 - iii. Common at airports and greatly offsets costs
 - c. Geothermal
 - i. An option for the terminal building after insulation work in the ceilings
 9. Recycle waste
 - a. Materials removed during reconstruction projects can be stored for use in future construction projects to offset costs
 10. Update airport vehicles to electric, diesel, utility vehicles
 - a. Current vehicles are ¾ ton and are not ideal for routine transportation around the airport
 11. Land and Natural Resource Management
 - a. Convert excess, unused land into conservation easements
 12. Search for as many in-kind contributions as possible

Mr. Deck concluded the overall theme is to think small, not large; focus on smaller projects that can be done now to build momentum. The final Public Information Session will take place Tuesday, May 9 at 6:00 PM and the last AMP Committee meeting will take place Wednesday, May 24 at 3:00 PM for final input and to recommend sending the AMP to City Council.

Mr. Bergevin asked if area reserved for a solar farm will just be for the airport. Mr. Wozmak replied a solar farm would benefit the whole City; the amount of energy produced will be allocated across the City. This will require determining how much land is available at the airport for solar, the approvals needed, the energy creation possibilities, and how that energy will be distributed. Mr. Lamb said the Planning Department has been approached by many solar developers and advertised an RFP this spring to find out what developers would do in the City if they had the opportunity. The airport is one location these developers have identified because they like to see the electricity being used where it is generated. Solar on airport land incentivizes future airport development because of the energy rate. Mr. Lamb asked if areas on the ALP compatible to aviation but will not be developed in the short or mid-term could be labeled as “future development and solar.” He thinks these spaces could be used for solar while waiting to be developed for their final purpose.

Carol Niewola of the NH DOT said the FAA encourages solar because it generates revenue and offsets energy costs. However, there are safety features the FAA must protect – navigation aids, and glares for incoming pilots. Mr. Lamb’s idea would be considered by the FAA if the panels are not in critical areas around navigation equipment and if a glare analysis is conducted. Mr. Wozmak said there are areas subject to development that could be labeled as “development

and/or solar” to identify parcels available for multiple uses. Ms. Niewola said the critical areas should be mapped and the airport should follow the interim guidance of the FAA federal register – anything outside those guidelines should be acceptable. Even if a development project at the airport is not using federal funds, if it is not in the ALP the FAA will say it has not been vetted as safe for development. Mr. Deck did not see a problem with this on areas selected as incompatible for aviation development.

Dr. Shedd, a member of the Cities for Climate Protection Committee, supported the solar suggestions and thinks those areas should be designated in this AMP. She said to offset greenhouse gas emissions just from jet fuel sales at the airport, a 4 megawatt photovoltaic installation would be required. She added the current net metering cap is 100 megawatts which is only 4% compliant with the City and State climate goals. She encouraged making contacts to advocate removing the net metering cap.

Chair Hansel asked if these proposed dual-use sites need to be relabeled as such on the ALP. Mr. Deck will speak with the FAA representatives. Ms. Niewola added that when the FAA and NH DOT sign off on this ALP that is not a guarantee of moving forward with any project – each project will still be subject to an individual vetting process. Chair Hansel suggested an all-encompassing tag on the map that indicates these areas can be used for development or solar.

Dr. Shedd noted there are spelling and grammar errors in the report and it should be proofread. She noted that in Section 5.4.8 on fencing it indicates an 8 foot fence whereas the summary of that section says 10 feet and should be clarified because it would mean a significant cost difference. Mr. Deck replied there is no strict FAA standard on fence height, it depends on the airports needs for that fence.

Mr. Suter suggested that in presenting this AMP to the Council, it should be placed in the context of the Comprehensive Master Plan as well as recent recommendations of the Economic Development Committee; this will be helpful to the Council and the public to show this plan is not in isolation from the rest of the City. Chair Hansel agreed and said staff can work to incorporate that into the AMP introduction. Mr. Wozmak said he has reached out to Councilor Mitch Greenwald, Chair of the Economic Development Committee to work on that missing link. Councilor Hansel added that staff can also make recommendations to Council.

Dr. Shedd noted she did not see the recommendation from the 2015 State Airport Systems Plan that Keene advance to the national airport category. She thinks it is important to frame that discussion in the AMP because some of the improvement projects recommended in this AMP would be moving the airport toward that national category without acknowledging that is why. Mr. Wozmak said this came up two months ago at the AAC, who reviewed the criteria and voted to not pursue national status at this time. Dr. Shedd said she still thinks it is important context to include in the report. Mr. Deck will add that in the recommendations section; Mr. Wozmak will send that AAC meeting minutes and the criteria memo to Mr. Deck.

4) Adjournment

Hearing no further business, Chair Hansel adjourned the meeting at 4:21 PM.

Respectfully submitted by,
Katie Kibler, Minute Taker

City of Keene
New Hampshire

AD HOC AIRPORT MASTER PLAN COMMITTEE
MEETING MINUTES

Wednesday, May 24, 2017

3:00 PM

Dillant Hopkins Airport Terminal

Members Present:

George Hansel, Chair
Jan Manwaring, Councilor
Kenneth Colby
Bob Bergevin
Bill Hutwelker (Arrived Late)
Beth Bendel, FBO

Staff Present:

Jack Wozmak, Airport Manager

Members Not Present:

Dr. Ann Shedd
Phil Suter
Jack Dugan
William Summers

1) Call to Order

Chair Hansel called the meeting to order at 3:00 PM.

2) Approval of Minutes – May 4, 2017

The May 4, 2017 minutes will be reviewed and approved at a later date.

3) Draft Master Plan Update

Ervin Deck of Stantec said there have been no technical changes to the Airport Master Plan (AMP) since the last meeting; there were no necessary changes from the final public information session. The NH Department of Transportation (DOT) confirmed and clarified that any areas on the Airport Layout Plan (ALP) designated for non-aeronautical use are possible areas to place solar arrays. The total area of non-aeronautical parcels on the ALP is 77 acres, though not contiguous.

Mr. Wozmak asked if parcels designated for non-aeronautical use on the ALP can be requested for aeronautical use in the future; Rita Hunt of NH DOT replied yes. Mr. Wozmak asked if the same is true for changing space designated for aeronautical use to non-aeronautical; Ms. Hunt replied yes, but more difficult.

With no other technical changes to the AMP since the last meeting, Chair Hansel welcomed questions. Mr. Bergevin asked how many years it would take to see the financial payback of a solar investment. Mr. Wozmak replied he does not have the answer because it would be a City project on Airport land; he said the bulk of the investment would come from a solar company that installs the array (approximately \$500,000/acre) and the City would receive energy and tax incentives.

Councilor Manwaring asked if it is being proposed that both ends of the crosswind runway be extended. Mr. Deck replied no, one end could be extended in terms of pavement and the threshold could be extended at the other end; this means no additional pavement but possibility of lowering the tree line to functionally lengthen the runway. Councilor Manwaring questioned of the 300-400 foot pavement addition to the end of the crosswind runway will impact wetlands; she said it appears it will on the map. Mr. Deck replied it will not impact wetlands; Mr. Wozmak said just because something is on the ALP does not mean it has to or will be implemented. Councilor Manwaring said this question should be explored further.

Councilor Manwaring asked if a question Dr. Shedd had risen regarding avigation easements had been addressed in the AMP. Mr. Deck replied yes, briefly in section 7.8. He added that avigation easements are on properties when identified obstructions lead the airport to hire an appraiser and use federal funds to guarantee the airspace above the property for aviation in perpetuity. Avigation easements are only required when using federal funds.

Mr. Bergevin made a motion to recommend the City Council adopt the Dillant Hopkins Airport Master Plan Update. The motion was seconded by Ms. Bendel and carried unanimously.

Mr. Deck thanked the AMP Committee for being a proactive group to work with.

4) **Adjournment**

Hearing no further business, Chair Hansel adjourned the meeting at 3:14 PM.

Respectfully submitted by,
Katie Kibler, Minute Taker

Appendix C. SURVEY

As part of the Airport Master Plan Update a survey was conducted to solicit feedback from users, neighbors and residents of Keene and the surrounding communities. The intent was to use the data collected in this survey to assist the City and the Airport Master Plan Committee in making decisions for the improvement of the airport.

The survey was prepared in both electronic and paper formats. The electronic version was published online on SurveyMonkey. All paper surveys were collected and uploaded into the website manually.

The survey was first made available on March 16, 2016 and ended on August 31, 2016. During this 168-day period, 65 people participated (58 electronic and 7 paper).

The public was made aware of the survey through several sources and media.

- The survey's availability was announced at a March 16, 2016 public information meeting.
- Notices of the survey were posted at the airport, the Keene City Hall and Swanzey Town Office. In addition, a link to the survey was posted on the airport and town's website as well as the airport's Facebook page.
- Email notices were sent to each member of the Planning Advisory Committee with a request to forward the notice and link to the SurveyMonkey website to other interested people.

Findings

The survey consisted of four parts and 19 questions and/or comment fields. It is accepted that the resulting samples corresponds exactly to the composition of the population who participated in the survey, and therefore, no effort was made to apply a weighted average to the responses. This was done primarily as a cost saving measure. The findings that follow should be considered at face value.

No effort was made to correct the spelling, grammar, or tone) of the personal responses options.

Finally, any response that contained inappropriate language was not included.

The following is a synopsis of the results

Part I – Current Use of the Airport

1. In the last 12 months, how many times have you visited the Dillant-Hopkins Airport (for any reason)?
 - Sample Size: 65
 - Response: 2.5 times
2. How many times in the past year have you flown into or out of the Airport?
 - Sample Size: 62

- Response: 1.2 times
3. How would you characterize your knowledge/awareness of the airport?
- Sample Size: 65
 - Response:
 - a. I didn't know the city had an airport..... 1.5% (1 response)
 - b. I knew the city had an airport, but I'm not at all familiar with it 13.8% (9 responses)
 - c. I'm somewhat familiar with the airport 29.2% (19 responses)
 - d. I'm very familiar with the airport 55.4% (36 responses)

PART II - Attitudes and Perceptions of the Dillant-Hopkins Airport

4. Using a scale of 1 to 5, where 1 means “extremely dissatisfied” and 5 means “extremely satisfied,” how satisfied or dissatisfied are you with the Dillant-Hopkins Airport overall? (circle one response only)
- Sample Size: 65
 - Response:
 - a. Extremely Dissatisfied 10.8% (7)
 - b. Somewhat Dissatisfied 13.8% (9)
 - c. Neutral 21.5% (14)
 - d. Somewhat Satisfied 24.6% (16)
 - e. Extremely Satisfied 24.6% (16)
 - f. Not Applicable to me 4.6% (3)
 - g. Don't Know 0.0% (0)
5. In question 4, if you answered either “extremely dissatisfied” or “extremely satisfied,” please tell us why, otherwise continue to Question 6.
- The follow 20 responses were posted:
 - (1) I am disturbed by the process that has occurred around planning for obstruction removal, the disrespect, insults, and disregard for opinions other than those popular among aviation users.
 - (2) Gas prices very high compared to surrounding airports.
 - (3) Extremely satisfied with Monadnock Aviation, less so with EEN Airport [Commission]
 - (4) FBO operator is stellar welcoming newsletter bbq etc
 - (5) Very well maintained and staffed. Great facilities

- (6) Modern, up to date, excellent runway and approach on 02, Nice people, Keene is a great city and the region has many attractions.
 - (7) Only 1 FBO. Trees on north end dangerous
 - (8) Repeated circling of small personal planes over our house, even though we live miles away. Constant annoyance almost every weekend!
 - (9) Playground for the rich
 - (10) I would like to have the ability to hop a plane, at reasonable cost, to Bradley or NY or Boston, as a quicker more convenient way to access major hubs rather than driving.
 - (11) The trees on the north end need to be removed so would could have a suitable precision approach to both runway directions "RWY 20". We desperately need the entire airport fenced in. Deer and other large animals on the runway!!!
 - (12) They completely ignore the concerns of people in the neighborhood.
 - (13) The aerobatics practicing on the weekend make it so we can not be out side on our deck. We cannot hear ourselves talking. They should be doing it over a non populated area. They should not even be considering cutting down trees. They should extend the runway since they have plenty of space.
 - (14) Poorly Run, not many benefits to the average Keene citizen who still have to travel to other airports for flights while their tax burden covers for the few corporations that gain the benefit without the associated costs!!
 - (15) Noise pollution. Serves mainly recreational pilots and costs us tax dollars.
 - (16) Noise pollution. Tax dollar support. Leaded fuel.
 - (17) I live in Edgewood ... The tree people... The people who pay lots of taxes and are getting ignored because one businessman has a plane...pilots that do not live in Keene have more of a vote... Aviation schools with more of a voice... The airport is never going to make money... The new manager is living in a bubble...it's a bit of a joke
 - (18) So far, I am somewhat neutral though I am disappointed that the long-term neglect but the airport/city of the forest may result in having to take trees down that buffer the Edgewood neighborhood. However, if the trees actually come down, I will be extremely dissatisfied.
 - (19) The management of the airport has seemed to go out of their way to show indifference bordering on disrespect for the neighborhood. This is a VERY small airport - statistics we have been given are clearly dishonest and call into question all other statements from management.
 - (20) Poor communication and fiscal decisions as well as environmental and noise/use development as plans have unfolded over years. Lack of true disclosure and fiscal viability. Voice of people often discarded, patronized as if decisions are already made, public venues held to go through the motions of appearing to give forum. Does not serve the value of dollars in for community and corporate value add. Many use airport for parking for recreational use of forest/park area.
6. Now, where 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree, please answer the following 6 questions.

Answer Options	1	2	3	4	5	NA	Don't Know No Opinion	Rating Average	Response Count
a) The Dillant-Hopkins Airport is among the best general aviation airports in the region.	9	5	14	7	7	4	19	4.32	65
b) Airplane noise reduces the quality of life in my neighborhood	11	6	3	5	26	13	1	4.11	65
c) The Airport should do more to protect the environment	4	4	11	11	29	0	6	4.25	65
d) Flights out of the Airport allow me to easily travel when and where I want to go.	24	1	4	2	14	13	7	3.74	65
e) The Airport is important to the City and the Region's economy	9	10	8	8	26	0	4	3.74	65
f) Protecting the natural environment is as important as accommodating airport growth	4	6	6	9	37	0	2	4.20	64

7. In Question 6 (a – f), if you either “strongly disagree” or “strongly agree,” please tell us why.

- The following 42 responses were posted:
 - (1) Quality of the environment and life for the neighbors should be highly considered in planning.
 - (2) EEN is a gem of an airport and a great economic value to the area.
 - (3) the environment is the most important think to consider
 - (4) The airport "belongs" to the region and especially Keene. The commercial growth potential at the airport needs to be developed. EG: C&S employees around 1000 local folks. Imagine having one or two more companies that base their aircraft at our airport. The airport is vital to our community and its growth should not be impeded by a few neighbors who moved into the area after the airport was already there! We need to do all that we can, as a community, to make our airport reach its potential. When the safety of pilots, passengers and those folks on the ground is dependent on some tree cutting to make an approach viable from the north, what are we waiting for.....a catastrophe to get things going?
 - (5) I have been flying for nearly forty years, and I have seen the positive impact an airport can have on a community. Sadly, I have watch several airports disappear from the region over the years as well.
 - (6) Beautiful underutilized airport
 - (7) d. There are no flights available to the public. c & f. Are you kidding? It is obvious... Don't it always seem to go, that you don't know what you've got 'Til it's gone. They paved paradise and put up a parking lot - or a bigger airport!
 - (8) I've lived around the airport with no issues. The airport is important for national security and the future of Keene.
 - (9) Great facility

- (10) The airport brings in people who spend money in the community. The airport is an incredible benefit to Keene.
- (11) if you take away the airport cns will move their headquarters to another city that has an airport.
- (12) The airport has so many benefits that people don't recognize. The economy would lose a lot without the airport.
- (13) One of Keene's largest businesses uses the airport almost daily. It is very important for the local economy. However, Wilson Pond is also important for its recreational usage and the local tax base. Airport development which could potentially destroy recreational usage and local land values must be carefully avoided in favor of more judicious approaches.
- (14) The airport allows businesses quick and efficient access to a wide spread customer base. But, as important as the airport is, only one environment exists, so the natural environment should be protected.
- (15) 6d - Lack of scheduled passenger service at personally and environmentally affordable cost; availability of readily accessible passenger service from BOS, BDL, MHT.
- (16) Unless you live under a rock, this question is silly. Of course the natural environment should be preserved with some balance for a struggling airport.
- (17) B. Noise is not noticed on Gilsum St. C. No scheduled air carriers.
- (18) Airport supports our economy
- (19) Low-flying planes can be a regular annoyance. Any loss of trees for the sake of pilot safety should be minimal. Any safety improvements should be nuanced and intelligent.
- (20) Plane based at EEN - local and long-distance trips. Jobs + ripple in economy
- (21) This survey, as a representation of the thoughts of any Monadnock region population, is not likely to be effective. It's not easy to find on the city website b) only available once per computer (so I had to do this paper form because my wife completed the form online). You will get results skewed towards (1) heavy airport users and (2) neighbors affected by the tree-clearing project. ALL those working on the airport master plan need to read the Keene master plan and be consistent with it.
- (22) Mike Moriarty and his crew do a great job with maintaining the airport. It is an absolute necessity to the city of Keene. We need to make it SAFE! An entire perimeter fence and approaches to both runways could do that.
- (23) The reasons are obvious -- the airport is NOT more important than the environment, nor more important than a very well-established and beautiful neighborhood.
- (24) I believe that any business has an obligation to protect the environment. I believe the airport only benefits a few.
- (25) The airport has a very strong presence right now; it's a very large powerful neighbor, and seems to place no importance on its impact on everyone else.

- (26) There is an abutting forest that stands to be removed for airport 'progress'. This is wrong. Other alternatives should be sought and applied.
- (27) Constant airplane noise on weekends is disrupting to personal home time. Phone and personal interactions and conversations must stop. Odors from idling jets are coming through the woods. On the past Easter holiday alone there were 4 or 5 jets that came in one after another. Which was very odd. C: The airport knew of the tree issue long before it came to be a "problem" There should have been corrections before this. Clear cutting is going to be a strong shock to the environment around the airport and the Edgewood neighborhood. This airport should remain a General Aviation Airport. Airport traffic should be limited in the evening. Opening this airport up for higher traffic rates is going to destroy the neighboring housing values. Plus the quality of life.
- (28) There should be no need to cut all the trees in Edgewood area to accommodate a few recreational flights. Should have been managing that forested area all along to avoid the current issue. (Selectively cut tall trees, put in tree types that maintain habitat without getting too tall.)
- (29) The city should not make decisions that affect hundred of people for one company. They are not exploring other options.
- (30) Protecting the neighborhoods and the environment in and around airports in Keene and or in any other area is important.
- (31) There are no options for non corporate flyers except to travel to another airport.
- (32) The few legitimate businesses that use the airport are not the problem. Such events as "Aerobatics" are disruptive and bring in NO money. This is a beautiful natural area and should be preserved.
- (33) What does sustainability mean? Can we sustain continuous growth and sustain what we have?
- (34) No need for extra noise via aerobatics.
- (35) The natural environment (adjacent to the airport) was a gift to the people of Keene. It deserves to be treated with the same respect as Robin Hood Park which was also donated to the people of Keene. The mere thought of a plan to destroy the environment to assist the airport is offensive. there is little to no valid commercial flights out of the airport. Just about everything is either corporate, aero-club, lessons, or now no thanks to the city counsel, aerobatics club from out of town. There is little to no consistent city revenue stream coming from the airport that benefits the cities in the area. There is no 'economic vitality' to be improved upon that I am aware of. This facility has NEVER operated in the black, and continues to suck more and more revenue from the state and the city at taxpayers' expense. I find it appalling that study after study is conducted at great expense to residents to satisfy the special interests of a few businesses at the airport. They appear eager to push through their own agendas at the expense of locals who do not support these excessive studies and expenses. I am concerned about pilot safety but feel the city shirked its responsibility in maintaining the Edge Wood Forest that was gifted to them years ago. Now the airport and it's residents are crying 'foul' saying no one cares about pilot safety, expecting neighboring communities to forfeit their quality of life and accept devalued properties.
- (36) The airport is for everyone except Keene taxpayers

- (37) I have never used our airport as a means of travel. The impact to the natural environment has more long reaching consequences than does the ability to increase small plane traffic. I think the health and safety of residents should take precedence over the ambitions of moneyed parties. Realistically, Keene RESIDENTS have little need for small plane activity. Such people fly in but do not add to Keene's prosperity. It's wishful thinking to project big bucks from them.
- (38) b. Especially on the weekends the noise is disruptive with the take-offs & landings of the flight school. c. Tree cutting without concern for the environment (airpoed natural habitat) is detrimental to the health & well being of Keene residents.
- (39) I live in the nearby Edgewood neighborhood. We have been there about 1 year. One of the things we love most is how accessible it is to downtown Keene, but that it still provides the privacy and quietness of a rural neighborhood. The largest factor in this are the woods behind our neighborhood - we have wildlife, wooded trails, and easy access to the water treatment road which is great for walking/exercising. One of the first things we learned about our neighborhood, after moving in, was that the trees we loved so much and which had so strongly influenced our decision to buy our home, we possibly being threatened. The removal of the wildlife, forest, trees, etc would significantly impact our quality of life and our ability to resell our house in the future. Right now, the noise pollution from planes is manageable - we don't have small children, our dog doesn't mind the planes, and the planes are mostly noticeable during the weekend. However, the noise pollution is still significant and should it increase would again impact our quality of life and future resale options. We want to remain in our neighborhood for a very long-time, it is an amazing place to live. But if someone asked me what the biggest negative was of our neighborhood, it would be the airport (noise pollution and threat to the trees/woods).
- (40) The Airport is important to the City and the region's economy. --I strongly disagree with this. The 2-3 private jets that fly executives in and out on a weekly basis may have had some influence on why they brought their companies here...but as for all the private planes that fly(uncounted and unaccounted for as there is no tracking of take offs and landings!) in and out of our airport--they do very little for the local economy. A supper or lunch does not add up to much. The gasoline is all sold by one vendor who pays no income tax to the state. The taxes paid by residents in the Edgewood neighborhood bring in much more money to the City than the private airplanes. 2. Protecting the natural environment is as important as accommodating airport growth--I strongly agree with this--the City's Master Plan is very clear on protecting and developing Green Space to promote the health of the population. Vision 20/20 planned to make the Monadnock Region the healthiest in the country--somehow expanding a carbon producing facility while cutting down many carbon absorbing trees seems quite counterproductive!
- (41) Poor communication and fiscal decisions as well as environmental and noise/use development as plans have unfolded over years. Lack of true disclosure and fiscal viability. Voice of people often discarded, patronized as if decisions are already made, public venues held to go through the motions of appearing to give forum. Does not serve the value of dollars in for community and corporate value add. Many use airport for parking for recreational use of forest/park area.
- (42) The airport is parking for MANY in the region who don't have access to this hidden survey for recreational use of the forested area rich in diverse wildlife and community use, exercise,

photography, families, mixed physical abilities find ways to use this area which will be greatly diminished in quality of life by a clearing. Our dollars have been part of the maintenance that was entrusted and yet never happened here I suppose but someone will also benefit from the square foot wood dollars, hmm? While those of us lose and lose again for years. The travel for average individuals out of this airport is not relevant. It doesn't happen. We have constant noise from dawn to evening of practice groups booted from other small airports for noise- sure we'll take them, even though they break the rules sometimes. But why? We cannot have phone conversations or even conversations in our yard when small planes go overhead, several an hour weekdays, weekends. Working from home is also challenging for this reason. Recently, several homes were for sale on our street, and interested buyers walked away because specifically the jet traffic shook the windows or small plans were too loud and frequent. We can here the jets warming for a long time b4 take off. It creates heat too. Pollution gathers in the valley of many streets. Helicopters shake our home. If a private person, Easter weekend, has an event, they fly in 5 or more jets of guests and fly them out again. Does this help our local economy? I don't see incentives for large companies to come or stay. That's a state and local government issue. I hear the talk that c&s will go if airport has trouble. Is our local economy so fragile that an in the red airport can be muscled by this company, which I think is a statement baring more scrutiny. The tax dollars going into the airport need more attention. It's always in the red, the airport is not well maintained, and not much use to the average citizen, who can find if asked other purposes for those dollars that more directly benefit them. Many large companies that don't use the airport are having trouble staying.

8. Please select the answer that best describes how you feel about the Airport

Answer Options	Response Percent	Response Count
I appreciate the airport as it is	9.2%	6
I appreciate the airport, but believe it could perform better in some areas	30.8%	20
I appreciate the airport, but I have concerns about certain aspects	32.3%	21
I have no feelings about the airport	3.1%	2
I do not appreciate the airport	12.3%	8
Other (please specify)	12.3%	8

9. Please tell us why you selected the response you did in Question 8.

- The following 51 responses were posted:
 - (1) The airport has a balanced with the needs and impact on the people around it.
 - (2) Need to develop the develerable area within it.
 - (3) The city pushed my Mechanic out of the hanger that he maintained and now has to spend money to make a less useful use of it. Less business more cost.
 - (4) FBO

- (5) More variety of hangers available would be nice along with covered tiedowns.
- (6) I see the need for growth in our region and realize that our airport is the place where growth can be realized faster than any other means that already exists.
- (7) EEN is a little more sophisticated and larger than the last airport where I based my aircraft (Northampton, MA), yet it still retains a small town atmosphere about it.
- (8) Nice to have a grass strip
- (9) With planning, I think that the terminal area could become a destination for small planes... adding to the local economy. I don't ever expect it to become a feeder to larger airport hubs.
- (10) The loss of an established fbo and restaurant is evidence of poor management.
- (11) Having an onsite restaurant would bring in even more people, money, and attention to the airport. Many pilots would come to Keene and purchase fuel and food if there was a pleasant breakfast/lunch restaurant on the airport grounds.
- (12) there is a lot that can be done to improve the airport that has not been done yet
- (13) The FBO is doing a very good job of promoting aviation the AAC is capably led and supported the restaurant area will again be occupied. Use by more aircraft is being energetically worked on
- (14) I believe the airport could use some improvements, there should be more emphasis on becoming self supporting over the long term, there are too many people making the decisions for the airport some with little knowledge about the operation.
- (15) From what I can tell, there is very little information available to the public about the airport and its benefits, although I assume it provides benefits for more than just C & S and a handful of hobby airplane enthusiasts. It would be great for the City to provide more information about the airport and its benefits.
- (16) I would like to see additional responsible growth to help the local economy.
- (17) Reported negative impact from Swanzey residents due to noise levels
- (18) I think that the terminal area could be developed to support more businesses. Was pleased to see that a new restaurant was coming in.
- (19) More local businesses with distant customers could take advantage of the access to customers available via the airport.
- (20) Concern about the cost-benefit ratio of the City supporting EEN.
- (21) I am concerned the City of Keene is caught up in some kind of giddy excitement that the airport will actually be anything more than a playground for the wealthy. Also, see previous comments about C&S. Until passenger service returns, which I can't see happening, the airport will never be self reliant.
- (22) We had a \$90,000 manager their for 20 years. The city manager, council sort of forgot the airport. Seems to be a problem with who was in charge of making sure tenant income was paid timely. Close follow-up on actions when always late.

- (23) I fear a hamfisted approach toward the trees and the lives of the people nearby. (edgewood neighborhood)
- (24) I am a pilot who rents. I fly about once a month. The airport is conveniently located. The folks at Monadnock Aviation are very nice and very professional.
- (25) Trees on RWY 20 approach, Fuel prices more competitively, promote non-aviation uses
- (26) As a resident of an adjacent neighborhood, I would not like to experience significant increases in noise level or deterioration of air quality. I would also not want to have my home value decrease as a result of increase visual exposure to the airport.
- (27) Air traffic at this airport is low, and DECREASING -- yet there seem to be plans for "growth" -- This seems unrealistic to me.
- (28) Because I do have serious concerns. Without a fence, We approach we don't encounter a deer strike that would either kill or seriously injure many involved.
- (29) trees on approach end of 20 need to be removed, fence to keep wild life off of runway
- (30) I do not directly benefit from the airport and am concerned about what an expansion will do to the surrounding neighborhoods
- (31) The airport has a role in the area, and certainly serves a number of purposes, but those directly involved with it are so focused on its goals and the concept that all growth is good, that it's become a bad citizen, a "bully" in the neighborhood. There is a disregard for the quality of life for those living near it, both in Swanzey and Keene. Property values will certainly drop if the facilities are expanded as proposed and there will be a significant negative impact on the environment.
- (32) It seems that the managers of the airport see it as more than it is- a small, recreational airport.
- (33) While I understand certain flights are needed for local businesses. I worry about increasing air traffic and the very real possibility of planes crashing into the neighborhood. It hasn't happened yet but there have been accidents. One just this past week which had no fatalities. Just runway lighting.
- (34) Please refer to "Sustainability: Working Towards a Sustainable Future" on City of Keene website. If airport is owned and managed by City of Keene, then airport management should reflect this as well.
- (35) I have family that live in Keene and they are concerned about the noise, neighborhood and environment where they live.
- (36) It's very frustrating to see the amount of money spent to support an airport that only supports a very!! Small part of the population.
- (37) As stated, it does not serve the general population of Keene or Swanzey enough to justify any expense (except maintenance) or environmental degradation.
- (38) It really does not have anything to do with the general population of this region.
- (39) It has no bearing on our life except for the noise.

- (40) The airport has placed itself above the needs of the people of Keene. It completely lacks any respect for the natural environment and the needs of the people to maintain a natural environment.
- (41) The airport is but one small part of the regional transportation system; nothing more and nothing less. It offers value to those who need it and of little value to those who don't. And it offers a very large natural green area with acres of green grass void of homes and people.
- (42) The airport and the city counsel have repeatedly ignored the citizens in the neighborhoods surrounding the airport when it comes to concerns over the Nashua Aerobatics club practicing, there is no concern for the Edgewood Expanse and their want to cut down trees without completing a thorough environmental impact study. They are doing nothing to pull in cost-effective commuter hops to other local destinations (thus improving revenue for both the airport and the local communities), and the current management at the airport hid several facility issues from the city until it was a glaring issue (see recent meeting notes on rented facilities).
- (43) Safety trumps a handful of tall pine trees growing in the approach corridor of the runway. The city has height restrictions and yet homeowners have allowed THEIR trees to violate these ordinances. So, who's to blame?
- (44) I said I appreciate the airport but I mean by that that I appreciate the space and land on which the airport sits. Concern about the impact on my home, neighborhood and the natural environment surrounding the airport are why I indicated that I have concerns.
- (45) The grit and the noise from the airport are a constant reminder of its presence. The aerobatic planes do not honor their stunt box - either they can't follow directions or they don't give a damn - either way they shouldn't be allowed to fly above our houses, but the city/airport has approved their use.
- (46) I am a homeowner near the airport. I want the quality of life and the natural environment to be protected.
- (47) Our neighborhood is historically important to Keene - preserving it should be a priority.
- (48) The airport exists--it is part of our city and region. It has co-existed with the pre-existing Edgewood neighborhood since it was developed as an anti-terrorist strategy shortly after Pearl Harbor was bombed. Our Swanzey neighbors were not so lucky when the land on their side of the airport was raped. I do not believe an expanded airport will benefit the region in any way.
- (49) I liked the airport, especially the main runway 2-20 because of the smooth pavement, but twice the Cessna I landed on rwy 20 I had to back taxi, or go all the way to the next turnoff, roughly 1,500 ft from a usual stop. It wasn't that big of a problem, because it wasn't crowded when I landed.
- (50) Their plans to eliminate the Forest !
- (51) Livability is already increasingly affected. Taxation in the Keene area is higher than surrounding areas and forcing out many. As the region grows, if it is indeed growing, many factors need to be considered before the airport to secure the vitality of businesses and families in the area. Large

and small retail as well as other industry is not thriving. One asset of the region is the environment and natural resources/wildlife, access to such within the region and the agriculture, artisons, inventors, and athletes it supports. More attention can be spent on this which has historically grown and gotten this region even through times like the depression and currently.

PART III - Understanding Key Impacts

10. As the region grows, the impact of the Airport on adjacent neighborhoods might increase, such as noise, air pollution, etc. We'd like to ask you to consider the following tradeoffs between accommodating growth and protecting livability. Rate using the following scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. Respondents could also respond "Not Applicable to me" or "Don't Know", in which case the respondent's response was not calculated. The scores for each question were then averaged.

Answer Options	1	2	3	4	5	N A	Don't Know No Opinion	Rating Average	Response Count
a) Support airport development consistent with demand and safety	11	7	7	24	15	1	0	3.43	65
b) Require all future terminal renovations and expansions, if any, to be certified as energy efficient and environmentally friendly	1	4	12	18	29	0	0	4.09	64
c) Protecting the surrounding neighborhoods "livability" is important to me	2	4	10	12	36	1	0	4.22	65
d) Protecting the airport and my air travel options is important to me	17	5	11	12	15	5	0	3.28	65
e) Protecting the airport's ability to support the region's economic vitality is important to me	8	8	7	18	24	0	0	3.65	65

11. In Question 10 (a – e), if you either "strongly disagree" or "strongly agree," please tell us why.

- The following 42 responses were posted.
 - (1) The environment and quality of life for neighbors, and there are many effected by the airport, need to be seriously considered. The process thus far has been very disappointing. I hope the new leadership for the airport and city managers will take concerns more seriously. Property values are also a strong concern.
 - (2) C&S currently provides 1000 jobs in Keene because we have an airport.
 - (3) Business use is important to the area
 - (4) general aviation is important
 - (5) Our airport already exists and it is in excellent usable condition. Room exists for additional commercial enterprise to join our region by moving onto airport property. Our community needs the growth. Finally, if livability is an issue, why did these few folks move next to an airport and now complain about it. We need to look at this matter from a broad prospective and our airport's value will be self evident.It is just plain wrong to postpone such an important safety issue for the sake of a

- few folks who are more concerned about their own "quality of life" than the safe progress of our airport and the safety of the people who use it for its intended purpose.
- (6) I think that airports provided a positive impact on a region.
 - (7) Beautiful underutilized airport is irreplaceable, and a regional jewel for future commerce.
 - (8) Living by the airport is a choice. Property is priced according to its location.
 - (9) Without the airport, my business would go to a different community. I depend on the airport and pay for airplane maintenance and fuel. This airport is conveniently located and is indispensable for a thriving community and economic center of southwestern New Hampshire.
 - (10) the fact that the airport has grown and improved since I started flying in 1960 and Keene has grown with vis-à-vis other communities within 100 +/- miles have not grown or sustained themselves economically speaks for itself.
 - (11) The airport is a useless waste as it is. If you want to improve the region's economic viability, close it and save the taxpayers the burden of dealing with it. Keene is forcing businesses away already; having an improved airport won't change the fact that this area is quickly becoming a slum.
 - (12) I think its high time for the City to make a stronger case about the airport's benefits to taxpayers.
 - (13) ALL devt in Keene should be as environmentally low-impact as possible; the terminal is only one part of EEN's impact. Keene's residents defined the City before the Airport existed, and will in some future era when air travel may be obsolete - so of course protecting livability for Keen's citizens is important.
 - (14) Obviously, a well-managed, efficient and contributing airport is an asset to economic viability.
 - (15) Energy efficiency should be a top priority. The city has very little regard for the Edgewood neighborhood as told by the approval of nuisance aerobatics. A fine example of building up use at any cost.
 - (16) The airport conveys the first impression of Keene for air travelers.
 - (17) Economic development is important. Neighborhoods are important.
 - (18) Insensitive tree pruning could have a stark impact on the nearby Edgewood neighborhood.
 - (19) If you move into a house near an airport, you are a volunteer and have no basis for complaints.
 - (20) Airport is a key resource to SW NH. General aviation is key to US national interests + keeping a vibrant airport community will help the "food chain" - new, younger pilots, etc.
 - (21) Because I live in adjacent neighborhood, its "livability" is important to me.
 - (22) 10b. Read the Keene master plan. 10c. I live in a nearby neighborhood.
 - (23) The City of Keene needs this airport. Is is a vital aspect of Keene and its ability to promote business and residential growth.
 - (24) The airport has not been responsive AT ALL to neighborhood concerns, which I find absolutely appalling. It's a tiny airport that virtually no one cares about except those directly involved. I don't

- know ANYONE who uses it (the only people I know who have EVER used it was when the Indian restaurant was there!).
- (25) I believe the airport only benefits a few so I don't think it has a great impact on area businesses. I am not aware of commercial flights.
- (26) The quality of the environment is consistently ignored and not valued, nor is impact on other species considered – a common but unethical practice, and also costly in many ways, a loss in property values being only one of many costs.
- (27) I live here and I am concerned about living here in the future and the value of my home. I would lose a substantial amount of money if this expands unnecessarily. I have lived in this neighborhood for 50 years. People comment about the beauty of the neighborhood all the time. Let's not destroy it and ruin the landscape. It's what makes this area beautiful.
- (28) This airport provides no travel options for me, and I don't imagine that it would. If there WERE, they would most likely be cost prohibitive anyway.
- (29) Trading off quality of life for convenience of one company is not acceptable
- (30) Question d. It provides no travel options for 99% of Keene's citizens. Question e. I don't believe it contributes to the region's economy. The costs don't justify the benefits except the corporate users who have a free ride.
- (31) The airport does not "support the region's economic vitality" and it is adjacent to very beautiful homes which have been here more than 100 years. Further, the forest is an important habitat and its preservation is important for everyone.
- (32) Economic vitality is a joke. If it were vital it would not need taxpayer support.
- (33) Trick questions - Drop the airport or keep it small. The region is not growing.
- (34) The "livability" is already impinged upon by the airport's extant activity. Cutting down trees and destroying forested land that belongs to the people of Keene will destroy the "livability" of this neighborhood.
- (35) The airport CAN be a viable part of the community if properly managed with competent oversight. Expansion may become necessary, and even though I live in one of the neighborhoods affected by that possibility, I also understand the airport was there when I bought the house. I also spent 21 years in the Air Force, so the planes flying out of Keene pale in comparison to F-16s, F22s, C-5s, U-2s, KC-10s, etc...
- (36) I mostly disagree because: 1) As a lifelong resident of Keene, the airport does not satisfy any of my travel needs and never has. 2) This survey is skewed - pitting airport supporters against quality of life issues raised by neighboring residents. 3) Studies have shown that airport expansion will reduce the property values of neighboring homes by up to 30%, yet there will be no tax reduction for this property devaluation. 4) In reference to letter e - WHAT ECONOMIC VITALITY TO THE REGION? C&S will eventually leave this area after residents spend mountains of money on 'improvements'. It is not my responsibility as a taxpayer to ensure the success of the aviation school by making the facility more user friendly for their business. Frankly, it is a total conflict of interest that the business owner

actually serves on the airport advisory board. Much like the realtor spouse of a local pilot who spouts off that property values near the airport will not be affected.

- (37) The credibility of the airport is minimal - I don't believe you when you say it is important to the economics of the area. C&S is doing fine with the airport as it is. You have delusions of grandeur.
- (38) a. It doesn't appear there is a great demand in our region in support of airport expansion. It seems what is being considered will benefit the few at the expense of many. c. Residents are deeply concerned with air pollution, noise pollution, destruction of the Edgewood forest preserve, and losing value in our homes.
- (39) I have not heard any evidence one way or the other, that the airport support's a large portion of Keene's economy. I, nor anyone I know, has utilized the airport. To me, it seems like it benefits few but impacts many. ****For instance, as far as I know, the aeronautic exercises, which are occasionally performed at the airport, provide no financial benefit to the city but impact that quality of life for nearby citizens. Our neighborhood is historically important to Keene - preserving it should be a priority.
- (40) I strongly disagree because you lumped together "safety" and "demand"-these are two different subjects. I support improving the safety but demand has no hold on me. We already charge no take off or landing fees and don't track usage-- b and c-the environment is of paramount importance to me and I live in the neighborhood... d. I am not rich enough to own a private plane (although I do pay about \$9,000 in real estate taxes per year!) and even if I were, I would consider owning a private plane to travel in a disservice to the earth's population(small planes still use lead fuel and lots of it!) e I do not believe the airport contributes much to the regions economic vitality.
- (41) Devaluation of our property !
- (42) It's simply foolish to not be environmentally conscious in any construction. My air travel options have never been served via keene nor do they need to be. I'm satisfied going to Manchester or Boston and using local limo to get there. The livability of the local life, including wildlife both rare and common, flora and fauna is important to the region and greater ecosystem. Moreso than a few recreational planes blustering around and increased jets that don't ACTUALLY spend dollars in town. A rec area encourages regular people daily to use the space among their normal lives and be part of our community. A vital ecosystem has import beyond our knowing. Our local government has bigger fish to fry. My house and neighborhood doesn't need MORE noise. The airport wasn't always here, it's ok that it is, but it can't expand too much, nor should it. There needs to be transparency and balance. Of course I want pilots to be safe, but my investment needs to be safe and i need to be able to run my business, ie talk on phone and speak with my family in my yard and not have my windows/walls rattle multi-daily. Wildlife has value too. More retail/museums likely won't be supported well in town. It's barely surviving now.

12. In what areas would you like to see the Airport improve upon the most?

- Sample Size: 61
- Responses: Percent response (response count):
 - a. Community Relations 65.6% (40)

- b. Non-aviation services (e.g. restaurant)..... 41.0% (25)
- c. Expanded aviation services 36.1% (22)
- d. Transparency..... 52.5% (32)
- e. Fiscal performance..... 41.0% (25)

13. Which of these presently available services do you use? (Check all that apply)

Answer Options	Daily	Weekly	Monthly	Annual	Rating Average	Response Count
Flight training	0	4	3	9	4.55	60
Aircraft maintenance	1	2	4	4	4.61	57
Hangar (aircraft storage)	8	2	1	2	4.26	57
Aircraft tie down (non-electric)	2	2	2	0	4.68	57
Aircraft tie down (electric)	0	1	0	1	4.93	55
Wi-Fi	1	6	3	1	4.49	57
Restrooms	1	7	10	6	4.16	61
FBO services	1	8	6	2	4.28	58
Car rental	0	0	2	3	4.88	56
Park & Ride (Thomas Transportation)	0	0	1	6	4.85	55

14. The following list contains services and facilities found at some airports. Please check the ones that you think would be a good fit at this airport.

Answer Options	Response Percent	Response Count
Aircraft wash rack	22.0%	11
Avionics repair shop	30.0%	15
Conference room/Business or Hospitality Center	42.0%	21
Restaurant/Kitchen	70.0%	35
Sleeping/shower facility (for use by visiting pilots/air crew)	18.0%	9
Auto car wash	8.0%	4
Air cargo service	22.0%	11
Courtesy vehicle (short term use by visiting pilots/air crew)	40.0%	20
Post office	6.0%	3
ATM/Bank	22.0%	11
Driving range/putting course	8.0%	4
Photovoltaic power station (solar power farm)	38.0%	19
Farm stand	12.0%	6
Playground/day care/after school program	10.0%	5
Education center/college	22.0%	11
Dry cleaning store	2.0%	1
Hair salon/barber shop	0.0%	0
Other (please specify)	20.0%	10

3. PART IV
- TELLS US A
LITTLE BIT
ABOUT
YOURSELF

12. Please
select the
response(s)
that describe
you best.

15. Please select the response(s) that describe you best.

Answer Options	Response Percent	Response Count
Pilot	27.7%	18
Business owner	15.4%	10
Airport tenant at EEN	6.2%	4
Own or rent a hangar at EEN	9.2%	6
Reside close to the airport (within 1+ mile)	49.2%	32
None of the above	15.4%	10

16. Please tell us where you live.

Answer Options	Response Percent	Response Count
City of Keene	52.3%	34
Town of Swanzey	16.9%	11
Town of Marlborough	1.5%	1
Town of Roxbury	0.0%	0
Other	29.2%	19

Appendix D. AIRPORT LAYOUT PLAN

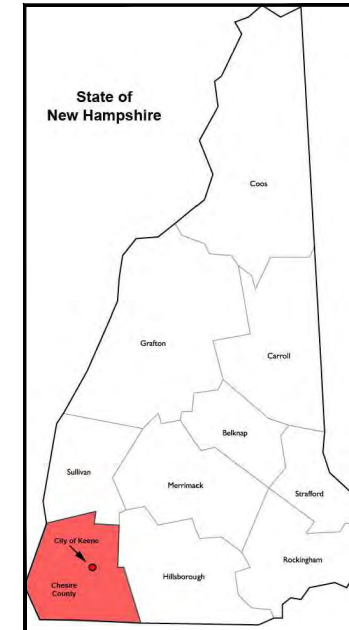
This appendix contains the Airport Layout Plan Set as discussed in Chapter 6. The following sheets are included:

• Sheet 1	Title Sheet.....	D-2
• Sheet 2	Data Sheet	D-3
• Sheet 3	Existing Facilities Plan.....	D-4
• Sheet 4	Airport Layout Plan (Ultimate)	D-5
• Sheet 5	Terminal Plan.....	D-6
• Sheet 6	Runway 2 Plan and Profile.....	D-7
• Sheet 7	Runway 20 Plan and Profile.....	D-8
• Sheet 8	Runway 14-32 Plan and Profile	D-9
• Sheet 9	Airspace Plan (Part 77 Imaginary Surfaces).....	D-10
• Sheet 10	Land Use Plan	D-11
• Sheet 11	Exhibit A Property Map	D-12

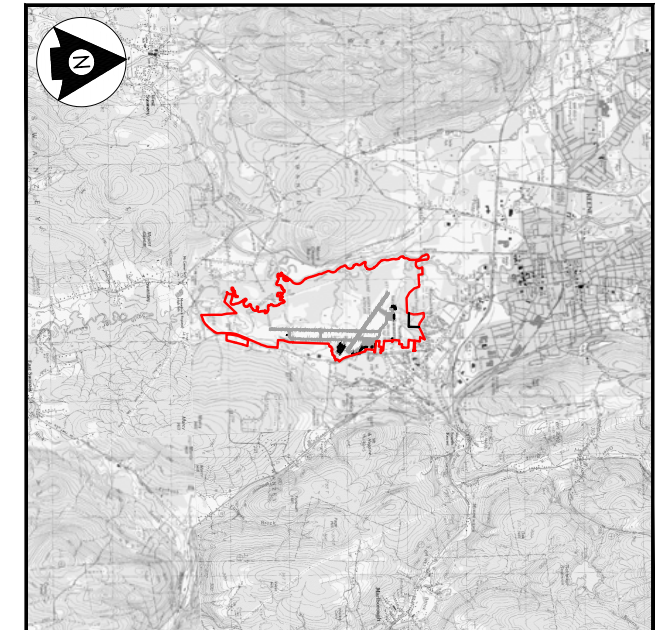
DILLANT HOPKINS AIRPORT
KEENE, NEW HAMPSHIRE

AIRPORT MASTER PLAN

JUNE 2017
SBG GRANT NO. 08-12-2014
STANTEC PROJECT NO. 195210711



LOCATION MAP
NOT TO SCALE

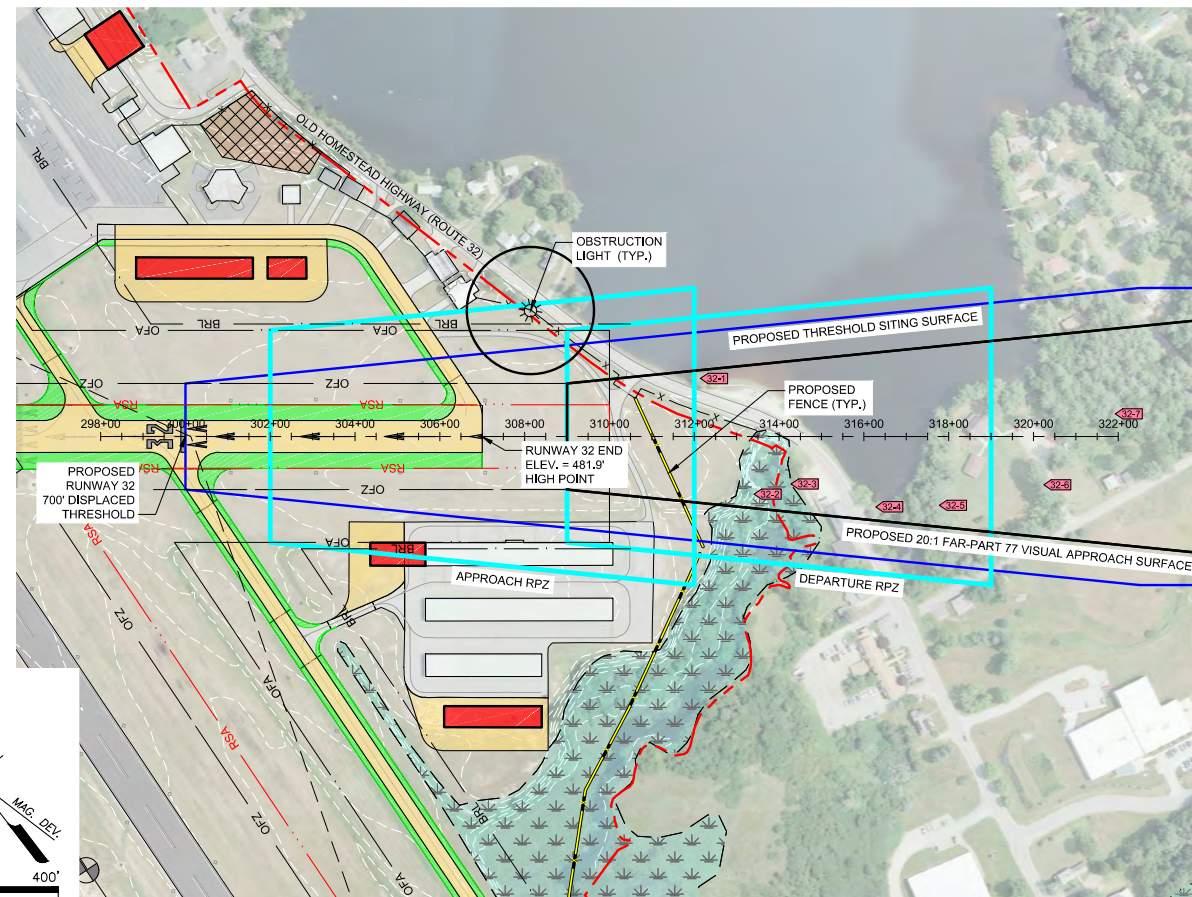
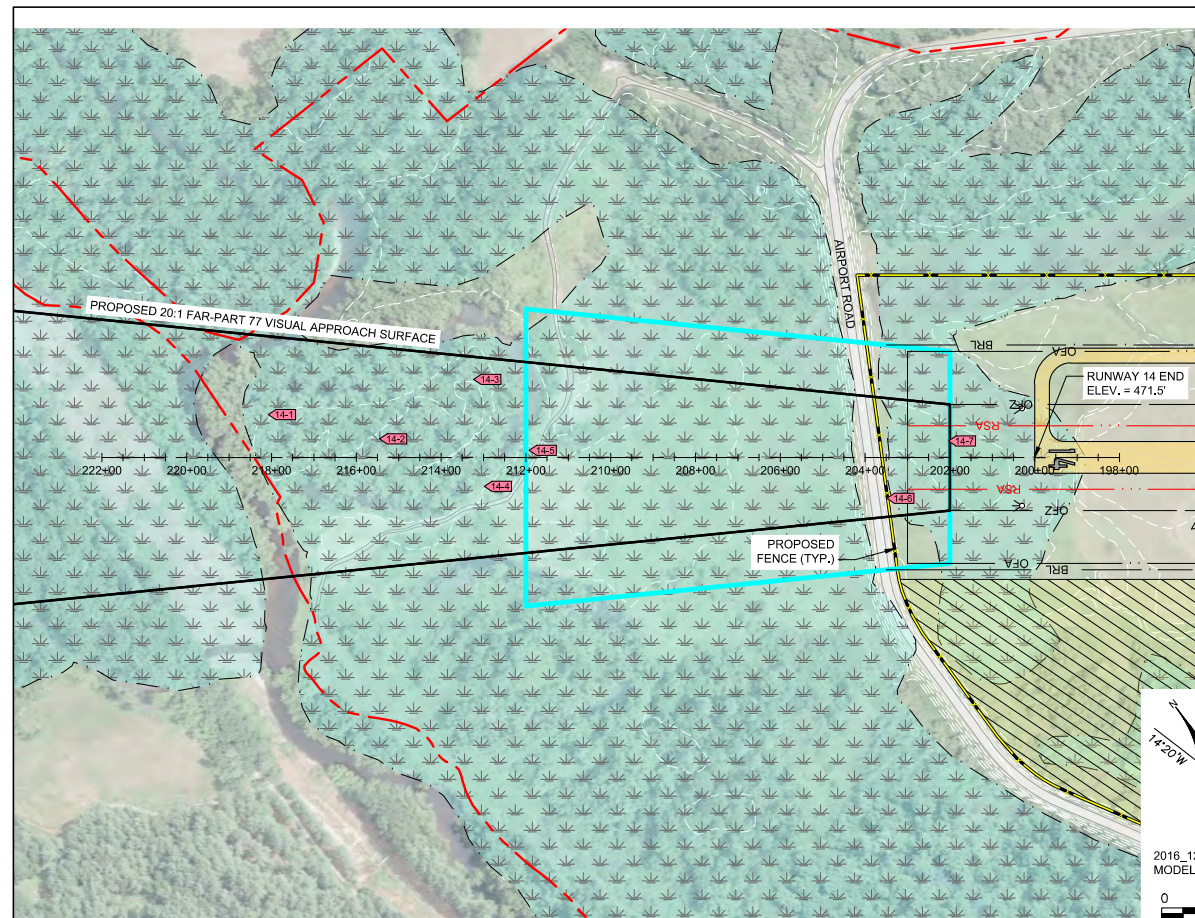


VICINITY MAP
NOT TO SCALE



INDEX OF SHEETS

<u>SHEET NO.</u>	<u>TITLE</u>	<u>REVISION DATE</u>
1.	TITLE SHEET	
2.	DATA TABLES PLAN	
3.	EXISTING FACILITIES PLAN	
4.	ULTIMATE AIRPORT LAYOUT PLAN	
5.	TERMINAL AREA PLAN	
6.	RUNWAY 2 PLAN AND PROFILE	
7.	RUNWAY 20 PLAN AND PROFILE	
8.	RUNWAY 14-32 PLAN AND PROFILE	
9.	FAR PART 77 IMAGINARY SURFACES PLAN	
10.	LAND USE PLAN	
11.	EXHIBIT A SHEET 1 OF 2	
12.	EXHIBIT A SHEET 2 OF 2	



LEGEND	
(Red dashed line)	AIRPORT PROPERTY LINE
(Black dashed line)	EXISTING CONTOUR
(X-X)	EXISTING FENCE
(Yellow dashed line)	PROPOSED FENCE
(Red dashed line with 'RSA')	RUNWAY SAFETY AREA
(Black dashed line with 'OFA')	OBJECT FREE AREA
(Black dashed line with 'OFZ')	OBJECT FREE ZONE
(Black dashed line with 'BRL')	BUILDING RESTRICTION LINE
(Black dashed line with 'RVL')	RUNWAY VISIBILITY LINE
(Cyan dashed line)	RUNWAY PROTECTION ZONE
(Black dashed line)	FAR PART 77 SURFACE
(Blue dashed line)	THRESHOLD SITING SURFACE
(Grey hatched)	EXISTING PAVEMENT
(Yellow hatched)	PROPOSED PAVEMENT
(Green hatched)	PAVEMENT TO BE REMOVED
(White)	EXISTING BUILDING
(Red hatched)	PROPOSED BUILDING
(Cross-hatched)	FUTURE AVIATION DEVELOPMENT
(Diagonal hatched)	RESERVED FOR NON-AVIATION DEVELOPMENT
(Blue wavy)	EXISTING WETLANDS
(Green wavy)	EXISTING TREE LINE
(Red circle with 'X')	OBSTRUCTION ID TO FAR PART 77 APPROACH SURFACES ONLY

RUNWAY 14

RUNWAY 14 OBSTRUCTION TABLE			
NO	DESCRIPTION	TOP ELEV. (FT)	PENETRATION (FT)
14-1	TREE	562.9	11
14-2	TREE	555.0	16
14-3	TREE	545.8	18
14-4	TREE	529.0	4
14-5	TREE	528.6	8
14-6	TREE	482.7	4
14-7	BUSH	475.0	3

RUNWAY 32

RUNWAY 32 OBSTRUCTION TABLE			
NO	DESCRIPTION	TOP ELEV. (FT)	PENETRATION (FT)
32-1	TREE	507.0	7
32-2	TREE	501.4	1
32-3	TREE	542.8	33
32-4	TREE	529.8	12
32-5	TREE	584.9	59
32-6	TREE	599.1	61
32-7	TREE	588.9	42

NOTE:
 ALL ELEVATIONS ARE MEAN SEA LEVEL (MSL)
 VERTICAL DATUM - NAVD 88
 COORDINATE SYSTEM - NAD 83
 AERIAL PHOTOGRAMETRY COLLECTED BY COL-EAST INC.
 DATED: MARCH 2015

Revision	By	Appd.	Y.M.M.D.D

Issued

File Name: sta_06_to_08_rwy14-32_rst_n_civil.mxd DWR ECD 17.06.14
 Dwn. Chkd. Dgn. Y.M.M.D.D

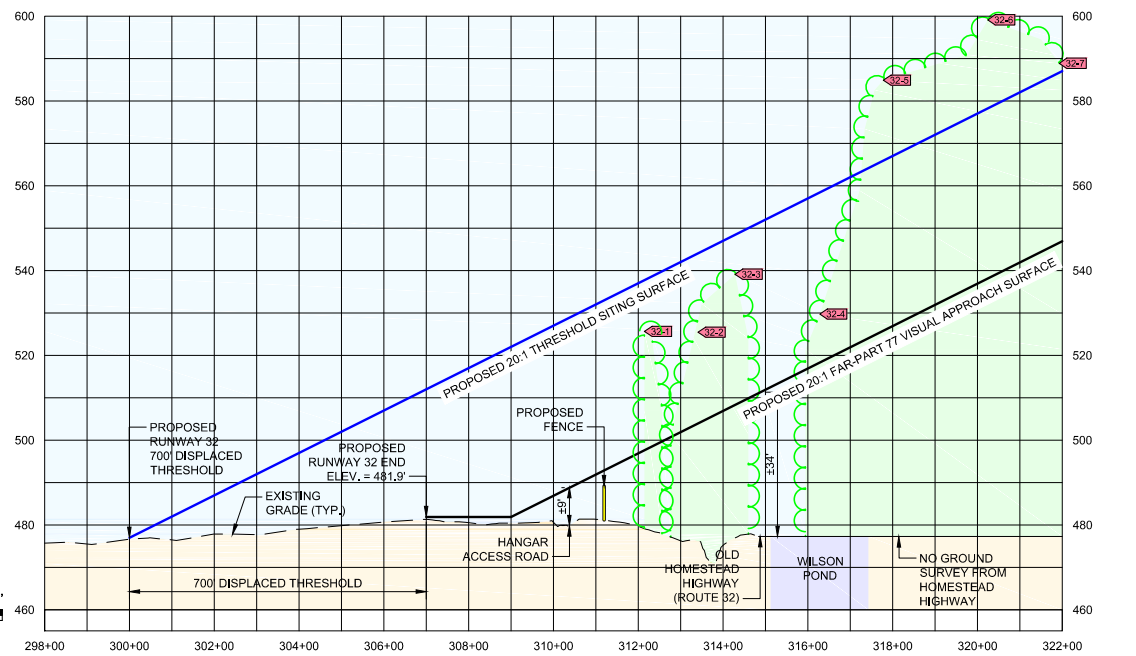
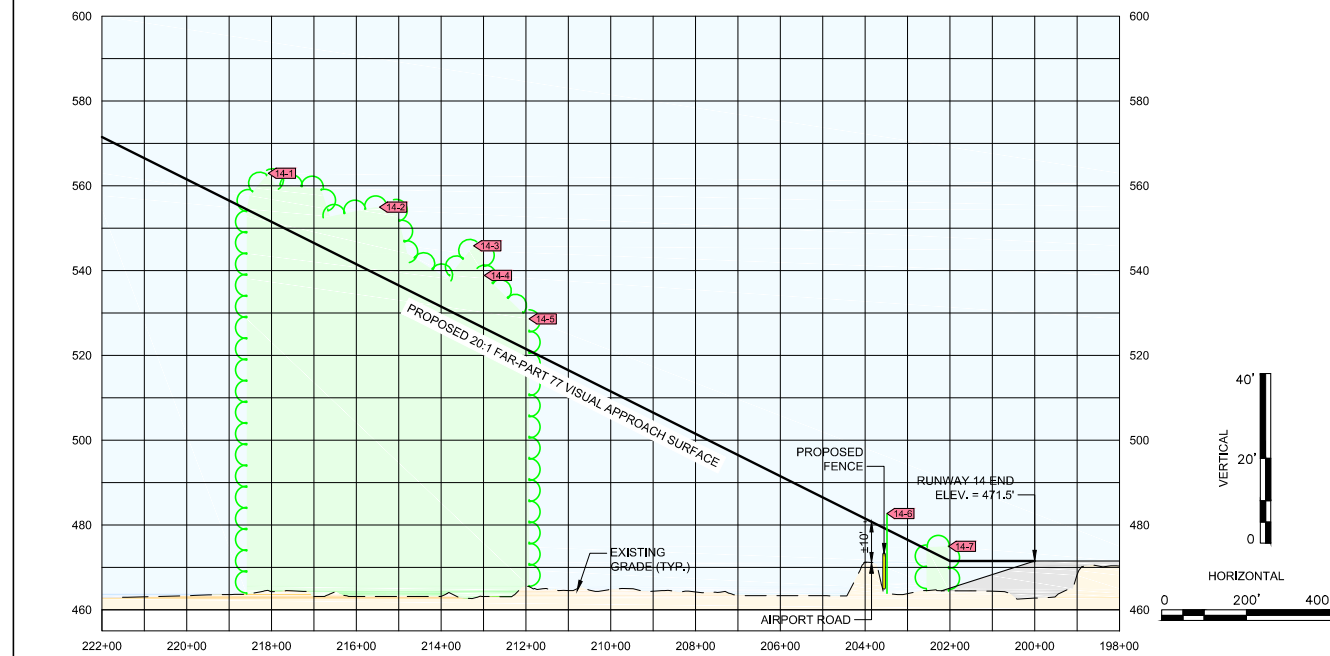
Client/Project
DILLANT HOPKINS AIRPORT

KEENE, NEW HAMPSHIRE

Title
**RUNWAY 14-32
 PLAN AND PROFILE**

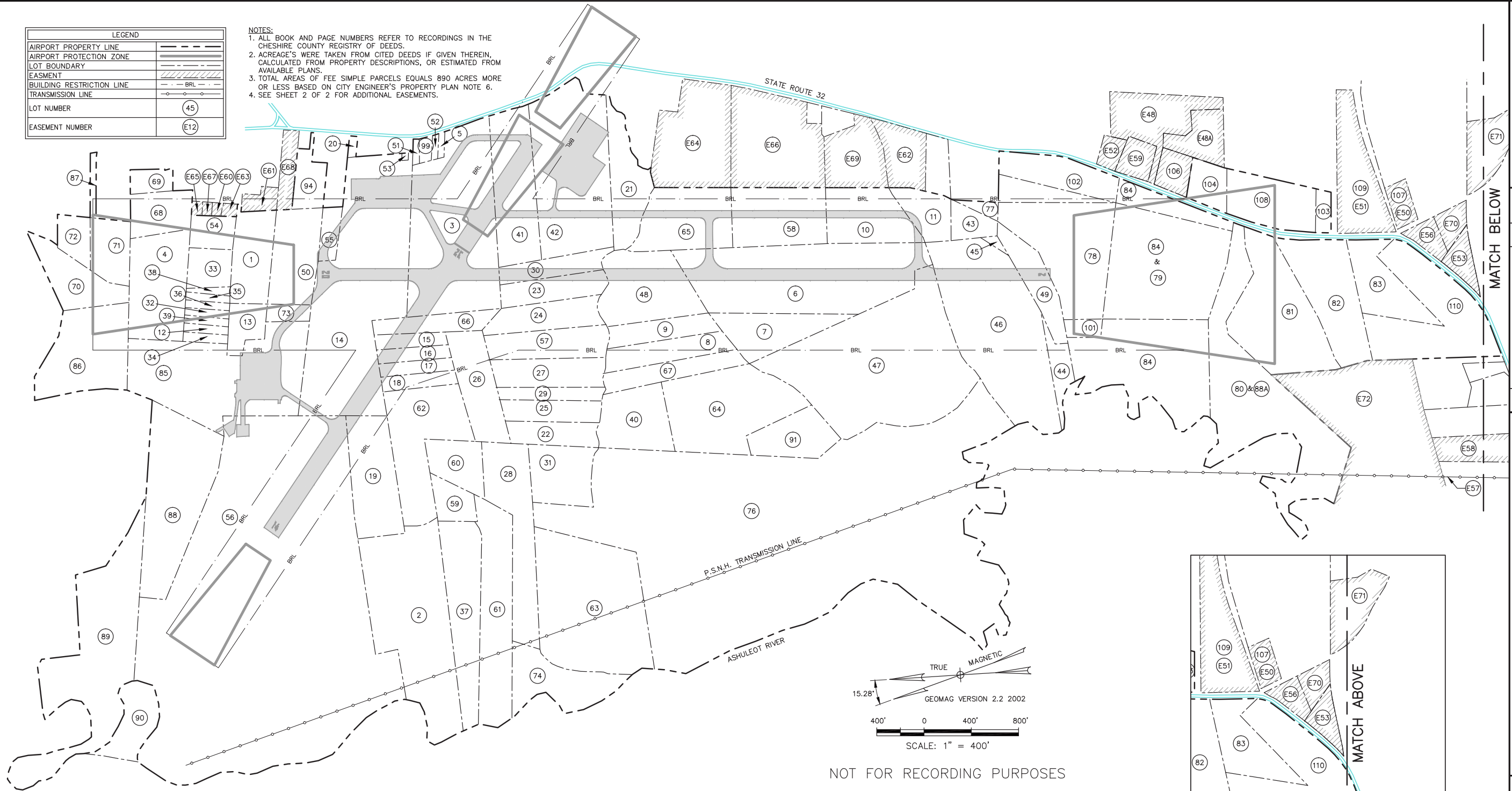
Project No. Scale
 195210711 AS NOTED

Drawing No. Sheet Revision
 8 8 of 11 0



LEGEND	
AIRPORT PROPERTY LINE	---
AIRPORT PROTECTION ZONE	---
LOT BOUNDARY	---
EASEMENT	---
BUILDING RESTRICTION LINE	---
TRANSMISSION LINE	---
LOT NUMBER	(45)
EASEMENT NUMBER	(E12)

- NOTES:
1. ALL BOOK AND PAGE NUMBERS REFER TO RECORDINGS IN THE CHESHIRE COUNTY REGISTRY OF DEEDS.
 2. ACREAGE'S WERE TAKEN FROM CITED DEEDS IF GIVEN THEREIN, CALCULATED FROM PROPERTY DESCRIPTIONS, OR ESTIMATED FROM AVAILABLE PLANS.
 3. TOTAL AREAS OF FEE SIMPLE PARCELS EQUALS 890 ACRES MORE OR LESS BASED ON CITY ENGINEER'S PROPERTY PLAN NOTE 6.
 4. SEE SHEET 2 OF 2 FOR ADDITIONAL EASEMENTS.



Lot No.	Grantor	Grantee	Book/Page	Instrument	Date	Area	Remarks
1-2	Sandra Casarini	The City of Keene	499/129	FEF	04/01/42	30.8 AC	
3	Mary M. Sprague	The City of Keene	499/113	FEF	04/01/42	26.1 AC	
4	Helen M. Kershaw	The City of Keene	499/168	FEF	04/01/42	3.1 AC	
5	Charles M. Seas	The City of Keene	499/164	FEF	03/31/42	3.3 AC	
6	Osie Wetmore	The City of Keene	499/161	FEF	10/05/42	25.1 AC	
7-9	Osie Wetmore	The City of Keene	503/109	FEF	08/17/43	16.2 AC	
10	Mrs. M. Ward, Helen Ward Adams, and Harold Adams	The City of Keene	499/160	FEF	10/05/42	8.8 AC	
11	Mrs. M. Ward, Helen Ward Adams, and Harold J. Adams	The City of Keene	504/108	FEF	13/15/42	3.3 AC	
12-13	Clementine J. Trombly	The City of Keene	499/157	FEF	03/30/42	3.3 AC	
14-19	Bessie B. Rutter	The City of Keene	486/95	FEF	03/30/42	48.3 AC	
20	Bessie B. Rutter	The City of Keene	500/387	FEF	01/10/44	3.3 AC	
21-29	Leander and Margaret M. Page	The City of Keene	501/125	FEF	08/11/42	42.2 AC	
30	Clifford C. Wilber	The City of Keene	501/127	FEF	08/11/42	3.1 AC	
31	Claude Ballou	The City of Keene	504/106	FEF	07/19/43	5 AC	
32	Morgan H. Dix	The City of Keene	499/151	FEF	03/30/42	0.6 AC	
33	M. Lydia Bishop	The City of Keene	499/150	FEF	03/30/42	3 AC	
34	Eunice A. Jones	The City of Keene	499/154	FEF	03/30/42	3.7 AC	
35	Walter R. Burroughs, Administrator of the Estate of Ed M. Burroughs	The City of Keene	501/129	FEF	08/11/42	2.03 AC	
36	Edwin G. Landers	The City of Keene	499/169	FEF	04/01/42	0.6 AC	
37	William McCreary	The City of Keene	500/116	FEF	08/05/43	8 AC	
38	George Howard	The City of Keene	499/153	FEF	03/30/42	8.5 AC	
39	Grace A. Swan	The City of Keene	499/166	FEF	03/31/42	0.6 AC	
40	Jennie F. Bourne	The City of Keene	504/953	FEF	08/17/43	7 AC	
41	Jerome J. Sullivan	The City of Keene	499/165	FEF	03/31/42	9.89 AC	
42	Clementine H. and Margaret Demar	The City of Keene	499/160	FEF	03/30/42	19.5 AC	

Lot No.	Grantor	Grantee	Book/Page	Instrument	Date	Area	Remarks
43	Franklin Ellsworth Safford	The City of Keene	504/103	FEF	12/15/42	2.1 AC	
44-45	Myrtle B. Wheeler, Bert W. Wheeler, and Marion W. Taylor	The City of Keene	504/104	FEF	12/15/42	2.8 AC	
46-47	Myrtle B. Wheeler, Bert W. Wheeler, and Marion W. Taylor	The City of Keene	503/29	FEF	03/30/43	62.9 AC	
48	Henry F. Safford	The City of Keene	496/473	FEF	05/25/42	7.0 AC	
49	Henry F. Safford	The City of Keene	504/105	FEF	12/15/42	4.4 AC	
50	Minnie L. Pollard	The City of Keene	496/156	FEF	03/30/42	8.04 AC	
51	Robert L. Mallat	The City of Keene	496/155	FEF	03/30/42	0.24 AC	
52-53	Frank J. and Christa L. Domina	The City of Keene	496/152	FEF	03/30/42	0.4 AC	
54	Samuel H. Channing, Administrator of the Estate of Grace L. Channing	The City of Keene	496/121	FEF	04/04/42	2.2 AC	
55	Irene S. Barton	The City of Keene	496/183	FEF	03/31/42	1.5 AC	
56	Grace S. Hewitt	The City of Keene	496/114	FEF	04/03/42	110 AC	
57	Charles E. Frazier	The City of Keene	496/170	FEF	04/03/42	110 AC	
57-58	Swain May Ballou, John L. Ballou, East Ballou, Walter S. Thompson, and Herman W. Ballou	The City of Keene	504/364	FEF	06/07/43	14 AC	
59-61	Hudson L. Christensen	The City of Keene	506/17	FEF	06/25/43	33.8 AC	
62	Henry F. Safford and John Doe	The City of Keene	501/85	FEF	08/24/42	8 AC	
63-64	Charles K. Whitcomb, Will of Joseph P. Whitcomb	The City of Keene	312/388	FEF	02/28/45	35.1 AC	
65	Leander Page	The City of Keene	504/36	FEF	11/05/42	6.8 AC	
66	Walter R. Burroughs, Administrator of the Estate of Ed M. Burroughs	The City of Keene	501/129	FEF	08/11/42	2.03 AC	
67	Walter E. Day	The City of Keene	513/562	FEF	07/28/45	2.5 AC	
68	Carlo Bianchi and Company	The City of Keene	500/433	FEF	07/27/48	4 AC	
69	Helen M. Kershaw	The City of Keene	524/337	FEF	07/27/48	1.5 AC	
70	Keene Forestry Association	The City of Keene	641/198	FEF	05/22/57	5.3 AC	
71	Marie C. Sweet	The City of Keene	641/200	FEF	05/22/57	4.0 AC	
72	Earl A. and Idella M. Brown	The City of Keene	641/204	FEF	05/22/57	2.2 AC	
73	Keene Forestry Association	The City of Keene	641/198	FEF	05/22/57	1.3 AC	

Lot No.	Grantor	Grantee	Book/Page	Instrument	Date	Area	Remarks
74	Clifford H. Goodell	The City of Keene	543/196	FEF	02/22/57	7 AC	
76	Hazen S. Ballou and Guy E. Ballou	The City of Keene	581/279	FEF	08/24/42	100 AC	
77	Winston C. and Coles W. Ferguson	The City of Keene	646/25	FEF	10/01/57	0.8 AC	
78	Henry F. Safford	The City of Keene	646/28	FEF	10/01/57	14.2 AC	
79	Stanley L. and Mary A. Taylor	The City of Keene	646/33	FEF	10/01/57	19.3 AC	
80	Carroll E. and Eleanor Goodell	The City of Keene	601/216	FEF	09/10/60	24.4 AC	PAAP 9-21-05-0909
81	Keene Sand and Gravel Incorporated	The City of Keene	783/385	FEF	03/27/69	12.75 AC	
82	Rose F. Dubois	The City of Keene	712/218	FEF	08/20/67	10.3 AC	
83	Elva Bolewski	The City of Keene	803/193	FEF	10/25/69	5.5 AC	
84	Stanley L. and Mary Taylor	The City of Keene	794/83	FEF	07/30/69	22.1 AC	PAAP 9-21-05-0909
85	Keene Forestry Association	The City of Keene	789/148	FEF	07/30/69	22.1 AC	
86	Edgewood Civic Association	The City of Keene	789/144	FEF	07/30/69	12.3 AC	
86A	Edgewood Civic Association	The City of Keene	1003/289	FEF	3/18/1983	12.3 AC	
87	Moms and Minnie Wilber	The City of Keene	808/119	FEF	3/18/1970	0.97 AC	
88	George R. Harris	The City of Keene	960/980	FEF	12/14/1978	26 AC	
88A	Carroll E. and Eleanor Goodell	The City of Keene	803/195	FEF	10/25/69	8 AC	
89	C.L. Lane Company Incorporated	The City of Keene	980/335	FEF	02-28-80	22.97 AC	
90	Abraham Cohen and Deborah Cohen	The City of Keene	982/983	FEF	03/10/84	3 AC	
91	Kendal C. Page	The City of Keene	721/280	FEF	06/10/84	5.3 AC	
94	James D. Walker and Norman H. Cotton	The City of Keene	987/14	FEF	7/17/1982	3.1 AC	ADAP 6-33-2008-08
99	Rose F. Malasoin	The City of Keene	1005/244	FEF	3/17/1981	0.8 AC	ADAP 6-33-2008-08
101	Norma J. Safford	The City of Keene	1118/487	FEF	1/3/1986	1.0 AC	AIP 3-33-0008-03
102	Norma J. Safford	The City of Keene	1118/485	FEF	1/3/1986	8.3 AC	AIP 3-33-0008-03
103	Benjamin and Virginia Brown	The City of Keene	1484/548	FEF	06/20/94	1.04 AC	AIP 3-33-0008-06
104	Richard and Sandra Desobreaux	The City of Keene	1511/234	FEF	12/10/94	2.4 AC	AIP 3-33-0008-08

Lot No.	Grantor	Grantee	Book/Page	Instrument	Date	Area	Remarks
106	Harold and Joan Kottwitz	The City of Keene	1564/79	FEF	04/02/97	2.2 AC	AIP 3-33-0008-10
106	City of Keene	Kevin F. Stone	1700/741	FEF	01/13/96	3.1 AC	PARCEL SOLD WITH EASEMENT RETAINED (SEE E40)
107	Hans Bolewski	The City of Keene	1592/274	FEF	04/07/97	1.6 AC	AIP 3-33-0008-12
107	City of Keene	Andrew A. Hall	1718/544	FEF	09/26/99	1.8 AC	PARCEL SOLD WITH EASEMENT RETAINED (SEE E50)
108	Amold and Maylou Stywest	The City of Keene	1518/681	FEF	05/22/97	6.8 AC	AIP 3-33-0008-13
109	Elsa Bolewski	City of Keene	1660/797	FEF	09/25/98	8.1 AC	AIP 3-33-0008-13
109	City of Keene	Anthony B. AHN	1704/329	FEF	06/16/99	8.1 AC	PARCEL SOLD WITH EASEMENT RETAINED (SEE E51)
110	Alps Corporation	City of Keene	1660/758	FEF	09/03/98	15.4 AC	AIP 3-33-0008-13

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Rev.	Description	By	Date
2	EASEMENTS E68-E72	LRK	8/17/07
1	EASEMENTS E60-E67	LRK	9/21/06

NEW HAMPSHIRE

DILLANT-HOPKINS AIRPORT
AIP PROJECT NO. 3-33-0008-20

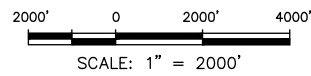
EXHIBIT A

KEENE

Project No.	8120074.01
Prog. Manager	RD YARNOLD
Proj. Designer	RD YARNOLD
Drawn By	LR KING
Checked By	RD YARNOLD
Scale	1"=400'
Approved	DC DARGIE
Date	APRIL 2006



NOTES:
 1. PARCEL NO. 1 IS IN THE AIRPORT PROPERTY.
 2. PARCEL NO. 19 ACQUIRED BY CITY, SEE EASEMENT 51 AND LOT 109.
 3. PARCEL NO. 21 ACQUIRED BY CITY, SEE LOT 110.
 4. PARCEL NO. 21 IS THE LOCATION OF THE ILS OUTER MARKER.



EASEMENTS HELD BY THE AIRPORT

Easement No.	Grantor	Grantee	Book/Page Plan No.	Instrument	Date	Area	Remarks
E1	Leander and Margaret Page	City of Keene	666/125 18-17	Easement	07/20/49	--	Cheshire Fairgrounds obstruction lights Parcel 6
E2	Leander and Margaret Page	City of Keene	666/125 20-503 21-35	Easement	07/20/49	--	Forbush Hill hazard beacon Parcel 5
E3	Stanley and Mary Taylor	City of Keene	693/247 19-105	Easement	04/27/62	0.14 AC	Now owned by City - Lot 84
E4	Stanley and Mary Taylor	City of Keene	693/245 19-105	Easement	04/27/62	0.25 AC	Now owned by City - Lots 79 and 84
E5	Keene Sand and Gravel	City of Keene	693/146 19-105	Easement	03/30/62	11.7 AC	South End Airport Parcel 10
E6	Town of Swanzey	City of Keene	666/125 20-503 21-35	License	04/04/49	--	Mount Caesar hazard beacon Parcel 3
E7	Elsie and Douglas Navish	City of Keene	669/142 18-17	Easement	08/17/50	--	Wilson Pond Parcel 9 Airspace and obstruction lights
E8	Grace D. Taylor	City of Keene	669/141 18-17	Easement	08/05/50	--	West side of Route 32 Parcel 22 Airspace and clearing rights
E9	Leander and Margaret Page	City of Keene	669/143 18-17	Easement	08/05/50	--	Wilson Pond Parcel 22 Airspace and clearing rights
E10	State of New Hampshire	City of Keene	570/333 18-17	Easement	06/19/51	--	Keene State College airspace Parcel 9
E11	State of New Hampshire	City of Keene	570/335 18-17	Easement	08/01/51	--	Keene State College obstruction lights Parcel 9
E12	Frederick and Janis Morris	City of Keene	693/150 19-105	Easement	04/13/62	0.01 AC	South End Airport Parcel 10 (formerly Parcel G)
E13	Keene Forestry Association	City of Keene	693/173 21-22	Easement	04/13/62	0.75 AC	North End Runway 02-20 Parcel 11 (formerly Parcel L) FAAP 9-27-005-C203
E14	Eliza and David Wetmore	City of Keene	693/303 19-105	Easement	04/27/62	--	South End of Airport Parcel 12 (formerly Parcel H) Airspace and obstruction lights
E14A	David Wetmore	City of Keene	19-98	Easement	05/13/69	--	South End of Airport Parcel 12 (formerly Parcel H) Obstruction light poles
E15	Roy and Mamie Crossman	City of Keene	11010/811 21-22	Easement	10/31/64	0.4 AC	North End Airport Parcel 13 (Formerly Parcel J)
E16	Earl and Stella Brown	City of Keene	729/112 21-22	Easement	11/17/64	0.32 AC	North End Airport Parcel 13 (Formerly Parcel K)
E17	Frederick Morris	City of Keene	803/197 19-80	Easement	07/25/69	6 AC	South End Airport Parcel 10 Airspace and obstruction lights
E18	Forrest and Carrie Carey	City of Keene	666/127 20-503 21-35	Easement	04/08/50	--	Beech Hill hazard beacon Parcel 8
E19	May L. Adams	City of Keene	669/144 20-503 21-35	Easement	09/07/50	--	Mount Cresson hazard beacon Parcel 2
E20	Max and Etta Kaploff	City of Keene	669/138 20-503 21-35	Easement	08/05/50	--	Forbush Hill hazard beacon Parcel 5
E21	Norma Buckminster	City of Keene	666/128 20-503 21-35	Easement	04/06/50	--	Mt. Huggins hazard beacon Parcel 7
E22	Bernice and Paul Cantin	City of Keene	666/125 20-503 21-35	Easement	05/11/50	--	Mt. Huggins hazard beacon Parcel 7
E23	Robertson Motor Company (Ellis Robertson)	City of Keene	666/126 20-503 21-35	Easement	07/23/49	--	Massey Hill hazard beacon Parcel 4
E24	Carl and Marion Marshall	City of Keene	666/131 20-503 21-35	Easement	07/28/49	--	Massey Hill hazard beacon Parcel 4
E25	Harold and Bernice Morris	City of Keene	666/131 20-503 21-35	Easement	05/11/50	--	Massey Hill hazard beacon Parcel 4
E26	Russell and Ruth Morris	City of Keene	666/131 20-503 21-35	Easement	05/11/50	--	Massey Hill hazard beacon Parcel 4
E27	Rudolphe Campagna	City of Keene	669/138 20-503 21-35	Easement	08/12/50	--	Massey Hill hazard beacon Parcel 4
E28	Joseph and Helen Kershaw	City of Keene	669/138 20-503 21-35	Easement	08/07/50	--	Massey Hill hazard beacon Parcel 4
E29	PHF Incorporated	City of Keene	710/555 18-8	Easement	05/10/63	1.70 AC	West Hill (Keene) hazard beacon Parcel 14 FAAP 9-27-005-C205
E30	Richard and Louisa Snowman	City of Keene	710/555 18-8	Easement	07/24/63	0.06 AC	West Hill (Keene) hazard beacon Parcel 14 FAAP 9-27-005-C205
E31	Cheshire Fair Association	City of Keene	666/127 20-503	Easement	05/10/50	--	Cheshire Fairgrounds obstruction lights Parcel 6
E32	Earl, Mildred and Susan Ballou	City of Keene	669/140 20-503 21-35	Easement	8/5/1950	--	Cheshire Fairgrounds Parcel 6 Airspace and obstruction lights
E33	Lee Bowman (Bowman Flying Service)	City of Keene	669/143 18-17	Easement	10/23/50	--	West of Route 32 Parcel 9
E34	Walter J. Harrison	City of Keene	710/554 18-8	Easement	05/08/63	--	West Hill (Marlboro) hazard beacon Parcel 16 FAAP 9-27-005-C205
E35	Ruth E. Hemenway	City of Keene	710/555 18-8	Easement	05/08/63	--	West Hill (Marlboro) hazard beacon Parcel 16 FAAP 9-27-005-C205
E36	Paul and Florence West	City of Keene	710/560 18-8	Easement	07/30/63	1.04 AC	West Hill (Marlboro) hazard beacon Parcel 16 FAAP 9-27-005-C205
E37	Lawrence and Katherine Conant	City of Keene	710/561 18-8	Easement	08/02/63	--	West Hill (Marlboro) hazard beacon Parcel 16 FAAP 9-27-005-C205
E38	Kendall Page	City of Keene	721/381 20-504	Easement	05/28/64	0.25 AC	West side of Route 32 to canal Parcel 17 Power line to airport obstruction lights
E39	Elsa Bolewski	City of Keene	836/236 19-38	Easement	11/09/71	--	Obstruction lights 9 and 10 Parcel 19 See also E51 and Lot 109
E40	Minnie and Walter Day	City of Keene	666/132 20-503	Easement	07/22/49	--	Mt. Caesar hazard beacon Parcel 3
E41	City of Keene	Bruce C. Wixon	--	Agreement	10/19/87	--	West Hill (Keene) Parcel 14 Right to pull wires on hazard beacon poles
E42	Kendall Page	City of Keene	724/113 20-504	Easement	05/28/64	0.25 AC	West side of Route 32 to canal Parcel 17 Power line to airport obstruction lights
E43	Perley Safford	City of Keene	739/80 18-8	Easement	08/29/65	0.60 AC	Hill 1102 Parcel 18 FAAP 9-27-005-C205
E44	Elsa Bolewski	City of Keene	803/193	Easement	07/29/69	--	Formerly Parcels D and R Now owned by City - Lots 83 and 110
E45	Edgewood Civic Association	City of Keene	1032/269	Easement	03/18/63	--	Right to cut trees on Lot 86
E46	City of Keene	Roberts Communication	--	Agreement	08/29/92	--	West Hill (Keene) Parcel 14 Right to use ROW in return for transferring hazard beacon to WKBK tower
E47	John and Mary Meenan	City of Keene	1400/290	Easement	03/17/92	--	Right to operate sewage treatment plant
E48	Eugene and Judith Armento	City of Keene	1700/309 18-27	Easement	05/11/99	3.7 AC	East side of Route 32 AIP 3-33-0008-12
E49	Kevin F. Stone	City of Keene	1706/741	Easement	13/07/99	2.1 AC	Airspace Lot 106 AIP 3-33-0008-13
E50	Andrew A. Hall	City of Keene	1718/43	Easement	09/09/99	1.6 AC	Airspace Lot 107 AIP 3-33-0008-13
E51	Anthony B. Ahlf	City of Keene	1704/829	Easement	10/06/99	8.1 AC	Airspace Lot 108 AIP 3-33-0008-13
E52	Gregory and Lilly Curry	City of Keene	1740/865 18-27	Easement	03/10/99	1.0 AC	Airspace AIP 3-33-0008-12
E53	Okell Hill Enterprises	City of Keene	1929/815	Easement	09/03/02	2.1 AC	Airspace AIP 3-33-0008-13
E54	State of New Hampshire	City of Keene	1956/749	Easement	10/22/02	--	Keene State College hazard beacon (See also E11)
E56	Rice Family Limited Partnership	City of Keene	2033/241	Easement	06/10/03	1.6 AC	Airspace AIP 3-33-0008-13
E57	Public Service of New Hampshire	City of Keene	2024/653	Easement	06/10/03	--	Airspace over power transmission wires AIP 3-33-0008-13
E58	Frederick and Charlene Donohoe	City of Keene	2024/658	Easement	06/20/03	4.4 AC	Airspace AIP 3-33-0008-13
E59	Peter and Kristen Goodenough	City of Keene	1997/650	Easement	04/18/03	1.85 AC	Airspace AIP 3-33-0008-13
E60	Roland B. and Elaine C. Hall	City of Keene	2331/271	Easement	03/22/06	0.16 AC	Airspace AIP 3-33-0008-13
E61	Wayne L. Christo	City of Keene	2337/155	Easement	04/13/08	1.1 AC	Airspace AIP 3-33-0008-13
E62	Gerald L. and Jeanne Desjardins	City of Keene	2338/830	Easement	04/20/06	4.08 AC	Airspace AIP 3-33-0008-13
E63	Gale A. Clark	City of Keene	2347/682	Easement	05/25/06	0.29 AC	Airspace AIP 3-33-0008-13
E64	Raette F. Trombly	City of Keene	2351/906	Easement	06/09/06	12 AC	Airspace AIP 3-33-0008-13
E65	NH Finance Housing Authority	City of Keene	2353/774	Easement	06/15/06	0.31 AC	Airspace AIP 3-33-0008-13
E66	Furlone, LLC	City of Keene	2357/741	Easement	06/28/06	13.32 AC	Airspace AIP 3-33-0008-13
E67	Wendy A. Paro	City of Keene	2360/452	Easement	07/05/06	0.23 AC	Airspace AIP 3-33-0008-13
E68	Rouleau	City of Keene	2391/432	Easement	10/26/06	2.13 AC	Airspace AIP 3-33-0008-13
E69	Stanley	City of Keene	2451/204	Easement	07/19/07	6.8 AC	Airspace AIP 3-33-0008-13
E70	Lane Construction Corp.	City of Keene	2451/655	Easement	07/20/07	1.5 AC	Airspace AIP 3-33-0008-13
E71	Lane Construction Corp.	City of Keene	2451/650	Easement	07/20/07	4.7 AC	Airspace AIP 3-33-0008-13
E72	Lane Construction Corp.	City of Keene	2451/660	Easement	07/20/07	28.2 AC	Airspace AIP 3-33-0008-13

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EXHIBIT A

DILLANT-HORVANS AIRPORT
 AIP PROJECT NO. 3-33-0008-20

2	1	LRK	LRK	07/07	07/08	Date	By	
EASEMENTS 688-E72							NEW HAMPSHIRE	Description
EASEMENTS 688-E72							NEW HAMPSHIRE	Rev.

KEENE

Project No.	8/2007/401	Prof. Manager	RD YARNOLD	Prof. Designer	RD YARNOLD	Drawn By	HM ELLIOTT	Checked By	DC DARGIE	Scale	1"=2000'	Approved	RD YARNOLD	Date	APRIL 28, 2008
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Sheet 2 of 2

Appendix E. AIRPORT DEVELOPMENT PROGRAM

The Airport Development Program that follows was prepared independent of this master plan by the Dillant Hopkins Airport Manager and is included solely as a reference document only.



Dillant-Hopkins Airport 2017 Development Program

May 11, 2017

The following development program will guide development that occurs on the City of Keene Dillant-Hopkins Airport property located within the municipality of Swanzey, NH.

Statement of Objectives

It is the objective of the City of Keene to revitalize the 73 year-old airport by undertaking renewed marketing efforts, identifying developable parcels on airport land and updating the airport master plan to reflect areas for future development.

The Swanzey EZ Enterprise Zone, Tax Increment Financing District (TIF or TIFD), originally contained land located south and southwest of Wilson Pond between NH Routes 12 and 32. At the Town Meeting of 2003, voters approved an expansion of the TIF District to include properties along Route 32 as well as the east side of the airport property and a portion of the Cheshire Fairgrounds. Although the Swanzey Board of Selectmen declined to enlarge the current TIF District, in the future a proposal that seeks an additional district or expanded district to provide financing for infrastructure improvements necessary to support new industrial and

other commercial development within the west and north side of the airport should be considered.

The State of New Hampshire estimates that the 2015 economic value of the Keene Dillant-Hopkins Airport is more than \$21 million. Tracking the direct and indirect employment and funds that enter the region as a result of airport and airport-related activity demonstrates an economic impact of between \$18 and \$30 million.

Virtually all airports operate based on a mix of revenue from land business development combined with aviation-related revenue. Nationally, only 44% of "airport" revenue comes from aviation-related activities. While Dillant-Hopkins generates nearly \$500,000 in revenue, it, too, achieves this through a mix of aviation and non-aviation activities. Looking forward, revenue from general aviation is not expected to rise significantly. Revenue from private jet charter activity and corporate travel, however, is expected to increase. While there are a variety of factors responsible for increased activity at our airport, landing fees reflect an approximate 15% increase in 2016 over 2015. Another measure of increased airport activity is obviously the number of people that visit the airport to eat at the newly opened restaurant, take a flight lesson or scenic tour, get their drone certification or arrive and depart on a charter flight. In the year 2016 and 2017 we have seen an increase in visitors to the airport from 100-200 per week to 1,000 per week, nearly a 10-fold increase in activity. This pattern is indicative of the untapped potential of the airport and underscores some of the projects contemplated in this development program.

Infrastructure Improvements Proposed

The City of Keene, the Airport Advisory Commission and the Airport Master Plan Update Committee are working to develop the western and northern side of the airport. The terminal building and private hangars at the airport are currently served by three individual septic systems. There are additional parcels along Airport Road that can be developed. Necessary infrastructure development for the expanded district includes extending water and wastewater so that these municipal services are available near developable lots.

A Sewer service project will extend the sewer main from the airport driveway entrance along Airport Road to create a municipal sewer line to service the airport. Due to the flat grades

throughout the airport property, a pump station is needed to convey sewer service to the airport driveway entrance. This pump will be outfitted with supervisory control and data acquisition (SCADA) software and hardware. This will be used to maintain operation of the pump and alert staff should there be a problem with the operation of the pump. The proposed pipeline for sewer would be along Airport Road. Preliminary construction cost estimates for the sewer work is \$499,245 in 2018 dollars.

Water service to the airport terminal building is currently provided by a 6 inch line through Greenwood Avenue through the Edgewood Neighborhood in the City of Keene. This water service project proposes extending the 6-inch main from the airport driveway entrance along Airport Road. It will be connected to the existing 6-inch water main within Route 32. This will create a service loop for the airport. The American Water Works Association recommends that water mains be looped to provide for improved flow capacity, water quality and resiliency. The new main will be 8-inches to account for potential replacement of the existing 6-inch mains in the future. Preliminary construction cost estimates for the water service work is \$347,550 in 2018 dollars.

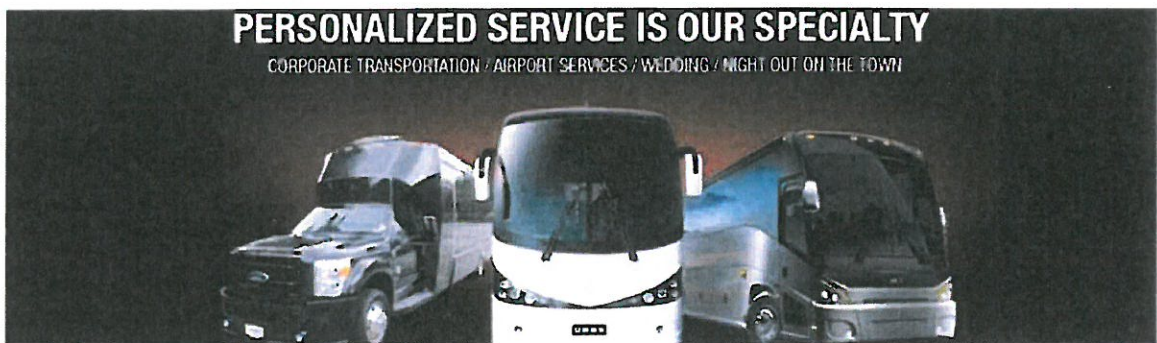
Development at the airport

The airport has approximately 30 acres of developable property (see attached map). Marketing efforts are currently underway for the following:

1. **Construction of a Transportation Center located at the Dillant-Hopkins Airport.**
Negotiations are currently underway to construct a transportation center with an anchor tenant. The concept of a regional transportation center is being considered in cooperation with the Southwest Regional Planning Commission. (SWRPC). SWRPC has sought and received funding to conduct a feasibility study for an intermodal transportation center to be created in the greater Keene area. The focus of this study is anticipated to be areas in or near the City of Keene including Gilbo Avenue, Marlboro Street and Dillant-Hopkins Airport. It is also anticipated that one or more potential suitable locations may emerge from this study. This could establish the airport as a keystone for regular shuttle service to these airports

- Manchester-Boston International Airport, Manchester NH
- Logan International Airport, Boston MA
- Bradley International Airport, Windsor CT
- LaGuardia Airport, New York NY
- John F. Kennedy International Airport, New York NY
- Newark Liberty International Airport, Newark NJ

Creating a database of shuttle traffic will be an important metric towards reexamining scheduled flight services at Dillant-Hopkins Airport. Construction of a 15,000 square foot transportation center has preliminary construction estimates of \$1.2 million and would produce approximately \$32,784 in real estate taxes.



2. **Adding a regional bus service center.** Greyhound has expressed an interest in having a location out of the existing terminal building at the airport for passengers as well as freight, which is a large part of their overnight service. A shuttle from the current downtown Gilbo Avenue stop will be very useful to bring this location to fruition as many bus passengers are college students. Adding this location as a bus stop would not require significant capital investment as it would utilize the existing terminal building.



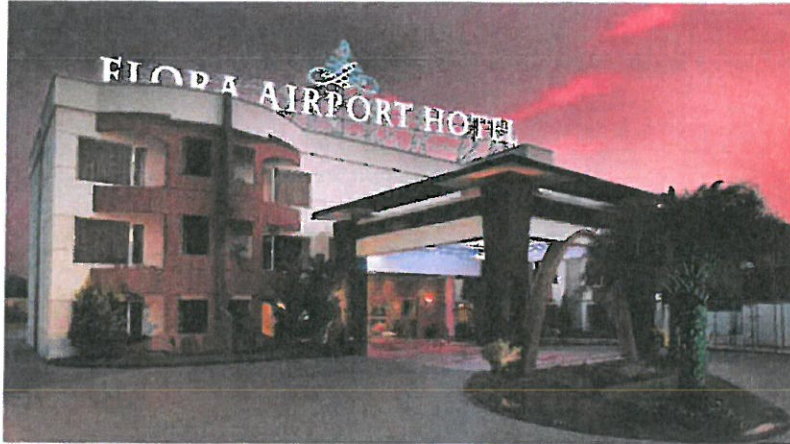
3. **Enhanced marketing of existing car rental agencies.** Airport management has begun conversations with the existing car rental agencies to develop a stronger presence at the airport, including better signage. With greater visibility on both the landside and airside, there is the potential for a modest increase in commission revenue from this activity and increased visitors to the airport property.

4. **Opening counter space and signage for taxi service.** The Taxi and Limousine Services industry has coasted on clear roads during the past five years. The economy's return to health has directly benefited the industry as business expense accounts have grown and consumers have been more willing to spend on small luxuries such as taxi and limousine rides. Moreover, increased demand from corporate travelers, tourists and private households is expected to result in the continued recovery of the industry over the next five years. Adding this location as a more formal taxi location would not require significant capital investment as it would utilize the existing terminal building.



5. **Construct a boutique hotel for fly-in guests.** While there is more than one site on which a hotel could be constructed, one clear location is on or near the former Alps building (also known as the former Hillside Village Pizza building). As we all know, the hotel industry is cyclical. When occupancy and average rate performance improves and financing is available, new hotels get built. We are in the midst of a robust operating environment and development period and new hotel rooms are expected to open at a vigorous pace for the next two to four years. Putting this data into context, however, shows that the new hotels opening now and in the near term are compensating for the dearth of new inventory during the last ten years. The supply that has opened since the nadir of the recession in 2009 has not kept pace with the nightly demand for hotel rooms. The U.S. lodging industry will achieve 65 percent occupancy in 2015, the highest national occupancy rate since STR, Inc., a hotel analyst, began reporting data in 1987.

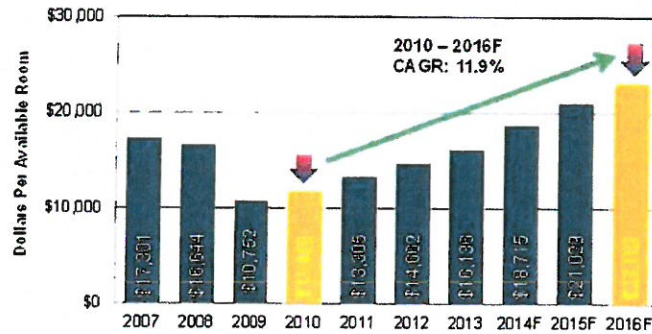
By year-end 2015, PKF-HR, a hotel industry analyst, projects that the demand for lodging accommodations will have increased 25.8 percent since the depths of the recession in 2009, while the supply of hotel rooms will have grown by just 5.6 percent.



Industry experts say that the best news for U.S. hotel owners and investors is that the combination of high occupancy levels and significant real average daily rate growth will perpetuate strong bottom-line gains. In a 2015 report, hotel industry analysts noted “We have not seen six years of such strong and sustained profit growth in the 78 years of tracking the U.S. lodging industry.” Construction costs for a mid-level hotel are estimated at \$200,000 per room or \$5 million for a 25 room boutique hotel. Real estate taxes from a project like this would generate \$136,600 in annual tax payments.

As part of the determination of whether this region can tolerate another hotel, this plan envisions a market feasibility study to assess market demand and financial projections, both of which are considered essential to create interest in this region by hoteliers.

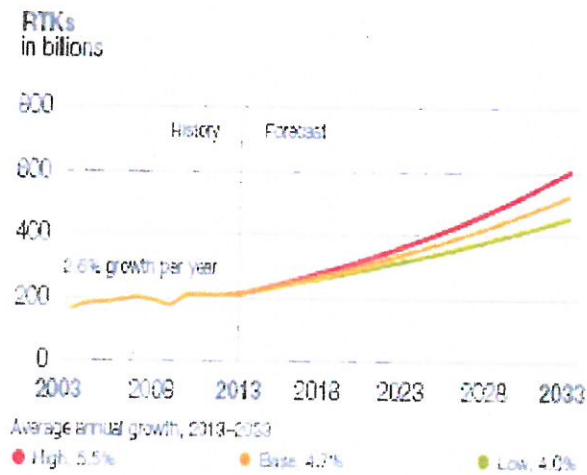
Nominal Dollar Operating Profits* Six Years of Double Digit Growth



Note: * Before deductions for capital reserve, rent, interest, income taxes, depreciation, and amortization.
Source: PKF Hospitality Research, *Trends in the Hotel Industry*, September - November 2014/Hotel Horizons® forecast report.

6. **Develop a warehouse for ground/air regional air freight.** After consultation with aviation and development experts, there appears to be potential for a regional ground/air transportation center off Airport Road on 16 acres of developable property adjacent to runway 14. Air cargo growth patterns often combine one or more countervailing trends. The air cargo sector is projected to grow at a rate of 4.2% through to 2032, according to the International Air Cargo Association. World air cargo is expected to more than double over the next 20 years. International freight services have continued to concentrate at the major U.S. gateways for efficiency and cost purposes, supporting new development plans (i.e., Chicago O'Hare \$200M Cargo Center). At the same time, shifts in business and supply chain locations will create a need for new facilities at secondary-type airports such as Dillant-Hopkins Airport (DH has the third longest runway in the state).

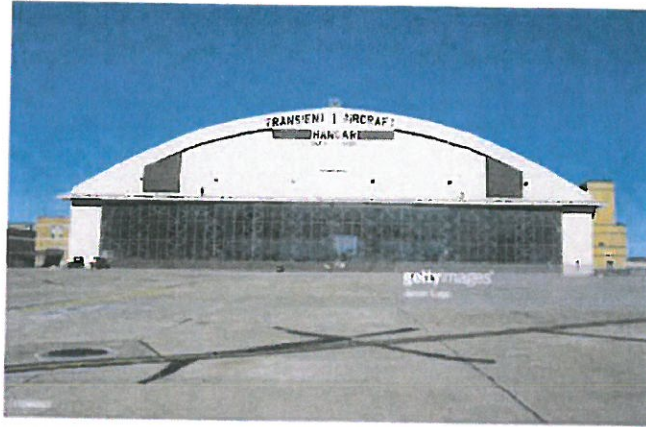
World air cargo traffic will more than double over the next 20 years



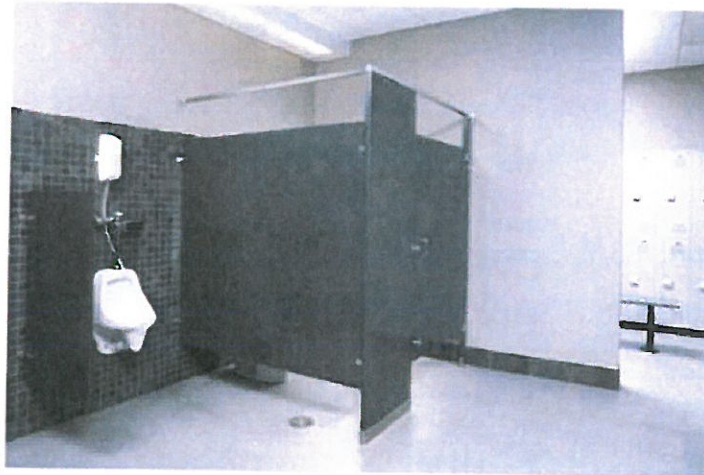
The integrated carriers (FedEx and UPS) dominate the handling of domestic air cargo shipments and therefore the domestic catchment area is determined by the ability to meet next-day morning delivery schedules for those carriers. The size and scope for any particular airport's catchment area is primarily based on the location of alternative airports and relative drive times to the primary pickup/delivery areas. With Dillant-Hopkins only 30 minutes from Interstate 91, under a revised logistical approach to domestic air cargo, the airport will be well situated. As gateway airports struggle with increased congestion, it will drive a logistical reorientation to shed regional air cargo to secondary airports capable of easily servicing the domestic air freight destinations. A 30,000 square foot warehouse structure would be estimated to cost \$2.8 million and would produce real estate taxes in the amount of \$76,496 at the Swanzey tax rate of \$27.32/thousand.



7. **Construct a hangar for transient visiting overnight jets.** This new hangar could be located adjacent to the existing terminal building or in several other easily-developable lots on airport property. An airplane is a traveling machine, likely to spend a substantial number of nights on the road—particularly if listed on a Part 135 charter certificate as a means of offsetting some of the owner’s costs. Many aircraft operators are resigned to letting the airplane remain on the ramp overnight under those circumstances—at least in the summer. But come winter, the ravages of ice, snow and fluid-chilling temperatures make the cost of shelter in a heated hangar more palatable. Not surprisingly, FBOs in northern climes are more attuned to husbanding some of their hangar space for transients—both those who prearrange the service and those whose schedules sometimes force them to show up virtually unannounced. At Dillant-Hopkins, we have airside property suitable for construction of a transient jet hangar and we have already had interest from a developer to construct such a hangar. Overnight rates for jets of various sizes range from \$650 to \$1,500 per night plus landing fees of around \$300 and fuel purchases. Hangar construction costs are estimated at around \$1 million. Cash flow projections suggest that the interest and principle payments would be \$6,000 per month. A 40% occupancy rate would provide a break-even scenario. At the Swanzey tax rate of \$27.32/thousand, tax revenue would be \$27,320.



8. **Modern ADA compliant public rest rooms.** Terminal building upgrades are included in the City of Keene Capital Improvement Plan that would encompass a renovation of the handicap ramp to the building and renovation of the public bathrooms to meet ADA standards (they have not been updated in nearly 50 years). The City of Keene Capital Improvement Plan includes approximately \$100,000 for bathroom renovation work and ADA access ramps.



9. **Build a private pilot's lounge for visiting crew.** One clear success strategy for encouraging frequent jet traffic is creating an environment that is comfortable for visiting pilots and crew. We understand that pilots need a place to rest in between flights. We are planning to allocate some of the existing terminal building to construct a (modest) private pilot's lounge that would have large flat screen TV, as well as a weather data station, flight planning center, Internet computer, and PC stations with a printer, and a crew car. We also provide an ATM located in

the terminal building as well as transportation to and from close area restaurants. It is planned that the City of Keene Capital Improvement Plan will include approximately \$80,000 for this work.



10. **Terminal entrance sign redesign.** Airport management is working with several sign vendors for a re-design of the airport entrance sign as well as coordinated signage on the terminal building. There are capital funds already appropriated that may provide all the funding necessary once new signage is designed.



11. **Increase community use of the airport property for a variety of events.** Airport management and tenants are working to invite community groups to more fully utilize the airport and its facilities. Events such as car cruise events, holiday events by the restaurant and FBO, “Touch-a-Truck” and “Walk-for-Animals”, vintage aircraft shows and other events are planned along with more frequent pilot training programs.
12. **Evaluate solar farm potential as an economic incentive to development.** There are potentially 80 acres available for solar panels. Some of the energy from these solar panels could be used to either offset energy costs generally or could be allocated to a

potential development site as an economic development incentive for a potential tenant.

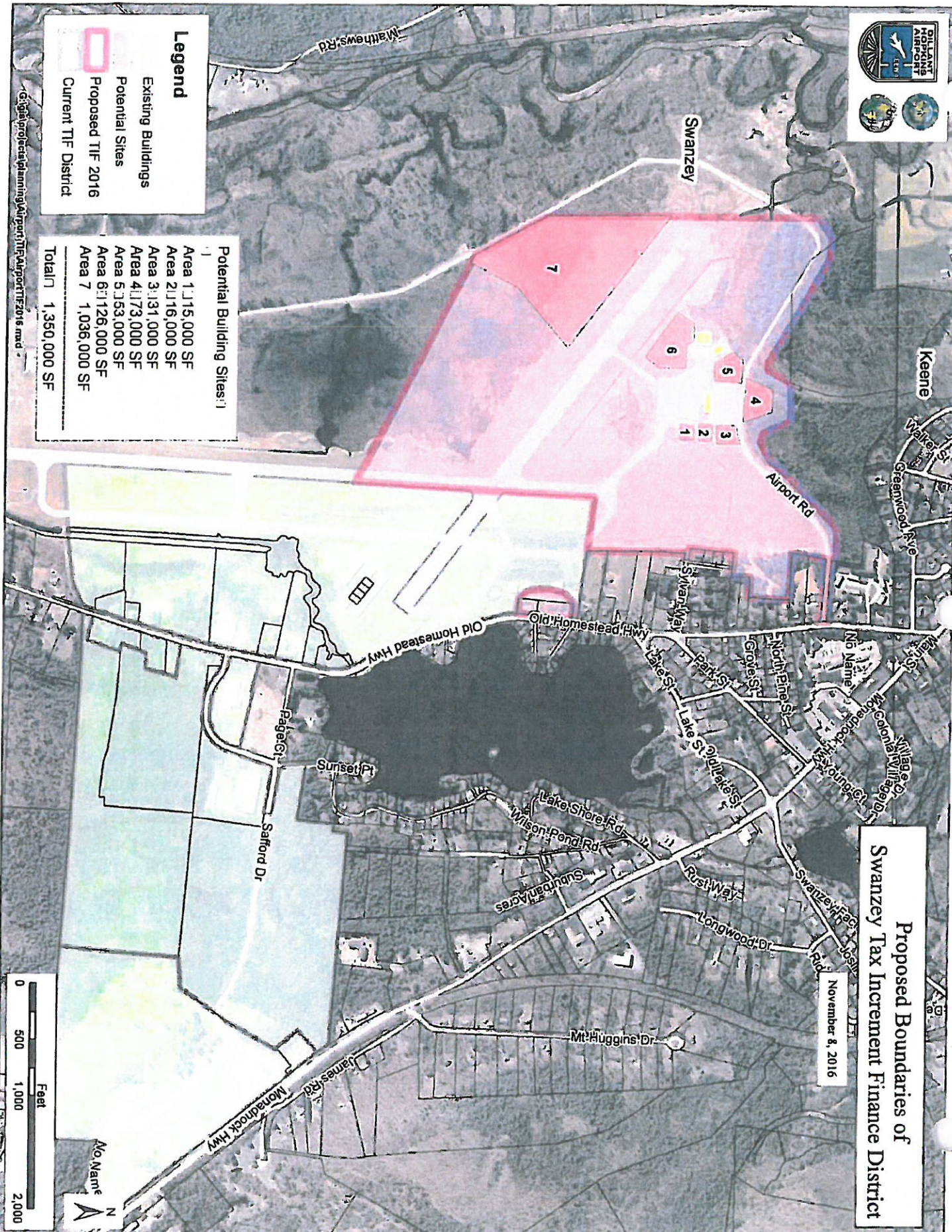
Summary

The Dillant-Hopkins Airport is a chronically underutilized resource for the region. There is significant potential at the airport to improve the tax base for the Town of Swanzey as well as provide revenue for the City of Keene from land leases, utilities and perhaps other services. The purpose of this plan is to create a simple but realistic vision, based on economic trends to utilize the approximate 30 acres of airport property for both airside and landside development. If all of the projects contained in this report come to fruition over the coming years, it will represent a total of \$10 million of new investment yielding an annual property tax benefit of \$272,600. Total infrastructure development costs are estimated at \$846,795.



Proposed Boundaries of Swanzy Tax Increment Finance District

November 8, 2016

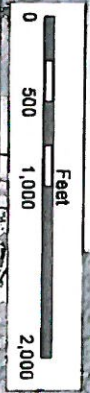


Legend

- Existing Buildings
- Potential Sites
- Proposed TIF 2016
- Current TIF District

Potential Building Sites:

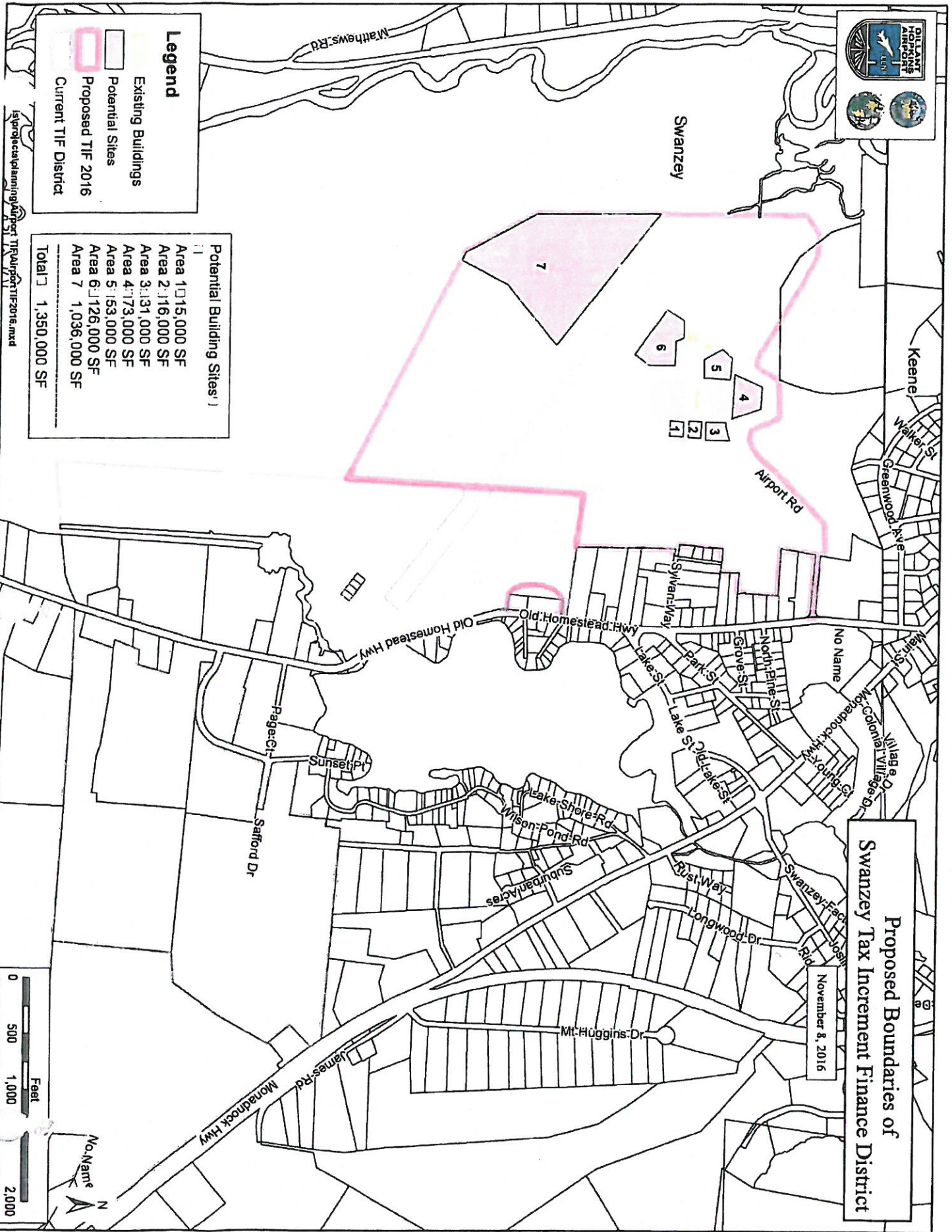
Area 1	1,115,000 SF
Area 2	1,116,000 SF
Area 3	1,131,000 SF
Area 4	1,173,000 SF
Area 5	1,153,000 SF
Area 6	1,126,000 SF
Area 7	1,036,000 SF
Total	1,350,000 SF





Proposed Boundaries of Swanzey Tax Increment Finance District

November 8, 2016



Legend

- Existing Buildings
- Potential Sites
- Proposed TIF 2016
- Current TIF District

Potential Building Sites 1

Area 1	15,000 SF
Area 2	16,000 SF
Area 3	31,000 SF
Area 4	173,000 SF
Area 5	153,000 SF
Area 6	126,000 SF
Area 7	1,036,000 SF
Total	1,350,000 SF

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