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NH State Airport System Plan

McFarland Johnson

New Hampshire DOT
Bureau of Aeronautics

Louis Berger

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New Hampshire State Airport System Plan

Technical Report and Appendices

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Prepared for:

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Prepared By:

McFarland Johnson

Louis Berger

Project Management Team:

NHDOT
Patrick C. Herlihy – Director of Aeronautics, Rail & Transit
Tricia L. Schoeneck Lambert – Bureau Administrator
Carol L. Niewola PE, CM – Senior Aviation Planner
Rita L. Castonguay Hunt – Aviation Planner

McFarland Johnson
Jorge E. Panteli – Project Manager
Rick L. Lucas – Deputy Project Manager/Lead Planner
Scott R. LeCount – Senior Project Planner

Louis Berger
Nicholas A. Stefaniak – Principal Planner

Planning Advisory Committee:

Christopher F. Nevins – Former New Hampshire State Representative
Kim W. Hopper, AAE – Airport Manager, Portsmouth International Airport at Pease
Beth Bendel – Owner, Monadnock Aviation
Stephen Bourque, CM – Airport Manager, Boire Field
James Thomforde, Sr. – President and CEO, Wiggins Airways
Colin McIver – Airport Manager, Plymouth Municipal Airport
Karmen Gifford – Executive Director, Lakes Region Chamber of Commerce
Tracey McInnis – Airport Planner/OEAAA Specialist, Federal Aviation Administration
Paul Brown – Town Manager, Town of Newport
Robert Pustell – President, Windsock Village Aviation Corporation
Gary Chabot – Business Development Specialist, NH Department of Resources and Economic Development's Division of Economic Development

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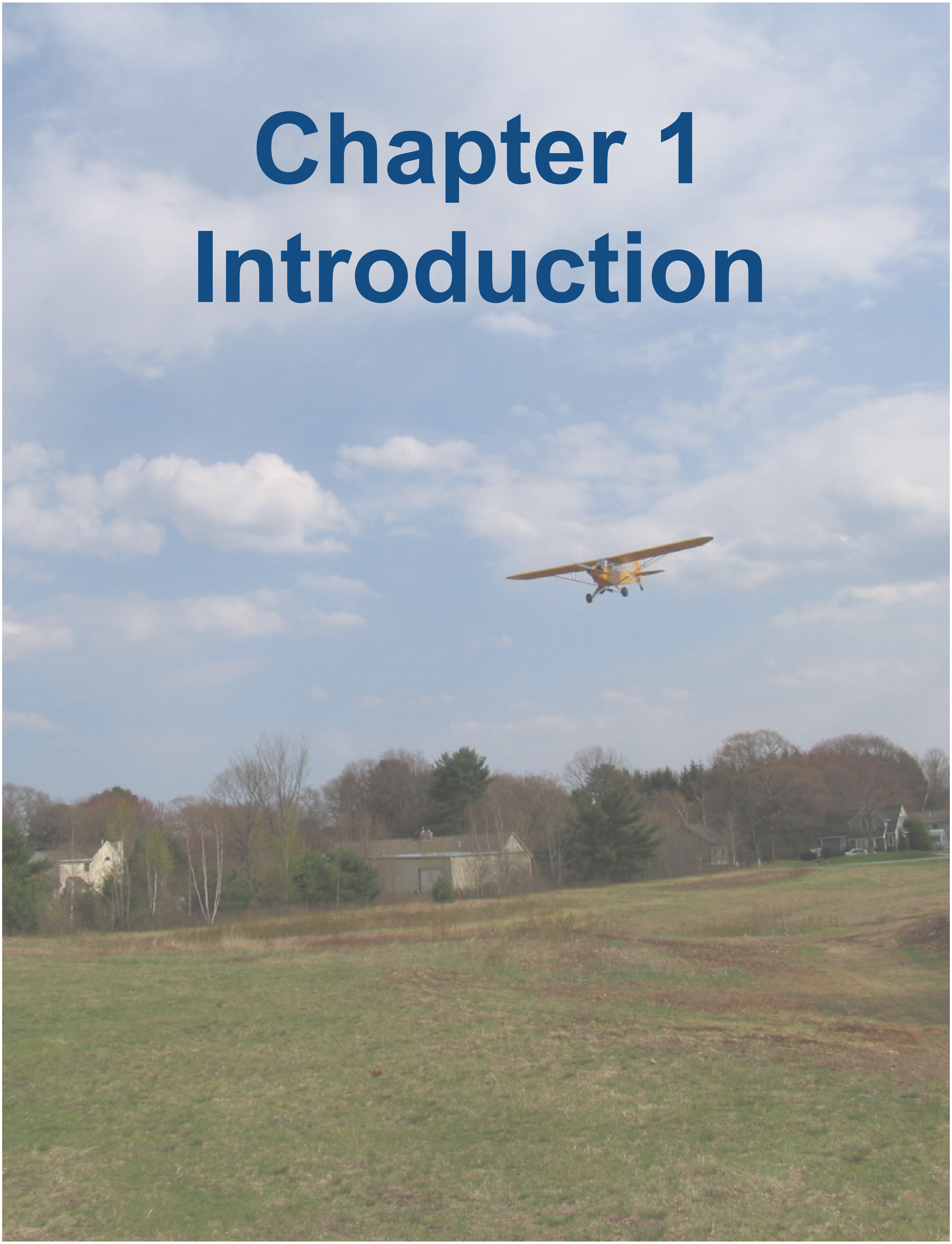
Chapter 1
Introduction



CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

The New Hampshire State Airport System Plan (NHSASP) provides the guide to maintain and develop the system of airports in New Hampshire (NH). The interaction between airports of all sizes and capabilities is the fundamental purpose behind the national air transportation system. When airport activity occurs in a cluster or grouping, it can be seen as an airport system. An airport system can exist on a regional level such as New England, or on a state level such as NH. For system planning, the focus shifts from the intricate detail found in an individual airport master plan to a more broad-based analysis of connectivity and access between airports within the system.

Market demands and socioeconomic conditions are different for every airport, and as such, facility demands will differ also. Of the 19,786 airports in the US, fewer than 3,000 are able to accommodate jet activity, and fewer than 500 provide any form of scheduled passenger service. However, this in no way means that any of the airports that do not have these capabilities are less vital to the national aviation system as a whole. One key purpose of the system planning process is to define each airport's role within the system. The role of an airport helps to profile the user base and identify the types of facilities and infrastructure needed. In doing this, funding agencies (both state and federal) are able to best allocate limited funds to ensure states and their airports have the necessary facilities to serve the needs of their users.

1.2 SYSTEM PLAN ELEMENTS

System planning is different than a traditional airport planning study since it focuses on the interaction of multiple airports. In place of facility requirements and development alternatives, a system plan measures the existing and future performance (effectiveness) of the airport system based on predetermined parameters. The following sections are included as part of this system plan:

- **Facility and Service Objectives –** The initial task in the development of a system plan is establishing the framework for the desired airport system in terms of facilities and services provided. Establishing facility objectives will serve as the benchmark to measure the effectiveness of the current and future system.

- **Inventory –** In order to establish a baseline for the subsequent analysis and recommendations, a comprehensive system-wide inventory of system airports and aviation assets was completed. The inventory analysis focused on the elements identified in the facility and service objectives as well as collecting data needed for the analysis of airport economic benefits.

- **Current System Performance –** Data collected during the inventory process is measured against the desired facility and service objectives. The analysis provides an overview of how the system is currently performing based on the established objectives. The resulting analysis identifies the areas that do not meet the desired objectives (i.e. system deficiencies).

Small-scale aviation offers crucial gateway

"Small, noncommercial general aviation airports are a necessity, not a luxury, in small… towns. Pilots and airport supporters say the airports are necessary for spraying crops, watching for and fighting fires, bringing hunters and fishermen in, and helping businesses transport goods. The facilities are especially vital for emergency medical flights and patient transfers."

–Great Falls Tribune, 29 SEP 2009

Tens of thousands of general aviation aircraft, including corporate jets, medical evacuation helicopters, and airplanes owned by individuals for business and personal use are flown in the United States. In fact, three out of every four takeoffs and landings at U.S. airports are conducted by general aviation aircraft, and most of these flights occur at general aviation airports. Source: FAA General Aviation Airports: A National Asset 2012

- **Forecast –** The forecasts developed as part of the system plan focus on big picture, state level items such as, the number of based aircraft and overall socioeconomic conditions in order to estimate projected growth rates.
- **Future System Performance –** The deficiencies identified in the current system performance are combined with the forecast for an analysis of potential improvements to the airport system. Proposed improvements in the NH airport system are reevaluated to demonstrate how the system will perform against the same desired objectives in the future.
- **System Plan Recommendations –** Proposed system improvements to determine the future system performance will be combined with system wide policy guidance and operational strategies to summarize the recommendations for the NHSASP.
- **Economic Benefits Study –** The data collection conducted as part of the inventory was expanded to include employment, spending and activity data, which are used to calculate economic benefits. The economic contributions are identified for each system airport as well as the entire state of NH.

Each of these elements is presented with supporting analysis as chapters in this report and additional information can be found in the various appendices.

1.3 GOALS AND OBJECTIVES

At the start of the planning process, the project team identified goals and objectives for the NHSASP. A total of five overall goals were identified as part of a collaborative planning process with the NH Department of Transportation Bureau of Aeronautics. The goals developed were expanded to include key attributes and desired elements identified by the project team. The following goals and objectives were identified for the NHSASP (in no particular order):

1) Goal: Provide a Safe, Secure and Efficient Aviation System – A safe, secure, and efficient airport system requires compliance with Federal Aviation Administration (FAA) and Transportation Security Administration (TSA) regulations and guidelines.

2) Goal: Maximize Economic Value of NH's Airport System – In addition to providing an airport system capable of accommodating increased aircraft activity, the NHSASP should explore development opportunities that will help foster job creation.

3) Goal: Promote and Educate Stakeholders on the Importance of the State's Aviation System - Every resident of NH is a stakeholder in the State's airport system. The NHSASP can be used as a resource for ongoing advocacy of the State's airports with the general public, local businesses, and policy makers.

4) Goal: Enhance, Preserve, and Maintain State Aviation System Assets – Airports throughout the State, both public and private, must address encroachment and other adverse impacts every day. Adverse impacts to an airport's operational viability most commonly result from land development, economic challenges and vegetative growth. These challenges can reduce the capacity and/or economic value of airside and landside airport assets.

5) Goal: Maximize and Diversify Connectivity for State's Aviation Users – Airports represent just one piece of transportation connectivity in NH. In addition to ensuring that the State's airports are connected and accessible to the national airspace system, airports should also provide connectivity with other modes of transportation throughout the state such as highways, busses, and rail – connecting communities, businesses, and people.

These goals and objectives serve as key themes and guiding principles throughout the course of the NHSASP and will be reflected in the recommendations and project deliverables.

1.4 REFERENCED SYSTEM PLANS

The FAA has conducted or sponsored airport systems plans developed on both the regional and national levels. These system plans were reviewed prior to the start of the development of this study and referenced throughout the process. It is important that the policies and recommendations for NH airports be consistent and considers those outlined in the national and regional plans.

National Plan of Integrated Airport Systems (NPIAS) – Every two years, the FAA updates their report to Congress on the NPIAS. This plan identifies approximately 3,355 of the 19,765 airports in the US that are considered of national importance and thus eligible for federal funding. Categories of airports in the NPIAS include: Primary (greater than 10,000 annual enplanements), Commercial Service (between 2,500 and 10,000 annual enplanements), Reliever, and General Aviation.

General Aviation Airports: A National Asset (ASSET) – ASSET documents an 18-month study of the nearly 3,000 general aviation (GA) airports, heliports, and seaplane bases identified in the FAA's NPIAS. This in-depth analysis provides the traveling public with highlights of the pivotal role GA airports play in our society, economy, and the aviation system. The study also aligns the GA airports into four categories; national, regional, local, and basic, based on their existing activity levels. The new categories better capture the diverse functions and economic contributions that GA airports make to their communities and the nation (Source: faa.gov, 2014).

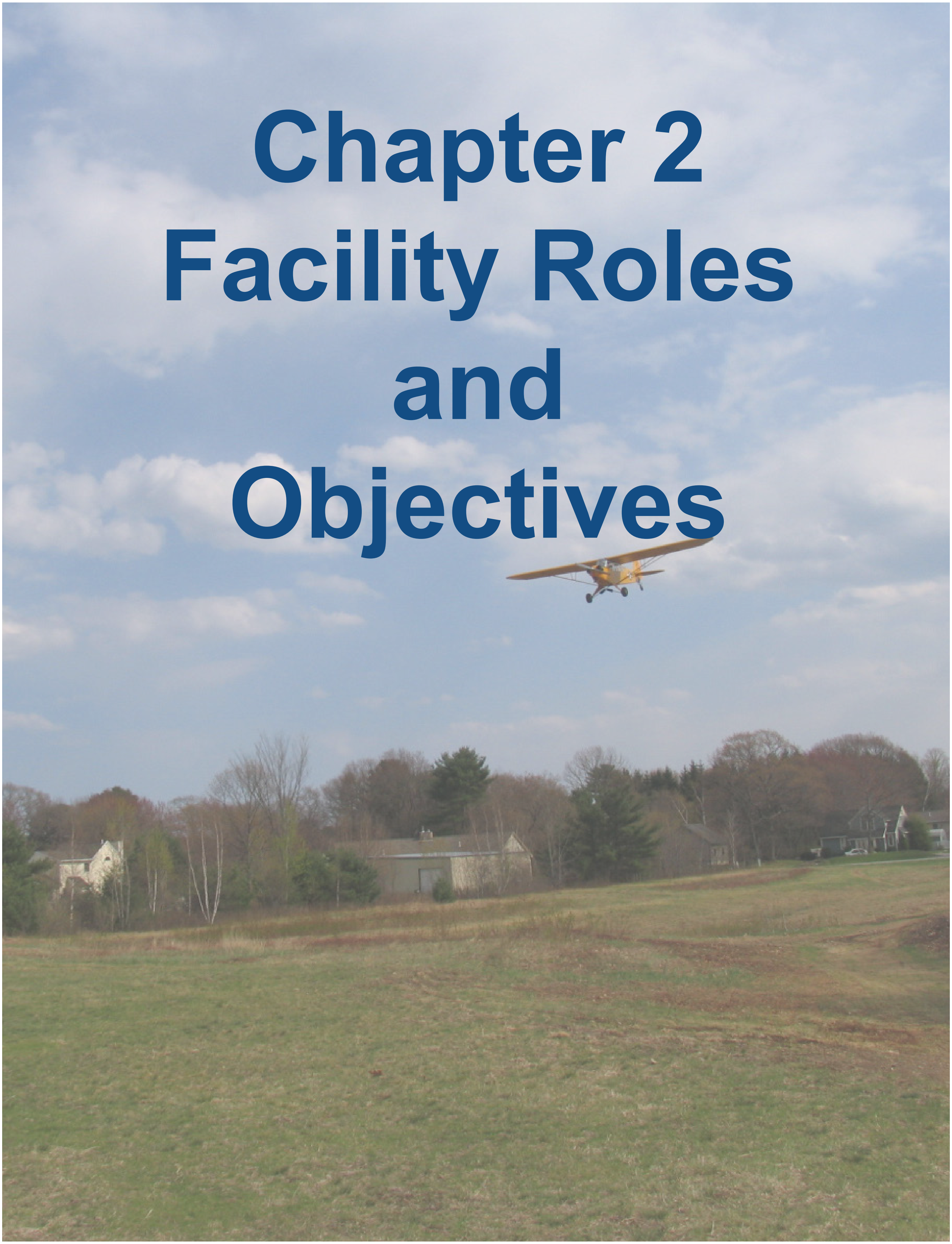
New England Regional Airport System Plan – In 2008, a study was completed for the commercial service airports in New England to better understand the dynamics between larger airports like Boston Logan International and regional airports like Manchester and Portsmouth. This study discussed the existing airport roles and also how the airport could serve the growing needs of the region.

A similar study is underway currently for GA airports in New England. Similar to the study completed for New England's commercial airports, this study focuses on the market dynamics and issues facing the regions GA airports. This study employs the same airport classifications identified in the ASSET study and was completed in March 2014. The NHSASP presented in this document uses draft material available from the March 2014 study.

Business Aviation: The Unfair Advantage

"Only about 3 percent of the approximately 15,000 business aircraft registered in the U.S. are flown by America's largest and most well-known companies, while the remaining 97 percent are operated by a broad cross-section of organizations, including governments, universities, charitable organizations and businesses – large, medium, and small. And that 97% represents the vibrant heartbeat of what keeps American business humming... or in this case, flying." – Forbes, 6 AUG 2012

Chapter 2 Facility Roles and Objectives



CHAPTER 2: FACILITY ROLES AND OBJECTIVES

2.1 INTRODUCTION

As part of a statewide air transportation system, each airport performs at varying levels based on a variety factors. The primary factors that affect an airport's ability to meet demand are the facility's infrastructure, service offerings, and location. Together, each system airport in the state of New Hampshire (NH) contributes to a functioning system within a regional, national, and international context. It is from this overarching perspective that this NH State Airport System Plan (NHSASP) addresses system-wide performance of all system airports.

To evaluate the NH airport system's performance, the system planning process dictates that performance parameters be objective and impartial to the functioning of the current system. This means that parameters are to be determined based upon the State's vision and goals for their airport system, rather than existing conditions at system airports. In this way, the NHSASP charts the course for the future of the statewide airport system. Therefore, the final plan presents research, analysis, and the framework of minimum facility infrastructure and service offerings necessary for individual airports to adequately meet demand as part of the statewide system. Recommended additional facilities and services will also be included.

This chapter provides an overview of the current NHSASP, defines the parameters that will be utilized to measure the current system's performance and identifies each airport's category and role. Each system airport role is a snapshot of conditions at this time (2014) and should be considered the baseline, or starting point for the system planning process.

2.2 AIRPORT CATEGORIES

All airports provide important access to their respective region, whether that access is utilized for recreation, business, or emergency medical or relief purposes. Recreational purposes include individual use for vacation travel, sightseeing, or to access second homes. Business uses include visits to manufacturing sites, clients, government officials, and industry partners.

Understanding and defining each of NH's system airports' categories and roles is an important step in this NHSASP. These roles will be defined by infrastructure and operational objectives that underscore each airport's ability to perform at a level that provides access and services to meet the demands of users that rely on them. While the focus of this effort is based on the unique airport system for NH, it is important that this plan also be consistent with regional and national plans as well. The FAA recently completed a study focused on the varied roles that General Aviation (GA) airports serve. The FAA's *General Aviation Airports: A National Asset study (ASSET),* considered a variety of factors in the categorization of GA airports.

These categories and roles are consistent with those used in the New England Regional Airport System Plan (NERASP). The following section capitalizes on the data and research efforts included in those studies and expands the scope of those categories based on the characteristics that define the airport system in NH (see **Table 2-1**). While the ASSET study included only GA airports, the NHSASP establishes a role of Primary for those airports with scheduled commercial service (Manchester, Lebanon, and Portsmouth).

Table 2-1 – NHSASP – Airport Categories & Roles

AIRPORT CATEGORY	AIRPORT ROLE
GENERAL AVIATION	BASIC
	LOCAL
	REGIONAL
	NATIONAL
COMMERCIAL SERVICE	PRIMARY

Source: McFarland Johnson, Inc.

For the NHSASP, airport roles are defined as follows:

- **General Aviation - Basic Airports:** Airports in the General Aviation - Basic role are those that provide the essential elements necessary to support aviation users in the State. Such Basic Airports can be located within the service area of larger airports but are most commonly in remote areas of the State, sometimes providing the only public landing site for many miles. Therefore, facilities and services at Basic Airports typically focus on serving smaller aircraft for clear weather flying. Users that rely on these airports as a base of operations often support other system airports by purchasing fuel and/or maintenance services elsewhere in the system.

- **General Aviation - Local Airports:** Airports in the General Aviation - Local role are similar to Basic Airports in that they provide vital access to the air transportation system for their local community. However, in addition to providing all the essential services and facilities of a General Aviation Basic Airport, Local Airports offer a greater diversity of additional services that might include a combination of flight training, recreation, medical evacuation, tourism and/or business aviation services. Local Airports typically serve a greater diversity of aircraft than Basic Airports, experience higher activity levels by twin-engine piston aircraft and may accommodate occasional light turbine aircraft.

- **General Aviation - Regional Airports:** General Aviation - Regional Airports are those that provide all the services and facilities of Basic and Local Airports, with more advanced accommodations for an even greater variety and volume of aviation users as well as a more multifaceted interface with the general public. 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 active business and recreational travelers.

- **General Aviation - National Airports:** Building on the roles discussed thus far, General Aviation - National Airports are those that have the capability to provide all services and facility infrastructure required by users and communities served by General Aviation Basic, Local, and Regional Airports. More importantly, National Airports can also provide aircraft access to national and sometimes international markets, depending upon the local business climate and the needs of their most sophisticated based and transient aircraft operators. Typically, General Aviation - National Airports are those where growth and expansion have driven improvements to airside and landside facilities in order to accommodate increases in demand by sophisticated aircraft and business/corporate aircraft operators.

- **Primary Airports:** Primary Airports in the state fulfill the highest level of access for aviation users in the state, with a main focus on providing access to air transportation for passengers through scheduled airline commercial service. Additionally, Primary Airports also provide all the capabilities and facilities of the other General Aviation airports in the system, and may also provide commercial air cargo services.

Figure 2-1 illustrates NHSASP system airports by these roles.

The minimum and recommended facilities for each role of system airport are presented in the sections that follow. These minimums serve as the primary factors for determining NH system airports' category and role. Facilities and services shown include those offered by the airport sponsor, Fixed Base Operators (FBO), Specialized Aviation Service Operations (SASO), or other tenants. FBO's traditionally provide fuel and other aircraft services, where as a SASO will focus on specific areas such as maintenance, avionics or aircraft painting.

As a nationwide effort, the ASSET Study considered a variety of factors on the macro-level in the categorization of airports. While there are benefits to having airport roles and categories consistent with those used in the regional and national plans, some features and characteristics are unique to NH. As such, a number of system airports do not meet all minimum recommended facilities. The purpose of these objectives is to provide a set of baseline and desirable facilities and services that can accommodate the types of users each airport is best positioned to serve.

2.3 FACILITY AND SERVICE OBJECTIVES

2.3.1 GENERAL AVIATION - BASIC AIRPORTS

General Aviation - Basic Airports should have a minimum runway length of 1,500 feet, which may or may not be paved, and a 20:1 clear approach slope from the runway threshold. Some airports in this role have a more specialized set of services that cater to a unique niche of aviation operations, such as gliders, skydiving, or agricultural aviation. As such, some Basic Airports operate seasonally and the facilities and services are specific to their users' unique operational activities. These airports do not typically have a full-time airport manager or support staff and instead rely heavily on volunteer efforts for airport operations and maintenance.

General Aviation - Basic Airports should also strive to provide basic public facilities that include a modest shelter, restroom, and telephone if cell phone service is spotty at the airport. A detailed list of desired facilities and services are presented in **Table 2-2**.

Table 2-2 – NHSASP – General Aviation Basic Airports – Facilities and Service Objectives

MINIMUM AIRPORT FACILITIES
Runway Gravel, Turf, Water, Ice or Pavement
Runway Length ≥ 1,500 feet
Aircraft Parking Area
Windsock (Visual Aid)
Open Seasonally
Airport Manager Contact Information Available
Posted Emergency Contact List
Basic Shelter 100 square feet
Public Phone
RECOMMENDED ADDITIONAL AIRPORT FACILITIES
Open All Year
100 Low Lead Aviation Fuel on Site
Rotating Airport Beacon (Visual Aid) (Where Runway Lights are Available)
Terminal Building Heated
20:1 Clear Approach Slope

Source: McFarland Johnson, Inc.

NH system airports classified in the General Aviation Basic Airport role are:

- Alton Bay
- Dean Memorial
- Errol
- Franconia
- Gifford
- Gorham
- Hawthorne – Feather Airpark
- Moultonboro
- Newfound Valley
- Plymouth Municipal
- Twin Mountain

2.3.2 GENERAL AVIATION - LOCAL AIRPORTS

General Aviation - Local Airports have increased activity and diversity of aircraft than Basic Airports. Therefore, Local Airports should have airfield facilities and aviation services that can adequately meet the needs of more sophisticated aircraft and their users. As such, a minimum paved runway length of 2,500 feet or greater (3,200 feet is recommended), with a non-precision instrument approach and taxiway infrastructure is required. Self-service fueling for 100LL (used by single and multi-engine piston engine aircraft) is recommended and, if business conditions permit, Jet-A fuel (used by jet and turboprop aircraft) is desired for airports in this role. Local Airports should offer a modest improvement in public facilities over that of Basic Airports, with well-maintained restrooms, telephone and pilot rest area. These airports may have a full- or part-time airport manager but may not have support staff. A detailed list of desired facilities and services for Local Airports is presented in **Table 2-3.**

Table 2-3 – NHSASP – General Aviation Local Airports – Facilities and Service Objectives

MINIMUM AIRPORT FACILITIES
Includes all minimum requirements of General Aviation Basic Airports plus or superseded by:
Runway Paved
Runway Length ≥ 2,500 feet
Pavement Strength 6,000 lbs (Single Wheel Landing Gear Configuration)
Paved Aircraft Parking Area 4 Aircraft Spaces
Hangar Storage for all Winter-Based Aircraft
Runway Lights
Taxiway Reflectors
Rotating Airport Beacon
Lighted Windsock
Non-Precision Instrument Approach Procedure
Open All Year
Part-Time Airport Manager Available During Normal Working Hours
Posted Emergency Contact List
Basic Terminal Building 250 square feet
100LL Fuel on Site
RECOMMENDED ADDITIONAL AIRPORT FACILITIES
Runway Length 3,200 feet
Pavement Strength 12,000 lbs (Single Wheel Landing Gear Configuration)
Paved Aircraft Parking Area - 6 Aircraft Spaces
Runway Lights Pilot Controlled
Low Intensity Taxiway Lights
VGSI (Vertical Glide Slope Indicator) to Primary Runway End
Basic Terminal Building 500 square feet
One Instrument Approach Procedure
Self-Serve 100LL Fuel available 24/7
Jet-A Fuel
Aircraft Maintenance on Site
Airport-Owned Snow Removal Equipment
Snow Removal Equipment Storage Building
Access to Rental Cars at Airport
Parking for Transient Aircraft
On-Site Automated Weather Reporting System
20:1 Clear Approach Slope

Source: McFarland Johnson, Inc.

NH system airports classified in the General Aviation Local Airport role are:

- Claremont Municipal
- Hampton Airfield
- Jaffrey Airport – Silver Ranch
- Mt. Washington Regional
- Parlin Field
- Skyhaven

2.3.3 GENERAL AVIATION - REGIONAL AIRPORTS

General Aviation - Regional Airports maintain a more robust airside infrastructure that includes a paved runway of 4,200 feet or greater with a partial or full parallel taxiway. Flight operations are supported by an Instrument Landing System (ILS) or satellite-based vertically guided Geographic Positioning System (GPS) approaches with on-site weather reporting capabilities. Additionally, Regional Airports may offer additional operational capacity during inclement weather with the availability of a crosswind runway. Another common component of these airports is on-site full-service FBOs that provide aircraft fueling (both Jet-A and 100LL), with self-service being preferred. If demand warrants, a SASO providing aircraft airframe, powerplant, and avionics maintenance services are often desirable for Regional Airports, as well as a full-time professional airport manager and support staff to accommodate the needs of a diverse and active client base. A detailed list of desired facilities and services are presented in the **Table 2-4**.

Table 2-4 – NHSASP – General Aviation Regional Airports – Facilities and Service Objectives

MINIMUM AIRPORT FACILITIES
Includes all minimum requirements of General Aviation Basic Airports plus or superseded by:
Runway Length ≥ 4,200 feet
Pavement Strength 12,000 lbs (Single Wheel Landing Gear Configuration)
Full-Time Airport Manager On Site During Normal Working Hours, Available 24/7
Emergency Contact List Posted and Distributed
Terminal Building of Moderate Size (Suggest 500+ square feet)
Self-Serve 100LL Fuel
Jet-A Fuel
One Straight-In Instrument Approach Procedure
On-Site Automated Weather Reporting System
Medium Intensity Runway/Taxiway Lights (Pilot Controlled)
VGSI on Primary Runway
Airport-Owned Snow Removal Equipment
Snow Removal Equipment Storage Building
Full-Service Fixed Based Operator
Secure Aircraft Parking Apron 10+ Jet/Turboprop Aircraft
Hangar Storage for 90% for Winter-Based Aircraft
Access to Rental Cars at Airport
Partially Fenced Airport Property Perimeter
RECOMMENDED ADDITIONAL AIRPORT FACILITIES
Runway Length ≥ 4,600 feet
Pavement Strength 30,000 lbs (Single Wheel Landing Gear Configuration)
Terminal Building of Moderate Size 1,000± square feet
Straight-In Instrument Approach Procedure to Two Runway Ends
Secure Aircraft Parking Apron 15+ Jet/Turboprop Aircraft
Self-Serve Jet-A Fuel Available 24/7
VGSI on Each Runway End
Complete Airport Property Perimeter Fencing

Source: McFarland Johnson, Inc.

NH system airports classified in the General Aviation Regional Airport role are:

- Berlin Regional
- Concord Municipal
- Dillant-Hopkins
- Laconia Municipal

2.3.4 GENERAL AVIATION - NATIONAL AIRPORTS

General Aviation - National Airports have a well-developed and maintained infrastructure, including a minimum paved runway length of at least 5,500 feet and a full parallel taxiway. With this runway length, National Airports can support operations by sophisticated aircraft in the general aviation fleet, including long-haul international flights. At these airports, ILS approach capability with advanced vertical guidance and on-site weather reporting capabilities to provide maximum poor weather accessibility is the standard. Additionally, with more sophisticated aircraft operations comes the demand for a full-service FBO offering facilities and services on par with nationally recognized FBO's found at larger airports across the country. Specialized services are also more common at General Aviation - National Airports, providing aircraft operators a reliable source for routine checks on aircraft airframe, powerplant, and avionics systems. Finally, a professional airport manager, support and operations staff, and FBO typically provide coverage 24 hours per day, 7 days per week to respond quickly to the volume and diversity of unique needs of tenants and itinerant travelers. A detailed list of desired facilities and services are presented in **Table 2-5**.

Table 2-5 – NHSASP – General Aviation National Airports – Facilities and Service Objectives

MINIMUM AIRPORT FACILITIES
Includes all minimum requirements of General Aviation Basic Airports plus or superseded by:
Runway Length ≥ 5,500 feet
Pavement Strength 30,000 lbs (Single Wheel Landing Gear Configuration)
Medium Intensity Runway/Taxiway Lights
Medium Intensity Approach Light System w/ Flashers
Full-Time Airport Professional Manager. On Site During Business Hours., Available 24/7
Emergency Contact List Posted and Distributed
Terminal Building 2,500+ square feet
Full-time Airport Operations & Maintenance staff
Airport Maintenance Building
Self-Serve Jet-A and 100LL Fuel Available 24/7
Secure Aircraft Parking Apron 25 Jet/Turboprop Aircraft
Hangar Storage for All Winter-Based Aircraft
Hangar Parking for Transient Aircraft
Instrument Approach to All Runways, at Least One Vertically Guided Approach
Complete Airport Property Perimeter Fence
Rental Cars On-Site
Local Fire Department Trained in Basic ARFF Procedures

Source: McFarland Johnson, Inc.

Table 2-5 – NHSASP – General Aviation National Airports – Facilities and Service Objectives (Continued)

RECOMMENDED ADDITIONAL AIRPORT FACILITIES
Runway Length ≥ 6,000 feet
Pavement Strength 60,000 lbs (Single Wheel Landing Gear Configuration)
High Intensity Runway Lights/Medium Intensity Taxiway Lights
Medium Intensity Approach Light System w/ Flashers
Terminal Building 5,000 square feet
Full-Time On-Site Airport Security
Secure Aircraft Parking Apron 40± Jet/Turboprop Aircraft
Instrument Approach to All Runways, at Least Two Vertically Guided Approaches
Intermodal Ground Transportation Options
Air Traffic Control Tower
ARFF On Site 24/7
Access to Customs
Airport Emergency Plan
34:1 Clear Approach Slope
Other Facilities and Services as Required by Users

Source: McFarland Johnson, Inc.

NH system airports classified in the General Aviation National Airport role are:

- Boire Field

2.3.5 PRIMARY AIRPORTS

Airside facilities at Primary Airports typically include the most robust runway configurations, advanced instrument approach systems, all-weather instrumentation and weather reporting. The infrastructure allows Primary Airports to support all general aviation aircraft and a wide array of commercial aviation aircraft. Similar to General Aviation National Airports, aviation services at Primary Airports are likely to include multiple full-service FBOs, full-service and self-service 100LL and Jet-A fueling and could include larger aircraft Maintenance, Repair, and Overhaul (MRO) operations and capabilities. Desired services include US Customs, foreign trade zones, and multi-modal connectivity with public and private transportation systems. Primary Airports have a broad complement of full-time professional management, operations, support, and specialty trained staff commensurate with the expectations of paying aviation customers. A detailed list of desired facilities and services are presented in the following **Table 2-6**.

Table 2-6 –Primary Airports – Facilities and Service Objectives

MINIMUM AIRPORT FACILITIES
Includes all minimum requirements of General Aviation Basic Airports plus or superseded by:
Runway Length ≥ 7,000 feet
Pavement Strength 250,000 lbs (Dual Tandem Wheel Landing Gear Configuration)
High Intensity Runway Lights/Medium Intensity Taxiway Lights
Medium Intensity Approach Light System w/ Sequenced Flashers
Full-Time Airport Professional Manager. On Site During Business Hours., Available 24/7
Emergency Contact List Posted and Distributed
Full-time Airport Operations & Maintenance Staff
Airport Maintenance Building
Self-Serve Jet-A and 100LL Fuel Available 24/7
Hangar storage for All Winter-Based Aircraft
Hangar Parking for Transient Aircraft
Instrument Approach to All Runways, at Least Two Vertically Guided Approaches
Complete Perimeter Fence
Rental Cars On-Site
Terminal Building 5,000+ square feet
Full-time On-Site Airport Security
Secure Aircraft Parking Apron 40+ Jet/Turboprop Aircraft
Intermodal Ground Transportation Options
Air Traffic Control Tower
ARFF on site 24/7
Access to US Customs
Airport Emergency Plan Exercised
34:1 Clear Approach Slope
RECOMMENDED ADDITIONAL AIRPORT FACILITIES
Runway and Taxiway Characteristics Determined by Users (Minimum B757/B767)
Category-III Insurgent Landing System Approach to One Runway
50:1 Clear Approach Slope
High Intensity Approach Lighting System With Sequenced Flashing Lights
Air Traffic Control Tower 24/7
Scheduled Airline Passenger Service (Passenger/Baggage Security Screening)
Passenger Terminal Building with Concessions
Aircraft Cargo Handling Facilities
US Customs and Border Protection Facility On-Site
Other Facilities and Services as Required by Users

Source: McFarland Johnson, Inc.

As of calendar year 2014, the following airports have been defined as a Primary Airports:

- Lebanon Municipal
- Manchester-Boston Regional
- Portsmouth International Airport at Pease

2.4 PERFORMANCE METRICS

A series of performance metrics were established to evaluate the performance of NH's existing airport system. In airport system planning, the most common denominator for evaluating a system's performance is geography, or geographic coverage. In this regard, each airport in a system has a primary geographic service area that attracts users (i.e., pilots, passengers, aircraft owners, businesses, etc.) located in proximity to each airport. Service areas for airports can be defined by automobile drive times and nautical miles. For the NHSASP, both drive times and nautical mile service areas were utilized.

Geographic service areas for the NHSASP are determined utilizing a Geographic Information System (GIS). GIS is a computer software package that can evaluate spatial relationships such as drive times or distances between airports and geographic features in NH such as population centers, land area or top employers. The area analyzed using GIS is referred to as the Geographic Service Area for the SASP.

Airports and features were evaluated from both the Ground Access and Air Access perspective. They are defined as follows:

- **Ground Access** – The Geographic Service Area for ground access identifies the area within which the airport is likely to be most effective in serving local user demand at the airport.

  A 30-minute drive time analysis is used for each NHSASP general aviation airport. The 30-minute drive time is consistent with guidance from the FAA used to evaluate a general aviation airport's eligibility for inclusion in the NPIAS per FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*. This may be adjusted to meet geographic or airport capabilities as appropriate.

- **Air Access** – The Geographic Service Area for air access identifies the area of the airport feature/service that is likely to be most effective in serving aircraft flying to an airport whether it is intended or unintended (diversion/emergency).

  To accomplish this, a 20-nautical mile distance surrounding each airport was identified and analyzed for each airport and specific airport features applicable to airborne aircraft where 30-minute drive time may not be the most accurate assessment (i.e. automated weather reporting systems). This measure is also consistent with guidance in FAA Order 5090.3C, and may also be adjusted to meet geographic or airport capabilities as appropriate.

In all instances the actual service area is not finite to the geographic service area shown. Airport use is at the discretion of the pilot in command and can be based on a variety of factors such as fuel prices, tie-down fees, familiarity, weather conditions, ground transportation, or simply a general preference. Since many of these discretionary factors can change or fluctuate, the NHSASP will use the finite measurement of a specific drive time and/or nautical mile distance from the airport to facilitate further evaluations with all other factors being equal. There is no FAA service area standard for specific airport features such as runway length or fuel so the NHSASP will consider the same geographic service areas (30-mile ground or 20-nautical mile air) as the baseline for the analysis.

2.4.1 GEOGRAPHIC ADJUSTMENTS

The geography and topography of NH are notably different from the northern part of the state to the southern part of the state. In discussions with aviation users in NH, it was noted that the weather can change more rapidly in the mountainous parts of the state north of the Lakes region. In addition, the density of the mountainous terrain limits the weather reporting stations that use FM radio frequency (line of sight) reception, which results in transmission limitations. Based on this limitation, a 20-nautical mile geographic service area will be utilized for airports outside of the mountainous areas. In mountainous areas, the service area was adjusted to a 15-nautical mile service area to account for the inherent limitations created by the mountainous terrain and approximate the average limits of coverage for these line-of-sight facilities.

2.4.2 COMMERCIAL SERVICE ADJUSTMENTS

Airports with scheduled passenger service (Manchester, Pease and Lebanon) provide an additional level of service not found at other airports in the NH system. These airports connect NH to cities across the US with non-stop flights to other cities and connecting opportunities throughout the world. For system-wide analyses not related to specific airport features (i.e., runway length, weather reporting, or fuel type), commercial service airports will be shown with a 60-minute drive time geographic service area to reflect the additional level of service provided by these airports and the average drive-time distance most passengers will drive to use commercial airline services. Specific airport features will be represented with the same 30-minute drive time as the rest of the system airports, reflecting the general aviation components of these airports.

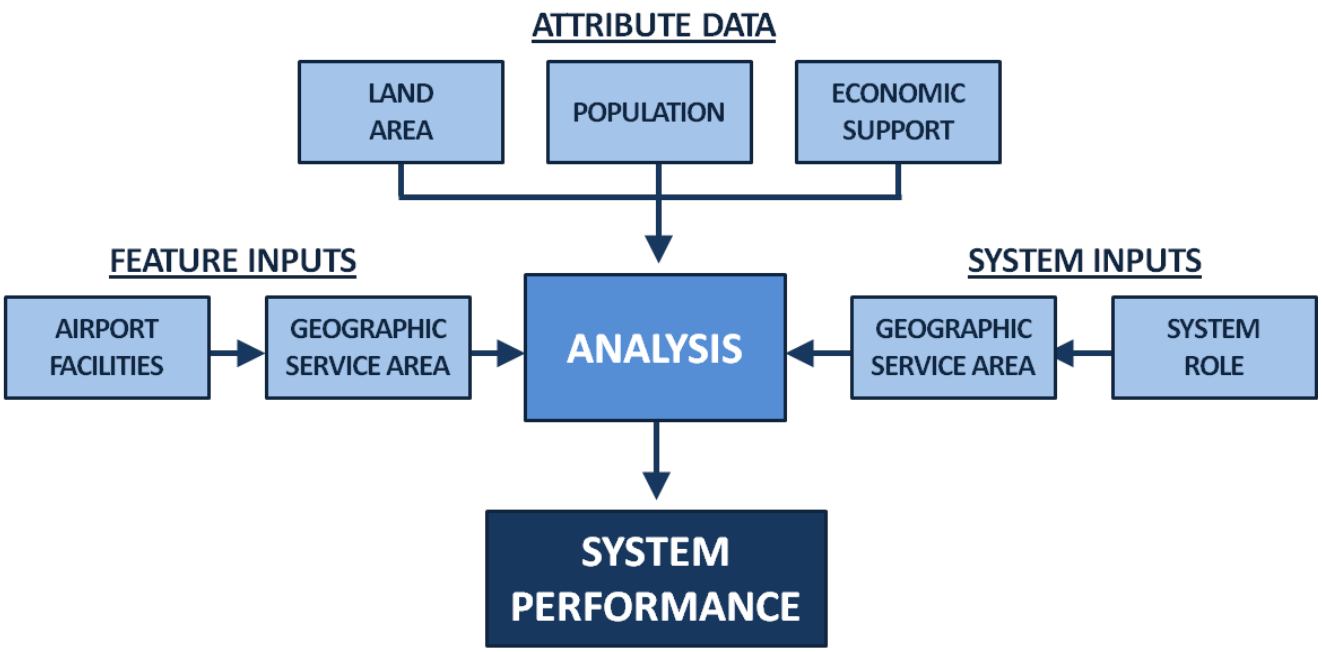
Utilizing the two coverage areas described in the previous sections, the GIS analysis results in a quantifiable geographic service area for each system airport that represents the area of the state that is served by each system airport or airport feature. Conversely, the analysis also identifies areas of gaps in coverage that are not influenced by system airports/airport features. The analysis uses the geographical analysis to develop a “report card” that illustrates how the existing statewide system of airports performs and where improvements may be warranted.

2.4.3 GIS ANALYSIS PROCESS

The evaluation of the NH state airport system is performed by populating the GIS with specific data relative to individual airports and the system as a whole. Once the GIS captures this data, various analyses can be performed and results can be interpreted.

Figure 2-2 illustrates the three types of inputs that are used in the analysis: socioeconomic attribute data, airport-specific facility infrastructure and services data, and NHSASP-specific inputs regarding each airport's role.

Figure 2-2 –NHSASP – GIS Input Data and Analysis



Source: McFarland Johnson, Inc.

This data is aggregated into a robust GIS database that can be queried and quantified to produce outputs such as illustrated map figures and statistics that represent geographic service area coverage and system performance.

2.5 SUMMARY

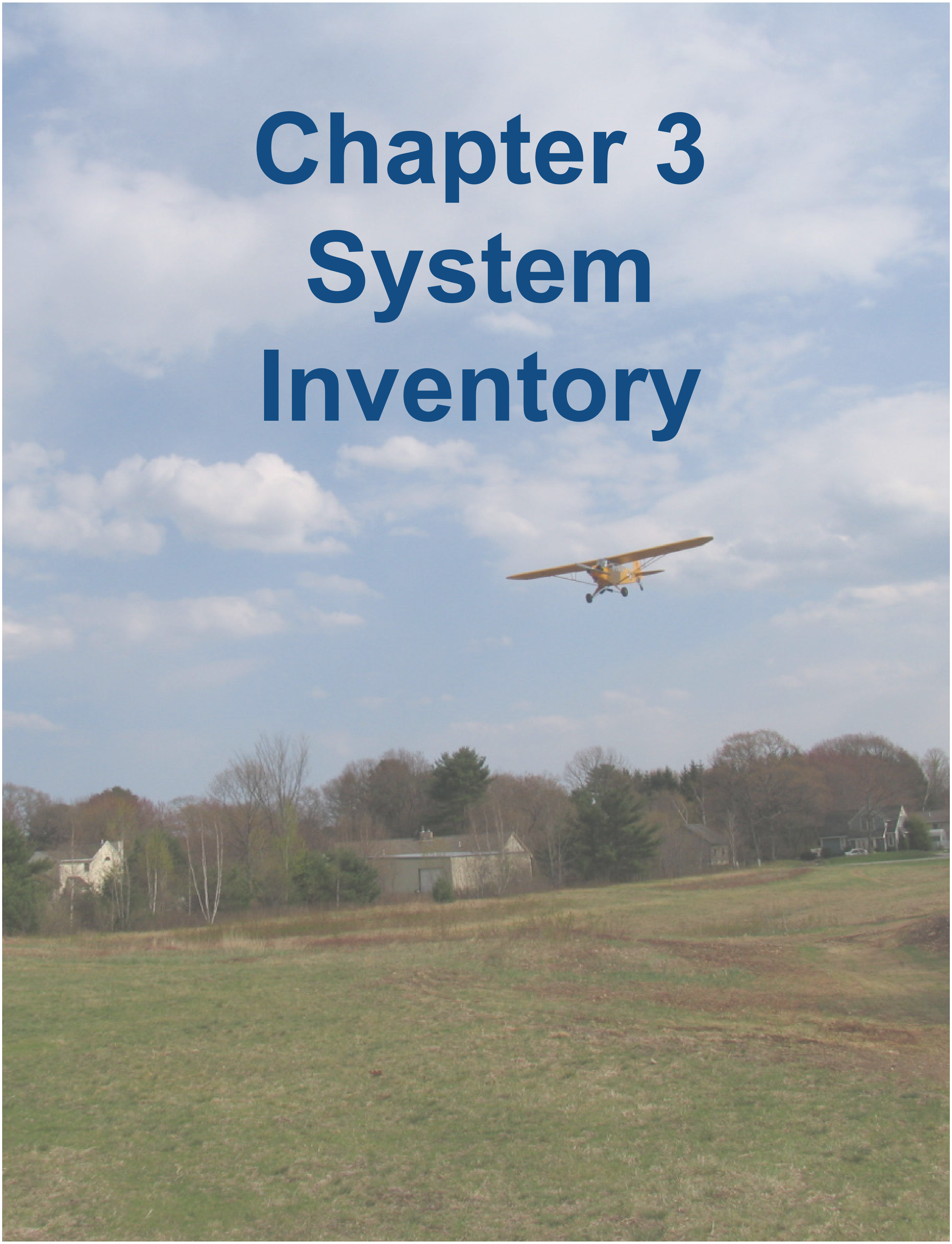
As described in the introduction of this chapter, each airport in the statewide system performs at varying levels based on a variety factors. The primary factors that affect an airport's ability to meet demand are the facility's infrastructure, service offerings and location.

Chapter 4, Current Statewide Airport System Performance, evaluates the NH airport system's performance based upon the inventory data presented in *Chapter 3, System Inventory,* and the performance metrics described in this chapter, to determine the system's coverage in terms of population, employment, land area, and overall access.

Based on the analysis of system coverage contained in this chapter and the ability of system airports to meet minimum facility objectives, both currently and under future demand conditions, recommendations will be presented that can enhance the NH state airport system.

Statewide recommendations are intended to complement and support local airport planning efforts. Local airport planning efforts include airport master plans, environmental assessments and/or development plans are crucial for determining airport-specific facility needs for each system airport. The NHSASP can, however, assist in validating elements of those plans and highlighting facility needs at a system level.

Chapter 3 System Inventory



CHAPTER 3: SYSTEM INVENTORY

3.1 INTRODUCTION

This chapter presents an inventory of existing facilities at the 25 public-use airport facilities currently identified as part of the New Hampshire (NH) Airport System and will serve as the basis of the remaining chapters of this study. According to the FAA's Airport Master Records (form 5010), as of January 2014, there are a total of 140 airports in the state of NH, which includes all privately-owned airports, landing fields, and heliports. However, this study focuses on the 25 of those airports that are open to the public.

For system planning purposes, the NH State Airport System Plan (NHSASP) considers only public-owned, public-use airports included in the National Plan of Integrated Airport Systems (NPIAS). The NPIAS identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and thus eligible to receive federal grants under the Airport Improvement Program (AIP). Therefore, this study focuses on airports that are eligible for federal funding. **Figure 3-1** displays system airports by NPIAS status. Data and facility information for non-NPIAS airports was collected and provided by the NH Department of Transportation, Bureau of Aeronautics (BOA).

3.2 SUMMARY OF EXISTING SYSTEM

Figure 3-1 illustrates the location of the public use airports currently included in the NH aviation system. These airports are categorized as follows:

- **Basic:** Airports in the Basic category are those that typically focus on serving smaller aircraft for clear weather flying.
- **Local:** Airports in the Local category are similar to Basic Airports however, Local Airports offer a greater diversity of services, experience usage by a greater diversity of twin-engine piston aircraft, and may accommodate occasional light turbine aircraft.
- **Regional:** Airports in the Regional category are those that provide all the services and facilities of Basic and Local Airports with more advanced infrastructure for a greater variety and volume of operators and users. Typically located proximate to more populated areas, Regional Airports provide services for a wide range of recreational and corporate users and are often an alternative to larger airports for active business and personal travelers.
- **National:** Airports in the National category are those that have the capability to provide a full complement of services and facility infrastructure required by users to access national and sometimes international markets. Typically, National Airports are those that have infrastructure to accommodate use by jet aircraft and business/corporate aircraft operators.

FIGURE 3-1:

NPIAS AIRPORTS

STATE AIRPORT SYSTEM PLAN

- **Primary**: Airports in the Primary category fulfill the highest level of access for aviation users in the state with their role being the provision of scheduled airline commercial service.

3.2.1 STATE AIRPORTS SUMMARIES

This section provides a brief summary of the airports that are within the State's aviation system. The airport information is summarized by airport role and the descriptions of each present the character of the airports and the areas the airport serve, as well as any unique activities associated with the facilities.

General Aviation Basic Airports

Alton Bay Ice Runway/Seaplane Base (B18)

Alton Bay Ice Runway/Seaplane Base (B18) (Alton Bay) in the Lakes region is a winter season airport with a plowed ice runway and a seaplane base the remaining seasons. The airport is located on the southeast corner of Lake Winnipesauke in the town of Alton. The airport operates from January to February and offers a unique experience for the aviation community. The airport has a 2,600-foot x 100-foot runway. The Bureau of Aeronautics works with the volunteers who manage the ice runway during the winter season to develop an airport layout that provides the necessary aviation facilities while also addressing safety needs for people on the ice. During the winter season, this is one of NH's busiest airports with nearly 100 aircraft arriving each weekend.

Dean Memorial Airport (5B9)

Dean Memorial Airport (5B9) is located in the White Mountain region of the state in the town of Haverhill in Grafton County. The airport is a public use airport owned by the town of Haverhill and operated by an airport commission comprised of municipal and airport officials. The airport was identified for inclusion into the NPIAS program as part of the 2003 NHSASP and accepted into the program in 2010. The airport has a 2,511-foot x 58-foot runway.

There are no Fixed Base Operator (FBO) services provided at the airport but the airport does have self-serve 100 Low Lead (LL) fuel. The aircraft based at the airport are the primary generators of activity however, the airport does see several itinerant flights during the summer. The airport has a very successful annual "Airport Day" held in the summer that attracts the local community to the airport, helping to increase the airport's visibility within the community.

887

Every year Dean Memorial Airport hosts an "Airport Awareness Day" which includes exhibits and airplane rides. As of 2011, the Experimental Aircraft Association's Young Eagles program has introduced aviation to 887 children at Dean Memorial Airport's Airport Awareness Day events.

26

Years

Hawthorne-Feather Airpark is the site of the former Nathaniel Hawthorne Aviation College. For 26 years, Nathaniel Hawthorne was the premier aviation college in the region having closed in 1988.

Errol Airport (ERR)

Errol Airport (ERR) is located in the Great North Woods region of the state in the town of Errol in Coos County. The airport is a privately owned airport open to the public. The airport has a 3,680-foot x 75-foot gravel runway and several based aircraft. The airport has a hangar and several turf tie-downs. A paved helipad was constructed in 2008 using a state grant and a grant from the Tillotson Fund to support helicopter operations in a safe manner that otherwise wouldn't be able to use the gravel runway surface.

Gorham Airport (2G8)

Gorham Airport (2G8) is located in the White Mountain region of the state. The Gorham Airport is owned and operated by the town of Gorham in Coos County. Day-to-day airport operation and management are coordinated on a part-time basis with the town of Gorham Water and Sewer Commission and a part-time volunteer airport manager. The 2,667-foot turf runway facility is open seasonally from spring through fall. The airport sits atop a protected aquifer and doesn't allow aircraft fueling in order to help protect the aquifer from spills.

Moultonboro Airport (5M3)

The Moutlonboro Airport (5M3) is located in the Lakes region of the state in the town of Moultonborough in Carroll County. Located on the northern side of Lake Winnipesauke, the airport is a privately owned, public-use facility and has a 3,625-foot x 50-foot paved runway. The airport has several hangars and a tiedown apron, as well as a maintenance hangar. Moultonboro Air Base LLC, the FBO offers aircraft maintenance, fuel and aircraft tiedowns.

Hawthorne Feather Airpark (8B1)

Hawthorne Feather Airpark (8B1) is a privately owned, public-use airport located in the Monadnock region of the state in the town of Hillsborough in Hillsborough County. The airport has a paved 3,260-foot x 75-foot runway and has 100LL fuel. It is used primarily by local pilots for recreational use.

Newfound Valley Airport (2N2)

Newfound Valley Airport (2N2) is located in the Lakes region in the town of Bristol in Grafton County. The airport is a privately owned, public-use facility that is managed by a full-time airport manager and a small group of volunteers, which are based aircraft owners. There are several based aircraft and a small hangar at the airport. The runway is a 1,900-foot x 40-foot paved surface runway.

Plymouth Municipal Airport (1P1)

Plymouth Airport (1P1) is located in the Lakes region of the state in the town of Plymouth in Grafton County. The town of Plymouth owns and operates the airport with a part-time airport manager. The airport has a 2,380-foot x 90-foot turf runway, a small terminal building and a small hangar. The airport is open three seasons because the Town does not plow the runway during the winter and aircraft operations are not possible during that time.

Franconia Airport (1B5)

Franconia Airport (1B5) is located in the White Mountain region of the State. The airport is situated in the town of Franconia in Grafton County. The airport is a privately owned, public-use facility with a turf runway, which is open from spring until fall depending on runway conditions. The Franconia Soaring Association, a gliding club for members and non-members, primarily uses the facility. As a lodging facility neighboring the airport, the Franconia Inn (owner of the Airport), uses the facility within its marketing campaign to attract guests who are interested in taking advantage of the opportunity to experience gliding in the White Mountains.

Twin Mountain Airport (8B2)

Twin Mountain Airport (8B2) is located in the White Mountain region of the state in the town of Twin Mountain in Coos County. The airport is a privately owned/public-use airport with a paved 2,640-foot x 60-foot runway. The airport has a small terminal building and a tiedown apron for aircraft.

Gifford Field (4C4)

Gifford Field (4C4) is the northernmost public use airport in the NH system. The airport is located in the Great North Woods region in the town of Colebrook in Coos County. Gifford Field is a privately owned, public-use facility. The 2,440-foot turf

Franconia Inn

Franconia Airport is owned by the Franconia Inn, located just across the street from the airfield. The Inn focuses on the airport's glider activity in its own marketing campaign as a way to attract visitors to Franconia, which also happens to be the long time home of poet Robert Frost.

runway at Gifford Field is open spring through late fall. Recreational and some business flights occur here.

General Aviation Local Airports

Claremont Municipal Airport (CNH)

Claremont Municipal Airport (CNH) is located within the Dartmouth-Lake Sunapee region of the state in the city of Claremont in Sullivan County. The airport is owned and operated by the city of Claremont. The Claremont Airport Advisory Board serves in an advisory function to the City Council relative to airport operations. Due to the limited availability of funds, the airport relies on a part-time airport manager, who is also the City Fire Chief and volunteers to assist with airport maintenance.

The airport, located near the border of Vermont, sees activity from both NH and Vermont and has a 3,000-foot x 100-foot runway. One of the primary factors in this split of activity is that NH fuel taxes allow for lower fuel prices at Claremont. These lower fuel prices attract aircraft to the airport and generate additional revenue for the airport. CNH Aviation is the FBO located at the airport and offers flight training and aircraft maintenance.

Mt. Washington Regional (HIE)

The Mt. Washington Regional Airport (HIE), located in the White Mountain region of the state, is owned by the town of Whitefield in Coos County and is operated and managed by the Mt. Washington Regional Airport Commission. The Commission is comprised of surrounding towns in a voluntary cooperative financial agreement to support the airport. Each member town in the Commission supports the airport by voluntarily providing revenue (as a line item in their annual budget) based on a suggested amount per town resident.

The airport's location in the Mt. Washington region provides easy access to two well-known resorts: Mountain View Grand Resort & Spa, and Omni Mount Washington Resort, which is home to and Omni Bretton Arms Inn at Mount Washington. Portions of the itinerant operations that occur during the summer months are corporate turboprop/jet aircraft and charter aircraft that transport passengers to these two resorts. The airport also sees aircraft during the winter that are travelling to the various ski resorts in the region.

The airport has a 4,002-foot x 75-foot runway and a Localizer Performance with Vertical Guidance (LPV) approach. The airport's current master plan shows an extension of the runway up to an additional 1,000' to allow the airport to more efficiently accommodate corporate jet aircraft. Discussions with airport management indicated that the lack of Jet-A

58 Years

Mt. Washington Regional Airport has provided general aviation services in the White Mountains for over 58 years.

fuel is an issue for attracting more jet and turboprop traffic to the airport. As such, the airport is considering installing Jet-A tanks to support the projected corporate traffic once the runway extension has been built.

Jaffrey Airport - Silver Ranch (AFN)

Jaffrey Airport–Silver Ranch (AFN) is also located in the Monadnock region of the state in the town of Jaffrey in Cheshire County. The airport is a privately owned, public-use airport. The owners operate and manage the facility full-time as well as a busy charter service. The airport has a 2,982-foot x 134-foot paved runway with several large box hangars for aircraft storage. The airport also has several tiedown aprons and 100LL fuel. The airport is used primarily for recreational flights and due to its close proximity to the Massachusetts border. AFN sees flight training activity from nearby airports in MA as well as NH.

Hampton Airfield (7B3)

Hampton Airfield (7B3) is located in the Seacoast region in the town of North Hampton in Rockingham County. The airport is a privately owned, public-use airport. The airport has an active 2,100-foot turf runway open year round. The airport has a large number of privately owned hangars on either side of the runway. The airport offers maintenance services as well as aircraft restoration services. The airport also has a small restaurant, which attracts recreational aircraft, as well as a small ice cream stand that attracts local residents during the summer months. During the summer, the airport has banner towing services and scenic flights along the beaches.

Parlin Field (2B3)

Parlin Field (2B3) is located in the Dartmouth-Lake Sunapee region of the state in the town of Newport in Sullivan County. Parlin Field is owned and operated by the town of Newport with a part-time airport manager. The elected five member Parlin Field Airport Commission exists as an advisory mechanism to Newport selectmen. The airport has a paved 3448-foot x 50-foot runway, a 2,140-foot x 80-foot turf runway, 100LL fuel and a tiedown apron. The airport has several businesses located on the airfield including; Edmonds Aircraft Service, which does maintenance and aircraft restoration services and the Lil' Red Baron restaurant, which

1946

Legend has it that in 1946 the original owners of Hampton Airfield bought 17 parcels of land to make up what was to be a gladiola farm. Once all parcels were obtained, they opened an airport instead! Although it has never been proven to be true, the airport now grows gladiolas in front of the café to make good on the promise. Hampton Airfield has been an official Piper dealer and training site continuously since 1946.

is open year round and attracts aircraft from NH and neighboring states.

Skyhaven Airport (DAW)

Skyhaven Airport (DAW) is located in the Lakes region of the state in the city of Rochester in Strafford County. It is about 20 miles northwest of Portsmouth International Airport at Pease. The airport was owned by the state of NH, but was transferred to the Pease Development Authority in 2009 and is now being staffed by aviation personnel from Portsmouth International Airport at Pease. The airport is a small active general aviation airport whose activity is primarily recreational in nature but also serves corporate and medical helicopter operations. The airport has a 4,200-foot x 75-foot runway. The only aviation business tenant on the airport is an aircraft maintenance shop.

General Aviation Regional Airports

Berlin Regional Airport (BML)

Berlin Regional Airport (BML) is located in the town of Milan, just north of the city of Berlin, in Coos County and within in the Great North Woods region of the state. The Berlin Airport Authority owns the facility with financial and administrative operations coordinated through the city of Berlin. The Airport Authority is comprised of a seven-member agency with representation from the city of Berlin, town of Milan and Coos County. The airport manager coordinates day-to-day operation and management.

The airport has a 5,200-foot x 100-foot runway. The airport is primarily used by small general aviation aircraft and serves a notable amount of training activity due to the available instrument approaches at the airport. The airport also serves an important role in emergency medical evacuation and support facility for search and rescue operations. The airport's location in the northern portion of the state and the availability of Jet-A fuel are key factors to the airport's importance to the Great North Woods region.

The airport's primary business is a part time maintenance shop that provides seasonal aircraft maintenance service and part time flight instruction.

Laconia Municipal Airport (LCI)

The airport is located in the Lakes region on the south side of Lake Winnipesauke in Belknap County. The airport is owned by the city of Laconia and located in the town of Gilford. An Airport Authority was established by state legislature and has nine members with the Mayor of Laconia as the Authority Chairperson. The Authority is primarily

43

Times

Flying from Berlin Regional Airport, Carmeno Onofrio landed on the summit of Mt. Washington 43 times in 1947 with his J-3 Cub aircraft.

advisory in nature. The city of Laconia formally acts as the sponsor.

The airport's location near Lake Winnipesauke attracts a variety of aviation activity, much of it recreational in nature. Due to a large number of vacation homes located along the lake, the airport sees a large number of corporate jets and turboprop aircraft that are used to transport homeowners to their homes or bring campers to historical lakeside camp sites. This aviation traffic is unique among the NH airports and accounts for a large portion of activity during the summer.

The airport has a 5,890-foot x 100-foot runway. It also has two full-service FBOs including; Sky Bright Aviation, which services corporate activity at the airport, and Emerson Aviation that serves smaller general aviation aircraft. The airport recently added a new tenant, C-R Helicopters, who expanded to Laconia to supplement their existing operation at Boire Field in Nashua.

$455

$455 was the cost to get a private pilots license administered by Robert Fogg, owner of Fogg's flying service at Concord Municipal Airport in 1930.

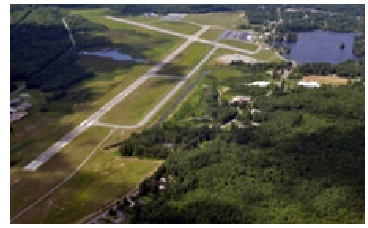
Concord Municipal Airport (CON)

Concord Municipal Airport (CON) is located in Merrimack County, in the Merrimack Valley region of the state in the State's Capitol. The airport is owned and operated by the city of Concord. The City's General Services Administration oversees the airport in terms of building and grounds maintenance and plowing. Concord Aviation Services is the airport's full service FBO and serves as the airport manager under contract to the City. The City's Airport Advisory Committee, which reports to the Concord City Council, serves in an advisory role relative to airport financial and administrative operations.

The airport is an active general aviation airport and sees a mix of corporate, business and recreational flights. Corporate activity is associated with businesses in the City as well as St. Paul's School. The airport also serves corporate aircraft associated with two NASCAR races held at the NH Motor Speedway in July and September each year.

The airport has a 6,005-foot x 100-foot main runway. Concord Aviation Services provides FBO services at the airport including maintenance, flight training, hangar and tiedown parking and fuel. Other notable tenants include Craig Avionics, which specializes in aircraft avionics installations, the NH state Police and the Army Air National Guard facility housing UH-60 Medevac helicopters. Numerous private aircraft owners lease aircraft and hangar space at the airport as well.

Dillant-Hopkins Airport (EEN)



Dillant-Hopkins Airport (EEN) is located in the Monadnock region of the state in the town of Swanzey, Cheshire County. The airport is owned and operated by the city of Keene. The facility has a full-time manager who oversees maintenance, administration and operation of the airport. The airport has a 6,200-foot x 100-foot main runway and can accommodate all types of aircraft from single-engine piston aircraft to large corporate jets.

The airport sees a mix of corporate turboprop and jet aircraft, along with recreational flights and flight training by smaller piston aircraft during the summer. The airport has one full-service FBO, Monadnock Aviation, which provides a variety of aviation services including fueling services. Green River provides similar services, but does not provide fueling services. A major tenant on the airfield is C&S Aviation, which is a corporate flight department that owns a Bombardier Challenger and other aircraft.

Busiest

Boire Field is the busiest general aviation airport in NH and also has the largest based aircraft fleet out of all the state's airports.

General Aviation National Airports

Boire Field (ASH)

Boire Field (ASH) is located in the city of Nashua in Hillsborough County, which is in the Merrimack Valley region of the state. The airport is owned by the city of Nashua and operated and managed by the Nashua Airport Authority. The airport authority was created by state Legislation whose members are appointed by the Mayor of Nashua. The facility has a full-time manager and several operations and administration staff who are employed by the airport authority. The airport has a business park that serves a number of non-aviation businesses.

The airport is the busiest general aviation airport in the state serving general aviation and corporate activity and also has the largest based aircraft population of the State's airports. The airport has a 6,000-foot x 100-foot runway. The airport's operations have declined over the past two years as Daniel Webster College (located adjacent to the airport) eliminated the aviation flight program, which resulted in a loss of flight training operations. The aviation flight program made up a large component of annual aircraft operations. However, the airport's business tenants are active and growing and they have served to stabilize activity for the airport. The airport is also a key facility serving corporate activity associated with the high-tech and financial companies located in the Greater Nashua area including BAE and Fidelity Investments.

Major aviation businesses on the airport include Nashua Jet and Infinity

Aviation, both of which provide fuel services. Fixed Based Operator (FBO) services on the airfield include flight training, aircraft maintenance and hangar storage. In addition to the FBOs, there are several successful aircraft maintenance facilities including CR Helicopters, which provides helicopter training and maintenance services. Non-aviation businesses include the Midfield Café, a restaurant providing breakfast and lunch, and the Nashua Pilot Shop.

Primary Airports

Lebanon Municipal Airport (LEB)

The airport is located in the Dartmouth-Lake Sunapee region in the city of Lebanon in Grafton County. It is located along the NH/Vermont border where Interstate 89 crosses into the state of Vermont. The Airport is owned and operated by the city of Lebanon.

The airport is one of three commercial air service airports in the state and has air service provided by Cape Air, which operates to Boston and New York. The airport is one of the largest airports in the region and has an active general aviation base. The airport has one FBO, Granite Air Center, that provides a variety of aviation services including maintenance, flight training and aircraft hangar and tiedown. The other major tenant is Sharkey's Helicopter, which services and sells piston and turbine helicopters nationally and internationally. The airport has a 5,496-foot x 100-foot main runway.

A number of industries located in Lebanon use the airport, allowing executives and visitors to access their facilities quickly using charter aircraft or corporate aircraft instead of flying to and driving from other airports. Several companies also have corporate turboprop and jet aircraft located at the airport or use charter services provided by businesses on the airport.

The airport serves the city of Lebanon as a transportation gateway to the region, but also contributes as an economic generator for the city of Lebanon. The airport generates jobs through staff operating and managing the airport as well as jobs related to the many tenants located at the airport including airline, rental car companies, FBO and aviation service providers. Outside of on-airport jobs, activity generated by the airport supports job creation within the city of Lebanon through the use of local services such as hotels, rental cars and restaurants located in Lebanon.

Manchester-Boston Regional Airport (MHT)

The Manchester-Boston Regional Airport (MHT) is owned and operated by the city of Manchester. The airport is located in the Merrimack Valley region of the state in the County of Hillsborough and is one of three commercial service airports in NH. American, Delta, Southwest, and United Airlines currently serve the airport. Manchester-Boston Regional offers air travelers non-stop and direct service to leading U.S. Cities.

4th Largest

Once a final stop for military bombers and fighters before transiting the Atlantic to Europe during WWII, Manchester-Boston-Regional Airport now serves as New England's fourth-largest airport by passenger volume and third largest airport by cargo volume.

The airport has a 9,250-foot x 150-foot main runway. The airport also has Customs and Border Protection services available.

The airport has one FBO, Wiggins Airways, which provides a variety of aviation services to corporate and general aviation aircraft. Wiggins also provides cargo support services to Federal Express and UPS. The FBO also provide services, such as fueling and deicing to the airlines serving the airport. The FBO recently built an additional hangar capable of accommodating large corporate aircraft.

Portsmouth International Airport at Pease (PSM)

Portsmouth International Airport at Pease (PSM) is located in the Seacoast region of NH in the city of Portsmouth in Rockingham County. The Pease International Tradeport, a former U.S. Air Force base, opened for civilian use in 1991 and is owned and operated by the Pease Development Authority (PDA). The airport occupies approximately 900 acres of the 4000-acre Pease International Tradeport property. The airport has had scheduled commercial passenger service periodically over the years, and initiated new commercial air service in 2013 by Allegiant Air. The airport also has Customs and Border Protection services available.

The airport's terminal not only serves Allegiant, but also military charters bringing back military personnel from Europe and the Middle East. The airport is also home to the NH Air National Guard aerial tanker squadron serving the military fueling needs of the Northeast and overseas missions. The squadron of KC-135 Stratotankers will soon be converting to the new KC-46A tankers, a military version of the Boeing 767. The airport is known for the Pease Greeters, a community group of volunteers that welcomes military personnel as they arrive back in the United States.

The airport has a number of tenants who provide general aviation services at the airport including Port City Air, which is the FBO at the airport. The FBO offers flight training, aircraft maintenance, and hangar and tiedown storage. Port City Air also services Boeing 747 cargo freighters on technical stops to refuel or as required, clear U.S. customs. Plane Sense is the other major tenant at the airport. Plane Sense offers fractional shares in Pilatus PC-12 corporate turboprop aircraft as well as charter services with the PC-12 throughout the Northeast and along the East Coast. Their headquarters facility is comprised of offices and a large maintenance hangar that is located on the flight line of the airport.

3.2.2 PRIVATE FACILITIES NOT IN STATE SYSTEM

Outside of the twenty-five airports making up NH's system of airports, there are over 80 other small privately owned, private use airports registered with the Bureau of Aeronautics. These airports are comprised of the following types of facilities:

- **Private Airports (Private Use)** – Similar to public airports, private airports often have the same types of facilities to support basic flying; however, the airport is owned by a private entity and not available for public use. As a private facility these airports are not subject to federal oversight, nor are they eligible for federal assistance. One example is Brookline Airport in Brookline, NH, which has a paved 1,900-foot runway and has 15 based aircraft that are stored in a number of single and multi-aircraft hangars and T-hangars located on the airfield.

- **Private Airstrip (Private Use)** – Located primarily on personal property, these private airstrips are comprised of turf, gravel or paved runways. Aircraft are stored either in or under small shelters or in aircraft specific buildings. These strips are usually for day use only and have no lights for night use.

- **Heliports** – Many of the heliports in NH are privately owned and located on or near office buildings or on private residential property. They have turf or prepared surfaces and are used primarily during the day. As an example, JBI Helicopters, which provides helicopter services throughout New England, has a facility with several helipads located in Pembroke, NH.

  In addition to these types of facilities, many of the larger hospitals have certified trauma units. As part of this certification, the hospitals have helipads for emergency helicopters and are typically used by Dartmouth-Hitchcock Advanced Response Team helicopters. Dartmouth Hitchcock and Concord Hospital are two of the State's hospitals with emergency helicopter helipads.

- **Seaplane Bases** – NH has many lakes and large ponds that are capable of accommodating small single engine aircraft that are equipped with floats. A number of seaplane bases are located around the state, several of which are located on Lake Winnipesauke and include Loons Nest and Winter Harbor. Access from the lake to land is typically provided by a special use dock.

- **Fly-in Community** - Windsock Village in Ossipee, NH is a fly-in community that has a private 4,000-foot' turf runway. Residential homes are located on either side of the runway and many of them have small hangars, much like an automobile garages, to store their aircraft. There were about 24 aircraft located on the airfield in 2014.

3.2.3 REVIEW OF PREVIOUS SYSTEM PLAN

The 2003 NHSASP focused on the economic analysis of the system with the intent of preserving the existing system of airports and funding future needs of the system. Funding for the NHSASP was obtained through a Transportation Equity Act for the 21st Century (TEA-21) grant

Hospital Helipad

in order to conduct an economic analysis of the system of airports. The study also provided elements of a traditional system plan in order to identify the aviation funding needs necessary to move forward.

The 2003 NHSASP identified three fundamental objectives upon which the study was developed. Those objectives stated the following:

- Clearly identify the relationship between airports and economic development.
- Develop a program to increase investments by local and state agencies in airports.
- Identify the key constituencies to target the promotion of the economic value of airports to the State.

From these three objectives, goals for the study were identified and included the following:

- Identify the specific role of each airport in terms of economic development.
- Develop a system plan suited to meet the goals of airport users, the State's citizens, and the Bureau of Aeronautics.
- Develop strategies to preserve airports, and identify the investment required to maintain and enhance airports.
- Develop strategies to enhance statewide intermodal access.

Following a comprehensive inventory, a side-by-side analysis of the aviation system and the economic benefits of the aviation system were completed. Forecasts of aviation activity were developed and were based on current and anticipated aviation trends at that time. The data was then used in an economic model to develop an economic analysis defining the primary and secondary economic benefits generated by each of the airports and then aggregated to a state level economic impact. From this analysis, the findings were developed into a series of recommendations. Key recommendations included the following:

System Capacity

- The system of airports meet the current and future capacity needs of the state.
- Monitor adjacent states for any changes in state laws that would affect activity in NH, as well as changes at adjacent airports in the bordering states that could affect NH airports.
- Revise entry criteria for NH airports inclusion into the NPIAS program.
- Work to include Dean Memorial Airport (Haverhill) in the NPIAS program.
- Support and promote North Country airport projects to enhance access to this region.

Financial and Economic

- Partner with the congressional delegation to increase FAA funding for NH airports.
- Direct revenue from the aviation fuel tax from the General Fund to airport improvements.
- Identify innovative funding sources to fund airport development needs.
- Develop a comprehensive education program highlighting the business use of airports.
- Develop a program in collaboration with Department of Resources and Economic Development (DRED) to help market airports to reduce budget shortfalls through innovative development on the airport.

Bureau of Aeronautics

- Develop a program to preserve the existing system of airports, possibly through changes to current legislation.
- Develop a statewide aviation steering committee to review the system and to make recommendations as appropriate to manage and enhance the system of airports.

Intermodal Transportation

- Identify opportunities to provide alternate transportation at airport such as courtesy cars at general aviation airports.
- Evaluate the potential for shuttle services serving Manchester-Boston Regional Airport from the new park and ride facility at Exit 4 on Interstate 93.

Environmental Issues

- Develop general environmental guidelines to educate airports.

Airport Security

- Work with aviation and security organizations to monitor and implement security measures at the general aviation airports.

Several of the recommendations that were implemented and completed include:

- Inclusion of Dean Memorial Airport into the NPIAS airport.
- Support of projects at North Country Airports to enhance approaches at Mt. Washington Regional Airport and Berlin Regional Airport.
- Designation of NH as a Block Grant state for AIP funding and the BOA as the administrator of the federal grant program for the state.

3.3 INVENTORY PROCESS

The inventory is an important element of the NHSASP as it serves as the basis of information that all other analyses are developed. As such, an extensive and comprehensive data collection process was initiated to collect all of the relevant data for this study effort. Two types of data were collected from the airports: 1.) airport specific data such as airside and landside facilities, and 2.) economic data specific to the airports, tenants and airport users.

The inventory process involved the following steps:

- Collection of data from BOA files including grant summaries, Capital Improvement Programs and Airport Layout Plan data.
- Comprehensive Airport Inventory and Data survey to collect both qualitative as well as quantitative data through face-to-face interviews.
- The Airport Management Economic Impact Survey collected relevant economic data such as employment, payroll and other economic data for the Airport Economic Analysis.
- Airport Economic Tenant Survey collected economic data for key airport tenants.
- Airport User Surveys were placed at the FBOs to collect economic data of airport users that included items such as spending data and purpose of trip.

Outside of the BOA data, the Airport Inventory and Data Survey provided most of the data on the airports. The questionnaire was extensive and collected qualitative information such as airport facilities and activity, but also quantitative information, such as issues with the community, aviation outreach and community participation.

Visits and interviews were conducted at each of the NPIAS airports. BOA staff contacted and collected inventory for the Non-NPIAS airports. The visits provided an opportunity to understand the issues facing the airport and obtain an understanding of the diverse aviation activity occurring at each facility.

As part of the airport visits, information pertaining to the Airport Management Economic Impact Survey was collected. The economic data included payroll, staffing, capital improvements and operating expenses. The survey also identified key tenants to visit and obtain additional data for the economic analysis. Follow-on visits to the airport tenants were conducted to collect their economic data. A copy of the Airport Tenant Survey may also be found in **Appendix 3-A**. Finally, Airport Users Surveys were left with the FBOs to collect data about airport users. The survey asked for the purpose of the visit, places visited and money spent.

The data collection process was very successful and collected the necessary data for the system plan analysis as well as the economic analysis. A copy of each of the four surveys used during the inventory process is presented in **Appendix 3-A** of this report.

3.4 AIRPORT INVENTORY DATA

This section presents data collected for NH system airports via the inventory process previously described. Data for system airports is organized and presented in the following sections:

- General Airport Information
- Airside Facilities
- Landside Facilities and Services
- Airport Activity Data

3.4.1 GENERAL AIRPORT INFORMATION

General airport information from the survey is presented in **Table 3-1**, and includes the following:

- Airport Name: The official name of each facility.
- Airport Identifier: The three-character code assigned to each airport by the FAA.
- Associated City: The primary city served by each airport.
- NPIAS Status: The current classification of the airport in the NPIAS.

NH has 12 airports in the NPIAS. Manchester-Boston Regional is a Primary Airport, Lebanon Municipal is a Commercial Service Airport, and Boire Field is a Reliever Airport. The remaining nine airports are General Aviation Airports. As noted in **Table 3-1**, Jaffrey Airport-Silver Ranch, Parlin Field, and Plymouth Municipal are designated as General Aviation Airports by the NPIAS; however, these facilities are not officially part of the NPIAS system and are not funded by the AIP. These designations are a holdover from a previous period when the state was pursuing their inclusion into the NPIAS. The remaining 13 airports, including the three airports noted above, are privately owned/public-use airports that make up the remaining airports that comprise NH's system of airports.

3.4.2 AIRSIDE FACILITIES

This section presents and summarizes airside facility information collected for system airports. Airside facilities include runways, taxiways, associated visual and navigational aids (NAVAIDS), and the communication and weather reporting infrastructure utilized to support aircraft operations. This information for NH's system airports is described in the following sections, and presented in **Tables 3-2** and **3-3**:

- Runway Information
- Runway Lighting
- Taxiway Coverage
- Approach Type
- Visual and Navigational Aids (NAVAIDS), Weather Reporting, and Communications

Aircraft storage facilities, including hangars and apron are described and summarized together in Section 3.4.3, Landside Facilities.

Concord Municipal Airport

Table 3-1 – NHSASP - General Airport Information

AIRPORT NAME	AIRPORT IDENTIFIER	ASSOCIATED CITY	NHPIAS STATUS
Berlin Regional	BML	Berlin	General Aviation
Boire Field	ASH	Nashua	Reliever
Claremont Municipal	CNH	Claremont	General Aviation
Concord Municipal	CON	Concord	General Aviation
Dean Memorial	5B9	Haverhill	General Aviation
Dillant-Hopkins	EEN	Keene	General Aviation
Laconia Municipal	LCI	Laconia	General Aviation
Lebanon Municipal	LEB	Lebanon	Commercial Service
Manchester-Boston Regional	MHT	Manchester	Primary
Mt. Washington Regional	HIE	Whitefield	General Aviation
Portsmouth International at Pease	PSM	Portsmouth	General Aviation
Skyhaven	DAW	Rochester	General Aviation
Alton Bay	B18	Alton Bay	None
Errol	ERR	Errol	None
Franconia	1B5	Franconia	None
Gifford Field	4C4	Colebrook	None
Gorham	2G8	Gorham	None
Hampton Airfield	7B3	Hampton	None
Hawthorne-Feather Airpark	8B1	Hillsborough	None
Jaffrey Airport-Silver Ranch	AFN	Jaffrey	General Aviation[1/]
Moultonboro	5M3	Moultonborough	None
Newfound Valley	2N2	Bristol	None
Parlin Field	2B3	Newport	General Aviation[1/]
Plymouth Municipal	1P1	Plymouth	General Aviation[1/]
Twin Mountain	8B2	Twin Mountain	None

Source: McFarland Johnson, Inc.

Runway Information

Runways represent the most essential and primary factor for evaluating the utility and market area for an airport. The primary runway's length, surface type, and width are critical for determining which aircraft can safely operate at an airport, and therefore serve as one of the first infrastructure items considered in a system plan.

As shown in **Table 3-2**, eight of the system airports have a primary runway length greater than 5,000 feet. The longest runway in the system is at Portsmouth International, which boasts an 11,321-foot runway. For planning purposes, a runway length of 5,000 feet or greater is typically benchmarked as the minimum for airports to serve turbo-prop and jet aircraft most often in service by business/corporate operators.

The shortest paved runways at system airports are 3,000 feet or less and are found at Newfound Valley (1,990 feet), Dean Memorial (2,511

Table 3-2 – NHSASP – Primary Runway and Taxiway Facilities

AIRPORT NAME	Primary Runway Length	Primary Runway Width	Primary Runway Lighting	Taxiway Coverage	Best Approach
Berlin Regional	5,200	100	High	Turnaround/Stub	Non-Precision
Boire Field	6,000	100	High	Full	Precision
Claremont Municipal	3,098	100	Medium	Partial	Non-Precision
Concord Municipal	6,005	100	High	Full	Precision
Dean Memorial	2,511	58	Non-Std	Stub	Non-Precision
Dillant-Hopkins	6,201	100	High	Partial	Precision
Laconia Municipal	5,890	100	High	Full-DBL	Precision
Lebanon Municipal	5,496	100	Medium	Full	Precision
Manchester-Boston Regional	9,250	150	High	Full	Precision
Mt. Washington Regional	4,002	75	Medium	Partial	Non-Precision
Portsmouth International at Pease	11,321	150	High	Full	Precision
Skyhaven	4,200	75	Medium	Full	Non-Precision
Alton Bay	2,600	100	None	None	Visual
Errol	3,680	75	None	None	Visual
Franconia	2,305	150	None	Full	Visual
Gifford Field	2,466	75	None	Full	Visual
Gorham	2,667	70	None	None	Visual
Hampton Airfield	2,100	170	None	None	Visual
Hawthorne-Feather Airpark	3,260	75	Medium	Partial	Visual
Jaffrey Airport-Silver Ranch	2,982	134	Low	Partial	Non-Precision
Moultonboro	3,475	50	Non-Std.	Stub	Visual
Newfound Valley	1,990	40	None	None	Visual
Parlin Field	3,448	50	Non-Std.	Full	Visual
Plymouth Municipal	2,380	90	None	Full	Visual
Twin Mountain	2,660	60	Low	None	Visual

Source: McFarland Johnson, Inc., FAA 5010 Form

feet), Twin Mountain (2,660 feet), and Jaffrey Airport-Silver Ranch (2,982 feet). Five system airports offer secondary, or crosswind runways (not shown in T**able 3-2**). These airports are: Manchester-Boston Regional (7,650 feet), Lebanon Municipal (5,200 feet), Dillant-Hopkins (4,001 feet), Concord Municipal (3,200 feet) and Parlin Field (2,140 feet – turf surface). There are also five (5) system airports whose main runways are turf and include Franconia (2,305 feet) Gifford Field (2,466 feet), Gorham (2,667 feet), Hampton Airfield (2,100 feet) and Plymouth Municipal (2,380 feet). Unique to NH, Alton Bay Ice Runway/Seaplane Base is a seasonal airport with a 2,600 foot runway where the surface is ice.

In terms of primary runway widths, two system airports offer primary runways of 150 feet in width eight system airports have primary runways of 100 feet in width. Four airports have a primary runway is 75 feet wide. The remaining airports have runway widths that range from 40 feet to 70 feet. Crosswind runways described range in width from 50 to 150 feet.

Runway Lighting

Runway lighting provides the use of the airport at night or use during poor weather conditions. The types of runway lighting include High Intensity Runway Lighting (HIRL), Medium Intensity Runway Lighting (MIRL) and Low Intensity Runway Lights (LIRL). As shown in **Table 3-2**, seven airports have HIRLs, five airports have MIRLs, and two have LIRLs. Three airports have non-standard lighting; these lighting systems do not meet current FAA lighting design criteria. The remaining seven airports have no lighting.

Taxiway Coverage

Table 3-2 also presents the type of taxiway coverage for each system airport's primary runway. A full-length taxiway is a taxiway that spans the entire length of the primary runway. A partial-length taxiway spans only part of the length of its associated runway. Runways without a taxiway system may have a turnaround at one or both ends of the runway for aircraft to reverse direction and perform other operations off the runway. Additionally, stub taxiways are also shown for system airports without parallel taxiways. A stub taxiway is defined as one that connects a runway to a parallel taxiway or an adjacent apron area. An airport's taxiway "coverage" contributes to the runway's capacity for accommodating higher volumes of aircraft operations, such that aircraft have taxiway pavement available to perform off-runway operations prior to take-off and after landing. In this way, parallel taxiways offer greater coverage than turnarounds and stub taxiways.

As shown, eleven system airports offer a full parallel taxiway, with Laconia Municipal offering two full parallel taxiways to serve the primary runway. Five airports have a partial parallel taxiway, three airports have stub taxiways connecting the terminal apron with the runway, and the remaining airports have no taxiways, requiring aircraft to backtaxi to either depart or taxi to the terminal apron upon landing.

Approach Type

During periods of low visibility, pilots rely on NAVAIDS and instruments to operate aircraft to a point when a runway element is visually acquired. An instrument approach procedure is the means by which pilots perform such operations; however, not all airports offer an instrument approach. Therefore, operations at airports without an instrument approach have visual approaches only. An approach is referred to as precision (used during the most restrictive visibility conditions), non-precision, or circling approach (used under the least restrictive conditions). Precision approaches have both lateral and vertical guidance equipment, while non-precision offer lateral guidance only.

As presented in **Table 3-2**, seven of NH's system airports have precision approach procedures and six system airports have non-precision approaches. The remaining twelve airports have visual approaches with no instrument approach procedures. The primary approach systems in place for primary runways at system airports are Instrument Landing Systems (ILS) and non-precision approaches such as Area Navigation Global Positioning Systems (RNAV/GPS). For system planning purposes, the most important consideration for evaluating approach systems is the existence or lack of these systems - not the specific type of equipment installed.

Visual and Navigational Aids (NAVAIDS), Weather Reporting, and Communications

In addition to runway lighting and approach procedures at system airports, system planning considers other visual and NAVAIDS, and weather reporting and air traffic communications facilities that aid in safe operations for aircraft operators. **Table 3-3** lists the availability of Air Traffic Control Towers (ATCT), communications systems, approach lighting and vertical guidance systems, weather reporting equipment, and visual aids such as rotating beacons, wind indicators, and segmented circles.

ATCT/ATC Communications Systems

Table 3-3 displays the presence of ATCT facilities and air traffic control (ATC) radio systems at system airports. As shown, NH system airports with ATCT are Boire Field, Lebanon Municipal, Manchester-Boston Regional, and Portsmouth International. At airports without an ATCT, a radio frequency is provided for pilots using airports to communicate with one another. Operating procedures at airports without towers require the pilot to state their operational intentions, whether operating in the airport traffic pattern or ground movements on the airport runway and taxiway system. The remaining airports within the system have an ATC radio communication system.


Approach Lighting System

Approach Lighting and Vertical Guidance Systems

Approach Lighting Systems (ALS) are a configuration of sequenced signal lights that guide pilots on approach to the runway threshold. An ALS is typically installed to serve runways with an instrument approach procedure. Approach lights also provide additional visual guidance for nighttime approaches under Visual Flight Rules (VFR) or poor weather conditions during Instrument Flight Rules (IFR). **Table 3-3** shows that six system airports that offer an ALS.

Table 3-3 also shows that Vertical Glideslope Indicators (VGSI) are available at eleven system airports. VGSI equipment installations at system airports vary among Visual Approach Slope Indicators (VASI) and Precision Approach Path Indicators (PAPI).

Weather Reporting

Automated weather reporting systems are a great benefit to pilots. The most common types of weather reporting systems are Automated Weather Observing Systems (AWOS) and Automated Surface Observation Systems (ASOS). ASOS report wind, visibility, cloud height, temperature, dew point, pressure, and precipitation. There are several variations of AWOS, ranging from AWOS I to AWOS II, and AWOS III to AWOS III-P; however, for system planning purposes, the most important consideration for weather reporting systems is the existence or lack of this capability, not the specific type of equipment installed.

As shown in **Table 3-3**, ten system airports offer weather reporting systems. System airports without automated weather reporting systems are Claremont Municipal, Dean Memorial, and Portsmouth International.

Other Visual Aids

The NHSASP inventory process also collected and recorded information regarding the following visual aids at system airports:

- **Rotating Beacon:** A rotating beacon helps pilots locate the airport at night and during periods of low visibility. Fifteen airports have a rotating beacon, the remaining airports do not.
- **Wind Indicator:** A wind indicator provides wind direction information to pilots, and is often lighted for night operations. All but two system airports have wind indicators, seventeen of which are lighted.
- **Segmented Circle:** A segmented circle shows pilots information on the traffic pattern visually, without use of ATC communication. Six system airports have a segmented circle.

Table 3-3 – NHSASP – Navigational Aids and Weather Reporting Capability

AIRPORT NAME	ATCT / CTAF Comms	Approach Lighting / Visual Guidance	Weather Reporting	Rotating Beacon	Wind Indicator	Segmented Circle
Berlin Regional	No / Yes	- / Yes	ASOS	Yes	Lighted	Yes
Boire Field	Yes / Yes	Yes / Yes	AWSS	Yes	Lighted	No
Claremont Municipal	No / Yes	- / Yes	No	Yes	Lighted	Yes
Concord Municipal	No / Yes	Yes / Yes	ASOS	Yes	Lighted	No
Dean Memorial	No / Yes	- / -	No	No	Lighted	No
Dillant-Hopkins	No / Yes	Yes / Yes	AWOS-III	Yes	Lighted	Yes
Laconia Municipal	No / Yes	Yes / Yes	AWOS-III	Yes	Lighted	Yes
Lebanon Municipal	Yes / Yes	- / Yes	ASOS	Yes	Lighted	Yes
Manchester-Boston Regional	Yes / Yes	Yes / Yes	ASOS	Yes	Lighted	No
Mt. Washington Regional	No / Yes	- / Yes	ASOS	Yes	Lighted	No
Portsmouth International at Pease	Yes / Yes	Yes / Yes	ASOS	Yes	Lighted	No
Skyhaven	No / Yes	- / Yes	ASOS	Yes	Lighted	Yes
Alton Bay	No / Yes	- / -	No	No	None	No
Errol	No / Yes	- / -	No	No	Lighted	No
Franconia	No / Yes	- / -	No	No	Yes	No
Gifford Field	No / Yes	- / -	No	No	Yes	No
Gorham	No / Yes	- / -	No	No	None	No
Hampton Airfield	No / Yes	- / -	No	No	Lighted	No
Hawthorne-Feather Airpark	No / Yes	- / -	No	Yes	Yes	No
Jaffrey Airport-Silver Ranch	No / Yes	- / -	ASOS	Yes	Lighted	No
Moultonboro	No / Yes	- / -	No	Yes	Lighted	No
Newfound Valley	No / Yes	- / -	No	No	Yes	No
Parlin Field	No / Yes	- / -	No	Yes	Lighted	No
Plymouth Municipal	No / Yes	- / -	AWOS-III	No	Yes	No
Twin Mountain	No / Yes	- / -	No	No	Yes	No

Source: McFarland Johnson, Inc., FAA 5010 Form

3.4.3 LANDSIDE FACILITIES AND SERVICES

This section presents and summarizes landside facility information collected for system airports. Landside facilities include terminal buildings, other airport buildings, fuel farms, hangars, T-hangars, aprons, automobile parking facilities and services such as flight training, aircraft rental, snow removal, and courtesy cars. Landside facility information for NH's system airports is described in following sections, and presented in **Tables 3-4, 3-5**, and **3-6**:

- Fuel Services
- Aircraft Storage
- Operator and Passenger Services

Fuel Services

In terms of the airport "business", fueling at airports especially general aviation airports, often provides the most significant source of revenues. For system planning purposes, airports that offer aircraft fuels and fueling services to meet user demand is important. **Table 3-4** presents fueling services available at system airports.

As shown, seventeen of NH's system airports offer AvGas (100LL) fuel and eight of the system airports offer Jet A fuel. Motor vehicle fuel (MoGas) is offered at one airport; however, this is not a distinguishing characteristic for aviation system planning purposes.

The service aspect of fueling at system airports is represented by whether airports offer 24-hour or part-time availability. Part time availability of fuel at airports can include after hours or on-call fueling services made through prior arrangement at airports that are not attended 24-hours a day. **Table 3-4** presents hourly availability of fueling services and self-fueling availability at system airports. As shown, thirteen system airports offer 24-hour fueling and eleven system airports offer self-fueling services.

Aircraft Storage

Aircraft storage at airports consists primarily of hangars and tie-down/apron parking. Hangar types vary from airport to airport, but typically include T-hangars and conventional or "box" hangars. T-hangars are individual covered units constructed in multi-bay buildings, most suitable for storing single-engine piston aircraft and small twin-engine aircraft. Conventional hangars are free-standing, covered buildings for storing larger twin-engine and jet aircraft. **Table 3-5** lists the types of aircraft storage facilities available at each system airport.

Use of conventional hangars depends on aircraft size and ownership, such that some are constructed by private individuals or businesses for the storage of business/corporate aircraft, whereas others are used to store multiple aircraft as a "community" hangar. Community hangars can be owned by the sponsor, private operators, or on-airport businesses such as a FBO or SASO offering a range of services to airport users.

The third option for storing aircraft at an airport is on a parking apron utilizing tie-down spaces. Aircraft tie-down spaces are individual, outdoor locations where aircraft are tied-down and stored. Larger airports will maintain paved tie-down spaces, while smaller general aviation facilities often have grass tie-down areas.

Table 3-4 – NHSASP – Fueling Services Available

AIRPORT NAME	AvGas	Jet A	Fuel Farm Ownership	24-Hour/ PT/ After Hours/ On-Call	Self Fueling
Berlin Regional	Yes	Yes	Sponsor	24 Hours	AvGas
Boire Field	Yes		Sponsor	PT/On-Call	No
Claremont Municipal	Yes	Yes	Sponsor	24 Hours	No
Concord Municipal	Yes	No	Sponsor	PT/On-Call	No
Dean Memorial	Yes	Yes	Sponsor	On-Call	Yes
Dillant-Hopkins	Yes	No	Sponsor/FBO	24 Hours	Yes
Laconia Municipal	Yes	Yes	FBO	24 Hours	Yes
Lebanon Municipal	Yes	Yes	FBO	PT/On-Call	No
Manchester-Boston Regional	Yes	Yes	FBO	24 Hours	No
Mt. Washington Regional	Yes	Yes	Sponsor	24 Hours	Yes
Portsmouth International at Pease	Yes	No	FBO	24 Hours	No
Skyhaven	Yes	Yes	Sponsor	24 Hours	Yes
Alton Bay	No	No	-	-	-
Errol	No	No	-	-	-
Franconia	No	No	-	-	-
Gifford Field	No	No	-	-	-
Gorham	No	No	-	-	-
Hampton Airfield	Yes	No	-	24 Hours	Yes
Hawthorne-Feather Airpark	Yes	No	Sponsor	24 Hours	Yes
Jaffrey Airport-Silver Ranch	Yes	No	-	24 Hours	Yes
Moultonboro	Yes	No	-	24 Hours	Yes
Newfound Valley	No	No	-	-	-
Parlin Field	Yes	No	Sponsor	24 Hours	Yes
Plymouth Municipal	No	No	-	-	-
Twin Mountain	No	No	-	-	-

Source: McFarland Johnson, Inc., FAA 5010 Form

As shown, system airports offer the full range of aircraft storage options, from T-hangars to conventional hangars to tie-downs. As reported by each airport via survey, nine system airports have 261 T-hangar units and 101 conventional hangars. Ownership of these hangar facilities is split between sponsors and private interests, with 35 percent of T-hangars and 27 percent of conventional hangars owned by airport sponsors.

Table 3-5 – NHSASP – Aircraft Storage Available

Airport Name	T-Hangars Total	T-Hangars Ownership (Sponsor/ Private)	Conventional Hangars Total	Conventional Hangars Ownership (Sponsor/ Private)	Hangar Waiting List	Based / Trans Tie-Downs
Berlin Regional	2	0/2	13	0/13	No	1 / 2
Boire Field	0	-	1	1 / 0	No	0
Claremont Municipal	6	6 / 0	12	12 / 0	Yes	15 / 0
Concord Municipal	21	0 / 21	5	4 / 1	No	49 / 29
Dean Memorial	4	2 / 2	3	1 / 2	No	4 / 4
Dillant-Hopkins	52	32 / 20	12	5 / 7	No	54 / 0
Laconia Municipal	47	0 / 47	17	0 / 17	No	37 / 45
Lebanon Municipal	32	16 / 16	4	2 / 2	Yes	12 / 18
Manchester-Boston Regional	21	0 / 21	5	0 / 5	No	50 / 9
Mt. Washington Regional	0	-	14	0 / 14	Yes	0 / 12
Portsmouth International at Pease	30	0 / 30	8	0 / 8	No	28 / 0
Skyhaven	34	34 / 0	1	1 / 0	Yes	26 / 0
Alton Bay	0	-	0	-	No	- / -
Errol	0	2	1	1 / 0	No	- / -
Franconia	0	-	0	-	No	- / -
Gifford Field	0	-	0	-	No	- / -
Gorham	0	-	0	-	No	- / -
Hampton Airfield	0	-	0	-	No	- / -
Hawthorne-Feather Airpark	0	-	1	0/1	No	- / -
Jaffrey Airport-Silver Ranch	4	0/4	1	0/1	No	- / -
Moultonboro	6	0/6	1	0/1	No	- / -
Newfound Valley	0	-	0	-	No	- / -
Parlin Field	2	0/2	3	1/2	Yes	6/2
Plymouth Municipal	0	-	0	-	No	- / -
Twin Mountain	0	-	0	-	No	- / -

Source: McFarland Johnson, Inc., FAA 5010 Form

Completed surveys indicated that system airports also have 395 tie-down spaces, of which 276 (approximately 70 percent) are utilized for based aircraft. The survey also included space for reporting data pertaining to hangar waiting lists. As indicated in **Table 3-5**, four system airports maintain waiting lists for existing or current hangar storage at the time of the survey.

General Aviation Services

Airports offer a range of services to operators and passengers, whether they are managed by the airport sponsor, FBOs, or other on-airport service providers. **Table 3-6** presents a snapshot of services offered at each system airport. The following summarizes services reported in the airport surveys:

- **Terminal Building:** Terminal facilities can be provided by either the airport sponsor or an FBO. Ten system airports have sponsor-owned terminal buildings; Boire Field and Dean Memorial Airports do not have a terminal facility.
- **Fixed Base Operator:** FBO's provide critical services for operators and their passengers, and oftentimes serve as the "face" of an airport to these two groups of primary users. As indicated in **Table 3-6**, fourteen system airports have FBOs. Boire Field, Laconia Municipal, and Portsmouth International each reported two FBOs.
- **Catering:** Catering services refers to the availability of on-site meal services. On-site catering includes services offered by on-airport restaurants and local restaurants and/or catering service companies that are known to offer catering to their local airport. Five system airports offer catering services.
- **On-Site Rental Car:** On-site rental car services are important for passengers arriving to an airport, providing easy transition from air to ground transportation and transfer to local destinations, whether for business or recreational purposes. Six system airports offer on-site rental car outlets.
- **Courtesy Car:** A courtesy car is one that is maintained on-airport by the sponsor, FBO, or other service provider, which is offered to aircraft crews and operators free of charge. Seven system airports offer a courtesy car for these purposes.
- **Based Flight Instruction:** The existence of based flight instruction refers to a flight school that is established and located at an airport, as opposed to individual flight instructors that offer instruction services on a more limited basis. Nine system airports reported based flight instruction availability at their airport.
- **Airframe Repairs:** Airframe repair services at airports can include both minor and major repairs by technicians certified to repair single-engine piston, multi-engine, and jet engine aircraft. As shown, eleven system airports offer some level of airframe repairs, with minor repairs available at Berlin Regional, Claremont Municipal, and Skyhaven. Major airframe repairs are offered at eight airports. Dean Memorial

Table 3-6 – NHSASP – Operator and Passenger Services Available

AIRPORT NAME	Terminal Building	FBO	Catering	On-Site Car Rental	Courtesy Car	Based Flight Ins.	Airframe Repairs[1]	Powerplant Repairs[1]
Berlin Regional	Yes	Yes	No	No	No	Yes	Min	Min
Boire Field	No	Yes/Two	No	No	Yes	Yes	Yes	Yes
Claremont Municipal	Yes	Yes	No	No	No	No	Min	Min
Concord Municipal	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Dean Memorial	No	No	No	No	No	No	No	No
Dillant-Hopkins	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Laconia Municipal	Yes	Yes/Two	Yes	Yes	Yes	Yes	Yes	Yes
Lebanon Municipal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manchester-Boston Regional	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mt. Washington Regional	Yes	Yes	No	No	No	Yes	Yes	Yes
Portsmouth International at Pease	Yes	Yes/Two	Yes	Yes	Yes	No	Yes	Yes
Skyhaven	Yes	Yes	No	No	No	Yes	Min	Min
Alton Bay	No	No	No	No	-	-	No	No
Errol	No	No	No	No	-	-	No	No
Franconia	Yes	No	No	No	No	Yes	No	No
Gifford Field	No	No	No	No	-	-	No	No
Gorham	No	No	No	No	-	-	No	No
Hampton Airfield	Yes	Yes	No	No	-	Yes	Yes	Yes
Hawthorne-Feather Airpark	No	No	No	No	-	-	No	No
Jaffrey Airport-Silver Ranch	Yes	No	No	No	-	Yes	Yes	Yes
Moultonboro	Yes	Yes	No	No	-	-	Yes	Yes
Newfound Valley	No	No	No	No	-	-	No	No
Parlin Field	Yes	Yes	No	No	No	No	Yes	Yes
Plymouth Municipal	Yes	No	No	No	-	-	No	No
Twin Mountain	Yes	No	No	No	-	-	No	No

Source: McFarland Johnson, Inc., FAA 5010 Form
1/Note: Entry for Airframe and Powerplant repairs indicates "Yes" for Major and Minor Repair Services and "Min" for Minor Repair Services only.

is the only system airport that does not offer airframe repairs.

- **Powerplant Repairs:** Powerplant repair services at airports can include both minor and major repairs by technicians certified to repair single-engine piston, multi-engine, and jet engine aircraft. The same breakdown of system airports offering airframe repairs noted above applies to powerplant repairs.

- **Avionics Repairs:** Avionics repair services refers to whether radio, navigation instrument, and other electronic gear repairs are available at the airport. **Table 3-6** shows that five system airports offer avionics repairs.

- **Aircraft Sales:** Aircraft sales refer to businesses located on-airport that sell aircraft, but does not include aircraft sold by private

Table 3-6 – NHSASP – Operator and Passenger Services Available Con't

AIRPORT NAME	Avionics Repair	Aircraft Sales	Snow Removal	Deicing	Oxygen	Lavatory	Ground Transport	Hotels - 3 Miles	Dining - 3 Miles
Berlin Regional	No	No	Yes	No	No	No	Yes	2	2
Boire Field	Yes	No	Yes	Yes	Yes	No	Yes	4	10+
Claremont Municipal	No	No	Yes	No	No	No	No	3	20+
Concord Municipal	Yes	No	Yes	No	No	No	Yes	6	10+
Dean Memorial	No	No	Yes	No	No	No	No	No	No
Dillant-Hopkins	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Laconia Municipal	No	Yes	Yes	No	No	Yes	No	Yes	2
Lebanon Municipal	No	Yes	Yes	Yes	Yes	Yes	Yes	8	60+
Manchester-Boston Regional	Yes	No	Yes	Yes	Yes	Yes	Yes	4	6+
Mt. Washington Regional	No	No	Yes	No	No	No	Yes	4	5
Portsmouth International at Pease	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	50
Skyhaven	No	No	Yes	No	No	No	Yes	Yes	Yes
Alton Bay	No	No	Yes	No	No	No	Yes	Yes	Yes
Errol	No	No	Yes	No	No	No	Yes	Yes	Yes
Franconia	No	No	No	No	No	No	No	Yes	Yes
Gifford Field	No	No	Yes	No	No	No	Yes	Yes	Yes
Gorham	No	No	Yes	No	No	No	Yes	Yes	Yes
Hampton Airfield	No	Yes	Yes	No	No	No	Yes	Yes	Yes
Hawthorne-Feather Airpark	No	No	Yes	No	No	No	Yes	Yes	Yes
Jaffrey Airport-Silver Ranch	No	No	Yes	No	No	No	Yes	Yes	Yes
Moultonboro	No	No	Yes	No	No	No	Yes	Yes	Yes
Newfound Valley	No	No	Yes	No	No	No	Yes	Yes	Yes
Parlin Field	Yes	No	Yes	No	No	No	Yes	Yes	Yes
Plymouth Municipal	No	No	Yes	No	No	No	Yes	Yes	Yes
Twin Mountain	No	No	Yes	No	No	No	Yes	Yes	Yes

Source: McFarland Johnson, Inc., FAA 5010 Form

individuals. Four system airports have businesses that are engaged in aircraft sales.

- **Snow Removal:** The survey inquired about the existence of snow removal equipment on each system airport. All system airports offer some level of snow removal.

- **Deicing:** Deicing services include primarily chemical and radiant (an available heated hangar) deicing services. As shown, five system airports offer deicing services.

- **Oxygen:** This indicates whether oxygen, either in bulk or for individual use, is available for purchase at system airports. As indicated in **Table 3-6**, five system airports offer oxygen for operators.

- **Lavatory:** Lavatory services provide sanitary disposal of aircraft lavatory holding tanks. Four system airports provide lavatory services for operators.

- **Ground Transportation:** Ground transportation at airports includes the availability of bus service, taxi service, intermodal connectivity with local transit lines, as well as private limousine or executive coach providers. Nine system airports reported the availability of ground transportation for operators and passengers.

- **Hotels within Three Miles:** For operators and passengers alike, the availability of hotels or other lodging options in close proximity to an airport is important. The airport survey inquired as to the number of hotels within a three-mile radius to each system airport. **Table 3-6** shows that all system airports aside from Dean Memorial offer varying levels of lodging options within three miles.

- **Restaurants within Three Miles:** As with hotels, the availability of restaurants in close proximity to an airport is important for operators and passengers. The airport survey inquired as to the number of restaurants within a three-mile radius to each system airport. **Table 3-6** shows that all system airports aside from Dean Memorial and Laconia Municipal offer numerous dining options within three miles.

3.4.4 AIRPORT ACTIVITY DATA

This section presents and summarizes airport activity information collected for system airports. Activity at an airport can be useful in evaluating an airport's role within NH's system, as activity levels are a strong indicator of market demand, the justification for expanded facilities. Activity at an airport is measured in terms of based aircraft and operations. Both aircraft type and operations will be one factor evaluated for the system's current performance, as well as to classify the system's airports' roles for the future.

Table 3-7 displays the most recent count available for each system airport's total number of based aircraft by type. As noted, counts were provided by airport management when available, or FAA 5010 data was utilized.

Operations at general aviation airports are often difficult to account for accurately. This is because there is no means of tabulating operations at most general aviation airports. Even at facilities with ATCT, operations counts are only recorded during operating hours, after which operations are estimated.

Table 3-8 provides information regarding the most recent general aviation activity level estimated at each airport, and the type of operations (one landing and one takeoff equals two operations). These operation estimates are from two sources: estimates from airport management and FAA 5010 data. FAA 5010 data was utilized where no estimate was provided by airport management.

General Aviation Activity Overview

The diversity in the general aviation activity in NH is as varied as the general aviation industry itself. Airports across the state support all types of recreational, leisure, and business aviation on a year-round basis. At the time of the previous system plan in 2003, the general aviation industry was considered relatively stable. While weakened by the effects of September 11, 2001, the effects were not as far reaching as it was for the airlines and commercial aviation.

General aviation activity however was greatly impacted by the sharp increased in the price of oil in 2008 that nearly tripled the cost of aviation fuel (Both 100LL and Jet-A). This fuel spike occurred just prior to the economic recession in 2008-2009. All segments of general aviation activity were affected by the fuel costs and weak economy with reductions in both recreational and corporate activity occurring on the national level.

The general aviation industry, both recreational and corporate, has stabilized in recent years. A detailed discussion of the trends affecting the growth of general aviation can be found in *Chapter 5, Aviation Forecast*.

Table 3-7 – NHSASP – Based Aircraft

AIRPORT NAME	Single	Multi	Jet	Helo	Other	Military	Total
Berlin Regional	22	0	0	0	0	0	22
Boire Field	182	23	16	9	4	0	234
Claremont Municipal	17	3	0	0	1	0	21
Concord Municipal	70	5	0	2	3	10	90
Dean Memorial	12	0	0	0	0	0	12
Dillant-Hopkins	69	8	2	1	0	0	80
Laconia Municipal	161	29	3	8	0	0	161
Lebanon Municipal	39	8	0	13	1	0	61
Manchester-Boston Regional	49	5	8	2	0	0	64
Mt. Washington Regional	22	4	0	1	2	0	29
Portsmouth International at Pease	89	13	12	3	0	8	114
Skyhaven	59	2	0	2	13	0	76
Alton Bay	0	0	0	0	0	0	0
Errol	2	0	0	0	0	0	2
Franconia	1	0	0	0	11	0	12
Gifford Field	7	0	0	0	0	0	7
Gorham	3	0	0	0	0	0	3
Hampton Airfield	75	0	0	3	7	0	82
Hawthorne-Feather Airpark	9	0	0	0	1	0	10
Jaffrey Airport-Silver Ranch	0	0	0	0	0	0	0

Table 3-7 – NHSASP – Based Aircraft Con't

Moultonboro	15	2	0	0	1	0	18
Newfound Valley	7	0	0	0	0	0	7
Parlin Field	25	0	0	1	2	0	28
Plymouth Municipal	0	0	0	0	4	0	0
Twin Mountain	1	0	0	0	0	0	1

Source: McFarland Johnson, Inc., FAA 5010 Form

Table 3-8 – NHSASP – Operations

AIRPORT NAME	Air Carrier	Air Taxi	GA Local	GA Itinerant	Military	Total Operations	Total GA Operations
Berlin Regional	0	100	8,000	4,000	100	12,200	12,000
Boire Field	0	318	26,624	26,286	26	55,764	52,910
Claremont Municipal	0	0	5,900	4,600	0	10,500	10,500
Concord Municipal	0	3,000	20,000	30,000	7,000	60,000	50,000
Dean Memorial	0	0	1,040	260	0	1300	1,300
Dillant-Hopkins	0	7,204	31,053	7,455	3,314	49,027	38,508
Laconia Municipal	0	427	39,483	3,710	105	43,725	43,193
Lebanon Municipal	0	8,347	13,665	12,187	334	34,533	25,852
Manchester-Boston Regional	31,457	19,711	2,319	10,332	136	63,955	12,651
Mt. Washington Regional	0	20	3,000	4,000	10	7,030	7,000
Portsmouth International at Pease	617	5,956	19,699	2,344	7,712	36,329	22,043
Skyhaven	0	0	12,000	5,000	0	17,000	17,000
Alton Bay	0	0	0	600	0	600	600
Errol	0	25	300	300	10	635	635
Franconia	0	0	4,000	200	0	4,200	4,200
Gifford Field	0	0	350	250	0	600	600
Gorham	0	0	500	200	30	730	730
Hampton Airfield	0	0	30,000	7,500	10	37,510	37,510
Hawthorne-Feather Airpark	0	0	1,500	1,500	0	3,000	3,000
Jaffrey Airport-Silver Ranch	0	900	1,400	4,900	100	7,300	7,300
Moultonboro	0	100	1,500	3,000	100	4,700	4,700
Newfound Valley	0	0	1,400	100	10	1,510	1,510
Parlin Field	0	50	1,400	1,600	0	3,050	3,050
Plymouth Municipal	0	0	2,000	1,000	30	3,030	3,030
Twin Mountain	0	0	100	500	0	600	600

Source: McFarland Johnson, Inc., FAA 5010 Form

3.5 COMMERCIAL SERVICE OVERVIEW

In 2003, the commercial aviation industry was rebounding from the effects of September 11, 2001 and the economy was relatively strong. Also at this time, the regional competitive market consisted of no major low fare airline presence at Logan International, whereas Southwest Airlines offered nearly 30 flights at their peak at Manchester-Boston Regional Airport. Since that time low fare airlines like jetBlue and Southwest Airlines have added over 100 daily flights at Boston Logan.

In addition to the changes in the airport competitive environment, the airline competitive environment has also changed tremendously since 2003. Airlines have encountered increasing costs both for crews and especially fuel costs for their operations. To counter the increased operational costs, the entire industry has undergone a round of consolidation that has cut the number of major airlines operating in the US by half. Major airlines like America West, Continental, Northwest, Air Tran, and US Airways, have all merged with, or have been acquired by other airlines. With this consolidation, the airlines have also scaled down hub locations as an effort to reduce capacity and increase fares to offset higher costs. These capacity cuts affected airports of all sizes across the country.

Manchester-Boston Regional Airport

Manchester-Boston Regional Airport

At the time of the previous system plan, Manchester-Boston Regional was experiencing tremendous growth as a result of congestion at Boston's Logan International Airport and the traffic associated with the "Big Dig" in Boston. As the construction projects completed and low fare airlines expanded in Boston, regional passenger booking behavior changed. The result of the changes in the airport and airline competitive environments has resulted in a reduction in passenger traffic at Manchester-Boston Regional that is down near 50 percent from peak levels. As airlines merged and reduced capacity, airline hubs in places like Pittsburgh, Cincinnati, and Cleveland, that each had service to/from Manchester at one time, have all been eliminated as connecting airports.

Today, the airport is served by American Airlines (formerly US Airways), Delta Air Lines, Southwest Airlines and United Airlines. Many of these flights are operated by regional affiliates. Key non-stop destinations include Atlanta, Baltimore, Charlotte, Chicago, Detroit, New York, Orlando, Tampa and Washington, DC. These airports provide one-stop connections to hundreds of destinations throughout the country and around the world.

While historical trends paint an unfavorable picture, the regional airport environment with it's now level playing field has stabilized. Passenger traffic is not expected to return to levels near the previous peak in the next few years; however, a more steady and traditional growth pattern is anticipated. A more detailed discussion of the market dynamics for passenger service at the Manchester-Boston Regional airport can be found in their recent master plan update.

In addition to scheduled passenger service, Manchester-Boston accommodates a robust amount of air cargo activity ranking number 6 in the Northeast in terms of total air cargo landed weight in 2012. Both UPS and FedEx operate several flights per day on large aircraft such as the Airbus A300-600F and McDonnell Douglas MD-11. These air cargo flights are also supported by feeder activity from Wiggins Airways a NH-based airline that flies a fleet of Cessna 208 Caravans throughout the Northeast to support both UPS and FedEx.

Portsmouth International Airport at Pease

Scheduled passenger service resumed at Portsmouth International in the Fall of 2013 with service to Florida on Allegiant Airlines. Portsmouth International has had scheduled service intermittently in the past on airlines including Allegiant, Skybus (defunct), and Pan Am (defunct). Allegiant Airline service consists of less than daily service on mainline sized aircraft such as the MD80 and Airbus 320 to Florida. As the service grows, additional destinations and weekly frequencies are added. While this type of service adds tens of thousands of passengers to the airport, this type of service does not connect the local area to the national air transportation network of major airlines.

Lebanon Municipal Airport

Commercial Air Service at the Lebanon Municipal Airport is provided in conjunction with the Essential Air Service (EAS) Program which subsidizes service to rural communities that lack access to otherwise affordable air service. Cape Air operates a nine seat Cessna 402 with service to Boston Logan and White Plains, NY. The service to White Plains includes complementary ground transportation to Manhattan. Due to the limited size of the aircraft operated by Cape Air, the airport is not required to satisfy the same FAR Part 139 certification requirements of other commercial service airports that have service on aircraft larger than nine seats. Lebanon has served over 10,000 enplanements in recent years classifying the airport as a Primary airport by the FAA.

3.6 SUMMARY

The data in this inventory represents the basis for the evaluation to measure the effectiveness of the airports within the State. The next chapter, *Chapter 4, Current Statewide Airport System Performance,* establishes the facility and service objectives for the recommended features for the different types of airports. The data presented in this inventory chapter will be measured against the established system parameters.

APPENDIX 3-A

Airport Inventory & Data Survey

NH State Airport System Plan

NHDOT, Bureau of Aeronautics requests your participation in this airport inventory and data survey. This information will be used as the basis for developing the NH State Airport System Plan, which is now underway. It will be personally collected from you by a member of the consultant team who will be calling to schedule a visit to your facility.

Prior to that visit, please complete/update this form to the best of your ability – but DO NOT RETURN. During the visit any unanswered questions will be answered and the survey will be collected.

Note that all study airports will be visited in early 2014. Meanwhile, if you have questions about this form or the NH State Airport System Plan, please contact Jorge Panteli of McFarland-Johnson, Inc. (jpanteli@mjinc.com; 603-225-0576.
Your attention and time is appreciated! Thank you!

3-letter FAA ID:		Airport Name:	

SURVEY COMPLETED BY	
Organization Name:	
Name:	Title/Position:
Telephone:	Mobile Phone:
Fax:	Email:

GENERAL AIRPORT INFORMATION	
General Data (in addition to Airport 5010 data)	
Airport Ownership (Name)	
Airport Ownership/Use	☐ Public/Public ☐ Private/Public ☐ Private/Private
Airport Management Status (check all that apply)	☐ Full-Time ☐ Part-Time ☐ Volunteer ☐ Municipal Dept. Staff ☐ FBO Staff ☐ Other:
Airport Manager Name	
Airport Manager Email	
Airport Manager Telephone	
Airport Mailing Address	
Airport Fax	
Airport Website URL	
Current FAA-designated Airport Reference Code (ARC):	
Part 139 certificated	☐ Yes ☐ No Part 139 Class: ☐ I ☐ II ☐ III ☐ IV
Airport Hours Attended	☐ Full-Time (24 hrs) ☐ Part-Time - Indicate hours:

Airport Inventory & Data Survey

General Data *(continued)*	
Unicom or CTAF Frequency	Unicom CTAF ___ ___ ___ . ___ ___
Air Traffic Control Tower (ATCT)	☐ Yes ☐ No FAA or Contract Tower: ☐ FAA ☐ Contract ☐ Other
ATCT Operating Hours	Hours:

AIRSIDE FACILITIES

RUNWAY/TAXIWAY

Item	Primary	Secondary	Other
Orientation (Runway ID)			
Length x Width (feet)			
Runway Design Code (RDC)			
Taxiway Type (associated with Runway) (Full Parallel, Partial Parallel, Turnaround, Stub)			
Taxiway Width			
Displaced Threshold (Distance in feet)			

If YES, what is the reason for the Displaced Threshold(s):

Are Declared Distances in use on the primary runway?	☐ Yes ☐ No

If YES, what is the reason for the Declared Distances:

Is the primary runway in compliance with Runway Safety Area (RSA) standards?	☐ Yes ☐ No

If NO, which ends are in noncompliance? Why?

Notes:

Considering the current critical design aircraft and approach minima for the Airport's primary runway, are FAA Airport Design separation standards being met for the following?		**Existing Separation Distance (feet)**
RW Centerline to Parallel TW Centerline	☐ Yes ☐ No ☐ Unknown	
RW Centerline to Aircraft Parking Area (Estimate if Unknown)	☐ Yes ☐ No ☐ Unknown	
Taxiway/Taxilane Centerline to Fixed or Moveable Object (Estimate if Unknown)	☐ Yes ☐ No ☐ Unknown	

Notes:

Airport Inventory & Data Survey

NH STATE AIRPORT SYSTEM PLAN

ALP MODIFICATIONS TO FAA STANDARDS	
How many modifications to FAA Standards are shown on the Airport's ALP?	# Mods
Please explain:	

AIRFIELD LIGHTING/NAVAIDS/WEATHER INSTRUMENTATION			
RUNWAY/TAXIWAY			
Item	**Primary**	**Secondary**	**Other**
Runway Lighting[1] (HIGH/MED/LOW)			
Taxiway Lighting (MED/LOW/REFL)			
Visual Glide Slope Indicator (PAPI/VASI/ Other) (also indicate RW approach end)			
Runway End Identifier Lights (REILs) (indicate RW approach end)			
Approach Lighting System (MALS, MALSR, MALSF, ALSF)			
Rotating Beacon	☐ Yes ☐ No	Operating Schedule:	
Wind Indicator	☐ Yes ☐ No	Lighted? ☐ Yes ☐ No	
Segmented Circle	☐ Yes ☐ No		
Weather Reporting Equipment	☐ Yes ☐ No	Which Type?	
Other Facilities:			
Notes:			

[1] Please note if lighting is non-standard. Also indicate if Pilot Controlled Lighting (PCL)

BEST INSTRUMENT APPROACH		
Best Approach Type[2]	**Best Minimums**	**Runway End**
Does the airport have plans to improve its instrument approaches? (please explain):		

[2] Classify approaches as: (P) precision; (APV) approach with vertical guidance; (NP) non-precision; (C) circling; and, (v) visual

Airport Inventory & Data Survey

AIRPORT BASED AIRCRAFT (Enter airport manager's estimate if 5010 data is considered inaccurate)							
Year	**Single**	**Multi**	**Jet**	**Helo**	**Other**	**Mil**	**Total**
2012 (5010 data)							
2012 (airport data)							
Notes:							

AIRPORT OPERATIONS (Enter airport manager's estimate if 5010 data is considered inaccurate)						
Year	**Air Carrier**	**Air Taxi**	**GA (Local)**	**GA (Itinerant)**	**Military**	**Total**
2012 (5010 data)						
2012 (airport data)						
Does the Airport have air freight totals and forecasts available for use?					☐ Yes ☐ No	
Notes:						

LANDSIDE FACILITIES				
AIRCRAFT HANGARS (Please Comment on Seasonality in Notes Sections)				
Hangar Types	**Total Number (by Hangar Owner)**	**% Occupied (estimate)**	**Total Square Footage**	**Largest Aircraft Accommodated**
T-Hangars	Airport _____ Private _____			
Community	Airport _____ Private _____			
Portables/Other	Airport _____ Private _____			
Transient Hangars	Airport _____ Private _____			
TOTALS:	**Airport _____ Private _____**	**N/A**		**N/A**
Waiting List for Existing Hangars	☐ Yes ☐ No	# of A/C on list:	% Large A/C*:	
Waiting List to Build Hangar	☐ Yes ☐ No	# of A/C on list:	% Large A/C*:	
Notes: * Large aircraft are defined as any aircraft with a maximum certified take –off weight of 12,500 pounds or more.				

AIRPORT APRONS (Please Comment on Seasonality in Notes Sections)		
How many square yards of apron space does the airport have? (estimate)		
Aircraft Tie-Downs	**Total Number**	**Number Occupied**
How many tie-downs does the Airport have for based aircraft?		

LANDSIDE FACILITIES *(continued)*		
AIRPORT APRONS *(continued)*		
How many tie-downs does the Airport have for transient aircraft?		
TOTALS:		
Waiting List for Tie-Downs	☐ Yes ☐ No	# of A/C on list:
Notes:		

TERMINAL BUILDING	
Does the Airport have a terminal building?	☐ Yes ☐ No
Terminal Building Owner (if different than Airport Owner)	
Date(s) Constructed/Rehabilitated/Expanded?	
Approximate total square footage?	
For what purpose is the terminal building used? ☐ General Aviation ☐ Commercial Service ☐ Scheduled Air Charter ☐ Other:	
What is the general condition/appearance?	
Who are the tenants of the terminal building (e.g. FBO, Airport administration, flight school, etc.)?	
Does the terminal building have:	
Public Access Restrooms & Courtesy Telephone?	☐ Yes ☐ No
Restaurant?	☐ Yes ☐ No
Food/Beverage/Vending Machines?	☐ Yes ☐ No
Pilot Lounge?	☐ Yes ☐ No
Conference Room?	☐ Yes ☐ No
Flight Planning Room?	☐ Yes ☐ No
WiFi?	☐ Yes ☐ No
Notes:	

AIRCRAFT RESCUE & FIRE FIGHTING CAPABILITY	
Does the Airport have rescue and fire fighting capability and a dedicated building?	☐ Yes ☐ No ☐ Building
If YES, what is the estimated square footage of the building:	Square Footage:
Does the Airport have a mutual aid agreement?	☐ Yes ☐ No

LANDSIDE FACILITIES *(continued)*	
AIRFIELD MAINTENANCE/SNOW REMOVAL EQUIPMENT/OPERATIONS BUILDINGS	
Does the Airport have an Airfield Maintenance building?	☐ Yes ☐ No ☐ Building
If YES, what is the estimated square footage of the building:	Square Footage:
Does the Airport have Snow Removal Equipment (SRE) and a building?	☐ Yes ☐ No
If YES, what is the estimated square footage of the building:	Square Footage:
If YES, how many vehicles do you have and what types:	# Vehicles: Vehicle Types:
Does the Airport have a dedicated Operations building?	☐ Yes ☐ No
If YES, what is the estimated square footage of the building:	Square Footage:
OTHER BUILDINGS	
Does the Airport have other aviation-related buildings?	☐ Yes ☐ No
If YES, what are they and what is their estimated square footage (if more than two, note on reverse side): Building 1 Building 2	Square Footage: Square Footage:
Are there unique or historic buildings/structures on the airport?	☐ Yes ☐ No
If YES, what are they and what is their estimated square footage:	Square Footage:
AUTOMOBILE PARKING	
How much automobile parking does the Airport have for General Aviation?	# spaces OR sq.ft.
How much automobile parking does the Airport have for Passengers?	# spaces OR sq.ft.
Does the Airport have sufficient automobile parking for all operational functions?	☐ Yes ☐ No
If NO, please explain:	
AIRPORT ACCESS	
Is Airport access signage adequate?	☐ Yes ☐ No
Is the Airport's main entrance road adequate?	☐ Yes ☐ No
Is the public road leading to the Airport's main entrance road adequate?	☐ Yes ☐ No
If NO to any question, describe inadequacy:	

Airport Inventory & Data Survey

LANDSIDE FACILITIES *(continued)*	
AIRPORT SECURITY/MISCELLANEOUS	
Does the Airport have a Part 139 Security Plan?	☐ Yes ☐ No
Is the Airport equipped with an access control system to operating areas?	☐ Yes ☐ No
Does the control system use an ID badging system and/or card readers?	☐ Yes ☐ No
Is the Airport subject to TSA 1542 security requirements?	☐ Yes ☐ No
Is the Airport equipped with CCTV?	☐ Yes ☐ No
Is there a law enforcement agency on-site? If YES, name of agency.	
Does the Airport have perimeter fencing?	☐ Complete ☐ Partial ☐ None
Does the Airport have an interior perimeter road?	☐ Complete ☐ Partial ☐ None
Notes:	

AIRPORT FUELING INFRASTRUCTURE & SERVICES		
What types of fuel does the Airport provide?	☐ AvGas ☐ JetA ☐ Other:	
Who owns, operates, and controls the fuel farm(s)?	☐ Airport ☐ FBO(s) ☐ Other:	
	AvGas	**JetA**
What were the estimated fuel sales and volume on the Airport in 2012?	___________ gallons $ _____________	___________ gallons $ _____________
Describe the Airport's aviation fuel tank storage capacity: Total Number of Gallons in Fuel Tanks Total Number of Airport-Owned Fuel Tanks Total Number of Privately-Owned Fuel Tanks Total Number of Fuel Tanks	_______________ _______________ _______________ _______________	_______________ _______________ _______________ _______________
Does the Airport offer self fueling?	☐ Yes ☐ No	
When are fueling services offered?	☐ 24 Hours ☐ Part-Time ☐ After Hours ☐ Unattended/On-Call	
Does the Airport utilize fuel trucks?	☐ Yes ☐ No	
Does the Airport have secondary containment for fuel truck parking?	☐ Yes ☐ No	
Notes:		

Airport Inventory & Data Survey

AIRPORT SERVICE & ACCOMODATIONS	
Fixed Base Operator (FBO)	☐ Yes ☐ No ☐ Multiple # FBOs:
Catering Services	☐ Yes ☐ No
On-Site Car Rental	☐ Yes ☐ No
Courtesy Vehicle/Crew Car	☐ Yes ☐ No
Based Flight Instruction	☐ Yes ☐ No ☐ Full-Time ☐ Part-Time
Airframe Repairs	☐ Turbine ☐ Piston ☐ None
Power Plant Repairs	☐ Turbine ☐ Piston ☐ None
Avionics Repair	☐ Yes ☐ No
FAA Part 145 Repair Station	☐ Yes ☐ No
Aircraft Sales	☐ Yes ☐ No
Snow Removal Operations	☐ Yes ☐ No
Aircraft Deicing	☐ Chemical ☐ Radiant/Hangar ☐ None
Aircraft Oxygen	☐ Yes ☐ No
Aircraft Lavatory Disposal	☐ Yes ☐ No
On-Airport Ground Transportation Access	☐ Public Bus ☐ Light Rail ☐ Taxi ☐ Other: ☐ Other:
# Hotels within 3 miles of Airport:	
# Restaurants within 3 miles of Airport:	
Notes:	

AIRCRAFT OPERATIONS ACTIVITY					
Category	**Daily**	**Weekly**	**Monthly**	**Seasonal**	**Never**
Air Carrier	☐	☐	☐	☐ When:________	☐
Air Taxi	☐	☐	☐	☐ When:________	☐
Scheduled Charter	☐	☐	☐	☐ When:________	☐
Aircraft Charter	☐	☐	☐	☐ When:________	☐
Air Cargo	☐	☐	☐	☐ When:________	☐
Corporate/Business Activities	☐	☐	☐	☐ When:________	☐
Emergency Medical	☐	☐	☐	☐ When:________	☐
Charity Flights	☐	☐	☐	☐ When:________	☐

Airport Inventory & Data Survey

AIRCRAFT OPERATIONS ACTIVITY *(continued)*					
Category	**Daily**	**Weekly**	**Monthly**	**Seasonal**	**Never**
Agricultural Flights	☐	☐	☐	☐ When:________	☐
Law Enforcement	☐	☐	☐	☐ When:________	☐
Skydiving/Banner Tow	☐	☐	☐	☐ When:________	☐
Flight Training	☐	☐	☐	☐ When:________	☐
Military	☐	☐	☐	☐ When:________	☐
Search and Rescue/CAP	☐	☐	☐	☐ When:________	☐
Aerial Inspection	☐	☐	☐	☐ When:________	☐
Recreational Flights	☐	☐	☐	☐ When:________	☐
State/Federal Govt. Flights	☐	☐	☐	☐ When:________	☐
Aerial Firefighting Staging	☐	☐	☐	☐ When:________	☐
Aerial Advertising	☐	☐	☐	☐ When:________	☐
Air Shows	☐	☐	☐	☐ When:________	☐
Agricultural Spraying Flights	☐	☐	☐	☐ When:________	☐
Other: _________________	☐	☐	☐	☐ When:________	☐
Notes:					

AVIATION OUTREACH	
Does the airport actively coordinate with FAA and NHDOT on regulatory and compliance issues *(e.g., RSA improvements, obstruction removal, through-the-fence, non-standard leases ,etc.)?*	☐ Yes ☐ No
Is your airport a member of your local Chamber of Commerce?	☐ Yes ☐ No
Does your airport actively coordinate with your local economic development agency?	☐ Yes ☐ No
Does your airport have an active community outreach program? *(including residential, governmental, pilot, and business communities)*	☐ Yes ☐ No
If YES, please describe and check all that apply: (e.g. airport open house, fly-ins, membership in civic organizations, chamber of commerce, etc.) ☐ E-mail Outreach ☐ Newsletters ☐ Community Events	
Notes:	

Airport Inventory & Data Survey

EXISTING AIRPORT PLANS		
PLAN/STUDY/POLICY		**YEAR**
Airport Master Plan	☐ Yes ☐ No ☐ NA	
Airport Layout Plan (ALP)	☐ Yes ☐ No ☐ NA	
Airport Minimum Standards Document	☐ Yes ☐ No ☐ NA	
Airport Emergency Plan	☐ Yes ☐ No ☐ NA	
Airport Rules & Regulation Document	☐ Yes ☐ No ☐ NA	
EPA Spill Prevention, Spill Control, Spill Countermeasure (SPCC) Plan	☐ Yes ☐ No ☐ NA	
EPA Stormwater Pollution Prevention Plan (SWPPP)	☐ Yes ☐ No ☐ NA	
Airport Pavement Maintenance Plan	☐ Yes ☐ No ☐ NA	
Airspace Analysis/Obstructions Survey	☐ Yes ☐ No ☐ NA	
Is the airport recognized in local/regional comprehensive/transportation plans?	☐ Yes ☐ No ☐ NA	
Other Plans and Plan Year:		
Any issues or concerns with existing plans?		

AIRPORT SPONSORSHIP	
Have you been able to get local match for Federal/State-funded projects?	☐ Yes ☐ No
If *YES*, please estimate the value of those grant matches:	$______________
Is the airport budget supplemented by other sources *(e.g. sponsor/owner/town)* for its basic operating and maintenance costs?	☐ Yes ☐ No
What sources of non-aviation revenue does the airport have?	
Have the airport's leasing agreements been standardized?	☐ Yes ☐ No
Have the airport's leasing agreements been reviewed/updated in the past 5 years?	☐ Yes ☐ No

AIRPORT DEVELOPMENT	
Does the Airport have a CIP data sheet for review?	☐ Yes ☐ No
If available, please attach a copy of bid tabulations for airfield and land acquisition projects from the last 3 years. Notes:	

Airport Inventory & Data Survey

AIRPORT DEVELOPMENT *(continued)*

What factors may limit or restrict the future growth of your airport? *(Specifically identify them):*

Physical Factors/Limitations: ☐ Yes ☐ No (Explain below)

Environmental Factors: ☐ Yes ☐ No (Explain below)

Community Relations: ☐ Yes ☐ No (Explain below)

Financial Shortfalls: ☐ Yes ☐ No (Explain below)

What are your top 3 major projects?	Shown on ALP?	Included in CIP?
1.	☐ Yes ☐ No	☐ Yes ☐ No
2.	☐ Yes ☐ No	☐ Yes ☐ No
3.	☐ Yes ☐ No	☐ Yes ☐ No

AIRPORT UTILITIES

Type	On-Airport	Near Airport (within 1 mile)	Not Available	Explanation (include provider name)
Electric	☐	☐	☐	
Water	☐	☐	☐	
Wastewater	☐	☐	☐	
Stormwater	☐	☐	☐	

NH STATE AIRPORT SYSTEM PLAN

AIRPORT UTILITIES *(continued)*

Type	On-Airport	Near Airport (within 1 mile)	Not Available	Explanation (include provider name)
Natural Gas	☐	☐	☐	
Telephone	☐	☐	☐	
Fiber Optics/DSL	☐	☐	☐	
Wireless	☐	☐	☐	
Other: ________________	☐	☐	☐	
Other: ________________	☐	☐	☐	
Is there adequate cell phone coverage?	☐	☐	☐	

Notes: (Are there areas without access to utilities?)

AIRPORT COMPATIBLE LAND USE

Do the surrounding municipalities have any dedicated airport controls to make land use in the airport environs compatible with airport operations and development?	☐ Yes ☐ No ☐ Unknown

If YES, what controls? ☐ Land Use Plan ☐ Zoning Ordinance/Resolution ☐ Noise Abatement Procedures

Notes:

RUNWAY PROTECTION ZONES (RPZs)

RW ___________	Fee simple __________% Easement __________% Uncontrolled __________%
RW ___________	Fee simple __________% Easement __________% Uncontrolled __________%
RW ___________	Fee simple __________% Easement __________% Uncontrolled __________%
RW ___________	Fee simple __________% Easement __________% Uncontrolled __________%
RW ___________	Fee simple __________% Easement __________% Uncontrolled __________%
RW ___________	Fee simple __________% Easement __________% Uncontrolled __________%

Are there any public roads currently traversing any of the airport's RPZs? Please explain.

AIRPORT PROPERTY & ENVIRONS

What is the total area of Airport property (acres)? _______________acres

AIRPORT PROPERTY & ENVIRONS *(continued)*	
Are all Airport acres contiguous or are there other parcels divided by roadways/right-of-ways, etc.?	
Has the airport purchased or sold land in the last five years?	☐ Yes ☐ No
If *YES*, what was the average cost per acre for these transactions?	
Are you aware of average land values per acre in the vicinity of the airport?	☐ Yes ☐ No
If *YES*, what was the average value per acre?	
Are you aware of any assessments or appraisals of the airport or structures on the airport by the county, municipality or financial institutions, etc?	☐ Yes ☐ No
If *YES*, where is this information available?	
What approximate percentage of Airport acreage is considered: *Non-aviation includes uses such as farming or industrial parks ** Airport acreage that is considered unusable or undevelopable due to steep terrain, land use issues, wetlands, or other physical/regulatory restrictions, etc.	Airside ________% Landside ________% Non-Aviation* ________% Unusable** ________% **TOTAL 100%**
How would you describe the Airport's environs? ☐ Rural ☐ Suburban ☐ Urban ☐ Mixed ☐ Other:__________	
Does the airport have a business/industrial park on the property?	☐ Yes ☐ No
If *YES*, what is the size of the business/industrial park (acres)?	
If *YES*, does that business/industrial park have direct access to the airfield?	☐ Yes ☐ No
Is there an business/industrial park adjacent or in proximity *(within one mile)* of the airport?	☐ Yes ☐ No
If *YES*, please describe any linkages that businesses within these parks may have with the airport:	
Does the airport currently have through-the-fence (TTF) operations? (TTF operations involve Airport use by adjoining property owners that do not have a written agreement with the Airport.)	☐ Yes ☐ No ☐ Commercial ☐ Residential
If *YES*, please describe the TTF operations in detail, noting any TTF agreements: *(e.g. hangars, aviation-related businesses, residences, etc.)*	

Airport Management Economic Impact Survey

NH State Airport System Plan

AIRPORT DATA / CONTACT INFORMATION	
Airport Name:	**Airport Identifier:**
Contact Name:	Title/Position:
Telephone:	Email:

AIRPORT EMPLOYMENT INFORMATION		
	Full-time employees	**Part-time employees**
How many YEAR-ROUND **full-time and part-time employees** were employed by airport management on July 1, 2013?		
How many SEASONAL **full-time and part-time employees** were employed by airport management between July 2012 and June 2013 (i.e. FY2013)?		
In a typical workweek, how many hours per week does each full-time employees work?		
In a typical work week, how many hours per week does each part time employees work?		

PAYROLL	
Please estimate the total annual **salary, wages, and benefits** paid to all **YEAR-ROUND** employees shown in Question 2 for Fiscal Year 2013 (i.e., July 2012-June 2013) or Calendar Year ending in 2013. **Instead of providing the benefit amount, you may also provide an estimate of benefits as a percent of salary and wages.**	
Salary and wages (in dollars)	$
Benefits (in dollars OR as % of salary and wages)	
Please estimate the total annual **salary, wages, and benefits** paid to all **SEASONAL** employees shown in Question 2 for Fiscal Year 2013 (i.e., July 2012-June 2013) or Calendar Year ending in 2013. **Instead of providing the benefit amount, you may also list benefits as a percent of salary and wages.**	
Salary and wages (in dollars)	$
Benefits (in dollars OR as % of salary and wages)	

CAPITAL IMPROVEMENTS	
Please estimate how much the airport spent for **capital improvements** in the following fiscal years. Include federal, state, and local funding.	
FY 2011 Improvements	$
FY 2012 Improvements	$
FY 2013 Improvements	$

Airport Management Economic Impact Survey

OPERATING EXPENSE	
Omitting the expenditure categories above (i.e., payroll and capital improvements), please estimate how much the airport spent for all other **operating expenses** (i.e., payments to vendors providing goods and services) in FY 2013.	
Operating Expenses	$

ON-AIRPORT BUSINESS LIST

Please list any on-airport businesses currently operating at your airport. These businesses should include all operators/businesses located on airport property that have at least one full-time or part-time on-airport employee. Businesses can include, but not be limited to, concessionaires, FBOs, flight schools, other government agencies, charter operators, corporate flight departments, etc. Please estimate the number of full- and/or part-time employees for each business listed. **Please attach additional sheets as needed.**

On-Airport Business & Type of Service Provided	Contact Name, E-mail & Phone Number	Full Mailing Address & Zip Code	Estimated Full- & Part-time Employment
Aviation Flight Services (FBO)	***Bob Jones*** ***bjones@aviationflight.com*** ***603-111-1212 (phone)***	***110 Airport Blvd*** ***Any City, NH*** ***000000***	***8 Full-time*** ***6 Part-time***

Airport Management Economic Impact Survey

PAYROLL AND NUMBER OF JOBS BY LOCATION

Please include a summary of **year-round** employees; their total compensation; and where they live by county. For compensation, please list wages and salaries. You may also include benefits (e.g., health premium, retirement contributions, life insurance) if you have that information available.

Instead of filling out the table below, you may also provide us with a list of employees (without names) by ZIP code with wage and salary and benefit information and we will summarize the list by county.

County Where Employee Resides	Number of Employees	Compensation
Belknap County, NH		$
Carroll County, NH		$
Cheshire County, NH		$
Coos County, NH		$
Grafton County, NH		$
Hillsborough County, NH		$
Merrimack County, NH		$
Rockingham County, NH		$
Strafford County, NH		$
Sullivan County, NH		$
Not in New Hampshire		$

Does the compensation you listed in the table above include benefits (e.g., health premium, retirement contributions, life insurance)? ☐ Yes ☐ No

If NO, please provide an estimate of benefits as percent of wages and salaries.
% of wages and salaries for full-time employees:
% of wages and salaries for part-time employees:

Airport Management Economic Impact Survey

MAJOR AIRPORT USERS AND OFF-AIRPORT DEPENDENT BUSINESSES:		
Please list any businesses located in the area because the airport exists or those businesses in the area that frequently use the airport for business purposes. **<u>Attach additional sheets as needed</u>.**		
Business Name	**Contact Name, E-mail & Phone Number**	**Address**
Aviation Flights Services	***Robert Jones rj@email.com (555) 555-1212***	***110 Airport Blvd. Any City, NH 01221***

Airport Management Economic Impact Survey

AVIATION ACTIVITIES

What kinds of activities occur at your airport? Please check one box per activity. If the activity takes place daily or nearly daily place a check under Daily **(D)**. If it takes place weekly or nearly weekly place a check under Weekly **(W)**). If the activity occurs monthly, place a check under monthly **(M)**). Summer is defined as the time between Memorial Day and Labor Day. Winter is defined as Mid-December to Mid-March.

	SUMMER ONLY			WINTER ONLY			SPRING ONLY			FALL ONLY			Once a Year	NEVER
ACTIVITY	D	W	M	D	W	M	D	W	M	D	W	M		
Recreational flying														
Aerial agricultural spraying														
Corporate/business activity														
Aerial inspections (pipeline, electric. etc.)														
Air cargo														
Flight training and instruction														
Gateway for resort visitors														
Staging area for community events														
Police/law enforcement														
Prisoner transport														
Military exercises/training														
Aviation career training/education														
Search & rescue/Civil Air Patrol														
Environmental patrol (i.e., wildlife, fisheries)														
Emergency medical evac/patient transfer														
Medical doctor transport														
Forest/wildland firefighting														
Aerial photography/surveying														
Real estate tours														
Aerial advertising/banner towing														
Youth outreach (Young Eagles, scouting, etc.)														
Air shows														
Other (Add below)														

Airport Management Economic Impact Survey

INDUSTRIAL/BUSINESS PARKS

Is there an Industrial/Business park located either on or adjacent to airport property?	☐ Yes ☐ No
If *YES*, please estimate the acreage:	
If *YES*, please estimate the number of businesses:	
If *YES*, please estimate the employment rate:	

VISITING AIRCRAFT

Please **estimate** how many GA aircraft visit the airport **per day** during summer (i.e., Memorial Day to Labor Day), during winter (i.e., mid-December to mid-March) and during the rest of the year by MAIN purpose. If you do not know the main purpose for any or all of the visiting aircraft, please make sure to list them under "main purpose unknown" and include them in the Total row.

NOTE: Visiting aircraft are defined as aircraft that are not based at your airport.

Main Purpose	**Daily Average Visiting GA Aircraft**		
	Average Ops/Week	**% Summer**	**% Winter**
Flight Training			
Recreational/Leisure			
Business Trips			
Aircraft Maintenance			
Main purpose unknown			
Total			

Please describe below, the average number of yearly operations of any other notable activities:

____

____

____

BUSINESS & CORPORATE ACTIVITY

Please estimate the percentage of operations at your airport that pertain to business/corporate activity.
NOTE: Business and corporate activity includes both passenger and freight transport and may be conducted with based or visiting aircraft**.**

Percent Business/Corporate Activity	%

FLIGHT SCHOOLS

Are there any on or off-airport flight schools that conduct flight training at your airport?	☐ Yes ☐ No
If yes, please identify the type(s) of flight school(s). *(Check ALL that are located on- and off-airport.)*	☐ FBO ☐ Private Business ☐ Community College/Technical School ☐ Other (please specify):

Airport Management Economic Impact Survey

COMMUNITY INVOLVEMENT	
Does your airport sponsor any community events to promote or market the airport?	☐ Yes ☐ No
If yes, please provide a description of these events and provide (1) general time of year and (2) number of attendees of the event.	

RECREATION DESTINATIONS
Please provide examples of how your airport supports area recreational venues (e.g., skiing, beaches, etc.) and/or businesses.

Please complete this survey <u>within 10 days</u> of receiving it. A project team member will contact you to collect your completed survey and answer any questions you may have.

Again, your help with this effort is greatly appreciated. Thank You!

Airport Tenant Survey

New Hampshire Dot Bureau of Aeronautics – Economic Impact

Dear Airport Tenant:

The New Hampshire Department of Transportation's Bureau of Aeronautics is conducting a tenant survey to help quantify the economic importance of the businesses at this airport. Please take a few moments to complete the survey and forward it on to our consultant. On behalf of the New Hampshire Department of Transportation Bureau of Aeronautics and Airport Management we would like to thank you for your time. ***Individual responses with business names will not be published in the report.***

BUSINESS DATA / CONTACT INFORMATION	
Business Name:	
Airport Name:	Airport Identifier:
Contact Name:	Title/Position:
Telephone:	Email:

BUSINESS OVERVIEW	
How many years has your business or agency been located on the airport?	
What best describes your **business' activity**? Please check all that applies to your business or agency at the airport? *If your business or agency has multiple locations, please only provide information for the **ON AIRPORT LOCATION**.*	
☐ Aerial Applicator ☐ Aircraft Maintenance ☐ Aircraft Sales/Rental ☐ Airline ☐ Air Freight/Cargo Carrier ☐ Air Taxi/Charter Operator ☐ Concession (Restaurant, etc.)	☐ Corporate Flight Department ☐ FBO ☐ Flight Instruction ☐ Government Agency ☐ Military ☐ Rental Car ☐ Other (please specify) ________________
You may use the space below to provide any additional information to help us better understand the type of business that you conduct at the airport.	

Airport Tenant Survey

EMPLOYMENT INFORMATION		
	Full-time employees	**Part-time employees**
How many **YEAR-ROUND full-time and part-time employees** were employed by your business or agency on July 1, 2013? *If your business or agency has multiple locations, please only provide information for the* ***ON AIRPORT LOCATION****.*		
How many **SEASONAL full-time and part-time employees** were employed by your business or agency in between July 2012 and June 2013? *If your business or agency has multiple locations, please only provide information for the* ***ON AIRPORT LOCATION***		

PAYROLL	
Please <u>estimate</u> the total annual **salary, wages, and benefits** paid to **YEAR-ROUND** employees identified in Question 4. **Instead of providing the benefit amount, you may also provide an estimate of benefits as a percent of salary and wages.**	
Salary and wages (in dollars)	$
Benefits (in dollars OR as % of salary and wages)	
Please <u>estimate</u> the total annual **salary, wages, and benefits** paid to **SEASONAL** employees identified in Question 3. **Instead of providing the benefit amount, you may also provide an estimate of benefits as a percent of salary and wages.**	
Salary and wages (in dollars)	$
Benefits (in dollars OR as % of salary and wages)	

OTHER EXPENSES	
Please estimate how much your business or agency spent for all **other expenses** (i.e., not payroll) between July 2012 and June 2013? *If your business or agency has multiple locations, please only provide information for the* ***ON AIRPORT LOCATION***	
Other Expenses (e.g., vendor payments)	$

ADDITIONAL BENEFITS
Please describe any additional economic benefits or services that your business or agency provides to the local community.

Please complete and return this survey <u>within 10 days</u> of receiving it. If you have any questions regarding this survey, please contact Jeremy Martelle of The Louis Berger Group, Inc. at (518) 432-9545 or via email at jmartelle@louisberger.com.

Please send all Completed Surveys to:

The Louis Berger Group, Inc.
Attn: Jeremy P. Martelle, ACE
20 Corporate Woods Blvd.
Albany, NY 12211

Airport Visitor Survey

NEW HAMPSHIRE DOT BUREAU OF AERONAUTICS

Dear Airport User:

The New Hampshire Department of Transportation's Bureau of Aeronautics is conducting a pilot/passenger survey to help quantify the economic importance of the aircraft operations at this airport. Please take a few moments to complete the survey and place it in the envelope provided. On behalf of the New Hampshire Department of Transportation's Bureau of Aeronautics and Airport Management we would like to thank you for your time.

PLEASE COMPLETE THIS SURVEY ONLY IF YOU ARE AN ARRIVING VISITOR

(I.E., PILOT, OTHER CREW, or PASSENGER WHO DOES NOT RESIDE IN THIS AREA)

AIRPORT INFORMATION
At which airport did you receive this survey?
Airport Name:

PILOT /PASSENGER INFORMATION		
Please indicate the number of travelers, including the pilot, in your aircraft today.		
Pilot(s):	**Other Air Crew:**	**Passengers:**
Are you the pilot or a passenger in the visiting aircraft? *(Please check one box)*	☐ Pilot ☐ Other Air Crew ☐ Passenger	
Where is your aircraft based?	Airport Name:	State:
Where do you live?	State:	Zip Code *(if New Hampshire)*:
Where do the other persons who traveled with you (i.e., crew, passengers) live? *Please summarize by state and zip code.*		
State	**Zip Code *(if New Hampshire)***	**Number of persons**

<u>Please turn over and complete the other side</u>

Visitor Survey

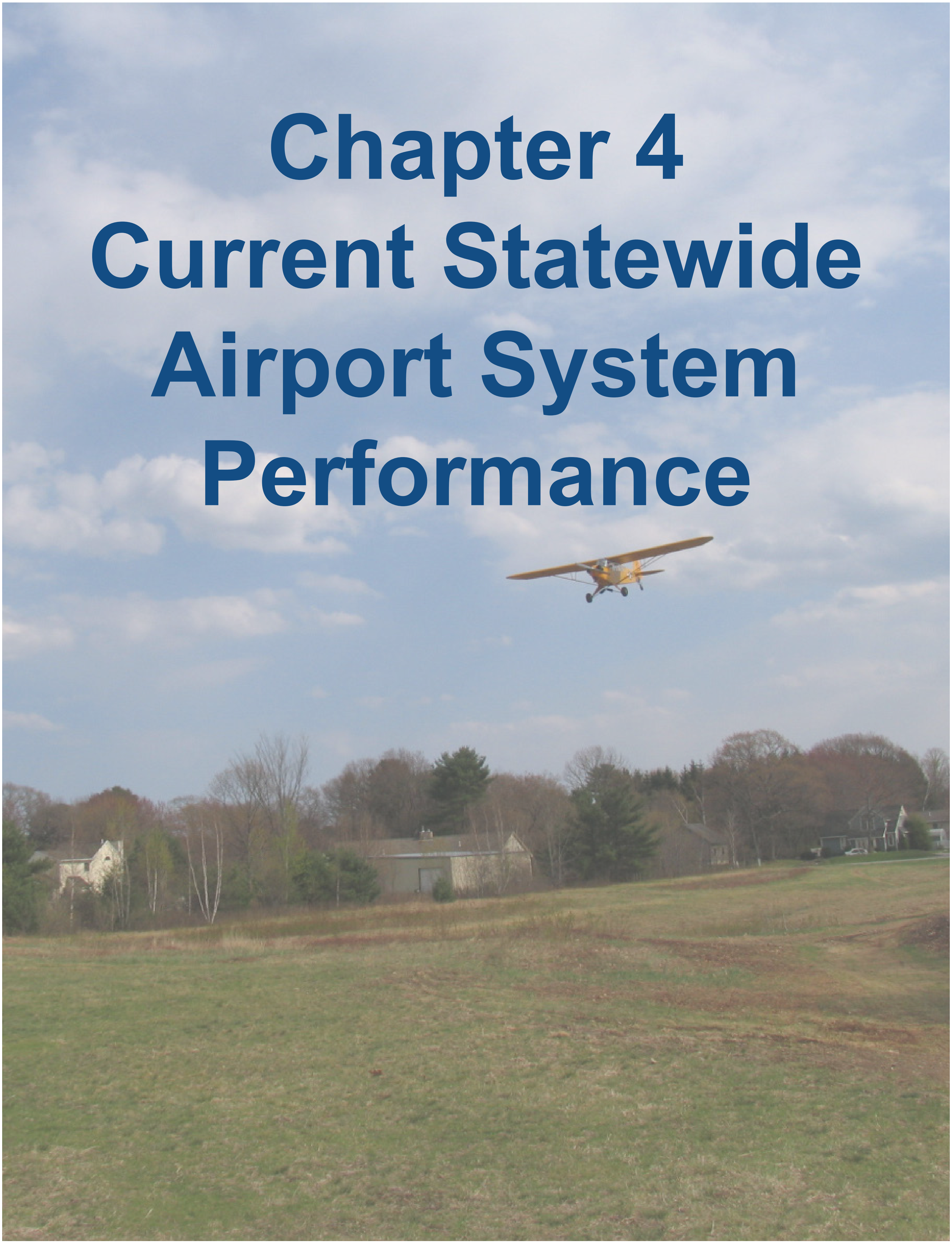
OVERALL AIRPORT INFORMATION	
Please indicate the primary reason you are using this airport today *(Please check one box)*	☐ Business ☐ Recreation ☐ Maintenance ☐ Flight training ☐ Fuel Stop ☐ Other *(please specify)*:
How long was your visit to this airport/area?	☐ Day only – No overnight ☐ Overnight – Indicate number of nights:
Did you fly into this airport as an alternative to a more congested commercial service airport? *(Please check one box)*	☐ Yes ☐ No

EXPENDITURES		
Please **estimate** total on-airport and **off-airport** expenditures during your visit to this area:		
	Off-Airport	**On-Airport**
Lodging	$	$
Food & Beverage	$	$
Taxi/Limousine/Shuttle	$	$
Rental Car	$	$
Auto Fuel	$	$
Retail/Entertainment	$	$
Other	$	$
Total	$	$
How many travelers, including you, accounted for these expenditures?		
Please describe how this airport benefits you or your business.		

Please feel free to fold and staple this closed if you choose and place in the envelope, or return to an airport staff member. If you have any questions regarding this survey, please contact a member of The Louis Berger Group, Inc. at (518) 432-9545 or jmartelle@louisberger.com. Thank you!

If you choose to complete the survey off-site, please scan and email the survey to the above address or fax each side to 518-432-9571 or feel free to call an associate at the Louis Berger Group, Inc. to record your response.

Chapter 4
Current Statewide Airport System Performance



CHAPTER 4: CURRENT STATEWIDE AIRPORT SYSTEM PERFORMANCE

4.1 INTRODUCTION

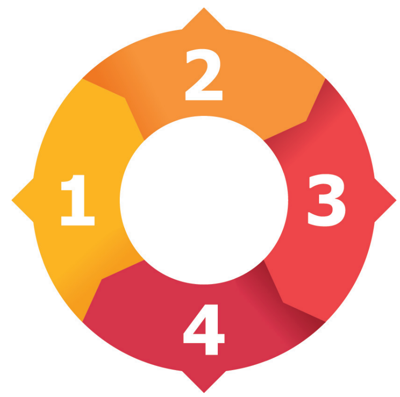
This chapter presents the analyses and results of evaluating the existing performance of New Hampshire's (NH) state airport system. As described in *Chapter 2*, *Facility Roles and Objectives*, the evaluation is based upon the following metrics:

- Facility & Service Objectives
- Performance Metrics

The process for evaluating the performance of the existing system involves two steps. First, each airport is measured against minimum facility and service objectives defined in *Chapter 2*, *Facility Roles and Objectives*. This evaluation draws upon inventory data in *Chapter 3*, *System Inventory*, to affirm system airport facilities and services that are provided and which specific facilities and services are not fully met. Then, the evaluations of each system airport are aggregated by system role, such that a report card can be developed that clearly illustrates how each system role performs, and how each airport contributes to NH State Airport System Plan (NHSASP) performance.

The second step to evaluating the performance of the existing system is to consider performance metrics, as outlined in *Chapter 2.* The performance metrics utilized are based upon the determination of geographic service areas described in *Chapter 2*. Geographic service areas are polygons that represent areas of the state that can reach a system airport within a 30-minute drive time for general aviation airports and a 60-minute drive time for Primary airports. Geographic service areas were also developed based upon nautical mile radius rings around each system airport, which represent areas of the state that are best served by specific air access features.

As described, this evaluation of NH's existing airport system represents a thoughtful and analytical approach to measuring the current statewide aviation system's performance. The results provide data regarding specific facilities and services provided, or not provided, at each system airport and the geographic reach of those facilities and services in terms of area, population, and employment centers that are currently served.



4.2 FACILITY & SERVICE OBJECTIVES PERFORMANCE

Facility and service objectives are assigned to each airport role, and serve as the baseline for desirable facilities and services that can accommodate the types of users each airport is best positioned to serve. As such, this chapter measures the statewide system's performance against facility and service objectives outlined in *Chapter 3*, *System Inventory,* where inventory data for each airport is compared to the minimum facility and service objectives of each airport category (Basic, Local, Regional, National, and Primary). This analysis yields a report card for how well each airport category performs against those objectives as well as how each category of airports in NH are performing.

This performance evaluation considers the minimum facility and service objectives defined in *Chapter 3*. Recommended facility and service objectives for each role will be considered in *Chapter 6, Future System Performance.*

The analysis of facility and service objectives for each airport category is presented in the following sections.

4.2.1 GENERAL AVIATION BASIC AIRPORTS

System airports categorized into the General Aviation Basic Role were measured against minimum facility and service objectives for their role. The report card illustrated in **Figure 4-1** presents the current performance of General Aviation Basic Airports in the NH state airport system. Facility and service objectives that are not fully met by these airports include:

- Aircraft Parking Area
- Basic Shelter (100 square feet)
- Public Phone
- Open Year-Round
- Airport Manager Contact Available
- Posted Emergency Contact List

As described above, performance against system facility and service objectives is based upon data collected for the NHSASP inventory. As shown in the report card table, there were two airports with surveys that were not completed (Dean Memorial and Errol); therefore, complete data was not available. For scoring purposes, these items were considered to be not available, which had only a minor effect for the combined performance of General Aviation Basic Airports.

4.2.2 GENERAL AVIATION LOCAL AIRPORTS

System airports categorized into the General Aviation Local Role were measured against minimum facility and service objectives for their role. The report card illustrated in **Figure 4-2** presents the current performance of General Aviation Local Airports in the NH state airport system. Facility and service objectives that are not fully met by these airports include:

- Paved Aircraft Parking Area (4 spaces)
- Hangar Storage for all Winter-Based Aircraft
- Runway Lights
- Taxiway Reflectors
- Lighted Windsock
- Non-Precision Instrument Approach Procedure
- Posted Emergency Contact List

Similar to General Aviation Basic Airports, there were three airports with surveys that were not completed (Claremont Municipal, Mt. Washington Regional, and Skyhaven); therefore, complete data was not available. However, as with General Aviation Basic Airports, the impact to the overall performance was not significant.

4.2.3 GENERAL AVIATION REGIONAL AIRPORTS

System airports categorized into the General Aviation Regional role were measured against minimum facility and service objectives for their role. The report card illustrated in **Figure 4-3** presents the current performance of General Aviation Regional Airports in the NH state airport system.

The General Aviation Regional Airports, comprised of Berlin Regional, Concord Municipal, Dillant-Hopkins, and Laconia Municipal, meet 100 percent of facility and service objectives for airports serving in the General Aviation Regional Airport role.

4.2.4 GENERAL AVIATION NATIONAL AIRPORTS

The System airport categorized into the General Aviation National Role was measured against minimum facility and service objectives for that role. The report card illustrated in **Figure 4-4** presents the current performance of the General Aviation National Airport in the NH state airport system.

Boire Field, which is the only airport under General Aviation National Airports, meets 100 percent of facility and service objectives for airports serving in the General Aviation National Airport role.

4.2.5 PRIMARY AIRPORTS

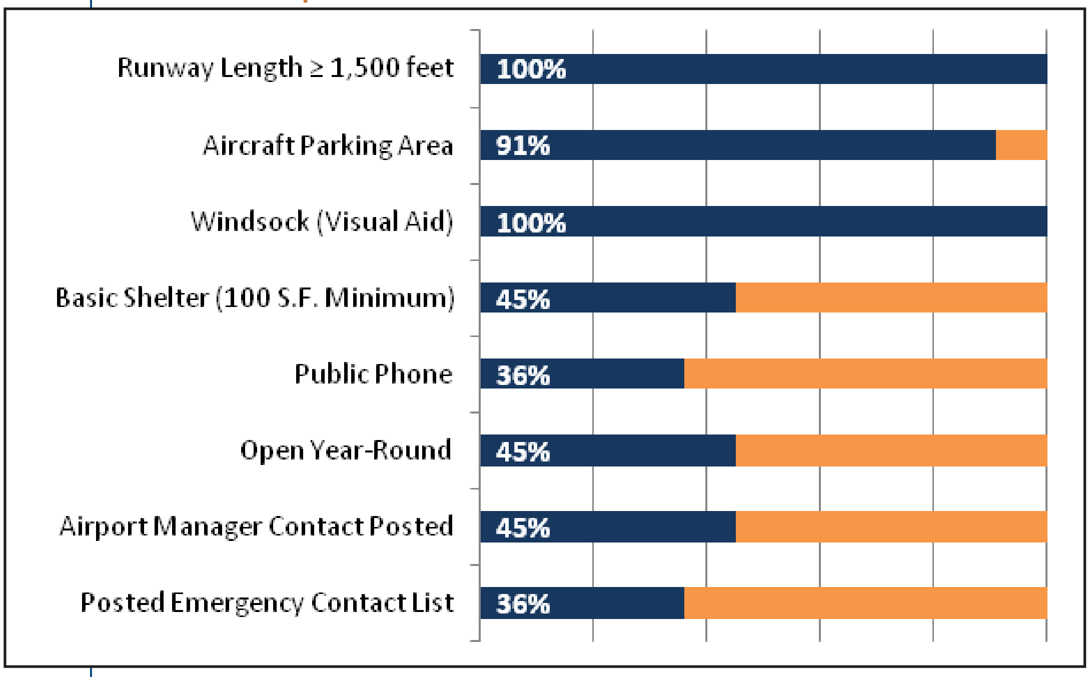
System airports categorized into the Primary Role were measured against minimum facility and service objectives for their role. The report card illustrated in **Figure 4-5** presents the current performance of Primary Airports in the NH state airport system. Facility and service objectives that are not fully met by these airports include:

- Runway Length > 7,000 Feet

- Pavement Strength (250,000 lbs, Dual Tandem Wheel)
- Medium Intensity Approach Light System with Sequential Flashers
- Full-Time On-Site Airport Security

All of the inventory data for these airports was collected; therefore, there are no data gaps within this airport category.

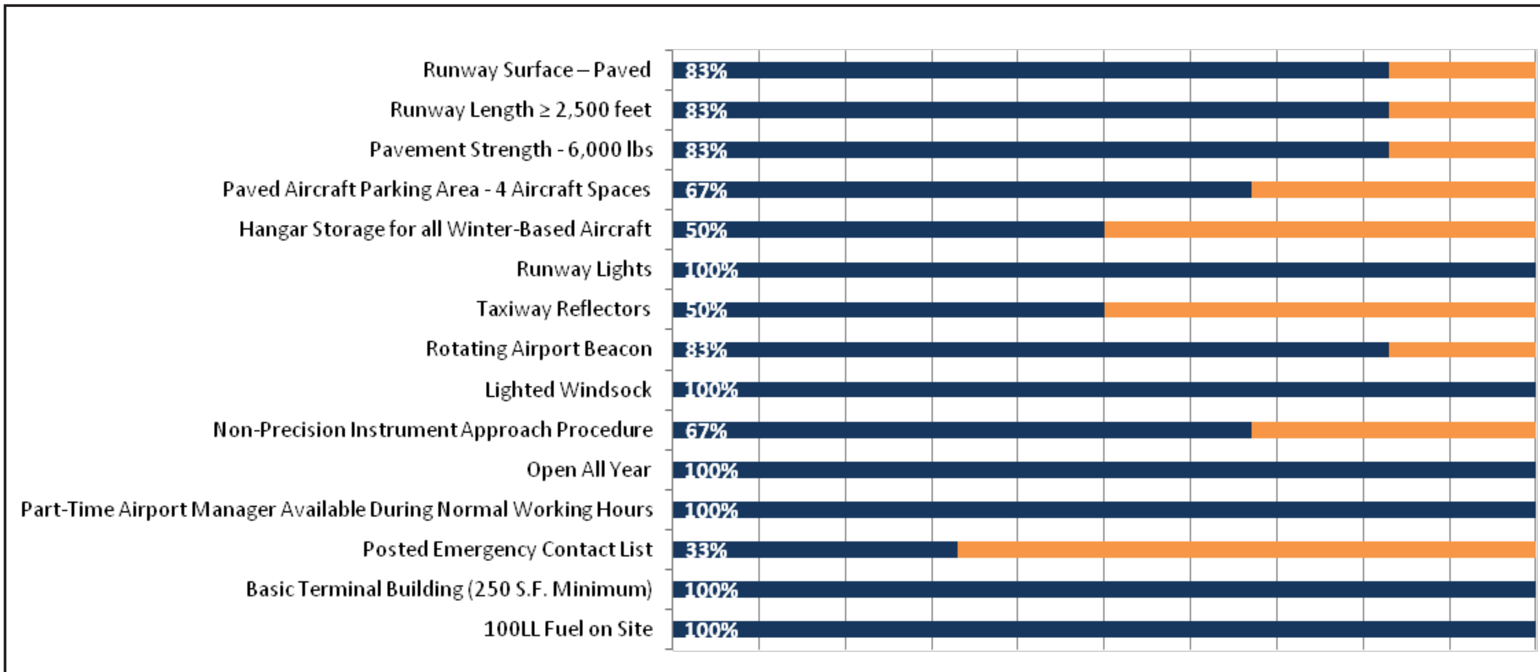
Figure 4-1 NHSASP – Performance Report Card – General Aviation Basic Airports



Airport	Runway Length	Aircraft Parking	Windsock	Open Year-Round	Manager Contact Posted	Emergency Contact Posted	Basic Shelter	Public Phone	Performance
Alton Bay	✓	✓	✓	x	x	x	x	x	38%
Dean Memorial	✓	✓	✓	✓	✓	-	x	x	63%
Errol	✓	x	✓	x	-	-	-	-	25%
Gorham	✓	✓	✓	x	x	x	x	x	38%
Moultonborough	✓	✓	✓	✓	✓	✓	✓	✓	100%
Hawthorne-Feather	✓	✓	✓	✓	-	-	-	x	44%
Newfound Valley	✓	✓	✓	✓	x	✓	✓	x	75%
Plymouth Municipal	✓	✓	✓	✓	✓	✓	✓	✓	100%
Franconia	✓	✓	✓	x	✓	x	✓	✓	75%
Twin Mountain	✓	✓	✓	x	x	x	✓	✓	63%
Gifford Field	✓	✓	✓	x	✓	✓	x	x	63%

Source: McFarland Johnson, Inc.

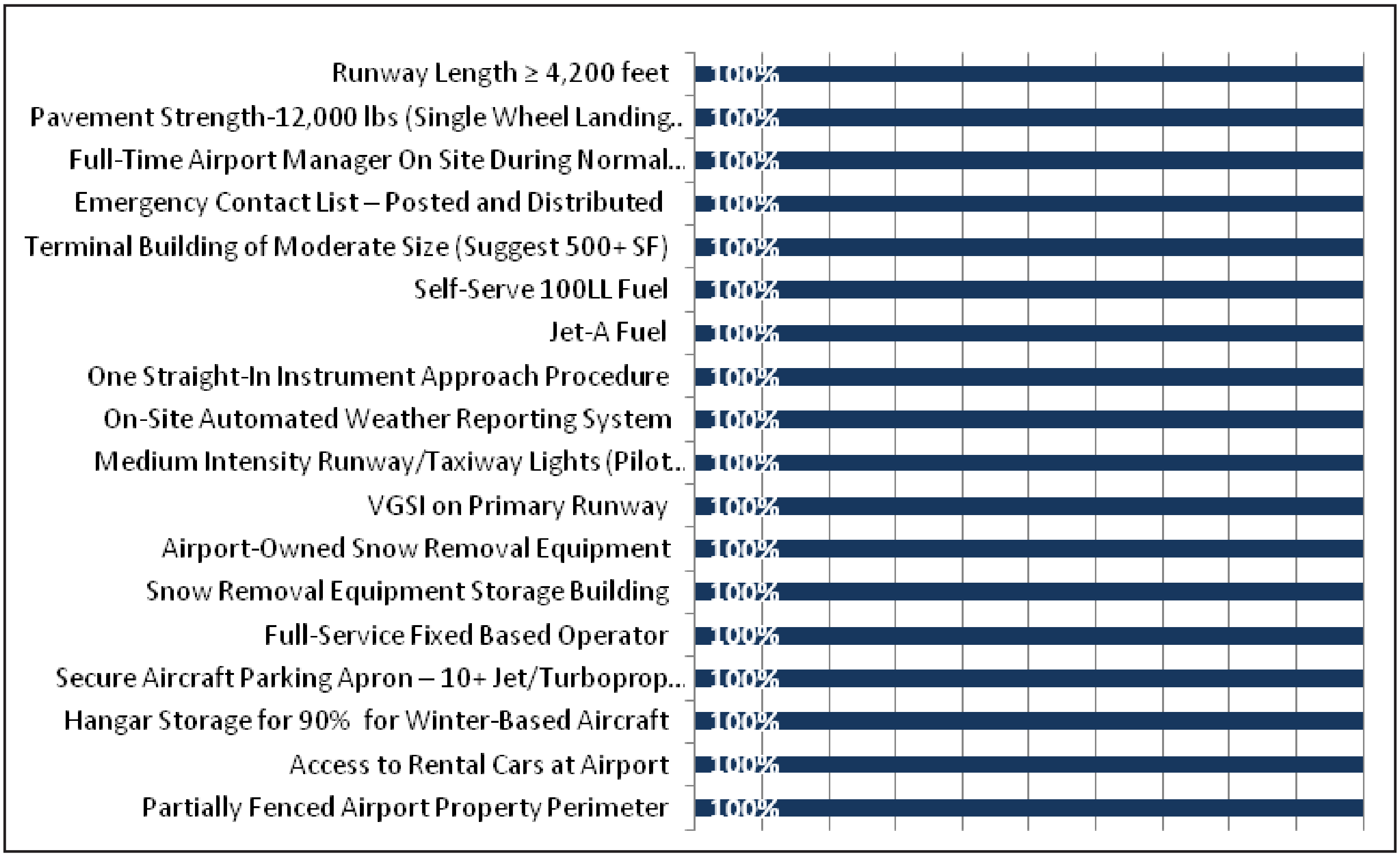
Figure 4-2 NHSASP – Performance Report Card – General Aviation Local Airports



Airport	Paved Runway	Runway Length	Pavement Strength	Paved Aircraft Parking	Adequate Hangar Storage	Runway Lights	Taxiway Reflectors	Rotating Beacon	Lighted Windsock	Non-Precision Approach	Open Year-Round	PT Airport Manager	Posted Emergency Contact List	Basic Terminal	100LL Fuel Service	Performance
Skyhaven	√	√	√	√	x	√	√	√	√	√	√	√	-	√	√	87%
Claremont Municipal	√	√	√	√	√	√	√	√	√	√	√	√	-	√	√	93%
Mt. Washington Regional	√	√	√	√	x	√	-	√	√	√	√	√	-	√	√	80%
Jaffrey Airport - Silver Ranch	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	100%
Hampton Airfield	x	x	x	x	x	x	x	x	√	x	√	√	x	√	√	40%
Parlin Field	√	√	√	x	√	√	x	√	√	x	√	√	√	√	√	80%

Source: McFarland Johnson, Inc.

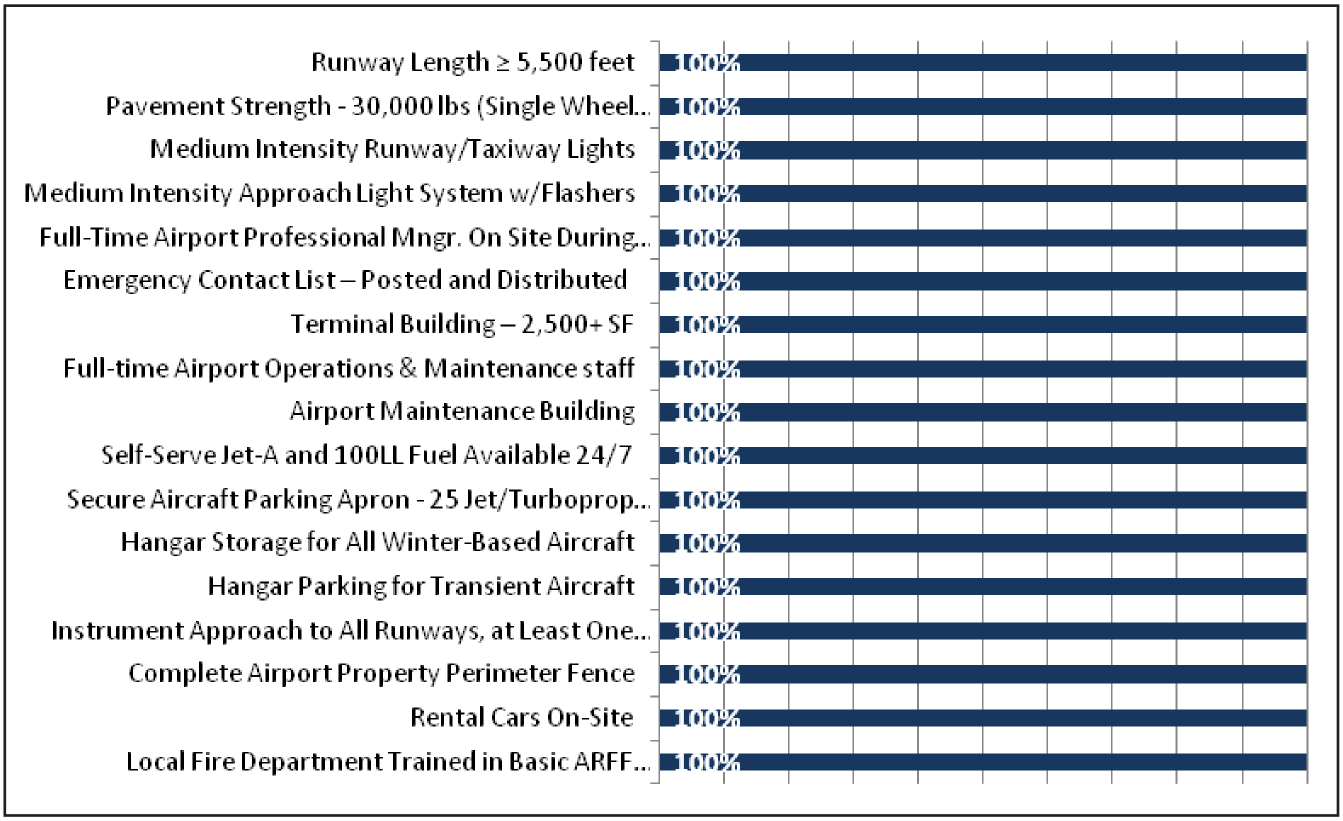
Figure 4-3 NHSASP – Performance Report Card – General Aviation Regional Airports



Airport	Runway Length	Pavement Strength	FT Airport Manager	Emergency Contact List	Terminal Building (500 S.F.)	Self-Serve 100LL Fuel	Jet-A Fuel	Straight-In Instrument Approach	On-Site Weather Reporting	Medium Intensity Runway/Taxiway Lights	VGSI on Primary Runway	Airport-Owned SRE	SRE Storage Building	FBO	Secure Aircraft Parking – 10+ Jet/Turboprop Aircraft	Adequate Hangar Storage	Rental Cars at Airport	Partial Perimeter Fencing	Performance
Berlin Regional	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	100%
Laconia Municipal	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	100%
Concord Municipal	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	100%
Dillant-Hopkins	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	100%

Source: McFarland Johnson, Inc.

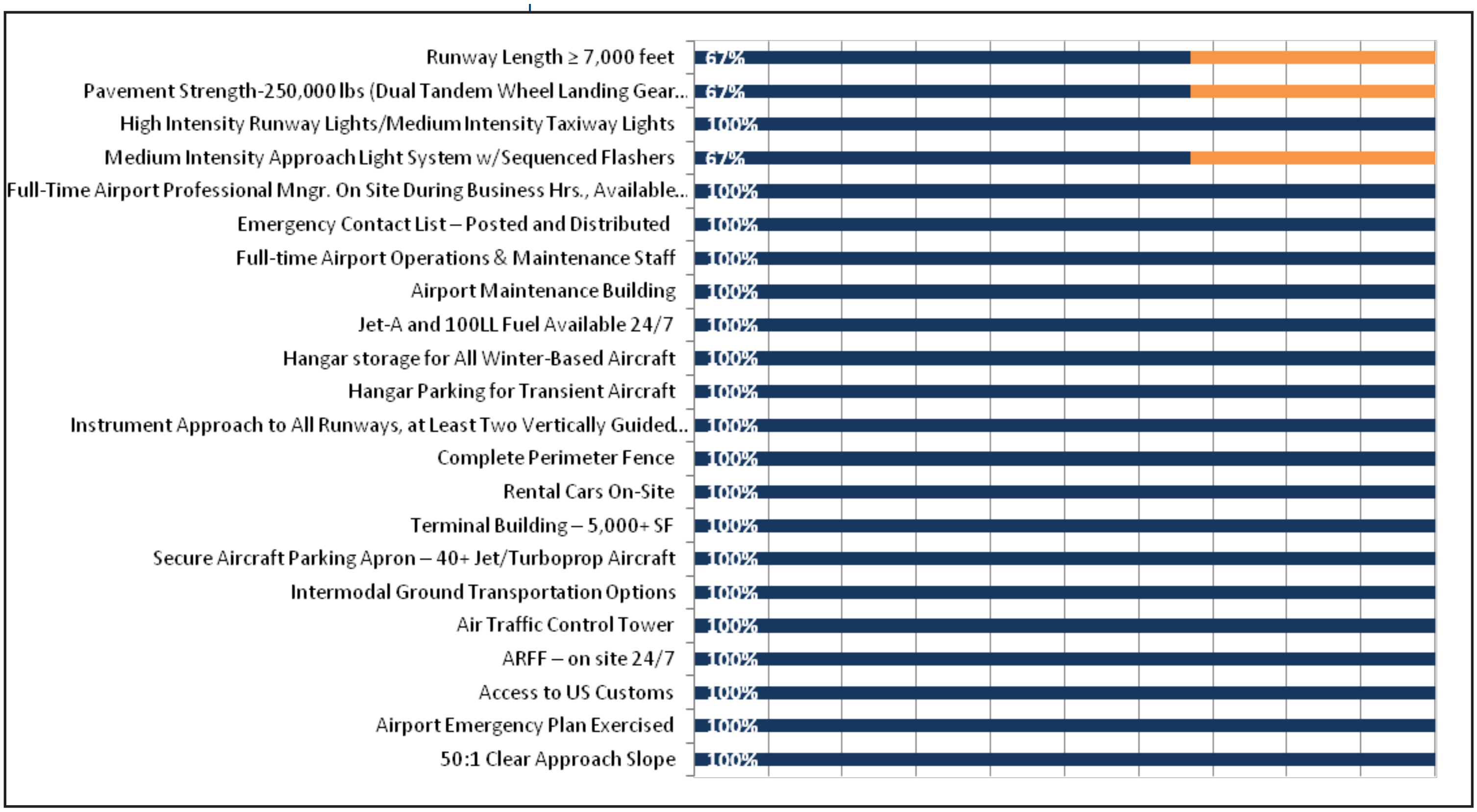
Figure 4-4 NHSASP – Performance Report Card – General Aviation National Airports



Airport	Runway Length	Pavement Strength	Medium Intensity Runway/Taxiway	Medium Intensity Approach Light	FT Airport Manager - 24/7	Emergency Contact List	Terminal Building (2,500SF)	Full-time Operations & Maintenance Staff	Airport Maintenance Building	Self-Serve Jet-A and 100LL Fuel	Secure Aircraft Parking Apron - 25	Adequate Hangar Storage	Transient Hangar Storage	ILS - All Runways/ VGSI - One	Complete Perimeter Fencing	Rental Cars at Airport	Local Fire Department - Basic ARFF	Performance
Boire Field	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	100%

Source: McFarland Johnson, Inc.

Figure 4-5 NHSASP – Performance Report Card – Primary Airports



Airport	Runway Length	Pavement Strength	High Intensity Runway Lights/	Medium Intensity Approach Light	FT Airport Manager - 24/7	Emergency Contact List	Full-time Airport Operations &	Airport Maintenance Building	Jet-A & 100LL Fuel - 24/7	Adequate Hangar Storage	Transient Hangar Storage	Instrument Approach to All Runways,	Complete Perimeter Fence	Rental Cars at Airport	Terminal Building (5,000+ SF)	Secure Aircraft Parking Apron – 40+	Intermodal Ground Transportation	Air Traffic Control Tower	ARFF – On-Site 24/7	Access to US Customs	Airport Emergency Plan Exercised	34:1 Clear Approach Slope	Performance
Lebanon Municipal	x	x	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	86%
Manchester-Boston Regional	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	96%
Portsmouth International	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	96%

Source: McFarland Johnson, Inc.

4.2.6 ANALYSIS SUMMARY

The evaluation of NH system airports performance against the NHSASP facility and service objectives presented in the preceding report cards can be summarized as follows

- **General Aviation Basic Airports:** System airports serving in this role perform at a level appropriate for small piston-engine aircraft based at the facility and operating under visual flight rules (VFR) conditions. Seven of these airports are not open year-round, such as Alton Bay, which serves users with a plowed ice runway during the winter months.

While General Aviation Basic Airports may perform well for current operators, the evaluation indicates that less than 50 percent of airports meet safety-related objectives, including:

- The availability of a posted emergency contact list;
- Posted airport manager contact information;
- A basic shelter (minimum of 100 square feet); and
- A public telephone.

Traditionally, access to a public telephone has been considered an important safety feature for small general aviation airports. However, as cellular service carriers have expanded their networks, only a few areas of the state remain difficult to access. These areas include the Great North Woods, portions of the White Mountains region, and to a lesser extent some pockets in the Dartmouth-Lake Sunapee and Monadnock regions.

- **General Aviation Local Airports:** System airports serving in this role perform well for based aircraft and small piston-engine aircraft operating in proximity to each airport and for recreational flights. As indicated, all six airports are open year-round, have a part-time airport manager available during normal working hours, provide Avgas (100LL) fuel, and a lighted windsock.

  The evaluation indicates that less than 50 percent of General Aviation Local Airports have a posted emergency contact list. Fifty percent of airports in this role do not have adequate hangar storage for 100 percent of winter-based aircraft, and 50 percent do not have taxiway lighting or reflectors.

- **General Aviation Regional Airports:** System airports serving in this role meet 100 percent of minimum facility and service objectives.
- **General Aviation National Airports:** System airports serving in this role meet 100 percent of minimum facility and service objectives.
- **Primary Airports:** System airports serving in this role perform at a level appropriate for facilities scaled to meet the offered scheduled

passenger service, as well as to attract and maintain based aircraft that include multi-engine, turboprop, and business/corporate jet aircraft. Portsmouth International at Pease meets 96 percent of minimum facility and service objectives. Manchester-Boston Regional meet 100 percent of minimum facility and service objectives. Lebanon Municipal meets 83 percent of facility and service objectives.

Lebanon Municipal is the smallest airport in this role, and does not meet minimum facility and service objectives for runway length, pavement strength, approach lighting, and full-time on-site airport security.

4.3 AIRPORT SYSTEM PERFORMANCE

Following the evaluation of airports and roles against minimum facility and service objectives, this section considers geographic areas of the state that are proximate to system airports as a measure of the area each airport, and each grouping of NHSASP roles, serves. The purpose of identifying the geographic service areas is to provide airport management, aviation businesses, and aviation policy makers with a graphic tool to understand saturation and gaps in service coverage within the state's aviation system. Alton Bay Ice Runway/Seaplane Base was not evaluated under the existing performance analysis as the airport is seasonal only operational during the 10 weeks during the winter. As such, there are no measures that can be applied that would adequately define the airport or its needs.

One overarching and reasonable assumption for evaluating the current performance of the NH state airport system is that an airport's performance is based upon its location relative to existing and prospective users. In this way, drive times and nautical mile distances from system airports represent service areas for the NH airport system, where aviation services are available to aircraft owners, operators, and passengers.

Airport system performance is evaluated by estimating geographic service areas for system airports. Utilizing geographic information system (GIS) software, the service area for an airport was determined based on automobile drive times and nautical mile radii. In this analysis, polygons are created for drive times that follow the local roadway system, and nautical mile rings are created to represent direct air access. Within the GIS, geodatabases with area, population, and employment center data are then matched to these polygons to quantify land area, population, and employment centers served by each system airport.

Once the service area for each system airport is established and the GIS analysis is performed, the performance of the NH state airport system can be presented. The analysis concludes with service area gaps throughout the state, which are areas that are not proximate to a system airport or the facilities and services they offer.

4.3.1 DRIVE TIME SERVICE AREA COVERAGE

Each system airport's service area, defined by automobile drive-times, was utilized to quantify discrete values for coverage in terms of land area, population and employment centers. These metrics are applied using 30-minute drive times for General Aviation Basic, Local, Regional and National Airports, and 60-minute drive times for Primary Airports.

Additionally, 30-minute drive times were also applied to Primary Airports to approximate the geographic reach of general aviation services component of these airports. In this way, the system's performance was measured such that airports serving in Commercial Service Primary Role were not unduly weighted for providing general aviation services similar to GA Basic, Local, Regional, and National airports in the system.

DRIVE TIME LAND AREA EVALUATION

Drive-time coverage was assessed for each airport category, and is summarized below. Importantly, and as shown on each subsequent figure, individual airport drive time service areas overlap in some areas. Therefore, total coverage noted in each table (i.e., for Basic, Local, Regional and National airports as a group, and Primary airports as a group) is not a sum of each individual category, but a combination.

- **General Aviation Basic, Local, Regional, and National Airports: Figure 4-6** illustrates 30-minute drive-time coverage for system airports classified in Basic, Local, Regional, and National roles. As indicated, these airports combine to cover 5,818 square miles, or 62 percent of the state. **Table 4-1** presents drive time coverage by each of these categories.

Table 4-1 – NHSASP – Drive Time Coverage by Basic, Local, Regional, and National Roles

AIRPORT CATEGORY	30-MINUTE DRIVE-TIME LAND AREA COVERAGE
Basic Airports	3,398 SQMI / 36.3%
Local Airports	1,426 SQMI / 14.3%
Regional Airports	1,733 SQMI / 18.5%
National Airport	385 SQMI / 4.1%
Total Coverage	5,818 SQMI / 62.2%

Source: U.S. Census Bureau, Census Blocks, 2010

- **Primary Airports: Figure 4-7** illustrates 60-minute drive-time coverage for system airports classified in the Primary role. As indicated, these airports combine to cover 5,439 square miles, or 58 percent of the state. **Table 4-2** presents drive time coverage by Commercial Service Primary Airports.

Table 4-2 – NHSASP – Drive Time Coverage by Primary Role

AIRPORT CATEGORY	60-MINUTE DRIVE-TIME LAND AREA COVERAGE
Primary Airports	5,439 SQMI / 58.2%

Source: U.S. Census Bureau, Census Blocks, 2010

- **All System Airports, 30-Minute Drive Time Coverage:** While Primary airports are considered to have a service area that reaches out to include areas within a 60-minute drive time for scheduled commercial passenger service, the analysis also included the application of 30-minute drive times for all system airports. This places all system airports on a level playing field in terms of providing coverage for general aviation users, such that Primary system airports are not unfairly weighted for providing GA services.

Figure 4-8 illustrates 30-minute drive-time coverage for all system airports. As indicated, system airports combine to cover 6,234 square miles, or 67 percent of the state.

Figure 4-9 illustrates total geographic reach of the NH state airport system, including all airports in their respective roles. Together, the current system of airports covers nearly 90 percent of the state, which accounts for 86 percent of the state's population and 49 of the top 50 employers.

FIGURE 4-6:
30 MINUTE DRIVE TIME: BASIC, LOCAL, REGIONAL, & NATIONAL AIRPORTS

NH STATE AIRPORT SYSTEM PLAN

- Basic
- Local
- Regional
- National
- Primary
- Neighboring State Airports
- Drive Time: Basic
- Drive Time: Local
- Drive Time: Regional
- Drive Time: National

DATE: FEBRUARY 2015

Prepared By: McFarland Johnson

Source: GRANIT, Natural Earth.

FIGURE 4-7:

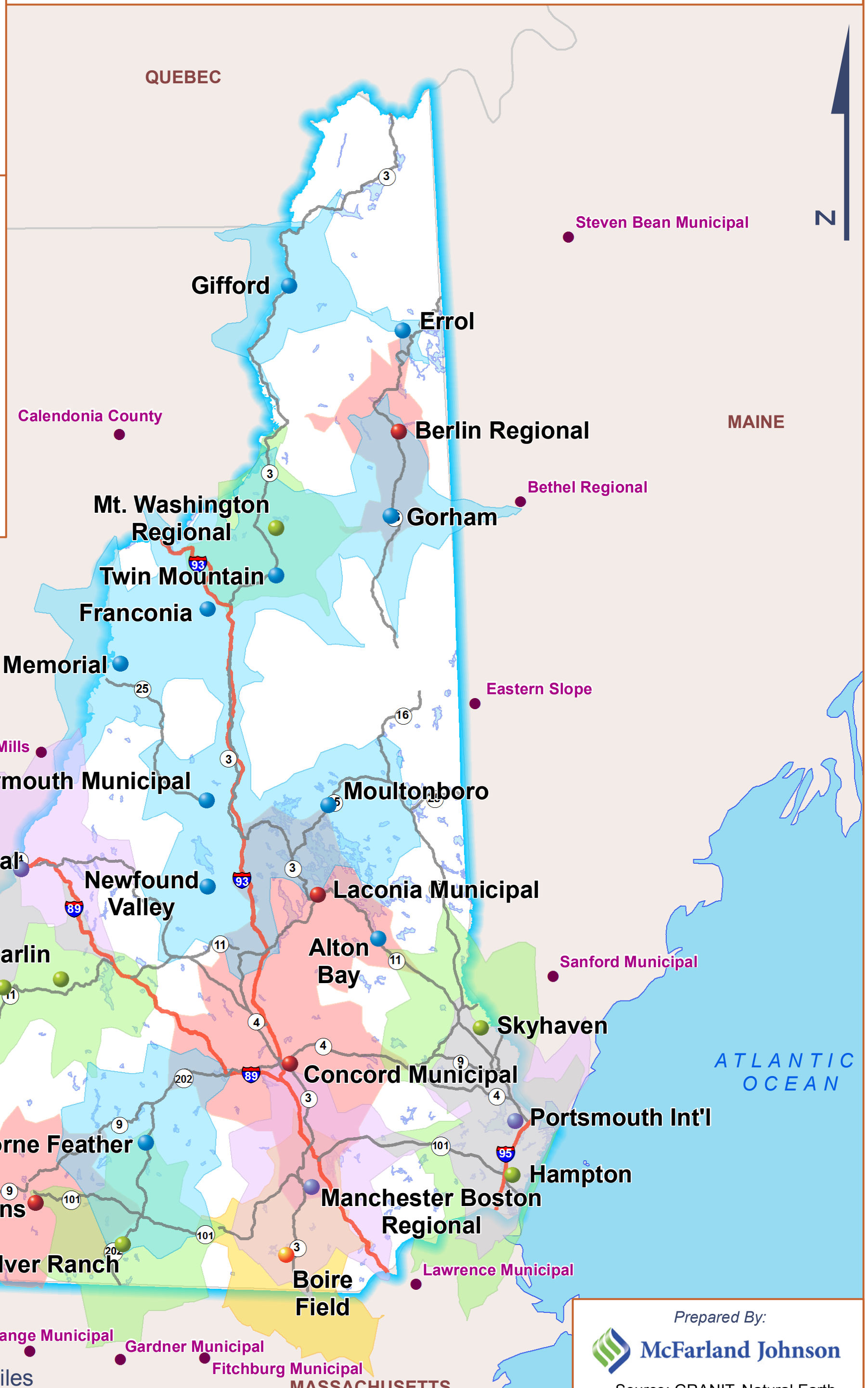
60 MINUTE DRIVE TIME: PRIMARY AIRPORTS

FIGURE 4-8:
30 MINUTE DRIVE TIME: ALL AIRPORTS

NH STATE AIRPORT SYSTEM PLAN

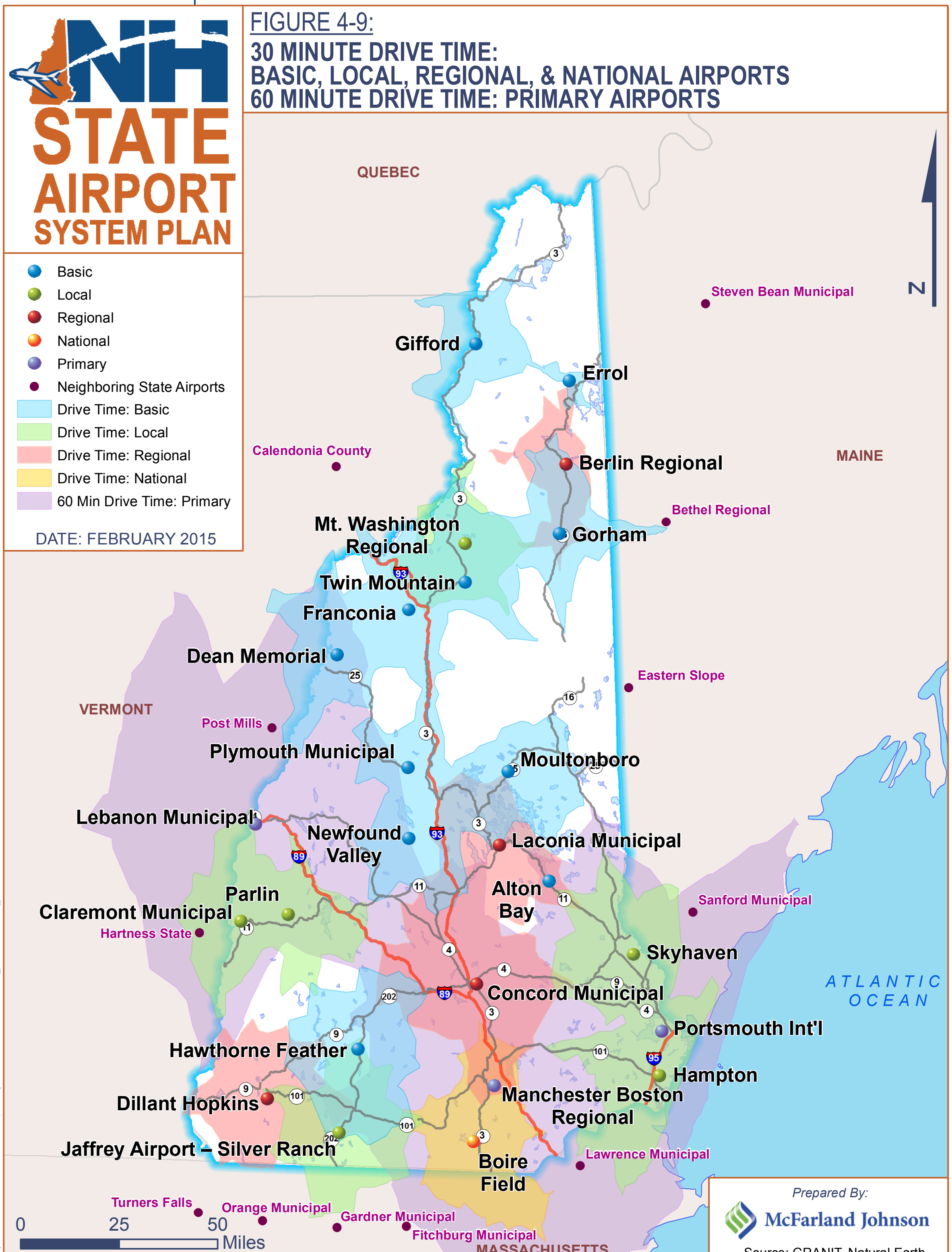
- Basic
- Local
- Regional
- National
- Primary
- Neighboring State Airports
- Drive Time: Primary
- Drive Time: Basic
- Drive Time: Local
- Drive Time: Regional
- Drive Time: National

DATE: FEBRUARY 2015



Prepared By: McFarland Johnson

Source: GRANIT, Natural Earth.



NH STATE AIRPORT SYSTEM PLAN
FIGURE 4-9:
30 MINUTE DRIVE TIME:
BASIC, LOCAL, REGIONAL, & NATIONAL AIRPORTS
60 MINUTE DRIVE TIME: PRIMARY AIRPORTS
Basic
Local
Regional
National
Primary
Neighboring State Airports
Drive Time: Basic
Drive Time: Local
Drive Time: Regional
Drive Time: National
60 Min Drive Time: Primary
DATE: FEBRUARY 2015
QUEBEC
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
Steven Bean Municipal
Gifford
Errol
Calendonia County
Berlin Regional
Bethel Regional
Mt. Washington Regional
Gorham
Twin Mountain
Franconia
Dean Memorial
Eastern Slope
Post Mills
Plymouth Municipal
Moultonboro
Lebanon Municipal
Newfound Valley
Laconia Municipal
Alton Bay
Parlin
Claremont Municipal
Hartness State
Sanford Municipal
Skyhaven
Concord Municipal
Portsmouth Int'l
Hawthorne Feather
Hampton
Dillant Hopkins
Manchester Boston Regional
Jaffrey Airport – Silver Ranch
Boire Field
Lawrence Municipal
Turners Falls
Orange Municipal
Gardner Municipal
Fitchburg Municipal
0 25 50 Miles
N
Prepared By:
McFarland Johnson
Source: GRANIT, Natural Earth.

4.3.2 POPULATION COVERAGE

Population coverage was assessed for each airport category by drive-time, and is summarized in this section. As shown on preceding Figures, individual airport drive time service areas overlap in some areas. Therefore, total population coverage noted in each table (i.e., for Basic, Local, Regional and National airports as a group, and Primary airports as a group) is not a sum of each individual category, but a combination of them. It should be noted that the population data does not include adjacent state data where the service area extends into an adjacent state.

For illustrative purposes, **Figures 4-6** through **4-8** that show service areas in terms of drive times also represent the areas of population that are served. Quantities and percentage served are for NH population data only and do not include adjacent state data.

Drive Time Population Evaluation

- **General Aviation Basic, Local, Regional, and National Airports:** System airports in these four categories combine to serve more than 1.0 million people in the state, or greater than 76 percent of the population. **Table 4-3** presents the breakdown of population coverage within a 30-minute drive time for system airports in these roles.

Table 4-3 – NHSASP – Drive Time Population Coverage by Basic, Local, Regional, and National Roles

AIRPORT CATEGORY	30-MINUTE DRIVE-TIME POPULATION COVERAGE
Basic Airports	330,878 / 24.1%
Local Airports	206,683 / 14.7%
Regional Airports	377,439 / 28.7%
National Airport	350,004 / 26.6%
Total Coverage	1,005,408 / 76.49%

Source: U.S. Census Bureau, Census Blocks, 2010

- **Primary Airports:** System airports in Primary roles combine to serve over 1.05 million people in the state, or 80 percent of the population. **Table 4-4** presents population coverage within a 60-minute drive time for system airports in the Primary role.

Table 4-4 – NHSASP – Drive Time Population Coverage by Primary Role

AIRPORT CATEGORY	60-MINUTE DRIVE-TIME POPULATION COVERAGE
Primary Airports	1,053,433 / 80%

Source: U.S. Census Bureau, Census Blocks, 2010

PORTSMOUTH, NH

MOUNT WASHINGTON RESORT, BRETTON WOODS, NH

- **All System Airports, 30-Minute Drive Time Coverage:** As described in the previous section, the analysis also included the application of 30-minute drive times for all system airports. This places all system airports on a level playing field in terms of providing coverage for general aviation users, such that National and Primary system airports are not unfairly weighted for providing GA services.

Population served within 30-minute drive time coverage areas for all system airports combine to serve over 1.12 million people, or about 84.3 percent of the state population.

4.3.3 EMPLOYMENT CENTER COVERAGE

Employment center coverage was assessed in the same way as population coverage, and for each airport category by drive-time. Coordinating with the Department of Resources and Economic Development (DRED), third party data available from Infogroup, Inc. was used for the top 50 employers in the state (2013); the same geographic analysis was performed to assess employment center coverage by system airports.

Table 4-5 shows the industries represented by NH's top 50 employers and total employment by these top 50 employers within these industries provided by the Infogroup dataset.

For the NH Airport System Plan, these top 50 employers are utilized to represent employment centers within the state.

Table 4-5 – NHSASP – Top 50 Employers in NH

EMPLOYMENT CENTER INDUSTRIES	EMPLOYMENT
Hospitals & Healthcare	28,460
Colleges & Universities	13,844
Manufacturing & Warehousing	8,458
Banking, Financial & Insurance	6,660
Retail & Wholesale	5,662
Recreation, Travel/Tourism, & Resorts	3,800
Skilled Trades & Craftsman*	3,500
Other General & Professional Services	3,802
Government & Utilities	1,650
Technology, Communications & Electronics	1,220
Total Employment, Top 50 Employers	77,056

Source: ReferenceUSAGov, infogroup, Inc.

Note: Skilled Trades & Craftsman category is the UA Local 788 Marine Pipefitters union. Infogroup data reports the mailing address as Portsmouth, NH; however, actual jobs' location is Portsmouth Naval Shipyard is located in Kittery, ME.

As described for population coverage, total employment center coverage noted in each table is not a sum of each individual category, but a combination of them so that employers are not counted twice. Quantities and percentage served are for NH employers only and do not include adjacent state employers or employment data.

Drive Time Employment Center Evaluation

- **Basic, Local, Regional, and National Airports:** System airports in these four categories combine to serve 45 of the top 50 employers. **Table 4-6** presents the breakdown of employment center coverage within a 30-minute drive time for system airports in these roles.

Table 4-6 – NHSASP – Drive Time Employment Center Coverage by Basic, Local, Regional, and National Roles

AIRPORT CATEGORY	30-MINUTE DRIVE-TIME TOP 50 EMPLOYER COVERAGE
Basic Airports	14 Top Employers
Local Airports	9 Top Employers
Regional Airports	19 Top Employers
National Airports	36 Top Employers
Total Coverage	45 Top Employers

Source: McFarland Johnson, Inc.

- **Primary Airports:** System airports in the Primary category combine to serve 42 of the top 50 employers. **Table 4-7** presents this data.

Table 4-7 – NHSASP – Drive Time Employment Center Coverage by Primary Role

AIRPORT CATEGORY	60-MINUTE DRIVE-TIME TOP 50 EMPLOYER COVERAGE
Primary Airports	42 Top Employers

Source: McFarland Johnson, Inc.

- **All System Airports, 30-Minute Drive Time Coverage:** As described in the previous section, the analysis also included the application of 30-minute drive times for all system airports. This places all system airports on a level playing field in terms of providing coverage for general aviation users, such that National and Primary system airports are not unfairly weighted for providing GA services.

Forty-nine of the top 50 employers are within 30-minute drive time coverage areas for all system airports.

4.3.4 AIR ACCESS COVERAGE

In addition to the analyses of service area coverage by airport category presented thus far, the analysis also considered service area coverage by system airports with specific infrastructure facilities. *Chapter 3, System Inventory*, includes a summary of all data collected for NHSASP airports. This section focuses on a set of key infrastructure elements that are important for aircraft owners and operators. The key infrastructure elements included in the analysis of air access coverage are:

- Runways of 3,200 Feet or Greater
- Runways of 5,000 Feet or Greater
- Precision Approach Capability
- Non-Precision Approach Capability
- On-Site Weather Reporting Service
- Avgas Fuel Service
- Jet-A Fuel Service

These key infrastructure elements are important decision factors for operators of aircraft common in the business/corporate aircraft fleet, and for attracting aircraft operators of all types.

As described at the opening of this chapter, the overarching assumption for evaluating the current performance of the NH state airport system is that an airport's performance is based upon its location relative to existing and prospective users. This section extends the analysis, and assigns a 20-nautical mile service area to system airports based upon the key infrastructure and aviation service elements that are available. Applying nautical mile service areas represents a measure of air access coverage and accessibility to NH via the regional and national air transportation system.

Additionally, as described in *Chapter 2, Facility Roles and Objectives*, special consideration was given to the effect that NH's northern geography has on the performance of system airports located there. In this regard, weather reporting services offered by system airports in the northern half of the state are constrained by the natural terrain and environs. To ensure that the performance evaluation reflected these conditions, a 15-nautical mile service area was utilized for those airports due to the limitations of radio frequency line of sight within the mountainous terrain of the region.

Coverage by System Airports with Runways of 3,200 Feet or Greater

- **3,200-Foot (or Greater) Runway Coverage:** System airports with primary runways 3,200 feet or greater in length combine to serve nearly 1.25 million people, or 94.9 percent of the population in the state and all 50 top employers. **Table 4-8** presents the breakdown of nautical mile coverage by these system airports. **Figure 4-10** illustrates this coverage.

Table 4-8 – NHSASP – Nautical Mile Coverage by System Airports with 3,200-Foot Runways or Greater

COVERAGE TYPE	20 NAUTICAL MILE COVERAGE
Geographic Area	8,038 SQMI / 86%
Population	1,249,330 / 94.9%
Top 50 Employers	50 Top Employers

Source: McFarland Johnson, Inc.

Coverage by System Airports with Runways of 5,000 Feet or Greater

- **5,000-Foot (or Greater) Runway Coverage:** System airports with runways 5,000 feet or greater combine to serve 1.216 million people, or 92.4 percent of the population in the state and 47 of the top 50 employers. **Table 4-9** presents the breakdown of nautical mile coverage by these system airports. **Figure 4-11** illustrates this coverage.

Table 4-9 – NHSASP – Nautical Mile Coverage by System Airports with 5,000-Foot Runways

COVERAGE TYPE	20 NAUTICAL MILE COVERAGE
Geographic Area	6,810 SQMI / 72.8%
Population	1.216 million / 92.4%
Top 50 Employers	47 Top Employers

Source: McFarland Johnson, Inc.

Coverage by System Airports with Precision Approach Capability

- **Precision Approach Coverage:** System airports offering precision approach capability combine to serve 1.193 million people, or 90.6 percent of the population in the state and 47 of the top 50 employers. **Table 4-10** presents the breakdown of nautical mile coverage by these system airports. **Figure 4-12** illustrates this coverage.

Table 4-10 – NHSASP – Nautical Mile Coverage by System Airports with Precision Approach Capability

COVERAGE TYPE	20 NAUTICAL MILE COVERAGE
Geographic Area	5,689 SQMI / 60.9%
Population	1.193 million / 90.6%
Top 50 Employers	47 Top Employers

Source: McFarland Johnson, Inc.

Coverage by System Airports with Non-Precision Approach Capability

- **Non-Precision Approach Coverage:** System airports with non-precision approach capability combine to serve more than 1.26 million people, or 96.3 percent of the population in the state and all 50 top employers. **Table 4-11** presents the breakdown of nautical mile coverage by these system airports. **Figure 4-13** illustrates this coverage.

Table 4-11 – NHSASP – Nautical Mile Coverage by System Airports with Non-Precision Approach Capability

COVERAGE TYPE	20 NAUTICAL MILE COVERAGE
Geographic Area	8,239 SQMI / 88.1%
Population	1,267,760 / 96.3%
Top 50 Employers	50 Top Employers

Source: McFarland Johnson, Inc.

FIGURE 4-10:

20 NAUTICAL MILES: PRIMARY RUNWAYS 3,200 FEET OR GREATER

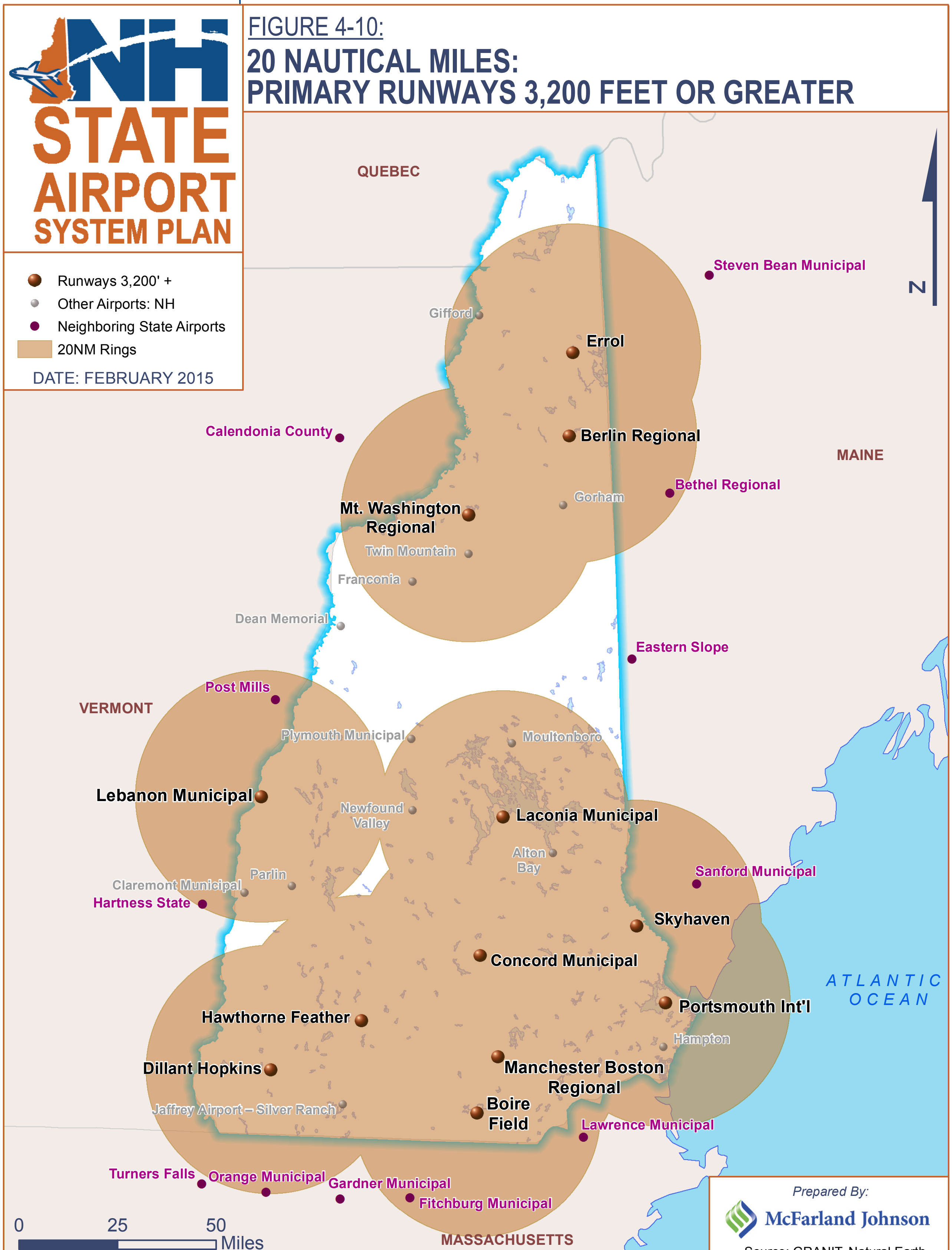


FIGURE 4-11:
20 NAUTICAL MILES: PRIMARY RUNWAYS 5,000 FEET OR GREATER

FIGURE 4-12:
20 NAUTICAL MILES: PRECISION APPROACHES

FIGURE 4-13:

20 NAUTICAL MILES: NON-PRECISION APPROACHES

Coverage by System Airports with On-Site Weather Reporting Service

- **On-Site Weather Reporting Service Coverage:** System airports with on-site official weather reporting service combine to serve 1.245 million people, or 94.6 percent of the population in the state and 49 of the top 50 employers. **Table 4-12** presents the breakdown of nautical mile coverage by these system airports. **Figure 4-14** illustrates this coverage, with system airports north of the lakes region assigned 15 nautical mile radius.

Table 4-12 – NHSASP – Nautical Mile Coverage by System Airports with On-Site Weather Reporting Service

COVERAGE TYPE	20 NAUTICAL MILE COVERAGE
Geographic Area	7,566 SQMI / 80.9%
Population	1.245 million / 94.6%
Top 50 Employers	49 Top Employers

Source: McFarland Johnson, Inc.

Coverage by System Airports that Offer Avgas Fuel Service

- **Avgas Fuel Service Coverage:** System airports offering Avgas fuel service combine to serve more than 1.28 million people, or 97.6 percent of the population in the state and all 50 top employers. **Table 4-13** presents the breakdown of nautical mile coverage by these system airports. **Figure 4-15** illustrates this coverage.

Table 4-13 – NHSASP – Nautical Mile Coverage by Airports with Avgas Fuel Service

COVERAGE TYPE	20 NAUTICAL MILE COVERAGE
Geographic Area	8,653 SQMI / 77.3%
Population	1,284,874 / 97.6%
Top 50 Employers	50 Top Employers

Source: McFarland Johnson, Inc.

Coverage by System Airports that Offer Jet-A Fuel Service

- **Jet-A Fuel Service Coverage:** System airports offering Jet-A fuel service combine to serve roughly 1.21 million people, or 92.3 percent of the population in the state and 47 of the top 50 employers. **Table 4-14** presents the breakdown of nautical mile coverage by these system airports. **Figure 4-16** illustrates this coverage.

Table 4-14 – NHSASP – Nautical Mile Coverage by Airports with Jet-A Fuel Service

COVERAGE TYPE	20 NAUTICAL MILE COVERAGE
Geographic Area	6,794 SQMI / 72.7%
Population	1.21 million / 92.3%
Top 50 Employers	47 Top Employers

Source: McFarland Johnson, Inc.

FIGURE 4-14:
20 NAUTICAL MILES: ON-SITE WEATHER REPORTING

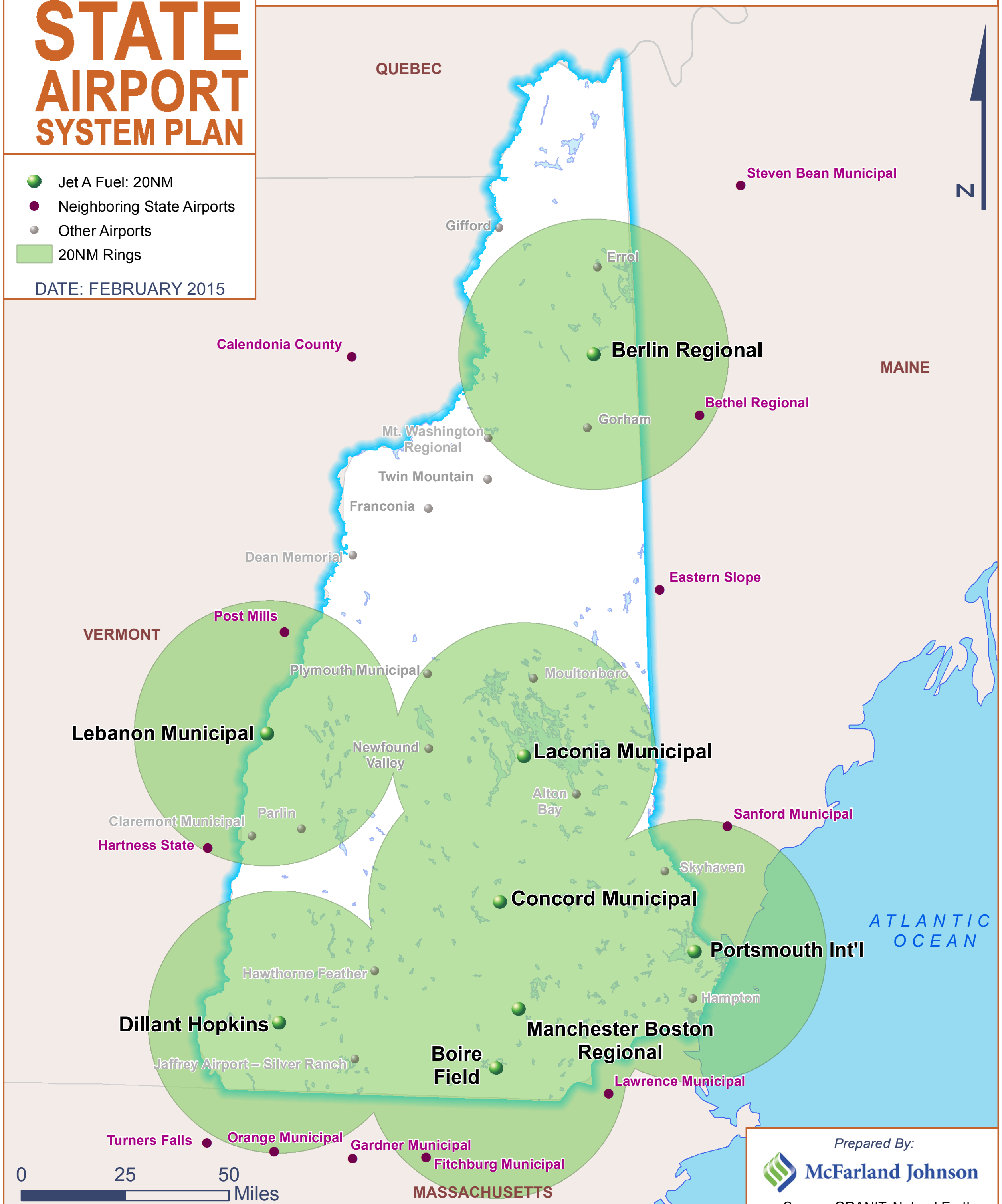
NH STATE AIRPORT SYSTEM PLAN

FIGURE 4-15:

20 NAUTICAL MILES: AVGAS FUELING

FIGURE 4-16:

20 NAUTICAL MILES: JET A FUELING



4.3.5 ANALYSIS SUMMARY

The evaluation of NH airport system performance in terms of service area, population, employment center, and air access coverage presented and illustrated in this section can be summarized as follows:

- **Drive Time Coverage Evaluation:** The NH state airport system serves approximately 90 percent of the state's land area, which accounts for 86 percent of the population and 49 of the top 50 employers. A significant percentage of the population and employment centers are predominantly located in the southern part of the state. Given this density of socioeconomic activity, and the geographic reach of system Primary airports, a high percentage of population and employment centers are served by the existing system. Similarly, the high number of general aviation system airports also combines to serve a high percentage of population and employment centers.

A breakdown of general aviation airports, Primary airports, and general aviation services provided at all system airports yields the following coverages:

- **General Aviation Airports Coverage:** System airports in General Aviation Basic, Local, Regional, and National roles serve approximately 62 percent of the state's land area, 76 percent of state population, and 45 of the top 50 employers.

- **Primary Airports Coverage:** System airports in Primary role serve approximately 58 percent of the state's land area, 80 percent of state population, and 42 of the top 50 employers.

- **General Aviation Services Coverage:** General aviation services at all system airports combine to serve 67 percent of the state's land area, 85 percent of the state population, and 49 of the top 50 employers.

These breakdowns indicate that the number of airports in the southern part of the state benefits owners, operators, and passengers by providing multiple options for which system airports to utilize. Notably, general aviation services coverage by all system airports reaches 85 percent of the population and 49 of the top 50 employers.

- **Air Access Coverage Evaluation:** Measuring specific airport features described in this chapter provides insight into how system airports with certain capabilities serve general aviation aircraft owners and operators of different types of aircraft. Certain features were found to have moderate correlations, such that coverage by system airports with 3,200-foot runways or greater is similar to system airports with non-precision approach capability. Similarly, coverage by system airports with 5,000-foot runways or greater correlate to system airports with precision approach capability.

Air access coverage by feature is as follows:

- **3,200-Foot Runway Coverage:** System airports with at least 3,200-feet of primary runway represent those facilities that can accommodate light twin-engine and small turbo-prop aircraft. System airports with 3,200-foot runways serve approximately 86 percent of the state's land area, nearly 95 percent of state population, and all of the top 50 employers.
- **5,000-Foot Runway Coverage:** System airports with at least 5,000-feet of primary runway represent those facilities that are best-suited to accommodate sophisticated business/corporate aircraft. System airports with 5,000-foot runways serve approximately 73 percent of the state's land area, nearly 92 percent of state population, and 47 of the top 50 employers.
- **Precision Approach Coverage:** System airports with precision approach capability also represent those facilities that can accommodate sophisticated business/corporate aircraft, as well as commercial passenger aircraft, under the most challenging weather and instrument flight rules (IFR) conditions. System airports with precision approach capability serve approximately 61 percent of the state's land area, nearly 91 percent of state population, and 47 of the top 50 employers.
- **Non-Precision Approach Coverage:** System airports with non-precision approach capability represent those facilities that are equipped to accommodate operators during adverse weather conditions, but without sophisticated Instrument Landing Systems (ILS). System airports with non-precision approach capability serve approximately 88 percent of the state's land area, nearly 96 percent of state population, and all of the top 50 employers.
- **On-Site Weather Reporting Coverage:** System airports with on-site weather reporting systems aid all pilots, especially during changing weather conditions. System airports with on-site weather reporting systems serve approximately 81 percent of the state's land area, nearly 95 percent of state population, and 49 of the top 50 employers.
- **Avgas Fueling Coverage:** System airports offering Avgas (100LL) fueling are important facilities for both based and transient, piston-powered aircraft. System airports with Avgas fueling serve approximately 77 percent of the state's land area, nearly 98 percent of state population, and all of the top 50 employers.
- **Jet-A Fueling Coverage:** System airports offering Jet-A fueling are important facilities for based and transient turbo-prop and jet aircraft. System airports with Jet-A fueling serve approximately 73 percent of the state's land area, nearly 92 percent of state population, and 47 of the top 50 employers.

The next section identifies existing geographic service gaps by drive times and air access metrics, which will highlight areas of the state that may warrant future improvements to enhance facilities and services at system airports.

4.4 EXISTING SERVICE GAPS

Based upon the geographic analyses performed and land area coverage presented in beginning of this section, geographic service gaps within NH's state airport system have been identified. Geographic service gaps for the System are illustrated in **Figure 4-17**. These geographic service gaps are areas of NH that are not located within a 30-minute drive from General Aviation Basic, Local, Regional, and National airports, and a 60-minute drive from Primary airports. These gaps are quantified in terms of land area, population, and employment centers in **Table 4-14**.

Table 4-15 – NHSASP – Service Gaps by Drive Times; Geographic, Population & Employment Center Gaps

COVERAGE TYPE	SERVICE GAPS
Geographic Service Gap – All Airports	935 SQMI / 10%
Population Service Gap – All Airports	184,306 / 14%
Employment Center Service Gap – All Airports	1 Top Employer

Source: McFarland Johnson, Inc.

As shown, the NH state airport system does not reach 10 percent of state land area, 14 percent of state population, and one of the Top 50 employers. These gaps represent areas, people, and businesses that are underserved by the current airport system.

Table 4-16 breaks down these service gaps by General Aviation airport roles and Primary role. Additionally, gaps are also quantified for general aviation services, where Primary Airports are assigned 30-minute drive times.

Table 4-16 – NHSASP – Service Gaps by Airport Role Drive Times; Geographic, Population & Employment Center Gaps

COVERAGE TYPE	SERVICE GAPS
Geographic Service Gap – Basic, Local, Regional, & National Airports	3,532 SQMI / 37.8%
Geographic Service Gap – Primary Airports	3,911 SQMI / 41.8%
Geographic Service Gap – General Aviation Services	3,113 SQMI / 33.3%
Population Service Gap – Basic, Local, Regional, & National Airports	311,062 / 23.6%
Population Service Gap – Primary Airports	263,037 / 20.0%
Population Service Gap – General Aviation Services	193,477 / 14.7%
Employment Service Gap – Basic, Local, Regional, & National Airports	6 Top Employers
Employment Service Gap – Primary Airports	9 Top Employers
Employment Center Service Gap – General Aviation Services	1 Top Employer

Source: McFarland Johnson, Inc.

FIGURE 4-17:
DRIVE TIME COVERAGE GAPS:
30 MINUTE DRIVE TIME: BASIC, LOCAL, REGIONAL, & NATIONAL AIRPORTS /
60 MINUTE DRIVE TIME: PRIMARY AIRPORTS

As presented in **Table 4-16**, the geographic analysis of service area coverage by drive times indicates that the existing NH Airport System performs as follows:

- **General Aviation Airports Gap:** General aviation airports do not reach approximately 38 percent of NH land area, which accounts for nearly 24 percent of the population and six of the top 50 employers. However, when Primary airports are included, these gaps are reduced to 33 percent and 15 percent respectively, and one top employer. These gaps represent geographic area, population, and employment centers not within a 30-minute drive to a system airport.
- **Primary Airport Gap:** Approximately 42 percent of the state land area, which accounts for 20 percent of the population. Nine of the top 50 employers are not within 60-minute drive of Primary airports.
- **General Aviation Services Gap:** When all system airports are assigned 30-minute drive times to measure the reach of general aviation services provided by all system airports, there is a gap of about 33 percent of state land area, which accounts for nearly 15 percent of the state population.

4.4.1 AIR ACCESS GAPS

In addition to service gaps described above, gaps have also been identified by air access features. Thus, there are people, businesses and areas of the state that are not within 20 nautical miles of a system airport with certain features. The following bullets present the analysis of Air Access gaps.

- **Runway Length Service Gap: Table 4-17** shows that the system's airports with at least 3,200 feet of primary runway do not reach four percent of state population. System airports with at least 5,000 feet of runway length do not reach eight percent of the population and three of the top 50 employers. **Figures 4-18** and **4-19** illustrate these service gap areas.

Table 4-17 – NHSASP – Service Gaps by Runway Length

COVERAGE TYPE	SERVICE GAPS
Runways of 3,200 Feet or Greater Coverage Gap	
Geographic Service Gap	1,312 SQMI / 14%
Population Service Gap	67,139 / 4.1%
Employment Center Service Gap	N/A
Runways of 5,000 Feet or Greater Coverage Gap	
Geographic Service Gap	2,540 SQMI / 27.2%
Population Service Gap	100,470 / 7.6%
Employment Center Service Gap	3 Top Employers

Source: McFarland Johnson, Inc.

- **Approach Capability Service Gap:** As shown in **Table 4-18**, the system's airports with non-precision approach capability do not reach four percent of state population. System airports with precision approach capability do not reach nine percent of the population and three of the top 50 employers. **Figures 4-20 and 4-21** illustrate these service gap areas.

ASOS

Table 4-18 – NHSASP – Service Gaps by Approach Capability

COVERAGE TYPE	SERVICE GAPS
Non-Precision Approach Coverage Gap	
Geographic Service Gap	1,111 SQMI / 11.9%
Population Service Gap	48,709 / 3.7%
Employment Center Service Gap	N/A
Precision Approach Coverage Gap	
Geographic Service Gap	3,661 SQMI / 39.2%
Population Service Gap	123,470 / 9.4%
Employment Center Service Gap	3 Top Employers

Source: McFarland Johnson, Inc.

- **On-Site Weather Reporting Service Gap: Table 4-19** shows that the system's on-site weather reporting services do not reach 19 percent of state land area. **Figure 4-22** illustrates these service gap areas, with northern airports assigned 15 nautical mile radii.

Table 4-19 – NHSASP – Service Gaps by On-Site Weather Reporting Capability

COVERAGE TYPE	SERVICE GAPS
Geographic Service Gap	1,784 SQMI / 19.1%
Population Service Gap	71,470 / 4.4%
Employment Center Service Gap	1 Top Employer

Source: McFarland Johnson, Inc.

- **Fuel Services Gap:** As shown in **Table 4-20**, the system's Avgas fueling services do not reach two percent of state population, and Jet-A fueling services do not reach eight percent of the population and three of the top 50 employers. **Figures 4-23 and 4-24** illustrate these service gap areas.

Table 4-20 – NHSASP – Service Gaps by Fuel Service

COVERAGE TYPE	SERVICE GAPS
Avgas Fuel Service Coverage Gap	
Geographic Service Gap	697 SQMI / 7.5%
Population Service Gap	31,595 / 2.4%
Employment Center Service Gap	N/A
Jet-A Fuel Service Coverage Gap	
Geographic Service Gap	2,556 SQMI / 27.3%
Population Service Gap	106,470 / 8.1%
Employment Center Service Gap	3 Top Employers

Source: McFarland Johnson, Inc.

FIGURE 4-18:
AIR ACCESS COVERAGE GAPS:
20 NAUTICAL MILES:
PRIMARY RUNWAYS 3,200 FEET OR GREATER
NH STATE AIRPORT SYSTEM PLAN
Runways 3,200' +
Other Airports: NH
Neighboring State Airports
Gap Areas
DATE: FEBRUARY 2015
QUEBEC
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
N
Steven Bean Municipal
Gifford
Errol
Calendonia County
Berlin Regional
Bethel Regional
Gorham
Mt. Washington Regional
Twin Mountain
Franconia
Dean Memorial
Eastern Slope
Post Mills
Plymouth Municipal
Moultonboro
Lebanon Municipal
Newfound Valley
Laconia Municipal
Alton Bay
Parlin
Claremont Municipal
Hartness State
Sanford Municipal
Skyhaven
Concord Municipal
Portsmouth Int'l
Hawthorne Feather
Hampton
Dillant Hopkins
Manchester Boston Regional
Jaffrey Airport – Silver Ranch
Boire Field
Lawrence Municipal
Turners Falls
Orange Municipal
Gardner Municipal
Fitchburg Municipal
0
25
50
Miles
Prepared By:
McFarland Johnson
Source: GRANIT, Natural Earth.

FIGURE 4-19:
AIR ACCESS COVERAGE GAPS:
20 NAUTICAL MILES:
PRIMARY RUNWAYS 5,000 FEET OR GREATER

FIGURE 4-20:

AIR ACCESS COVERAGE GAPS: 20 NAUTICAL MILES: PRECISION APPROACHES

FIGURE 4-21:
AIR ACCESS COVERAGE GAPS:
20 NAUTICAL MILES:
NON-PRECISION APPROACHES

FIGURE 4-22: AIR ACCESS COVERAGE GAPS: 20 NAUTICAL MILES: ON-SITE WEATHER REPORTING

FIGURE 4-23: AIR ACCESS COVERAGE GAPS: 20 NAUTICAL MILES: AVGAS FUELING


NH STATE AIRPORT SYSTEM PLAN
FIGURE 4-24:
AIR ACCESS COVERAGE GAPS:
20 NAUTICAL MILES:
JET-A FUELING
Jet A Fuel
Other Airports: NH
Neighboring State Airports
Gap Areas
DATE: FEBRUARY 2015
QUEBEC
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
N
Steven Bean Municipal
Gifford
Errol
Calendonia County
Berlin Regional
Bethel Regional
Gorham
Mt. Washington Regional
Twin Mountain
Franconia
Dean Memorial
Eastern Slope
Post Mills
Plymouth Municipal
Moultonboro
Lebanon Municipal
Newfound Valley
Laconia Municipal
Alton Bay
Parlin
Claremont Municipal
Hartness State
Sanford Municipal
Skyhaven
Concord Municipal
Portsmouth Int'l
Hawthorne-Feather
Hampton
Dillant Hopkins
Manchester Boston Regional
Boire Field
Jaffrey Airport – Silver Ranch
Lawrence Municipal
Turners Falls
Orange Municipal
Gardner Municipal
Fitchburg Municipal
0 25 50 Miles
Prepared By:
McFarland Johnson
Source: GRANIT, Natural Earth.

4.4.2 ANALYSIS SUMMARY

The evaluation of NH airport system service coverage can be summarized as follows:

- **Drive Time Gaps Evaluation:** The primary areas of NH that are not covered by system airports are portions of the White Mountains region, near Conway, and significant parts of the Great North Woods region, which is sparsely populated and mostly timber farms. Notably, these areas account for just 14 percent of the state population, and 10 percent of land area, and just one of the top 50 employers. As described in previous sections, this reflects the higher density of population and economic activity that takes place in the southern part of the state.

A breakdown of by general aviation airports, Primary airports, and general aviation services provided at all system airports yields the following service gaps:

- **General Aviation Airports Coverage**: System airports in General Aviation Basic, Local, Regional, and National roles do not reach approximately 38 percent of the state's land area, 24 percent of state population, and five of the top 50 employers.
- **Primary Airports Coverage:** System airports in Primary role do not reach approximately 42 percent of the state's land area, 20 percent of state population, and eight of the top 50 employers.
- **General Aviation Services Coverage:** General aviation services at all system airports do not reach 33 percent of the state's land area and 15 percent of the state population.

These breakdowns indicate that while sizable portions of the state's land area may be outside the 20 nautical mile coverage area for system airports, just 15 percent of the population is underserved by general aviation services and all top 50 employers are served.

- **Air Access Coverage Evaluation**: The primary areas of NH that are not covered by air access features are similar to drive time gaps and include the White Mountains and Great North Woods Regions. Air access coverage gaps by feature is as follows:
- **3,200-Foot Runway Coverage:** System airports with at least 3,200-feet of primary runway represent those facilities that can accommodate light twin-engine and turbo-prop aircraft. System airports with 3,200-foot runways do not reach approximately 14 percent of the state's land area and five percent of state population.
- **5,000-Foot Runway Coverage:** System airports with at least 5,000-feet of primary runway represent those facilities that are best-suited to accommodate sophisticated business/corporate aircraft. System airports with 5,000-foot runways do not reach 27 percent of the state's land area, eight percent of state population, and three of the top 50 employers.

- **Precision Approach Coverage:** System airports with precision approach capability also represent those facilities that can accommodate sophisticated business/corporate aircraft, as well as commercial passenger aircraft, under the most challenging weather and IFR conditions. System airports with precision approach capability do not reach approximately 39 percent of the state's land area, eight percent of state population, and three of the top 50 employers.

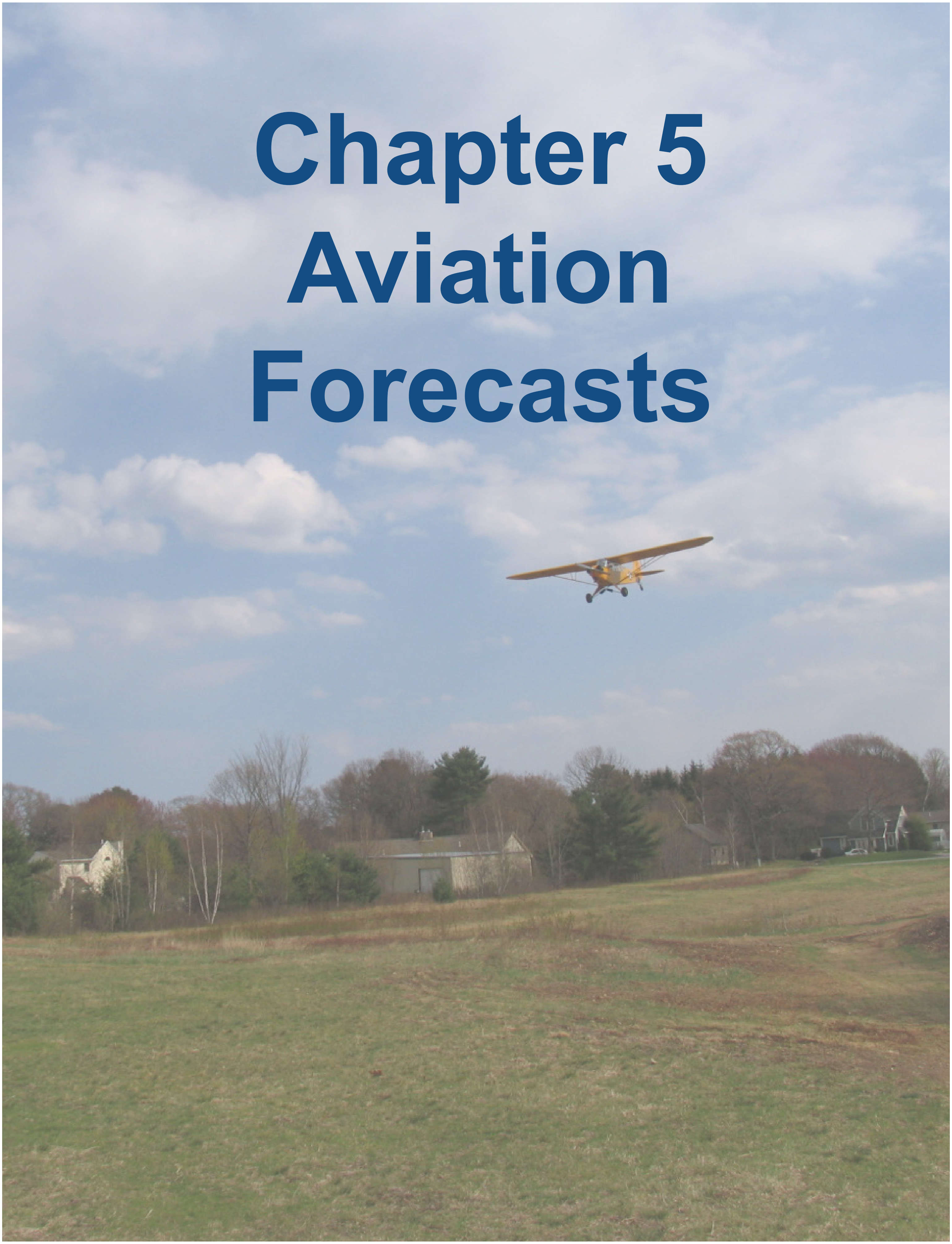
- **Non-Precision Approach Coverage:** System airports with non-precision approach capability represent those facilities that are equipped to accommodate operators during adverse weather conditions, but without ILS equipment. System airports with non-precision approach capability do not reach approximately 12 percent of the state's land area and four percent of state population.

- **On-Site Weather Reporting Coverage:** System airports with on-site weather reporting systems represent those facilities that aid all pilots, especially during changing weather conditions. System airports with on-site weather reporting systems do not reach approximately 19 percent of the state's land area and five percent of state population.

- **Avgas Fueling Coverage:** System airports offering Avgas (100LL) fueling are important facilities for both based and transient, piston-powered aircraft. System airports with Avgas fueling do not reach approximately 23 percent of the state's land area and two percent of state population.

- **Jet-A Fueling Coverage:** System airports offering Jet-A fueling are important facilities for based and transient turbo-prop and jet aircraft. System airports with Jet-A fueling do not reach approximately 27 percent of the state's land area, eight percent of state population, and three of the top 50 employers.

Chapter 5 Aviation Forecasts



CHAPTER 5: AVIATION FORECASTS

5.1 INTRODUCTION

A key element in the development of a state airport system plan is projecting aviation demand at both the local and state level. The demand projections provide insight into how aviation activity is anticipated to change over time. The changes in activity are used to determine if facility and service improvements are needed to serve the projected demand. Future aviation demand forecasts may also suggest other needs related to airport roles. Details of aviation demand projections for this study's 24 public-use airports comprising the New Hampshire (NH) statewide airport system are presented in this chapter. Note that Alton Bay, a seasonal public-use facility on Lake Winnipesaukee is not included in the aviation projections included in this plan due to its seasonal nature and lack of based aircraft.

Both commercial and general aviation positively affect the U.S. economy. For purposes of the NH Statewide Airport System Plan (NHSASP), the focus on the aviation forecasts is on general aviation activities. General Aviation (GA) is defined as all aviation activity other than commercial airline and military operations. It encompasses a wide variety of aviation activities including private/recreational flying, flight instruction, business jet operations, emergency medical/air ambulance services, aerial vegetation management, photography, and surveying among others. GA operations are conducted through the use of a diverse group of aircraft ranging from gliders and single- and multi-engine piston driven aircraft, to high-performance, long-range business jet aircraft.

General aviation is an important transportation resource in the U.S. and the demand for business jet aircraft and services has grown in recent years. Safety and security concerns for corporate executive staff and flight delays at some U.S. airports have made on demand, corporate, and fractional ownership charter flights more prudent than traveling on scheduled air carriers for a certain segment of the population.

The Federal Aviation Administration (FAA) Aerospace Forecast for the period 2014-2034 indicates that while economic uncertainties still affect the business jet market, the rate of decline has slowed in the recent past and a recovery is expected in the near term, with a robust outlook in the long-term. This is due to overall higher corporate profits and the growth of worldwide GDP 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 will expand at a faster pace than that for personal and recreational use.

This chapter presents the aviation demand forecast in the following sections:

- Historical Airport Data and Activity Measures
- Forecast Methodology
- Airport Activity Forecasts
- Summary of Forecasted System Activity

5.2 HISTORICAL AIRPORT DATA AND ACTIVITY MEASURES

During the process of forecasting aeronautical activity at an airport, or in this case a system of airports, understanding the demand for aviation-related services is extremely important. Two key components in conducting this evaluation are drawing relationships between the number of based aircraft and the number of aircraft operations. For this system planning effort, an airport inventory for each airport was conducted. During this process, significant data was collected, including based aircraft and annual aircraft operations.

5.2.1 HISTORICAL BASED AIRCRAFT

The FAA defines a based aircraft as one that is operational and airworthy and which is typically operated from the airport for the majority of the year. According to NH Department of Transportation Bureau of Aeronautics (BOA) records, there were 1,066 registered based aircraft reported for the 24 study airports which for the purposes of this forecasting effort will be used to represent the current total based aircraft in NH, although based on the data collection survey used for this study, *Chapter 3, System Inventory,* indicated 1,134 based aircraft across the 24 airports. This discrepancy may indicate that some of the same NH based aircraft are being counted at multiple airports.

Evaluation of FAA's based aircraft data reveals that from 2009 to 2012 the number of aircraft based in New England and NH decreased. In fact, based on NH state data, since 2004 the total based aircraft in NH has been declining while New England as a whole saw growth in based aircraft from 2003 until 2009. As of 2013, NH bases roughly 18 percent of all aircraft in New England.

5.2.2 NEW ENGLAND REGIONAL TRENDS

A recent study of general aviation in the New England region (NERASP-GA) indicated that over an 11-year period from 2000 to 2010 the total number of active aircraft in New England varied cyclically from year to year, with a peak in 2004 and troughs in 2002 and 2006. There appears to have been a significant decline in the region's active aircraft since 2007. Whether this is just another cyclical trough due to the recent economic recession or the start of a longer-term trend will not become clear until more recent data becomes available. During that 11 year period, the cyclical pattern varied by state, with Connecticut, Maine and NH having the greatest declines in 2002 and Maine having the greatest decline in 2006.

The NERASP study also indicated that the New England region in total has a significantly lower ratio of active aircraft to population than the U.S., and in particular from 2008 to 2010 the ratio declined more steeply for New England than for the U.S. in total. The study also showed that from 2000 to 2007 the ratio of active aircraft to population was fairly stable, with some fluctuation from year to year, particularly the decline in the two years following the 2001 recession and during the steady increase in fuel prices from 2004 to 2006.

The combination of the dramatic increases in oil prices in the summer of 2008 and the Great Recession that began at the end of 2007 and lasted until mid-2009, resulted in a fairly steady decline in the ratio of active aircraft to population for both the U.S. and New England to levels in 2010 comparable to or below the lowest levels in the previous ten years. Recent data suggests that the decline has continued beyond 2010 which may have contributed from historically high fuel prices since 2010.

The NERASP study also indicated that the ratio of active aircraft per 100,000 people varies widely across the New England region from year to year, with the more urbanized states, Connecticut, Massachusetts, and Rhode Island, having significantly lower numbers of active aircraft per 100,000 people than the other three states. Although NH was shown to have the highest ratio of active aircraft to population of the New England states, the study showed a declining trend for NH over an 11-year period (2000-2010). Conversely, the ratio for Maine showed a slowly increasing trend over the same period.

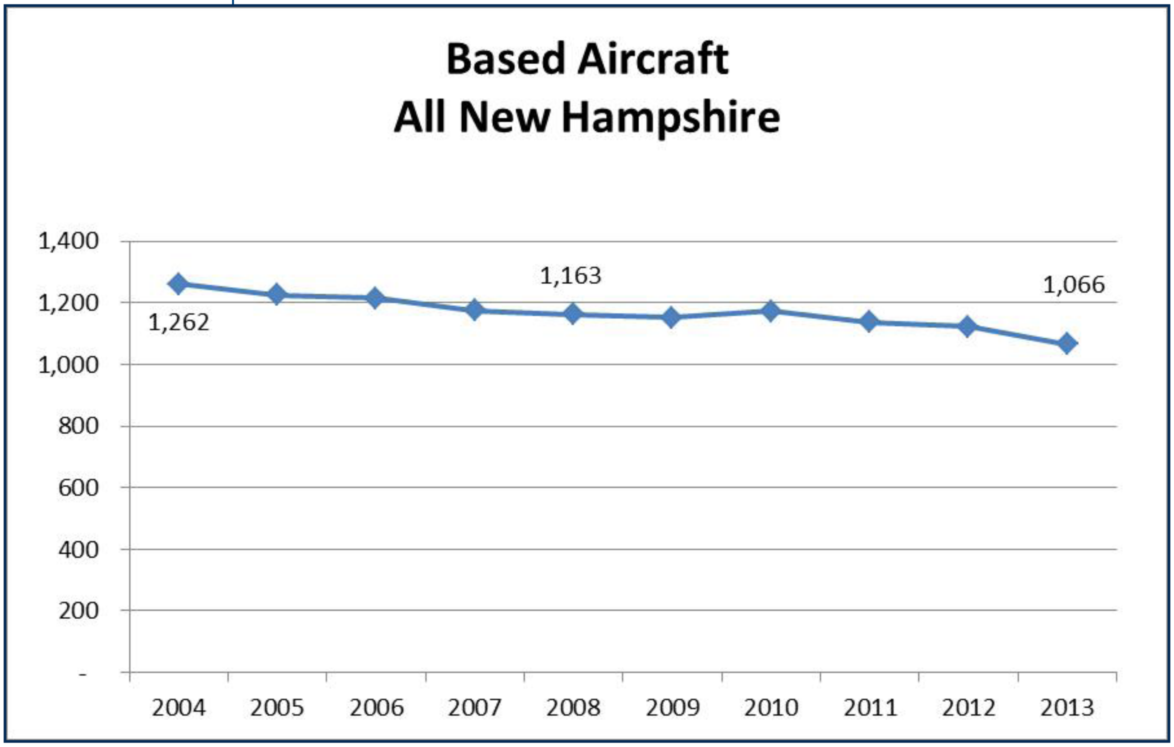
The study also looked at the average hours flown per year by active aircraft for the U.S. as a whole and New England overall. Average aircraft utilization for the U.S. indicated a steadily declining long-term trend, with possibly a recovery starting in 2010. The long-term trend in average aircraft utilization 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. Excluding the data for Connecticut, the combined average aircraft utilization for the other five New England states with the exception of 2002, showed a declining long-term trend with values significantly below those for the U.S.

5.2.3 HISTORICAL NH TRENDS

Figure 5-1 illustrates historical based aircraft data in NH while **Figure 5-2** illustrates the relationship between based aircraft in New England and the number of based aircraft in NH. The figure displays historical based aircraft data since 2004. The similarities in based numbers on a regional and state level indicate there is a general correlation of aviation activity within the region and activity within the NH system of airports. New England region saw a 17 percent decline in based aircraft over the past ten years while NH saw a 15.5 percent decline.

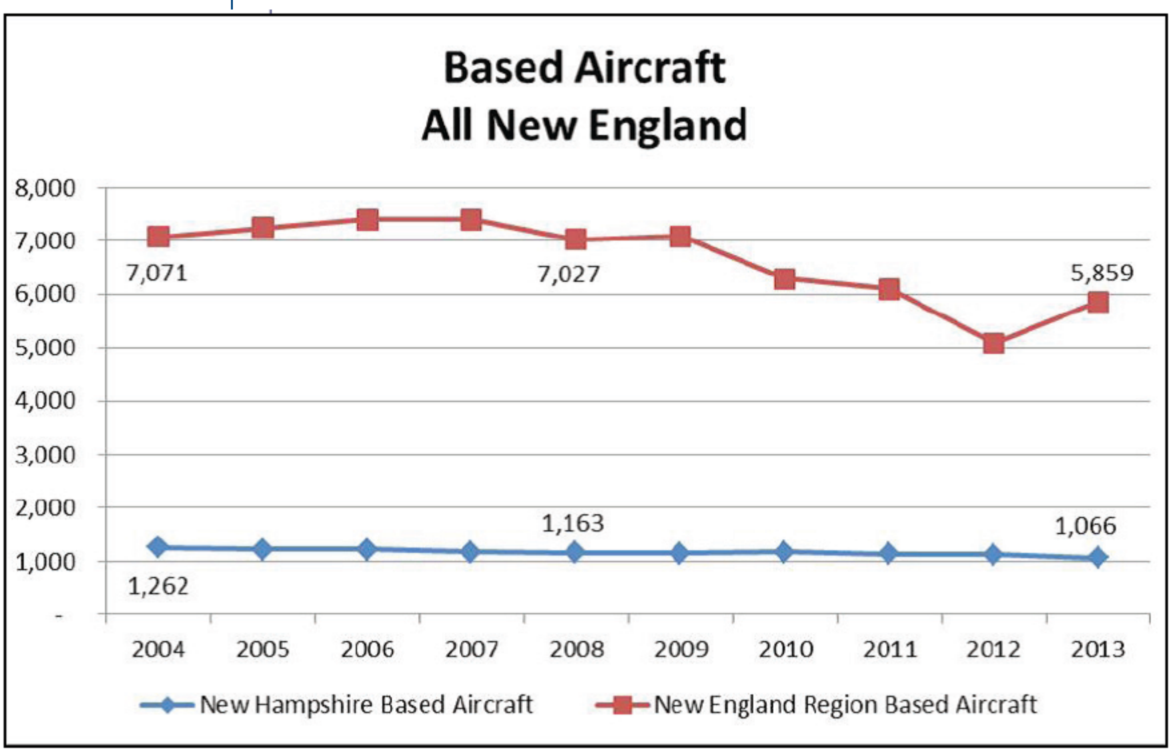
The General Aviation survey data used to produce the FAA Aerospace Forecasts showed that between 2010 and 2012 the number of active GA aircraft based on aircraft registration figures went down by 6.4 percent, from 223,370 to 209,034. During that same time period, NH experienced a 4.3 percent decline of registered aircraft from 1,173 to 1,122. From 2012 to 2013 NH saw a 5.4 percent decline. The FAA Aerospace forecast indicates that between 2012 and 201 the total national general aviation fleet declined by roughly 3 percent, from 209,034 to 202,865.

Figure 5-1 - NH Historical Based Aircraft (2004-2013)



Source: BOA Reported Data

Figure 5-2 - Based Aircraft Comparison (2004-2013)



Source: BOA Reported Data

5.2.4 HISTORICAL AIRCRAFT OPERATIONS

The FAA categorizes an aircraft operation, a takeoff or a landing, into varied groups. These categories include commercial operations (air carrier, air taxi and commuter), general aviation, and military activity. For the purposes of this study, general aviation operations are used and identify aircraft takeoffs and landings not classified as air carrier or military. Unless an airport has an air traffic control tower (ATC) facility, aircraft operations activity at airports is merely an estimate. Activity at airports with air traffic control towers are systematically recorded and reported.

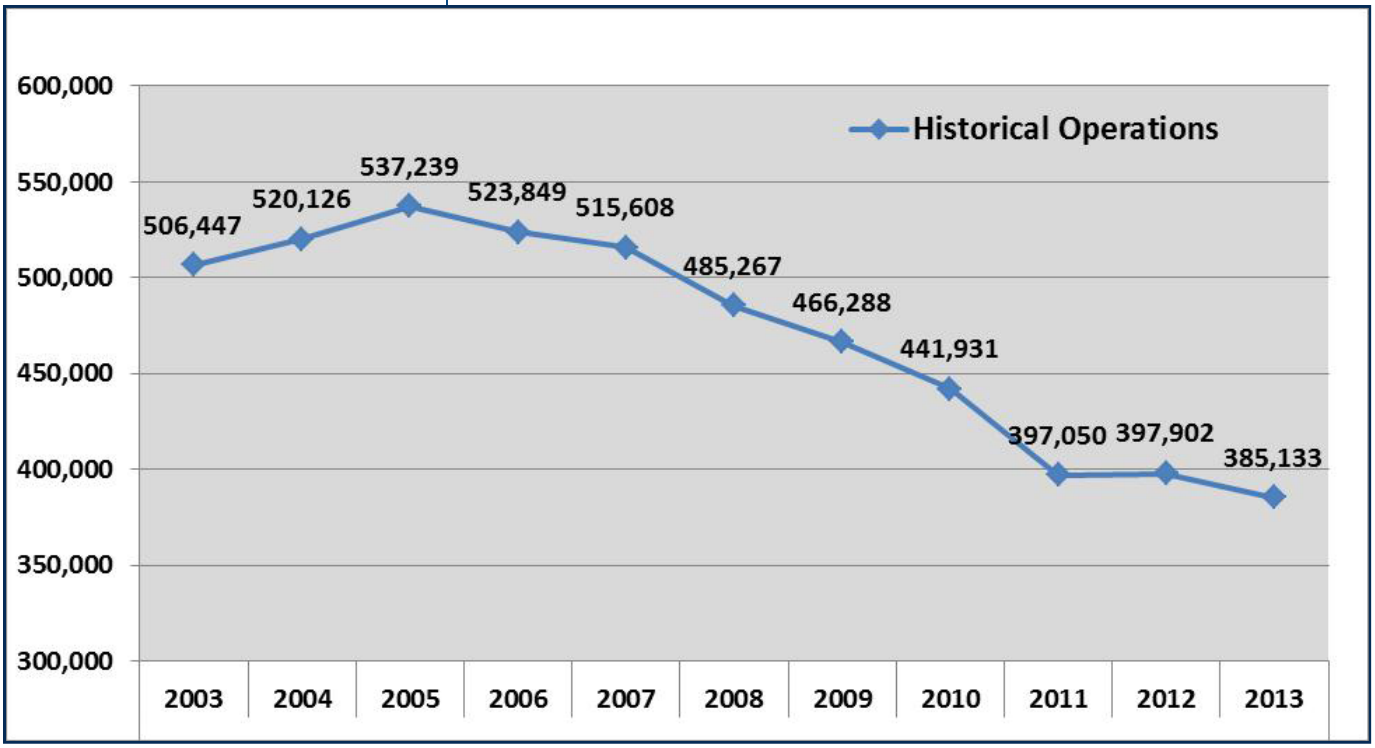
As with all of the data collected for the forecast, the operations data for the system airports was collected from various sources. As noted, most annual aircraft operations reported by the airports are estimates of activity. Since the FAA Air Traffic Activity Data System (ATADS) is most accurate, the ATADS data was used where available and supplemented with FAA Terminal Area Forecast Data for the airports without an air traffic control tower.

Of the 24 study airports considered for this forecast, historical aircraft operations data was readily available for 15 airports through the FAA Terminal Area Forecast or the ATADS system. These airports include:

- Berlin Regional
- Boire Field
- Claremont Municipal
- Concord Municipal
- Dean Memorial
- Dillant-Hopkins
- Laconia Municipal
- Lebanon Municipal
- Manchester-Boston Regional
- Mt. Washington Regional
- Portsmouth International at Pease
- Skyhaven
- Jaffrey Airport-Silver Ranch
- Parlin Field
- Plymouth Municipal

Figure 5-3 shows the historical trend of GA operations in NH from 2003-2013.

Figure 5-3 - Historical Operations (2003-2013)



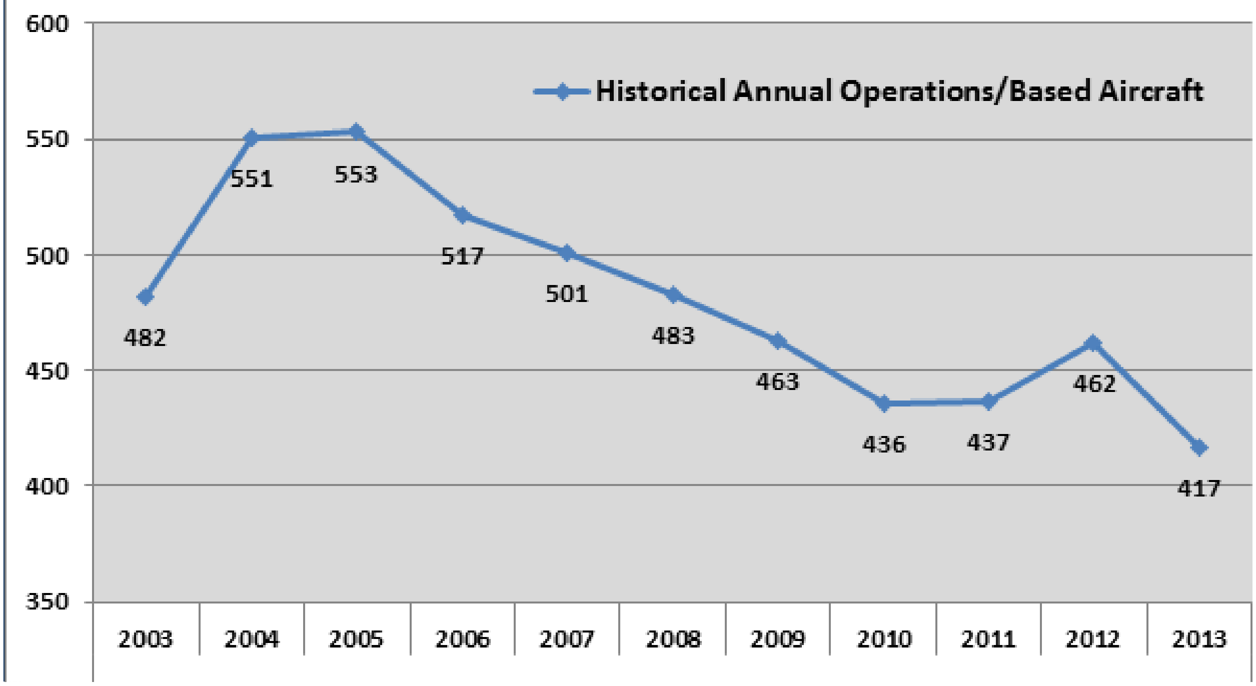
Source: FAA Terminal Area Forecast (TAF) database

There are many challenges associated with aircraft operations data at general aviation airports without air traffic control towers and oftentimes this data is developed based on a best guess by airport management. Historically, this has led to various data sources reporting aircraft operations numbers that differ. **Figure 5-3** indicates that NH experienced an average annual decline in operations of 4.7 percent from 2009-2013.

The operations data at towered airports can be used to derive historical operations per based aircraft (OPBA) ratios that are often a better indication of actual activity across an entire system of airports. To develop this ratio, the number of based aircraft is divided into the total general aviation operations. **Figure 5-4** on the following page shows the average number of annual operations of based aircraft at towered airports from 2003-2013. These airports included:

- Boire Field
- Lebanon Municipal
- Manchester-Boston Regional
- Portsmouth International at Pease

Figure 5-4 - Historical Annual Operations per Based Aircraft at NH Towered Airports (2003-2013)



Source: Louis Berger Calculations

The historical data collected for this study shows a decline in based aircraft and operations data at many of the airports inventoried. Historical data also shows that passenger enplanement activity at the study airports has varied due to changes in air service and seasonal fluctuations. The FAA has indicated however, that as the economy recovers from the most recent serious economic downturn and a slow recovery, aviation activity will grow over the long run.

5.3 AIRPORT ACTIVITY FORECASTS

Forecasts of aviation activity are developed to enable airport operators and other entities involved in the development of aviation facilities to properly plan for the distribution of limited financial resources to enable the highest return on investment. Whether that funding is intended for a single airport or across a system of airports, the forecasts lay the foundation to identify the required facilities to meet future demand.

One of the most significant current challenges in the aviation industry, and general aviation in particular, is the slow rebound from the recent economic recession. The lack of capital for the purchase of aircraft as well as the increase in general operating costs makes general aviation a less inviting endeavor than in previous years. In addition to the recreational aviation activities, many corporate operations have experienced the crunch of the economy over the past several years with cutbacks to, or elimination of corporate flight departments. These types of fiscal constraints and decreased aviation activity can have a negative impact on revenue and budgets of small to medium-sized general aviation airports.

5.3.1 FORECASTING METHODOLOGY

Choosing the appropriate methodology is an important component to developing forecasts which allow for appropriate planning for future system needs. The general approach often used to develop forecasts requires the identification of specific historical relationships between regional, state, and individual airport forecasts as well as specific operational and based aircraft data. As mentioned, historical data at smaller airports without air traffic control towers is generally less reliable than airports with control towers. Consequently, it is more of a challenge to produce accurate quantitative forecasts.

Demand projections for general aviation aircraft operations and based aircraft for this effort were primarily developed through an analysis of historical trends nationally, regionally, as well as statewide. This historical trending analysis, combined with growth rates from the FAA Aerospace Forecast for Fiscal Years 2014-2034, were the chosen methodology for this forecast effort.

Utilizing this information for a system plan forecast is an industry accepted practice and an appropriate level of effort for this system plan. Other methodologies commonly used to forecast aviation activity (e.g., regression analysis) were not employed. These more rigorous methodologies are usually reserved for more in depth forecasts at the master planning level.

It is important to emphasize that aviation forecasting is not an "exact science", so experienced 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.

5.3.2 BASED AIRCRAFT FORECAST

To forecast the number of based aircraft at each airport for the forecast periods of five, ten, and 20 years, each airport was inventoried for current and historical based aircraft. Actual airport and NHBOA based aircraft data was collected for the previous ten years (2004-2013). Analysis of this information provided a yearly growth percentage for each airport from which a Historical Average Annual Growth (HAAG) trend was derived.

It should be noted that the based aircraft forecast methodology for this study was chosen to fit within the constraints of the project. The based aircraft situation in NH and throughout New England is complex and dynamic and includes many variables. Notably, with the exception of the remote airports, aircraft owners in the region generally have flexibility with regard to their choice of where to base their aircraft due to the proximity of airports without regard to geo-political boundaries. This means that an owner who is a resident of NH can base an aircraft outside of the state such as airports in Maine, Vermont, or Massachusetts. Variables such as these were not considered when conducting this forecasting effort.
The HAAG data was analyzed and anomalies were evaluated and compared to ATADS and other data collected to determine the validity of the findings. Once the data was validated the airports were separated into two historical performance categories. These categories are based on the airport historically experiencing positive or negative average annual growth in the last ten years. They include:

- HAAG Category 1 – Negative Average Annual Growth
- HAAG Category 2 – Positive Average Annual Growth

Using the determined HAAG, the forecast considered applying either a negative Future Annual Growth rate of -0.3 percent (Category 1) or a positive growth rate of +0.5 percent (Category 2) to the general aviation operations. The negative 0.3 percent rate is based on the projected decrease of active piston-powered aircraft through 2034 as indicated in the FAA Aerospace Forecast (2014-2034). Piston-powered aircraft are primarily the single-engine aircraft that utilize the system of airports. The positive 0.5 percent rate is based on the overall projection of the general aviation fleet through 2034 as also indicated in the FAA Aerospace Forecast. For Manchester-Boston Regional Airport and Portsmouth International Airport at Pease, a 2.7% annual growth rate for air carrier operations presented in the FAA Aerospace Forecast (2014-2034) was applied. For Manchester-Boston Regional Airport, Portsmouth International Airport at Pease, Dillant-Hopkins Airport, and Lebanon Municipal Airport a negative .1% annual decline was applied to air taxi operations. This forecast for air taxi operations is also consistent with the projections presented in the FAA Aerospace Forecast (2014-2014).

FAA TAF Forecasts of itinerant general aviation operations and local civil operations at FAA facilities are based primarily on time series analysis. Based aircraft data are collected by FAA inspectors, airport managers, and state aviation officials and reported on FAA Form 5010. The information collected by the FAA on this form is the description of the physical and operational characteristics of an airport that is kept on file with the FAA. The information is maintained in FAA computers for record keeping purposes and use in airspace studies. The form includes the number of aircraft, mostly general aviation aircraft, permanently based at an airport.

For Non-NPIAS facilities (airports that are not eligible for federal funding), historic operations in the TAF are from the FAA Form 5010 database. These operation levels are held constant for the forecast unless otherwise specified by a local or regional FAA official.

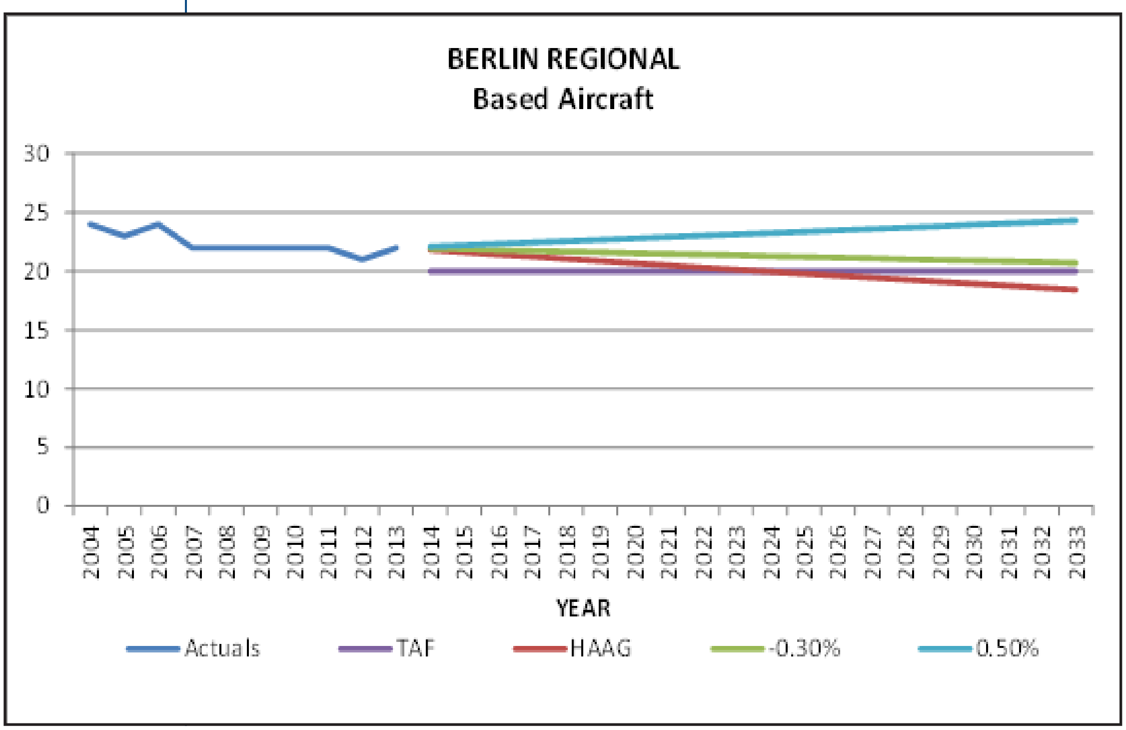
The forecast utilizing this methodology is presented for each airport on the following pages.

Berlin Regional Airport

As demonstrated in the following table and chart, the Future Annual Growth Category 2 produces the highest forecast and the HAAG rate produces the lowest. The HAAG rate calculated for Berlin Regional is -0.88 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes. In 2013 Berlin Regional reported 22 based aircraft.

Berlin Regional Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	20	20	20
-0.30%	22	21	21
0.50%	23	23	24
HAAG	21	20	18



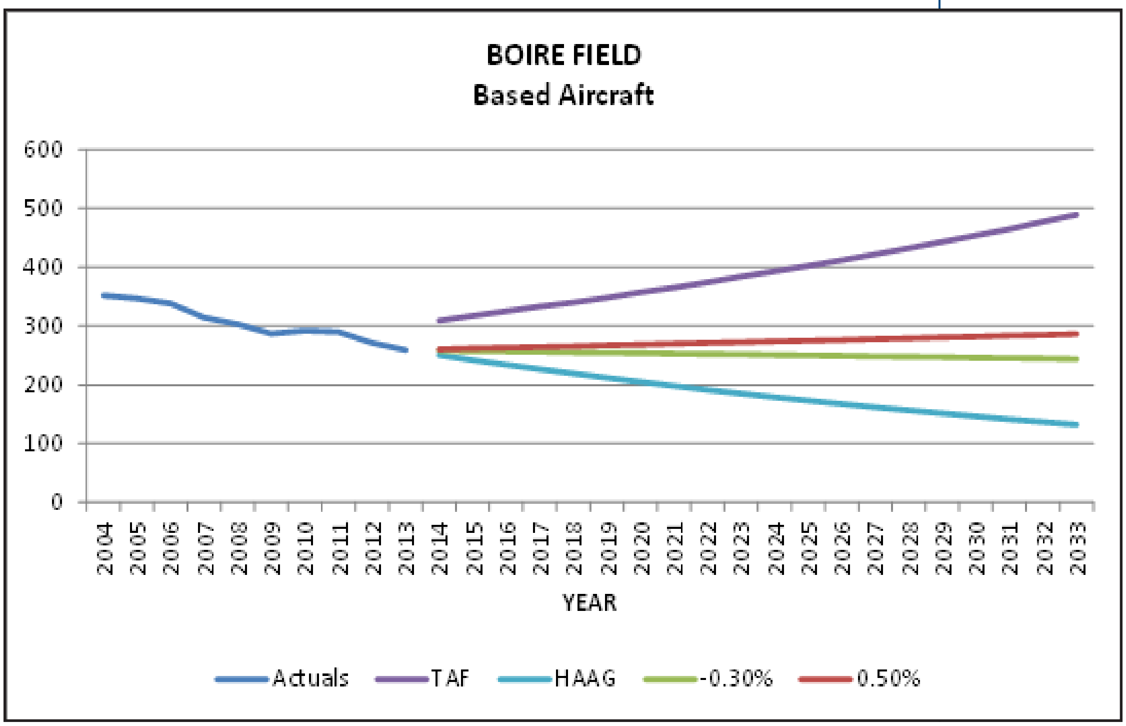
Source: FAA & Consultant Calculations

Boire Field

As demonstrated in the following table and chart, the TAF produces the highest forecast and the HAAG rate produces the lowest. The HAAG rate calculated for Boire Field is -3.31 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes. In 2013 Boire Field reported 234 based aircraft.

Boire Field Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	340	384	489
-0.30%	255	251	244
0.50%	266	272	286
HAAG	219	185	132



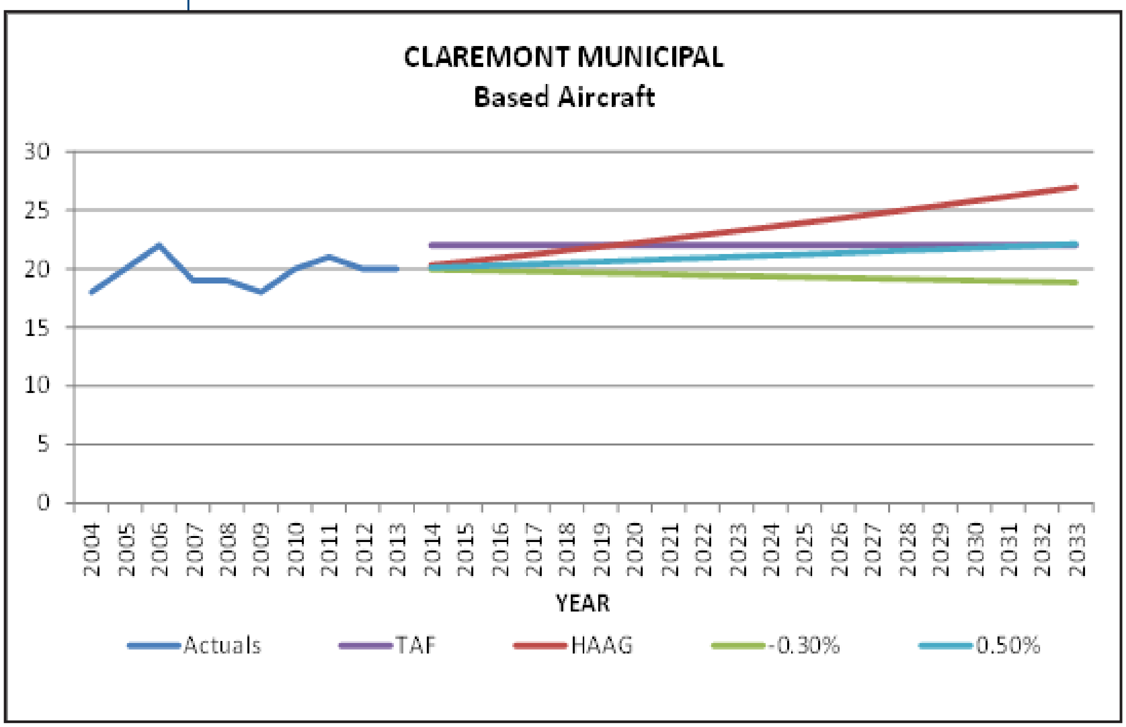
Source: FAA & Consultant Calculations

Claremont Municipal Airport

As demonstrated in the following table and chart, the HAAG produces the highest forecast and the Future Annual Growth Rate 1 produces the lowest. The HAAG rate calculated for Claremont Municipal is 1.5 percent. The Future Annual Growth Category 2 is emphasized in the table below for planning purposes. In 2013 Claremont Municipal was reported to have 21 based aircraft.

Claremont Municipal Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	22	22	22
-0.30%	20	19	19
0.50%	21	21	22
HAAG	22	23	27



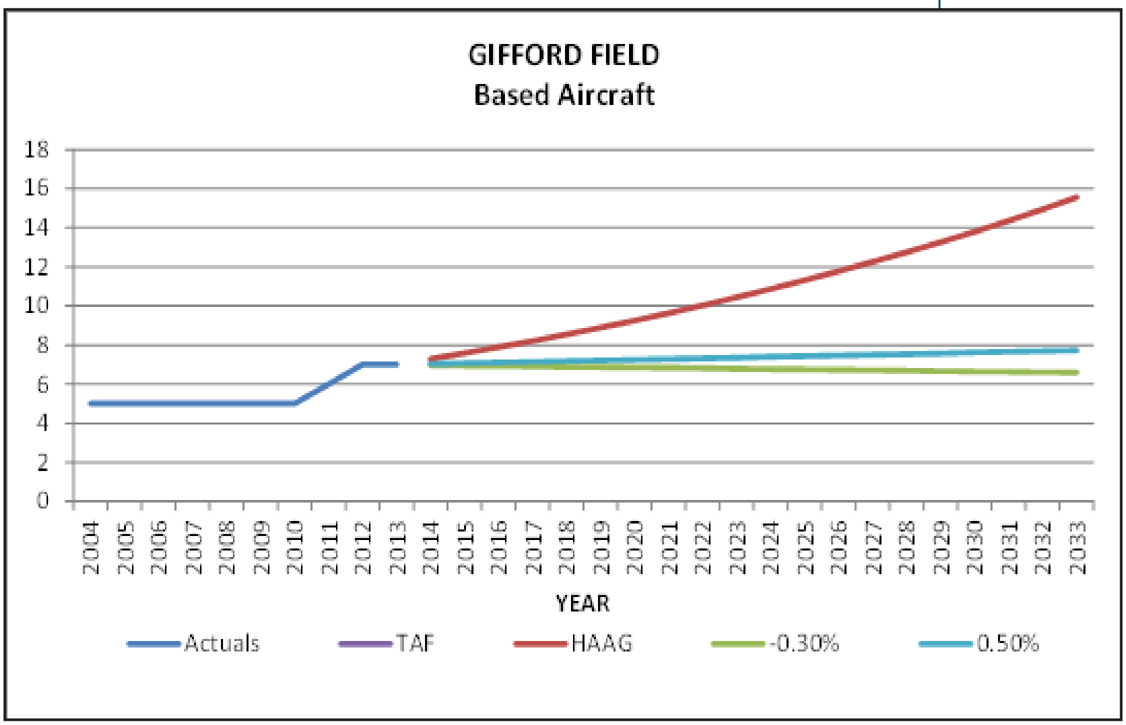
Source: FAA & Consultant Calculations

Gifford Field

As demonstrated in the following table and chart, the HAAG produces the highest forecast and the Future Annual Growth Rate 1 produces the lowest. TAF data was not available for Gifford Field. The HAAG rate calculated for Gifford Field is 4.1 percent and Future Annual Growth Category 2 is emphasized in the table below for planning purposes. In 2013 Gifford Field was reported to have seven based aircraft.

Gifford Field Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	N/A	N/A	N/A
-0.30%	7	7	7
0.50%	7	7	8
HAAG	9	10	16



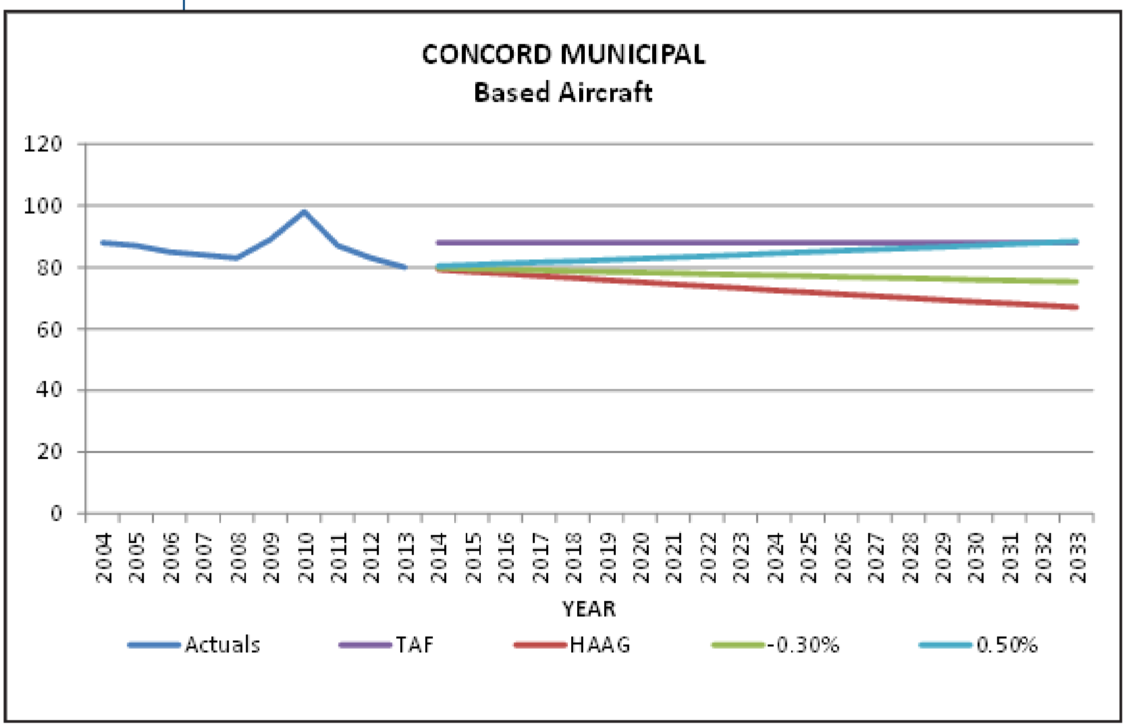
Source: FAA & Consultant Calculations

Concord Municipal Airport

As demonstrated in the following table and chart, the TAF produces the highest forecast and the HAAG rate produces the lowest. The HAAG rate calculated for Concord Municipal is -0.88 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes. In 2013 Concord Municipal reported 90 based aircraft.

Concord Municipal Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	88	88	88
-0.30%	79	78	75
0.50%	82	84	88
HAAG	77	73	67



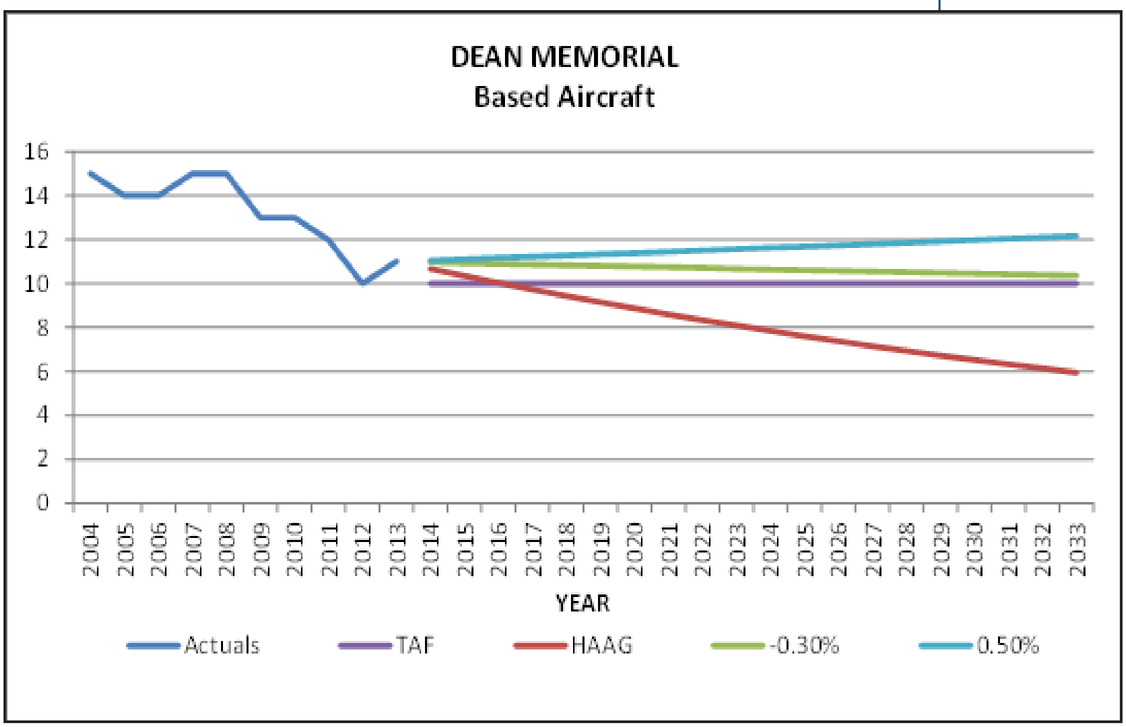
Source: FAA & Consultant Calculations

Dean Memorial Airport

As demonstrated in the following table and chart, similar forecasts exist for both the TAF and Future Annual Growth Rates 1 and 2. The HAAG rate produces the lowest forecast. The HAAG rate calculated for Dean Memorial is -3.0 percent and Future Annual Growth Category 1 is emphasized in the table below for planning purposes. In 2013 Dean Memorial was reported to have 12 based aircraft.

Dean Memorial Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	340	384	489
-0.30%	255	251	244
0.50%	266	272	286
HAAG	219	185	132



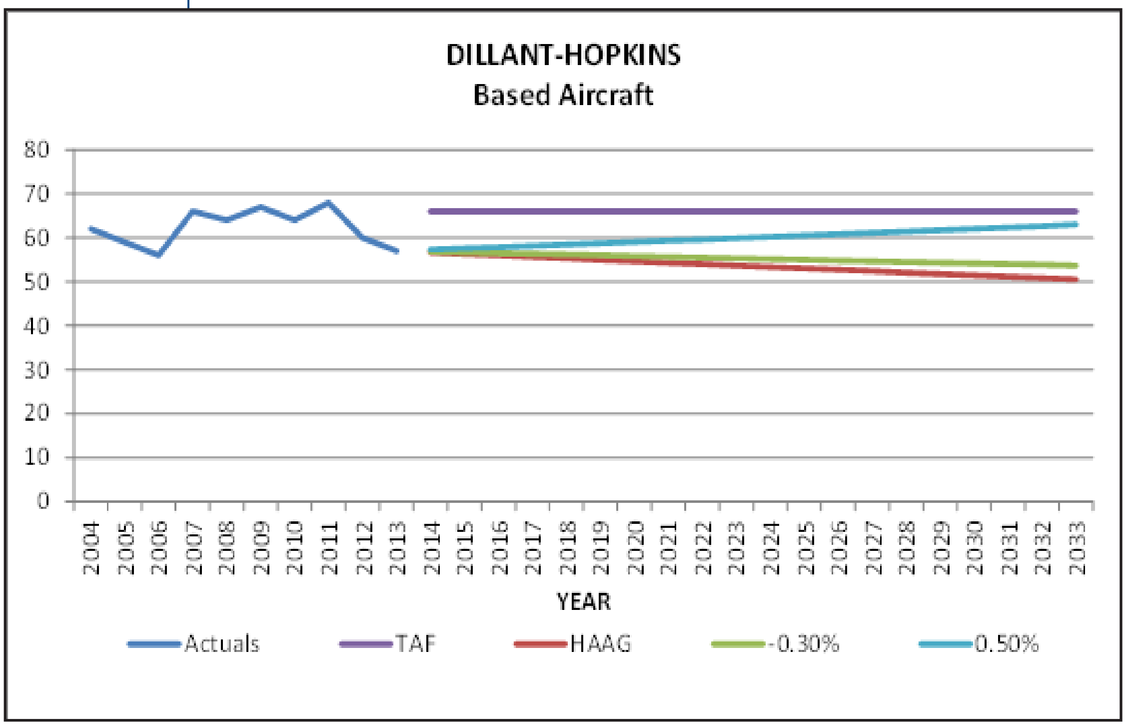
Source: FAA & Consultant Calculations

Dillant-Hopkins Airport

As demonstrated in the following table and chart, the TAF produces the highest forecast and the HAAG rate produces the lowest. The HAAG rate calculated for Dillant-Hopkins is -0.6 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes. In 2013 Dillant-Hopkins reported 80 based aircraft.

Dillant-Hopkins Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	66	66	66
-0.30%	56	55	54
0.50%	58	60	63
HAAG	55	54	51



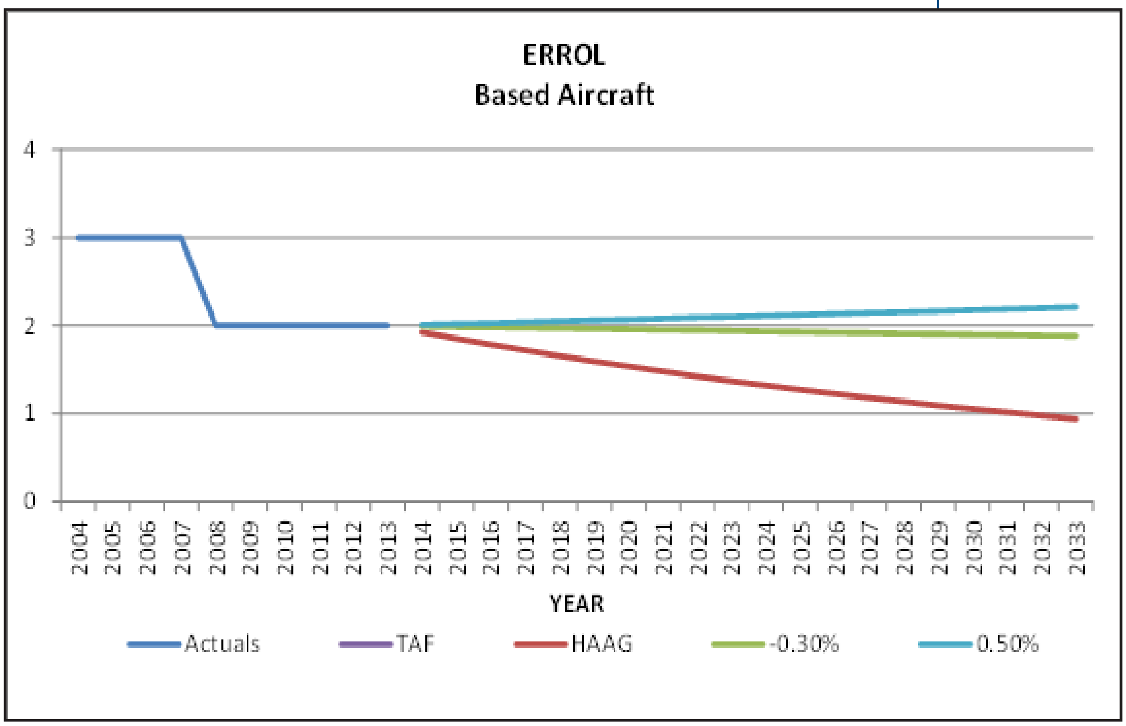
Source: FAA & Consultant Calculations

Errol Airport

As demonstrated in the following table and chart, Errol is expected to have very few based aircraft and TAF data was not available. The HAAG rate calculated for Errol is -3.7 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes. In 2013 Errol reported 2 based aircraft.

Errol Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	N/A	N/A	N/A
-0.30%	2	2	2
0.50%	2	2	2
HAAG	2	1	1



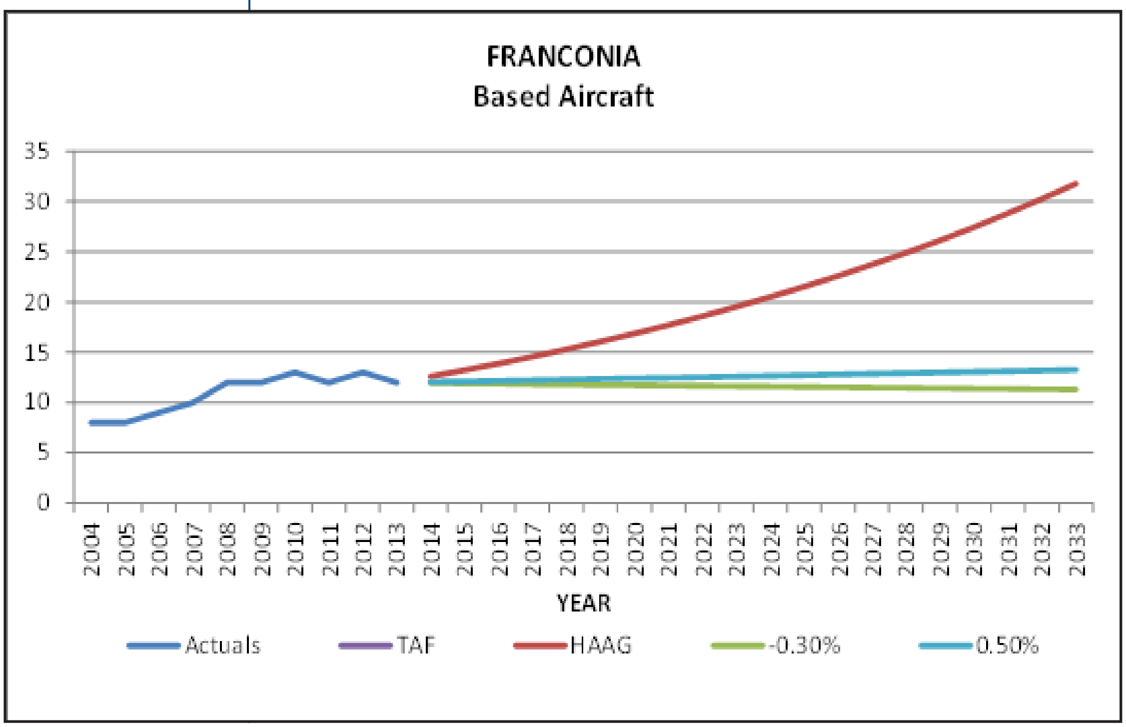
Source: FAA & Consultant Calculations

Franconia Airport

As demonstrated in the following table and chart, the HAAG rate produces the highest forecast and the Future Annual Growth Rate 1 produces the lowest. The HAAG rate calculated for Franconia is 5.0 percent. Future Annual Growth Category 2 is emphasized in the table below for planning purposes. In 2013 Franconia reported 12 based aircraft.

Franconia Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	N/A	N/A	N/A
-0.30%	12	12	11
0.50%	12	13	13
HAAG	15	20	32



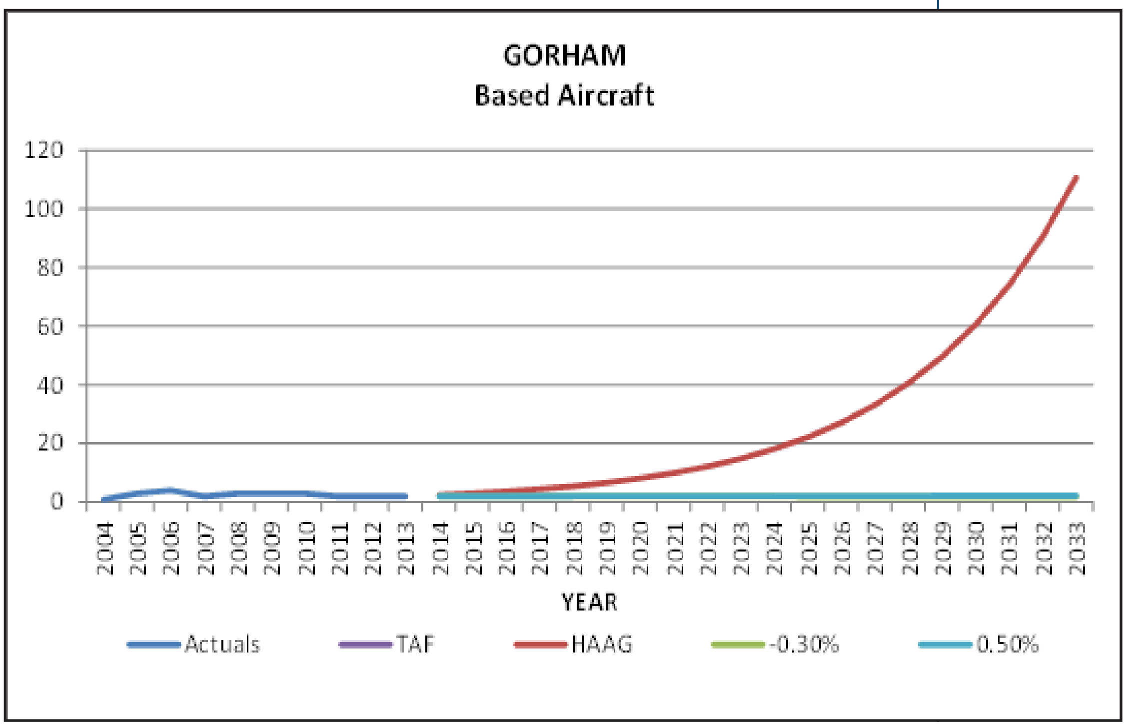
Source: FAA & Consultant Calculations

Gorham Airport

As demonstrated in the following table and chart, Gorham is expected to have very few based aircraft and TAF data was not available. The HAAG rate calculated for Gorham is 22.2 percent and produces an inflated HAAG rate forecast due to the relatively high rate but low initial volume. Since this percentage yields an unreasonable forecast, the HAAG has been omitted. Future Annual Growth Category 1 is emphasized in the table below for planning purposes.

Gorham Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	N/A	N/A	N/A
-0.30%	2	2	2
0.50%	2	2	2
HAAG	N/A	N/A	N/A



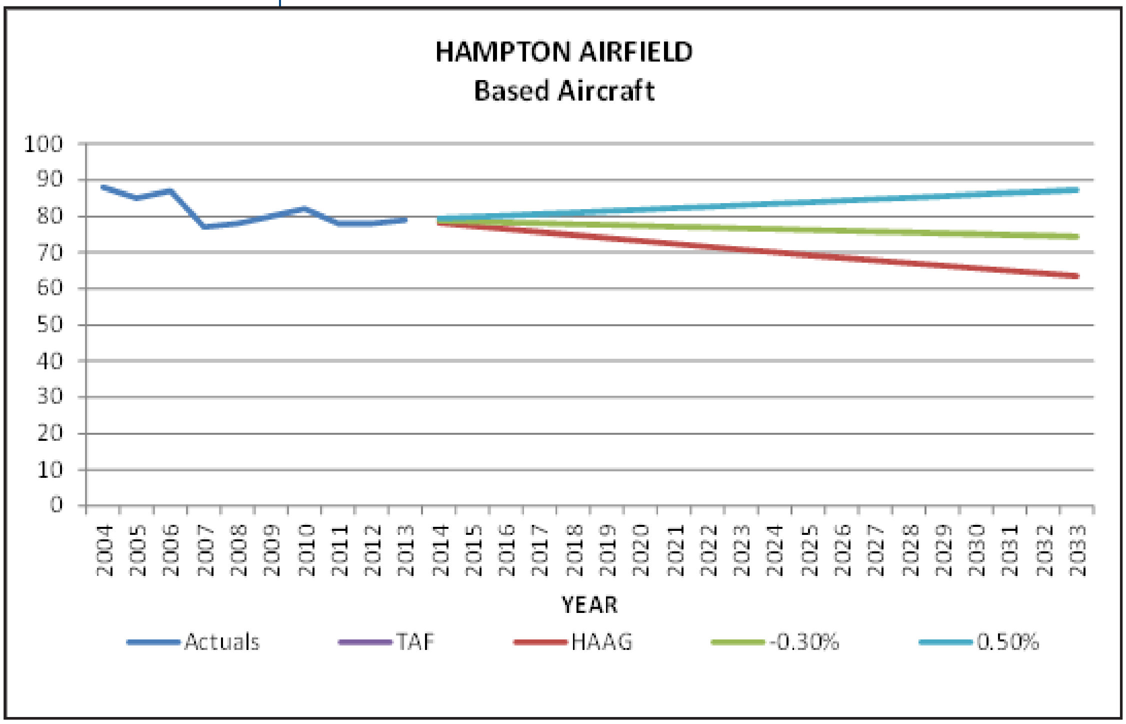
Source: FAA & Consultant Calculations

Hampton Airfield

As demonstrated in the following table and chart, the Future Annual Growth Rate 2 produces the highest forecast and the HAAG rate produces the lowest. TAF data was not available. The HAAG rate calculated for Hampton Airfield is -1.1 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes. In 2013 Hampton Airfield reported 82 based aircraft.

Hampton Airfield Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	N/A	N/A	N/A
-0.30%	78	77	74
0.50%	81	83	87
HAAG	75	71	63



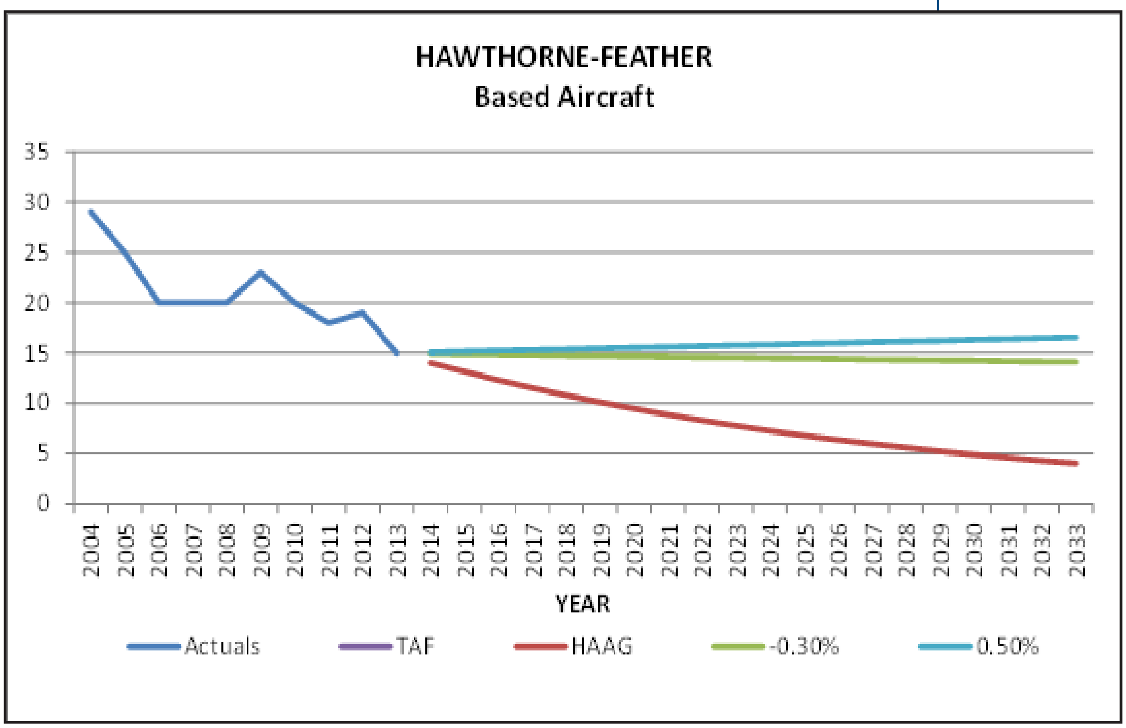
Source: FAA & Consultant Calculations

Hawthorne-Feather Airport

As demonstrated in the following table and chart, the HAAG rate produces the highest forecast and the Future Annual Growth Rate 1 produces the lowest. TAF data was not available for Hawthorne-Feather. The HAAG rate calculated for Hawthorne-Feather is -6.4 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes.

Hawthorne-Feather Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	N/A	N/A	N/A
-0.30%	15	15	14
0.50%	15	16	17
HAAG	11	8	4



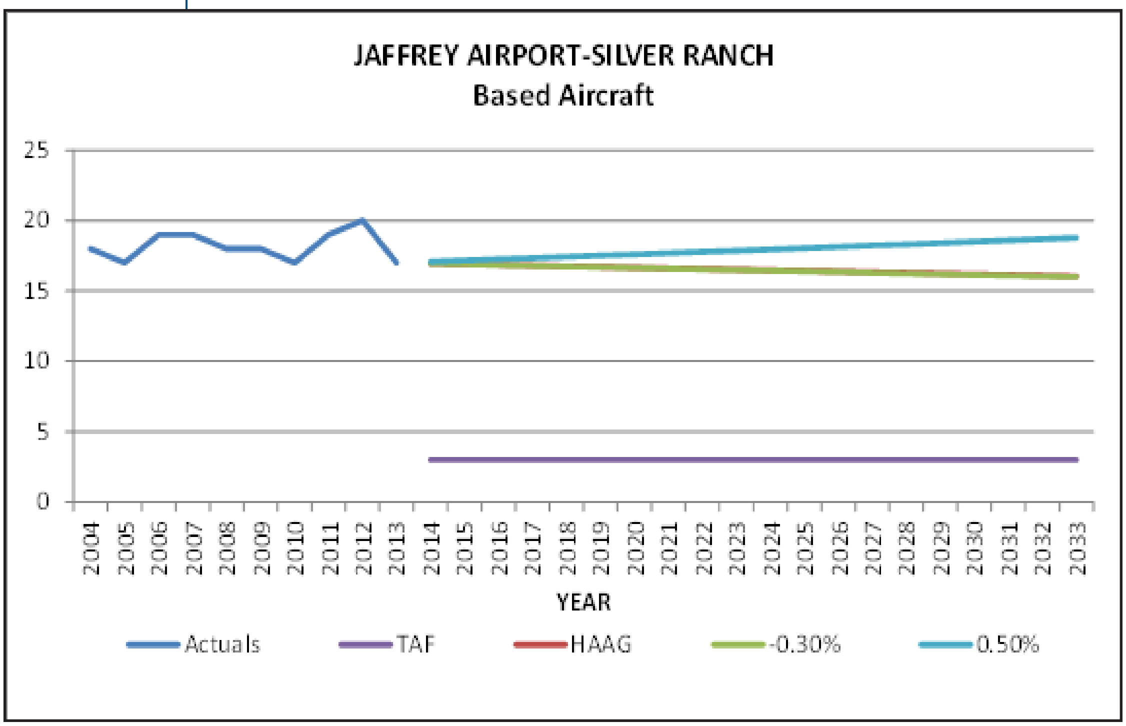
Source: FAA & Consultant Calculations

Jaffrey Airport - Silver Ranch

As demonstrated in the following table and chart, similar forecasts exist for the HAAG and Future Annual Growth Rates 1 and 2. The TAF rate produces the lowest forecast. The HAAG rate calculated for Jaffrey Airport - Silver Ranch is -0.29 percent and Future Annual Growth Category 1 is emphasized in the table below for planning purposes.

Jaffrey Airport-Silver Ranch Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	3	3	3
-0.30%	17	16	16
0.50%	17	18	19
HAAG	17	17	16



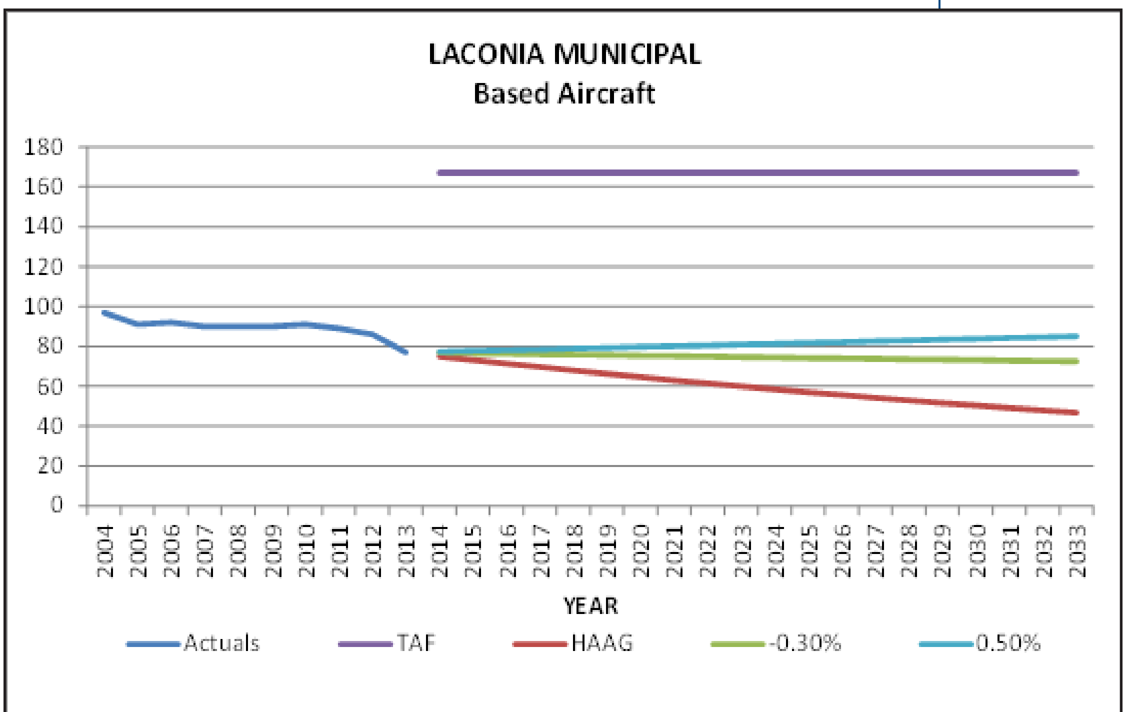
Source: FAA & Consultant Calculations

Laconia Municipal Airport

As demonstrated in the following table and chart, TAF data for Laconia Municipal is much higher than the other forecasts. There is a large discrepancy between TAF and NHDOT historical data. For this effort, NHDOT data was used to produce a forecast for planning purposes. The HAAG rate calculated for Laconia Municipal is -2.5 percent and Future Annual Growth Category 1 is emphasized in the table below for planning purposes.

Laconia Municipal Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	167	167	167
-0.30%	76	75	73
0.50%	79	81	85
HAAG	68	60	47



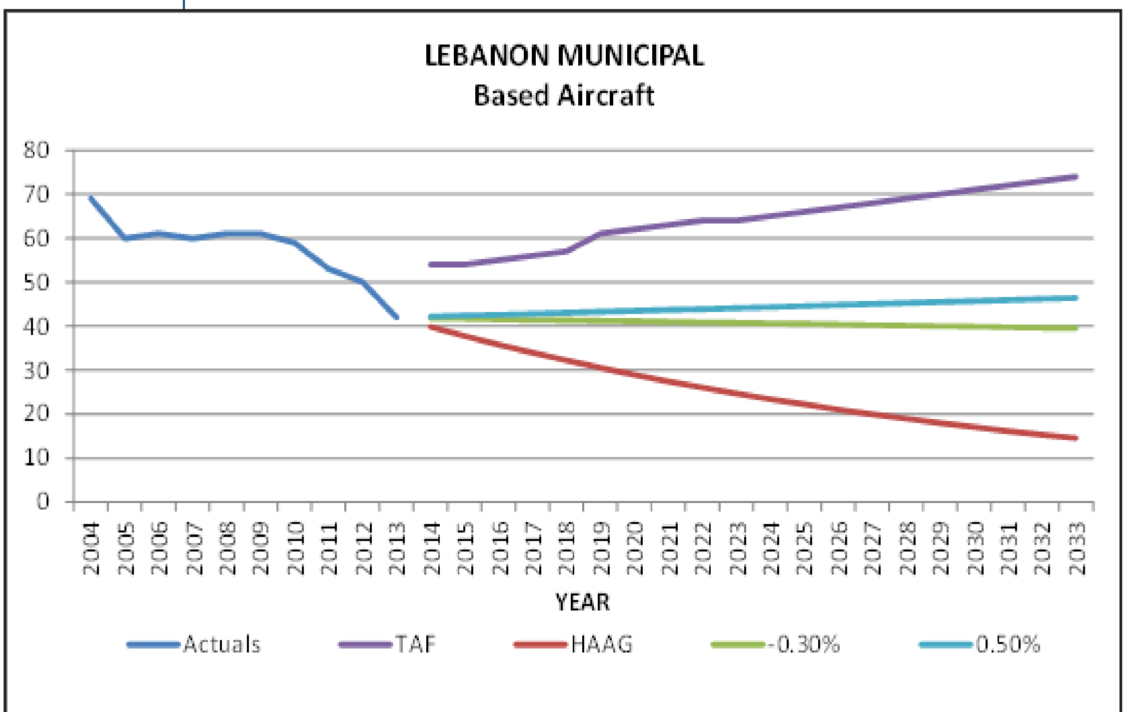
Source: FAA & Consultant Calculations

Lebanon Municipal Airport

As demonstrated in the following table and chart, the TAF produces the highest forecast and the HAAG rate produces the lowest. The HAAG rate calculated for Lebanon Municipal is -5.2 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes.

Lebanon Municipal Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	57	64	74
-0.30%	41	41	40
0.50%	43	44	46
HAAG	32	25	15



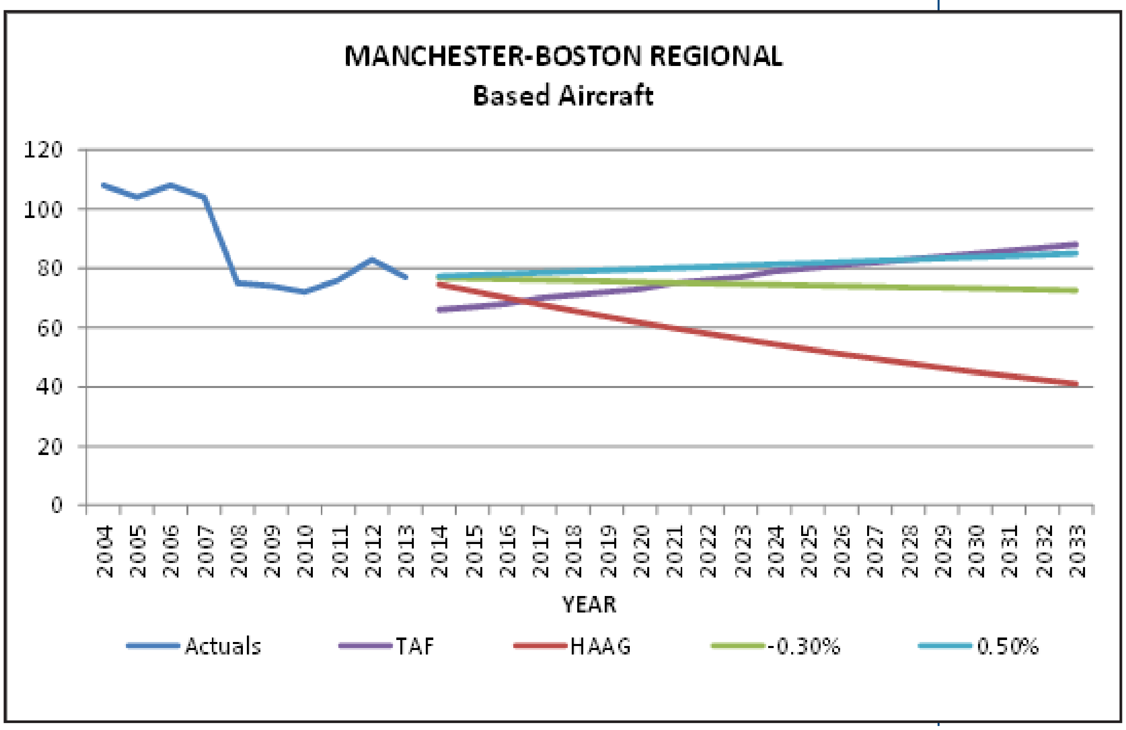
Source: FAA & Consultant Calculations

Manchester-Boston Regional Airport

As demonstrated in the following table and chart, the TAF produces the highest forecast and the HAAG rate produces the lowest. The HAAG rate calculated for Manchester-Boston Regional is -3.1 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes.

Manchester- Boston Regional Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	71	77	88
-0.30%	76	75	73
0.50%	79	81	85
HAAG	66	56	41



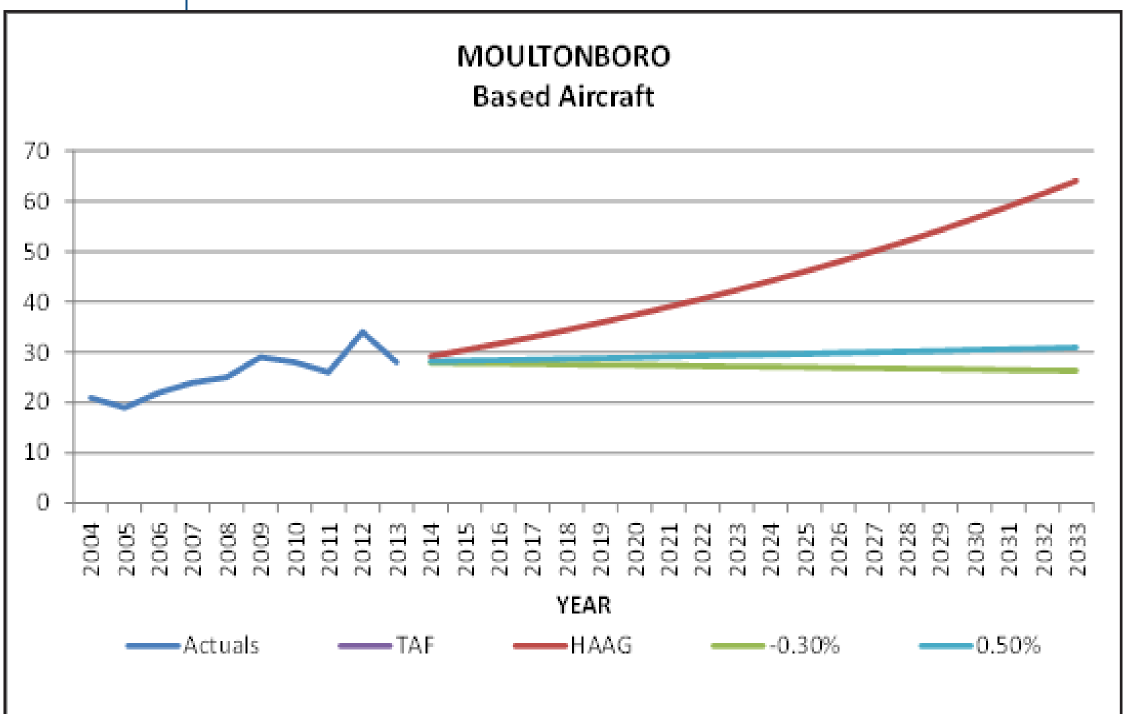
Source: FAA & Consultant Calculations

Moultonboro Airport

As demonstrated in the following table and chart, the HAAG produces the highest forecast and the Future Annual Growth Category 1 rate produces the lowest. The HAAG rate calculated for Moultonboro is 4.2 percent. Future Annual Growth Category 2 is emphasized in the table below for planning purposes.

Moultonboro Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	N/A	N/A	N/A
-0.30%	28	27	26
0.50%	29	29	31
HAAG	34	42	64



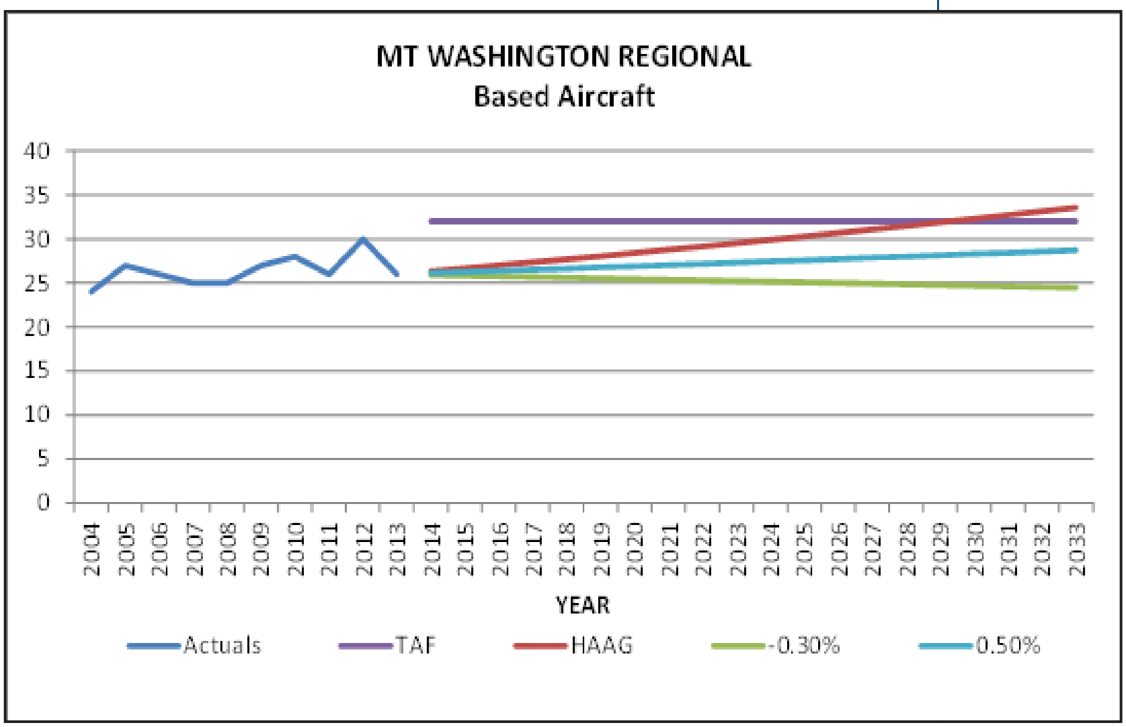
Source: FAA & Consultant Calculations

Mt. Washington Regional Airport

As demonstrated in the following table and chart, the HAAG produces the highest forecast and the Future Annual Growth Category 1 rate produces the lowest. The HAAG rate calculated for Mt. Washington Regional is 1.3 percent. Future Annual Growth Category 2 is emphasized in the table below for planning purposes.

Mt. Washington Regional Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	32	32	32
-0.30%	26	25	24
0.50%	27	27	29
HAAG	28	30	34



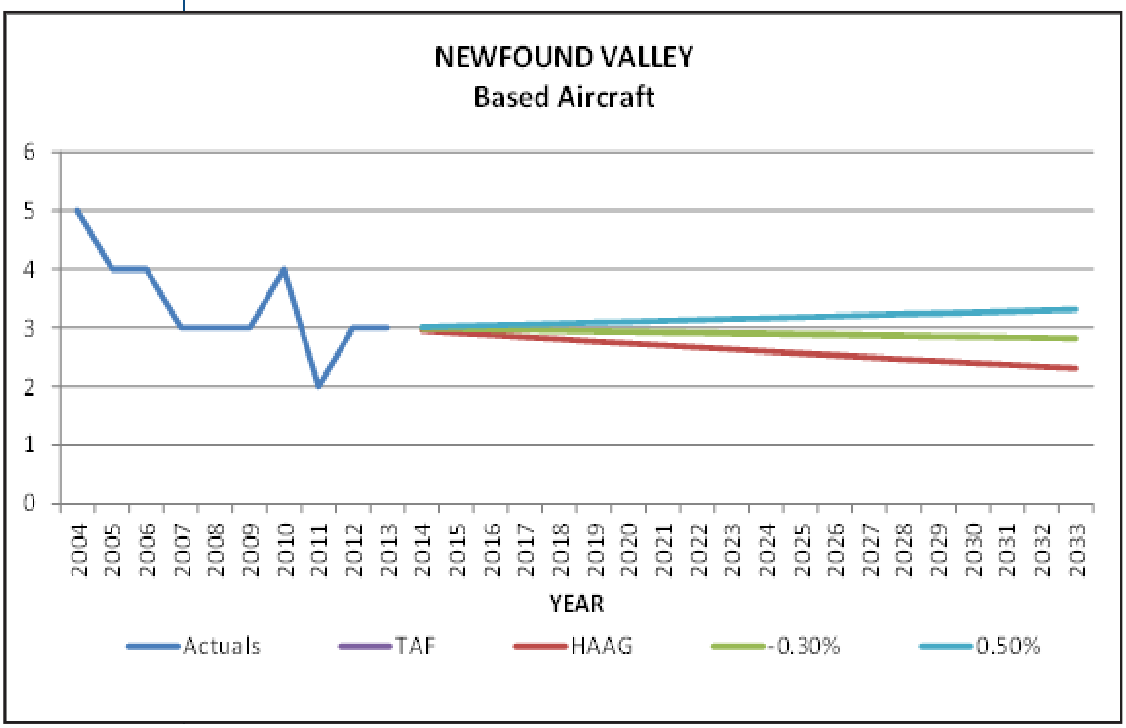
Source: FAA & Consultant Calculations

Newfound Valley Airport

As demonstrated in the following table and chart, Newfound Valley is expected to have very few based aircraft and TAF data was not available. The HAAG rate calculated for Newfound Valley is -1.3 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes.

Newfound Valley Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	N/A	N/A	N/A
-0.30%	3	3	3
0.50%	3	3	3
HAAG	3	3	2



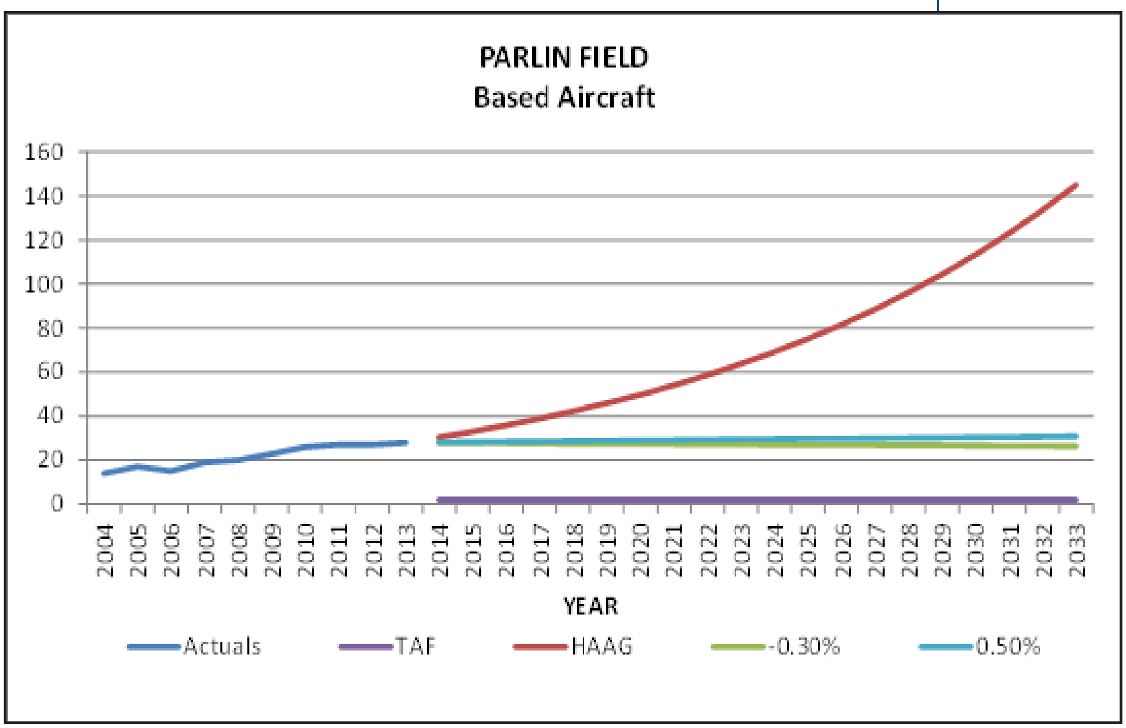
Source: FAA & Consultant Calculations

Parlin Field

As demonstrated in the following table and chart, TAF data for Parlin Field is much lower than the other forecasts. There is a large discrepancy between TAF and NHDOT historical data. For this effort, NHDOT data was used to produce a forecast for planning purposes. The HAAG rate calculated for Parlin Field is 8.6 percent and for the purpose of this forecast was considered unrealistic due to the numbers the growth percentage yielded. It has been omitted from the table and chart below. Future Annual Growth Category 2 is emphasized in the table below for planning purposes.

Parlin Field Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	2	2	2
-0.30%	28	27	26
0.50%	29	29	31
HAAG	N/A	N/A	N/A



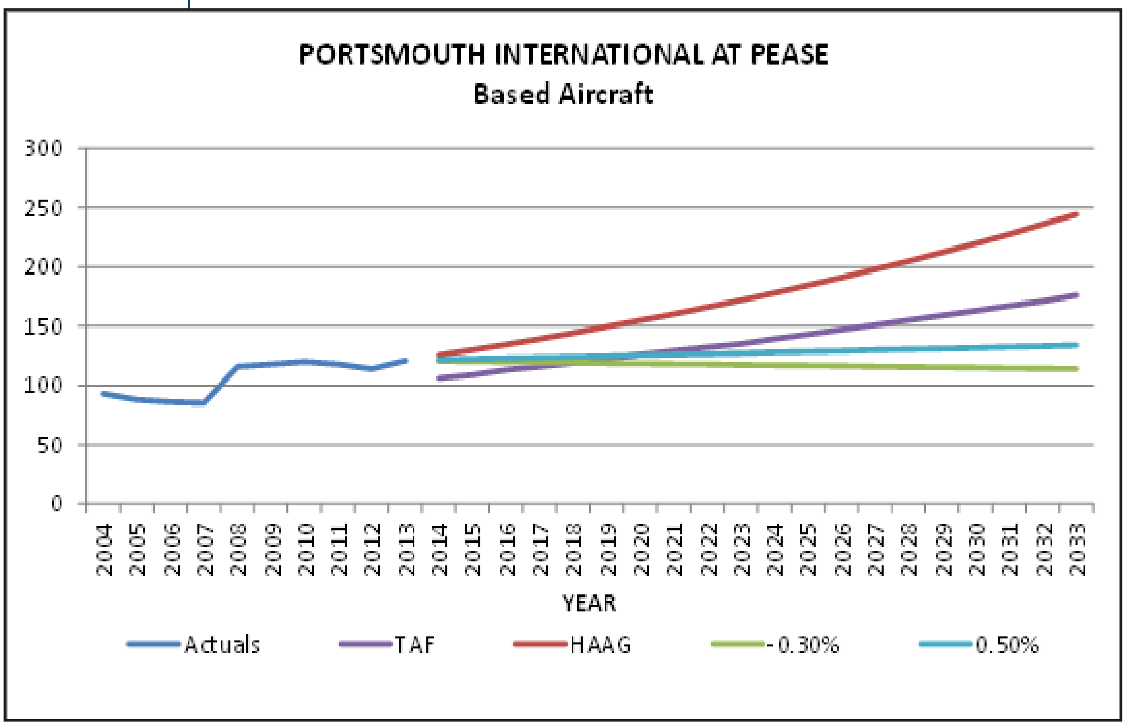
Source: FAA & Consultant Calculations

Portsmouth International Airport at Pease

As demonstrated in the following table and chart, the HAAG produces the highest forecast and the Future Annual Growth Category 1 rate produces the lowest. The HAAG rate calculated for Portsmouth International Airport at Pease is 3.6 percent. Future Annual Growth Category 2 is emphasized in the table below for planning purposes.

Portsmouth International at Pease Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	119	135	176
-0.30%	119	117	114
0.50%	124	127	134
HAAG	144	172	244



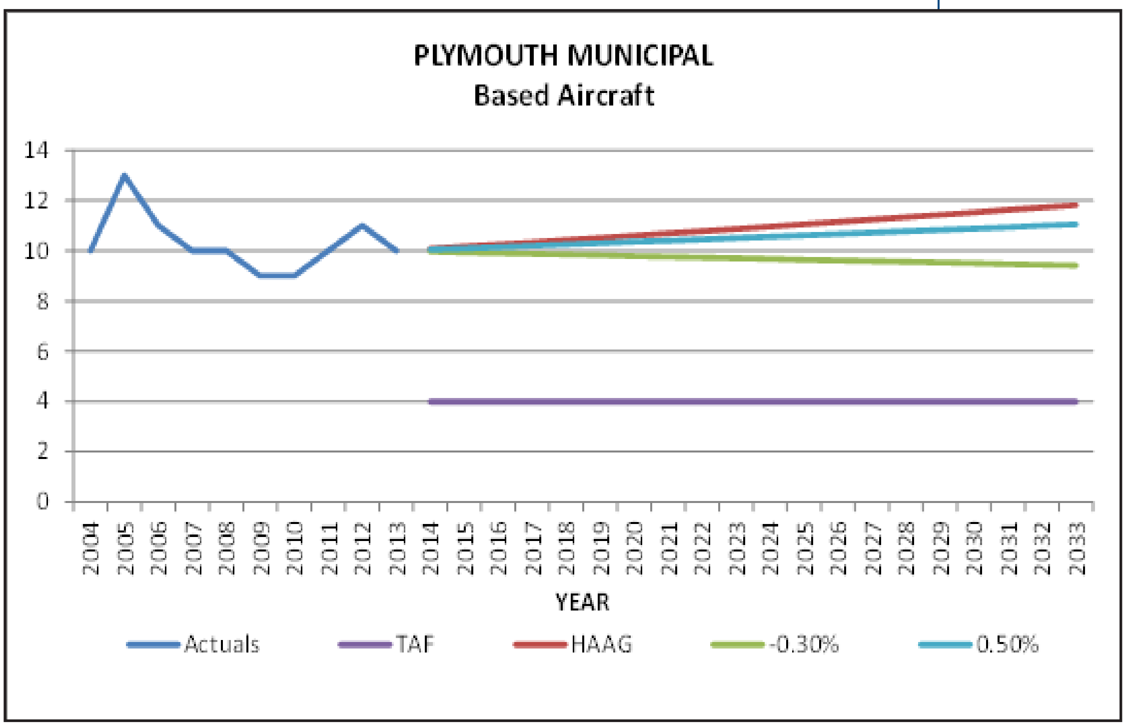
Source: FAA & Consultant Calculations

Plymouth Municipal Airport

As demonstrated in the following table and chart, the HAAG rate produces the highest forecast and the Future Annual TAF produces the lowest. The HAAG rate calculated for Plymouth Municipal is 0.8 percent. Future Annual Growth Category 2 is emphasized in the table below for planning purposes.

Plymouth Municipal Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	4	4	4
-0.30%	10	10	9
0.50%	10	11	11
HAAG	10	11	12



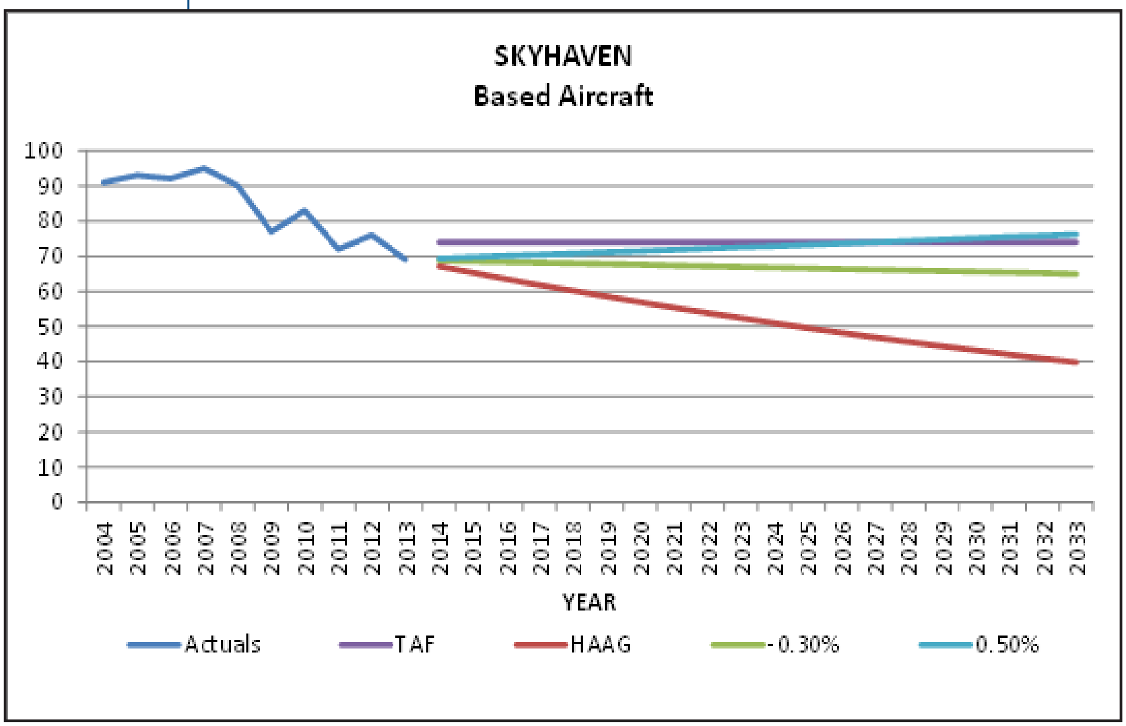
Source: FAA & Consultant Calculations

Skyhaven Airport

As demonstrated in the following table and chart, the Future Annual Growth Rate 2 produces the highest forecast and the HAAG rate produces the lowest. The HAAG rate calculated for Skyhaven is -2.7 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes.

Skyhaven Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	74	74	74
-0.30%	68	67	65
0.50%	71	73	76
HAAG	60	52	40



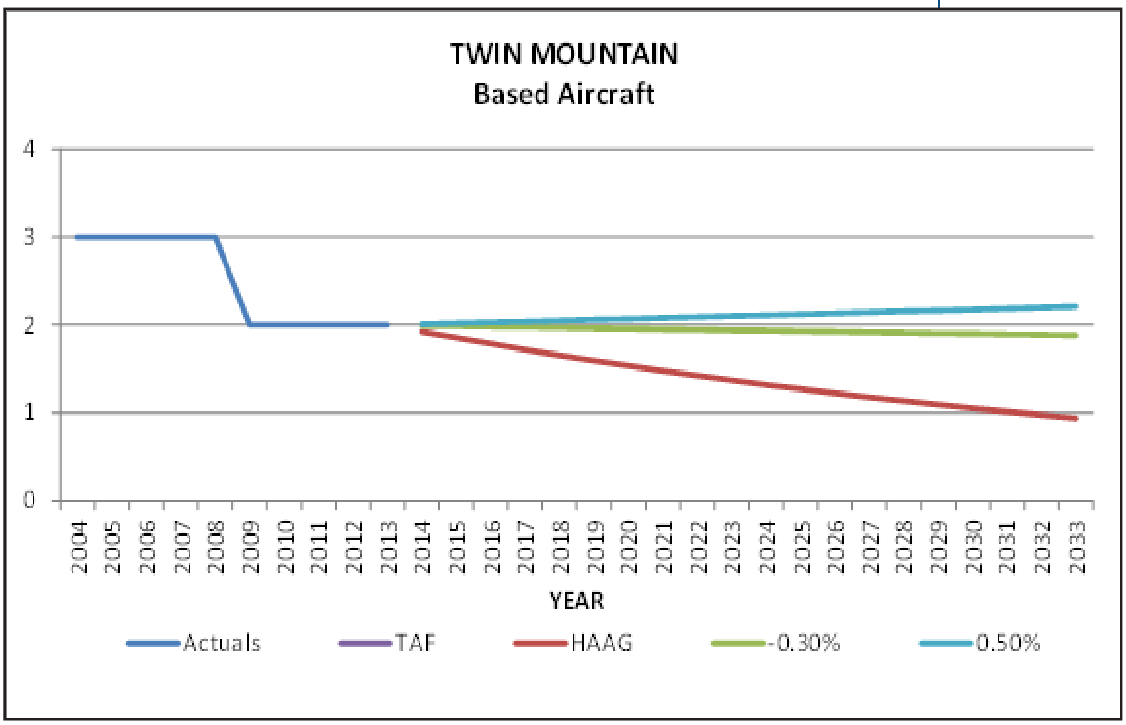
Source: FAA & Consultant Calculations

Twin Mountain Airport

As demonstrated in the following table and chart, Twin Mountain is expected to have very few based aircraft and TAF data was not available. The HAAG rate calculated for Twin Mountain is -3.7 percent. Future Annual Growth Category 1 is emphasized in the table below for planning purposes.

Twin Mountain Forecasted Based Aircraft

	5 Year	10 Year	20 Year
TAF	N/A	N/A	N/A
-0.30%	2	2	2
0.50%	2	2	2
HAAG	2	1	1



Source: FAA & Consultant Calculations

State-Wide Based Aircraft Forecast based on Airport Specific Growth Rates

The results of all individual airport forecasts based on either a positive or negative future annual growth through 2033 are shown below and provide total based aircraft forecasted for five, ten, and 20 year time frames. These results will be compared to forecasts prepared for the statewide fleet mix using the FAA Aerospace forecast projections for piston, multi-engine turbine, jet, and turbine powered rotorcraft in the next section.

Table 5-1 - Forecasted Based Aircraft – All Airports

Airport	2013	2018	2023	2033
Berlin Regional	22	22	21	21
Boire Field	259	255	251	244
Claremont Municipal	20	21	21	22
Gifford Field	7	7	7	8
Concord Municipal	80	79	78	75
Dean Memorial	11	11	11	10
Dillant-Hopkins	57	56	55	54
Errol	2	2	2	2
Franconia	12	12	13	13
Gorham	2	2	2	2
Hampton Airfield	79	78	77	74
Hawthorne-Feather	15	15	15	14
Jaffrey Airport - Silver Ranch	17	17	16	16
Laconia Municipal	77	76	75	73
Lebanon Municipal	42	41	41	40
Manchester-Boston Regional	77	76	75	73
Moultonboro	28	29	29	31
Mt. Washington Regional	26	27	27	29
Newfound Valley	3	3	3	3
Parlin Field	28	29	29	31
Portsmouth Intl at Pease	121	124	127	134
Plymouth Municipal	10	10	11	11
Skyhaven	69	68	67	65
Twin Mountain	2	2	2	2
Total	1066	1,062	1,055	1,047

Source: NHDOT Database

5.3.3 AIRCRAFT FLEET MIX FORECAST

In the FAA Aerospace Forecast the FAA forecasts the fleet of "active aircraft", one that flies at least one hour during the year, not total aircraft. They utilize a methodology that takes into account numerous industry factors as well as economic conditions. The following summarizes their most recent average growth rates for the general aviation fleet nationally and are applicable for this effort:

- Piston-powered Fleet (Negative 0.3%)
- Turbine-powered Fleet (2.6%)
- Turbine-jet Fleet (3.0%)
- Turbine Helicopter Fleet (3.1%)

Considering these FAA national forecasted growth rates, the FAA rates were applied to the 2014 based aircraft numbers and projected out to 2033. A fleet mix breakdown was performed using historical aircraft data provided by the state. The data provided suggests the following percentage of total based aircraft can reasonably be estimated for each category as follows:

- Piston-powered Fleet (90%)
- Turbine-powered Fleet (4%)
- Turbine-jet Fleet (3%)
- Turbine Helicopter Fleet (3%)

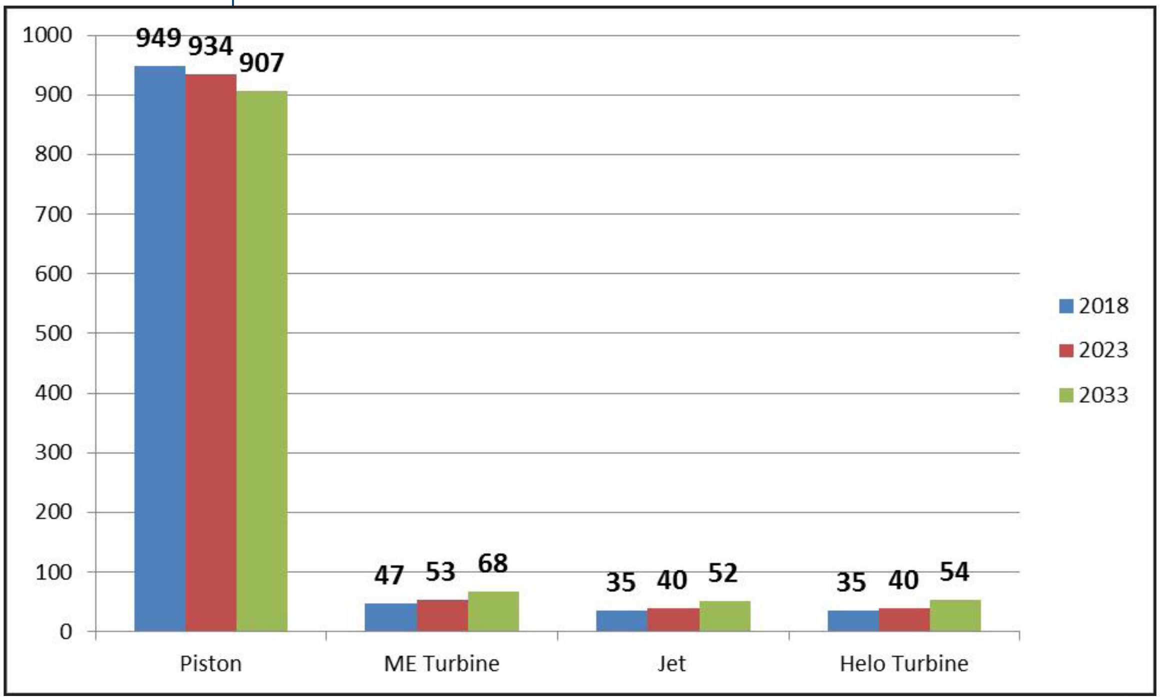
The FAA growth rates applied to the NH based aircraft fleet yield the following results for the five, ten, and 20-year periods.

Table 5-2 - Forecasted State Aircraft Fleet – All Airports

	2013	2018	2023	2033
Piston	960	949	934	907
ME Turbine	42	47	53	68
Jet	32	35	40	52
Helo Turbine	32	35	40	54
Total	1066	1066	1067	1081

Source: Consultant Calculations

Figure 5-5 - Forecasted State Aircraft Fleet – All Airports



Source: Consultant Calculations

5.3.4 STATEWIDE BASED AIRCRAFT FORECAST CONCLUSION

The relative small disparity in forecasted based aircraft using the FAA aerospace aircraft fleet growth rates compared to the forecasted based aircraft utilizing either a positive or negative growth rate determined for each airport verifies the methodology chosen to conduct the system forecast. Considering the two methodologies applied for based aircraft, the results suggest that over the next 20 years, NH may experience either a very slight decrease in based aircraft or a very slight increase in based aircraft over the next 20 years, with based aircraft over the next ten years remaining relatively flat across the airport system.

The following table presents the findings of the based aircraft forecast by airport category.

Table 5-3 - Forecasted Based Aircraft by Airport Category

Category	2018	2023	2033
Basic	188	188	186
Local	167	165	168
National	255	251	244
Primary	241	243	247
Regional	211	208	202
Total	1062	1055	1047

Source: Consultant Calculations

5.3.5 AIRCRAFT OPERATIONS FORECAST

In an effort to project future operations for these airports, a systematic method was used to calculate future aircraft operations through drawing a correlation between based aircraft and aircraft operations reported in the FAA TAF. The process uses the average of ten years of based aircraft and operations data by dividing the number of total operations by the number of total based aircraft which results in the Operations per Based Aircraft (OPBA). The OPBA is then multiplied by the projected number of based aircraft resulting in the projected operations for each forecast milestone.

As is typical with GA, airport data can differ substantially from year to year due to changes in management, ownership, or other circumstances which affect how the data is reported to the FAA. The OPBA method is generally used in instances where the historical operations data is questionable. While this methodology for determination of future activity is not always the most accurate, it does provide a sound basis for estimating future activity at the airport where no other methodology can be employed due to a lack of reliable data. Judgment of the study team based on experience with the reliability of historical general aviation airport data was used to evaluate the data and provide more likely estimates with respect to gaps or other anomalies. Adjustments were performed in a manner taking into account operational characteristics of the airport, its historical operations, and other pertinent information.

In order to determine the projected aircraft operations forecast for the airports, the based aircraft projections were multiplied by the average historical OPBA for the past ten years to derive the forecast for that particular year. As mentioned previously, there are four system airports with air traffic control towers. As a result, aircraft operations data from these airports is recorded daily and provides a higher level of accuracy in the data that ultimately results in a higher level of confidence in the OPBA derived for those airports.

The historical based aircraft, operations (where available) and average OPBA for each of the study airports utilized for the operations forecast are presented in **Tables 5-4 through 5-6**.

Table 5-4 - NHSASP – Historical Based Aircraft

Airport	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Berlin Municipal	24	23	24	22	22	22	22	22	21	22
Boire Field	352	347	338	314	303	287	292	290	271	259
Claremont Municipal	18	20	22	19	19	18	20	21	20	20
Concord Municipal	88	87	85	84	83	89	98	87	83	80
Dean Memorial	15	14	14	15	15	13	13	12	10	11
Dillant-Hopkins	62	59	56	66	64	67	64	68	60	57
Laconia Municipal	97	91	92	90	90	90	91	89	86	77
Lebanon Municipal	69	60	61	60	61	61	59	53	50	42
Manchester-Boston Regional	108	104	108	104	75	74	72	76	83	77
Mt. Washington Regional	24	27	26	25	25	27	28	26	30	26
Portsmouth International at Pease	93	88	86	85	116	118	120	118	114	121
Skyhaven	91	93	92	95	90	77	83	72	76	69
Errol	3	3	3	3	2	2	2	2	2	2
Franconia	8	8	9	10	12	12	13	12	13	12
Gifford Field	5	5	5	5	5	5	5	6	7	7
Gorham	1	3	4	2	3	3	3	2	2	2
Hampton Airfield	88	85	87	77	78	80	82	78	78	79
Hawthorne-Feather Airpark	29	25	20	20	20	23	20	18	19	15
Jaffrey Airport-Silver Ranch	18	17	19	19	18	18	17	19	20	17
Moultonboro	21	19	22	24	25	29	28	26	34	28
Newfound Valley	5	4	4	3	3	3	4	2	3	3
Parlin Field	14	17	15	19	20	23	26	27	27	28
Plymouth Municipal	10	13	11	10	10	9	9	10	11	10
Twin Mountain	3	3	3	3	3	2	2	2	2	2
Total	1,246	1,215	1,206	1,174	1,162	1,152	1,173	1,138	1,122	1,066

Source: NHDOT

Table 5-5 - NHSASP – Historical Operations

Airport	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Berlin Regional	12,000	12,100	12,100	12,100	12,100	12,200	12,200	12,200	12,200	12,200
Boire Field	120,262	129,313	117,907	104,237	99,730	96,253	78,399	66,440	59,581	55,461
Claremont Municipal	10,459	10,603	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500
Concord Municipal	89,926	89,926	89,926	89,926	89,926	90,000	90,000	60,000	60,000	60,000
Dean Memorial	N/A	4,000	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750
Dillant-Hopkins	54,294	54,294	54,294	54,294	54,294	49,027	49,027	49,027	49,027	49,027
Laconia Municipal	35,343	35,343	35,343	35,343	35,343	35,343	37,527	41,643	41,643	41,643
Lebanon Municipal	61,834	63,360	62,248	62,705	53,779	45,285	38,126	35,181	35,324	31,671
Manchester-Boston Regional	100,488	106,870	94,805	93,737	80,990	70,835	68,673	66,102	60,831	56,565
Mt. Washington Regional	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Portsmouth International at Pease	37,138	37,740	37,333	51,673	43,503	36,633	34,565	34,565	39,954	39,954
Skyhaven	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17,000
Errol	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	636
Franconia	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4,200
Gifford Field	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	600
Gorham	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	730
Hampton Airfield	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	37,510
Hawthorne-Feather Airpark	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,000
Jaffrey Airport-Silver Ranch	10,648	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300
Moultonboro	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4,700
Newfound Valley	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,510
Parlin Field	5,730	2,900	2,900	2,900	2,900	3,000	3,050	3,050	3,050	3,050
Plymouth Municipal	3,000	3,000	3,000	3,000	3,030	3,030	3,030	3,030	3,030	3,030
Twin Mountain	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	600

Source: FAA ATADS (Commercial Airports), FAA TAF (NPIAS Airports), FAA 5010 (Non-NPIAS Airports)

Table 5-6 - Operations per Based Aircraft (OPBA)

Airport	OPBA
Berlin Regional	555
Boire Field	204
Claremont Municipal	525
Concord Municipal	625
Dean Memorial	432
Dillant-Hopkins	676
Laconia Municipal	561
Lebanon Municipal*	616
Manchester-Boston Regional*	164
Mt. Washington Regional	269
Portsmouth International at Pease*	182
Skyhaven	246
Errol	318
Franconia	350
Gifford Field	86
Gorham	365
Hampton Airfield	475
Hawthorne-Feather Airpark	200
Jaffrey Airport - Silver Ranch	429
Moultonboro	168
Newfound Valley	503
Parlin Field	109
Plymouth Municipal	303
Twin Mountain	300

Source: NHDOT

Using the based aircraft derived for each airport using either the positive or negative future annual growth rate and the OPBA calculated in this section, annual operations were forecasted for the five, ten, and 20 year periods. These forecasts are presented in **Table 5-7**.

Table 5-7- Forecasted Annual Operations

Airport	2013	2018	2023	2033
Berlin Regional	12,000	12,210	11,655	11,655
Boire Field	52,910	52,020	51,204	49,776
Claremont Municipal	10,500	11,025	11,025	11,550
Concord Municipal	50,000	49,375	48,750	46,875
Dean Memorial	4,750	4,750	4,750	4,320
Dillant-Hopkins*	45,712	45,024	44,312	43,520
Laconia Municipal	43,193	42,636	42,075	40,953
Lebanon Municipal*	34,199	33,561	33,520	32,822
Manchester-Boston Regional*	63,819	68,016	72,875	84,888
Mt. Washington Regional	7,000	7,263	7,263	7,801
Portsmouth International at Pease*	28,616	29,199	29,816	31,277
Skyhaven	17,000	16,728	16,482	15,990
Errol	635	636	636	636
Franconia	4,200	4,200	4,550	4,550
Gifford Field	600	602	602	688
Gorham	730	730	730	730
Hampton	37,510	37,050	36,575	35,150
Hawthorne-Feather Airpark	3,000	3,000	3,000	2,800
Jaffrey Airport - Silver Ranch	7,300	7,293	6,864	6,864
Moultonboro	4,700	4,872	4,872	5,208
Newfound Valley	1,510	1,509	1,509	1,509
Parlin Field	3,050	3,161	3,161	3,379
Plymouth Municipal	3,030	3,030	3,333	3,333
Twin Mountain	600	600	600	600
	436,564	438,490	440,159	446,874

Source: Consultant calculations (Includes Air Carrier and Air Taxi Operations)*

Although the figures presented for each forecast period vary greatly from FAA TAF data, it is important to note that the TAF data only considers the 12 NPIAS airports. When OPBA calculations are applied to the 11 non-NPIAS airports, the results are likely more indicative of actual activity across NH's entire system of airports.

5.4 SUMMARY OF FORECAST SYSTEM ACTIVITY

As a result of applying the various methodologies identified in this chapter, the NH system of airports is forecasted to see an approximate 2.5% increase in total operations through 2033, this is mostly attributed to the forecasted growth of air carrier operations at Manchester-Boston Regional Airport. However, with regard to general aviation operations, the forecast suggests that operational levels will remain relatively flat through the end of the 20-year planning period. This forecasted trend beyond 2018 is caused by applying a negative growth over a 20 year period to the airports that are home to mostly piston driven aircraft which essentially nullifies the forecasted growth of the system airports that experience air carrier, and turbine aircraft operations. In other words, the projected increase in operations at airports projected to experience an increase in the level of operations is nearly negated by the airports projected to experience decreased levels.

As discussed earlier, forecasting operations at non-towered GA airports especially on a system-wide level is difficult due to the methods available to collect accurate historical data. Unfortunately, due to the nature of a majority of the NH system airports the most common method of collecting operational data is asking airport personnel. This method is also the most inaccurate. It is recommended that the state undertake a feasible method that will contribute to more accurate operational counts of the airport system. There are currently six different methods being used to sample aircraft traffic which include:

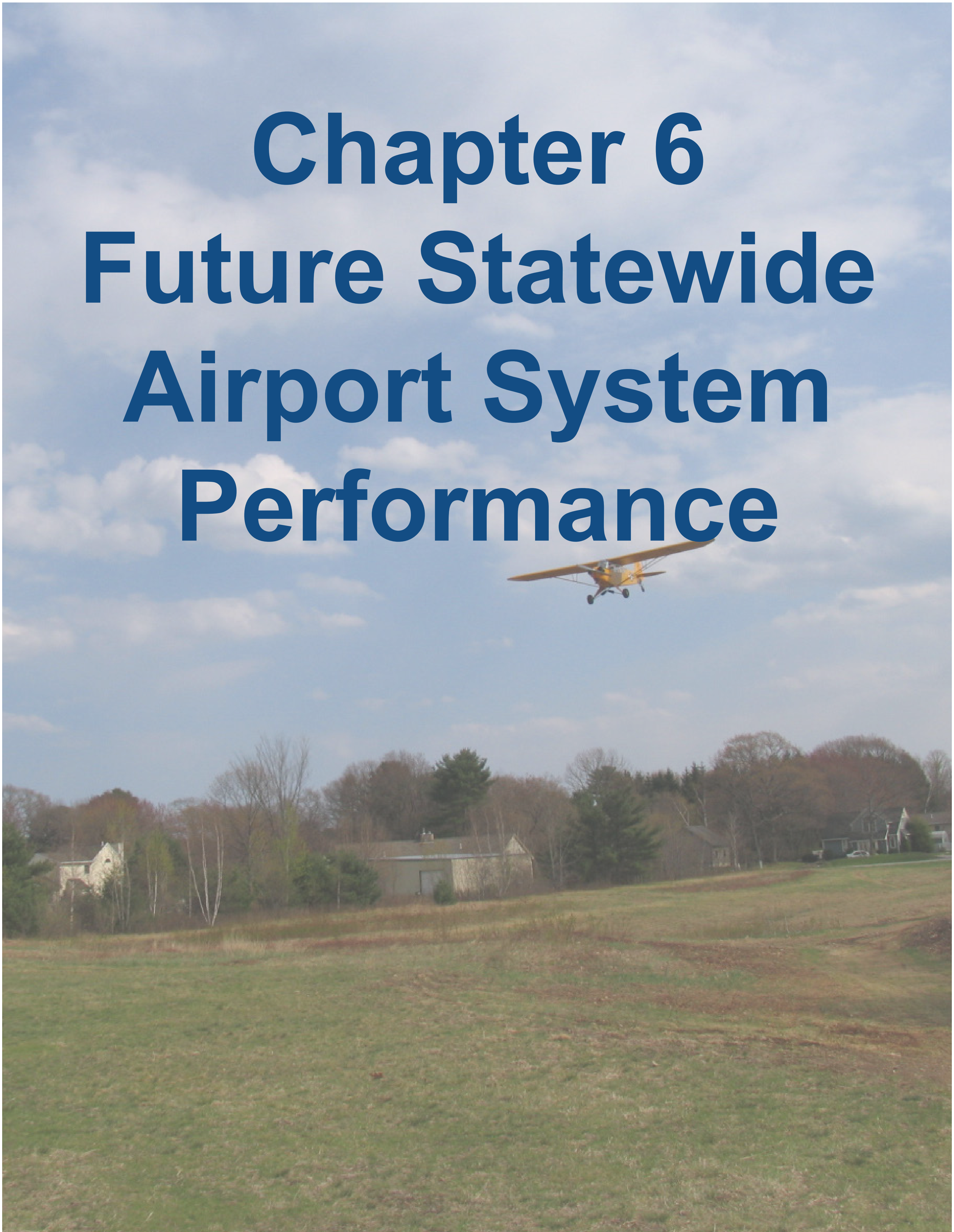
- Acoustical
- Airport guest logs
- Fuel sales
- Pneumatic
- Video image detection, and
- Visual

Industry studies suggest that the most accurate and cost-effective way to estimate aircraft operations at a non-towered airport is to sample traffic for two weeks for each of the four seasons and extrapolate that sample into an annual estimate. This is considered the best practice if year-round counts are not feasible. An acoustical counter provides a cost-effective, efficient, and accurate way to collect the sample, whereas the video image detection system, although more costly, adds additional information that may be useful to an airport. Pneumatic counters and inductance loop counters have several serious limitations and would only be useful at airports that have a most simple configuration of one runway and one entry taxiway. Airport guest logs and fuel sales have been determined unreliable and are also not recommended as a way to accurately count traffic. New technologies such as the General Audio Recording Device (GARD) are also being used at general aviation airports as a way to measure trends, record aircraft movements, and improve the overall reliability of airport data. Implementing such technologies should also be considered by the state.

In conclusion, since forecasting is not an "exact science", outside influences, the economy, or industry changes can impact NH's system of airports. Therefore, the state is encouraged to monitor some of the influences that could trigger impacts on the level of GA activity at the system airports. Some of these include but are not limited to:

- The rate of economic recovery and the economic well-being of NH
- Development in the vicinity of any system airport
- The price of oil
- The number of active general aviation pilots in NH throughout the forecast period
- The growth of the Unmanned Aircraft Systems (UAS) sector
- Statewide Aviation Policies and Practices

Chapter 6 Future Statewide Airport System Performance



CHAPTER 6: FUTURE STATEWIDE AIRPORT SYSTEM PERFORMANCE

6.1 INTRODUCTION

This chapter presents the options and recommendations to improve the performance of New Hampshire's (NH) State Airport System (NHSASP). These options and recommendations respond to facility and service objective shortfalls and geographic gaps in service as presented in *Chapter 4, Current Statewide Aviation System Performance*, and are described in the following sections:

- Purpose & Rationale for Upgraded Airport System Roles
- Facility & Service Objective Improvement Options
- Geographic Coverage Performance Improvement Options

The process for determining options and recommendations for the future performance of NHSASP begins with assessing/synthesizing the current performance of system airports to determine airports which should be earmarked for an upgrade in their roles. The purpose and rationale for upgrading the role for particular airports establishes a future baseline airport system that can address facility and service shortfalls and gaps in coverage.

Once system airport roles are defined for the future statewide system, recommendations are made directing system airports to pursue improvements needed to meet minimum facility and service objectives defined in *Chapter 2, Roles and Objectives*. The process continues with a prioritization model to guide system airports in pursuing recommended facility and service objectives based on their system role.

The third step to determining options and recommendations for the future performance of NHSASP is to address geographic service gaps to provide improved services for areas of the state, population, and employment centers that are underserved. Included in this part of the process is an evaluation of the impact that adjacent states' airports have in NH, and an incremental approach to addressing any remaining gaps in the future system.

As described in the sections that follow, this chapter presents options and recommendations for airport-specific and system role improvements that align with the goals and objectives for the NHSASP.

6.2 PURPOSE & RATIONALE FOR UPGRADED SYSTEM ROLES

SYSTEM ROLES

Improving the future performance of the NHSASP begins with the evaluation of existing system performance and exploring whether any airport(s) should be upgraded to new roles in the statewide system. Elevating an airport system role should be considered when the benefits of doing so can provide or improve the following:

- **Expanded Capacity for the NH State Airport System:** Upgrading a system airport's role may also be warranted to provide expanded airport infrastructure that can better accommodate anticipated growth or change in aviation activity locally as well as regionally. Adding system capacity can be accomplished in several ways, including: an extended runway that can serve a greater diversity of aircraft; increased hangar storage that can serve new based and transient aircraft, as well as airport businesses providing maintenance or other specialized services; improvements to taxiways that can improve an airport's ability to accommodate increasing operations; or, adding fuel service that can better serve based and transient aircraft and attract new business/corporate aircraft.
- **Enhanced Service to Employers & Economic Centers:** Upgrading a system airport's role may be warranted to provide improved services to general employment centers and/or clusters of employers that drive year-round economic activity and jobs. For example, while the existing system does provide adequate coverage for the state's Top 50 employers, many small and medium-sized companies not on that list also rely on aviation services to support their business. Thus, an upgraded role also supports a broad spectrum of other local businesses.
- **Enhanced Service to Geographic Gap Areas:** Upgrading a system airport's role may be warranted to provide improved services to areas of the state where particular air access features are not present at existing system airports. For example, where large portions of the state are farther than 20 nautical miles from a 5,000-foot runway, Jet-A fuel service, or a precision approach, upgrading the role of an existing airport elevates applicable minimum facility and service objectives for that airport.

An upgraded role for a system airport comes with an expanded set of minimum facility and service objectives, and an expanded program of capital priorities for recommended facility and service objectives. As described in *Chapter 4, Current Statewide Aviation System Performance*, the level of services provided by system airports varies widely. This is due to the different roles each airport fulfills and also the range of services available within these roles.

Four airports have been identified as potential candidates for upgraded roles. The purpose and rationale for consideration of these airports as candidates for upgraded roles is as follows:

- **Dean Memorial Airport:** Dean Memorial Airport serves the southwestern portion of the White Mountain region of NH and is one of two publicly owned, public use facilities within the area. It serves not only Haverhill, but the Littleton area, which is the businesses center in this part of the state. It is the only paved runway in the region and has significant growth potential with available land to develop, whereas the other airports within this region do not. The airport is also a National Plan of Integrated Airport System (NPIAS) airport, therefore eligible for Federal Aviation Administration (FAA) funding whereas the other airports are not.

  These assets make Dean Memorial Airport a key facility within the southwestern portion of the White Mountain region, offering an aviation transportation facility capable of supporting and growing the economy in the northwestern corner of the state. Upgrading the role of this airport from a Basic to Local will address the aviation facility needs for the airport to serve as a key transportation facility for the region.

Dean Memorial Airport

- **Dillant-Hopkins Airport:** Keene is the largest urban area in NH not served by an interstate Highway. In addition, the Keene area is not serviced by scheduled commercial air service or passenger rail, and has limited intercity bus service. Despite being somewhat isolated with regards to transportation infrastructure, the region is home to over 25,000 residents and several of the state's top employers. One of the top employers, C&S Wholesale Grocers, is the largest grocery wholesaler in the US. Customers for C&S include grocery chains and retail stores across the country.

  With the key employers and customers already using the Dillant-Hopkins Airport on a daily basis, it is no surprise that facilities at the airport currently meet most of the criteria identified in this system plan for a National Airport. As the community and businesses continue to grow in the region, the dependence on the airport will continue to expand, especially with the lack of other transportation infrastructure.

Dillant-Hopkins Airport

- **Moultonboro Airport:** The Lakes region of NH has proven to be one of the most important economic assets in the state with regards to tourism. Many of the affluent visitors and home owners in the region utilize general aviation to visit the area during all seasons of the year, but especially so during the summer months. Presently, the majority of the general aviation demand for the Lakes region is served by the Laconia Municipal Airport located on the south side of Lake Winnipesaukee.

  As tourism and real estate continues to grow in the lakes region, so will the demand for general aviation. The forecast in the previous chapters also identified strong growth potential for the Moultonboro Airport. The Moultonboro Airport is considered for the upgrade from Basic to Local as it is the only system airport on the North side of Lake Winnipesaukee. The facilities and services associated with a Local Airport will help improve access to visitors and residents for the north side of the lake.

Moultonboro Airport

Mt. Washington Regional Airport

- **Mt. Washington Regional Airport:** The North Central portion of the White Mountain region is the premier tourism center of NH with two well-known resorts: Mountain View Grand Resort & Spa, and Omni Mount Washington Resort, which is home to and Omni Bretton Arms Inn at Mount Washington. Other prominent ski resorts, and summer sports including extensive hiking, zip lines, biking, and water sports are nearby. Mt. Washington Regional's central location also allows for quick access to Cannon Ski Area and Bretton Woods Ski Area. Fractional share aircraft transporting passengers to the region for business and pleasure use the airport extensively.

  Accessing the North Central portion of the White Mountain region efficiently is imperative to the regional economy. As with Dillant-Hopkins, the airport serves the regional need for the North Country and has many of the facilities associated with a regional facility. Changing the role from Local to Regional affirms the airport's key contributions to the North Country economy.

The sections that follow further explore the suitability of upgrading these airports' roles for the future NH state airport system.

6.3 FACILITY & SERVICE OBJECTIVE IMPROVEMENT OPTIONS

As described in *Chapter 4, Current Statewide Aviation System Performance*, system airports have been measured against the minimum facility and service objectives established for their respective roles. These minimum facility and service objectives build upon the Goals and Objectives set forth in *Chapter 1, Introduction*, and are restated below:

1) Provide a Safe, Secure, and Efficient Aviation System
2) Maximize Economic Value of NH's Airport System
3) Promote and Educate the Importance of the State's Aviation System
4) Enhance, Preserve, and Maintain State Aviation System Assets
5) Maximize Diverse Connectivity for State's Aviation Users

Pursuant to these goals, and to ensure that the NH state airport system provides a baseline of user value, safety, and access to the air transportation system, it is important for system airports to meet minimum facility and service shortfalls identified in *Chapter 4*, *Current Statewide Aviation System Performance*. These shortfalls are summarized by role in **Table 6-1**.

The NHSASP recommends that all system airports provide these minimum facilities and services; however, improvements at system airports are ultimately the decision of each airport sponsor. Additionally, demand for services also plays a key role in driving sponsor and private business investments at airports. As such, the NHSASP recognizes that the ability of each airport to meet all minimum standards depends upon local demand and private business interests, along with federal eligibility, funding cycles, and local funding support/match availability in the sponsors' capital budgets.

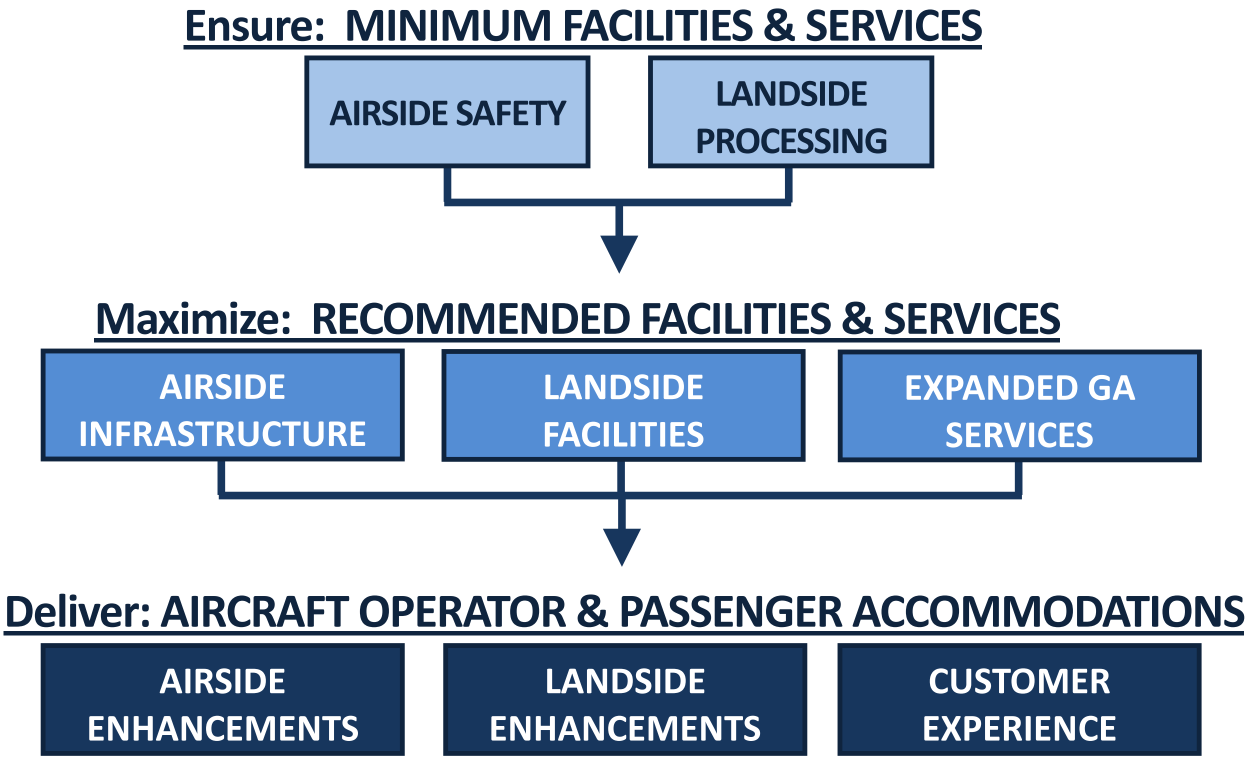
Table 6-1 – NHSASP – Minimum Facility & Service Objective Shortfalls by Role

Airport Role	Minimum Facility & Service Objectives Not Met
General Aviation Basic Airports	Aircraft Parking Area Basic Shelter (100 S.F.) Public Phone Open Year-Round Airport Manager Contact Available Posted Emergency Contact List
General Aviation Local Airports	Paved Aircraft Parking Area (4 spaces) Hangar Storage for all Winter-Based Aircraft Runway Lights Taxiway Reflectors Lighted Windsock Non-Precision Instrument Approach Procedure Posted Emergency Contact List
General Aviation Regional Airports	100% of Minimum Facility & Service Objectives Currently Met
General Aviation National Airports	100% of Minimum Facility & Service Objectives Currently Met
Primary Airports	Runway Length > 7,000 Feet Pavement Strength (250,000 lbs, Dual Tandem Wheel) Medium Intensity Approach Light System with Sequential Flashers Full-Time On-Site Airport Security Access to US Customs 34:1 Clear Approach Slope

Source: McFarland Johnson, Inc.

6.3.1 PRIORITIZATION OF RECOMMENDED FACILITY & SERVICE OBJECTIVES

For the NH state airport system to provide a level of performance that meets current and future needs, the NHSASP suggests priorities for each airport role. These priorities are based on the following prioritization model, where minimum facilities and services provide a foundation for expanding and delivering quality aviation services:



This model illustrates that the NHSASP prioritizes implementation of recommended facilities and services based upon ensuring safety, maximizing opportunity, and delivering quality service. As such, the model represents that system airports – regardless of NHSASP role – should first focus on ensuring that minimum facilities and services are in place. Once minimum facilities and services are met, each airport should focus on maximizing their market niche, including partnering with on- and off-airport businesses toward continued growth. Finally, system airports should focus on delivering great customer service and accommodations that can maintain system assets for the long term.

Based on this prioritization model, recommended facility and service objective priorities are presented in **Table 6-2**, by airport role.

Table 6-2 – NHSASP – Facility & Service Objective Priorities by Role

Airport Role	Minimum Facility & Service Objectives Not Met
General Aviation Basic Airports	100LL Fuel on Site Rotating Airport Beacon (Visual Aid) 20:1 Clear Approach Slope Terminal Building - Heated Open All Year
General Aviation Local Airports	Self-Serve 100LL Fuel available 24/7 Aircraft Maintenance on Site Runway Length 3,200 feet Pavement Strength -12,000 lbs (Single Wheel Landing Gear) Configuration) Jet-A Fuel Runway Lights – Pilot Controlled Low Intensity Taxiway Lights VGSI (Vertical Glide Slope Indicator) to Primary Runway End One Instrument Approach Procedure On-Site Automated Weather Reporting System 20:1 Clear Approach Slope Paved Aircraft Parking Area - 6 Aircraft Spaces Basic Terminal Building – 500 square feet Access to Rental Cars at Airport Airport-Owned Snow Removal Equipment Snow Removal Equipment Storage Building
General Aviation Regional Airports	Self-Serve Jet-A Fuel Available 24/7 Straight-In Instrument Approach Procedure to Two Runway Ends VGSI on Each Runway End Runway Length ≥ 4,600 feet Pavement Strength - 30,000 lbs (Single Wheel Landing Gear Configuration) Secure Aircraft Parking Apron – 15+ Jet/Turboprop Aircraft Terminal Building of Moderate Size 1,000± square feet Complete Airport Property Perimeter Fencing

Source: McFarland Johnson, Inc.

Table 6-2 – NHSASP – Facility & Service Objective Priorities by Role Con't

General Aviation National Airports	Runway Length ≥ 6,000 feet Pavement Strength - 60,000 lbs (Single Wheel Landing Gear Configuration) High Intensity Runway Lights/Medium Intensity Taxiway Lights Medium Intensity Approach Light System w/ Flashers Instrument Approach to All Runways, at Least Two Vertically Guided Approaches 34:1 Clear Approach Slope Secure Aircraft Parking Apron – 40± Jet/Turboprop Aircraft Terminal Building – 5,000 square feet Intermodal Ground Transportation Options Full-Time On-Site Airport Security ARFF – On Site 24/7 Airport Emergency Plan Air Traffic Control Tower Access to Customs
Primary Airports	Runway and Taxiway Characteristics Determined by Users (Minimum B757/B767) Category-III Insurgent Landing System Approach to One Runway 50:1 Clear Approach Slope High Intensity Approach Lighting System With Sequenced Flashing Lights Air Traffic Control Tower 24/7 Scheduled Airline Passenger Service (Passenger/Baggage Security Screening) Passenger Terminal Building with Concessions Aircraft Cargo Handling Facilities US Customs and Border Protection Facility On-Site

Source: McFarland Johnson, Inc.

These priorities offer general guidance for improvements at system airports; however, capital planning and programming, as well as local funding initiatives should also respond to changes in activity levels or the unique needs of current and prospective operators.

6.3.2 AVIATION ACTIVITY DEMAND & FORECAST IMPLICATIONS

Since 2008 the number of aircraft based in NH has decreased due to the economic recession, where aircraft not flown often or those that were mechanically deficient or derelict, were eliminated from the active fleet. Effectively, recessionary forces have "weeded out" aircraft that could not be adequately maintained, such that aircraft flying are affordable by their owners or flown for a specific purpose such as business use. The result of this fundamental change is reflected in the projection of aviation activity.

The aviation forecasts presented in *Chapter 4, Aviation Forecasts,* suggest a neutral or flat forecast of activity over the twenty planning period. The forecast of Based Aircraft showed a relatively small 1.4 percent increase or decrease depending upon which forecast is used (FAA Aerospace Forecast versus airport-specific forecast methodologies). In either case, this represents a stable future given the 15.5 percent decrease the state experienced over the past 10 years.

With regard to aviation operations, the forecasts represent a 5 percent increase over the twenty-year planning period, which equates to a 0.26 percent growth annually. An analysis of the data indicates that for the NPIAS airports, five are forecasted for activity increases and the remaining seven are anticipated to experience decreased activity. For the Non-NPIAS airports, five airports are forecasted to experience increased activity, four airports are anticipated to have declines, and three airports are forecasted to remain at current levels.

There are several positive implications of the forecasts on NHSASP airports. They are as follows:

- NH lost 15.5 percent of its based aircraft over the past ten years. The forecast of based aircraft by fleet mix, which used the FAA Aerospace Forecasts for the projections, suggests that there will be a shift in the types of based aircraft in the state. There will be a continued loss of single and multi-engine piston aircraft while turboprop, jet, and helicopters increase over the twenty-year planning period. The forecast showed a 1.4 percent growth over the twenty-year period, which is essentially a flat growth, but growth nonetheless.
- In terms of operations, the 5 percent growth over twenty years can be accommodated within the System. This level of growth also allows the system to absorb the increased activity, limiting spikes in capital funding to accommodate growth within the System.
- On a system-wide basis, operational forecasts appear balanced among all airports, with some airports forecasted to experience gains, others remain flat, and still others anticipated to see decreases in activity.

In summary the activity forecasts suggest that aviation activity within NH will stabilize, and slow growth in activity is projected over the next twenty years. As NH lost the least amount of aviation activity out of all of the New England states, this represents a positive future for aviation in NH.

6.4 GEOGRAPHIC PERFORMANCE IMPROVEMENT OPTIONS

As described in *Chapter 4*, *Current Statewide Aviation System Performance*, the geographic analyses identified service gaps within NH's state airport system. **Table 6-3** summarizes these service gaps.

Table 6-3 – NHSASP – Service Gap Summary

Coverage Type	Service Gaps
System-Wide Service Gaps (30- & 60- Minute Drive Times)	
Geographic Coverage Gap –System-wide	935 SQMI / 10%
Population Coverage Gap – System-wide	184,306 / 14%
Employment Coverage Gap – System-wide	N/A
General Aviation Airport Gaps, Primary Airport Gaps, & General Aviation Services Gap	
Geographic Service Gap – Basic, Local, Regional, & National Airports	3,532 SQMI / 37.8%
Geographic Service Gap – Primary Airports	3,911 SQMI / 41.8%
Geographic Service Gap – General Aviation Services	3,113 SQMI / 33.3%
Population Service Gap – Basic, Local, Regional, & National Airports	311,062 / 23.6%
Population Service Gap – Primary Airports	263,037 / 20.0%
Population Service Gap – General Aviation Services	193,477 / 14.7%
Employment Service Gap – Basic, Local, Regional, & National Airports	6 Top Employers
Employment Service Gap – Primary Airports	9 Top Employers
Employment Center Service Gap – General Aviation Services	1 Top Employer
Runways of 3,200 Feet or Greater Coverage Gap	
Geographic Service Gap	1,312 SQMI / 14%
Population Service Gap	67,139 / 6.1%
Employment Center Service Gap	N/A
Runways of 5,000 Feet or Greater Coverage Gap	
Geographic Service Gap	2,540 SQMI / 27.2%
Population Service Gap	100,470 / 7.6%
Employment Center Service Gap	3 Top Employers
Non-Precision Approach Coverage Gap	
Geographic Service Gap	1,111 SQMI / 11.9%
Population Service Gap	48,709 / 3.7%
Employment Center Service Gap	N/A
Precision Approach Coverage Gap	
Geographic Service Gap	3,661 SQMI / 39.2%
Population Service Gap	123,470 / 9.4%
Employment Center Service Gap	3 Top Employers

Table 6-3 – NHSASP – Service Gap Summary (con't)

On-Site Weather Reporting Coverage Gap	
Geographic Service Gap	1,784 SQMI / 19.1%
Population Service Gap	71,470 / 6.4%
Employment Center Service Gap	1 Top Employer
AvGas Fuel Service Coverage Gap	
Geographic Service Gap	697 SQMI / 22.7%
Population Service Gap	31,595 / 2.4%
Employment Center Service Gap	N/A
Jet-A Fuel Service Coverage Gap	
Geographic Service Gap	2,556 SQMI / 27.3%
Population Service Gap	106,470 / 8.1%
Employment Center Service Gap	3 Top Employers

Source: McFarland Johnson, Inc.

Considering these gaps in geographic, population, and employment center coverage, this section presents considerations and options for improving coverage of the NH state airport system.

6.4.1 ADJACENT STATES' AIRPORTS

Prior to exploring options for NH to improve coverage of its existing airport system, it is informative to consider how airports in adjacent states currently serve areas of NH, including population and employment centers. To do so, the NHSASP identified the following airports in Vermont, Massachusetts, and Maine for consideration.

Vermont

- **Caledonia County**
- **Post Mills**
- **Hartness State**

Massachusetts

- **Turners Falls**
- **Orange Municipal**
- **Gardner Municipal**
- **Fitchburg Municipal**
- **Lawrence Municipal**

Maine

- **Steven A. Bean Municipal**
- **Bethel Regional**
- **Eastern Slope Regional**
- **Sanford Municipal**

Utilizing the same methodology applied for NH, where 30-minute drive times were assessed with GIS software for these airports, a geographic performance analysis was conducted to measure the impacts and coverage of these neighboring states' airports. Importantly, the analysis focused calculations of coverage on system-wide gap areas identified for the NHSASP, to pinpoint the significance of services offered by these airports on areas of NH that are underserved today.

Geographic coverage provided for NH by adjacent states' airports is illustrated in **Figure 6-1.**

The result of this analysis yielded NH land area, population, and employment center coverage for these airports, and is presented in **Table 6-4**. **Figure 6-2** illustrates which portions of existing NH state airport system gaps adjacent states' airports serve.

As shown, adjacent states' airports have service areas that reach approximately 560 square miles of NH. Within these areas, adjacent states' airports serve more than 139,000 NH residents and four of the state's top 50 employers. When considering just existing gap areas in the state not served by NH system airports, adjacent states' airports serve 130 square miles and 11,113 residents that are not within a 30-minute drive to a NH system airport.

Table 6-4 – NHSASP – Adjacent States' Airports Drive Time Coverage Summary

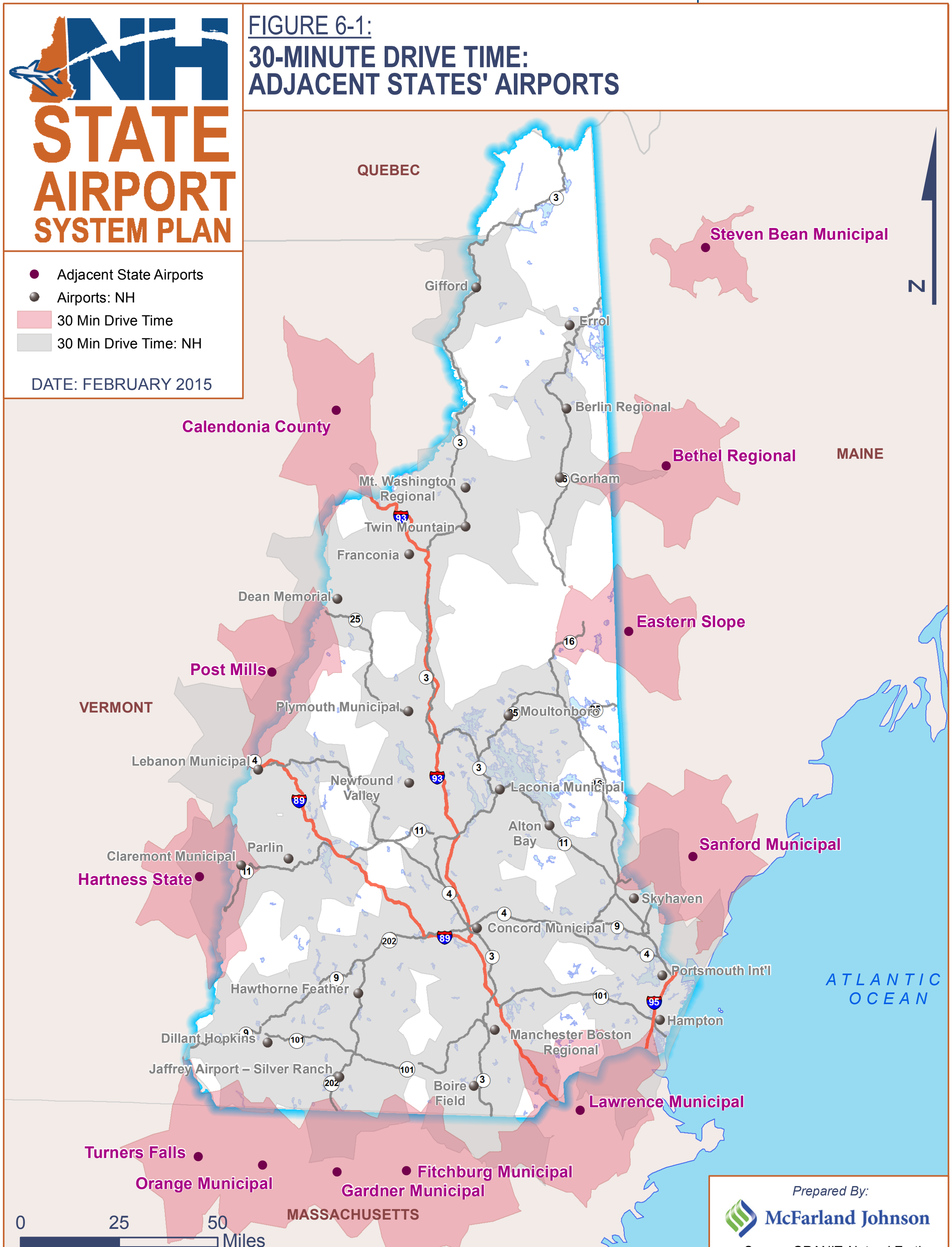
Coverage Type	Land Area Coverage	Population Coverage	Employment Center Coverage
Drive Time Coverage in NH	560 SQMI / 6%	139,436 / 10.6%	4 Top Employers
Drive Time Coverage of NH Gap Areas	130 SQMI / 1.4%	11,113 / 0.8%	N/A

Source: McFarland Johnson, Inc.

Similar to assessing drive time coverage for adjacent states' airports, 20 nautical mile service areas were assessed for air access features in order for these airports to measure the impacts and coverage of neighboring states' airports with these features. The analysis also focused calculations of coverage on system-wide gap areas identified for the NH state airport system, to pinpoint the significance of services offered by these airports on areas of NH that are underserved today.

Table 6-5 presents adjacent state airports that have the air access features considered in the analysis. Notably, Post Mills Airport in Vermont does not have any of the air access features, and therefore has no impact on coverage in NH.

FIGURE 6-1:
30-MINUTE DRIVE TIME: ADJACENT STATES' AIRPORTS



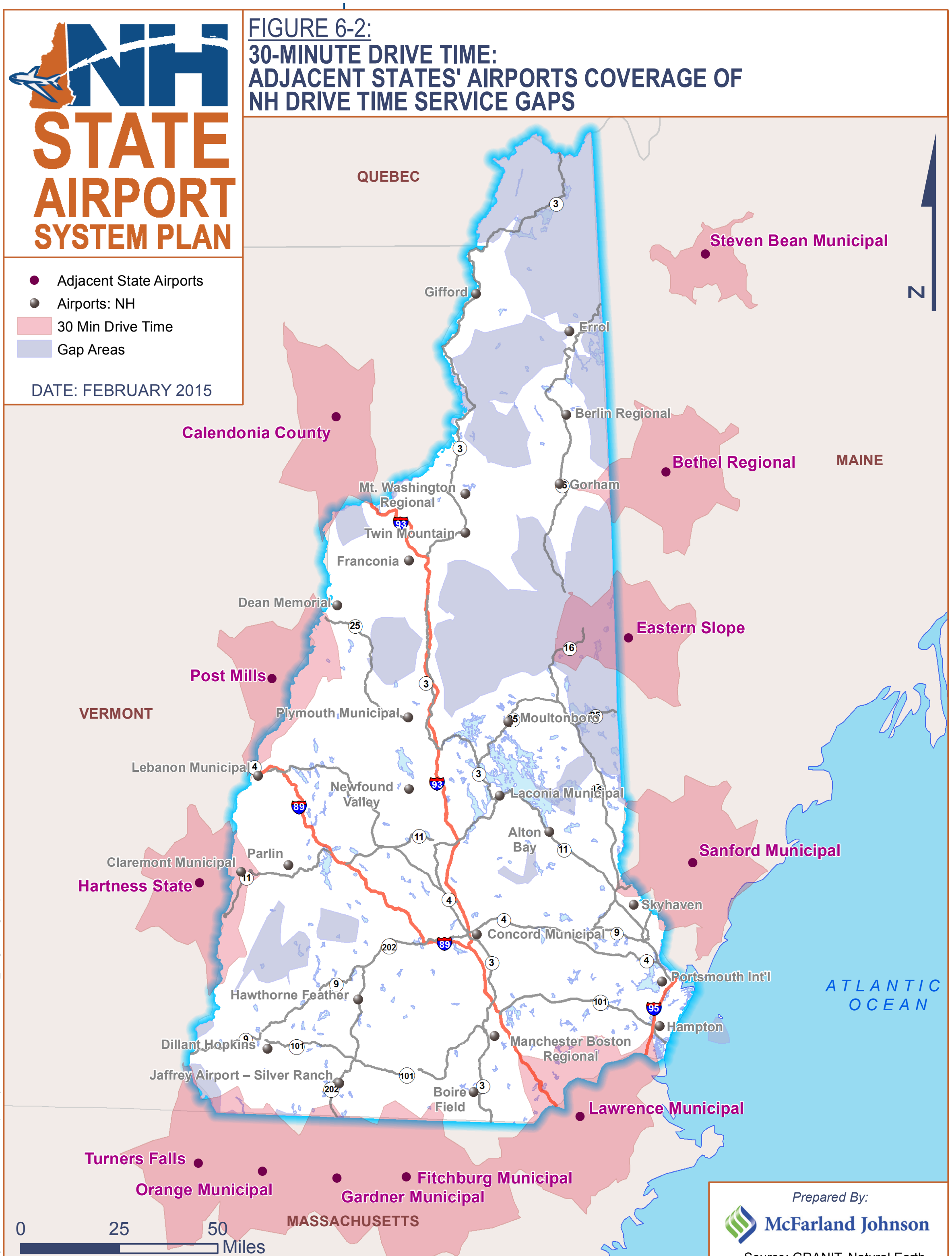

NH STATE AIRPORT SYSTEM PLAN
FIGURE 6-2:
30-MINUTE DRIVE TIME:
ADJACENT STATES' AIRPORTS COVERAGE OF
NH DRIVE TIME SERVICE GAPS
Adjacent State Airports
Airports: NH
30 Min Drive Time
Gap Areas
DATE: FEBRUARY 2015
QUEBEC
VERMONT
MAINE
MASSACHUSETTS
ATLANTIC OCEAN
N
Steven Bean Municipal
Calendonia County
Bethel Regional
Eastern Slope
Post Mills
Sanford Municipal
Hartness State
Lawrence Municipal
Turners Falls
Orange Municipal
Gardner Municipal
Fitchburg Municipal
Gifford
Errol
Berlin Regional
Gorham
Mt. Washington Regional
Twin Mountain
Franconia
Dean Memorial
Plymouth Municipal
Moultonboro
Lebanon Municipal
Newfound Valley
Laconia Municipal
Alton Bay
Claremont Municipal
Parlin
Skyhaven
Concord Municipal
Portsmouth Int'l
Hawthorne Feather
Hampton
Dillant Hopkins
Manchester Boston Regional
Jaffrey Airport – Silver Ranch
Boire Field
0 25 50 Miles
Prepared By:
McFarland Johnson
Source: GRANIT, Natural Earth.

Table 6-5 – NHSASP – Neighboring States' Airports Air Access Features

Neighboring Airport	3,200-Foot Runway	5,000-Foot Runway	Precision Approach	Non-Precision Approach	On-Site Weather Reporting	AvGas Fueling	Jet-A Fueling
Vermont							
Caledonia County	✓	X	X	X	✓	✓	X
Post Mills	X	X	X	X	X	X	X
Hartness State	✓	✓	X	✓	X	✓	✓
Massachusetts							
Turners Falls	✓	X	X	✓	X	✓	X
Orange Municipal	✓	X	X	✓	X	✓	✓
Gardner Municipal	X	X	X	✓	X	✓	
Fitchburg Municipal	✓	X	X	✓	✓	✓	✓
Lawrence Municipal	✓	✓	✓	✓	✓	✓	✓
Maine							
Steven A. Bean Municipal	✓	X	X	✓	✓	✓	✓
Bethel Regional	✓	X	X	X	✓	✓	X
Eastern Slope Regional	✓	X	X	✓	✓	✓	✓
Sanford Municipal	✓	✓	✓	✓	✓	✓	✓

Source: McFarland Johnson, Inc.

Note: ✓ = airport meets air access features X= airport does not meet air access features

The result of this analysis yielded NH land area, population, and employment center coverage for air access features at adjacent state airports, and is presented in **Table 6-6** and illustrated in **Figure 6-3**. As shown, adjacent states' airports have air access service areas that reach approximately 3,290 square miles of NH. Within these areas, adjacent states' airports serve more than 680,700 NH residents and 22 of the state's top 50 employers. When considering just existing gap areas in the state, adjacent states' airports reach 232 square miles and 12,870 residents that are not within a 20 nautical mile radius to a NH system airport.

Table 6-6 – NHSASP – Adjacent States' Airports Air Access Coverage Summary

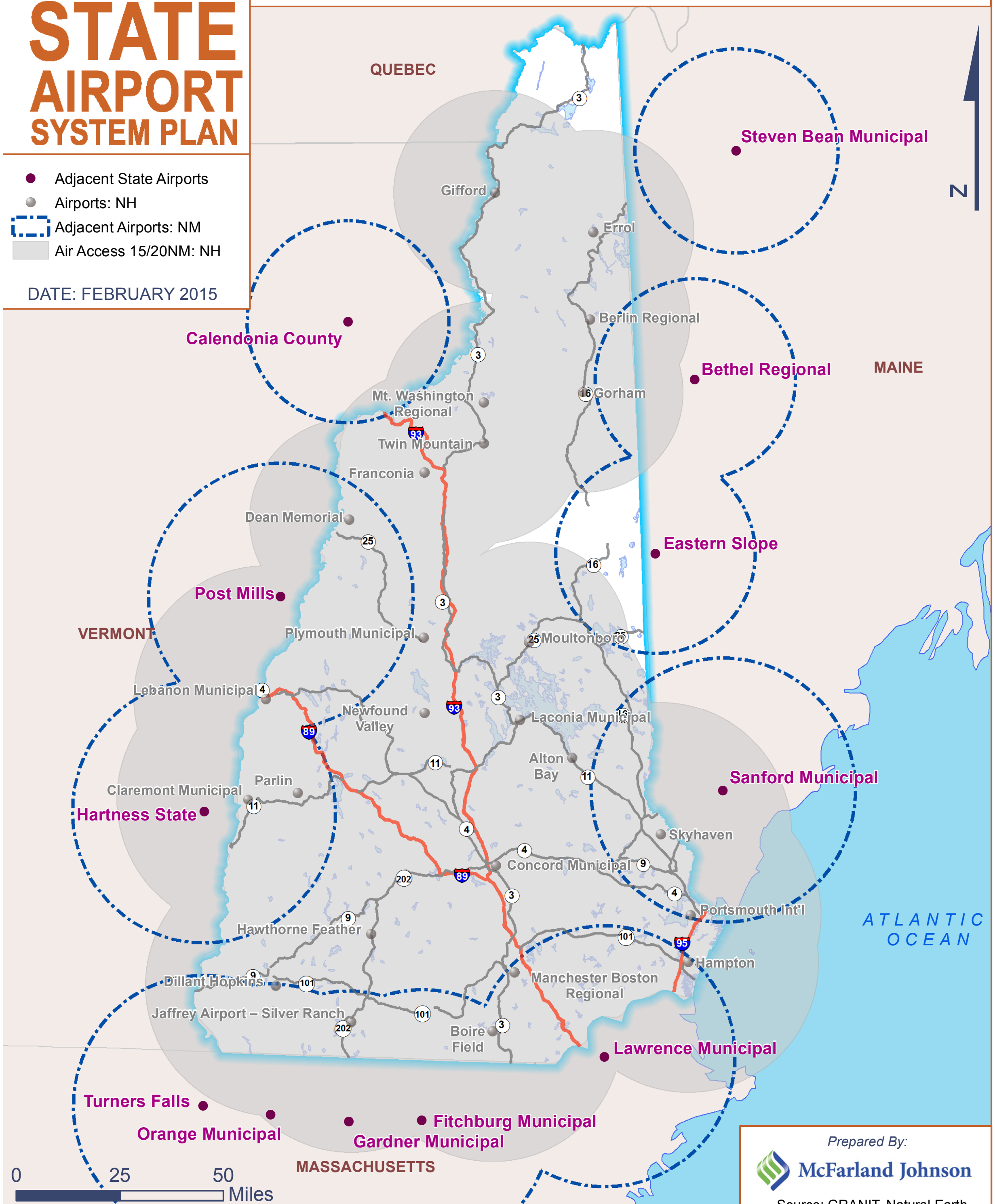
Coverage Type	Land Area Coverage	Population Coverage	Employment Center Coverage
Air Access Coverage in NH	3,290 SQMI / 36.2%	680,774 / 51.7%	22 Top Employers
Air Access Coverage of NH Gap Areas	232 SQMI / 46.5%	12,870 / 94.5%	N/A

Source: McFarland Johnson, Inc.

FIGURE 6-3:
AIR ACCESS COVERAGE: ADJACENT STATES' AIRPORTS

Adjacent State Airports
Airports: NH
Adjacent Airports: NM
Air Access 15/20NM: NH

DATE: FEBRUARY 2015



Prepared By: McFarland Johnson

Source: GRANIT, Natural Earth.

The drive time analysis of adjacent state's airports indicates that airports in Vermont, Massachusetts, and Maine do not serve significant portions of NH. The coverage data of adjacent states' airports presented in **Table 6-4** illustrates this, showing that overall land area coverage of 560 square miles in NH serves only 0.8 percent of population not fully served by the NH system airports. In fact, considering drive time areas shown in **Figure 6-2**, this coverage can be almost entirely attributed to services provided by Eastern Slope Regional Airport in Fryeburg, Maine.

Considering air access features, adjacent states' airports provide services to large portions of NH, which overlap areas served by system airports. As shown in **Table 6-5**, the 3,290 square miles of coverage provided by adjacent states' airports accounts for nearly 95 percent of NH population not fully served by NH system airports. As with the drive time analysis, this coverage can be almost entirely attributed to services provided by Eastern Slope Regional Airport.

A larger issue that affects NH airports with regard to bordering states is the differences in border state's aviation taxes and aircraft registration fees. Over the past twenty years, based aircraft in NH have fluctuated due to changes in border state aviation taxes and registration fees. Based on discussions with airports during the inventory process, there is a potential concern in registration fees for larger and newer aircraft. Aircraft registration fees in border states are lower for these aircraft, and several airports have seen either a loss in those aircraft or the inability to attract these aircraft to NH. As such, this issue will be further evaluated in *Chapter 8, System Recommendations,* to determine if there are any potential solutions.

6.4.2 COVERAGE IMPROVEMENT OPTIONS

To identify options for improving future geographic coverage of the NHSASP, this NHSASP assumes that the most practical means is to upgrade existing system airports. As such, this section identifies existing system airports that are positioned to fill an air access gap identified in *Chapter 4*, *Current Statewide Aviation System Performance*, which are areas of the state beyond 20 nautical miles from airports with specific air access features. Drive time coverage improvements are discussed in the following sections.

Drive Time Coverage Improvement Options

As described in *Chapter 4*, *Current Statewide Aviation System Performance*, statewide drive time coverage provided by the existing system reaches 90% of the state's land area, 86 percent of the population, and all of the Top 50 employers. This high level of coverage for the existing system indicates that ground access to public airports in NH is good. Given that service areas for general aviation airports are those areas roughly within a 30-minute drive, improvements to drive time coverage will depend almost entirely on local roadway systems, commuting patterns, and overall residential and commercial development as the primary driver of local traffic volumes.
Options to improve drive time coverage and to better serve gap areas within the NH state airport system range from addressing local roadway

and highway connectivity issues to building a new airport – both of which could expand coverage into areas not currently served. (The potential for a new airport is explored at the conclusion of this section.)

Air Access Coverage Improvement Options

While ground access to system airports in general is good, the analysis of air access coverage identified gap areas for specific airport features. As described in *Chapter 4, Current Statewide Aviation System Performance,* air access features are: runway length, approach capability, on-site weather reporting systems, and fuel service.

The analysis of coverage improvement options includes and considers the following elements:

- Impacts of Improvements at Candidate Airports;
- Obstacles at Candidate Airports;
- Potential of Airports Identified for Upgraded Roles to Improve Coverage; and,
- Coverage Provided by Adjacent States' Airports.

The impacts of making improvements at airports positioned to fill air access gap areas are measured in terms of the amount of land area, population, and Top 50 employers that stand to be gained, or covered, by the system if the improvement is made at each particular airport. The data shown represents the increase in land area, population, and Top 50 employers that will be covered if the improvement is made at each particular airport. The percentage is the statistical portion of the current gap area that would be added back into service by the statewide system.

The following summarizes these elements by air access feature.

- **Runways of 3,200 Feet or Greater Options:** To improve coverage by system airports with a primary runway of at least 3,200 feet, the NH state system has two options: either extending runways at existing system airports or the construction of a new airport in identified gap areas. The following airports are proximate to areas of the state that are not currently served by system airports with at least 3,200-foot runways:

The impacts of extending runways to 3,200 feet for each candidate airport in terms of gap area, population, and Top 50 employers served are listed in descending order by area.

Table 6-7 – NHSASP – Candidate Airports for 3,200 Foot Runways

	Candidate Airports	
	NPIAS Airports	
Dean Memorial	Claremont Municipal	
	Non-NPIAS Airports	
Gifford	Twin Mountain	Plymouth Municipal
Gorham	Franconia	Newfound Valley

Source: McFarland Johnson, Inc.

As NPIAS facilities, Dean Memorial and Claremont Municipal Airports are the only candidate airports that have access to federal funding for

Table 6-8 – NHSASP – Candidate Airport Gap Coverage - 3,200 Foot Runways

Airport	Area(SQMI)	%	Population	%	Employers	%
			NPIAS Airports			
Dean Memorial	506	38.6%	13,526	20.1%	0	N/A
Claremont Municipal	55	4.2%	4,678	7.0%	0	N/A
			Non-NPIAS Airports			
Plymouth Municipal	522	39.8%	8,533	12.7%	0	N/A
Franconia	505	38.5%	12,264	18.3%	0	N/A
Twin Mountain	319	24.3%	4,723	7.0%	0	N/A
Newfound Valley	182	13.9%	5,516	8.2%	0	N/A
Gorham	120	9.1%	121	0.2%	0	N/A
Gifford	74	6.6%	24	0.0%	0	N/A

Source: McFarland Johnson, Inc.

capital projects. Funding for a runway extension project at non-NPIAS airports would likely prove a significant obstacle.

Dean Memorial Airport was identified as a candidate for a role upgrade, and will have the largest impact in terms of additional population served of all candidate airports.

In terms of adjacent states' airport coverage, Eastern Slope Regional offers the greatest coverage in the existing gap area located in the East Central side of NH.

- **Runways of 5,000 Feet or Greater Options:** To improve coverage by system airports with a primary runway of at least 5,000 feet, the NH state system has two options, either extending runways at existing system airports or the construction of a new airport in identified gap areas. The following airports are proximate to areas of the state that are not currently served by system airports with at least 5,000-foot runways:

The impacts of extending runways to 5,000 feet for each candidate airport in terms of gap area, population, and Top 50 employers served are listed in descending order by area.

Table 6-9 – NHSASP – Candidate Airports for 5,000 Foot Runways

	Candidate Airports	
	NPIAS Airports	
Dean Memorial	Claremont Municipal	Skyhaven
	Mt. Washington Regional	
	Non-NPIAS Airports	
Gifford	Franconia	Parlin
Gorham	Plymouth Municipal	Hawthorne Feather
Twin Mountain	Newfound Valley	

Source: McFarland Johnson, Inc.

As mentioned for improving coverage by airports with 3,200-foot runways or greater, funding for a runway extension project at non-NPIAS airports would likely prove a significant obstacle due to funding limitations. With

Table 6-10 – NHSASP – Candidate Airport Gap Coverage - 5,000 Foot Runways

Airport	Area(SQMI)	%	Population	%	Employers	%
			NPIAS Airports			
Dean Memorial	828	32.6%	26,885	26.8%	1	33.3%
Mt. Washington Regional	717	28.2%	17,276	17.2%	2	66.7%
Claremont Municipal	191	7.5%	9,428	9.4%	0	N/A
Skyhaven	14	0.6%	1,919	1.9%	0	N/A
			Non-NPIAS Airports			
Franconia	1,163	46.8%	30,476	30.3%	2	66.7%
Twin Mountain	1,036	40.8%	23,564	23.5%	2	66.7%
Plymouth Municipal	575	22.6%	9,629	9.6%	1	33.3%
Gifford	408	16.1%	4,514	4.5%	0	N/A
Gorham	420	16.5%	7,074	7.0%	1	33.3%
Parlin	219	8.6%	10,628	10.6%	0	N/A
Newfound Valley	205	8.1%	6,234	6.2%	0	N/A
Hawthorne Feather	191	7.5%	9,428	9.4%	0	N/A

Source: McFarland Johnson, Inc.

the exception of Hawthorne-Feather Airport, none of the non-NPIAS airports would be airports to consider for a runway extension, as four of the airports have short turf runways, and the two paved runways are land constrained.

The two NPIAS airport that showed a potential benefit to the NH system were Dean Memorial and Mt. Washington Regional Airports, as both airports were identified as candidates for a role upgrade. Further evaluating the potential, Dean Memorial's role upgrade from Basic to Local would not require a 5,000-foot runway and given this, the airport is not seen as a candidate at this time. In the case of Mt. Washington, the role change does address a 5,000-foot runway potential. Given the increased coverage the airport provides for population and employment and that the airport has evaluated such an extension, Mt. Washington Regional Airport should be included as a candidate airport for a 5,000-foot runway.

In terms of adjacent states' airports coverage, only Hartness State (VT) and Sanford Municipal (ME) Airports have runways of 5,000 feet or greater and provide marginal coverage to gap areas in NH.

- **Non-Precision Approach Gaps:** To improve coverage by system airports with a non-precision approach, the NH state system can consider non-precision approaches at the following system airports. Notably, all NPIAS system airports offer non-precision approaches.

The following non-NPIAS system airports are proximate to areas of the state that are not currently served by system airports with non-precision approach capability.

The impacts of upgrading to non-precision approaches for each candidate airport in terms of gap area, population, and Top 50 employers served are listed in descending order by area below.

Table 6-11 – NHSASP – Candidate Airports for Non-Precision Approaches

Candidate Airports		
	Non-NPIAS Airports	
Gifford	Twin Mountain	Newfound Valley
Errol	Franconia	Parlin
Gorham	Plymouth Municipal	Hawthorne Feather

Source: McFarland Johnson, Inc.

The impact of either improving or adding a non-precision approach at any of the above candidate airports does not yield a significant impact to

Table 6-12 – NHSASP – Candidate Airport Gap Coverage - Non-Precision Approaches

Airport	Area(SQMI)	%	Population	%	Employers	%
			NPIAS Airports			
Gifford	408	36.7%	4,514	9.3%	0	N/A
Errol	353	31.8%	4,148	8.5%	0	N/A
Twin Mountain	166	14.9%	2,048	4.2%	0	N/A
Gorham	120	10.8%	3,121	6.4%	0	N/A
Plymouth Municipal	117	10.5%	779	1.6%	0	N/A
Franconia	89	8.0%	464	1.0%	0	N/A
Newfound Valley	42	3.8%	1,429	2.9%	0	N/A
Parlin	28	2.5%	893	1.8%	0	N/A
Hawthorne Feather	7	0.6%	33	0.1%	0	N/A

Source: McFarland Johnson, Inc.

population or employers. For example, potential improvements in land area coverage offered such a Gifford and Errol Airports would expand land area covered by greater than 30 percent, but do not result in greater than 10 percent of an improvement in population served. If fact, many of these airports would require runways of 3,200-feet to qualify for a non-precision approach as all of these airports are Non-NPIAS system airports, funding would be an obstacle.

Adjacent state airports currently serving areas of NH without access to no-precision approach capability include Eastern Slope Regional (ME), and to a lesser extent Steven Bean Municipal (ME) Airports.

- **Precision Approach Gaps:** To improve coverage by system airports with a precision approach, the NH state system can consider precision approaches at the following system airports.

These are proximate to areas of the state that are not currently served by system airports with precision approach capability.

The impacts of upgrading to precision approaches for each candidate airport in terms of gap area, population, and Top 50 employers served are listed in descending order by area below.

Table 6-13 – NHSASP – Candidate Airports for Precision Approaches

Candidate Airports		
	NPIAS Airports	
Berlin Regional	Dean Memorial	Claremont Municipal
Mt. Washington Regional	Skyhaven	
	Non-NPIAS Airports	
Gifford	Twin Mountain	Parlin
Errol	Franconia	Hawthorne Feather
Gorham	Plymouth Municipal	Newfound Valley

Source: McFarland Johnson, Inc.

As NPIAS facilities, Berlin Regional, Dean Memorial, Claremont Municipal, Mt. Washington Regional, and Skyhaven Airports are the only candidates that have access to federal funding for capital projects.

Table 6-14 – NHSASP – Candidate Airport Gap Coverage - Precision Approaches

Airport	Area(SQMI)	%	Population	%	Employers	%
			NPIAS Airports			
Mt. Washington Regional	1,319	36.0%	39,378	31.9%	2	66.7%
Berlin Regional	1,121	30.6%	23,305	18.9%	0	N/A
Dean Memorial	828	22.6%	36,885	29.9%	1	33.3%
Claremont Municipal	191	6.2%	9,428	7.6%	0	N/A
Skyhaven	14	0.4%	1,919	1.6%	0	N/A
			Non-NPIAS Airports			
Twin Mountain	1,469	40.1%	35,971	29.1%	2	66.7%
Franconia	1,281	36.0%	34,350	27.8%	2	66.7%
Gorham	1,222	33.4%	29,923	24.2%	1	33.3%
Errol	1,048	28.6%	18,520	16.0%	0	N/A
Gifford	870	23.8%	8,485	6.9%	0	N/A
Plymouth Municipal	575	16.7%	9,629	7.8%	1	33.3%
Newfound Valley	205	6.6%	6,234	6.0%	0	N/A
Parlin	219	6.0%	10,682	8.7%	0	N/A
Hawthorne Feather	143	3.9%	4,419	3.6%	0	N/A

Source: McFarland Johnson, Inc.

Based upon activity projections for these airports provided in *Chapter 5, Aviation Forecasts,* the aircraft operations projected for the NPIAS airports would not qualify them for an Instrument Landing System (ILS). This is also true of the non-NPIAS airports as well. Given the activity levels, Global Positioning System (GPS) approaches are more likely to be recommended for these airports and can provide approach minimum closer to ILS minimums if the approach surfaces obstruction clearing criteria can be met.

The only adjacent state with a precision approach capability that serves gap areas in NH is Sanford Municipal Airport (ME), which overlaps with Laconia Municipal Airport and provides only marginal improvement in coverage.

- **On-Site Weather Reporting Gaps:** To improve coverage by system airports with on-site weather reporting systems, the NH state system can consider on-site weather reporting at the following system airports. These are candidate to areas of the state that are not currently served by system airports with on-site weather reporting systems.

The impacts of installing on-site weather reporting systems for each candidate airport in terms of gap area, population, and Top 50 employers served are listed in descending order by area below.

As a NPIAS facility, Claremont Municipal Airport is the only candidate airport with access to federal funding for such an improvement. A

Table 6-15 – NHSASP – Candidate Airports for On-Site Weather Reporting Systems

Candidate Airports		
NPIAS Airports		
Claremont Municipal		
Non-NPIAS Airports		
Gifford	Twin Mountain	Newfound Valley
Errol	Franconia	Parlin
Gorham	Moultonboro	Hawthorne Feather

Source: McFarland Johnson, Inc.

population coverage increase of over 10 percent can be realized and would enhance aviation safety by providing additional weather reporting specific to Claremont.

As the non-NPIAS airports could not obtain funding for on-site weather reporting systems, the likelihood of obtaining such a facility is limited. However, Plymouth Airport has an AWOS that is operated by Plymouth State University. There may be an opportunity to fund an AWOS at selected non-NPIAS airports in the future and a further discussion with Plymouth State University is recommended.

Adjacent state airports offering on-site weather reporting services to areas not served in NH are Bethel Regional (ME), Eastern Slope Regional (ME), and Hartness State (VT) Airports.

Table 6-16 – NHSASP – Candidate Airport Gap Coverage - On-Site Weather Reporting Systems

Airport	Area(SQMI)	%	Population	%	Employers	%
			NPIAS Airports			
Claremont Municipal	191	10.7%	9,428	13.2%	0	N/A
			Non-NPIAS Airports			
Gifford	413	23.2%	5,411	7.6%	0	N/A
Errol	327	18.3%	1,038	1.5%	0	N/A
Franconia	244	13.7%	7,655	10.7%	0	N/A
Parlin	214	12.0%	10,563	14.8%	0	N/A
Twin Mountain	174	9.8%	425	0.6%	0	N/A
Gorham	150	8.4%	275	0.4%	0	N/A
Hawthorne Feather	143	8.0%	4,419	6.2%	0	N/A
Moultonboro	119	6.7%	2,334	3.3%	0	N/A
Newfound Valley	54	3.0%	2,540	3.6%	0	N/A

Source: McFarland Johnson, Inc.

- **AvGas Fuel Service Gaps:** To improve coverage by system airports with AvGas (100LL) fueling, the NH state system can consider AvGas fueling at the following system airports. Notably, all NPIAS system airports offer AvGas fuel services. The following non-NPIAS system airports are candidate to areas of the state that are not currently served by system airports with AvGas fuel service.

The impacts adding AvGas fuel service for each candidate airport in terms of gap area, population, and Top 50 employers served are listed in descending order by area.

The impact of providing AvGas fuel service at the above candidate airports represents significant improvements in terms of gap area and population served. While funding is likely an obstacle for non-NPIAS system airports, the upside benefits offer a compelling case for potential improvements, especially at Gifford and Errol Airports, where land area and population gains are above 50 percent and 13 percent, respectively. Gorham Airport, however, would not be a candidate at the airport as it is within an aquifer area.

Adjacent state airports currently serving areas of NH with access to AvGas include Bethel Regional (ME) and Eastern Slope Regional (ME) Airports.

Table 6-17 – NHSASP – Candidate Airports for AvGas Fuel Service

Candidate Airports		
	Non-NPIAS Airports	
Gifford	Gorham	Newfound Valley
Errol	Plymouth Municipal	

Source: McFarland Johnson, Inc.

- **Jet-A Fuel Service Gaps:** To improve coverage by system airports with Jet-A fueling, the NH state system can consider Jet-A fueling at the following system airports. These are candidate airports to areas of the state that are not currently served by system airports with Jet-A fuel service.

Table 6-18 – NHSASP – Candidate Airport Gap Coverage - AvGas Fuel Service

Airport	Area(SQMI)	%	Population	%	Employers	%
			NPIAS Airports			
Gifford	408	58.5%	4,514	14.3%	0	N/A
Errol	353	50.6%	4,148	13.1%	0	N/A
Gorham	111	16.9%	2,690	8.5%	0	N/A
Plymouth Municipal	6	0.9%	8	0.0%	0	N/A
Newfound Valley	6	0.9%	8	0.0%	0	N/A

Source: McFarland Johnson, Inc.

The impacts of adding Jet-A fuel service for each candidate airport in terms of gap area, population, and top 50 employers served are listed in descending order by area.

As NPIAS facilities, Dean Memorial, Claremont Municipal, Mt. Washington Regional, and Skyhaven Airports are the only candidates that have access to federal funding for capital projects. The two airports that could benefit from having Jet-A fuel in the immediate future would be Mt. Washington Regional and Skyhaven, both of which have 4,000 foot runways and are frequented by turbine aircraft. The existing runway lengths at Dean Memorial and Claremont are not long enough to support turbine aircraft operations, but might be considered for Jet-A fueling when considered for a longer runway.

The non-NPIAS airports listed are not considered candidates for Jet-A fuel, as they are not capable of accommodating turboprop or jet aircraft.

Table 6-19 – NHSASP – Candidate Airports for Jet-A Fuel Service

	Candidate Airports	
	NPIAS Airports	
Dean Memorial	Claremont Municipal	Skyhaven
Mt. Washington Regional		
	Non-NPIAS Airports	
Gifford	Franconia	Newfound Valley
Errol	Plymouth Municipal	Parlin
Gorham	Moultonboro	Hawthorne Feather
Twin Mountain		

Source: McFarland Johnson, Inc.

However, turbine helicopters can use non-NPIAS airports. Given this, consideration should be given to the potential to provide Jet-A fuel at the non-NPIAS airports for aviation activity associated with special operations for search and rescue or emergency medical evacuation. Discussions with the Army National Guard and other federal agencies could provide a determination if having Jet-A fuel at these airports would be beneficial. This will be evaluated in the next chapter.

Adjacent state airports currently serving areas of NH with access

Table 6-20 – NHSASP – Candidate Airport Gap Coverage - Jet-A Fuel Service

Airport	Area(SQMI)	%	Population	%	Employers	%
NPIAS Airports						
Dean Memorial	831	32.5%	26,974	26.3%	1	33.3%
Mt. Washington Regional	717	28.1%	17,276	16.2%	2	66.7%
Claremont Municipal	200	7.8%	10,024	9.4%	0	N/A
Skyhaven	14	0.5%	1,919	1.8%	0	N/A
Non-NPIAS Airports						
Franconia	1,163	46.5%	30,475	28.6%	2	66.7%
Twin Mountain	1,036	40.5%	23,564	22.1%	2	66.7%
Plymouth Municipal	582	22.8%	9,771	9.2%	1	33.3%
Moultonboro	573	22.4%	15,084	14.2%	0	N/A
Gorham	420	16.4%	7,074	6.6%	1	33.3%
Gifford	408	16.0%	4,514	4.2%	0	N/A
Errol	353	13.8%	4,148	3.9%	0	N/A
Parlin	231	9.0%	11,296	10.6%	0	N/A
Newfound Valley	216	8.5%	6,675	6.3%	0	N/A
Hawthorne Feather	146	6.7%	4,690	4.4%	0	N/A

Source: McFarland Johnson, Inc.

to Jet-A fuel service include Steven A Bean Municipal (ME), Eastern Slope Regional (ME), Sanford Municipal (ME), and Hartness State (VT) Airports.

6.5 SUMMARY & PRELIMINARY RECOMMENDATIONS

The following summarizes future statewide aviation performance improvements, which serve as preliminary recommendations that will be further explored and justified in *Chapter 7, Airport Facility Recommendations*:

- **Upgraded Airport System Roles:** Section 6.2 identified four airports that were considered for role changes including; Dean Memorial Airport, Dillant-Hopkins Airport, Mt. Washington Regional Airport, and Moultonboro Airport.

- **The Service Gap Analysis:** Section 6.4.2 addressed the service gaps among seven service gap elements. The findings of the analysis showed that Dean Memorial, Dillant-Hopkins and Mt. Washington Regional would provide real benefits in capturing additional population and employers within many of the service gap analyses. This is a confirmation that the benefits derived from upgrading the roles of these three airports will significantly enhance the system of airports and ensure system performance is maximized. Although the gap analysis did not show recommendations for Moultonboro Airport, the reason for upgrading Moultonboro was to address air access within the Lakes region. Given that Laconia Airport serves the Lakes region well, Moultonboro Airport will provide additional aviation access on the northern side of the Lake, which will continue to support the economic development, tourism, and second homes in the Lakes region.

- **Facility & Service Objective Improvements:** Section 6.3 outlines existing system minimum facility and service objective shortfalls. This section recommends that all system airports provide these minimum facilities and services. The NHSASP recognizes that the ability of each airport to meet all minimum standards depends upon local demand and private business interests, along with federal eligibility, funding cycles, and local funding support and availability in the sponsors' capital budgets. However, pursuant to NHSASP goals, these minimum facilities and services are intended to ensure that the NH state airport system provides a baseline of user safety, value, and access to the air transportation system.

  In addition to minimum facilities and services, the NHSASP provides a prioritization model for undertaking recommended facilities and services for each airport role. The prioritization model is additive, such that minimum facilities and services are to provide a foundation of safe operations. Once minimums are substantially met, the model prioritizes facilities and services that build and expand activities toward delivering a complement of aviation services that can meet the needs of current and future users and operators for the long term.

- **Geographic Performance Improvements:** Section 6.4 presents an analysis of geographic coverage improvement options, which is based upon identifying system airport candidates that could provide services to "gap" areas. The analysis focuses on air access feature coverage rather than drive-time coverage improvements, as the latter can only be enhanced via road and highway projects that can reduce travel times.

  For air access features, once these candidate airports are identified, the analysis quantifies the impacts that making improvements at each candidate airport in terms of land area, population and employment centers that are currently outside 20 nautical miles from these features. In this way, the analysis identifies those airports where improvements will have the largest impacts for the system.

  Importantly, the analysis segregates candidate airports by inclusion in the NPIAS, recognizing that non-NPIAS airports face significant funding hurdles for airfield construction projects that could benefit the NHSASP. Candidate system airports that stand to have the largest system-wide impacts are listed below by air access feature. Only candidate system airports included in the NPIAS with the largest impact are shown, except that each airport identified for a role upgrade is included where applicable.

As shown, Dean Memorial and Mt. Washington Regional Airports are positioned geographically to have the largest impacts to improve system-wide coverage for several air access features. Conversely, the addition of a non-precision approach, precision approach, and AvGas fuel service were found to have a negligible impact on improving "gap" area service coverage for the NH system.

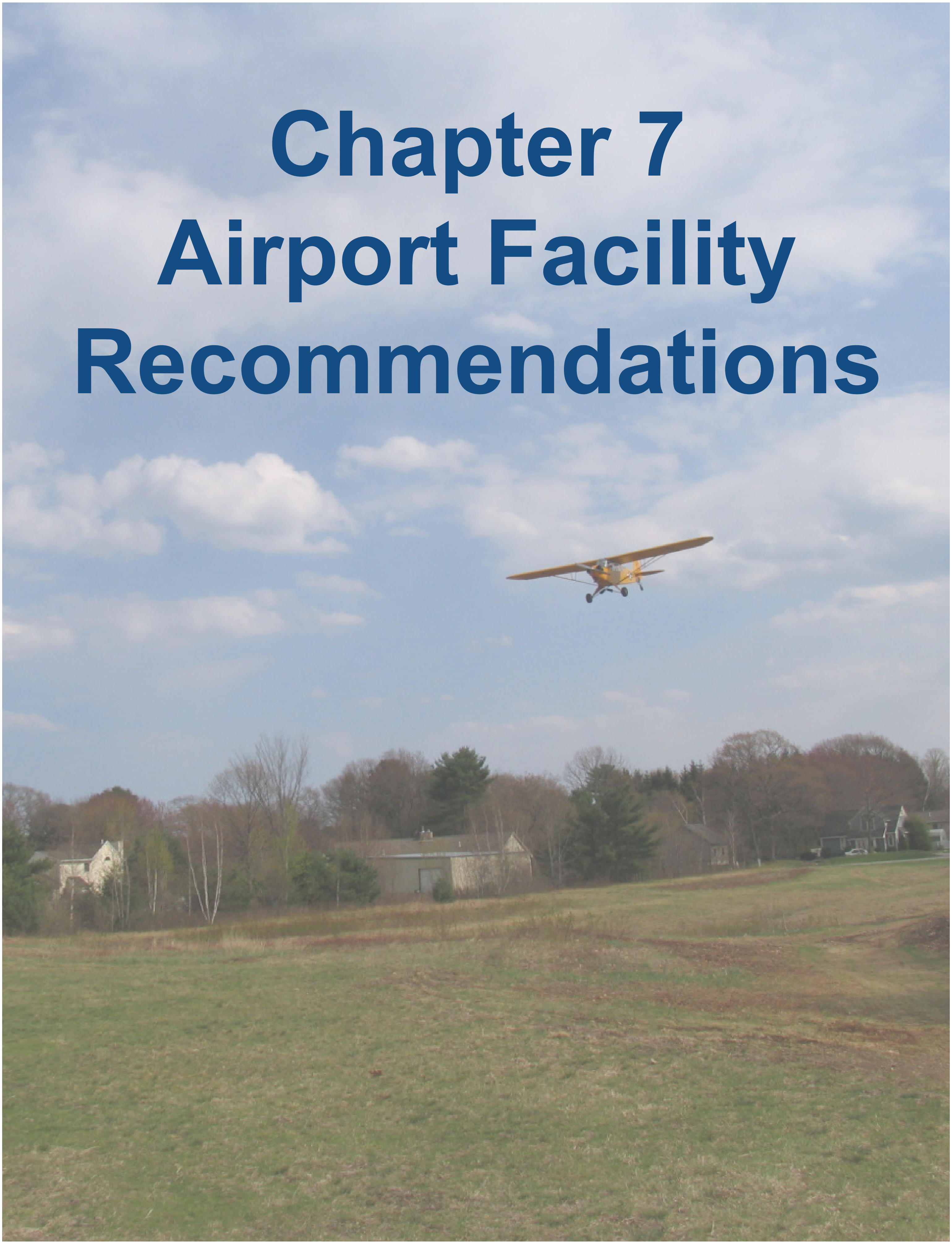
Regarding adjacent states' airports, only Eastern Slope Regional Airport was found to have any significant impact on areas of NH that are currently underserved by the existing state airport system.

Table 6-21 – NHSASP – Geographic Performance Improvements - Summary of Recommendations

Airport	% Land	% Population	# Employers
Runways of 3,200 Feet or Greater			
Dean Memorial	39%	20%	N/A
Runways of 5,200 Feet or Greater			
Mt. Washington Regional	28%	17%	2
Non-Precision Approaches			
N/A	N/A	N/A	N/A
Precision Approaches			
N/A	N/A	N/A	N/A
On-Site Weather Reporting			
Claremont Municipal	11%	13%	N/A
AvGas Fuel Service			
N/A	N/A	N/A	N/A
Jet-A Fuel Service			
Dean Memorial	33%	26%	1
Mt. Washington Regional	28%	16%	2

Source: McFarland Johnson, Inc.

Chapter 7
Airport Facility Recommendations



CHAPTER 7: AIRPORT FACILITY RECOMMENDATIONS

7.1 INTRODUCTION

The previous chapters provided the baseline data and objective analyses from which airport recommendations are developed. The inventory and forecast chapters provided the supporting data used to inform the performance analysis. The performance analysis (current and future) measured the effectiveness of the system today and with the recommended system-level changes. While previous chapters primarily reflect the state-wide system-level recommendations, this chapter focuses on recommendations for each individual airport included in the New Hampshire (NH) State Airport System Plan (NHSASP). The recommendations for each system airport are organized as follows:

- Minimum Facilities & Services
- Recommended Additional Facilities & Services
- Recommendations for Air Access Gaps
- System-Level Cost Estimates & Phasing

Recommendations presented in this chapter begin with the results of the analysis presented in *Chapter 4, Current Statewide Aviation System Performance*, which identified those minimum facilities and services that were not fully provided at each system airport. From this point, recommendations also include additional facilities and services that were established alongside minimums in *Chapter 2, Statewide Airport System Parameters.* Together, these minimums and additional facilities and services represent the infrastructure and services defined by the NHSASP as important for system airports to adequately serve users based upon each airport's specified system role.

Building upon facilities and service objectives defined at the outset of this NHSASP, the recommendations that follow also include improvements based on the gap analysis presented in *Chapter 6, Future Statewide Airport System Performance*. *Chapter 6* also identified the recommended minimum and additional facilities and services required to upgrade the role of four airports including Dean Memorial, Dillant-Hopkins, Mount Washington Regional, and Moultonboro Airports. *Chapter 6* concluded with the following recommendations, which will improve statewide coverage (in terms of land area, population, and employment centers):

Facility or Service	System Airport
Runways of 3,200 Feet or Greater	Dean Memorial
Runways of 5,000 Feet or Greater	Mt. Washington Regional
On-Site Weather Reporting	Claremont Municipal
Jet-A Fueling Service	Dean Memorial, Mt. Washington Regional

Source: McFarland Johnson, Inc.

These recommendations are included on each of the three airports' respective sections in the pages that follow.

For some system airports, facility and service objectives for their role dictate that a particular improvement (i.e., runway length of 3,200 feet or greater) is a minimum or recommended facility or service. However, an individual airport with such an objective may not have been identified in *Chapter 6* as a system airport that would improve system-wide geographic, population, or employment center coverage with that particular facility or service. In such cases, the NHSASP supports ***both*** the implementation of improvements that help system airports meet minimum facilities and service objectives identified in *Chapter 2, Facility Roles and Objectives,* and implementation of improvements that further advance a balanced system of airports, facilities, and services that complement each other for the state of NH. In this way, the NHSASP advocates for targeted investment at individual system airports to build an effective and efficient state airport system.

Planning-level cost estimates are included for each system airport's major recommended project items, along with suggested project phasing for use as guidance by the sponsor in their capital programming efforts. These planning level costs include engineering fees ("soft cost"), and account for other variables that will affect costs via a contingency factor. Details on these cost calculations and assumptions are in **Appendix 7-A**, which provides the detailed cost estimates developed for each airport with a breakdown of state, federal, and local funding sources at 5%, 90% and 5%, respectively, for AIP-eligible projects (discussed in more detail in *Chapter 8, System Recommendations*). Costs are based on specific NH or New England region projects.

Phases coincide generally with the airport master planning process, such that:

Phase	Timeframe
■ Phase 1	0-5 Years
■ Phase 2	5-10 Years
■ Phase 3	10-20 Years

Importantly, recommendations shown in Phase 1 for every system airport captures the specific minimum facility and service objectives that are not currently met by an airport. In this way, Phase 1 prioritizes a set of minimum objectives to improve the performance of the statewide system as described in *Chapter 2, Facility Roles and Objectives*. Recommended projects in Phases 2 and 3 contain recommended additional facilities and services as set forth in *Chapter 2*, and represent those areas of airport improvement where there is more flexibility in terms of project timing.

Finally, these timeframes are not intended to be applied rigidly, and should not be construed to begin with official publishing date of this NHSASP. Rather, this phasing is intended to provide general guidance to airport sponsors and NH Department of Transportation Bureau of Aeronautics (BOA) for prioritizing planning and funding processes for the benefit the NHSASP.

7.2 AIRPORT FACILITY RECOMMENDATIONS

This section presents recommended facilities and services for each system airport in the NHSASP. These recommendations are the result of the analysis presented in previous chapters, and are therefore those which best represent the needs of the statewide system and are of importance to the state's interests. However, it is ultimately up to the community and airport sponsor, with support from the BOA, to implement these recommendations. Airport recommendations with known barriers to project implementation, such as terrain constraints or environmental limitations, will be noted in this chapter. However, there may be additional hurdles for the implementation of certain recommendations identified in more airport-specific studies such as a master plan or environmental study. Similarly, other airport-specific recommendations for airport specific tenants or users may warrant additional projects or improvements. Therefore, these lists should not be considered comprehensive or a replacement for traditional master planning for each airport.

7.2.1 ALTON BAY

Alton Bay Ice Runway/Seaplane Base is a winter season ice runway on Lake Winnipesaukee. The BOA, which owns the facility and is run with volunteers, developed a basic Airport Layout Plan (ALP) that describes the various airside area requirements including safety areas, Runway Protection Zone, and separation standards for parked aircraft. Bureau staff work with the volunteers to ensure that the basic layout is established and that safety standards are met and maintained.

With the increase in activity over the past several years, there have been a number of projects identified for the facility. Such projects include additional equipment (cones, plow truck, etc.), marking wires in the vicinity of the ice runway, and the potential to build a dock for summer use.

7.2.2 ERROL AIRPORT

Recommendations for Errol Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Basic Airport

Minimum Facilities & Services (Not Met)

- Open Year-Round
- Aircraft Parking Area
- Manager Contact Posted
- Emergency Contact Posted
- Basic Shelter – 100 Square Feet
- Public Telephone[1/]

Recommended Additional Facilities & Services

- 100LL Fueling Service
- Rotating Beacon[2/]
- Terminal Building – Heated
- 20:1 Clear Approach Slope[3/]

Recommendations for Air Access Gaps

- N/A

Table 7-1 – NHSASP – Recommendations - Errol Airport

Capital Projects	Phase	Cost	Funding Source(s)
	Minimum Facilities & Services		
Basic Shelter - 100 Square Feet	1	$ 5,000	Local
Aircraft Parking Area	1	$ 153,000	Local
	Recommended Additional Facilities & Services		
100LL Fueling Service	2	$ 9,000	Local
20:1 Clear Approach Slope	3	$ 100,000	Local
Terminal Building - Heated	3	$ 18,000	Local
Total Costs		$ 285,000	

Source: McFarland Johnson, Inc.

Note(s):

1/A cost was not developed for public telephone as adequate cellular network coverage should suffice.

2/ The cost for rotating beacon is not included as the airport does not have runway lighting.

3/ Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.3 FRANCONIA AIRPORT

Recommendations for Franconia Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Basic Airport

Minimum Facilities & Services (Not Met)

- Open Year-Round
- Emergency Contact Posted

Recommended Additional Facilities & Services

- 100LL Fueling Service
- Rotating Beacon[1/]
- Terminal Building – Heated
- 20:1 Clear Approach Slope[2/]

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-2 – NHSASP – Recommendations - Franconia Airport

Capital Projects	Phase	Cost	Funding Source(s)
Minimum Facilities & Services			
Meets Standards	-	-	-
Recommended Additional Facilities & Services			
100LL Fueling Service	2	$ 9,000	Local
20:1 Clear Approach Slope	3	$ 100,000	Local
Terminal Building - Heated	3	$ 18,000	Local
Total Costs		$ 127,000	

Source: McFarland Johnson, Inc.

Note(s):

1/The cost for rotating beacon is not included as the airport does not have runway lighting.

2/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.4 GIFFORD FIELD

Recommendations for Gifford Field are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Basic Airport

Minimum Facilities & Services (Not Met)

- Open Year-Round
- Basic Shelter – 100 Square Feet
- Public Telephone1/

Recommended Additional Facilities & Services

- 100LL Fueling Service
- Rotating Beacon2/
- Terminal Building – Heated
- 20:1 Clear Approach Slope3/

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-3 – NHSASP – Recommendations – Gifford Field

Capital Projects	Phase	Cost	Funding Source(s)
Minimum Facilities & Services			
Basic Shelter - 100 Square Feet	1	$ 5,000	Local
Recommended Additional Facilities & Services			
100LL Fueling Service	2	$ 9,000	Local
20:1 Clear Approach Slope	3	$ 100,000	Local
Terminal Building - Heated	3	$ 18,000	Local
Total Costs		$ 132,000	

Source: McFarland Johnson, Inc.

Note(s):

1/ A cost was not developed for public telephone as adequate cellular network coverage should suffice.

2/ The cost for rotating beacon is not included as the airport does not have runway lighting.

3/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.5 GORHAM AIRPORT

Recommendations for Gorham Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Basic Airport

Minimum Facilities & Services (Not Met)

- Open Year-Round
- Manager Contact Posted
- Emergency Contact Posted
- Basic Shelter – 100 Square Feet
- Public Telephone[1/]

Recommended Additional Facilities & Services

- 100LL Fueling Service[2/]
- Rotating Beacon[3/]
- Terminal Building – Heated
- 20:1 Clear Approach Slope[4/]

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-4 – NHSASP – Recommendations - Gorham Airport

Capital Projects	Phase	Cost	Funding Source(s)
Minimum Facilities & Services			
Basic Shelter - 100 Square Feet	1	$ 5,000	Local
Recommended Additional Facilities & Services			
20:1 Clear Approach Slope	3	$ 100,000	Local
Terminal Building - Heated	3	$ 18,000	Local
Total Costs		$ 123,000	

Source: McFarland Johnson, Inc.

Note(s):

1/ A cost was not developed for public telephone as adequate cellular network coverage should suffice.

2/Fueling Service is not allowed at the Airport due to its location over a protected aquifer.

3/The cost for rotating beacon is not included as the airport does not have runway lighting.

4/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.6 HAWTHORNE FEATHER AIRPARK

Recommendations for Hawthorne Feather Airpark are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Basic Airport

Minimum Facilities & Services (Not Met)

- Manager Contact Posted
- Emergency Contact Posted
- Basic Shelter – 100 Square Feet
- Public Telephone[1/]

Recommended Additional Facilities & Services

- Terminal Building – Heated
- 20:1 Clear Approach Slope[2/]

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-5 – NHSASP – Recommendations – Hawthorne Feather Airpark

Capital Projects	Phase	Cost	Funding Source(s)
	Minimum Facilities & Services		
Basic Shelter - 100 Square Feet	1	$ 5,000	Local
	Recommended Additional Facilities & Services		
100LL Fueling Service	2	$ 9,000	Local
20:1 Clear Approach Slope	3	$ 100,000	Local
Terminal Building - Heated	3	$ 18,000	Local
Total Costs		$ 132,000	

Source: McFarland Johnson, Inc.

Note(s):

1/ A cost was not developed for public telephone as adequate cellular network coverage should suffice.

2/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.7 NEWFOUND VALLEY AIRPORT

Recommendations for Newfound Valley Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Basic Airport

Minimum Facilities & Services (Not Met)

- Manager Contact Posted
- Public Telephone1/

Recommended Additional Facilities & Services

- 100LL Fueling Service
- Rotating Beacon2/
- Terminal Building – Heated
- 20:1 Clear Approach Slope3/

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-6 – NHSASP – Recommendations – Newfound Valley Airport

Capital Projects	Phase	Cost	Funding Source(s)
	Minimum Facilities & Services		
Meets Standards	-	-	-
	Recommended Additional Facilities & Services		
100LL Fueling Service	2	$ 9,000	Local
20:1 Clear Approach Slope	3	$ 100,000	Local
Terminal Building - Heated	3	$ 18,000	Local
Total Costs		$ 127,000	

Source: McFarland Johnson, Inc.

Note(s):

1/ A cost was not developed for public telephone as adequate cellular network coverage should suffice.

2/ The cost for rotating beacon is not included as the airport does not have runway lighting.

3/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.8 PLYMOUTH MUNICIPAL AIRPORT

Recommendations for Plymouth Municipal Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Basic Airport

Minimum Facilities & Services (Not Met)

- Meets Standards

Recommended Additional Facilities & Services

- 100LL Fueling Service
- Rotating Beacon[1/]
- Terminal Building – Heated[2/]
- 20:1 Clear Approach Slope[3/]

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-7 – NHSASP – Recommendations – Plymouth Municipal Airport

Capital Projects	Phase	Cost	Funding Source(s)
Minimum Facilities & Services			
Meets Standards	-	-	-
Recommended Additional Facilities & Services			
100LL Fueling Service	2	$ 9,000	Local
20:1 Clear Approach Slope	3	$ 100,000	Local
Total Costs		$ 109,000	

Source: McFarland Johnson, Inc.

Note(s):

1/ The cost for rotating beacon is not included as the airport does not have runway lighting.

2/ The airport currently has a terminal building, however, it is not heated as it is not used during the winter.

3/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.9 TWIN MOUNTAIN AIRPORT

Recommendations for Twin Mountain Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Basic Airport

Minimum Facilities & Services (Not Met)

- Open Year-Round
- Manager Contact Posted
- Emergency Contact Posted

Recommended Additional Facilities & Services

- 100LL Fueling Service
- Rotating Beacon
- Terminal Building – Heated
- 20:1 Clear Approach Slope[1/]

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-8 – NHSASP – Recommendations – Twin Mountain Airport

Capital Projects	Phase	Cost	Funding Source(s)
Minimum Facilities & Services			
Meets Standards	-	-	-
Recommended Additional Facilities & Services			
100LL Fueling Service	2	$ 9,000	Local
Rotating Beacon	2	$ 23,000	Local
20:1 Clear Approach Slope	3	$ 100,000	Local
Terminal Building - Heated	3	$ 18,000	Local
Total Costs		$ 150,000	

Source: McFarland Johnson, Inc.

Note(s):

1/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.10 CLAREMONT MUNICIPAL AIRPORT

Recommendations for Claremont Municipal Airport are based upon minimum facility and service requirements in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Local Airport

Minimum Facilities & Services (Not Met)

- Emergency Contact Posted

Recommended Additional Facilities & Services

- Runway 3,200 Feet or Greater
- One Instrument Approach Procedure[1/]
- Jet A Fueling Service
- Access to Rental Cars at Airport
- On-Site Weather Reporting System
- 20:1 Clear Approach Slope[2/]

Recommendations for Air Access Gaps

- On-Site Weather Reporting System

System-Level Cost Estimates & Phasing

Table 7-9 – NHSASP – Recommendations – Claremont Municipal Airport

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Meets Standards	-	-	-		
Recommended Additional Facilities & Services					
Runway 3,200 Feet or Greater	2	$ 101,000	$ 90,900	$ 5,050	$ 5,050
One Instrument Approach Procedure	2	$ 50,000	$ 45,000	$ 2,500	$ 2,500
20:1 Clear Approach Slope	3	$ 100,000	$ 90,000	$ 5,000	$ 5,000
On-Site Weather Reporting System	3	$ 350,000	$ 315,000	$ 17,500	$ 17,500
Jet A Fueling Service	3	$ 300,000	$ 270,000	$ 15,000	$ 15,000
Total Costs		$ 901,000	$ 810,900	$ 45,050	$ 45,050

Source: McFarland Johnson, Inc.

Note(s):

1/ Future study to assess instrument procedures and evaluate potential to reduce approach minima.

2/ Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.11 DEAN MEMORIAL AIRPORT

Recommendations for Dean Memorial Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*. Additionally, since Dean Memorial is recommended for a role change from a GA Basic to a GA Local Airport, minimum and recommended additional facilities and services for GA Basic and GA Local airport roles apply.

Airport Role

- Local Airport

Minimum Facilities & Services (Not Met)

- Emergency Contact Posted
- Public Telephone[1/]
- Hangar Storage for All Winter-Based Aircraft
- Rotating Beacon
- Basic Terminal Building – 250 S.F.

Recommended Additional Facilities & Services

- Runway 3,200 Feet or Greater
- Pavement Strength 12,000 lbs (Single Wheel)
- Low Intensity Taxiway Lights
- Vertical Glide Slope Indicator (Primary Runway End)
- Basic Terminal Building – 500 Square Feet
- One Instrument Approach Procedure[2/]
- Jet A Fuel Service
- Aircraft Maintenance on Site
- Airport Owned Snow Removal Equipment
- Access to Rental Cars at Airport
- On-Site Weather Reporting System
- 20:1 Clear Approach Slope[3/]

Recommendations for Air Access Gaps

- Runway Length of 3,200 Feet or Greater
- Jet A Fuel Service

System-Level Cost Estimates & Phasing

Table 7-10 – NHSASP – Recommendations – Dean Memorial Airport

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Hangar Storage for All Winter-Based Aircraft	1	$ 1,200,000	$ 1,080,000	$ 60,000	$ 60,000
Rotating Beacon	1	$ 25,000	$ 22,500	$ 1,250	$ 1,250
Basic Terminal Building – 250 S.F.	1	$ 69,000	$ 62,100	$ 3,450	$ 3,450
Recommended Additional Facilities & Services					
Vertical Glide Slope Indicator (Primary Runway End)	2	$ 321,000	$ 288,900	$ 16,050	$ 16,050
Runway 3,200 Feet or Greater	2	$ 680,000	$ 612,000	$ 34,000	$ 34,000
Pavement Strength 12,000 lbs. (SW)	2	$ 3,450,000	$ 3,105,000	$ 172,500	$ 172,500
Low Intensity Taxiway Lights	2	$ 348,000	$ 313,200	$ 17,400	$ 17,400
Airport Owned Snow Removal Equipment	2	$ 150,000	$ 135,000	$ 7,500	$ 7,500
On-Site Weather Reporting System	3	$ 350,000	$ 315,000	$ 17,500	$ 17,500
Jet A Fueling Service	3	$ 300,000	$ 270,000	$ 15,000	$ 15,000
One Instrument Approach Procedure	3	$ 50,000	$ 45,000	$ 2,500	$ 2,500
Basic Terminal Building – 500 S.F.	3	$ 75,000	$ 67,500	$ 3,750	$ 3,750
Total Costs		$ 7,018,000	$ 6,316,200	$ 350,900	$ 350,900

Source: McFarland Johnson, Inc.

Note(s):

1/ A cost was not developed for public telephone as adequate cellular network coverage should suffice.

2/Future study to assess instrument procedures and evaluate potential to reduce approach minima.

3/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.12 HAMPTON AIRFIELD

Recommendations for Hampton Airfield are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Local Airport

Minimum Facilities & Services (Not Met)

- Runway Surface - Paved
- Runway 2,500 Feet or Greater
- Pavement Strength – 6,000 lbs.[1/]
- Paved Aircraft Parking Area – 4 Aircraft Spaces
- Hangar Storage for All Winter-Based Aircraft
- Taxiway Reflectors[2/]
- Rotating Beacon
- Non-Precision Instrument Approach Procedure
- Emergency Contact Posted

Recommended Additional Facilities & Services

- Runway 3,200 Feet or Greater
- Pavement Strength – 12,000 lbs. (Single Wheel)
- Paved Aircraft Parking Area – 6 Spaces
- Runway Lights – Pilot Controlled
- Low Intensity Taxiway Lights
- Vertical Glide Slope Indicator (Primary Runway End)
- Basic Terminal Building – 500 Square Feet

Table 7-11 – NHSASP – Recommendations – Hampton Airfield

Capital Projects	Phase	Cost	Funding Source(s)
Minimum Facilities & Services			
Runway Surface – Paved	1	$ 1,450,000	Local
Runway 2,500 Feet or Greater	1	$ 277,000	Local
Paved Aircraft Parking – 4 Spaces	1	$ 414,000	Local
Hangar Storage for All Winter-Based Aircraft	1	$ 2,625,000	Local
Rotating Beacon	1	$ 23,000	Local
Non-Precision Approach Procedure	1	$ 50,000	Local
Recommended Additional Facilities & Services			
Runway 3,200 Feet or Greater	2	$ 690,000	Local
Pavement Strength 12,000 lbs. (SW)	2	$ 2,398,000	Local
20:1 Clear Approach Slope	2	$ 100,000	Local
Paved Aircraft Parking – 6 Spaces	2	$ 207,000	Local
Runway Lights (Pilot Controlled)	2	$ 419,000	Local
Low Intensity Taxiway Lights	2	$ 144,000	Local
Vertical Glide Slope Indicator (Primary Runway End)	2	$ 289,000	Local
Basic Terminal Building – 500 S.F.	3	$ 53,000	Local
One Instrument Approach Procedure	3	$ 50,000	Local
Jet A Fueling Service	3	$ 270,000	Local
Airport-Owned Snow Removal Equipment	3	$ 135,000	Local
Snow Removal Equipment Storage Building	3	$ 267,000	Local
On-Site Weather Reporting System	3	$ 315,000	Local
Total Costs		$ 10,176,000	

Source: McFarland Johnson, Inc.

Note(s):

1/Pavement Strength – 6,000 lbs. not presented separate from cost of Runway 2,500 Feet or Greater.

2/Taxiway Reflectors – Low Intensity Taxiway Lights are the preferred long-term recommendation at the Airport, therefore a cost was not developed for taxiway reflectors.

3/Access to Rental Cars - Not available; however, the Airport provides a courtesy car.

4/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.13 JAFFREY AIRPORT – SILVER RANCH

Recommendations for Jaffrey Airport – Silver Ranch are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Local Airport

Minimum Facilities & Services (Not Met)

- Non-Precision Approach Procedure[1/]
- Emergency Contact Posted

Recommended Additional Facilities & Services

- Runway 3,200 Feet or Greater
- Pavement Strength 12,000 lbs (Single Wheel)
- Runway Lights – Pilot Controlled
- Low Intensity Taxiway Lights
- Vertical Glide Slope Indicator (Primary Runway End)
- One Instrument Approach Procedure
- Jet A Fuel Service
- Aircraft Maintenance on Site
- Airport Owned Snow Removal Equipment
- Snow Removal Equipment Building
- Access to Rental Cars at Airport[2/]
- On-Site Weather Reporting System
- 20:1 Clear Approach Slope[3/]

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-12 – NHSASP – Recommendations – Jaffrey Airport – Silver Ranch

Capital Projects	Phase	Cost	Funding Source(s)
Minimum Facilities & Services			
Non-Precision Approach Procedure	1	$ 50,000	Local
Runway 3,200 Feet or Greater	1	$ 341,000	Local
Recommended Additional Facilities & Services			
Low Intensity Taxiway Lights	2	$ 204,000	Local
One Instrument Approach Procedure	2	$ 50,000	Local
Pavement Strength 12,000 lbs. (SW)	3	$ 2,415,000	Local
Runway Lights (Pilot Controlled)	3	$ 419,000	Local
20:1 Clear Approach Slope	3	$ 100,000	Local
Vertical Glide Slope Indicator (Primary Runway End)	3	$ 289,000	Local
On-Site Weather Reporting System	3	$ 315,000	Local
Jet A Fueling Service	3	$ 270,000	Local
Airport Owned Snow Removal Equipment	3	$ 135,000	Local
Snow Removal Equipment Building	3	$ 267,000	Local
Total Costs		$ 4,855,000	

Source: McFarland Johnson, Inc.

Note(s):

1/Although the airport has three circling approach procedures, the recommendation is to assess a straight in approach.

2/Access to Rental Cars – Generally available; however, inventory of cars is limited and at times, unavailable.

3/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.14 MOULTONBORO AIRPORT

Recommendations for Moultonboro Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*. Additionally, since Moultonboro is recommended for a role change from a GA Basic to a GA Local Airport, minimum and recommended additional facilities and services for GA Basic and GA Local airport roles apply.

Airport Role

- Local Airport

Minimum Facilities & Services (Not Met)

- Non-Precision Instrument Approach Procedure
- Posted Emergency Contact Listed

Recommended Additional Facilities & Services

- Pavement Strength 12,000 lbs (Single Wheel)
- Runway Lights – Pilot Controlled

- Low Intensity Taxiway Lights
- Vertical Glide Slope Indicator (Primary Runway End)
- Basic Terminal Building – 500 S.F.
- One Instrument Approach Procedure
- Jet A Fuel Service
- Airport-Owned Snow Removal Equipment
- Snow Removal Equipment Storage Building
- Access to Rental Cars at Airport[1/]
- On-Site Weather Reporting System
- 20:1 Clear Approach Slope[2/]

Recommendations for Air Access Gaps

- Jet A Fuel Service

System-Level Cost Estimates & Phasing

Table 7-13 – NHSASP – Recommendations – Moultonboro Airport

Capital Projects	Phase	Cost	Funding Source(s)
Minimum Facilities & Services			
Non-Precision Approach Procedure	1	$ 50,000	Local
Recommended Additional Facilities & Services			
Pavement Strength 12,000 lbs. (SW)	2	$ 2,398,000	Local
Runway Lights (Pilot Controlled)	2	$ 419,000	Local
Low Intensity Taxiway Lights	2	$ 144,000	Local
Jet A Fueling Service	2	$ 270,000	Local
One Instrument Approach Procedure	2	$ 50,000	Local
On-Site Weather Reporting System	3	$ 315,000	Local
Vertical Glide Slope Indicator (Primary Runway End)	3	$ 289,000	Local
Basic Terminal Building – 500 S.F.	3	$ 53,000	Local
Airport-Owned Snow Removal Equipment	3	$ 135,000	Local
Snow Removal Equipment Storage Building	3	$ 267,000	Local
Total Costs		$ 4,390,000	

Source: McFarland Johnson, Inc.

Note(s):

1/Access to Rental Cars not available, but the Airport has a courtesy car.

2/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.15 PARLIN FIELD

Recommendations for Parlin Field are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Local Airport

Minimum Facilities & Services (Not Met)

- Non-Precision Approach Procedure[1/]

Recommended Additional Facilities & Services

- Paved Aircraft Parking – 6 Spaces
- Vertical Glide Slope Indicator (Primary Runway End)
- One Instrument Approach Procedure
- Airport Owned Snow Removal Equipment
- Snow Removal Equipment Building
- Parking for Transient Aircraft[2/]
- On-Site Weather Reporting System
- 20:1 Clear Approach Slope[3/]

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-14 – NHSASP – Recommendations – Parlin Field

Capital Projects	Phase	Cost	Funding Source(s)
		Minimum Facilities & Services	
Non-Precision Approach Procedure	1	$ 50,000	Local
		Recommended Additional Facilities & Services	
Paved Aircraft Parking – 6 Spaces	2	$ 207,000	Local
Vertical Glide Slope Indicator (Primary Runway End)	2	$ 289,000	Local
One Instrument Approach Procedure	2	$ 50,000	Local
On-Site Weather Reporting System	2	$ 315,000	Local
20:1 Clear Approach Slope	2	$ 100,000	Local
Airport-Owned Snow Removal Equipment	3	$ 135,000	Local
Parking for Transient Aircraft	3	$ 414,000	Local
Snow Removal Equipment Storage Building	3	$ 267,000	Local
Total Costs		$ 2,097,000	

Source: McFarland Johnson, Inc.

Note(s):

1/The Airport is pursuing an instrument approach (published approach anticipated in December 2015).

2/ Parking for Transient Aircraft – this project is an expansion of the existing transient apron.

3/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.16 SKYHAVEN AIRPORT

Recommendations for Skyhaven Airport are based upon minimum facility and service requirements presented in C*hapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Local Airport

Minimum Facilities & Services (Not Met)

- Hangar Storage for All Winter-Based Aircraft
- Emergency Contact Posted

Recommended Additional Facilities & Services

- One Instrument Approach Procedure[1/]
- Jet A Fuel Service
- 20:1 Clear Approach Slope[2/]

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-15 – NHSASP – Recommendations – Skyhaven Airport

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Hangar Storage for All Winter-Based Aircraft	1	$ 2,100,000	$ 1,890,000	$105,000	$105,000
Recommended Additional Facilities & Services					
Jet A Fueling Service	2	$ 300,000	$ 270,000	$ 15,000	$ 15,000
One Instrument Approach Procedure	3	$ 50,000	$ 45,000	$ 2,500	$ 2,500
20:1 Clear Approach Slope	3	$ 100,000	$ 90,000	$ 5,000	$ 5,000
Total Costs		$ 2,550,000	$ 2,295,000	$127,500	$127,500

Source: McFarland Johnson, Inc.

Note(s):

1/Skyhaven is currently pursuing an improved instrument approach procedure with omni-directional approach lighting.

2/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.17 BERLIN REGIONAL AIRPORT

Recommendations for Berlin Regional Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Regional Airport

Minimum Facilities & Services (Not Met)

- Meet Standards

Recommended Additional Facilities & Services

- Straight-In Instrument Approach Procedure to Two Runway Ends[1/]
- Secure Aircraft Parking Apron – 15+ Jet/Turboprop Aircraft
- Self Serve Jet A Fuel Available 24/7
- Vertical Glide Slope Indicator on Each Runway End
- Complete Airport Property Perimeter Fencing
- Part-Time Airport Operations and Maintenance Staff
- Local Fire Department Trained in Basic ARFF Procedures
- 20:1 Clear Approach Slope[2/]

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-16 – NHSASP – Recommendations – Berlin Regional Airport

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Meets Standards	-	-	-	-	-
Recommended Additional Facilities & Services					
Straight-In Instrument Approach Procedure to Two Runway Ends	2	$ 50,000	$ 45,000	$ 2,500	$ 2,500
Self Serve Jet A Fueling Available 24/7	2	$ 450,000	$ 405,000	$ 22,500	$ 22,500
Hangar Parking for Transient Aircraft	2	$ 1,250,000	$ 1,125,000	$ 62,500	$ 62,500
Complete Airport Property Perimeter Fencing	2	$ 297,000	$ 267,300	$ 14,850	$ 14,850
Vertical Glide Slope Indicator on Each Runway End	3	$ 432,000	$ 388,800	$ 21,600	$ 21,600
Secure Aircraft Parking Apron – 15+ Jet/Turboprop Aircraft	3	$ 2,216,000	$ 1,993,622	$ 110,800	$ 110,800
20:1 Clear Approach Slope	3	$ 100,000	$ 90,000	$ 5,000	$ 5,000
Total Costs		$ 4,795,000	$ 4,315,500	$ 239,750	$ 239,750

Source: McFarland Johnson, Inc.

Note(s):

1/ Runway 18 is the only runway end with an instrument approach. A study is proposed for Runway 36

2/ Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.18 CONCORD MUNICIPAL AIRPORT

Recommendations for Concord Municipal Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Regional Airport

Minimum Facilities & Services (Not Met)

- Meets Standards

Recommended Additional Facilities & Services

- Straight-In Instrument Approach Procedure to Two Runway Ends[1/]
- Self Serve Jet A Fuel Available 24/7
- Vertical Glide Slope Indicator on Each Runway End
- 20:1 Clear Approach Slope[2/]

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-17 – NHSASP – Recommendations – Concord Municipal Airport

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Meets Standards	-	-	-	-	-
Recommended Additional Facilities & Services					
Self Serve Jet A Fueling Available 24/7	2	$ 450,000	$ 405,000	$ 22,500	$ 22,500
Straight-In Instrument Approach Procedure to Two Runway Ends	3	$ 50,000	$ 45,000	$ 2,500	$ 2,500
Vertical Glide Slope Indicator on Each Runway End	3	$ 863,000	$ 776,700	$ 43,150	$ 43,150
20:1 Clear Approach Slope	3	$ 100,000	$ 90,000	$ 5,000	$ 5,000
Vertical Glide Slope Indicator on Each Runway End	3	$ 432,000	$ 388,800	$ 21,600	$ 21,600
Secure Aircraft Parking Apron – 15+ Jet/Turboprop Aircraft	3	$ 2,216,000	$ 1,993,622	$ 110,800	$ 110,800
20:1 Clear Approach Slope	3	$ 100,000	$ 90,000	$ 5,000	$ 5,000
Total Costs		$ 1,463,000	$ 1,316,700	$ 73,150	$ 73,150

Source: McFarland Johnson, Inc.

Note(s):

1/The study will evaluate an approach to Runway 30 and improvements to Runway 12 approach procedure.

2/Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.19 LACONIA MUNICIPAL AIRPORT

Recommendations for Laconia Municipal Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- Regional Airport

Minimum Facilities & Services (Not Met)

- Meets Standards

- ***Recommended Additional Facilities & Services***[1/]

- Self Serve Jet A Fuel Available 24/7

- Complete Airport Property Perimeter Fencing

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-18 – NHSASP – Recommendations – Laconia Municipal Airport

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Meets Standards	-	-	-	-	-
Recommended Additional Facilities & Services					
Self Serve Jet A Fueling Available 24/7	2	$ 450,000	$ 405,000	$ 22,500	$ 22,500
Complete Airport Property Perimeter Fencing	2	$ 225,000	$ 202,500	$ 11,250	$ 11,250
Total Costs		$ 675,000	$ 607,500	$ 33,750	$ 33,750

Source: McFarland Johnson, Inc.

Note(s):

1/Presence of prime wetlands will have an impact on development at the Airport.

7.2.20 MOUNT WASHINGTON REGIONAL AIRPORT

Recommendations for Mount Washington Regional Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*. Additionally, since Mt. Washington is recommended for a role change from a GA Local to a GA Regional Airport, minimum and recommended additional facilities and services for GA Local and GA Regional airport roles apply.

Airport Role

- Regional Airport

Minimum Facilities & Services (Not Met)

- Hangar Storage for All Winter-Based Aircraft
- Emergency Contact List Posted and Distributed
- Jet A Fuel Service
- Full-Service Fixed Base Operator
- Secure Aircraft Parking Apron – 10+ Jet/Turboprop Aircraft
- Partially Fenced Airport Property Perimeter

Recommended Additional Facilities & Services

- Runway Length of 4,600 Feet or Greater
- Straight-In Instrument Approach Procedure to Two Runway Ends[1/]
- Secure Aircraft Parking Apron – 15+ Jet/Turboprop Aircraft
- Self Serve Jet A Fuel Available 24/7
- Vertical Glide Slope Indicator on Each Runway End[2/]
- Complete Airport Property Perimeter Fencing
- Part-Time Airport Operations and Maintenance Staff

- 20:1 Clear Approach Slope[3/]

Recommendations for Air Access Gaps

- Runway Length of 5,000 Feet or Greater
- Jet A Fuel Service

System-Level Cost Estimates & Phasing

Table 7-19 – NHSASP – Recommendations – Mount Washington Regional Airport

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Hangar Storage for All Winter-Based Aircraft	1	$ 2,850,000	$ 2,565,000	$ 142,500	$ 142,500
Jet A Fueling Service	1	$ 300,000	$ 270,000	$ 15,000	$ 15,000
Partially Fenced Airport Property Perimeter	1	$ 278,000	$ 250,200	$ 13,900	$ 13,900
Secure Aircraft Parking Apron – 10+ Jet/Turboprop Aircraft	1	$ 1,034,000	$ 930,600	$ 51,700	$ 51,700
Recommended Additional Facilities & Services					
Runway Length of 4,600 Feet or Greater	2	$ 984,000	$ 885,600	$ 49,200	$ 49,200
Vertical Glide Slope Indicator on Each Runway End	2	$ 432,000	$ 388,800	$ 21,600	$ 21,600
Straight-In Instrument Approach Procedure to Two Runway Ends	2	$ 50,000	$ 45,000	$ 2,500	$ 2,500
Complete Airport Property Perimeter Fencing	3	$ 278,000	$ 250,200	$ 13,900	$ 13,900
Secure Aircraft Parking Apron – 15+ Jet/Turboprop Aircraft	3	$ 739,000	$ 665,100	$ 36,950	$ 36,950
Runway Length of 5,000 Feet or Greater	3	$ 658,000	$ 592,200	$ 32,900	$ 32,900
20:1 Clear Approach Slope	3	$ 100,000	$ 90,000	$ 5,000	$ 5,000
Total Costs		$ 7,703,000	$ 6,932,700	$ 385,150	$ 385,150

Source: McFarland Johnson, Inc.

Note(s):

1/ The cost estimate accounts for the existing approach to Runway 10 and recommends a study for Runway 28.

2/ The cost estimate accounts for the existing PAPI on Runway 10 and recommends a PAPI for Runway 28

3/ Approach Slope costs include an initial planning effort, which is accounted for in the above estimate. Not included are construction costs, which will vary widely and were not estimated at this time.

7.2.21 BOIRE FIELD

Recommendations for Boire Field are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

Airport Role

- National Airport

Minimum Facilities & Services (Not Met)

- Meets Standards

Recommended Additional Facilities & Services

- Terminal Building – 5,000 S.F. [1/]

- Full-Time On-Site Airport Security
- Intermodal Ground Transportation Options
- Access to US Customs
- Airport Emergency Plan[2/]

Recommendations for Air Access Gaps
- N/A

System-Level Cost Estimates & Phasing

Table 7-20 – NHSASP – Recommendations – Boire Field

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Meets Standards	-	-	-	-	-
Recommended Additional Facilities & Services					
Terminal Building – 5,000 SF	2	$ 1,875,000	$ 1,687,500	$ 93,750	$ 93,750
Total Costs		$ 1,875,000	$ 1,687,500	$ 93,750	$ 93,750

Source: McFarland Johnson, Inc.
Note(s):
1/Terminal Building - 5,000 SF.
2/ Airport does not currently have an emergency plan.

7.2.22 DILLANT-HOPKINS AIRPORT

Recommendations for Dillant-Hopkins Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*. Additionally, since Dillant-Hopkins is recommended for a role change from a GA Regional to a GA National Airport, minimum and recommended additional facilities and services for GA Regional and GA National airport roles apply.

Airport Role
- National Airport

Minimum Facilities & Services (Not Met)
- Emergency Contact List Posted and Distributed[1/]
- Self Serve Jet A and 100LL Available 24/7
- Hangar Storage for All Winter-Based Aircraft

Recommended Additional Facilities & Services
- Vertical Glide Slope Indicator on Each Runway End
- Full-Time On-Site Airport Security
- Secure Aircraft Parking Apron – 40+ Jet/Turboprop Aircraft
- Instrument Approach to All Runways, at Least Two Vertically Guided Approaches

- Intermodal Ground Transportation Options
- Air Traffic Control Tower[3/]
- ARFF On-Site 24/7
- Access to US Customs
- 34:1 Clear Approach Slope

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-21 – NHSASP – Recommendations – Dillant-Hopkins Airport

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Self Serve Jet A and 100LL Available 24/7	1	$ 460,000	$ 414,000	$ 23,000	$ 23,000
Hangar Storage for All Winter-Based Aircraft	1	$ 2,400,000	$ 2,160,000	$ 120,000	$ 120,000
Secure Aircraft Parking Apron – 40+ Jet/Turboprop Aircraft	1	$ 2,216,000	$ 1,994,400	$ 110,800	$ 110,800
Recommended Additional Facilities & Services					
Vertical Glide Slope Indicator on Each Runway End	2	$ 641,000	$ 576,900	$ 32,050	$ 32,050
Instrument Approach to All Runways, at Least Two Vertically Guided Approaches	2	$ 50,000	$ 45,000	$ 2,500	$ 2,500
ARFF On-Site 24/7	3	$ -	$ -	$ -	$ -
34:1 Clear Approach Slope	3	$ 100,000	$ 90,000	$ 5,000	$ 5,000
Total Costs		$ 5,867,000	$ 5,280,300	$ 293,350	$ 293,350

Source: McFarland Johnson, Inc.

Note(s):

1/ Emergency services are provided through City fire and police services, but no Emergency Contact List Posted at Airport.

2/ Runway 2/20 has a PAPI on both runway ends. The cost estimate is for two PAPI's for Runway 14/32.

3/ Air Traffic Control Tower is not included and requires coordination with NHDOT to determine potential need.

7.2.23 LEBANON MUNICIPAL AIRPORT

Recommendations for Lebanon Municipal Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance.*

Lebanon Municipal Airport serves the western portion of the state, providing commercial air service as well as a complement of general aviation services for both business and recreational users. As an important transportation asset and economic generator for the region, there are a number of projects and funding needs over the next 20 years and the current Airport Master Plan is the best source for information on these projects. At the time of this writing, the City is embarking on an update to the current Airport Master Plan. To more accurately quantify the overall funding need for the state, *Section 7.3, Summary of Total NH State Airport Funding Need* discusses order of magnitude system costs, and incorporates projects currently planned for Lebanon Municipal. Historical project and funding trends were reviewed for a 12-year period to create a projection of the 20-year anticipated need.

Airport Role

- Primary Airport

Minimum Facilities & Services (Not Met)

- Runway Length of 7,000 Feet or Greater[1/]
- Medium Intensity Approach Light System
- Full-Time On-Site Airport Security

Recommended Additional Facilities & Services

- Runway and Taxiway Characteristics Determined by Users (Minimum B757/B767) [2/]
- Aircraft Cargo Handling Facilities[3/]
- U.S. Customs and Border Protection Facility On-Site4/

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-22 – NHSASP – Recommendations – Lebanon Municipal Airport

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Medium Intensity Approach Light System	1	$ 500,000	$ 450,000	$ 25,000	$ 25,000
Runway Length of 7,000 Feet or Greater	3	$ 7,158,000	$ 6,442,200	$ 357,900	$ 357,900
Recommended Additional Facilities & Services					
Meets Standards	-	-	-	-	-
Total Costs		$ 7,658,000	$ 6,892,200	$ 382,900	$ 382,900

Source: McFarland Johnson, Inc.

Note(s):

1/ Runway Length of 7,000 Feet or Greater is placed in Phase 3 due to the variety of obstacles that would need to overcome in order for this to be a viable project at the Airport.

2/ Runway and Taxiway Characteristics at Airport are assumed to meet current and future user needs.

3/ Aircraft Cargo Handling Facilities were not included as there is no measurable demand at the Airport.

4/ U.S. Customs and Border Protection Facility On-Site is not included as current on-call access service is sufficient.

7.2.24 MANCHESTER-BOSTON REGIONAL AIRPORT

Recommendations for Manchester-Boston Regional Airport are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance*.

As the most complex and developed airport in the state of NH, it is no surprise that there are no identified system level capital needs for the Manchester-Boston Regional Airport. However, due to the higher level of activity, specialty users, scheduled passenger and air cargo, there will be a number of projects and funding needs over the next 20 years and the current MHT Master Plan is the best source for information on these projects. To more accurately quantify the overall funding need for the state, S*ection 7.3, Summary of Total NH State Airport Funding* Need discusses order of magnitude system costs, and incorporates projects currently planned for Manchester-Boston Regional. Historical project and funding trends were reviewed for a 12-year period to create a projection of the 20-year anticipated need.

Airport Role

- Primary Airport

Minimum Facilities & Services (Not Met)

- Meets Standards

Recommended Additional Facilities & Services

- Runway and Taxiway Characteristics Determined by Users (Minimum B757/B767) 1/

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

Table 7-23 – NHSASP – Recommendations – Manchester-Boston Regional Airport

Capital Projects	Phase	Cost	Funding Source(s)
Minimum Facilities & Services			
Meets Standards	-	-	-
Recommended Additional Facilities & Services			
Meets Standards	-	-	-
Total Costs		-	

Source: McFarland Johnson, Inc.

Note(s):

1/ Runway and Taxiway Characteristics at Airport are assumed to meet current and future user needs.

7.2.25 PORTSMOUTH INTERNATIONAL AIRPORT AT PEASE

Recommendations for Portsmouth International Airport at Pease are based upon minimum facility and service requirements presented in *Chapter 4, Current Statewide Aviation System Performance* and recommended additional facilities by airport role as presented in *Chapter 6, Future Statewide Airport System Performance.*

The Airport, due to its military heritage, meets many of the system level needs for a Primary Airport. However, due to the higher level of activity, specialty users, and scheduled passengers and air cargo service, there will be a number of projects and funding needs over the next 20 years and the current Portsmouth International Master Plan is the best source for information on these projects. To more accurately quantify the overall funding need for the state, *Section 7.3, Summary of Total NH State Airport Funding Need* discusses order of magnitude system costs, and incorporates projects currently planned for the Airport. Historical project and funding trends were reviewed for a 12-year period to create a projection of the 20-year anticipated need.

Airport Role

- Primary Airport

Minimum Facilities & Services (Not Met)

- Full-Time On-Site Airport Security

Recommended Additional Facilities & Services

- Runway and Taxiway Characteristics Determined by Users (Minimum B757/B767) 1/
- Category-III Instrument Landing System Approach to One Runway 2/

Recommendations for Air Access Gaps

- N/A

System-Level Cost Estimates & Phasing

14.7%

Job growth over the 10 years in the Portsmouth area is estimated at 14.7 percent…The Portsmouth area has the fastest projected growth in good-paying fields like computer and mathematical occupations, business and finance, insurance and technical occupation...The region's proximity to large population centers and tourist destinations on the Seacoast continue to drive employment growth… Source: Manchester Union Leader

Table 7-24 – NHSASP – Recommendations – Portsmouth International Airport at Pease

Capital Projects	Phase	Total Cost	Federal	State	Local
Minimum Facilities & Services					
Meets Standards	-	-	-	-	-
Recommended Additional Facilities & Services					
Category-III Instrument Landing System Approach to One Runway	3	$ 13,129,000	$ 11,816,100	$ 656,450	$ 656,450
Total Costs		$ 13,129,000	$ 11,816,100	$ 656,450	$ 656,450

Source: McFarland Johnson, Inc.

Note(s):

1/Runway and Taxiway Characteristics at Airport are assumed to meet current and future user needs.

2/The Airport retains a military component. Due to this joint use component, future civil projects costs may be shared with the military.

7.3 SUMMARY OF SYSTEM-WIDE CAPITAL PROJECTS

When planning capital resources, it is important to have a strong understanding on how and where the limited funds are being spent. Projects based on recommendations have been grouped into one of five categories and broken out by phase. **Table 7-25** categorizes all system airport projects into the following categories.

- **Airside –** Airside elements are those considered necessary for the movement and operation of aircraft without regard to aircraft base of servicing or storage needs. Elements considered under airside include runways, taxiways, airfield lighting, and aircraft parking aprons. For NPIAS airports, nearly all of these projects would likely be eligible for federal funding.
- **Landside –** Landside elements are those considered supporting in nature to the aircraft operation at the airport. These supporting elements include aircraft storage, terminal/public/operational buildings, and services such as fuel. For NPIAS airports, some of these projects may be eligible for federal funding; however, they would carry a lower priority ranking than airside projects.
- **Visual/Navigational Aids –** Visual and navigational aids are those airport features that assist a pilot in navigating to or from the airport. Visual and navigation aids can include items such as windsocks, visual glide slope indicators, weather reporting and rotating beacons.
- **Survey/Study –** Surveys and studies are non-physical items needed for an airport. Approach and obstructions surveys are one of the most common types identified in the NHSASP. Other studies can consist of airport master plans and feasibility studies.
- **Other** – Other items not included in the previously mentioned categories can vary, some common items identified in the NHSASP for NH include snow removal equipment and aircraft rescue and fire fighting vehicles.

Table 7-25 – NHSASP – Recommendations – Capital Project Summary

PHASE 1	Airside	Landside	Vis/NAVAIDS	Survey/Study	Other	Total
Basic	$153,000	$20,000	$0	$0	$0	$173,000
Local	$2,482,000	$6,092,000	$89,000	$200,000	$0	$8,863,000
Regional	$1,034,000	$3,428,000	$0	$0	$0	$4,462,000
National	$2,216,000	$2,860,000	$0	$0	$0	$5,076,000
Primary	$0	$0	$500,000	$0	$13,129,000	$13,629,000
SUBTOTAL	$5,885,000	$12,400,000	$589,000	$200,000	$13,129,000	$32,203,000
PHASE 2	**Airside**	**Landside**	**Vis/NAVAIDS**	**Survey/Study**	**Other**	**Total**
Basic	$0	$54,000	$23,000	$0	$0	$77,000
Local	$12,694,000	$945,000	$899,000	$300,000	$150,000	$14,988,000
Regional	$2,234,000	$1,872,000	$432,000	$100,000	$0	$4,638,000
National	$0	$1,875,000	$641,000	$50,000	$0	$2,566,000
Primary	$0	$0	$0	$0	$0	$0
SUBTOTAL	$14,928,000	$4,746,000	$1,995,000	$450,000	$150,000	$22,269,000
PHASE 3	**Airside**	**Landside**	**Vis/NAVAIDS**	**Survey/Study**	**Other**	**Total**
Basic	$0	$126,000	$0	$800,000	$0	$926,000
Local	$3,248,000	$2,389,000	$2,538,000	$550,000	$540,000	$9,265,000
Regional	$3,613,000	$278,000	$432,000	$1,213,000	$0	$5,536,000
National	$0	$0	$0	$100,000	$0	$100,000
Primary	$7,158,000	$0	$0	$0	$0	$7,158,000
SUBTOTAL	$14,019,000	$2,793,000	$2,970,000	$2,663,000	$540,000	$22,985,000
TOTAL	**Airside**	**Landside**	**Vis/NAVAIDS**	**Survey/Study**	**Other**	**Total**
	$34,832,000	$19,939,000	$5,554,000	$3,313,000	$13,819,000	$77,457,000

Source: McFarland Johnson, Inc.

7.4 SUMMARY OF TOTAL NEW HAMPSHIRE STATE AIRPORT FUNDING NEED

The previous section presents estimates developed for projects recommended by this NHSASP. However, there are additional costs that will be incurred over the next 20 years beyond those derived from facility and service objectives recommendations contained in this NHSASP. Such costs are related to both capital and non-capital projects identified in airport master plans and airport capital improvement plans (ACIP). Together, NHSASP costs presented in the previous section and costs estimated below offer an order of magnitude funding requirement toward meeting the total need for NH state airports over the long term.

The key areas comprising additional funding requirements for ongoing project costs at statewide airports in this section include:

- Additional Airside & Landside Infrastructure
- Pavement Maintenance
- Planning/Environmental/Specialty Studies

Planning-level cost estimates for statewide airport projects in these areas were developed utilizing 10-year ACIP on file with the BOA. These ACIP were extrapolated for an additional 10 years to provide a summary of total NH statewide airport funding need for the long-term, 20-year planning period.

7.4.1 ADDITIONAL AIRSIDE & LANDSIDE INFRASTRUCTURE

Based on 10-year ACIP information, costs associated with additional airside and landside infrastructure needs at NH airports amounts to roughly $372.25 million over the 20-year period. Importantly, NHDOT BOA should be able to meet a portion of the $372.25 million need via FAA Primary and FAA Block Grant funding. This 20-year ACIP need contained here includes these projects:

- **Additional Hangars -** The hangar need identified as part of the system plan consists of a measurement against the based aircraft forecast along with a basic hangar need for transient aircraft. At busier airports, namely those in the National and Primary roles, there may be a need for additional hangars above and beyond that which is prescribed in this system plan. Additional hangars are typically necessary to support the increased corporate activity and specific user demands. Airport master plans should carefully consider the airport specific requirements for additional hangars.

- **Additional Apron Space -** Similar to hangars, airports in the National and Primary roles may need additional infrastructure to accommodate higher volumes and more demanding clientele. In addition, some airports like Laconia and Concord may warrant additional apron area for special events like those associated with NASCAR. Airport master plans should carefully consider the airport specific requirements for additional apron space.

- **Airport-Specific Taxiway Needs -** From a system-wide perspective, only the type of taxiway infrastructure, such as a stub, turnarounds or full parallel were considered. No two airports are alike and so the necessary taxiway infrastructure to serve the terminal areas and all hangar areas will vary by airport with additional taxiways being required.

- **Crosswind/Secondary/Specialty Runways -** While no additional runways are currently proposed in the state of NH, there may be a future need for an additional or specialty runway for lighter aircraft such as gliders. No major additional runway infrastructure is anticipated; however, an additional turf or small crosswind paved runway cannot be ruled out at this time. Airport master plans will identify the need and analyze the feasibility of these runways.

- **Passenger Terminal Facilities -** While the NHSASP establishes an objective for passenger service at Primary Airports, the type and frequency of passenger service is established by the airlines and reflects business decisions related to broader market demands. A comprehensive market demand assessment and analysis of passenger terminal facility requirements should be a key part of the master planning process for each of the Primary Airports in NH. Facilities considered to be associated with passenger service include:

- Terminal buildings (inclusive of all passenger processing, security functions and concessions)

- Apron space dedicated to airline operations

- Passenger auto parking

- Terminal roadway network and access roads

- Specialty support services (rental car servicing, catering, belly cargo, ground transportation)

Each of these items will be unique for the airport to best match the necessary infrastructure with local and regional demands.

- **Additional Vehicles and Equipment –** The NHSASP identifies the basic need for specialty vehicles for things like snow removal and fire fighting. The specific number of vehicles required for both snow removal and fire fighting will vary based on each airport's specific needs. For airport certificated under Federal Aviation Regulation (FAR) Part 139, these requirements will be documented in the Airport Certification Manual (ACM).

7.4.2 PAVEMENT MAINTENANCE

One key system wide initiative for the next 20-years is to maintain the 24 airport system (Alton Bay excluded) in a state of good repair. The expected life-cycle of pavements in the New England region tends to be approximately 20 years between rehabilitations with minor servicing such as crack sealing completed several times during interim years. This level of maintenance is assumed to be true for all pavements that exist within the system today.

To estimate total system-wide funding needs for pavement maintenance over the 20-year period, a number of assumptions were made. These assumptions include a rehabilitation cost of $3.19 per square foot for runways and taxiways at Basic, Local, Regional and National Airports, and a cost of $6.29 per square foot for runways and taxiways at Primary Airports. When extrapolated across the existing system pavements today, it equates to an overall cost of roughly $51.5 million to simply maintain the system as it exists today. This estimate includes a 70 percent reduction of costs for pavements at non-NPIAS airports, which can many times construct pavement projects at a lower cost. This is due to the use of NHDOT specified aggregate materials and competitive labor rates, rather than FAA-funded pavement projects that require more expensive materials and pay at prevailing wage rates.

7.4.3 PLANNING, ENVIRONMENTAL, & FEASIBILITY STUDIES

Another non-capital cost for the NH airport system, is that associated with the planning, environmental, and specialized feasibility studies that often preclude construction projects. These include Master Plans, Airport Layout Plan (ALP) updates, environmental assessments (EAs) and noise studies. There was no pre-determined objective for various studies spelled out in the NHSASP; however, most every airport will need some form of planning/environmental study (and several more than once) over the 20-year study period. To account for the need for these studies over the 20-year planning period, an average annual amount has been assigned to each SASP role:

- Basic $25,000
- Local $50,000
- Regional $75,000
- National $100,000
- Primary $150,000

Overall the average equates to $400,000 annually for planning, environmental and specialty studies. These numbers are not meant to be exclusive to each role or phase, but rather provide a general guide on the order of magnitude required to fund the recommended planning and environmental studies. When distributed evenly over Phases I, II and III, the dollar amounts translate to $2 Million, $2 Million and $4 Million respectively, for a total of $8M over the 20-year planning period.

7.4.4 RECOMMENDATIONS CONCLUSION

These three elements (Additional Airside and Landside Infrastructure, Pavement Maintenance, and Planning/Environmental/Specialty Studies) represent up to over $431.75 million in additional needs for the NH state airport system. However, when combined with the NHSASP recommendations in the previous section ($77.46 million), the overall need identified amounts to more than $509.2 million over the 20-year planning period.

Table 7-26 presents this estimate of total NH state airport funding need for the 20-year planning period.

Table 7-26 – NHSASP – Total 20-Year NH State Airport Funding Need

Category	Amount
Additional Airside & Landside Infrastructure	$372,245,000
Pavement Maintenance	$51,500,000
Planning, Environmental, and Specialty Studies	$8,000,000
NHSASP Recommended Need (Section 7.2)	$77,457,000
Total NH State Airport Funding Need	$509,202,000

Source: McFarland Johnson, Inc.

APPENDIX 7-A

Non-NPIAS Capital Cost Adjustment Rate Sheet **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **All Non-NPIAS NHSASP Airports**

Assumptions:

The adjustments below are applied to capital cost assumptions for NPIAS airports.
These adjustents are made for capital projects at non-NPIAS airports because federal compliance is not required because no federal funds are utilized. For instance, NHDOT-specified materials can be used, which are slightly less costly and do not require the use of federal wage rates for labor. Capital projects at non-NPIAS airports will still require public bidding, full plans and specifications, compliance testing, and full-time inspection.
These adjustments were categorized as follows:

- **70% Reduction on Labor-Intensive Projects**
- **90% Reduction on Equipment-Focused Projects**

SRL/JEP

Date: **November 21, 2014** **RLL**

DESCRIPTION	ADJUSTMENT FACTOR	NPIAS UNIT COST	Non-NPIAS UNIT COST
Aircraft Parking Area (Unpaved)	70%	$ 9.11	$ 6.38
Paved Parking	70%	$ 24.64	$ 17.25
100LL Fueling Service	90%	$ 10,000.00	$ 9,000.00
Rotating Beacon	90%	$ 25,000.00	$ 22,500.00
Terminal Building - Heated	70%	$ 250.00	$ 175.00
Local Airport Paved Runway Surface - 2,500 Feet or Greater	70%	$ 986.00	$ 690.20
Hangar Storage Unit	70%	$ 150,000.00	$ 105,000.00
Basic Terminal - 250 Square Feet	70%	$ 275.00	$ 192.50
Local Airport Paved Runway Surface - 3,200 Feet or Greater	70%	$ 2,230.76	$ 1,561.53
Runway Strength (Full Length New Runway)	70%	See Jaffrey Airport - Silver Ranch, Moultonboro, Hampton	
Runway Lighting	90%	$ 465,192.00	$ 418,672.80
Low Intensity Taxiway Lighting	90%	$ 132.91	$ 119.62
Vertical Glide Slope Indicator	90%	$ 320,160.00	$ 288,144.00
Basic Terminal - 500 Square Feet	70%	$ 300.00	$ 210.00
JetA Fueling Service	90%	$ 300,000.00	$ 270,000.00
Snow Removal Equipment	90%	$ 150,000.00	$ 135,000.00
Snow Removal Equipment Building	70%	$ 292.43	$ 204.72
On-Site Weather Reporting Service	90%	$ 350,000.00	$ 315,000.00
Lighted Windsock	90%	$ 20,000.00	$ 18,000.00

Recommendations Estimate of Probable Cost McFARLAND-JOHNSON, INC.

NHDOT State Aviation System Plan

Airport: ERROL

Assumptions:

Aircraft Parking Area: Local Aircraft Parking 4 Spaces
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included
See: Non-NPIAS Capital Cost Adjustment Rate Sheet
Rotating Beacon: The cost for rotating beacon is not included as the airport does not have runway lighting

By: SRL/JEP
Ck: RLL

Date: November 21, 2014

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
		Public Telephone	EA	1	$ -	$ -	$ -	$ -	$ -
1	Landside	Basic Shelter - 100 Square Feet	EA	1	$ 5,000.00	$ 5,000	$ -	$ -	$ 5,000
1	Airside	Aircraft Parking Area	SF	23,970	$ 6.38	$ 153,000	$ -	$ -	$ 153,000
2	Landside	100LL Fueling Service	EA	1	$ 9,000.00	$ 9,000	$ -	$ -	$ 9,000
2	Vis/Navaid	Rotating Beacon	EA	0	$ 22,500.00	$ -	$ -	$ -	$ -
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
3	Landside	Terminal Building - Heated	SF	100	$ 175.00	$ 18,000	$ -	$ -	$ 18,000
					Total =	**$ 285,000**	**$ -**	**$ -**	**$ 285,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **FRANCONIA**

Assumptions:

Terminal Building - Heated: 100 SF Basic Shelter
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included
See: Non-NPIAS Capital Cost Adjustment Rate Sheet
Rotating Beacon: The cost for rotating beacon is not included as the airport does not have runway lighting

By: SRL/JEP

Date: **November 21, 2014** **Ck: RLL**

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
2	Landside	100LL Fueling Service	EA	1	$ 9,000.00	$ 9,000	$ -	$ -	$ 9,000
2	Vis/Navaids	Rotating Beacon	EA	0	$ 22,500.00	$ -	$ -	$ -	$ -
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
3	Landside	Terminal Building - Heated	SF	100	$ 175.00	$ 18,000	$ -	$ -	$ 18,000
					Total =	**$ 127,000**	**$ -**	**$ -**	**$ 127,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **GIFFORD**

Assumptions:

Terminal Building - Heated: 100 SF Basic Shelter
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included
See: Non-NPIAS Capital Cost Adjustment Rate Sheet
Rotating Beacon: The cost for rotating beacon is not included as the airport does not have runway lighting

By: **SRL/JEP**
Ck: **RLL**

Date: **November 21, 2014**

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
		Public Telephone	EA	1	$ -	$ -	$ -	$ -	$ -
1	Landside	Basic Shelter – 100 Square Feet	EA	1	$ 5,000.00	$ 5,000	$ -	$ -	$ 5,000
2	Landside	100LL Fueling Service	EA	1	$ 9,000.00	$ 9,000	$ -	$ -	$ 9,000
2	Vis/Navaids	Rotating Beacon	EA	0	$ 22,500.00	$ -	$ -	$ -	$ -
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
3	Landside	Terminal Building - Heated	SF	100	$ 175.00	$ 18,000	$ -	$ -	$ 18,000
					Total =	**$ 132,000**	**$ -**	**$ -**	**$ 132,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **GORHAM**

Assumptions:

20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included
100LL Fueling Service: Airport On Acquifer, No Fuel Allowed by Town
See: Non-NPIAS Capital Cost Adjustment Rate Sheet
Rotating Beacon: The cost for rotating beacon is not included as the airport does not have runway lighting

By: SRL/JEP
Ck: RLL

Date: **November 21, 2014**

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
		Public Telephone	EA	1	$ -	$ -	$ -	$ -	$ -
1	Landside	Basic Shelter – 100 Square Feet	EA	1	$ 5,000.00	$ 5,000	$ -	$ -	$ 5,000
2	Vis/Navaids	Rotating Beacon	EA	0	$ 22,500.00	$ -	$ -	$ -	$ -
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
3	Landside	Terminal Building - Heated	SF	100	$ 175.00	$ 18,000	$ -	$ -	$ 18,000
					Total =	**$ 123,000**	**$ -**	**$ -**	**$ 123,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **HAWTHORNE**

Assumptions:

20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included
Terminal Building - Heated: 100 SF Basic Shelter
See: Non-NPIAS Capital Cost Adjustment Rate Sheet

By: SRL/JEP
Ck: RLL

Date: November 21, 2014

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE FEDERAL	FUNDING SOURCE STATE	FUNDING SOURCE LOCAL/ PRIVATE
1	Landside	Basic Shelter - 100 Square Feet	EA	1	$ 5,000.00	$ 5,000	$ -	$ -	$ 5,000
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
3	Landside	Terminal Building - Heated	SF	100	$ 175.00	$ 18,000	$ -	$ -	$ 18,000
					Total =	**$ 123,000**	**$ -**	**$ -**	**$ 123,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **NEWFOUND VALLEY**

Assumptions:

Terminal Building - Heated: 100 SF Basic Shelter
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included
See: Non-NPIAS Capital Cost Adjustment Rate Sheet
Rotating Beacon: The cost for rotating beacon is not included as the airport does not have runway lighting

By: SRL/JEP
Date: November 21, 2014 **Ck:** RLL

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
		Public Telephone	EA	1	$ -	$ -	$ -	$ -	$ -
2	Landside	100LL Fueling Service	EA	1	$ 9,000.00	$ 9,000	$ -	$ -	$ 9,000
2	Vis/Navaids	Rotating Beacon	EA	0	$ 22,500.00	$ -	$ -	$ -	$ -
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
3	Landside	Terminal Building - Heated	SF	100	$ 175.00	$ 18,000	$ -	$ -	$ 18,000
					Total =	**$ 127,000**	**$ -**	**$ -**	**$ 127,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **PLYMOUTH**

Assumptions:

20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included
See: Non-NPIAS Capital Cost Adjustment Rate Sheet
Rotating Beacon: The cost for rotating beacon is not included as the airport does not have runway lighting

By: SRL/JEP
Ck: RLL

Date: November 21, 2014

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
2	Landside	100LL Fueling Service	EA	1	$ 9,000.00	$ 9,000	$ -	$ -	$ 9,000
2	Vis/Navaids	Rotating Beacon	EA	0	$ 22,500.00	$ -	$ -	$ -	$ -
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
					Total =	**$ 109,000**	**$ -**	**$ -**	**$ 109,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **TWIN MOUNTAIN**

Assumptions:

Terminal Building - Heated: 100 SF Basic Shelter
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included
See: Non-NPIAS Capital Cost Adjustment Rate Sheet

By: SRL/JEP

Date: **November 21, 2014** **Ck: RLL**

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
2	Landside	100LL Fueling Service	EA	1	$ 9,000.00	$ 9,000	$ -	$ -	$ 9,000
2	Vis/Navaids	Rotating Beacon	EA	1	$ 22,500.00	$ 23,000	$ -	$ -	$ 23,000
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
3	Landside	Terminal Building - Heated	SF	100	$ 175.00	$ 18,000	$ -	$ -	$ 18,000
					Total =	**$ 150,000**	**$ -**	**$ -**	**$ 150,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **CLAREMONT**

Assumptions:

Runway 3,200 Feet or Greater: Local Runway Construction Costs ADG B-I
One Instrument Approach Procedure: $50,000 Budgeted for Planning Effort
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included

By: **SRL/JEP**

Date: **November 21, 2014** **Ck:** **RLL**

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
2	Airside	Runway 3,200 Feet or Greater	LF	102	$ 985.64	$ 101,000	$ 90,900	$ 5,050	$ 5,050
2	Survey/Study	One Instrument Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ 45,000	$ 2,500	$ 2,500
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ 90,000	$ 5,000	$ 5,000
3	Vis/Navaids	On-Site Weather Reporting System	EA	1	$ 350,000.00	$ 350,000	$ 315,000	$ 17,500	$ 17,500
3	Landside	JetA Fueling Service	EA	1	$ 300,000.00	$ 300,000	$ 270,000	$ 15,000	$ 15,000
					Total =	**$ 901,000**	**$ 810,900**	**$ 45,050**	**$ 45,050**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **DEAN MEMORIAL**

Assumptions:

Airport Owned Snow Removal Equipment: Small Loader ($100,000), Displacement Plow Attachment ($5,000), and Blower Attachment ($45,000)
Vertical Glide Slope Indicator: Two-Box PAPI System
Hangar Storage Unit: 1,000SF T-Hangar Unit @ $150/SF (Unheated, No Fire Suppression)
Pavement Strength: New 3,200' Runway, Local Runway Construction Costs B-I
One Instrument Approach Procedure: $50,000 Budgeted for Planning Effort
Low Intensity Taxiway Lights: Unit Cost $132.91 (Same as MIRL) per LF @ 2611'

By: SRL/JEP

Date: **November 21, 2014** **Ck:** RLL

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
		Public Telephone	EA	1	$ -	$ -	$ -	$ -	$ -
1	Landside	Hangar Storage for All Winter-Based Aircraft	EA	8	$ 150,000.00	$ 1,200,000	$ 1,080,000	$ 60,000	$ 60,000
1	Vis/Navaids	Rotating Beacon	EA	1	$ 25,000.00	$ 25,000	$ 22,500	$ 1,250	$ 1,250
1	Landside	Basic Terminal Building – 250 S.F.	SF	250	$ 275.00	$ 69,000	$ 62,100	$ 3,450	$ 3,450
2	Airside	Runway Lights (Pilot Controlled)	EA	1	$ 465,192.00	$ 466,000	$ 419,400	$ 23,300	$ 23,300
2	Vis/Navaids	Vertical Glide Slope Indicator (Primary Runway End)	EA	1	$ 320,160.00	$ 321,000	$ 288,900	$ 16,050	$ 16,050
2	Airside	Runway 3,200 Feet or Greater	LF	689	$ 985.64	$ 680,000	$ 612,000	$ 34,000	$ 34,000
2	Airside	Pavement Strength 12,000 lbs. (SW)	LF	1	$ 3,449,754.00	$ 3,450,000	$ 3,105,000	$ 172,500	$ 172,500
2	Airside	Low Intensity Taxiway Lights	LF	2,611	$ 132.91	$ 348,000	$ 313,200	$ 17,400	$ 17,400
2	Other	Airport Owned Snow Removal Equipment	EA	1	$ 150,000.00	$ 150,000	$ 135,000	$ 7,500	$ 7,500
3	Vis/Navaids	On-Site Weather Reporting System	EA	1	$ 350,000.00	$ 350,000	$ 315,000	$ 17,500	$ 17,500
3	Landside	JetA Fueling Service	EA	1	$ 300,000.00	$ 300,000	$ 270,000	$ 15,000	$ 15,000
3	Survey/Study	One Instrument Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ 45,000	$ 2,500	$ 2,500
3	Landside	Basic Terminal Building – 500 S.F.	SF	250	$ 300.00	$ 75,000	$ 67,500	$ 3,750	$ 3,750
					Total =	**$ 7,484,000**	**$ 6,735,600**	**$ 374,200**	**$ 374,200**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **HAMPTON**

Assumptions:

Terminal Building - Heated: 100 SF Basic Shelter
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included
Aircraft Parking Area: Local Aircraft Parking 4 Spaces at 5,993 sf/space
Aircraft Parking Area: Local Aircraft Parking 6 Spaces: Assume 2 additional spaces at 5,993 sf/space
See: Non-NPIAS Capital Cost Adjustment Rate Sheet

By: SRL/JEP
Ck: RLL

Date: **November 21, 2014**

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE: FEDERAL	FUNDING SOURCE: STATE	FUNDING SOURCE: LOCAL/ PRIVATE
1	Airside	Runway Surface-Paved	LF	2,100	$ 690.20	$ 1,450,000	$ -	$ -	$ 1,450,000
1	Airside	Runway 2,500 Feet or Greater	LF	400	$ 690.20	$ 277,000	$ -	$ -	$ 277,000
1	Airside	Paved Aircraft Parking - 4 Spaces	SF	23,973	$ 17.25	$ 414,000	$ -	$ -	$ 414,000
1	Landside	Hangar Storage for All Winter-Based Aircraf	EA	25	$ 105,000.00	$ 2,625,000	$ -	$ -	$ 2,625,000
1	Vis/Navaid	Rotating Beacon	EA	1	$ 22,500.00	$ 23,000	$ -	$ -	$ 23,000
1	Survey/Study	Non-Precision Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ -	$ -	$ 50,000
1	Landside	Basic Terminal Building - 250 sf	SF	250	$ 192.50	$ 49,000	$ -	$ -	$ 49,000
2	Airside	Runway 3,200 Feet or Greater	LF	700	$ 985.64	$ 690,000	$ -	$ -	$ 690,000
2	Airside	Pavement Strength 12,000 lbs. (SW)	LF	1	$ 2,397,569.30	$ 2,398,000	$ -	$ -	$ 2,398,000
2	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
2	Airside	Paved Aircraft Parking - 6 Spaces	SF	11,986	$ 17.25	$ 207,000	$ -	$ -	$ 207,000
2	Airside	Runway Lights (Pilot Controlled)	EA	1	$ 418,672.80	$ 419,000	$ -	$ -	$ 419,000
2	Airside	Low Intensity Taxiway Lights	LF	1,200	$ 119.62	$ 144,000	$ -	$ -	$ 144,000
2	Vis/Navaids	Vertical Glide Slope Indicator (Primary Runw	EA	1	$ 288,144.00	$ 289,000	$ -	$ -	$ 289,000
3	Landside	Basic Terminal Building – 500 S.F.	SF	250	$ 210.00	$ 53,000	$ -	$ -	$ 53,000
3	Survey/Study	One Instrument Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ -	$ -	$ 50,000
3	Landside	JetA Fueling Service	EA	1	$ 270,000.00	$ 270,000	$ -	$ -	$ 270,000
3	Other	Airport Owned Snow Removal Equipment	EA	1	$ 135,000.00	$ 135,000	$ -	$ -	$ 135,000
3	Landside	Snow Removal Equipment Building	SF	1,300	$ 204.72	$ 267,000	$ -	$ -	$ 267,000
3	Vis/Navaids	On-Site Weather Reporting System	EA	1	$ 315,000.00	$ 315,000	$ -	$ -	$ 315,000
					Total =	**$ 10,225,000**	**$ -**	**$ -**	**$ 10,225,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **JAFFREY**

Assumptions:

Runway 3,200 Feet or Greater: National Runway Construction Costs ADG-CII
Snow Removal Equipment Storage Building: SRE Two-Bay Wood Frame
Airport Owned Snow Removal Equipment: Small Loader ($100,000), Displacement Plow Attachment ($5,000), and Blower Attachment ($45,000)
Vertical Glide Slope Indicator: Two-Box PAPI System
Hangar Storage Unit: 1,000SF T-Hangar Unit @ $150/SF (Unheated, No Fire Suppression)
Low Intensity Taxiway Lights: Unit Cost $132.91 (Same as MIRL) per LF @ 1,700'
Non-Precision Approach Procedure: $50,000 Budgeted for Planning Effort
One Instrument Approach Procedure: $50,000 Budgeted for Planning Effort
Pavement Strength: New 3,200' Runway, Local Runway Construction Costs B-I
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included
See: Non-NPIAS Capital Cost Adjustment Rate Sheet

By: SRL/JEP

Date: **November 21, 2014**

Ck: RLL

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
1	Survey/Study	Non-Precision Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ -	$ -	$ 50,000
1	Airside	Runway 3,200 Feet or Greater	LF	218	$ 1,561.53	$ 341,000	$ -	$ -	$ 341,000
2	Survey/Study	One Instrument Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ -	$ -	$ 50,000
2	Airside	Low Intensity Taxiway Lights	LF	1,700	$ 119.62	$ 204,000	$ -	$ -	$ 204,000
3	Airside	Pavement Strength 12,000 lbs. (SW)	LF	1	$ 2,414,827.80	$ 2,415,000	$ -	$ -	$ 2,415,000
3	Airside	Runway Lights (Pilot Controlled)	EA	1	$ 418,672.80	$ 419,000	$ -	$ -	$ 419,000
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
3	Vis/Navaids	Vertical Glide Slope Indicator (Primary Runway End)	EA	1	$ 288,144.00	$ 289,000	$ -	$ -	$ 289,000
3	Vis/Navaids	On-Site Weather Reporting System	EA	1	$ 315,000.00	$ 315,000	$ -	$ -	$ 315,000
3	Landside	JetA Fueling Service	EA	1	$ 270,000.00	$ 270,000	$ -	$ -	$ 270,000
3	Other	Airport Owned Snow Removal Equipment	EA	1	$ 135,000.00	$ 135,000	$ -	$ -	$ 135,000
3	Landside	Snow Removal Equipment Building	SF	1,300	$ 204.72	$ 267,000	$ -	$ -	$ 267,000
					Total =	**$ 4,855,000**	**$ -**	**$ -**	**$ 4,855,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **MOULTONBORO**

Assumptions:

Airport Owned Snow Removal Equipment: Small Loader ($100,000), Displacement Plow Attachment ($5,000), and Blower Attachment ($45,000)
Snow Removal Equipment Storage Building: SRE Two-Bay Wood Frame
Vertical Glide Slope Indicator: Two-Box PAPI System
Hangar Storage Unit: 1,000SF T-Hangar Unit @ $150/SF (Unheated, No Fire Suppression)
Low Intensity Taxiway Lights: Unit Cost $132.91 (Same as MIRL) per LF @ 1,500'
Non-Precision Approach Procedure: $50,000 Budgeted for Planning Effort
One Instrument Approach Procedure: $50,000 Budgeted for Planning Effort
Pavement Strength: New 3,475' Runway, Local Runway Construction Costs B-I
See: Non-NPIAS Capital Cost Adjustment Rate Sheet

By: SRL/JEP

Date: **November 21, 2014**

Ck: RLL

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
		Hangar Storage for All Winter-Based Aircraft	EA	0	$ -	$ -	$ -	$ -	$ -
1	Vis/Navaids	Rotating Beacon	EA	1	$ 22,500.00	$ 23,000	$ -	$ -	$ 23,000
1	Vis/Navaids	Lighted Windsock	EA	1	$ 18,000.00	$ 18,000	$ -	$ -	$ 18,000
1	Survey/Study	Non-Precision Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ -	$ -	$ 50,000
1	Landside	Basic Terminal Building – 250 S.F.	SF	250	$ 192.50	$ 49,000	$ -	$ -	$ 49,000
2	Airside	Pavement Strength 12,000 lbs. (SW)	LF	3,475	$ 689.92	$ 2,398,000	$ -	$ -	$ 2,398,000
2	Airside	Runway Lights (Pilot Controlled)	EA	1	$ 418,672.80	$ 419,000	$ -	$ -	$ 419,000
2	Airside	Low Intensity Taxiway Lights	EA	1,200	$ 119.62	$ 144,000	$ -	$ -	$ 144,000
2	Landside	JetA Fueling Service	EA	1	$ 270,000.00	$ 270,000	$ -	$ -	$ 270,000
2	Survey/Study	One Instrument Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ -	$ -	$ 50,000
3	Vis/Navaids	On-Site Weather Reporting System	EA	1	$ 315,000.00	$ 315,000	$ -	$ -	$ 315,000
3	Vis/Navaids	Vertical Glide Slope Indicator (Primary Runway End)	EA	1	$ 288,144.00	$ 289,000	$ -	$ -	$ 289,000
3	Landside	Basic Terminal Building – 500 S.F.	SF	250	$ 210.00	$ 53,000	$ -	$ -	$ 53,000
3	Other	Airport-Owned Snow Removal Equipment	EA	1	$ 135,000.00	$ 135,000	$ -	$ -	$ 135,000
3	Landside	Snow Removal Equipment Storage Building	SF	1,300	$ 204.72	$ 267,000	$ -	$ -	$ 267,000
					Total =	**$ 4,480,000**	**$ -**	**$ -**	**$ 4,480,000**

Recommendations Estimate of Probable Cost McFARLAND-JOHNSON, INC.

NHDOT State Aviation System Plan

Airport: PARLIN

Assumptions:

Airport Owned Snow Removal Equipment: Small Loader ($100,000), Displacement Plow Attachment ($5,000), and Blower Attachment ($45,000)
Snow Removal Equipment Storage Building: SRE Two-Bay Wood Frame
Vertical Glide Slope Indicator: Two-Box PAPI System
Paved Aircraft Parking - 6 Spaces: Local Aircraft Parking 4 Spaces (Existing = 4 Spaces, Need = 2 Spaces)
Parking for Transient Aircraft: Local Aircraft Parking 4 Spaces
Non-Precision Approach Procedure: $50,000 Budgeted for Planning Effort
One Instrument Approach Procedure: $50,000 Budgeted for Planning Effort
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included

By: SRL/JEP

Date: November 21, 2014

Ck: RLL

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
1	Survey/Study	Non-Precision Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ -	$ -	$ 50,000
2	Airside	Paved Aircraft Parking – 6 Spaces	SF	11,985	$ 17.25	$ 207,000	$ -	$ -	$ 207,000
2	Airside	Runway Lights (Pilot Controlled)	EA	1	$ 418,672.80	$ 419,000	$ -	$ -	$ 419,000
2	Vis/Navaids	Vertical Glide Slope Indicator (Primary Runway End)	EA	1	$ 288,144.00	$ 289,000	$ -	$ -	$ 289,000
2	Landside	Basic Terminal Building – 500 S.F.	SF	500	$ 210.00	$ 105,000	$ -	$ -	$ 105,000
2	Landside	JetA Fueling Service	EA	1	$ 270,000.00	$ 270,000	$ -	$ -	$ 270,000
2	Survey/Study	One Instrument Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ -	$ -	$ 50,000
3	Vis/Navaids	On-Site Weather Reporting System	EA	1	$ 315,000.00	$ 315,000	$ -	$ -	$ 315,000
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ -	$ -	$ 100,000
3	Other	Airport-Owned Snow Removal Equipment	EA	1	$ 135,000.00	$ 135,000	$ -	$ -	$ 135,000
3	Airside	Parking for Transient Aircraft	SF	23,970	$ 17.25	$ 414,000	$ -	$ -	$ 414,000
3	Landside	Snow Removal Equipment Storage Building	SF	1,300	$ 204.72	$ 267,000	$ -	$ -	$ 267,000
					Total =	**$ 2,621,000**	**$ -**	**$ -**	**$ 2,621,000**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **SKYHAVEN**

Assumptions:

Hangar Storage Unit: 1,000SF T-Hangar Unit @ $150/SF (Unheated, No Fire Suppression)
One Instrument Approach Procedure: $50,000 Budgeted for Planning Effort
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included

By: SRL/JEP

Date: **November 21, 2014** **Ck:** RLL

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
1	Landside	Hangar Storage for All Winter-Based Aircraft	EA	14	$ 150,000.00	$ 2,100,000	$ 1,890,000	$ 105,000	$ 105,000
2	Landside	JetA Fueling Service	EA	1	$ 300,000.00	$ 300,000	$ 270,000	$ 15,000	$ 15,000
3	Survey/Study	One Instrument Approach Procedure	EA	1	$ 50,000.00	$ 50,000	$ 45,000	$ 2,500	$ 2,500
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ 90,000	$ 5,000	$ 5,000
					Total =	**$ 2,550,000**	**$ 2,295,000**	**$ 127,500**	**$ 127,500**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **BERLIN**

Assumptions:

Straight-In Instrument Approach Procedure to Two Runway Ends: $50,000 Budgeted for Planning Effort
Secure Aircraft Parking Apron: Local Aircraft Parking 4 Spaces
Vertical Glide Slope Indicator: Four-box PAPI System
Complete Airport Property Perimeter Fencing: 6,600 LF @ $45 per LF. North of Runway End 18 from Existing Terminus to and South along East Side River Road to Stream Near Runway End 36
Hangar Parking for Transient Aircraft: One Box/Conventional Hangar @ 5,000 SF
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included

By: SRL/JEP

Date: **November 21, 2014**

Ck: RLL

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
2	Survey/Study	Straight-In Instrument Approach Procedure to Two Runway Ends	1	1	$ 50,000.00	$ 50,000	$ 45,000	$ 2,500	$ 2,500
2	Landside	Self Serve Jet A Fueling Available 24/7	EA	1	$ 450,000.00	$ 450,000	$ 405,000	$ 22,500	$ 22,500
2	Airside	Hangar Parking for Transient Aircraft	EA	5,000	$ 250.00	$ 1,250,000	$ 1,125,000	$ 62,500	$ 62,500
2	Landside	Complete Airport Property Perimeter Fencing	LF	6,600	$ 45.00	$ 297,000	$ 267,300	$ 14,850	$ 14,850
3	Vis/Naviads	Vertical Glide Slope Indicator on Each Runway End	EA	1	$ 431,040.00	$ 432,000	$ 388,800	$ 21,600	$ 21,600
3	Airside	Secure Aircraft Parking Apron – 15+ Jet/Turboprop Aircraft	SF	89,900	$ 24.64	$ 2,216,000	$ 1,994,400	$ 110,800	$ 110,800
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ 90,000	$ 5,000	$ 5,000
					Total =	**$ 4,795,000**	**$ 4,315,500**	**$ 239,750**	**$ 239,750**

Recommendations Estimate of Probable Cost McFARLAND-JOHNSON, INC.

NHDOT State Aviation System Plan

Airport: CONCORD

Assumptions:

Straight-In Instrument Approach Procedure to Two Runway Ends: $50,000 Budgeted for Planning Effort
Vertical Glide Slope Indicator: Four-box PAPI System
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included

By: SRL/JEP
Ck: RLL

Date: November 21, 2014

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
2	Landside	Self Serve Jet A Fueling Available 24/7	EA	1	$ 450,000.00	$ 450,000	$ 405,000	$ 22,500	$ 22,500
3	Survey/Study	Straight-In Instrument Approach Procedure to Two Runway Ends	EA	1	$ 50,000.00	$ 50,000	$ 45,000	$ 2,500	$ 2,500
3	Survey/Study	Vertical Glide Slope Indicator on Each Runway End	EA	2	$ 431,040.00	$ 863,000	$ 776,700	$ 43,150	$ 43,150
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ 90,000	$ 5,000	$ 5,000
					Total =	**$ 1,463,000**	**$ 1,316,700**	**$ 73,150**	**$ 73,150**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **LACONIA**

Assumptions:

Complete Airport Property Perimeter Fencing: ALP Shows Proposed Fencing; 13,000 LF @ $45 per LF. North from Existing Terminus near Aviation Drive, Encompassing Entire Close Runway and Private Businesses and South to Point Point along Taxiway and East to Stream. Includes Connection of Existing Fence along Lake Shore Road

By: SRL/JEP

Date: November 21, 2014

Ck: RLL

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
2	Landside	Self Serve Jet A Fueling Available 24/7	EA	1	$ 450,000.00	$ 450,000	$ 405,000	$ 22,500	$ 22,500
2	Landside	Complete Airport Property Perimeter Fencing	LF	5,000	$ 45.00	$ 225,000	$ 202,500	$ 11,250	$ 11,250
					Total =	**$ 675,000**	**$ 607,500**	**$ 33,750**	**$ 33,750**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **MT WASHINGTON**

Assumptions:

Straight-In Instrument Approach Procedure to Two Runway Ends: $50,000 Budgeted for Planning Effort
Secure Aircraft Parking Apron 10+ Jet/Turboprop Aircraft: Local Aircraft Parking 4 Spaces (Existing = 3, Need = 7)
Hangar Storage for 90% of Winter Based Aircraft: (90% = ~33 Hangar Spaces; Existing = 14, Need = 19)
Partially Fenced Airport Property Perimeter: 6,175 LF @ $45/LF (Half of Estimated Complete Perimeter Fence = 12,350 LF)
Runway Length of 4,600 Feet or Greater: Regional Runway Construction Costs
Secure Aircraft Apron 15+ Jet/Turboprop Aircraft: Local Aircraft Parking 4 Spaces, Need = 5)
Vertical Glide Slope Indicator on Each Runway End: Four-Box PAPI System
Complete Airport Property Perimeter Fence:6,175 LF @ $45/LF (Half of Estimated Complete Perimeter Fence = 12,350 LF)
Runway Length of 5,000 Feet or Greater: Regional Runway Construction Costs
20:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included

By: SRL/JEP

Date: **November 21, 2014** Ck: RLL

PHASE	Element	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
1	Landside	Hangar Storage for 90% of Winter Based Aircraft	EA	19	$ 150,000.00	$ 2,850,000	$ 2,565,000	$ 142,500	$ 142,500
1	Landside	JetA Fueling Service	EA	1	$ 300,000.00	$ 300,000	$ 270,000	$ 15,000	$ 15,000
1	Landside	Partially Fenced Airport Property Perimeter	LF	6,175	$ 45.00	$ 278,000	$ 250,200	$ 13,900	$ 13,900
1	Airside	Secure Aircraft Parking Apron – 10+ Jet/Turboprop Aircraft	SF	41,947	$ 24.64	$ 1,034,000	$ 930,600	$ 51,700	$ 51,700
2	Airside	Runway Length of 4,600 Feet or Greater	LF	598	$ 1,644.48	$ 984,000	$ 885,600	$ 49,200	$ 49,200
2	Vis/Navaids	Vertical Glide Slope Indicator on Each Runway End	EA	1	$ 431,040.00	$ 432,000	$ 388,800	$ 21,600	$ 21,600
2	Survey/Study	Straight-In Instrument Approach Procedure to Two Runway Ends	EA	1	$ 50,000.00	$ 50,000	$ 45,000	$ 2,500	$ 2,500
3	Landside	Complete Airport Property Perimeter Fencing	LF	6,175	$ 45.00	$ 278,000	$ 250,200	$ 13,900	$ 13,900
3	Airside	Secure Aircraft Parking Apron – 15+ Jet/Turboprop Aircraft	SF	29,962	$ 24.64	$ 739,000	$ 665,100	$ 36,950	$ 36,950
3	Airside	Runway Length of 5,000 Feet or Greater	LF	400	$ 1,644.48	$ 658,000	$ 592,200	$ 32,900	$ 32,900
3	Survey/Study	20:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ 90,000	$ 5,000	$ 5,000
					Total =	**$ 7,703,000**	**$ 6,932,700**	**$ 385,150**	**$ 385,150**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **BOIRE**

Assumptions:

Terminal Building - 5,000 SF: Estimated @ $375/SF

By: **SRL/JEP**

Date: **November 21, 2014** **Ck:** **RLL**

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
2	Landside	Terminal Building – 5,000 SF	EA	1	$ 1,875,000.00	$ 1,875,000	$ 1,687,500	$ 93,750	$ 93,750
					Total =	**$ 1,875,000**	**$ 1,687,500**	**$ 93,750**	**$ 93,750**

Recommendations Estimate of Probable Cost

McFARLAND-JOHNSON, INC.

NHDOT State Aviation System Plan

Airport: DILLANT-HOPKINS

Assumptions:

Secure Aircraft Parking Apron 40 Jet/Turboprop Aircraft: Local Aircraft Parking 4 Spaces (Existing = 25, Need = 15)
Hangar Storage for All of Winter Based Aircraft:
Secure Aircraft Apron 40+ Jet/Turboprop Aircraft:
ARFF On-Site 24/7: Look At Community Facility In Future
34:1 Clear Approach Slope: $100,000 Budgeted for Initial Planning Effort; Construction not Included

By: SRL/JEP

Date: November 21, 2014

Ck: RLL

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
1	Landside	Self Serve JetA and 100LL Available 24/7	EA	1	$ 460,000.00	$ 460,000	$ 414,000	$ 23,000	$ 23,000
1	Landside	Hangar Storage for All Winter-Based Aircraft	EA	16	$ 150,000.00	$ 2,400,000	$ 2,160,000	$ 120,000	$ 120,000
1	Airside	Secure Aircraft Pakring Apron – 40+ Jet/Turboprop Aircraft	SF	89,900	$ 24.64	$ 2,216,000	$ 1,994,400	$ 110,800	$ 110,800
2	Vis/Navaids	Vertical Glide Slope Indicator on Each Runway End	EA	2	$ 320,160.00	$ 641,000	$ 576,900	$ 32,050	$ 32,050
2	Survey/Study	Instrument Approach to All Runways, at Least Two Vertically Guided Approaches	EA	1	$ 50,000.00	$ 50,000	$ 45,000	$ 2,500	$ 2,500
3	Other	ARFF On-Site 24/7	EA	1	$ -	$ -	$ -	$ -	$ -
3	Survey/Study	34:1 Clear Approach Slope	EA	1	$ 100,000.00	$ 100,000	$ 90,000	$ 5,000	$ 5,000
					Total =	**$ 5,867,000**	**$ 5,280,300**	**$ 293,350**	**$ 293,350**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **LEBANON**

Assumptions:

Runway Length of 7,000 Feet or Greater: Primary Runway Construction Costs ADG D-IV

By: **SRL/JEP**

Date: **November 21, 2014** **Ck:** **RLL**

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
1	Vis/Navaids	Medium Intensity Approach Light System	EA	1	$ 500,000.00	$ 500,000	$ 450,000	$ 25,000	$ 25,000
3	Airside	Runway Length of 7,000 Feet or Greater	LF	1,594	$ 4,490.38	$ 7,158,000	$ 6,442,200	$ 357,900	$ 357,900
					Total =	**$ 7,658,000**	**$ 6,892,200**	**$ 382,900**	**$ 382,900**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **MANCHESTER**

Assumptions:

By: SRL/JEP
Ck: RLL

Date: **November 21, 2014**

PHASE	ELEMENT	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
1	Other	U.S. Customs and Border Protection Facility On-Site	EA	1	On-Call	$ -	$ -	$ -	$ -
					Total =	**$ -**	**$ -**	**$ -**	**$ -**

Recommendations Estimate of Probable Cost **McFARLAND-JOHNSON, INC.**

NHDOT State Aviation System Plan

Airport: **PORTSMOUTH**

Assumptions:

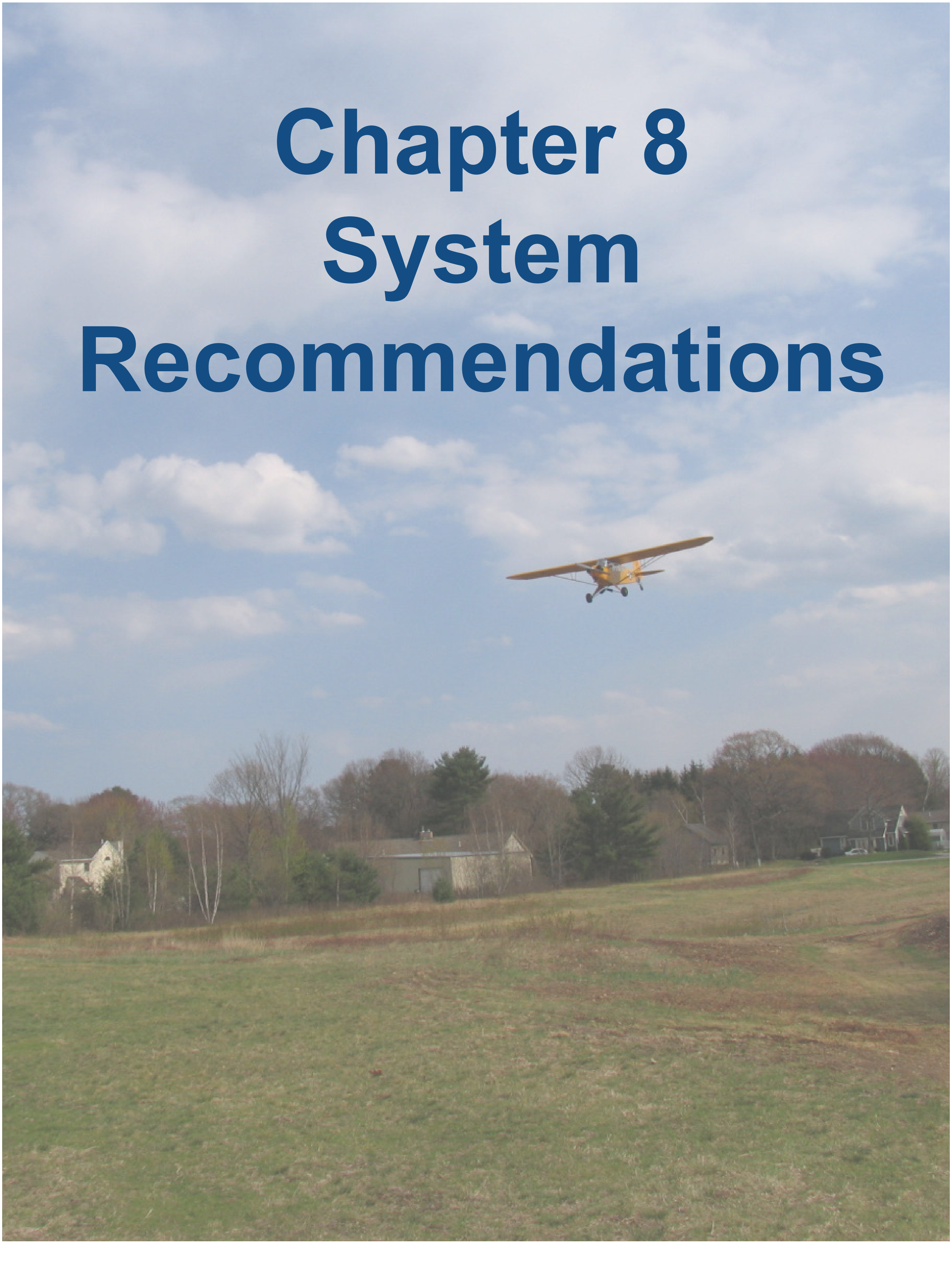
Category-III Instrument Landing System Approach to One Runway:

By: SRL/JEP

Date: **November 21, 2014** **Ck: RLL**

PHASE	ELEMENT'	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	TOTAL COST	FUNDING SOURCE		
							FEDERAL	STATE	LOCAL/ PRIVATE
1	Other	Category-III Instrument Landing System Approach to One Runway	EA	1	$13,128,720.00	$ 13,129,000	$ 11,816,100	$ 656,450	$ 656,450
					Total =	$ 13,129,000.00	$ 11,816,100.00	$ 656,450.00	$ 656,450.00

Chapter 8
System Recommendations



CHAPTER 8: SYSTEM RECOMMENDATIONS

This chapter of the New Hampshire (NH) State Airport System Plan (NHSASP) presents recommendations that provide the NH Department of Transportation (NHDOT) Bureau of Aeronautics (BOA) with guidelines to manage, support, and improve the system of 25 airports in NH over the next twenty years. These guidelines address system needs, define funding requirements, and develop policies to protect, operate, and maintain the airport system and maximize aviation access within the state.

This chapter is organized as follows:

- Summary of NHSASP Recommendations
- Funding the NHSASP
- Policy Recommendation and Tools

8.1 SUMMARY OF NHSASP RECOMMENDATIONS

Chapter 7, Airport Facility Recommendations, focused on projects that meet the minimum and recommended facility needs to fulfill the airport's defined role and meet future system performance needs. This section presents issues and considerations that were identified as part of the overall system performance analysis. As part of this analysis, recommendations, guidelines, and policy options are explored to provide guidance and options for the BOA as the system recommendations are implemented in the future. The intent of the recommendations discussed here should not be taken as absolutes, but rather options that provide flexibility to help the BOA manage and maintain the system in the face of dynamic challenges within aviation.

8.1.1 ADOPTION OF NHSASP RECOMMENDATIONS

The enhancement of the current system of airports will be based upon several factors as the BOA considers the implementation of projects outlined in the NHSASP.

The recommendations in the NHSASP represent the goals of the BOA to maintain and enhance a safe and efficient aviation system and as such, these projects are supported for additional consideration. However, implementation of the recommended projects is determined by the airport specific justification as well as the financial ability and will of the Airport Sponsor.

It is recognized that the ability of an airport to incorporate minimum or recommended projects identified in the NHSASP will be based on the

> "Without a comprehensive network of reliever (medium) and general aviation (small) airports, the hundreds of thousands of pilots, families, doctors, farmers, and businesses which rely on this network would be forced to operate solely from commercial (large) airports. Further, this would leave many communities without a vital lifeline for disaster relief efforts…and other important emergency services which aviation access provides across America." – Letter from Congress, General Aviation Caucus, 28 SEP 2009

physical ability of the airport to construct the project due to environmental considerations, physical terrain issues, financial issues, or political issues. As a result, if an airport is unable to incorporate projects that would address a gap in services, the BOA must weigh options for providing improvement to regional access via aviation. In such cases, the BOA has three options:

- Continue to work with an individual airport to incorporate improvements in the future.
- Identify another airport that could provide the necessary coverage gap and either assign a role upgrade or project to meet system needs.
- Maintain the gap in services in that region.

Maintaining the aviation system is vital to NH's transportation system. The NHSASP provides a roadmap that defines the needs and options to manage and support the aviation system. Implementation of the NHSASP recommendations will be a collaborative effort between the BOA, the airports, and the municipalities or owners that operate the airports.

Recommendation: The BOA should conduct a comprehensive review of the NHSASP recommendations every three to five years to identify potential changes needed to maintain or enhance the state airport system.

8.1.2 AIRPORT ROLE UPGRADES AND GAP COVERAGE

Chapter 6 – Future Statewide Airport System Performance assessed the performance of the airport system and made several recommendations for enhancements to the system through upgrades to several airports' roles within the system and several suggestions to address gap coverage. These recommendations are summarized in the following sections.

Airport Role Changes

Four airports were identified for a change in their role. Elevating the airport system role addressed one or several of these criteria:

- **Expanded Capacity for the NH State Airport System:** Upgrading a system airport's role may be warranted to provide expanded airport infrastructure that can better accommodate anticipated growth or change in aviation activity locally as well as regionally.
- **Enhanced Service to Employers & Economic Centers:** Upgrading a system airport's role may be warranted to provide improved services to general employment centers and/or clusters of employers that drive year-round economic activity and jobs.
- **Enhanced Service to Geographic Gap Areas:** Upgrading a system

airport's role may be warranted to provide improved services to areas of the state where particular air access features are not present at existing system airports.

The four airports recommended for a role change included Mt. Washington Regional Airport, Dean Memorial Airport, Dillant Hopkins Airport and Moultonboro Airport. In addition to meeting one or several of the criteria noted above, the role upgrades also satisfied a number of service gaps identified in the analysis such as fuel availability or runway length. The recommended role upgrades would be undertaken at the local level. These recommendations are made with an eye towards strengthening the airport system in the state. The bullets below summarize the recommendations to change the roles of four airports in the system to better serve aviation within the state:

- **Mt. Washington Regional Airport** – Upgrading this airport from Local to Regional has several major benefits that support both the recreational and business components of this unique region in NH. Mt. Washington is the only other public-use airport outside of Berlin Regional Airport and north of Franconia and Crawford Notches that is capable of accommodating a wide range of aircraft, including some corporate jet aircraft. In addition, both airports complement each other; when one airport is not available due to weather or another issue, the other airport provides an alternate option for pilots/users. The airports are about a 40 minute drive time apart, thus allowing aircraft passengers access to the towns within the region without significant loss of time if the alternate airport is used. In the mountainous areas of northern NH, having compatible public-use airports provides the needed alternatives to pilots during emergencies or when the weather alters their plans.

  The recommendations to potentially add Jet-A fuel and extend the runway to 5,000' with an upgraded instrument approach using satellite-based technology would ensure that access to this region is consistently available. Although terrain is an issue for approaches at Mt. Washington Regional Airport, satellite based approaches are maturing and in the next several years, the Localizer Performance with Vertical Guidance approaches are expected to meet precision or near precision approach standards, which will significantly enhance poor weather access in the region.

  Mt. Washington Regional Airport also serves tourism in the region, especially for pilots and passengers staying at the Mountain Grand View Hotel, the Omni Mount Washington Resort or other nearby lodging options. Based on discussions with the airport manager, there is an influx of aircraft during the summer; however, without Jet-A and the longer runway, access and reliability is limited.

  Wetlands are a significant constraint to expanding the runway. However, any potential lengthening of the runway, even if not to 5,000', and the addition of Jet-A fuel, will benefit the region by allowing aircraft that currently use the airport to operate more efficiently while also offering other aircraft that do not use the airport today the opportunity to do so in the future. This is important as Berlin and

Mt. Washington Regional Airport

Mt. Washington Regional Airports are the primary public-use airports serving the economic and transportation needs in the northern part of NH.

Dean Memorial Airport

- **Dean Memorial Airport** – The 2003 NHSASP identified Dean Memorial Airport as a candidate airport for inclusion into the National Plan of Integrated Airport System (NPIAS). That recommendation was realized March 18, 2010 when the Federal Aviation Administration (FAA) accepted the airport into the NPIAS program. Entering the NPIAS program allowed the airport to accept federal grants for eligible projects.

  In this NHSASP, Dean Memorial Airport was recommended to be upgraded from Basic to Local as the airport continues to be a key aviation facility serving this region. The airport is the only paved runway airport in this region and serves not only Haverhill, but also Littleton, which is a growing business center in this part of NH and a few towns in Vermont. One of the primary benefits of this role upgrade would be the potential extension of the runway to 3,200', which would enhance operations of small twin-engine business and recreational aircraft to operate more efficiently at the airport. The airport's strategic location allows it to support the overall economic development within the region. There are current issues to achieve the 3,200' runway, including available land; however, should conditions change, the future may allow an incremental extension and the BOA would support up to a 3,200' runway.

  In the future, Dean Memorial could also consider providing Jet-A fuel to support greater use of the airport by corporate turboprop aircraft. Outside of recommending Jet-A at Mt. Washington Regional Airport, the closest airports with Jet-A would include Berlin Regional, Laconia Municipal, and Lebanon Municipal Airports, all of which are not proximate to Dean Memorial Airport. Although the runway, existing or proposed, is short, there are a number of smaller turboprop and even Jet-Aircraft poised to serve short runways in the future. The aircraft that could operate on Dean Memorial's runway most efficiently is the Pilatus PC-12 series aircraft, which is a single engine turboprop aircraft that is becoming a very popular business aircraft over other traditional twin turboprop aircraft such as the Beech King Air series aircraft. Combined with a 3,200' runway, offering Jet-A fuel would provide further flexibility to access this part of the state by corporate aircraft.

Dillant-Hopkins Airport

- **Dillant-Hopkins Airport** – Dillant-Hopkins Airport serves the southwest region of the state and is located in the city of Keene. The NHSASP recommends an upgrade to the role of the airport from Regional to National for a variety of reasons. The city of Keene is relatively isolated from a transportation perspective as there is no immediate access to major interstates, rail or commercial air service. However, the city and the region is a major business center in this part of the state. In addition, Keene State College, Antioch College, Cheshire Medical Center, the Keene Pumpkin Festival and Mount Monadnock State Park make Keene the busiest cultural center in this region of NH. As the airport's facilities and services meet many of the requirements for the National Airport role, recommending the role upgrade will allow the airport to further serve the region by providing an accessible and efficient transportation facility.

- **Moultonboro Airport** – The recommendation to upgrade the role of Moultonboro Airport recognizes the airport's role in serving the Lakes region of NH. Laconia Municipal Airport on the south side of Lake Winnipesauke serves as the primary airport for tourism in the region, as well as second/third home owners who fly to the airport during the spring, summer and fall months. As there is a large second and third home market on the north side of the Lake, Moultonboro Airport is positioned to support such growth in the future. Changing the role from Basic to Local identifies facilities that will support future aviation activity from an aviation system perspective. However, as the airport is a privately owned, public-use airport, funding such development will be difficult as there is no state grant program currently funded that the airport could access for future capital projects.


Moultonboro Airport

Air Access Gap Recommendations

The performance analysis presented in *Chapter 4, Existing Statewide Airport System Performance,* addressed four critical access components to provide reliable air access to the airports within the state. A number of gaps were identified in that analysis, most of which are covered by the airport role upgrades discussed in the previous section. The remaining air access gaps can be addressed as follows:

- **Instrument Approaches –** Instrument approaches provide airport access during poor weather conditions, which ensures that aircraft, especially aircraft used for charter and business whose need for reliable airports is high, are able to utilize the state airport system when the weather is poor. Two types of instrument approaches were considered in the performance analysis: non-precision approaches which use ground-based and satellite technology, and precision approaches which currently use the ground-based Instrument Landing System (ILS).

The performance analysis determined that the non-precision coverage within the state is adequate and no further recommendations are needed. The precision approach analysis shows a major gap within the White Mountain and Great North Woods Regions of the state. The terrain in this part of the state is challenging and negates the benefits of an ILS system. Furthermore, the FAA is no longer funding ILS systems at airports and will eventually phase out the ILS system for satellite-based Localizer Performance with Vertical Guidance (LPV) approaches that will have the ability to provide cloud height and visibility minimums near that of the ILS system. As such, it was recommended to forego an ILS system in the northern part of the state and for airports in this region to pursue satellite-based approaches using new or revised obstruction surveys in order to maximize the approach minima.

- **Weather** – The Automated Weather Observation System (AWOS) and other similar weather observation systems (ASOS, AWSS) provide pilots with live weather data that aids pilots when departing or arriving at an AWOS equipped airport. Coverage within the state is very good, but there is a gap in the Dartmouth-Lake Sunapee region.

Bi-State Authority

The BOA should evaluate the opportunity to maximize the Eastern Slope Regional Airport's contribution to NH.

As such, an AWOS was recommended for Claremont Municipal Airport. An AWOS at Claremont Municipal Airport would also help support that airports non-precision instrument approach and provide additional weather date for pilots using Parlin Field's future instrument approach as well.

Recommendation: The BOA should work with each airport to review potential projects that can be implemented and would support both the local aviation needs of the airports as well as the needs of the airport system. Projects considered for implementation at the airport level that are identified in the NHSASP will be supported by the BOA.

8.1.3 NORTHERN NH COVERAGE GAPS

There were several gaps identified during the existing and future performance gap analysis that do not have airport coverage. The first gap exists in the very northern portion of NH north of Errol and Colebrook. This part of the state is very sparsely populated and primarily forested land that is actively logged. The area, however, has outdoor activity enthusiasts (hunting, fishing, snowmobiling, etc.) who from time to time need help (search and rescue, air ambulance). Based on the analysis, the need to provide new aviation facilities was not recommended. Errol Airport, Berlin Regional Airport and Gifford Field provide the necessary aviation infrastructure that can serve the very northern areas of NH. The emergency helipads at Berlin Regional Airport and Errol Airport can cover emergencies that occur within this part of the state. The BOA and NHDOT can also identify roadway improvements within this area that would allow better access to these airports to serve emergency evacuation options to the three airports located in this region. The state should continue to ensure that aviation facilities exist that can aid in emergencies as well as business development in Coos County.

The second major gap identified in the analysis was in-state airport coverage in Mt. Washington Valley in the White Mountain region. The primary reason for the airport service gap is the mountainous terrain in this region, limiting the potential for an airport in this area. However, when analyzing the coverage of bordering airports, Eastern Slope Regional Airport in Maine, across the border from North Conway, NH, serves NH's aviation services in this region.

The reason for this is that in the 1960s, the NH and Maine Departments of Transportation agreed to demolish the White Mountain Airport located in North Conway if a new airport was created in Fryeburg, ME to allow economic development and air access in this region. A bi-state authority was developed to manage the airport with representatives from both states serving on the Authority. However, the Sponsor recognized by the FAA is the town of Fryeburg and as such, NH does not contribute any state funding to this airport, but continues to receive all the benefits at the expense of others.

The airport serves many of NH's aviation needs. During the winter, the airport accommodates flights that access the ski resorts and second homes located in this part of the state. Limited funding availability has meant that the airport is limited to the existing facilities. The airport has adequate number of facilities and is currently searching to replace Fixed Based Operator services. The pavements are also in good condition. The cost alone to maintain the existing infrastructure limits any potential to extend the runway to better accommodate aircraft that use the airport today, including corporate turboprop and jet aircraft.

The BOA has several options to participate financially in improvements that would enhance economic development and tourism to NH and safety for the pilots flying into this area of the state.

- **Option 1:** This option would be to maintain the current structure of the bi-state authority. Gains have been made by the NH towns that participate on the bi-state authority to fund the airport's operational budget in recent years. However, the BOA does not fund federal projects at the airport. This provides an incremental benefit to NH, but without further facility improvements, the airport will remain as-is for the foreseeable future.

- **Option 2:** This option is for the BOA to develop a bi-state agreement to fund projects at the airport. Such an agreement is currently in place to maintain and improve bridges between NH and Maine. There is also a bi-state agreement between NH and VT for Advance Transit, which allows improvements by NH for infrastructure in VT. The recommendation would be to consider development of a bi-state agreement similar in nature to the bridge agreements. As part of the agreement, similar to the bridge agreements, a percentage of participation on federally funded projects, be it 50%/50% or some other arrangement, should be determined. Non-federally funded projects would continue to be funded as they are today through individual town contributions when available, with participation from both ME and NH through the operational budget.

- **Option 3:** The third option that exists is to build a new airport. The problem with building a new airport is that the terrain in this region is mountainous and finding a flat area to place an airport is limited. Terrain would also affect instrument approaches, likely eliminating the potential for low minima approaches. The cost would also be high; general construction costs for a runway, taxiway, apron and hangar would cost between $20 to $30 million dollars at minimum for a basic facility. If environmental factors are present (wetlands or endangered species), then the costs are much higher. As such building a new airport is not a practical option.

- **Option 4:** The final option would be to designate an existing airport to upgrade such as Moultonboro Airport or Gorham Airport to provide similar services in the region as the airport in Fryeburg. With

Moultonboro's upgrade, the airport's distant proximity to the North Conway area does not practically support aviation in this region. Upgrading the role of Gorham Airport and developing the airport to serve the gap in North Conway would not be viable as the airport overlies the town's aquifer and cannot be expanded further. As such, the option to upgrade other regional airports is not well suited to serving NH aviation in the North Conway area.

Recommendation: The BOA should pursue discussions with the state of Maine to determine the potential for a bi-state agreement to fund federal projects at Eastern Slope Regional Airport in Maine. If both states agree to work collaboratively, discussions with the FAA should ensue.

8.1.4 EXTERNAL DEMAND FACTORS

An analysis was completed to address the influence of the border state influences on airports and activity in NH. The analysis looked at two issues affecting activity and competition between NH and the bordering states, registration fees and fuel taxes. The issues associated with each are discussed in the following sections.

Registration Fees

The primary issue identified during the inventory process was that users of larger corporate aircraft were choosing to base their aircraft out of state due to the costs of registering those aircraft in NH, especially if the aircraft were new. As such, the registration fees for each state adjacent to NH were researched and are presented in **Table 8-1.**

As seen in this table, registration fees in Vermont and Massachusetts offer less expensive alternatives for registering a heavy, expensive, and new aircraft. For example, a 2014 Gulfstream G-V would cost $293,500 to register in NH, a little less in ME, and $300 in MA and no money in VT. Tenants at Portsmouth Intentional Airport at Pease, Manchester-Boston Regional, and Boire Field noted that the disparity of the registration fees place NH in an uncompetitive position with neighboring states. However, the cyclical nature of changes to other state aircraft registration programs

Table 8-1 – Aircraft Registration Fee Calculation Comparison

State	Registration Formula
NH	AC Registration In-State: $48 AC Registration Out of State: $63 Operating Fee: $0.01/lbs + millage/dollar [1/]
Vermont	None
Maine	List Price Millage [2/] (Property Tax)
Massachusetts	0 – 2,000 lbs: $100 2,001 – 3,500 lbs: $165 3,501 – 12,500 lbs: $230 Over 12,500 lbs: $300

1/ NH Mill Formula - Current Year = 6 mills. Descends to 1 mill in 5th-10th year. $15 minimum plus weight formula

2/ ME Mill Formula - Current Year = 9 mills. Descends to 3 mill in 5th and all succeeding years.

Source: McFarland Johnson, States of NH, VT, ME and MA

over the past 20 years has either made NH less expensive to register an aircraft or more expensive at one time or another. However, given the current programs, it appears that NH has the advantage for the smaller aircraft between the states, but at significant disadvantage in terms of larger, new, and more expensive aircraft such as corporate turboprop and corporate jet aircraft that generate most of the revenue.

The loss of accommodating these aircraft can be valued to NH airports as lost hangar and fuel revenues for the airport and basing staff (pilots, flight attendants, mechanics, etc.) within NH who would contribute to the overall local economy. As this focuses on a small group of aircraft that potentially generate significant fees, there are several options that could be explored by the BOA such as a flat fee for this group of aircraft or some other method that might be more competitive with other neighboring states. The potential reduction in registration fees (including the one-fourth turnback) could be offset through the revenue generation derived from housing these aircraft in NH.

The BOA should consider the following actions to assess potentially modifying the aircraft registration program:

Develop a white paper defining the issue, researching the issue at several airports within the state:

- As part of the effort, evaluate the surrounding border state aircraft registration programs and provide a comparison based upon the findings, determine if the NH program could be adjusted.
- Assess other state's registration fee programs to identify potential modifications.
- Evaluate the revenue impact (gain or loss) on the aircraft registration program.
- Determine how competition between border states would change and the financial gains seen at the local airport level (lease revenues, hangar rentals, fuel revenues, etc.).
- Recommendation based upon white paper analysis.

This effort will provide the BOA with an understanding of the issues, the potential gain or loss of revenue, and potential benefits for the state, the local airports and the aircraft owners.

Recommendation: The BOA should develop a white paper assessing the potential benefits of modifying the current aircraft registration fees to attract and retain the larger corporate aircraft at NH airports and offer proposed legislation, as appropriate.

Fuel Taxes

A number of airports, including Claremont Municipal Airport, noted that fuel prices at proximate border state airports were competitive with NH airports and aircraft would fly to the border airports to purchase fuel. They did, however, note that this was cyclical and that minor changes in prices, due either to local discounts or changes in state fuel taxes would affect fuel prices favoring NH airports. But the converse is also possible should changes to the fuel taxes change in the other states.

The difference in fuel taxes between the states is not significant. Avgas taxes for NH and VT are \$0.04/gallon and \$0.05/gallon respectively, and \$0.30/gallon for ME and MA. This would favor NH and VT airports, but would not create competition between NH and VT.

The BOA should evaluate the opportunities to revise the aircraft registration fees to attract and retain larger corporate aircraft within NH and options to generate more revenue through the aviation fuel tax.

For Jet-A fuel, NH and MA are $0.02 (charter and privately owned turbine aircraft)/$0.005/gallon (airlines) and $0.034/gallon respectively. VT applies a 6% charge while ME is $0.151/gallon. In this instance, NH has the lowest tax on Jet-A.

Based on taxes alone, NH appears to be the lowest among the other states and offering the least fuel tax on aviation fuels. However, as the state only generates about $300,000 per year, should the BOA modify their taxes to generate more revenues? The BOA should explore the options to see if a minor change could enhance revenues without creating an uncompetitive situation for NH airports that lie along the three state borders. With a small number of gallons sold every year compared to other states, NH must remain competitive with fuel taxes on aviation fuels. Airlines must also base part of their decision to serve an airport by the fuel costs compared to their bottom line. If it is found possible, then the BOA should implement the change.

Recommendation: The BOA should evaluate options to change the aviation fuel taxes such that revenues can be increased while minimizing the potential for competition among the border airports.

8.1.5 COMMERCIAL AIR SERVICE

The analysis of the NHSASP did not identify the need for additional commercial air service in NH. The three existing commercial air service airports, Lebanon Municipal Airport, Manchester-Boston Regional Airport, and Portsmouth International Airport at Pease provide commercial air service to the majority of NH residents. The analysis indicated that these airports, categorized as Primary Airports by role, cover 80% population and 41 of the top 50 employers in the state. The remaining area not directly covered (greater than 60-minute drive) is the northern part of the state.

As the industry's flight schedules are not regulated by the FAA, the gauge and frequency provided by commercial airlines represents a business decision and, outside of the Essential Air Service (EAS) Program, airlines fly routes of their choosing based on their goals as a private business. None of the remote northern communities in NH are eligible for airline service under EAS to the areas lacking desired coverage. Commercial air service airports in Vermont (Burlington International Airport) and Maine (Portland International Airport) may provide additional options for commercial air service for residents north of the Lakes region. However, as Manchester-Boston Regional Airport offers legacy and low cost carrier airlines, residents in Northern NH can just as easily travel to Manchester-Boston Regional Airport, albeit with a longer drive of two hours.

Recommendation: The coverage area provided by Primary (commercial service) airports encompasses the vast majority of the state's population and key employers. Primary airports should continue to market themselves for expanded service on new and incumbent airlines to maximize service to NH. In cases where new service would be supported by business travelers, airports should partner with key employers, Chamber of Commerce, NH Department of Resources and Economic Development and other economic agencies to promote the new service opportunity to NH. Airports are also encouraged to evaluate enhancements to improve the customer experience by offering such things as self check-in kiosks, valet parking, pet care and bag drops. By making it easier for the airlines passengers to move through the airport and making their experience more pleasurable, airports can continue to attract in-state and out-of-state passengers.

8.1.6 AVIATION FUEL

The analysis found that fueling services were adequate for 100 low lead (100 LL), which is the most common aviation fuel used by small single- and multi-engine piston aircraft. In fact, many of the smaller airports have fuel tanks with self-serve capabilities, which allows the pilot to fuel their aircraft independently and without the need of Fixed Base Operator (FBO) staff.

The issue related to 100LL fuel is that it contains lead and its use is becoming more politically charged on the national level. It is expected that the Environmental Protection Agency (EPA) will rule on the national level to phase out 100LL fuel. As it is considered a "boutique" fuel, there are only a few oil refineries that are manufacturing the fuel and the cost to do so is increasing, which is having a negative effect on General Aviation (GA) operational costs. As a result of these issues, the fuel industry is looking into options to remove the lead from the fuel or develop an all new drop in fuel with limited impact to existing fueling infrastructure. The government has awarded several grants for manufacturers to develop new fuels. This research is ongoing.

Engine manufacturers have approached the issue from another perspective. They have been researching the use of diesel engines, which will use Jet-A fuel, which is abundant and also less expensive. Continental Motors has developed this engine technology and Lycoming, the second major aircraft piston engine manufacturer, also has developed diesel engine technology. Cessna Aircraft now offers new model 172 and 182 aircraft with diesel engines and has stated that demand for these aircraft is increasing.

Until a fuel replacement is approved by the FAA or diesel engine technology becomes the preferred option to replace GA aircraft engines, aircraft owners will continue to fly their aircraft, albeit less due to the current cost of 100LL. During the Planning Advisory Committee meetings for the project, an interim option was discussed regarding the use of 80 octane automobile gasoline for older aircraft engines, which are capable of using this fuel with minor modifications to the engines. The availability of this fuel from the manufacturers is limited and only a few airports in NH have access to provide the fuel.

Regardless of whether a replacement fuel is developed quickly or engine replacement with diesel engines becomes the preferred option, there will be a period during which the continued use of 100LL or 80 octane fuel will be required.

The effects on the NHSASP are limited. The 100LL coverage is very good and as such, no further recommendations were necessary. However, the use of 80 octane may be an option for aircraft owners in the interim, especially since the aircraft fleet in NH is older and able to use this fuel. As such, the BOA has the option to discuss with various

The BOA should monitor the replacement of General Aviation Avgas (100LL) and potential effects on aviation within NH and evaluate options for 80 octane fuel at airports in the future.

airports, especially the smaller airports that have the older aircraft, the option to carry 80 octane fuel. This option, however, is strictly the decision of the local airport and their ability to store and make a viable profit providing 80 octane fuel.

The recommendation for the BOA is to query airports to determine the logistical and financial issues to acquire, store, and distribute 80 octane fuel. Fuel distributors may also provide some additional information on the cost of equipment to store the fuel. If it is found that carrying this fuel is economically viable, the BOA should support airports considering the option and determine if there are state funding mechanisms that could defray the cost of installation. NH RSA 422:34 may also need to be amended to reflect the storage and dispensing of 80 octane fuel and should be reviewed.

Recommendation: The BOA should monitor the leaded avgas issue and its potential effects on system activity. Once an approved product (fuel or equipment) is available to replace leaded avgas, the BOA will have a better understanding of the potential effects and act upon them accordingly. For 80 octane fuel, the BOA should query airports as to the viability of accommodating this fuel. If there is interest, the BOA and airports should discuss with fuel distributors the overall cost to acquire the equipment necessary and determine options to fund a portion or all of the cost through existing aviation and non-aviation grant programs.

8.1.7 WHITE MOUNTAIN AND GREAT NORTH WOODS AIRSPACE AND COMMUNICATIONS

During the last Planning Advisory Committee meeting held December 2014, the issue of airspace and communication needs in the White Mountain and Great North Woods regions were discussed. The primary issue is the high and rugged terrain, which limits radar coverage. Radar coverage is available between 5,000' to 7,000' depending upon location and given that there are no air traffic control towers at airports in the Great North Woods, only one aircraft is able to use an instrument approach at an airport, all other aircraft must wait until that aircraft has landed or departs altogether.

The BOA should discuss with the FAA opportunities to enhance radar coverage in the northern part of the state.

The resolution to these issues lies with the FAA providing additional radar facilities to expand the current radar coverage below the mountain peaks. The BOA has limited jurisdiction on this subject to recommend the addition of equipment. However, the BOA does maintain and protect the safety of aviation activity within NH.

Recommendation: The BOA should develop a white paper to address the ongoing issues, highlighting the capacity, safety and financial issues related to the current radar limitations, and present the results to the FAA.

8.2 FUNDING THE NHSASP

This section discusses funding the NHSASP and addresses the following elements:

- Summary of NHSASP Funding Needs
- How NHSASP Airports are Funded
- Available Funding Programs

8.2.1 SUMMARY OF NHSASP FUNDING NEEDS

Chapter 7, Airport Facility Recommendations generated the capital development costs of the 25 airports to meet the needs of the state aviation system. The overall cost of projects was $77.5 million dollars. The costs will be paid for with the following funding sources:

- Federal grant funding (federal share)
- BOA share of 5% of the federal projects (state share)
- The remaining 5% by the 12 federally funded airports (local share) and;
- The 13 non-federally funded airport would be self funded at 100% (local share)

Table 8-2 summarizes the funding breakdown for the 20-year total for the NHSASP projects.

Table 8-2 – Twenty Year System Funding Needs

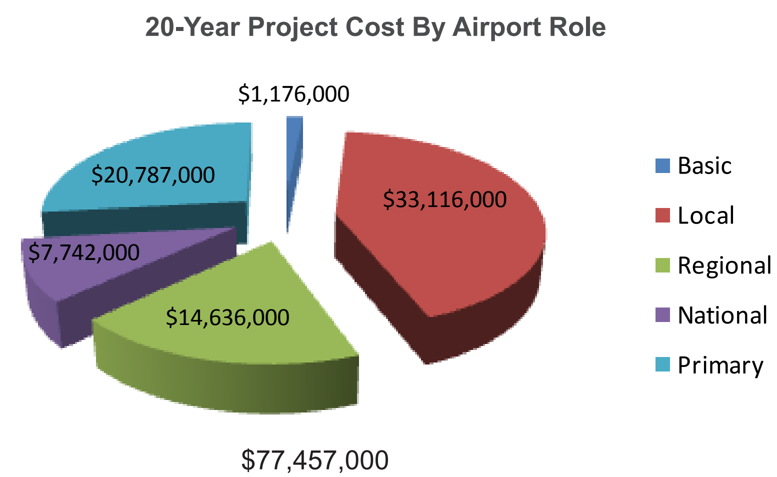
Airport	Federal Share	State Share	Local Share
Basic	$0	$0	$1,176,000
Local	$9,841,500	$546,750	$22,727,750
Regional	$13,172,400	$731,800	$731,800
National	$6,967,800	$387,100	$387,100
Total System Funding Need			$77,457,000
Total	$48,690,000	$2,705,000	$26,062,000

Source: McFarland Johnson, Inc.

Figure 8-1 presents a breakdown of total system funding needs presented above. The breakdown is presented by airport role and by five categories of projects. As shown in **Figure 8-1**, Local and Primary Airports account for 69% of the 20-year project costs by airport role. Basic Airports require the least amount of funding over the twenty years, as they are small facilities that already meet many of their minimum requirements. The airports also have the ability to complete projects more cost effectively as they are not bound to federal procurement requirements associated with FAA grant assurances. A further breakdown of project costs indicates about 71% of the development costs are for airside and landside facility development.

Figure 8-2 presents a breakdown of projects costs by phase and airport role. Projects were phased such that minimum objective projects were proposed for Phase I (first five years), and recommended objective projects proposed for Phase II (second five years) and Phase III (remaining 10 years). As seen in **Figure 8-2**, each phase represents about a third of the overall costs for the development costs, with Phase I being slightly higher than Phases II and III.

Figure 8-1 - Breakdown of Development Costs by Airport Role



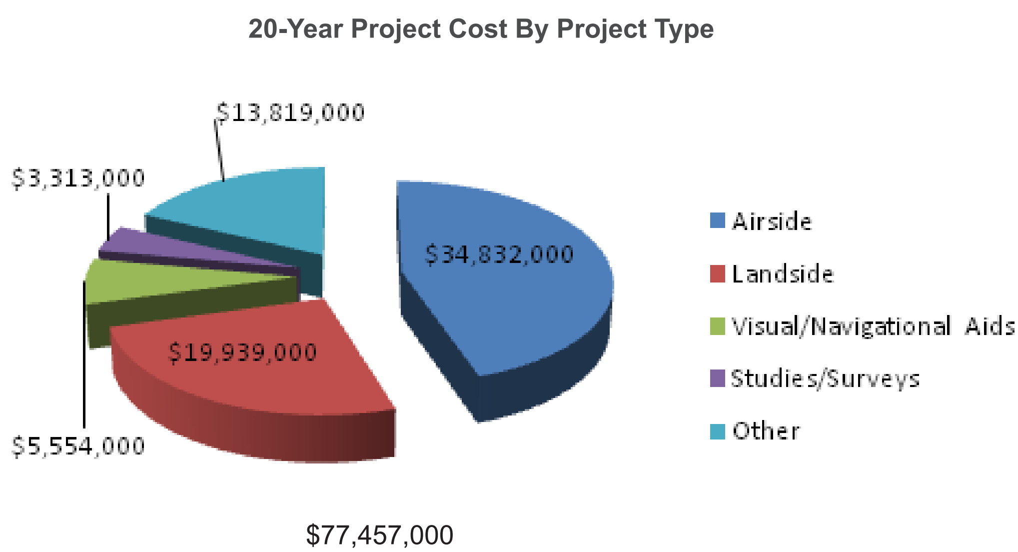
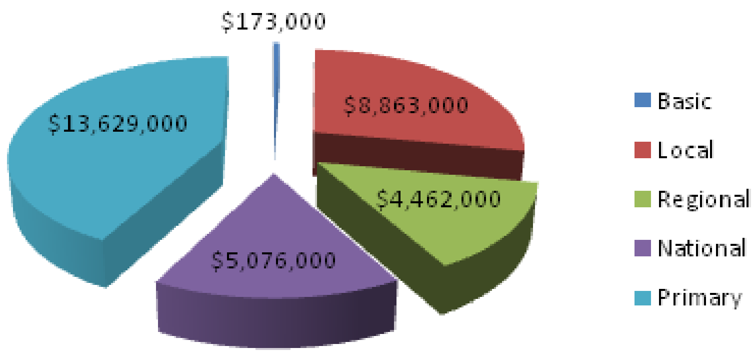


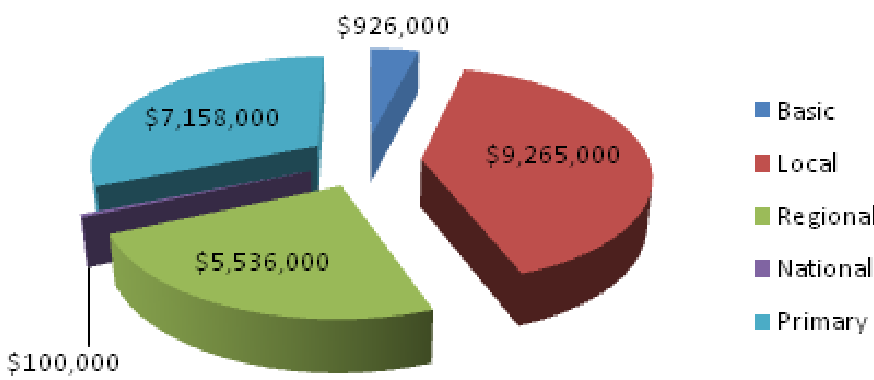
Figure 8-2 - Breakdown of Projects Costs by Phases and Airport Role

Phase I (0-5 Years) Project Costs By Airport Role



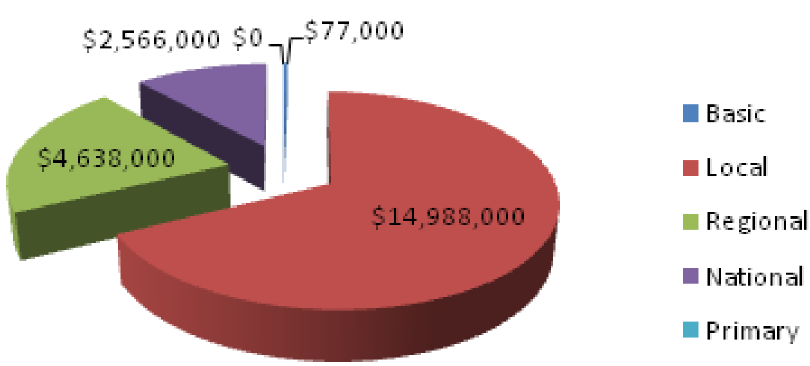
$32,203,000

Phase II (6-10 Years) Project Costs By Airport Role



$22,269,000

Phase III (11-20 Years) Project Costs By Airport Role



$22,985,000

Outside of the NHSASP costs, there are other costs that must be taken into consideration in the overall funding requirements for local airport project needs that the BOA is committed to funding over the next 20-years. They include the following:

- Funding of 12 federally eligible airport capital programs - $138 million for the three Primary Airports, $94.4 million for the 9 GA airports, totaling $372.3 million.
- Pavement Maintenance of the paved areas of 18 of 25 airports which was estimated at $51.5 million over the twenty years.
- Planning, environmental and specialty studies for all of the airports of $8 million.

Added together with the NHSASP cost of $77.5 million, the overall cost to maintain the airport system is estimated to be about $509 million. About $435 million would be federally eligible while $74 million would be covered by state and local funding over the 20 years. Approximately $25.7 million of the state and local funding is comprised of NHSASP and pavement maintenance project costs for the non-NPIAS airports.

8.2.2 FUNDING NPIAS AND NON-NPIAS AIRPORTS

The BOA funds airport development through federal and state funding sources. There are 12 publicly owned, public-use airport in the NHSASP that are identified in the FAA's NPIAS and qualify for federal funding. The remaining 13 airports are comprised of a mix of publicly and privately owned, public-use airports. For purposes of this discussion, the 12 FAA eligible airports are referred to as the NPIAS airports while the 13 state eligible airports are referred to as non-NPIAS airports. As the airports have been defined by airport role throughout the report, **Table 8-3** provides the reference between airport role and NPIAS/non-NPIAS status

The next sections describe the funding sources for each group of airports.

Table 8-3 – NPIAS/non-NPIAS and Airport Role Reference

Airport Role 1/	NPIAS Status	Non-NPIAS Status
Basic	0	9
Local	3	4
Regional	4	0
National	2	0
Primary	3	0
Total	12	0

1/ Airport Role represents the future system with airport role changes

Source: McFarland Johnson, Inc.

8.2.3 BOA BUDGET FOR PROJECTS

This section summarizes how the BOA is funded and generates financial resources used to support airport development needs. The funding is described in the following sections:

BOA Budget

The BOA has two budgets, an operational budget funding the operation of the BOA and capital projects for non-NPIAS airports, and a capital budget, which is used for the state match of federally funded projects. Both budgets are funded through the General Fund, which in turn is funded in part through fuel tax revenue and aircraft registration fees. For the BOA's capital budget, the state uses bonds to fund the capital budget.

The research on other state programs did not identify major differences between states. In fact, it was found that the funding components of the BOA's budget are similar to other states including Idaho, Florida, Massachusetts, California, and Pennsylvania. Idaho, for example, funds all of the projects and the aeronautics group through a dedicated fund solely financed through aviation fuel taxes while Massachusetts uses both aviation fuel taxes and funding from the general fund.

Aviation Fuel Taxes

The current aviation fuel taxes are defined in RSA 422:34 Airways Toll, that defines a tax of $0.04 per gallon of avgas, $0.02 per gallon of Jet-A for corporate or privately owned turbine aircraft and $0.005 per gallon for airlines. **Table 8-4** below provides the historic aviation fuel revenues.

Revenues generated by the BOA include Aviation Fuel Taxes and Aircraft Registration fees.

Table 8-4 – Historical Fuel Tax Revenues

Year	Fuel Tax Revenues
2002	$274,100
2003	$311,200
2004	$299,700
2005	$325,300
2006	$294,600
2007	$314,600
2008	$335,500
2009	$268,900
2010	$262,400
2011	$265,900
2012	$267,100
2013 1/	$248,900
2014 1/	$234,100

1/ Jet fuel data for State Fiscal Year 2013 and 2014 not finalized.

Source: NHDOT BOA

As seen in **Table 8-4**, there has not been a large fluctuation in the revenues as aviation in the state is relatively stable. The fluctuations represent national economic trends as well as commercial service trends at the Primary Airports.

Based on an analysis of other state aviation fuel taxes provided by the BOA, NH's aviation fuel taxes are some of the lowest taxes in the country. Although the taxes are similar to other states, the size of the state, number of based aircraft and only one large air carrier airport, the overall revenue is small. Preliminary information fiscal year 2013 revenues are at about $300,000.

Adjustment of the taxes is possible to generate more revenue, however, careful research would be necessary to identify the overall benefits as well as unintended consequences. It is possible that adjusting the taxes could give an adjacent state a fuel price advantage and lure aircraft away from the state. For Jet-A fuel, airlines are extremely sensitive to any changes in fuel tax increases and an adjustment could potentially reduce fuel sales significantly. As such, any adjustment would need to be researched to ensure that an increase revenue stream could be obtained with no competitive loss.

The BOA should consider options to enhance the current funding programs allowing the state to be more self-sufficient.

Aircraft Registration Fees

Aircraft receive registration certificates annually in NH if the aircraft owners have paid a two-part aircraft registration fee. The first part is called a state registration fee and is less for in-state residents than for out-of-state residents. In CY 2014, $57,657.58 were collected for this fee. The second part is called an aircraft operating fee that also has two components: a descending millage plus a fee based on the weight of the aircraft. In CY 2014, the aircraft operating fee collected by the BOA was $707,367.25. NH RSA 422:36 states that, "one-quarter of the aircraft operating fees collected (i.e., $176,842.46 in CY 2014) must be disbursed amongst the public-use airports for aeronautical purposes."

There are a number of states, including Maine, that use similar formulas for aircraft registration fees. However, there are states such as Massachusetts that use a flat fee for aircraft based on weights. The use of registration fees provides an additional revenue source for the states. Outside of the Aeronautical Fund discussed later in this chapter, there are no other unique funding programs found in other states that could be considered for NH, the current formula for NH will continue to be utilized for the current and near term funding programs in place. As with fuel taxes, research on the effects of adjusting the formula should be considered to determine if a revenue increase would be beneficial and what if any, are unintended consequences could exist.

Recommendations: The BOA's operational and capital needs are funded similarly to other states and through several different sources. The need to consider revising the current funding programs should be evaluated by the BOA to determine the potential increase in revenues, allowing the state to be more self-sufficient.

8.2.4 NPIAS AIRPORT FUNDING

The FAA determines which airports are needed in NH to provide for a complete National Airspace System. The 12 NPIAS airports represent a range of airports from small GA facilities such as Dean Memorial Airport that serves small business and recitation aircraft operation to Manchester-Boston Regional Airport, which serves large corporate aircraft and airline and cargo service.

They accommodate and offer service to a diverse range of aircraft and are located throughout the state. They provide access for tourism, business, emergency services, and ground infrastructure inspection to name a few. Each region of the state is served by at least one of these airports. These airfields are also important transportation facilities that provide air access to the municipalities they serve, and as such, contribute to the overall transportation infrastructure of the municipality, region, and the state.

10%

Of the six states that makes up the FAA's New England region, NH receives an average of 10% of FAA grant funds within the region.

Funding

The airports within this group of airports have eligible capital improvement projects primarily through FAA grants for eligible safety and capacity projects. Federal grants offer 90% of the total project cost; the remaining 10% is evenly split between the state and the municipality that owns the airport. Projects that are not eligible are funded at 100% either by the airport owner or built with private funding. The BOA, as a designated block grant state by the FAA, administers and manages the federal grant program for FAA for 9 of these 12 airports. The historical federal funding levels are presented in **Table 8-5**.

Table 8-5 – NH Federal AIP Grants 2009 - 2014

Year	NH FAA Funding	FAA Regional Funding	NH Share
2009	$14,132,143	$189,589,035	7%
2010	$13,398,809	$163,594,839	8%
2001	$30,051,041	$172,613,372	17%
2012	$17,102,149	$133,166,552	13%
2013	$13,446,127	$137,179,209	10%
2014	$7,375,125	$145,256,111	5%
Average/Year	$15,917,566	$156,899,853	10%

Source: Federal Aviation Administration Grant History

As seen in **Table 8-5**, the state has received an average of about $15M over the six-year period, which represents about 10% of the total federal grant money available within New England. NH has about 11% of the federally eligible airports within New England. Also, the amount that NH has received has fluctuated and is due to prioritization by FAA New England region, which balances the overall capital improvement needs of the region as well as the number and types of projects requested in NH. The amount of federal funding historically has not met the overall capital project needs of the federally funded airports within the state or the nation. As a result, projects tend to be phased over multiple years.

As such, the federal funding gap will remain and likely increase with the projected federal share of the system costs of $350 Million over the next 20 years with little options for future increases.

During the inventory process, many of the airports noted that the money they receive from the ¼ return of registration fees is important for their operational and capital budgets and they rely on that turn back. The airports are also eligible for the Grants to Airport Sponsor state program for operational and maintenance projects. Historically, only 10% of the total monies available in this state funding program went to the NPIAS airports. This program is discussed in more detail in the next section.

8.2.5 NON-NPIAS AIRPORTS

Non-NPIAS airports provide a number of functions including a support system of the NPIAS airports, allowing local and regional access for emergency services, and supporting flights associated with recreation or tourism.

The non-NPIAS airports are comprised of small GA airports, most of which are privately owned, public-use facilities. These airports are not eligible to receive federal funding for their capital improvement needs. Many of the privately owned airports have been in existence for better than 30 years and are family operated facilities such as Jaffrey Airport - Silver Ranch and Twin Mountain Airport. They offer access to less populated regions of the state and may not be proximate to a NPIAS airport.

Airport Function

An important finding of the NHSASP is that many of the non-NPIAS airports support the NPIAS airports. For instance, Jaffery Airport - Silver Ranch is an alternate airport when there is poor weather or fog at Dillant-Hopkins Airport in Keene. In 2014, Keene's main runway was reconstructed and for two weeks during construction, closed to aircraft activity. A number of aircraft from Dillant-Hopkins Airport temporarily relocated to Jaffrey Airport -Silver Ranch, and other airports, to remain operational. As Jaffrey is proximate to Keene, the impact to aircraft owners was limited as the drive to Jaffrey was not significant.

Another combination of airports, Moultonboro Airport and Laconia Municipal Airport operate in a similar fashion. However, the one additional aspect is that Moultonboro Airport, located on the northerly side of Lake Winnipesauke, also accommodates aircraft that are visiting second homes in the region. As the sales of second homes expands on the northern side of the lake, Moultonboro Airport will continue to serve aircraft flying to the region for recreation and second homes. The airport also accommodates amphibious aircraft that can land on water as well as land without a reconfiguration of the aircraft.

The non-NPIAS airports also serve an important emergency service role within the state. Errol Airport had built a helipad to provide emergency access for the Dartmouth Hitchcock Advanced Response Team (DHART) helicopters to serve the northern portion of NH. This is especially critical during the winter, where snowmobile or all-terrain vehicle (ATV) accidents may require quick extraction of critically injured patients.

The non-NPIAS airports also serve a tourism function within the state. Parlin Field, is a good example of an airport that draws pilots and tourists to the airport. The airport is staffed with a part time airport manager and a strong cadre of volunteers that maintain the airport year round. As the airport in not federally funded, the volunteers organize various fund raising efforts through the year to raise funds for maintenance and capital projects. The airport also markets itself through monthly newsletters and an extensive website providing information about the airport and links to local attractions. One large draw is the on-site restaurant that attracts pilots from NH, VT, and other states. To address transportation needs, the airport has courtesy bicycles that can be used and with nearby bicycles trail and close proximity to town, allows people flying in to explore the town offerings.

Funding

The non-NPIAS airports are primarily self-funded facilities that have been historically supported by several state funding programs under the BOA. Only one of the five programs, Aircraft Operating Fee Return, currently provides small revenues while the remaining four programs are not funded by the legislature. The programs are as follows:

- Aircraft Operating Fee Return is an annual disbursement of one-fourth of revenue from the aircraft operating fees for aircraft based at the non-NPIAS airport.
- Grants to Airport Sponsors is a line item within the BOA's operational budget that funds airports for the operation and maintenance of the public-use airports. This program is not currently funded, but when funded in the past, 90% of the grant monies went to the non-NPIAS airports and the remainder went to publicly owned, public-use airports.
- State-Local Grant Program is a grant program that is a line item within the BOA operational budget that is specifically designed for the non-NPIAS airports. The program was changed form a 50-50 split to an 80-20 split in 2012. The grants are for the capital projects at these airports. This program is currently not funded.
- Airport Property Tax Reimbursement Program is defined under Chapter 423, Section 423-A Airport Property Tax Base Sharing and is a program for privately owned, public-use airports and is used to offset some or all of the local property taxes these airport owners must pay on the portion of their property that is used to support a public airport. This program is also currently not funded.
- State Aeronautical Fund(NH RSA 422:35) was enacted by the legislature in 2010 to provide a dedicated aviation revenue source available to all public-use airports. The sources of revenue for this fund are donations, gifts and surplus equipment. The dedicated fund, as of January 2015, has $1,100 available to be disbursed.

The BOA provided historical information on three of the programs described above, the tax reimbursement program, the grants to airport sponsors, and state level grant programs. **Table 8-6** presents this information.

NH pilots fly relief supplies to hurricane victims

December 18, 2012 by GAN Staff

By Carol Lee Anderson

NEW HAMPSHIRE — The significance of local general aviation airports and the role they play during an emergency situation often go unnoticed by most, but victims of Hurricane Sandy quickly realized their importance after the Super Storm.

Within hours of calls for help from people in New York and New Jersey, efforts within the aviation community were well underway. During these situations, even the smallest local airport quickly becomes part of a much larger aviation system. Many times air-borne relief efforts are the only way to get supplies to victims as roads are often blocked after storms or earthquakes. Local commercial airports aid in the transport of supplies to and from more rural locations, expanding the areas donations can reach.

Vital supplies bound for storm-damaged parts of New York and New Jersey fly high above the Connecticut River as general aviation pilots from NH recently helped in the relief efforts for the victims of Hurricane Sandy.

NH's aviation relief efforts were organized by AERObridge, a national organization comprised of experienced aviation specialists that coordinate the emergency response of the aviation community during natural disasters, both here and abroad. When AERObridge needed pilots to fly donated supplies from NH to the areas hardest hit by the hurricane, there was no lack of pilots willing to donate their time, airplanes, and fuel to fly donations into Republic Airport on Long Island, N.Y. The donations, once delivered, were distributed to relief organizations and then directly to the victims.

Pilots Jim Murphy and John Wilson, connected to each other by AERObridge, agreed to meet at Nashua Airport. Murphy had put out a call for donations and was very quickly overwhelmed with the amount coming in. They used Wilson's plane to load 900 pounds of supplies, including diapers, wipes, and food and took off towards the storm-damaged areas.

Adding to the list of NH pilots donating their time were 10 pilots who came together in a team effort at Parlin Field in Newport. Lou Edmonds of Edmonds Aircraft Service was quick to donate the use of his hangar to house the donations as they came into the airport. Edmonds and his wife, Sherry, along with Parlin Airport Manager Heath Marsden, and wife, Angie, worked to bag and weigh the 1,500 pounds of donations the night before their flight to New York. Former manager Russ Kelsea and his wife, Judy, prepared the remaining donations on the morning of the flight. Due to the number of donations, not all were flown in the first round of relief flights. A helicopter pilot from Parlin Field flew the remaining donations a few days later.

One of the pilots, Rick Kloeppel, recently described the experience, telling of how the air traffic controllers at Boston-Logan International Airport were notified ahead of time of the mission of the flights. Controllers had received a full briefing on the "compassion flights" and worked to get all six airplanes through the heavily-congested airspace around the airport as directly and as quickly as possible.

Kloeppel was amazed at the efforts of everyone involved, saying, "We loaded the machines so fast and were so busy at Parlin, then, at Republic Airport, the ground team was all over the inbound airplanes. They were very, very efficient! Frankly, I was stunned that we were able to make any of it happen on two days' notice, but Heath, our manager, understands fully how to reach out to the community, whether it is through social media or by finding the right organizations that are able to get the message out. The local Chamber of Commerce and fraternal groups responded way faster than I imagined. The folks at Republic were very accommodating and efficient."

Diane Cooper, airport manager of Laconia Municipal Airport located in Gilford, NH, is well-aware of the importance of the 24 public-use of airports in NH as well as those located throughout the country. Cooper is a member of the outreach committee of the Granite State Airport Management Association. The organization works tirelessly to educate the public's understanding of aviation and the value of the state's aviation system.

"Most people don't realize that the relief efforts for disasters, such as Hurricane Sandy, often begin at our local airports," she explained. "Small airports can immediately turn into donation centers where the public can drop off much-needed disaster supplies. These supplies can then be sent immediately to where they are needed, mostly by mercy flights that are donated by general aviation pilots with their aircraft.

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http://generalaviationnews.com/2012/12/18/new-hampshire-pilots-fly-relief-supplies-to-hurricane-victims/

Table 8-6 – Historical State Grant Program Funding

Year	Tax Reimbursement Program	Grants to Airport Sponsors	State Local Grant Program	Total
1997	$9,029	$31,110	$14,182	$54,321
1998	$9,677	$42,022	$23,898	$75,597
1999	$6,966	$51,518	$23,898	$82,382
2000	$7,877	$51,518	$23,898	$83,293
2001	$9,995	$51,518	$23,898	$85,411
2002	$10,000	$49,808	$23,898	$83,706
2003	$9,997	$45,218	$23,898	$79,113
2004	$10,000	$51,518	$23,898	$85,416
2005	$12,500	$51,518	$23,898	$87,916
2006	$12,500	$55,568	$23,900	$91,968
2007	$15,500	$32,890	$23,900	$72,290
2008	$17,500	$0	$5,000	$22,500
2009	$0	$0	$20,000	$20,000
2010	$0	$0	$5,668	$5,668
2011-2014	$0	$0	$0	$0

Source: Federal Aviation Administration Grant History

2008

The Recession of 2008 was the main reason grant funding for public-use airports was lost. The non-NPIAS airports are the most affected as state funding was the primary source of capital funds.

As seen in this table, there was steady and increasing funding available to the non-NPIAS and public-use airports up to about 2007 and then funding was cut in the various programs through 2011. The loss of funding was a direct result of the economic recession, which started in late 2007 and continued through 2008 and beyond. The highest amount totaled $85,411 annually in 2001, but decreased to just over $72,000 in 2007. However, the fact is between 1997 and 2010, the privately owned airports had capital development resources to conduct maintenance and improvement projects whereas today, they have no capital development resources. This has placed a significant financial burden on the airports and many are having difficulty maintaining their airports, especially routine maintenance of runway, taxiway and apron pavements, which if allowed to continue, will make these airports unsafe due to pavement failures.

8.2.6 FUNDING SHORTFALLS

Funding shortfalls exist for NH aviation today and will be further exacerbated over the next 20 years. As discussed in Section 8.2.4, NH receives about 10% of the FAA grants within the FAA New England region and that average is unlikely to change with the number of federally eligible airports within the state system. Federal funding does not provide all of the financial resources required for NPIAS airports to maintain and grow their facilities. The estimated federal portion of all of the projects needed over the 20-year period (NHSASP projects, local level airport capital projects, pavement maintenance, and studies) presented in Section 8.2.1 was estimated at $435 million. Annualizing the overall cost over 20 years, the estimated overall annual federal shortfall less the $15M the state receives in grants, is $6.8M per year.

At the state level, Section 8.2.1 estimated the projected state and local funding needs was $74 million over the next 20 years. Of this total, $25.7M represents the projects costs for the NHSASP and pavement maintenance required for the non-NPIAS airports. Annualizing this number over the 20 years, $12.8M would be needed annual for the non-NPIAS airports. Applying the 2007 funding of $70,000 available to the non-NPIAS airports, the annual funding shortfall for would be $12.76 million.

The estimated shortfalls at both the federal and state levels hinder the full implementation of projects supporting the NHSASP and NH aviation's ability to move the state's economy forward. The potential to gain more FAA funding over the foreseeable future is not likely as the FAA grant program is funded at specific levels defined under current Airport Improvement Program which ends September 2015. New legislation to reauthorize the Airport Improvement Program over the next four years is ongoing and a new federal program for airports is expected in October 2015. Various national aviation organizations are lobbying Congress to increase funding for airports; however, the outcome is uncertain.

In terms of state funding shortfalls, the lack of funding for the Grants to Airport Sponsors Program, the Tax Reimbursement program, and the State Local Grant Program, which primarily serves the non-NPIAS airports, has major implications on the NHSASP. The lack of funding makes it very difficult for the non-NPIAS airports to maintain their facilities and provide safe and efficient airport environment. Discussions with a number of non-NPIAS indicated that without the availability of future funding mechanisms, maintaining their airports will become increasingly financially difficult resulting quite possibly in the closure of he airport. The loss of one or several non-NPIAS airports will have a significant impact on the NHSASP.

25

The 25 airports that comprise the system of airports within NH generate collectively $1.15 billion of economic output and 9,200 jobs.

The loss of any of the non-NPIAS airports will have an effect on the efficiency of the NH airport system and the ability of the system to provide air access and services to aviation users. The non-NPIAS airports play an integral role within the NHSASP. They serve as a secondary system of airports within the system, supporting activity at the larger NPIAS airports as well as provide air access for business, tourism, recreation and emergency services serving their communities and regions.

Without a restoration of program funding, the BOA has limited options available to preserve the non-NPIAS airports. A lack of funding may produce any one of the following results:

- Allowing non-NPIAS airports to close and not replace that function within the system.
- Consider a reduced role within the system if not already a Basic Airport.
- Identify a non-NPIAS airport critical to maintaining a safe and efficient system as a candidate for inclusion as a NPIAS airport if the NPIAS criteria can be met.
- Delay implementation of the NHSASP recommendations.
- Delay critical maintenance within the NHSASP.

- Assist in funding a new owner willing to be responsible for the airport.
- If a privately owned public-use airport becomes available, the state can purchase the airport and run it (NH RSA 422:19) or purchased by another public entity.

An important element to consider is the economic benefits the system of airports provides to NH.

The economic analysis completed for this study in *Chapter 9 – Economic Study* calculated that the system of 25 airports generated annually; $1.16 billion dollars of economic output to NH, over 9,200 jobs in the state and generated $27.9 million in tax revenues to the state. The non-NPIAS airports provide a small, but noteworthy impact of $750,000, 7 jobs and $50,000 of tax benefits. The 25 airports generate about 2% of the state's overall economic output of about $60 billion annually, a measurable contribution to the state's overall annual economic generation capacity. Evaluating this from another perspective, the $509 million 20-year costs identified in Section 8.2.1 represents one half of the total economic impact output the airport system provides NH for only one year. Stated another way, airport generate twice the benefit of what they take. Compared at the national level, the President's FY 2016 budget proposal noted that the funding request for aviation was partly based on "an investment in the future of aviation, an industry that accounts for more than 5 percent of our Nation's gross domestic product."

The economic impact of the 25 system airports in NH generates $1.16 billion dollars of economic output, 9,200 jobs, and $27.9 million dollars of tax revenues to NH annually. Evaluating this from another perspective, the $509 million 20-year cost to maintain and operate the system of the airports in NH represent one half of the total economic output the airport system provides NH in only one year.

As such, funding the needs of airports in NH is critical for the BOA to maintain a safe and efficient airport system that serves to support the state's transportation infrastructure and economic health. The BOA should consider the following:

- Continue to seek increased federal funding to meet the needs of the NPIAS airports.
- Continue to make every effort to have the legislative bodies' reinstate the Grants to Airport Sponsors, Tax Reimbursement program, and the State-Local Grant programs at the 2007 level in order to provide funding sources for future projects at non-NPIAS airports. However, the final level of funding to be requested will be dependent upon several factors including the status of the state budget and the needs of the aviation system.
- As part of reinstating the state funding programs, the BOA should identify critical projects at each of the airports and develop an initial phase capital program for the non-NPIAS airports. This provides an understanding of the overall financial needs and will help define future funding levels.

Recommendation: Maintaining and improve the 25 airports within the state is a priority for the BOA. The BOA should continue to seek increased federal funding for the NPIAS airports and work to reinstate state-level funding programs for the non-NPIAS airports so they can maintain safe and efficient facilities supporting the overall air access transportation infrastructure in NH.

8.3 POLICY RECOMMENDATIONS AND TOOLS

This section provides additional guidance to the BOA on the operation and management of the NH airport system. There are a number of issues that face the BOA including outdated statutes, staffing needs, monitoring other states' aviation issues and their programs, and providing relevant information to the airports comprising the NH airport system. This section touches upon various considerations for the BOA to address; changes that will enhance safety, improve aviation operations within the state, and strengthen the overall aviation system for NH.

8.3.1 BOA STAFFING

The BOA is organized under the Division of Aeronautics, Rail, and Transit within the NHDOT. The BOA administers the FAA Block Grant State program at airports without airline service for the FAA. The BOA is responsible for managing civil aviation within the state, administering both federal and state grants, overseeing the development of airports at the state and local level, performing airport inspections, managing the aircraft registration program, and representing the state in aircraft accident investigations. The BOA also manages staff and provides maintenance services for state-owned navigational aids.

Prior to 1986, the BOA was staffed with 11 people, but was reduced to 8 staff members in 1996. The BOA is now staffed with 5 full-time employees and one part-time. Managing the aviation program with this staffing structure is challenging, especially with the administrative requirements associated with the block grant state designation. However, the BOA has been able to utilize other staff expertise form within NHDOT to fill any gaps. Still, the BOA has been unable to add staff to manage daily operations, thus limiting the effectiveness of the BOA.

The Federal Highway Administration has grant programs which, when adopted by the governing state DOT, allow for temporary or permanent staff positions through the grant. There do not appear to be similar aviation programs that would fund additional staffing for the BOA. However, the BOA does have the potential to provide internships that could support daily operations on a temporary basis. Below are several options the BOA could consider:

- Through the FAA, explore the intern program to provide additional staffing needs on a temporary basis.
- Work with the NH Aviation Historical Society to obtain an intern over the summer to provide temporary staffing needs.
- Coordinate with Daniel Webster College or other local colleges to hire interns to provide temporary staffing needs.

Recommendations: The BOA should explore options to obtain interns from local colleges or the NH Aviation Historical Society to provide temporary staffing needs. In addition, the BOA should continue to request full-time and/or part-time positions to more efficiently manage the current workload.

8.3.2 SUCCESSION PLANNING FOR PRIVATELY OWNED, PUBLIC-USE AIRPORTS

The evaluation of the current airport system identified a concern for the privately owned, public-use airports. As many of these airports are owned by individuals, the question is who will run the airport when the current owner decides to retire or move away? There have been a number of airports that have closed over the past 20 years, Wolfboro Airport being the most recent to close in the early 2000s. Currently, there are no privately owned airports expected to close in the near term; however, there are a number of owners who have expressed an interest in retirement within the next five to ten years and the disposition of their airports is unknown.

NH's airport system provides air access to 86% of its citizens in 2014 (86% are within a 30-minute drive to a system airport). This metric was used as it is one of the guiding principles that were established by FAA to define an adequate National Airspace System (Federal Airport Act of 1946). Each public-use airport plays a unique role within the system providing the variety of services and facilities to meet the needs of pilots and customers. The loss of any one of these airports would strain the system as it tries to accommodate the demand with fewer airports. The BOA recognizes the value that each airport provides to the system and works to assist each of these airports.

The loss of one or several airports in the state will have an effect on the overall ability of the airport system to serve the aviation needs of NH and its citizens. This NHSASP allows the BOA to evaluate the potential impact and possible options to address the effects.

Airport Cooperative Research Program (ACRP) Report 44 - A Guidebook for the Preservation of Public-Use Airports (http://www.trb.org/Main/Blurbs/165624.aspx) describes why public-use airports close, and identifies measures and strategies that can be undertaken to potentially help preserve and prevent an airport closure. The report notes that part of the failure of privately owned airports is that there is no succession planning completed.

To get a better understanding of the future of the privately owned public-use airports in NH, the BOA should accomplish the following steps:

1. Discuss with the owners of each of the privately owned public-use airports what they expect to do with the airports once they decide to retire or leave the aviation community.
2. Identify which airports could or will be operated by future entities, whether family or another private entity.
3. For those airports that do not have a succession plan, discuss with the owner the possible options for continued support of the airport.

The following figure provides a typical process on how succession planning is done. Although this may be directed toward larger businesses, the model can be adapted to any airport.

4 Stage Succession Planning Process			
Now ? *(current situation analysis)*		**How ?**	**Where ?** *(future)*
1. Identify	**2. Evaluate**	**3. Plan**	**4. Implement**
1. Identify & acknowledge key issues: Need to manage succession & leadership transition to ensure business & family continuity **2. Appoint project team to manage succession process** **3. Identify & gather information (business & family):** • Background facts • Profiles of key personalities [especially current leaders] • Core Values & Philosophy • Plans, goals, key objectives • Needs & interests; issues & challenges • Chosen/potential candidates • Resources available (people, time and cost)	**1. Assess information from (1) for business & family:** • Plans & goals • Core Values & Philosophy **2. Strengths & weaknesses of:** • Business & family • Succession candidates • Current leaders • Support resources • Relationships generally **3. Potential impact on:** • Business continuity • Family dynamics • Staff • Customers, suppliers, financiers • Other stakeholders	**1. Develop Succession Plan for candidates & current leaders:** • Business & family objectives • Succession criteria • Candidate criteria • Selection program & process • Development program for candidates • Progress monitoring and measurement • Decision points • Contingency plans – other options; best and worst alternatives • Communication program for all stakeholders **2. Develop Transition Program for current leaders (timing, resources, mentor etc)**	**1. Implement the Plan:** • Select candidate(s) • Communicate choice • Train, coach and mentor through all facets of business • Monitor and assess candidate performance • Adjust training, timing, candidates or expectations (if required) • Final decision - accept or reject candidate • Complete process – handover ceremony **2. Support & mentor leaders through transitioning on, or out** • Monitor & assess transition • Respond & adjust as required

Source: www.familybusinessstrategies.com.au

There are also various guides available on the internet. One such document is a guide for small to medium businesses developed by Kent State University entitled “An Owners Guide to Succession Planning” (http://dept.kent.edu/oeoc/spp/OwnersGuide.pdf) and documents the process of conducting a succession planning effort, including various forms to help owners with documenting the analysis and outcomes.

Once the BOA determines that the succession of a privately owned public-use airport may not occur, the BOA has several options. The first option is to do nothing. The second is to assess the impact of losing the airport and its impact on system performance, then act on it as appropriate.

The analysis presented in this NHSASP allows the BOA to understand what a particular airport covers in terms of drive time and air access gap analysis. If it is determined that the airport will have a significant impact to the system or to the region the airport serves, the BOA can discuss these impacts with the owner and determine if there is an alternate option available. A number of options were previously discussed in Section 8.2.6.

If there are no alternatives available through the owner, the BOA has the option of purchasing the airport through the current RSA legislation. However, such an option may not be feasible and will require extensive analysis to further consider this course of action.

Airport business plans provide an airport with a valuable tool to enhance revenues, identify revenue generating opportunities and best management practices to strengthen the airport's financial position and continued economic contribution to the local and regional economy.

The loss of a privately owned public-use airport within the NHSASP will have some impact on the aviation transportation infrastructure, however, it would fall to other surrounding airports to assume the aircraft and services that the privately owned airport had if they had the capacity to do so. Nevertheless, any economic benefits provided by the airport to the community would be lost, as well as air access for its citizens. The BOA should be able to quantify the particular impact and determine what, if any, further actions may be necessary to fill the gap created by the loss of a privately owned public-use airport.

Recommendation: The BOA should actively discuss the future of the privately owned public-use airports with their owners and determine which airports may not have a clear future. Once identified, the BOA should discuss with the owners a potential succession plan for the airport and work with the owners to further those discussions. If an airport does not have a succession plan, the BOA should use the analyses presented in this NHSASP to determine the potential impact of the airport and determine options for the airport to remain operational.

8.3.3 BUSINESS PLANNING

A business plan provides an agency, community, or organization with a clear assessment of their current situation, helps to identify potential opportunities as well as obstacles, and defines the actions necessary to achieve specific goals. The business plan establishes the direction for short- and long-term economic development, helps to guide future land use decisions with economic development implications, and outlines the strategies required to help with economic development, retention, expansion, and attraction efforts. A business plan can help these entities take advantage of opportunities as they arise rather than forgo the opportunity.

The focus of an airport business plan should be the development of goals and objectives intended to improve the financial and operational sustainability of the airport, along with the identification of specific actions to be taken in support of achieving those goals. The airport business plan should be clear, concise, and actionable, with an emphasis on brevity to encourage stakeholders to read and enact the plan, as they channel their efforts toward building and sustaining the airport as an economic engine for their town and region. When used and implemented correctly, an airport business plan can be an effective management and decision-making tool.

A number of states including New York, Vermont, and Connecticut developed business plans for their airports to provide guidance, enhance their financial position, and remain/become self-sufficient. The purpose of the business plans was to provide the airport owners with opportunities to increase overall revenues at the airport through enhancing current fee structures, lease agreements, and evaluate the use of available land for aviation and non-aviation development. In general, these efforts were intended to help airports operate more like a business rather than public infrastructure.

The outcomes of theses business plans were successful for the state of Vermont. The state developed individual business plans for the six state-owned airports as well as a business plan for maintaining their system of state-owned airports. The later focused on standardizing the operation of the airports and fees for fuel, lease agreements, and other financial considerations. The results of these actions allowed each airport to become financially self-sufficient and operate at a profit rather than a deficit, and take full advantage of their uniqueness and ability to serve both based and itinerant aircraft activity.

A basic business planning guide for airports to reference is provided in ACRP Report 77 – Guidebook for Developing General Aviation Airport Business Plans. The guidebook provides an in-depth look at the importance of airport business plans, *Chapter 2*, as well as a detailed manual on how to create, implement, and evaluate an airport business plan, *Chapters 3, 4, and 5*. Since the ACRP Report is meant to serve as a general template, the wide-ranging components found within can be, and should be, modified to meet the unique business needs and situations of an airport; however, the overall elements and processes should remain the same. **Appendix 8-A** provides a template checklist that can be used as a guide to develop a business plan.

In addition to the ACRP Report, there are numerous online examples of completed airport business plans that should be used to facilitate the business planning process.

Recommendation: The BOA should fund two airport business plans, one for a NPIAS airport and one for a non-NPIAS airport, as pilot projects for exploring the business plan process, its value, and its implementation. Once completed, the BOA should evaluate the efficiency and effectiveness of these processes and then implement their own guidelines for preparing and implementing airport business plans within NH.

Meeting all FAA design standards ensures the highest level of safety for an airport. The BOA should work with the NPIAS airports to ensure they meet these standards.

8.3.4 COMPLIANCE WITH AIRPORT DESIGN STANDARDS

The FAA's Advisory Circular (AC) 150-5300-13A – Airport Design, provides guidance on the design of civilian airports, focusing on safety and efficient operations. In regard to safety, the FAA has, over the past five years, begun to focus on certain areas on the airport that must meet FAA standards, specifically Runway Safety Areas (RSAs) and Runway Protection Zones (RPZs).

The RSA is a rectangular area surrounding the runway and enhances the safety of aircraft that undershoot, overrun, or veer off the runway, and provides access for firefighting and rescue equipment. The FAA no longer provides modification of standards for RSAs, thus all airports that receive federal grant funds from FAA must meet RSA dimensional standards for their runways.

The RPZ is a trapezoidal-shaped area beyond the end of the runway that enhances the protection of people and property on the ground, and the FAA recommends ownership or control within the RPZ. The FAA has continued to focus on the RPZ and has provided supplemental guidance on land uses within the RPZ.

Given the FAA's focus on these two areas, the BOA should inventory the NPIAS airports to determine if their RSAs are in compliance. If not, the BOA should work with the airport to determine the best option to meet those standards and where applicable, support funding in the short term to correct the deficiency.

The new guidance for land uses within the RPZ has created concern among airports regarding ownership and potential incompatible land uses within the RPZs. The FAA is allowing the current uses in the RPZ until an action occurs, be it a runway rehabilitation or some other project, that would trigger a review of the RPZ. The BOA should work with the NPIAS airports to evaluate their RPZs against the current guidance, if they have not already, to determine the land uses within their RPZs. If there are issues found, the BOA should work with the airports to determine the best strategy to address the issue.

Recommendation: The BOA should work with the NPIAS airports to evaluate the current status of their RSAs and RPZs and document any deficiencies. A strategy should be developed with the airports to prioritize projects that would correct the deficiency and support funding for those projects in the short term. Correcting the deficiencies would significantly enhance safety for the airports and their users.

8.3.5 NON-NPIAS AIRPORT LAYOUT PLANS

Some of the non-NPIAS airports have, or will have, airport layout plans showing their existing facility and future development plans. Having an airport layout plan for the remaining nine airports will allow the airports and the BOA to discuss and develop future planning needs.

The BOA has proposed airport layout plans (ALPs) for non-NPIAS airports (Plymouth Municipal Airport, Parlin Field, Alton Bay Ice Runway/ Seaplane Base, Hampton Airfield), which means that nine non-NPIAS airports do not have information on future planning for these airports. Capital projects were discussed for these airports when funding for non-NPIAS airports was available. Given the nature of these airports and the lack of succession plans by the current owners, the BOA should have an understanding of the facilities and an ALP will help to provide much of this missing information. The ALP graphically demonstrates the value and capabilities of the airport, which is important during succession planning efforts.

The BOA developed a basic ALP for the Alton Bay Ice Runway/Seaplane Base, incorporating various features such as safety areas, runway protection zones, and separation standards between the runway, taxiway, and apron areas. The effort for that was unique given that the runway is made of ice, but now the BOA and the airport have a layout of the facilities during the winter which serves as a guide for airport operations during the winter season. This includes standardized plowing and aircraft parking, which in turn increase the overall safety at the airport.

Basic ALPs can be developed using Geographic Information Systems (GIS) and can provide graphics depicting the airport property and other associated FAA design requirements. Although these ALPs may not meet all of the FAA requirements, there should be enough information to detail key data (runway length, width, approaches, etc.) on the airports and provide a baseline layout to identify future development opportunities. The ALPs can be developed as follows:

- As available, obtain the GIS data for each municipality where an airport is located. The data will have basic parcel data. This data will provide a basis for land ownership and airport infrastructure.
- Obtain aerial photography from state GIS information and overlay on the parcel data.
- Develop a basic sketch including the runway, taxiway, apron, buildings, and the following FAA design standards or clearance surfaces: Runway Safety Area, Runway Object Free Area, the Runway Protection Zone and the Airport Property Line.
- Work with each airport to determine any future projects and incorporate into the ALP.
- Develop basic data tables with relevant airport facility information and incorporate into the ALP.

Once these are complete, the BOA will have the basic airport information for each airport. Should a non-NPIAS airport in danger of closing, the BOA will have information to make informed decisions regarding potential acquisition and future development needs to meet FAA standards as well as to mitigate impacts to the airport system. Alternately, the document can be passed to a new owner and maintained into the future.

Recommendation: The BOA should develop ALPs for the non-NPIAS airports that provide information on existing facilities and future development proposals using GIS and its readily available information.

8.3.6 AVIATION POLICIES FOR AIRSPACE PROTECTION, LAND USE, AND ZONING

Protection of airports is accomplished through several methods. The most common option is the adoption of land use and zoning regulations that protect the airport's environs from incompatible land use development near the airport and protect the airspace to maintain safe airways for airports.

NH RSA 424 addresses several elements of zoning policy and includes the following:

- Prevent airport hazards or obstructions through the development of airport approach plans for all public-use airports.
- Adoption and implementation of zoning by municipalities, including acquisition of acquisition of land in fee or easement.
- Limited guidance on land use recommendations.

Comparing NH RSA 424 to Federal Aviation Regulation Part 77 – Objects Affecting Navigable Airspace (Part 77) FAA airport design requirements, and FAA airport grant assurances, it is clear that the state's regulations need a significant update based on the following observations:

Several of the state statutes on airspace protection and zoning need to be updated to incorporate current FAA airspace protection requirements and provide more comprehensive zoning and land use information and reporting to the municipalities and their neighbors.

- The initial statute dates back to 1941 and is seemingly outdated. The latest updates to certain sections were in 1985 and recodified 2001, during which time several sections were also repealed.
- There is no mention of the relationship to the standards for Federal Aviation Regulation Part 77 or United States Terminal Instrument Procedures (TERPS).
- There is no guidance on land use (Section 424:5).
- There are no clear reporting requirements to the BOA.

NH RSA 424 zoning regulations largely delegate responsibilities to local municipalities and zoning boards and with little guidance on aeronautical standards, create a lack of consistency in processes and outcomes. A key deficiency is that the existing airport zoning statute makes no mention of the FAA's policies and guidance regarding airspace protection. Additionally, while the state legislation requires local municipalities and zoning boards to adopt and implement some degree of airport zoning, there is no information on the compliance, or effectiveness, thereof. Moreover, the bulk of the state zoning statutes emphasize obstructions to airspace (a reactive approach), rather than focusing on airport-compatible land uses on the ground (a proactive approach). Finally, the state's current legislation does not address overflight issues such as aircraft noise, which can affect the public's perception and support of local airport operations and development.

Table 8-7 presents a basic "gap" analysis to identify what and where the deficiencies exist.

Table 8-7 - Summary of Legislative Analysis*

Legislative Issue	Existing Deficiencies	Recommendation	Bridging Actions	Resources and Considerations
Airspace Obstructions	- Local jurisdiction - No adherence to FAA obstruction evaluation requirements and airspace analysis	- Standardized airspace protection laws and processes across the state and compatibility with federal laws	- Revise NH statutes to provide comprehensive airspace protection - Include Part 77 drawings in ALP sets - Update states airspace drawings	- Provide notice and continuing guidance to local municipalities - Consider airspace analyses as recommended
Land Use and Zoning	- Lack of standardization - Devoid of sensitive topics (noise, odor, etc.)	- Comprehensive and standardized airport and use and zoning laws and processes across the state	- Revise NH statutes to foster compatible aeronautical and non-aeronautical land uses around airports; - Standardize regulations and processes across the state	- Utilize existing legislation from other states as examples - Provide notice and continuing guidance to local municipalities with and without airports

**This methodology is a GAP analysis, which is intended to evaluate a system's current and existing conditions against potential and desired outcomes. The purpose is to bridge the gap between the differing ends of the performance spectrum by identifying explicit actions and processes to be applied.*
Source: McFarland Johnson, Inc. NHDOT BOA

As seen in this table, it is recommended that the BOA review its airport land use and zoning laws for opportunities to incorporate more comprehensive components, as well as to provide more thorough guidance for municipalities and zoning boards functioning at the regional and local levels. Research was done to identify unique or informative materials that could guide the BOA in updating NH RSA 424.

- The California Airport Land Use and Planning Handbook provides a comprehensive guide to inform the general public, elected officials, and decision-makers on the importance of appropriate and responsible land use planning to prevent encroachment and preserve the state's aviation system, an integral part of the transportation network. This comprehensive guide encompasses many topics including how to form airport land use commissions (unique to California municipalities), creating land use plans, current regulations surrounding FAA airspace and noise compatibility, developing land use compatible policies, and fostering inter-agency coordination. Implementation of the planning guidelines can be incorporated into the municipal zoning, either modifying the zoning language, or developing/revising an airport overlay to address the needs. The California guide provides the BOA, as well as the municipalities, with comprehensive information on developing land use requirements as well as policies regarding noise, overflight, safety and airspace protection. The land use handbook can be found at: http://www.dot.ca.gov/hq/planning/aeronaut/documents/alucp/AirportLandUsePlanningHandbook.pdf

- Florida Department of Transportation Aviation and Spaceports has extensive information on the aviation program in Florida. Reviewing their available information, they have an comprehensive compatible land use webpage (http://www.dot.state.fl.us/aviation/compland.shtm) that has a number of resources that can be used when considering updating NH RSA 424. A key document is Florida's Airport Compatible Land Use Handbook, which has significant amounts of information on airport zoning and land use. Section One of this handbook provides the principles underlying land use compatibility requirements and discusses the areas to protect around airports (FAR Part 77) for noise and safety. The handbook continues with information on statutes, regulations and processes governing land use compatibility and a section dedicated to reviewing development applications.

Both of these handbooks can provide the BOA with information that can be used to update NH RSA 424 as well as provide valuable information to the municipalities and airports within the state.

A major component missing today in NH RSA 424 is a reporting mechanism to the BOA on land use and zoning issues. Unless an airport or local zoning board informs the BOA of an issue, there is no way in which the BOA can be proactive with the various municipalities in the state to address needs or evaluate issues. Discussions with the Massachusetts Department of Transportation Aeronautics Division indicate that they rely on the building inspectors within the municipalities that have airports to inform them of proposed projects. The BOA should determine what the best option is for reporting requirements and incorporate them into the revised statute.

The BOA is currently working to develop Administrative Rules associated with the Tall Towers statute.

Another concern is that some neighboring municipalities do not have airport related zoning to protect an airport in the adjacent town. This is problematic in that efforts to maintain clear airspace and land use around and airport by the host municipality are undermined by no protection for the airport in the adjacent town. This should also be addressed as part of this process to ensure that airports are protected.

Recommendation: The BOA should consider revising state statutes on zoning and land use NH RSA 424 which would strengthen airport protection and preservation. Updating the statutes should also provide educational information for municipalities to develop or update effective land use and zoning practices.

8.3.7 TALL TOWER PROTECTION

NH RSA 422-B addresses tall tower protection of airspace. As with the zoning statute, this statute is also outdated and does not address Part 77 or TERPS requirements. The statute does touch upon when permits are required, heights upon which to report, marking and lighting the objects, and reviews by the BOA. Given the limited information in the statute, proponents may not be aware of all issues they need to address as part of their proposals. As there is a lack of a formal reporting program detailed in the statute, the BOA is currently drafting administrative rules including application/reporting requirements. The discussion below provides some additional guidance or considerations in the preparation of these administrative rules:

There needs to be a coordinated effort to require submission to the FAA (Form 7460) and obtain a copy for tracking purposes as well as evaluation of the tall tower and the resulting finding. Some states complete an analysis separate from the FAA ensuring that there are no effects on the airport, since the FAA evaluates national airspace only. This could also serve as a future revenue generator for the state by requiring a fee for the submission and review.

From a reporting perspective, discussions with the Massachusetts Department of Transportation Aeronautics Division indicated that they rely on building inspectors within the municipalities to report proposed tall towers. It is recommended that the BOA also consider a collaborative approach with the local municipalities to address these needs.

A good example of the requirements that trigger the need to submit a permit form is provided on the Minnesota Department of Transportation Aeronautics and Aviation website (http://www.dot.state.mn.us/aero/talltowers.html). The website page defines the criteria for submission under the FAA requirements including Form 7460 as well as the criteria for submission to the state. A brief two page brochure was also developed detailing the process, which is a valuable tool that can be used by the local airports to inform their municipalities of the requirements as well as proponents considering locations for tall tower structures.

Recommendation: Complete the Administrative Rule process to address the application and report needs as identified in NH RSA 422-B.

There should also be an informational campaign to educate developers, landowners, and municipal officials of the requirements of this important state statute.

8.3.8 INTERMODAL INTEGRATION

The 2003 System Plan Update addressed intermodal opportunities for the airports and made a number of recommendations. In looking at the aviation system within NH and its integration within the overall transportation infrastructure, airports are more connected today than they were in 2003. Below is a summary of findings gained during the development of the NHSASP.

The three Primary Airports are interconnected with other modes through their transportation infrastructure. Lebanon Municipal, Portsmouth International at Pease, and Manchester-Boston Regional Airports are the most modally interconnected airports within the state. The airports can be accessed through a number of taxi and limousine companies, local and regional bus services, and are interconnected with the Lebanon Transit Terminal, the Portsmouth Transportation Center, and the bus terminal in downtown Manchester, respectively. Manchester-Boston Regional and Portsmouth International at Pease both have shuttles to and from NH park and ride facilities as well. Bus service to and from these airports is also provided to a number of regional park and ride facilities. The airports are also served by local hotel shuttles serving the various facilities located near each of the airports. The airports also have many of the major rental car companies providing services to their passengers. Each airport is discussed in more detail below.

- Lebanon Municipal Airport has local bus and taxi service to and from the airport. There is also an Amtrak station in White River Junction, VT across the state border that has passenger rail service and can be accessed via local taxi or limousine companies.

- Portsmouth International Airport at Pease has local and regional bus service serving the airport. The Portsmouth Transportation Facility, which is a regional bus hub and NH park and ride facility, is on the airport and can be accessed via a shuttle to and from the terminal. The airport has access to local and regional taxi and limousine services as well.

  The airport handles and clears international cargo, but has not become a regional hub for small package or outsized cargo. However, the long runway does allow a niche for clearing large cargo aircraft flying from Europe and will continue to serve this niche well into the future.

- Manchester-Boston Regional Airport is also a regional cargo hub for Federal Express and United Parcel Service, both of which have extensive cargo facilities on and around the airport. Cargo is also handled through intermodal shippers through airline belly cargo. There are a number of regional trucking warehouses around the airport that transfer cargo to and from the airport.

There are opportunities for airports to enhance their intermodal connectivity and it does not stop at cars, busses and trains; courtesy bicycles provide the same opportunities at Parlin Field.

There is no rail service (cargo or passenger) with stops at any of the 25 public-use airports in NH, however; studies have been done to connect the Primary Airports with future regional commuter rail service. A plan for a stop in Manchester near the new access road was proposed in which passengers would be bussed to and from the airport. That program is not expected to be implemented in the short term, but the foundation has been developed to connect the airport with rail service as some point in the future.

The GA airports also have intermodal connections in a number of ways. Many of the airports have arrangements with the local car rental companies or automobile dealerships to provide rental cars for passenger flying into the airports. In addition to rental vehicles, many of the airports can be accessed via local taxi, limousine, or hotel shuttle services and some of the airports have courtesy cars available from either the FBO or the airport. The state continues to offer access to surplus vehicles for airports to purchase and use as courtesy vehicles (via NH state surplus). It is suggested that the BOA continue to offer airports this access in the future as this is an affordable option for airports to provide good transportation services to their customers.

Several GA airports have local bus routes running near the airport, such as Boire Field and Concord Municipal Airport. There are a number of GA airports that are also served by local car rental companies or car dealerships that will either drop off a car or pick up passengers at the airports. Generally, passengers flying to many of the GA airports in NH can obtain ground transportation services with little difficulty.

The recent introduction of internet based ridesharing may have a positive effect on GA airports in the future. These rideshare services are now being used for transportation to many of the commercial service airports throughout the nation. Such services, as these programs become more popular, could be used to get passengers to and from the airports.

Cargo is not a major element for NH GA airports. In most cases, small cargo is handled by charters flying to and from these airports. That cargo includes small parts, medical organ transport, or animal transport from shelters in New England and the nation. Manchester-Boston Regional Airport has an FBO that supplements feeder service for Federal Express and United Parcel Service, but that is unique among the 25 airports. There are no recommendations to place cargo at these airports as there is no outstanding demand for this service at this time.

Finally, there is a unique example of providing ground transportation at Parlin Field. The airport provides courtesy bicycles to use on the nearby bicycle trails where visitors can ride into town, have lunch, or just take in the local sites. This is a good example of marketing an airport and attracting visitors to the airport and to the area.

Recommendations: The system of airports in NH is well connected in terms of intermodal transportation opportunities and visitors are able to travel to their destinations once at the airport. The BOA should also continue to provide access to state surplus vehicles, which offers a low cost option for airports to obtain vehicles that can be used by visitors.

With the advent of internet based rideshare services, GA airports may also benefit and should consider liking the airport with one of these services to provide an additional ground transportation mode made available to airport passengers.

8.3.9 SUSTAINABLE STRATEGIES

Sustainable development and construction has become common in buildings across the nation. Developed by the U.S. Green Building Council (USGBC), Leadership in Energy and Environmental Design (LEED) is intended for building owners and operators to be environmentally responsible and use resources efficiently. This concept has now trickled down to airport development such as terminals and FBO hangars in particular. As the movement continues to stretch resources and minimize impacts on the environment, sustainable development is becoming an important element in infrastructure development. Public Law 112-95, FAA Modernization and Reform Act of 2012, in fact, identified recycling as an element to be addressed in airport planning projects.

The concept of sustainable development covers four areas: operational efficiency, social responsibility, natural resource conservation, and economic viability. Together, they reduce the overall impact of facilities on the environment, reduce the overall needs of non-renewable resources and enhance the operational economics by reducing energy consumption.

This can be applied to airports as well. As mentioned above, terminal facilities and support buildings are the primary facilities that airports can focus on. However, they can also look at other areas where sustainable practices can be attained and implemented.

A number of commercial service airports in the nation have developed sustainability plans for their airports. The focus has been on water conservation, use of solar farms to supplement electricity needs, and use of natural gas powered buses, work vehicles and in a number of cases, ground service equipment. There are also a number of GA airports that are conducting sustainability plans in the New England region, including Danbury Municipal Airport in Connecticut.

The basic structure of a sustainability plan is structured as follows:

- Sustainability Framework
- Sustainability Baseline Analysis
- Sustainability-Related Alternatives Screening Criteria
- Develop Implementation and Monitoring Plan

The general areas that are assessed include energy resource use, water, waste recycling, and greenhouse gas emissions. Some examples include replacing incandescent lights with light emitting diode (LED) lights within buildings and runway and taxiway lighting, energy efficient windows, new heating systems in building renovation projects, and reclamation and reuse of pavement tailings in other projects on the airport.

Airports are starting to evaluate and implement sustainable plans to reduce their overall environmental impact and manage and conserve resources in the future. This will have a significant and positive impact on the environment while also generating financial savings over time in the operation of the airport.

Implementation of such programs does need to be assessed for their practicality and location. For example, solar panels installed on top an automobile parking garage inadvertently created a solar glare issue for the FAA air traffic control tower. The issue has been resolved. Also, LED lighting is an electrical costs savings measure for airports. However, use of those lights for obstruction lights has been a concern because aircraft fitted with night vision goggles, such as emergency helicopters, cannot see the lights as they do not have a heat signature, which is the primary technology used for night vision goggles and certain high-end avionics.

As the use of sustainable equipment and construction techniques are improved over the next several years, the overall benefit of airport sustainability planning will result in reduced impacts on the surrounding community in terms of energy and resource consumption, air emissions, and water usage. It also serves to reduce the long-term costs of operating the airport which places the airport in a better financial position.

Recommendation: The BOA should build upon sustainability planning that has been completed at other airports and identify a pilot program to complete a sustainable master plan within the state. The BOA should also consider developing a pilot program to complete a sustainability study for one or two airports in the state in order to further understand sustainable practices airports can implement to foster their environmental stewardship.

Some of the more common environmental issues that airports must address in NH and nationally include wetlands, endangered species, historic structures or sites, and stormwater runoff.

8.3.10 ENVIRONMENTAL PERMITS AND CLEARANCES

Many airport activities and projects require permits or approvals from federal, state, or local agencies. Projects such as adding pavement, doing earthwork, altering infrastructure, even certain maintenance and operations work, can trigger permit requirements. The specific permits and approvals needed depend on what resources are present, the nature of the activities or projects that impact these resources, and the sources of funding.

This section provides a guide for airports to understand what permits may be required and where more information regarding the individual permits can be found. Projects to be undertaken by airports in the NHSASP will determine, in part, the type of environmental action that is needed. The non-NPIAS airports are subject to a range of state and federal environmental programs for any particular project. However, the NPIAS airports are subject to the National Environmental Policy Act (NEPA), which is a federal standardized environmental process that is a comprehensive review of a range of environmental considerations (noise, wetlands, parks, etc.) that must be followed as a condition of federal grants.

For example, work in wetlands requires approvals from both the NH Department of Environmental Services (NHDES) and U.S. Army Corps of Engineers (ACOE). Alterations in pavement areas may require stormwater permits from both NHDES and the U.S. Environmental Protection Agency (EPA). Ground-disturbing activities over one acre in size also require EPA approval, while any ground disturbance of any kind would require coordination with the state historic preservation office. Finally, any project with federal funding must meet the requirements of NEPA, which covers a broad range of resource categories.

Table 8-8 describes the most common kinds of resources and associated permit programs encountered that would apply to airport projects. Following the table, there are more detailed descriptions of NEPA, wetland permitting, rare species issues, and historic resource approvals, which are some of the more common permits airports will have to address.

Table 8-8 - Permitting Programs

Regulated Resources	Types of Airport Actions that Might Be Involved	Federally Permit or Approval Program (and Agency)	State Permit or Approval Program (and Agency)
Wetlands	Any project that impacts wetlands or surface waters	Section 404 of the Clean Water Act (Army Corps of Engineers)	NH RSA 482-A Fill and Dredge in Wetlands (NHDES)
Rare plants and animals	Any project that involves other federal permits (such as a wetland permit) requires compliance with U.S. Endangered Species Act	Federal Endangered Species Act (U.S. Fish and Wildlife Service)	Wetland and Alteration of Terrain permits require consideration (NHDES)
Historic sites, structures, or districts, including potential archeological resources	Any project that involves other federal permits (such as a wetland permit) requires compliance with Section 106.	Section 106 of the National Historic Preservation Act (State Historic Preservation Office - NHDHR)	
Historic sites, parks, and wildlife refuges	All Federally Funded Projects and Permits	Section 4(f) (FAA) Section 106	
River or lake shorelands	Certain activities within 250 feet of shorelines		NH RSA 483-B Comprehensive Shoreland Water Quality Protection Act (NHDES)
Stormwater runoff (non-construction)	New paved areas, buildings, or other "impervious" surfaces	National Pollutant Discharge Elimination System (EPA) for construction site runoff	Alteration of Terrain (NHDES)
Stormwater runoff (operations)	Runoff from existing airport facilities	National Pollutant Discharge Elimination System (EPA) for industrial site runoff	

Source: McFarland Johnson, Inc.

National Environmental Policy Act (NEPA)

NEPA was enacted to ensure information on possible environmental impacts from any federal (or federally funded) action is made available to public officials and citizens before decisions are made and actions are taken. NEPA requires that the federal funding agency project sponsor, which is normally FAA for airport projects, document potential impacts to a broad range of resources. NEPA also requires that the "significance" of impacts be determined. Significance is based on the context and intensity of the activity and the impact to environmental resources. The kinds of documentation required include the following:

- A project is "categorically excluded" from further NEPA documentation if the project falls within specific categories of actions outlined in FAA Order 5050.4B or 1050.1E. The findings are documented in a Categorical Exclusion, which can take one of two formats: simple statement or a full checklist submission. In 2014, FAA issued a Standard Operating Procedure with standardized guidance and format for Categorical Exclusions. It may be found here: http://www.faa.gov/airports/resources/sops/media/arp-SOP-500-catex.pdf.
- If the significance of impacts is uncertain or likely to exist, an Environmental Assessment (EA) is prepared. Guidance for preparing EAs is provided in the following FAA documents:
    - Order 5050.4B: National Environmental Policy Act Implementing Instructions for Airport Projects
    - Order 1050.1E: Environmental Impacts: Policies and Procedures
    - The FAA's Airport Environmental Desk Reference provides comprehensive guidance for compliance with federal environmental requirements for airport actions. It also provides the requirements for whether an impact is significant or not. It does not address state and local permitting. The Environmental Desk Reference may be found at this link: http://www.faa.gov/airports/environmental/environmental_desk_ref/media/desk_ref.pdf
- If the project is expected to result in significant impacts, an Environmental Impact Statement (EIS) is prepared. Guidance for preparing this document is available in FAA Orders 5050.4B and 1050.1E cited above.

The range of resources that must be considered in preparing FAA NEPA documents includes:

- Air quality
- Coastal resources
- Compatible land use

- Construction impacts
- Farmland soils
- Fish, wildlife and plants
- Rare species
- Floodplains
- Hazardous materials
- Pollution prevention
- Solid waste
- Historical, architectural, and archeological resources
- Light emissions and visual impacts
- Natural resources and energy supply
- Noise
- Secondary (induced) impacts
- Socioeconomic impacts
- Environmental justice
- Children's health and safety risks
- Water quality
- Wetlands
- Wild and scenic rivers

Wetland Permitting

Wetlands are aquatic and semi-aquatic environments such as forested swamps, marshes, and bogs. Wetlands need not have standing water to be regulated under state and federal laws. Wetlands, streams, rivers, ponds, and lakes are all regulated under various laws. In NH, only a "Certified Wetland Scientist" (certified by the NH Joint Board of Licensure) is qualified to delineate (define the borders of) wetlands.

Impacts to these resources may occur during construction of airport facilities, tree clearing, or during any disturbance of the ground. Replacement of existing culverts will typically require some kind of permit. Airport management should be aware of wetland areas on their airport and ensure that any disturbance to the wetland are kept to a minimum except where required for safety and permits have been first obtained.

State Wetland Permit

Wetlands are regulated under federal (Clean Water Act) and NH (RSA 482-A, Fill and Dredge in Wetlands) law. Some municipalities regulate wetlands, wetland setbacks, and vegetated swales through zoning. The NH Department of Environmental Services (NHDES) implements the state wetlands law and issues permits where appropriate for dredge and fill activities in wetlands. There is no minimum threshold for impacts to wetlands that require a permit under state law. NH state wetland permits are categorized as "minimum," "minor," or "major," based on size and on certain other criteria, such as the presence of rare species or stream crossings over a certain size. Size thresholds are listed below.

Permit Type	Size Threshold	Fee
Minimum	<3,000 sf	$200 flat fee
Minor	3,000 sf < 20,000 sf	$0.20/sf
Major	>20,000 sf	$0.20/sf

Source: NHDES

Waiting time between application submission and permit issuance is set by law at 75 calendar days for projects with under an acre of impact and 105 days for projects with over an acre, from the time NHDES formally accepts a complete application. These deadlines are extended if NHDES needs additional information to complete their review.

NH also allows municipalities to designate wetlands as "prime wetlands" based on a thorough analysis of features such as a wetland's size, functional value, presence of rare species, or other factors. Once NHDES approves the designation, prime wetlands receive a higher level of protection than other wetlands. Activities within the 100-foot buffer zone around prime wetlands are also regulated. Wetland areas have been given this designation at several airports in the state. For example, Laconia Municipal Airport has not been able to complete the closure of their security/wildlife fence near the Runway 26 end as the wetland area at this end of the runway has been designated as a prime wetland. As such, people and wildlife are able to get onto the runway and taxiway areas, creating a safety hazard and security issue for the airport.

Mitigation

In NH, wetland impacts over 10,000 square feet, inclusive of all major impact projects, require mitigation under state law. Mitigation may take the form of restoration or creation of new wetlands, preservation of existing wetlands, or payment into an "Aquatic Resource Mitigation" Fund that is managed by NHDES in lieu of other options. Airports must attempt to fund creative, restoration, and /or preservation mitigation before the in lieu payment to the Aquatic Resource Mitigation (ARM) fund can be accepted.

Federal Wetland Permit (Section 404)

In general, projects involving less than three acres of wetland impact are permitted under a State Programmatic General Permit (SPGP) with the U.S. Army Corps of Engineers (ACOE), the federal agency that regulates wetlands. Projects permitted under the SPGP do not require a separate submission to the ACOE. Projects with over three acres of impact, or that exceed certain other criteria, require an individual application be submitted to the ACOE.

Information about the state wetland permitting program can be found here: http://des.nh.gov/organization/divisions/water/wetlands/index.htm

The NH Programmatic General Permit issued by the ACOE can be found here: http://www.nae.usace.army.mil/Portals/74/docs/regulatory/StateGeneralPermits/NHPGPAug2013.pdf

Rare Species

Rare species are protected in NH under state and federal laws. NH RSA 217-A and 212-A protect several hundred plants, insects, fish, reptiles, amphibians, mammals, and birds from taking (a.k.a. killing), transporting, possessing, or sale. Airport projects that could affect rare species include airport construction or tree clearing, for example. There is no stand-alone state permit for state-listed rare species. Projects that involve wetland or Alteration of Terrain permits from the NH Department of Environmental Services (NHDES) require clearance from the NH Natural Heritage Bureau (NHNHB), which tracks occurrences of rare plant and animal species. For rare animals, impacts to animal habitat may be regulated in addition to direct impacts to animal species. This is also true for rare plants.

NHNHB maintains an online database that can be checked to verify whether or not rare species have been known to occur at the site. If a rare species is known to occur at the site, a $25 payment is required to acquire additional information about the species occurrence. If no rare species are known to occur, a letter can be printed clearing the project from impacts to rare plant and animal species. The NH Fish and Game Department non-game program tracks rare wildlife and provides recommendations when a rare animal is known to be present at a site where a project is planned. The NHNHB website is: http://www.nhdfl.org/about-forests-and-lands/bureaus/natural-heritage-bureau/services/

In addition to state laws, the federal Endangered Species Act of 1973 (ESA) protects species that are rare throughout the United States. The U.S. Fish and Wildlife Service (USFWS) manages the ESA for both rare plants and animals. An online tool developed by USFWS provides users a means for identifying federally listed species that might be in project area: http://ecos.fws.gov/ipac/wizard/chooseLocation!prepare.action

There are 11 federally listed plants and animals in NH, and many more state-listed species. All those that are federally listed are also state-listed. Federally listed species are listed by town at the following website: http://www.fws.gov/newengland/pdfs/NH%20species%20by%20town.pdf

Projects that would involve impacts to federally listed species require additional steps such as preparation of a Biological Assessment. Typically, a botanist, wildlife specialist, or other natural resource consultant would complete the consultation process associated with a Biological Assessment.

Concord Municipal Airport provides a unique example of how airports can support rare and endangered species. The airport maintains grass areas on the airport for the endangered Karner Blue butterfly. Working with NHDES, the grasslands are maintained and only mowed during certain times to allow lupine plants, which are a necessary part of the Karner Blue butterfly's life cycle, to grow. The airport and NHDES have been successful in maintaining the Karner Blue butterfly population.

Historic Resource Approvals

Historic resources may include bridges, buildings, structures, objects, sites, archeological resources, and historic districts that are at least 50 years old or meet certain other criteria. Archeological resources include both pre-contact Native American resources and more recent agricultural or industrial archeological artifacts and sites. The significance of historic resources may be recognized nationally by being on the "National Register of Historic Places," an official list of historic places that have been deemed worthy of preservation. Resources with statewide significance may be included on the "State Register of Historic Places," The National Historic Preservation Act (16 USC 470) provides for the preservation of historic resources, even those that are not on the Register, but are eligible for listing on the Register, which must be evaluated for federally funded airport projects. Section 106 of the law requires that federal undertakings (actions involving federal funding, permits, or property) must take into account the effect on historic properties. Because all wetland impacts involve a federal wetland permit, anything that requires a wetland permit also requires clearance under Section 106, at least for those parts of the project that involve wetland impacts. A project does not need to have federal funding to require clearance under Section 106.

Section 106 is administered in NH by the State Historic Preservation Officer, housed at the NH Division of Historic Resources (NHDHR). There is no permit issued for Section 106 compliance. The procedure for determining Section 106 compliance is as follows:

- Determine what the Area of Potential Effect (APE) is. The APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

- Identify properties listed on or eligible to be listed on the National Register (NR-eligible) within the APE. Procedures for this step are detailed in 36 CFR 800.4. In NH, NHDHR has developed a "Request for Project Review" form that helps expedite this process. In most cases, properties must be at least 50 years old to be NR-eligible. The form can be found here: http://www.nh.gov/nhdhr/review/rpr.htm. Before submitting the form, NHDHR also requires a visit to NHDHR's office to review files for known historic resources. NHDHR responds to the Request for Project Review within one month.

- Determine if there are any effects to NR-eligible properties. If there are no effects, either because there are no NR-eligible properties or no effects to properties that are NR-eligible, a recommended finding of No Historic Properties Affected is made by the SHPO to the federal sponsor (typically FAA, for FAA funded projects). No further review under Section 106 is necessary. The SHPO will prepare and sign a memo document their findings.
- If there are effects to NR-eligible properties proposed, determine if they are adverse. "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." (36 CFR 800.5) If there are effects, but the effects are not adverse, a finding of No Adverse Effect is made. The finding may include conditions that must be met for there to be no adverse effect, for example, precautions that must be taken during construction. It is the responsibility of Airport Block Grant Program, FAA and the airport to ensure that such conditions are met. The SHPO will prepare and sign a memo document their findings.
- If there are adverse effects proposed, a finding of Adverse Effect is made. The Airport must evaluate alternatives that would avoid adverse effects. If no such alternatives exist, the Airport must minimize or mitigate the adverse effect. Typically, a Memorandum of Agreement is signed by Airport Block Grant Program, FAA, the Airport, and SHPO, that stipulates mitigation measures for the adverse effects.

Historic resources are also protected under Section 4(f) of the Department of Transportation Act of 1966. Section 4(f) protects historic resources, parks, and wildlife refuges. More information can be found in FAA's Environmental Desk Reference: http://www.faa.gov/airports/environmental/environmental_desk_ref/media/desk_ref.pdf.

Recommendation: The information presented in this section is of use to the NHASAP airports and provides a general understanding of the process and can be shared with the airports through various presentations by the BOA or NH airport associations. Additionally, the BOA should work with the airports to ensure that any wetlands mapping they have is up to date and if not, work with the airports to update the wetland delineation. Finally, the BOA should investigate the potential to develop rules that exempt safety related projects within prime wetlands. The BOA should promote a balanced approach that meets regulatory requirement while maintaining safety for airports.

The BOA should work with the system airports to ensure their environmental information is up to date. The BOA should also investigate the potential to exempt safety related projects in wetland that have been designated as prime wetlands.

8.3.11 AIRPORT SELF INSPECTIONS

Maintaining and ensuring airfield safety requires a successful airport self-inspection program. Regular inspections are the main method used to identify and address issues on the airfield that should be resolved to ensure proper safety. Inconsistencies in an airport's physical condition are often the most common airport safety shortfall and most of these items can be avoided through basic preventative maintenance schedules and proper self-inspection procedures. Therefore, regular self-inspections are integral to maintaining airfield safety and ensuring compliance with standards. **Appendix 8-A** provides a scalable guide to assist airports in effectively conducting self-inspections. During inspections of the airfield, airport employees who conduct self-inspections inspect physical facilities, such as: Pavement, Runway Safety Areas, Pilot Visual Aids, Wind Direction indicators, NAVAIDS, construction areas, and nighttime conditions. It is recommended that these inspections be performed daily or weekly (depending on the complexity of the facility) and recorded in an airport logbook to provide standardized documentation such that airport maintenance personnel can review the checklists and take corrective action. Doing so helps minimize risk to both airport users and sponsors. Within **Appendix 8-A** are thorough descriptions on the type of inspections to be performed, specific areas that should be addressed, and how often, or when, self-inspections should take place.

Airport self inspection tools are provided in Appendix 8-A to assist airports in their day-to-day operations of the airport.

Appendix 8-A also includes tools made up of checklists for use by airports. Since the self-inspection appendix and the associated checklists will be distributed to all of the airports within the state, and the individual airports vary in size and function, it is likely that some of the items on the checklists may not apply to every system airport. The checklists have been developed in a manner that allows them to be tailored as necessary.

Recommendation: The BOA should distribute the Airport Self Inspection tool among airport system managers and encourage them to tailor the checklist according to their specific airport.

8.3.12 AIRPORT MANAGEMENT TYPES AND BEST PRACTICES

Airports have a particularly unique role in serving the public good and as public entities, are subject to budget restraints, regulation standards, and stringent public safety requirements that must be met at all times. The constant development, regulatory changes, and operational variations of the airport system can further complicate aviation management because it is controlled not only by federal, state, and local governance entities, but also by the overall economy and a comprehensive set of regulations, laws, statutes, and funding restraints. Therefore, the dynamic nature of airports, including operations and commerce, creates an environment that requires proper oversight to remain viable. Consequently, airport management must be prepared to respond to change accordingly.

Throughout their development, airports in the United States have traditionally been operated by municipal or state governments on a non-profit basis (i.e. not managed by, or as, a private business) with the intention of providing a service to the public. Their operational funding is typically broadly characterized as airside or landside, and a portion of capital program funding generally comes in the form of project grants.

Over the last 20 years, however, this relatively easy model has become more complex. First, many communities have acknowledged that not only do their airports represent a necessary component of transportation infrastructure, but also that the airport is a contributor to local jobs and positive economic impacts to the communities they serve. A second major complexity is that revenue and funding sources necessary to maintain and improve an airport have become more difficult to understand and manage. With these complexities, and needing to be more responsive to changes in the industry, many municipalities seek ways to organizationally position their airports to be as responsive to the free marketplace as possible. This often includes assessing and changing their airport governance model, and finding ways to secure highly qualified airport managers that possess the skills necessary to manage today's complex airport operating environment.

From financial management to the oversight of contracts and leases, airport safety and security, community relations, and compliance with federal grant assurances, facility maintenance, and capital improvements, managers within the NH state airports system are responsible for a wide range of activities. However, these managers have varying degrees of experience and a range of backgrounds. Although some management guidance is available for their use, much of it is dated, focused on specific issues, or intended for larger airports. In 2009 the Airport Cooperative Research Program (ACRP) published a guidebook to provide operators and managers of small airports with current, comprehensive advice on resources and techniques that can be applied to meet their responsibilities. This can be found at: http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_016.pdf

The efficiency of operating an airport is embedded in the management structure of the airport.

Appendix 8-A applies information found within the ACRP report and provides various airport management scenarios/structures in a matrix format to help individual airports assess their current model and identify potential ways to implement airport best practices.

Recommendation: The BOA should encourage system airport managers to assess their current management structure and practices on a regular basis and review the Airport Management Best Practices tool and consider models or techniques that could be implemented to improve airport management effectiveness at their facilities. They should also take advantage of emerging technologies and remain flexible to be able to address local and industry needs.

8.3.13 UNMANNED AERIAL SYSTEMS (UAS)

Unmanned Aerial Systems (UAS), often referred to as Unmanned Aerial Vehicles (UAVs), remotely piloted aircraft, or more commonly drones, are remotely piloted vehicles equipped with sensors and monitors, and are the fastest growing aerospace technology in the world today. Presently, unmanned aircraft are flying in the national airspace system under very controlled conditions, performing border and port surveillance by the Department of Homeland Security, helping with scientific research and environmental monitoring by National Aeronautics and Space Administration and National Oceanographic and Atmospheric Administration, supporting public safety by law enforcement agencies, helping state universities conduct research, and supporting various other missions for public entities.

The BOA and airports should continue to monitor UAS development and identify action or opportunities as change occurs in regulating and operating UAS' with the National Airspace System.

Operations range from ground level to above 50,000 feet, depending on the specific type of aircraft. However, UAS operations are currently not authorized in Class B airspace, which exists over major urban areas and contains the highest density of manned aircraft. The use of UAS is a rapidly evolving and dynamic sector of aviation. In recent years, UAS have become an emerging field in civil and commercial applications. Their need in industries such as: surveillance, reconnaissance, mapping, cartography, homeland security, traffic monitoring, inspection, rescue, fire detection, and agricultural imaging, are just a few of the many application domains that UAS can significantly impact. When first introduced, these systems were primarily utilized in military operations, but today these systems have been adapted for civilian application with unlimited potential for their use.

There are currently three types of unmanned aircraft system operations: Civil, Public, and Model Aircraft. Obtaining a Special Airworthiness Certificate in the experimental category for a particular UAS is currently the only way civil operators of unmanned aircraft can access the National Airspace System. Experimental certificate regulations preclude carrying people or property for compensation or hire, but do allow operations for research and development, flight and sales demonstrations, and crew training.

Certificates of Authorization are also available to public entities that want to fly a UAS in civil airspace. Common uses today include law enforcement, firefighting, border patrol, disaster relief, search and rescue, military training, and other government operational missions. To allow the FAA to evaluate a proposed operation to see if it can be conducted safely, applicants can make their request through the FAA website at: https://ioeaaa.faa.gov/oeaaa/Welcome.jspevaluates.

Recreational use of airspace by model aircraft is covered by FAA Advisory Circular 91-57, which generally limits operations for hobby and recreation to below 400 feet, away from airports and air traffic, and within sight of the operator. In June 2014, the FAA published a federal register notice on its interpretation of the statutory special rules for model aircraft in the FAA Modernization and Reform Act of 2012. The law is clear that the FAA may take enforcement action against model aircraft operators who operate their aircraft in a manner that endangers the safety of the national airspace system.

In today's aviation industry, approved commercial UAS operations are tightly controlled and primarily involve the smallest category UAS; but, as government application and access expands, it will pave the way for a broader and more lucrative non-government UAS marketplace. **Appendix 8-A** provides the BOA and individual airport managers with a tool that provides information, guidelines, and suggested practices relating to UAS. A key component to the tool is a checklist that presents a list of questions that should be considered when inquiries are made (either to the state or a specific airport) to conduct UAS operations.

The FAA has been working for several months to implement the provisions of Section 333 of the FAA Modernization and Reform Act of

2012, "Special Rules for Certain Unmanned Aircraft Systems," which will allow for commercial operations in low-risk, controlled environments. Since it is anticipated that by the end of 2015 fiscal year, the FAA will publish clearly outlined rules for UAS operations, it is likely that this tool will need to be updated accordingly to include FAA criteria and procedures.

Recommendation: The BOA should distribute the UAS tool among airport system managers and encourage them to familiarize themselves with the evolution of UAS and implement the UAS checklist as necessary.

8.3.14 AIRPORT EMERGENCY PLANS

Airports differ in complexity, and each has unique features. Some are basic facilities serving a more rural environment, while others are more complex and located in more densely populated settings that serve larger communities and major metropolitan areas with residential, industrial, and commercial installations. Airports within the state are either operated by the local government such as a city or county,or are privately owned and open to the public. However, one thing they have in common is that they are all subject to emergencies and incidents.

According to FAA Advisory Circular (AC) 150/5200-31C, Airport Emergency Plan, the FAA identifies an airport emergency as, "any occasion or instance, natural or man-made that warrants action to save lives and protects property and public health." An airport emergency can occur anywhere, at any time, day or night, under any weather condition, and in varying degrees of magnitude; it can occur instantaneously or develop slowly; it can last only a few minutes or last for days. Emergencies may be caused by a natural occurrence, such as a hurricane or earthquake, or it can be "man-made," such as a hazardous materials spill, civil unrest, terrorism, major fire, or power outage. Moreover, emergencies of the same type can differ widely in severity, depending on factors such as degree of warning, duration, and scope of impact. The important thing to remember is that while emergencies can seldom be exactly predicted, they can be anticipated and prepared for.

It is likely that many, if not most, of NH's state airports have experienced emergencies associated with aircraft accidents, power failures, fuel spills, floods, or other adverse events that result from natural processes. Therefore, the state encourages all airports to prepare a written plan that is focused on response and recovery. A template has been developed to help the system airports prepare such a plan. The template can be found in **Appendix 8-A.**

Recommendation: The BOA should encourage system airport managers to assess their current Airport Emergency Plan and utilize the Airport Emergency Template provided in **Appendix 8-A** to update or create an airport emergency plan according to their facility. The plan should be kept readily available and its implementation practiced periodically.

Airport Emergency Plans provide a guide to responding to emergencies. The tool provided in Appendix 8-A will assist airports in developing or enhancing tier airport emergency plans.

NH's TSA will evaluate an airport's security protocol and provide a detailed analysis and recommendations for the airport to implement in the future.

8.3.15 TSA GENERAL AVIATION SECURITY GUIDELINES

Since GA airports differ significantly in terms of their perceived security risks, including those emergencies mentioned above, mitigation strategies should be tailored to the likelihood and severity of those perceived risks. By using a risk analysis, a variety of options may exist for mitigating security threats specific to GA airports and flight operations. These include surveillance and monitoring; airport access controls; background checks and vetting of pilots, airport workers, and others having access to GA facilities and aircraft; and physical protections for airports and aircraft.

In 2001, the Transportation Security Administration (TSA) published Security Guidelines for General Aviation Airports to provide owners, operators, sponsors, and other entities charged with oversight of GA airports a set of federally endorsed security enhancements and a method for determining when enhancements may be appropriate. TSA, working collaboratively with key stakeholders, launched this project to develop and disseminate appropriate security guidelines for general aviation airports. A Working Group was established under the Aviation Security Advisory Committee (ASAC) to compile a list of recommended security best practices used throughout the industry. The ASAC delivered its recommendations to TSA in November 2003, upon which all of the ASAC recommendations were incorporated for publication.

The document offers an extensive list of scalable options, ideas, and suggestions for the airport operator, sponsor, tenant, and/or user to choose from when considering security enhancements for GA facilities. Access to this document can be found at: http://www.tsa.gov/sites/default/files/assets/pdf/Intermodal/security_guidelines_for_general_aviation_airports.pdf

Recommendation: In order to promote GA safety, the BOA should encourage system airport managers to review and implement the guidance and procedures found in the links above as appropriate. The BOA should also encourage airport to take advantage of NH's Department of Homeland Security, which offers a free screening of airports for potential security threats and documenting their findings in a letter back to the airport for use when implementing security improvements.

8.3.16 ON-AIRPORT BEST SAFETY PRACTICES

Critical to the effective day-to-day management of any airport is safely conducting activities in aircraft movement areas while minimizing impacts on flight operations. Since many necessary operational, maintenance, and construction activities occur in or near aircraft movement areas, and since many of these activities cannot be eliminated or deferred to time periods when the airfield is not in operation, various practices are available to help ensure the safety of employees and the flying public when these activities occur.

In 2014 the Airport Cooperative Research Board (ACRP) published a Best Practices Manual For Working In or Near Airport Movement Areas. This manual can be found at: http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_101.pdf

Further, the American Association of Airport Executives (AAAE) has available, an Accredited Airport Executive program committed to the advancement of aviation professionals by granting the A.A.E. designation to those who have demonstrated their ability to handle the responsibilities of airport management, regardless of airport size.

Candidates enrolling in the Accredited Airport Executive program are required to meet a number of pre-requisites and complete three phases. Each phase is carefully designed to test knowledge, comprehension and understanding of aviation management. Study materials, such as the Body of Knowledge modules, can be found electronically for free at: http://www.aaae.org/training_professional_development/professional_development/accredited_airport_executive_program/program_study_materials/bodyofknow.cfm

In addition to study materials, AAAE offers accreditation candidates various review courses and workshops to assist candidates in completing each phase of the program.

A prospective accreditation candidate must:

- Be at least 21 years old;
- Have current affiliate membership in AAAE;
- Have worked full time for at least one consecutive year at a public-use airport (Candidates with prior military experience may be exempt).
- Have either a four-year college degree or eight years of civil airport management experience.

In addition to ACRP and AAAE resources, the FAA has acknowledged the need to make greater efforts and adopt new measures to continue to improve airport and aviation safety. Through the use of what is called Safety Management Systems, or SMS, airports can identify problems before they result in accidents or incidents. Although the implementation of SMS is mostly intended for larger Part 139 airports, airports of varying size and function may find it helpful to review the lessons learned in SMS pilot studies and implement risk mitigation strategies tailored to their specific facility. SMS resources can be found at: http://www.faa.gov/airports/airport_safety/safety_management_systems/

Recommendation: In order to promote on-airport best safety practices, the BOA should encourage system airport managers to review the ACRP, AAAE, and SMS materials; implement the guidance and procedures found in the links above; and consider enrolling in the AAAE accreditation program.

There are a number of publications available to the BOA and airports that provide guidance for on-airport best safety practices. They should be reviewed and incorporated to enhance safety of the system airports.

APPENDIX 8-A

AIRPORT BUSINESS PLANS

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Components and Processes Utilized in Airport Business Planning

BUSINESS PLAN TOOL

What Makes an Airport Business Plan?

The airport business plan elements discussed below have been summarized from the Airport Cooperative Research Program (ACRP) Report 77 – *Guidebook for Developing General Aviation Airport Business Plans*. The guidebook provides an in-depth look at the importance of airport business plans (Chapter 2), as well as a detailed manual on how to create, implement, and evaluate an airport business plan (Chapters 3, 4, and 5). Since the ACRP Report is meant to serve as a general template, the wide-ranging components found within can be, and should be, modified to meet the unique business needs and situations of an airport; however, the overall elements and processes should remain the same.

✈ Elements of an Airport Business Plan

- Vision Statement – articulates the aspirations for an airport
- Goals – states a desired result, outcome, or level of attainment that needs to be reached in order to realize the vision for the airport
- Objectives – identifies significant steps toward achieving a goal(s)
- Action Plans – answers the key questions of who is going to do what, when, where, why, and how in order to accomplish a specific airport objective
- Budgets – forecasts the financial position or performance of the airport using existing conditions as a baseline
- Implementation – follows the business plan to accomplish what was intended to be achieved by the airport
- Evaluation – assesses the effectiveness of the business plan and encourages revisions/updates as necessary

What Is the Business Planning Process?

The following steps should serve as an abbreviated checklist for formulating and completing an airport business plan. For more detailed information, visit:

http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_077.pdf

✈ Airport Business Plan Process

- Identify Stakeholders – identify individuals, agencies, and institutions that have the potential to impact, or be impacted by, the airport. These include airport staff, local businesses, regional policymakers, colleges and universities, airport neighbors, and more. Representative stakeholders should take part in the business planning process to achieve a holistic planning approach, potentially improve available resources, and foster greater buy-in of the airport's vision.
- Articulate Vision Statement – How do the stakeholders envision the airport in the future? Is this aligned with how the airport views itself?
- Perform SWOT Analysis – What are the Strengths, Weaknesses, Opportunities, and Threats that the airport can capitalize on, or should mitigate, in pursuit of this vision? How can stakeholders assist?
- Establish Goals – Airport goals should incorporate the results of the SWOT Analysis, and should be Specific, Measurable, Attainable, Relevant, and Time Bound (S.M.A.R.T). Goals can also be separated by function – operations, marketing, financial, etc.
- Develop Objectives – What initial actions, or smaller steps, must to be taken in order to achieve the larger goals?
- Create Action Plan – Identify who will be responsible for completing which objectives, when (using a timeline), and how.
- Create Budget – What are the financial implications associated with pursuit and achievement of the airport's goals? Are the costs worth the benefits?
- Execute Plan – Once the business plan has been drafted and approved, it should be executed in accordance with its timeline and budget.
- Evaluate Plan – Updates and revisions to the business plan may be necessary pending the efficiency, effectiveness, and costs involved with execution of the plan.

AIRPORT SELF INSPECTIONS

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AIRPORT SELF INSPECTIONS

AIRPORT SELF INSPECTION TOOL

This tool provides a guide to airport self-inspections.

Introduction

Maintaining and ensuring airfield safety requires a successful airport self-inspection program and regular inspections are the main method used to identify and address issues on the airfield that should be resolved to ensure proper safety. Discrepancies in an airport's physical condition are often the most common airport safety shortfall and most of these items can be avoided through basic preventative maintenance schedules and proper self-inspection procedures. Therefore, regular self-inspections are integral to maintaining airfield safety and ensuring compliance with standards. This guide has been prepared to assist your airport in effectively conducting self-inspections at your airport. The pages that follow include thorough descriptions on the type of inspections to be performed, specific areas that should be addressed, and how often, or when self-inspections should take place.

The appendix to this document includes tools made up of checklists for your use. Since this document and the associated checklists have been distributed to all of the airports within the state, and the individual airports vary in size and function, it is likely that some of the items on the checklists may not apply to your particular facility. Therefore, the checklists have been developed in a manner that allows you to tailor it accordingly, by simply deleting the rows or cells within the checklist.

Inspection Personnel

The foundation for a successful airport self-inspection program lies in the personnel tasked with conducting self-inspections. Whether these personnel include the airport manager, operations, or maintenance personnel, specific considerations are necessary. Once personnel are hired, properly trained, and equipped, they engage in conducting airport inspections. It is recommended that airport personnel tasked with conducting inspections familiarize themselves with this document.

Frequency

The manner by which self-inspections are conducted varies among airports. However, it is important that all airport self-inspection programs incorporate inspections according to the four main types of frequencies. These include:

Regularly scheduled inspections - Conducted at least daily during both daytime and nighttime hours. These inspections would occur at least daily during a time when aircraft traffic is minimal in order to lessen any disruption to airport operations.

Continuous surveillance inspections - Conducted in areas and facilities that have been identified as being susceptible to hazardous conditions. By maintaining a constant awareness of specific areas and facilities that are prone to hazards, the incidence of hazards can be reduced.

Periodic condition inspections - Conducted on a regularly scheduled basis, but less frequently than daily. Periodic condition inspections are similar to daily inspections, but focus on areas and facilities that may not need to be attended to daily. Depending on the area or facility, these inspections may be conducted monthly, weekly, or quarterly.

Special inspections - Conducted after the receipt of a complaint or when an unusual event or condition occurs, such as a significant meteorological event, or an accident or incident. Additionally, special inspections would also be conducted at the end of a construction project. These are to be completed before construction personnel leave the airport, in case corrective measures need to be taken by the contractor. Airports may have specific checklists for each type of inspection or may incorporate each type of inspection into the daily self-inspection checklist. Regardless, all inspections are to be appropriately documented.

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Components of a Self-Inspection Program

A successful safety self-inspection program has four components, these include:

Regularly scheduled inspections of physical facilities. If the airport staff is on duty after dark, there should also be a nighttime inspection of lighting;

Continuous surveillance inspections of certain airport activities, such as fueling operations, construction, airfield maintenance;

A periodic condition inspection program for such things as approach slopes, obstructions, etc.; and

Special condition inspections during unusual conditions or situations, such as changing weather or days of unusually high number of aircraft operations.

The number and level of airport inspections vary by airport. However, it is recommended that at a minimum regularly scheduled inspections and continuous surveillance inspections be conducted daily. For airports that not required to adhere to FAA Part 139 standards, periodic condition, and special condition inspections can be performed at the discretion of the airport operator.

Regularly Scheduled Inspection

The regularly scheduled inspection consists of specific observations of airport physical facilities on at least a daily basis. This inspection should concentrate on the areas described in this section. If deficiencies exist, the inspector should indicate the deficient item and identify its location on an airport sketch, providing dimensions and depths, as necessary. If appropriate, the inspector should take photographs to document the condition.

Pavement Areas

The condition of pavement surfaces is an important part of airport safety. Pavement inspection should be conducted daily before flight operations commence to ensure pavement surfaces are clear. As a minimum, a daily inspection should be performed of all paved areas that are the responsibility of the airport operator. During the pavement inspection, the inspector should:

- Check the pavement lips—the area between full-strength pavement and shoulders or paved shoulders and safety areas—to assure that they are no greater than necessary to allow water to drain off the pavement. A lip height no greater than 1 1⁄2 inches is usually sufficient to allow proper drainage.
- Determine if there are any cracks wide enough to cause directional control problems for an aircraft. Report and monitor these cracks.
- Determine if there are any holes that could cause directional control problems for an aircraft. Typically, any hole that cannot be covered by a 5-inch circle, and the side slope at any point in the hole that exceeds 3 inches in depth and is 45 degrees or greater, should be documented and considered a discrepancy.
- Check the condition of pavement areas for cracks, scaling, spalling, bumps, low spots, and for debris that could cause foreign object damage to aircraft.
- Check for vegetation growth along runway and taxiway edges that may impede drainage from the pavement surface.
- Check for vegetation growth in cracks. Report and monitor any cracks, holes, variations and vegetation that can cause loss of aircraft directional control or may cause pavement damage, including damaged caused by damming or ponding water.

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Safety Areas

The inspector should know the dimensions of the runway and taxiway safety areas at the airport. During the safety area inspection, the inspector should:

- Determine if there are any hazardous ruts, depressions, humps or variations from the normal smooth surface.
- Check to ensure no object is located in a safety area, except objects that must be in the safety areas because of their function (such as runway lights, signs, or navigational aids). These objects must be constructed on frangibly mounted structures of the lowest practical height.
- Check to ensure that any manhole and handhole covers are at grade level and can support vehicles and aircraft.
- Check to ensure that mounts for light fixtures are at grade level.
- Check for surface variation and other damage caused by rodents or other animals.
- Report any objects that are not frangible or not at grade level.
- Report extraneous equipment and objects, such construction equipment, and surface variations that would cause damage to an aircraft or impede emergency response vehicles.

Markings

Airport markings provide important information to pilots during takeoff, landing, and taxiing. To avoid confusion and disorientation, airport markings should be in compliance with FAA marking standards specified in AC 150/5340-1, Standards for Airport Markings. (Compliance with these standards is mandatory for airport operators that have accepted Federal funds for runway and taxiway construction/ rehabilitation.) The inspector should know the appropriate markings required at the airport.

During the marking inspection, the inspector should:

- Check markings for correct color-coding, peeling, blistering, chipping, fading, and obscurity resulting from rubber buildup.
- Check to see if all runway hold position markings are clearly visible. During and after construction projects, check new markings for compliance with FAA marking standards.
- If the markings have glass beads, check markings during periods of darkness to determine if the reflectivity of glass beads is adequate at night.
- Report and monitor any nonstandard marking or markings that are obscured, faded or deteriorating.

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Signs

Signs provide important information to pilots while taxiing. To avoid pilot confusion and disorientation, airport signs should be in accordance with FAA sign standards specified in AC 150/5340-18, Standards for Airport Sign Systems. (Compliance with these standards is mandatory for airport operators that have accepted Federal funds for runway and taxiway construction/rehabilitation.) The inspector should know the appropriate sign standards and specifications at the airport and ensure signs are in compliance and conduct the following:

- Check signs to ensure they are easy to read, in accordance with color standards, retro-reflective, and that all lighted signs are working and not obscured by vegetation, dirt, snow, etc.
- Check signs to ensure they are frangible and concrete bases are properly maintained at grade level.
- Check to see that sign panels are not missing or damaged, that they have the correct legend and arrow orientation, and that they are not cracked or broken.
- During and after construction projects, check any new signs for FAA compliance.
- During periods of darkness, check signs to ensure they are properly illuminated. Ensure mandatory instruction signs are illuminated with the associated runway lighting system.
- Check signs for correct operations; that they are on the correct circuits, they do not flicker and that they follow the intensity setting of the runway or taxiway lights.
- Report and monitor any nonstandard sign or any sign that is not functioning, is faded or damaged. It is recommended that the airport issue a NOTAM regarding any malfunctioning holding position sign or ILS critical are sign (if applicable).

Lighting

At night and during periods of low visibility, lighting is important for safe airport operations. Lights come in different shapes, sizes, colors, and configurations. Inspection of lighting is best accomplished during periods of darkness in order to evaluate lighting systems when they provide the primary visual aid for pilots. The inspection should concentrate on the lighting owned by the airport operator. However, the inspector should observe any lighting owned or operated by others and report any observed problems immediately to the appropriate responsible owner. During the lighting inspection, the inspector should:

Check to ensure that the following are operable, if installed, and that vegetation or deposits of foreign material do not obscure the light fixture:

- Runway and taxiway edge lights;
- Apron edge lights;
- Runway centerline and touchdown zone lights;
- Taxiway centerline lights or centerline reflectors;
- Runway threshold/end lights; and
- Runway guard lights (both elevated and in-pavement, if installed).

Check that the following are operable, if installed:

- Ramp lights and floodlights used in construction to ensure they are properly shielded; Obstruction lights; and
- Lighting in fuel storage areas.
- Report all fixtures missing and lights that are not working or appear dim.
- Report any missing or broken light fixture lenses.
- Ensure that runway and taxiway lights and runway threshold lights are the proper color and are oriented correctly.
- Check the lights for proper alignment, aiming and correct changes in intensity, for correct height, erosion around the bases and the height of frangibility.

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Navigational Aids (NAVAIDs)

The inspection of NAVAIDs should concentrate on the visual navigational aids owned by the airport operator. However, the inspector should observe any navigational aids owned or operated by others, such as the FAA, and report any observed problems immediately to the NAVAID owner. During the inspection of NAVAIDs, the inspector should:

- Determine if the segmented circle is clear of vegetation and that it can be seen easily from the air.
- Determine if the airport rotating beacon is visible and working properly. Check the wind cone(s) to ensure that it swings freely, the cone fabric is not faded or frayed, and, if lighted, that all lights are operating.
- Determine if the Runway End Lights are flashing in proper sequence and mounted on frangible couplings.
- Check Visual Glide Slope Indicators (VASIs, PLASIs, or PAPIs) to ensure that their lights are working and mounted on frangible couplings.
- Determine if the Approach Lighting systems are functioning properly.
- Report and monitor any NAVAID that is malfunctioning, inoperable or misaligned, damaged or missing.

Obstructions

The inspection of obstructions should concentrate on a visual check of any construction underway on or near the airport that could affect aircraft operations. This also includes checking for any vegetation, especially trees that may penetrate the FAR Part 77 surfaces.

During the inspection of obstructions, the inspector should:

- Check to ensure that construction equipment, especially tall cranes being used at construction sites, are not an obstruction.
- If construction is found and thought to create an obstruction, the airport operator should determine if proper notification to FAA, such as is required through Part 77 or Airport Layout Plan review, has been provided.
- Determine if obstructions are properly marked and lighted. Direct any person proposing construction near a public-use airport meeting the notice requirements contained in Part 77, Objects Affecting Navigable Airspace, to the Air Traffic Division or Airports District Office immediately if their construction has not been reported to the FAA.
- Report and monitor any obstruction light that is missing, inoperative or damaged, and any object that appears to be an obstruction and is not properly marked or lit.

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Fueling Operations

The daily inspection on aircraft fueling operations should concentrate on a quick inspection for the most common problems concerning compliance with local fire safety codes at fuel storage areas and with mobile fuelers. The inspection should also include security, fire protection, general housekeeping, and fuel dispensing facilities and procedures. It is recommended that a more detailed fueling operation inspection be conducted quarterly.

During the daily inspection of aircraft fueling operations, the inspector should:

- Determine if the fueling operator is permitting any unsafe fueling practices or is in violation of local fire code, such as failure to bond aircraft with the mobile fuelers during fueling operations or fueling personnel smoking while fueling aircraft.
- Check to ensure that the appropriate signs for the fuel farm are installed and that all gates are locked except when the facility is occupied by an authorized user.
- Report and monitor any unsafe fueling practices and violation of local fire codes

Snow and Ice

The inspector should be familiar with the airport's snow and ice removal procedures and guidance provided in AC 150/5200-30, Airport Winter Safety and Operations. During the snow and ice control inspection, the inspector should:

- Determine if any lights and signs are obscured by snow or damaged by snow removal operations.
- Check to ensure that snow banks and drifts next to the runway and taxiways provide clearance for aircraft wing tips, engines, and propellers.
- Check to ensure that snow is not piled across the runway threshold or across runway/runway intersections. Check to be sure that no foreign objects are left on the pavement from snow removal operations.
- Check to ensure that snow removal operations have not blocked any taxiways or access routes dedicated for aircraft rescue and firefighting equipment.
- Check to ensure that snow is not accumulated or piled in the critical areas for electronic NAVAIDs.
- Check for and report slippery pavement conditions in terms of either braking action or MU values. If a friction measurement device is available, issue the appropriate numbers obtained from the equipment. (Do not attempt to correlate friction measurement numbers with braking action reports.)
- Report and monitor any snow and ice accumulation that has been missed by the snow and ice removal operation, and any dangerous condition created by such operations, such as obscured signs or lights.

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Construction

The inspector should be familiar with the airport's construction safety procedures and guidance provided in AC 150/5370-2, Operational Safety on Airports during Construction. During the construction inspection, the inspector should:

- Determine if stockpiled material and construction materials are properly stored to keep them from being moved by wind, jet blast, or prop wash, and is not left in safety areas or movement area.
- Check all construction adjacent to movement areas to ensure areas are identified with conspicuous marking and lighting.
- Determine if construction equipment (such as bulldozers, cranes, etc.) are marked and lighted and parked clear of the safety areas. Ensure construction barricades are properly positioned to define the limits of construction and hazardous areas and, if barricades are lighted, check to ensure lights are working properly and are positioned correctly.
- Check to ensure that debris and foreign objects are continuously being picked up around construction areas.
- Check for open trenches in the safety areas or adjacent to movement areas.
- Check operation of lighting in areas adjacent to construction daily before the construction crews depart for the day. In particular, ensure that mandatory instruction signs remain lit with the associated runway lights, even on taxiways that have been closed for construction.
- Check NOTAMs daily during construction projects to ensure they accurately reflect the conditions on the airport.
- Verify that closed taxiways or runways are properly marked and lighted. Report and monitor any dangerous condition created by construction activity, including damage to signs, lights, markings and NAVAIDS or equipment and supplies left in movement areas and safety areas.

Public Protection

During the public protection inspection, the inspector should:

- Check gates, fencing, locks, and other safeguards are in place and functioning properly to prevent inadvertent entry to movement areas by unauthorized persons and vehicles and offer protection from jet blast.
- Report and monitor any safeguards that are damaged or missing.
- In accordance with the airport's security plan, report unauthorized persons or vehicles in the movement area.

Wildlife Hazard Management

During the wildlife hazard inspection, the inspector should:

- Check for evidence of birds or animals on the runways, taxiways, aprons, and ramps or other signs that wildlife problems may have developed—such as large flocks of birds on or adjacent to the airport.
- Wildlife hazards found during the daily self-inspection should be properly documented. All dead wildlife found and all wildlife aircraft strikes should be reported to the FAA on the FAA Form 5200-7, Bird/Other Wildlife Strike Report. This form may be obtained from the FAA Internet site, at www.faa.gov.
- Additionally, the inspector should check fencing and gates for wildlife accessibility and should ensure that wildlife control equipment is available and operational.

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CONTINUOUS SURVEILLANCE INSPECTION

Continuous surveillance inspection consists of general observation of activities for compliance with regulations, procedures, etc., as well as abnormalities with physical facilities that are readily apparent. This is performed any time inspection personnel are on the air operations area. Continuous surveillance of airport physical facilities and activities should cover at least the areas described in this section.

Ground Vehicles

During the continuous surveillance inspection of ground vehicles, the inspector should:

- Determine if vehicle drivers are following the airport's procedures and arrangements for the orderly operations of ground vehicles (including mowing machines or other maintenance vehicles in the safety areas). Extra attention should be paid to ground vehicle activity during construction, winter operations, and other special events.
- Report and monitor any vehicle operator that is not complying with the airport's vehicle procedures and arrangements.
- Report any ground vehicle accident observed and any ground vehicle signs and markings that are damaged, missing or obscured.

Fueling Operations

The inspector should:

- Emphasize fire and explosion hazards inherent in aircraft refueling.
- Ensure proper bonding is being used, deadman controls are not blocked, and no smoking prohibitions are being observed, and aircraft are not being fueled inside hangars.
- Check for proper parking of mobile fuelers to ensure these vehicles are at least 10′ apart and 50′ from buildings.
- Check for fuel leaks or spills in the fuel storage area and around mobile fuelers.
- Determine if the fuel farm is free of flammable materials, including litter and vegetation.

Snow and Ice

During the continuous surveillance inspection of snow and ice removal operations, the inspector should:

- Check snow or ice covered pavements and report and monitor any surfaces where snow and ice may affect the safety of aircraft operations. In addition, the inspector should monitor snow and ice removal NOTAMS to ensure they remain current and issue timely corrections, as necessary.
- If the airport uses other means to notify tenants of snow and ice removal operations, e.g., faxed or electronic messages, the inspector should also monitor this information for accuracy.
- Check to ensure that snow or ice on pavement surfaces does not affect the safety of aircraft operations and that NOTAMS are current.

Construction

The Inspector should check construction projects to ensure that the contractor is following the construction safety plan. During the continuous surveillance inspection of construction activity, the inspector should check for, and report, any of the following conditions:

- Unauthorized use of runways, taxiways, and aprons by construction personnel and equipment.
- Conditions that may result in runway incursions and other irregularities. This includes ensuring that construction areas are delineated appropriately with barricades, cones, markings, etc. Perimeter gates are left open and unattended, unlocked or construction vehicles and personnel are not following access and escort procedures. Construction vehicles not properly marked or missing appropriate flags and/or beacons.

AIRPORT SELF INSPECTIONS

New Hampshire Aviation System

New Hampshire DOT Bureau of Aeronautics

- Foreign object debris on haul roads adjacent to movement areas that can be tracked onto taxiways, aprons, and ramp areas. Confusing or missing signs, markings or lighting that could potentially confuse or mislead pilots. Barricades and lighting are in place and operational.

Public Protection

Pay special attention to public protection during construction and special events. During the continuous surveillance inspection of safeguards used to protect the public, the inspector should check for, and report, any of the following conditions:

- Unauthorized personnel, vehicles, and animals, particularly in areas aircraft passengers and the general public are present on the air carrier ramp and other portions of the movement area, i.e., remote aircraft parking locations.

- Inoperable or blocked gates, particularly those that would impede access by aircraft rescue and firefighting equipment.

- Open or unlocked gates and missing or damaged signs posted to prevent unauthorized access to the airfield. Damaged or missing jet blast fences.

Wildlife Hazard Management

- During the continuous surveillance inspection of wildlife hazards, the inspector should check for, and report, any of the following conditions:

- Birds or animals, such as dogs, deer, etc., on or adjacent to the runways, taxiways, aprons, and ramps to determine if there is a potential wildlife hazard problem.

- Potential hazard created by birds on or adjacent to the airport. Wildlife strikes and carcasses found on the runways. Report these on FAA Form 5200-7, Bird/Other Wildlife Strike Report. This form may be obtained from the FAA Internet site at www.faa.gov.

Foreign Object Debris (FOD)

The inspector should continuously check for, and remove any FOD in movement areas, aircraft parking areas and loading ramps.

First, pavement areas are inspected, with attention to the following items:

- Pavement lips;
- Cracks;
- Holes;
- Spalling, low spots, debris (FOD), and contaminants;
- Vegetation growth; and
- Drainage and ponding.

Markings are also essential at an airport and play a key role in providing directional guidance and information to pilots. The following items need to be considered when inspecting markings:

- Condition of the markings (correct color, paint chipping, fading, or obscure);
- Visibility of runway hold-position markings;
- Reflectivity of markings at night;
- Standardization of markings; and
- Marking installation and configuration.

To ensure that appropriate sign standards are being met and maintained at the airport, inspection personnel need to be familiar with the airport's FAA-approved sign plan and regularly check that the airport's signs are:

- Easy to read, correct color, and retro-reflective;
- Properly illuminated and not obscured by vegetation, dirt, snow, or other obstructions;
- Frangible with concrete bases at grade level;

Specifically, the following lighting systems are to be inspected:

- Runway and taxiway edge lights;
- Apron edge lights;
- Runway centerline and touchdown zone lights;

Navigational Aids (NAVAIDs) also should be inspected during a regularly scheduled inspection. Although the inspection might focus on those visual NAVAIDs owned by the airport operator, inspection personnel are advised to also observe any NAVAIDs owned or operated by others, such as the FAA. Items to be observed include:

- Segmented circle;
- Rotating beacon;
- Wind cone(s);
- Runway end lights;
- Visual glide slope indicators (such as VASIs, PAPIs, or PLASIs); and
- Approach lighting

Snow and Ice Control Plan, inspection personnel can effectively observe these conditions (FAA Items to be inspected include:

- Lights and signs obscured by snow or damaged by snow removal operations;
- Snow banks and drifts adjacent to runways and taxiways to ensure clearance for aircraft wing tips, engines, and propellers;
- Piles of snow to ensure that snow is not piled across the runway threshold or across from the runway or runway intersections;
- FOD from snow removal operations;
- Taxiways or access routes dedicated for ARFF to ensure they are not blocked;
- Critical areas for electronic NAVAIDs to ensure that snow has not accumulated; and
- Slippery pavement conditions (with braking action or Mu values, as appropriate)

Operational Safety on Airports during Construction, will benefit inspection personnel

Items to be inspected include:

- Construction staging areas and stockpiled materials, to ensure that materials are properly stored and secured and are not left in safety or movement areas;
- Proper marking and lighting of construction areas and equipment adjacent to movement areas or as specified in the airport's plan;
- Construction barricades, to properly define the limits of construction and hazardous areas;
- FOD generated by construction activities;
- Open trenches in safety areas or adjacent to movement areas;
- Airfield lighting and signage adjacent to construction areas;
- Proper marking and lighting of closed pavement; and
- NOTAMs.

Inspection Techniques

There are numerous ways in which to conduct a self-inspection. These techniques vary among airports and often among personnel at the same airport. Even so, there are some commonly recognized techniques. For instance, before starting an inspection, it is beneficial for inspection personnel to review the most recently completed self-inspection checklists and any outstanding NOTAMs. By doing so, inspection personnel can stay up-to-date on airport conditions from shift to shift. If construction is in progress, it is important that inspection personnel be familiar with the current construction safety plan specific to that project, as well as any current construction issues, including escort requests, FOD control, and others (AC 5370-2E, Operational Safety on Airports During Construction, provides guidance in this area). Inspection personnel need to be prepared to use correct communication phraseology, procedures, and techniques as specified in the Aeronautical Information Manual (AIM).

The FAA provides guidance in AC 150/5200- 18C regarding the actual techniques to use in conducting self-inspections. Although fixed inspection patterns may be easy to learn and provide some standardization, they often do not allow for an adequate inspection, thus it is recommended that inspection personnel vary the pattern of the inspection. In addition, using a fixed inspection pattern can lead to complacency, with items deserving attention possibly being overlooked.

The FAA Advisory Circular also recommends that inspection personnel drive toward the direction of landing aircraft with high-intensity flashing beacon and headlights on, day and night. Although some airports conduct multiple passes during a runway inspection and the FAA actually recommends that a runway inspection be performed in both directions, if time only permits one pass, it is best to drive toward the direction of landing aircraft. By adopting this technique, self-inspection personnel will be able to see approaching aircraft and improve visibility of the vehicle to pilots. Third, inspection personnel need to drive the stub taxiways between the runways and parallel taxiways. Overlooking these areas may, for instance, allow FOD to remain on the pavement and be a danger to aircraft immediately before takeoff.

A sample inspection checklist can be found on the following page

REGULAR DAY/NIGHT AIRPORT SAFETY INSPECTION CHECKLIST (1/2)

MONTH/DAY/YEAR:			INSPECTOR NAME:	DAY ☐ NIGHT ☐
				Time:

	CONDITIONS	S	U	N/A	REMARKS	RESOLVED BY (INTIAL & DATE)
PAVEMENT AREAS	Pavement Lips (Over 3”)	☐	☐	☐		
	Hole- 5” diam., 3” deep	☐	☐	☐		
	Cracks/Spalling/Bumps	☐	☐	☐		
	FOD: Gravel/ Debris/ Sand	☐	☐	☐		
	Ponding	☐	☐	☐		
SAFETY AREAS	Ruts/Humps/Erosion	☐	☐	☐		
	Drainage/ Construction	☐	☐	☐		
	Objects Frangible Mount	☐	☐	☐		
	Unauthorized Objects	☐	☐	☐		
MARKINGS	All Runway, Taxiway, Apron markings Clearly Visible	☐	☐	☐		
	Glass Beads	☐	☐	☐		
LIGHTING & GUIDANCE SIGNS	Obscured/ Dirty/ Operable	☐	☐	☐		
	Damaged/ Missing	☐	☐	☐		
	Faulty Aim/ Adjustment	☐	☐	☐		
NAVAIDS	Rotating Beacon Operable	☐	☐	☐		
	Wind Indicators	☐	☐	☐		
	VASI/PAPI/REIL systems	☐	☐	☐		

Additional Remarks:

REGULAR DAY/NIGHT AIRPORT SAFETY INSPECTION CHECKLIST (2/2)

MONTH/DAY/YEAR:			INSPECTOR NAME:	DAY ☐ NIGHT ☐
				Time:

	CONDITIONS	S	U	N/A	REMARKS	RESOLVED BY (INTIAL & DATE)
FUELING OPERATIONS	Fencing; gates; signs; labels; grounding clips; fire extinguishers; spill control materials	☐	☐	☐		
PUBLIC PROTECTION	Perimeter Fence/Gates	☐	☐	☐		
	Terminal Fence/Gates	☐	☐	☐		
	Signs	☐	☐	☐		
SNOW & ICE	Surface Conditions	☐	☐	☐		
	Snowbank Clearance	☐	☐	☐		
	NAVAIDs	☐	☐	☐		
CONSTRUCTION	Barricades /red lights	☐	☐	☐		
	NOTAMs (current/cancelled)	☐	☐	☐		
WILDLIFE HAZARDS	Wildlife Present	☐	☐	☐		
AIRPORT SECURITY	Fence damage; gates open; gate locks damaged; signs obscured; lighting	☐	☐	☐		
OBSTRUCTION LIGHTS AND HAZARD BEACONS	Inoperative; obscured; damaged; missing	☐	☐	☐		
AIRCRAFT RESCUE AND FIREFIGHTING	Equipment not available; personnel not available; communications not working; alarms not working	☐	☐	☐		

Additional Remarks:

AIRPORT MANAGEMENT TOOL

New Hampshire Aviation System

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Airport Management Types and Best Practices

AIRPORT MANAGEMENT TOOL

This tool provides an overview of Airport Management Types and provides resources for Airport Best Practices.

General

Managers of small airports are responsible for a broad range of activities and interact with a variety of stakeholders on a daily basis. They must carry out their duties in accordance with an array of federal, state, and local regulations and ordinances. Many small airports operate under fiscally constrained circumstances that require maximizing scarce resources and utilizing county or municipal employees to perform certain functions, including snow removal, mowing, and pavement maintenance. Generally, very few small airport managers are trained in aviation management and are often hired or volunteer for the job because of an interest in or a passion for aviation. Many small airports have no airport manager, but rather are managed by elected or appointed local officials, such as a city clerk or a director of public works.

Several types of ownership exist for public-use airports in the United States. Typically, ownership and operation of an airport are conducted by the same entity, such as a city, county, state, or special unit of government. Airports can be established and maintained by the following jurisdictions:

- Airport authorities,
- Counties,
- Municipalities,
- Joint county–city commissions,
- Park districts,
- Port authorities,
- Bi-state authorities, or
- Private owners.

An airport manager is typically responsible for the daily operations of the airport. The airport manager directs, coordinates, and reviews all aircraft operations, maintenance of the airfield and buildings, community relations, and financial matters of the airport. Some airport managers are also responsible for running the airport's FBOs under a separate agreement with the airport owning jurisdiction.

No matter what specific duties an airport manager has each day; his or her number one responsibility is to operate a safe and efficient airport.

Function and Roles of Airport Staff

Airport staff members can perform a variety of functions, including administrative functions, maintenance, daily operations, and coordination with FBOs. Many airports share airport staff with the airport's governing body. For example, the city or county may provide maintenance staff, equipment, and other resources for daily operations. The airport staff may also serve in administrative roles, especially if the airport manager is a part-time position or if the role is delegated to someone who provides that service as part of her or his other duties outside the airport. Airport staff must be made aware of airport policies, liabilities, standards, and normal operating procedures, as they will conduct the daily operations of the airport and may serve as the primary contact for a variety of functions. They should have a basic understanding of the full scope of responsibilities of running an airport, as they will probably represent the airport manager when that person is not available.

Communication and Coordination with Airport Owners and Boards

Communication and coordination with the airport owner and governing board is one of the airport manager's key roles. The manager serves as the airport's representative on site and to the public at large. The owner and governing board assign the manager's responsibilities, and he or she reports back to them. A good working relationship is required for smooth operations. Typically, the manager performs the day-to-day functions of the airport owner or authority, acting for the board members or commissioners as necessary to maintain efficient operations. In doing so, it is the manager's responsibility to keep commissioners or board members informed of activities that may reflect upon them.

Whether a large commercial service airport or a smaller general aviation airport, one of the primary keys to success is how the management of the airport is structured. If there are too many layers, the operation becomes bogged down in redundancy and effective communication can falter. If there are not enough layers, management can become overwhelmed with day-to-day operational needs and lose sight of the larger issues that demand their attention.

Airport Management Types and Best Practices (cont.)

AIRPORT MANAGEMENT TOOL

Communication and Coordination with Airport Owners and Boards

Therefore, many airport operators have undergone organizational transformations to find the right balance of organizational layers. However, based on available resources many general aviation airport operators find it more efficient to balance an airport's organizational structure by utilizing town or city staff located off-site, or contractors to conduct various airport related services instead of having specialized personnel in-house. These services include but are not limited to: Airport Finance/Administration, Airfield and Vehicle Maintenance, airfield landscaping and snow removal, and airport security.

Once an airport's governance model is optimized, it is airport management's role to craft the airport organization in response to that model. Therefore, like governance models themselves, organization of a department or office to manage airport operations also comes in many forms. In large part, the specific structure depends on the size and type of airport(s) to be managed. As an airport grows in size, so does the need to provide greater departmentalization with more specialized tasks. However, it must be recognized that each organization must be tailored to meet the needs of operating the specific airport in an efficient, effective, safe and secure manner.

Ownership and management of an airport can come in many forms. Often what works at one airport will not always work at another. In some instances, the ownership and management of an airport is effectively run by a single municipality, and others find that sole ownership and management of an airport does not serve the best interests of the airport or community at large.

Governance Models

Several types of airport ownership exist. They include:

- **Sole Ownership/Management:** A single government entity (State, county, or municipality) who exclusively owns the airport and is responsible for all operational, financial, and maintenance needs of the airport, including but not limited to the day-to-day operation of the airport, facilities maintenance, and fueling.

This is the current structure that most of the NH system airports operate under.

- **Joint Ownership/Management:** Traditionally consists of two or more governmental agencies whereby both entities share the ownership and responsibility for the operation and upkeep of the airport. In most states, joint ownership of an airport requires codification into State law. The most common joint ownership relationships are:

  - Municipal/Municipal;
  - Municipal/County; and
  - County/County.

An example of this type of agreement is Auburn Lewiston Municipal Airport located in Maine.

Airport Best Practices Helpful Resource:

ACRP Report 16: Guidebook for Managing Small Airports:
http://www.trb.org/Publications/Blurbs/162145.aspx and
http://azdot.gov/docs/default-source/airport-development/arizona_best_practices_guide_final_41807.pdf?sfvrsn=2

Governance Models Cont'd

- **Sole Ownership/Private Management:** A single government entity maintains ownership of the airport, but contracts with a private enterprise (in some cases Fixed Base Operators) to maintain and operate the airport. Traditionally, the government entity also maintains its financial responsibility. This is most common at commercial and larger general aviation airports.

  An example is Westchester County Airport (NY), who currently contracts with AvPorts to maintain and operate the airport.

- **Private Ownership/Private Management:** A private entity owns the airport and is responsible for all operational, financial, and maintenance needs of the airport. In some instances, a government entity will transfer ownership of an airport to a private enterprise through a long-term lease, but will maintain ownership of the land the airport is situated upon.

  An example of this type of operation is Jaffrey-Silver Ranch which is owned by the Jaffrey Municipal Airport Development Corp.

Each of these ownership options has its own pros and cons. These are identified herein.

Sole Ownership/Management

The pros of a city acting as the sole owner of an airport include:

- Maintains its status as an eligible sponsor for both FAA AIP and NHDOT grants.
- Maintains sole decision making power in the development and operation of the airport. While these decisions would need to meet the Grant Assurances of the FAA and NHDOT, the city would maintain great latitude as sole owner.
- Maintains the ability to influence and directly benefit from the economic value generated by the airport.

The cons of sole ownership include:

- As sole owner the city, town or municipality (city) is solely responsible for the short and long term expenses of airport ownership. One key assurance that the city makes to the FAA in order to accept AIP funds is that the Airport will be operated and maintained in a safe and efficient manner.
- Airports, like any other asset, rarely satisfy all citizens or users. As sole owner, the city is faced with listening to and doing their best to resolve all complaints about the airport. In some areas the Grant Assurances preclude the city from making decisions popular with the majority of citizens.
- The city is solely responsible for the financial burdens of the Airport, while the airport provides an economic asset for New Hampshire.

Joint Ownership/Management

The pros of joint ownership include:

- Maintains its status as an eligible sponsor for both FAA AIP and NHDOT grants.
- If development, operation, or maintenance costs are high, the city has a co-owner to share the financial burden.
- Joint ownership has the potential to obtain nearly identical economic impact as sole ownership, and may see additional economic opportunities with the additional resources of the co-owner.

Governance Models Cont'd

The cons of joint ownership include:

- Just as the city can stop many things objectionable to the city, the city's partner(s) can hinder the decision making on city proposals that they do not support.
- In most cases, no one sponsor has complete decision making ability so the city may see protracted decision making ability.
- As a joint owner the city will receive citizen and user complaints similar to the level that they would receive as sole owner. One advantage may be the increased pool of resources between all ownership partners to study issues and recommend solutions.

Sole Ownership/Agency Management

The pros of sole ownership/agency management include:

- Maintains its status as an eligible sponsor for both FAA AIP and NHDOT grants.
- With the agency responsible for the issuance of contracts, the city has less financial responsibility and may be able to improve the efficiency of the airport. However, poor agency decisions can result in poor press for the city.
- With the agency having certain powers, fewer decisions reach the city, thereby reducing the day-to-day work required of the city.

The cons of sole ownership/agency management include:

- Based upon the terms of the codified law that sets up the agency, the city may not retain its decision making ability, and therefore would be unable to stop any proposed plans that the city deems objectionable or actions that the city deems as poor judgment from happening.
- It will be known that the city maintains its ownership of the airport and citizens and users who are not satisfied by the agency will likely complain to the city. Some of these complaints can be handled through an established protocol between the city and the agency outlining lines of communication and action by the agency to resolve the issue.

Sole Ownership/Private Management

The pros of sole ownership/private management include:

- Maintain its status as an eligible sponsor for both FAA AIP and NHDOT grants.
- Maintains sole decision making power in the development and operation of the airport. While these decisions would need to meet the Grant Assurances made to the FAA and NHDOT, the city would maintain great latitude as sole owner.
- A reduction or altogether elimination in the day-to-day work required of the city.

The cons of sole ownership/private management include:

- The city remains financially responsible for the airport.
- Many private enterprises who manage airports for municipalities often require multi-year contracts for their services. Should the city find that the enterprise is not fulfilling its end of the agreement, is providing a poor service to the citizens and users, or by poor decisions generate poor press for the city, it may prove difficult and/or costly to end the relationship with the enterprise.
- It will be known that the city maintains its ownership of the airport and citizens and users who are not satisfied by the private enterprise will likely complain to the city. Some of these complaints can be handled through an established protocol between the city and the enterprise outlining lines of communication and action by the enterprise.

Governance Models Cont'd

Private Ownership/Private Management

The pros of private ownership/private management include:

- The city is no longer financially responsible for the airport.
- A private enterprise is not required to adhere to a fiscal cycle in order to start maintenance and development projects, and therefore streamline these efforts.
- The city will no longer be required to resolve complaints from citizens or users unhappy with the airport. It is possible that a city may still receive the occasional complaint; however these concerns can be forwarded to the private enterprise to deal with directly.

The cons of private ownership/private management include:

- Eligibility to receive funds under the AIP is contingent upon the owner being a qualified public agency or a private entity if the airport is a commercial service airport or a general aviation airport that relieves general aviation traffic from a hub airport of the national aviation system.
- The city would no longer retain its decision making ability regarding development and maintenance at the airport. Therefore, the city cannot preclude most things that they see as disagreeable or poor judgment from happening.

Overall, a blend of the functional/matrix type organizational structures is very common at today's airports and generally speaking, the New Hampshire State Airport System Plan Update project team found no major problems with how the system airports are currently operated. However, it is recommended that existing management structure at each be regularly monitored for its effectiveness and the level of airport staff be monitored. Doing so will help to ensure that the level of airport staff corresponds to the level of operations and complexity, such that each system airport maintains adequate staffing levels and the necessary hierarchy to be fully effective. The following matrix presents a basic staffing matrix that identifies the minimum recommend airport staffing levels by airport category.

STAFF	BASIC AIRPORT	LOCAL AIRPORT	REGIONAL AIRPORT	NATIONAL AIRPORT	PRIMARY AIRPORT
AIRPORT MANAGER/DIRECTOR	◖	◖	●	●	●
ASSISTANT AIRPORT MANAGER/DEPUTY					●
AIRPORT ADMINISTRATION			◖	●	●●
AIRPORT ACCOUNTING CLERK			◖	◖	●
AIRPORT OPERATIONS SUPERVISOR			●	●	●
AIRPORT OPERATIONS COORDINATOR				●	●●●●●●
AIRPORT MAINTENANCE SUPERVISOR			●	●	●
AIRPORT ELECTRICAL LEAD		○		●	●●
AIRPORT MAINTAINERS	○	○○	◖◖	●●	●●●●●●
AIRPORT CONSULTANTING FIRM	▲	▲	▲	▲	▲▲
AIRPORT AUTHORITY/COMMISSION	Recommended	Recommended	Recommended	Recommended	Recommended

LEGEND

● Full Time Employee
◖ Part-time Employee
○ On-Call Contractor/Municipal

UNMANNED AERIAL SYSTEMS

New Hampshire Aviation System

New Hampshire DOT
Bureau of Aeronautics

UAS/UAV AIRPORT PROCEDURES/ GUIDELINES

UAS/UAV TOOL

This tool provides an overview in preparation for Unmanned Aerial Systems operations in the New Hampshire airport system.

General

The following provides general guidance and suggestions to airports and UAS operators on the operation of Unmanned Aerial Systems (UAS) in the airport environment.

✈ Evolution of Unmanned Aerial Systems

Unmanned Aerial Systems (UAS) also commonly referred to as Unmanned Aerial Vehicles (UAVs), are vehicles that are equipped with sensors and monitors that are remotely piloted. They reflect the fastest growing aerospace technology in the world today. The use of UAVs is rapidly evolving and dynamic sector aviation. In recent years, they have become an emerging field in civil and commercial applications. Their need in industries such as; surveillance, reconnaissance, mapping, cartography, homeland security, traffic monitoring, inspection, rescue, fire detection, and agricultural imaging, are just a few of the many application with unlimited potential for their use. In today's aviation industry approved commercial UAS operations are constrained and primarily involve the smallest category UAS; but, as government application and access expands, it will pave the way for a broader and more lucrative non-government UAS marketplace.

✈ UAS Issues/ Concerns

To assist in integrating a fully safe and functional unmanned aerial systems operation within the National Aerospace System (NAS), a variety of issues and concerns must be addressed. UAS are currently flying the NAS but on a minimal basis due to a special authorization process from the FAA. Currently the approval process for UAS operations is time consuming and can take at least two years before permission is granted. There are some basic concerns that need to be addressed. For example:

- What happens during a loss of communication link between the UAS and the operator?
- There are questions about the "see and avoid" for aircraft operations in the NAS;
- The inability of UAS to see and avoid manned aircraft;
- The inability of UAS to immediately respond to ATC instructions
- The absence of testing and demonstrations that UAS can operate safely in the same airspace as manned aircraft
- The need to certify UAS to same level of safety as manned aircraft
- Privacy provisions and managing the personal information collected through the use of UAS

✈ FAA Regulations and Next Steps

To resolve safety and operational issues, the FAA still needs to develop formal UAV policies, minimum qualifications and standards for UAV operation. Before UAV operators can safely fly the NAS the following steps need to be established.

- Develop Integrated Separation Concepts
- Develop Airspace Integration Safety Case/ Assessment
- Develop Sense-and-Avoid Sensors and Fusion
- Develop Separation Algorithms
- Assess Availability/ Quality of Surveillance Data
- Develop Safe and Efficient Terminal Airspace/ Surface Operations

It is anticipated that by the end of 2015 fiscal year, clearly outlined rules for UAV operations will be published by the FAA.

UNMANNED AERIAL SYSTEMS

New Hampshire Aviation System

New Hampshire DOT Bureau of Aeronautics

UAS/ UAV Operator Questionnaire/Checklist

UAS/UAV TOOL

Name	
Date of Proposed Operation:	
Method by which the operator may be contacted directly during the UAS activity:	
Purpose Of Operations	Experimental: ☐ Demonstration: ☐ Developmental: ☐ Commercial: ☐
Who is the UAV manufacturer?	**Make/ Model/Description:**
Size:	**Dimensions:**
Launch: Process by which vehicle leaves the ground?	
Payload: What will the UAV carry?	
UAV Operator: Does the UAV pilot hold a civilian pilot license that would be relevant to the UAV being flown?	
Flight Plan?	
Weather?	
Airspace?	
Coordinated with ATC to issue NOTAMs	
A complete description, including all pertinent flight data on the aircraft to be flown.	
How does the UAV "see" and how is it "seen" by other airspace users?	
How is the UAV maintained? Is there a maintenance schedule? Who performs the maintenance?	
Does the operator have an emergency contingency plan to deal with any disaster resulting from the operation?	
Documents: Attach as necessary	• Take-off and landing procedures ☐ • Loss of control data link ☐ • Abort procedures following critical system failure ☐ • Airworthiness certification ☐
Operators Checklist issued on:	**Signature**: **Date:**

For Further Information Contact:

NHDOT- Aeronautics, Concord, NH 603.271.2552 / nhdotaeronauticsdiv@dot.state.nh.us

UNMANNED AERIAL SYSTEMS

New Hampshire Aviation System

New Hampshire DOT Bureau of Aeronautics

General Do's/ Don'ts

UAS/UAV TOOL

Do's	Don'ts
Do fly a model aircraft/UAS at the local model aircraft club	**Don't** fly near manned aircraft
Do take lessons and learn to fly safely	**Don't** fly beyond line of sight of the operator
Do contact the airport or control tower when flying within five (5) miles of the airport	**Don't** fly an aircraft weighing more than 55 lbs. (unless certified by an aero modeling community-based organization)
	Don't fly contrary to your aero modeling community-based safety guidelines
	Don't fly model aircraft for payment or commercial purposes

UNMANNED AERIAL SYSTEMS

New Hampshire Aviation System

New Hampshire DOT Bureau of Aeronautics

GENERAL UAS AIRPORT PROCEDURES

UAS/UAV TOOL

✈ Operation of UAVs in Controlled Airspace

In general, when operating in controlled airspace, UAVs should be operated in accordance with the rules governing the flights of manned aircraft as specified by the appropriate ATS authority. UAVs should be able to comply with ATC regulations and equipment requirements applicable to the class of airspace with in which they intend to operate.

Flight Notification

- Where UAV flight is to be conducted in airspace shared with manned aircraft, flight notification may be in the form of a NOTAM or may be filed in accordance with normal procedures for IFR flight.
- UAVs may not enter controlled airspace without approval of the controlling authority; this would normally be in the form of an airways clearance. UAV flight procedures when operating within controlled airspace are as directed by the controlling authority.
- When the operation of a UAV does not involve flight higher than 400 ft. AGL or within close proximity to an aerodrome, the operator may exercise discretion in lodging flight notification.

Collision Avoidance

- UAV flights in controlled airspace will be treated as IFR flights, subject to ATC control.
- Large UAV to be equipped with an SSR transponder, a collision avoidance system of forward looking television as appropriate for the type of operation

Noise Abatement

- Follow applicable local noise abatement procedures at their launch and recovery sites as operating hours, directed flight paths/altitudes, etc., consistent with safe operation of UAV

Takeoff and Landing

- When a UAV is operated at an aerodrome normally used by manned aircraft, takeoff and landing should be in accordance with normal procedures and the UAV should follow ATC instructions
- Local airfield pattern regulation, and VFR weather minimums for the class of airspace will apply
- The UAV system must be monitored by the UAV supervising controller to verify UAV system status and compliance with navigational and flight path clearances.
- The UAV should be flown according to ATC instruction with traffic separation provided by ATC

Abort Procedures

- Specific abort and flight termination procedures should be developed by the supervising UAV controller, and should be briefed to ATC as required.

Meteorological Conditions

- Weather minimums for UAV flight should be determined by the equipment and capabilities of each specific UAV system, the qualifications of the supervising controller and the class of airspace in which the flight tis conducted.
- Visibility. For UAVs operating under VFR procedures for launch and recovery, visibility requirements are as defined for the type of airspace, but in no case less than 5 km and 1000 foot ceiling. For UAV systems equipped with an internal automatic precision landing aid such as those based on the Global Positioning Systems (GPS), weather minimums should be sufficient for an external observer to visually verify the UAV flight path and alert the UAV controllers of unsatisfactory landing approach in sufficient time to execute a missed approach, as such, minimum visibility is dependent on UAV approach speed, size, and performance capabilities.

UNMANNED AERIAL SYSTEMS

New Hampshire Aviation System

New Hampshire DOT
Bureau of Aeronautics

UAS AIRPORT PROCEDURES

UAS/UAV TOOL

Interfacing with ATC

- UAVs operating within radar controlled airspace should be equipped with a SSR transponder capable of operating modes 3 A and C. The supervising UAV controller should have the capability to squawk identification when required.
- UAV controller should initiate and maintain two way communications with the appropriate ATV authorities for the duration of any flight.
- UAVs operating in controlled airspace should be continuously monitored for adherence to the approved flight plan
- Each UAV flight should have some means of informing ATC that the flight is unmanned.

Operational Equipment

- Position Lights, Anti-Collison Lights, Transponder, Radios, and Acquisition light.
- UAV system should be capable of displaying tot eh supervising controller all aircraft system and attitude information
- Flight and Voice Recorder

Emergency Procedures/ Safety Standards

- The UAV flight plan should include procedures to be followed in the event of:
  - Engine failure
  - Loss of data link
  - Loss of control
  - Failure of navigation
  - Airframe damage
- UAV operations should be as safe as manned aircraft insofar as they should not present or create a hazard to persons or property in the air or on the ground greater than that created by manned aircraft of equivalent class or category.

Helpful Resources

- "Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) Roadmap" found at:

https://nppa.org/sites/default/files/UAS_Roadmap_2013.pdf

- U.S. Department of Transportation, Federal Aviation Administration "Study For the Advancement of Unmanned Aircraft Systems", found at:

http://www.sjedd.com/pdf/unmannedStudy.pdf

- FAA Regulatory information on Unmanned Aerial Systems found at:

https://www.faa.gov/uas/regulations_policies/

AIRPORT EMERGENCY PLAN (AEP)

New Hampshire Aviation System

New Hampshire DOT Bureau of Aeronautics

Airport Emergency Plans

Emergency Plan Template

Airports differ in complexity, but each has unique features. Some are basic facilities serving a more rural environment, while others are more complex with residential, industrial, and commercial installations serving major metropolitan areas. Airports within the state are operated by the local government such as a city or county; or are privately owned and open to the public. One thing they all have in common is that they are all subject to emergencies and incidents.

According to Advisory Circular (AC) 150/5200-31C, Airport Emergency Plan, the Federal Aviation Administration (FAA) identifies an airport emergency as, "any occasion or instance, natural or man-made that warrants action to save lives and protects property and public health". An airport emergency can occur anywhere, at any time - day or night, under any weather condition, and in varying degrees of magnitude; it can occur instantaneously or develop slowly; it can last only a few minutes or last for days. Emergencies may be caused by a natural occurrence, such as a hurricane or earthquake, or it can be "man-made", such as a hazardous materials spill, civil unrest, terrorism, major fire, or power outage. Moreover, emergencies of the same type can differ widely in severity, depending on factors such as degree of warning, duration, and scope of impact. The important thing to remember is that, while emergencies can seldom be exactly predicted, they can be anticipated and prepared for.

It is likely that many, if not most of our state airports have experienced emergencies associated with aircraft accidents, power failures, fuel spills, floods, or other adverse events that result from natural processes. Therefore, the state encourages all airports to prepare a written plan that is focused on response and recovery. This template has been developed to help you prepare such a plan.

The Federal Aviation Administration's Code of Federal Regulations Part 139.325 requires that each airport holding an Airport Certificate "develop and maintain an Airport Emergency Plan (AEP) designed to minimize the possibility and extent of personal injury and property damage on the airport in an emergency."

Knowing that not all airports hold an Airport Certificate nor possess a particular plan, the New Hampshire Bureau of Aeronautics, deemed that it was necessary to create an AEP template in order to help all airport managers develop an emergency plan specifically fashioned to the airports they operate and manage.

This template has been developed in accordance Advisory Circular (AC) 150/5200-31C, Airport Emergency Plan, and the requirements in Title 14, Code of Federal Regulations (CFR) Part 139.325 (14 CFR Part 139.325).

Helpful Resources

1 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, Airport Emergency Plan, June 19, 2009, p. 1.
1 U.S. Department of Transportation, Federal Aviation Administration, Federal Aviation Rule (FAR) 139.325, Airport Emergency Plan, June 09, 2004, p.22.

Airport Emergency Plans typically consist of the following components:

- **Base Plan:** this provides an overview of the airport's emergency response organization and policies;
- **Functional Conditions:** this section addresses critical services necessary to manage, communicate, respond and mitigate airport-related emergency situations;
- **Hazard-Specific:** this provides detailed information applicable to the performance of a particular function in support of a particular hazard; and
- **Standard Operating Procedures and Checklists:** this section provides detailed instructions that an individual or organization needs to fulfill responsibilities and perform tasks assigned in the AEP.

The template contained herein was particularly designed for General Aviation (GA) airports; therefore, it will not be as detailed as those typically developed for larger commercial service airports.

Therefore, this template is not meant to be all inclusive for all airports but instead, is intended to provide recommendations for the development of the typical sections included in most Airport Emergency Plans (AEPs).

Within the template you will find text shaded in gray, as you see here, at the beginning of each section and throughout the document. This shaded area gives direction and instruction as to what should be included in a particular section of the plan. These highlighted areas can simply be added to or deleted from each section, once your airport specific data has been entered. You will also find other areas throughout the document that are highlighted to indicate where text should be changed and/or added, i.e. areas where a date should be included or your airport name.

In addition, sample text is provided within each section of the plan following the gray shaded directional/instructional text. This text is not shaded in any way. This sample language may potentially be used within the framework of the plan. This sample language is consistent with text from AEP's developed for airports of various size and function and meant assist you in developing a particular section for your AEP. **This language should be modified as necessary to reflect the uniqueness of your particular airport.**

The AEP should not be written solely by the airport. It is a document that should be developed through collaboration with outside agencies that may respond to an airport incident/accident.

Airport Emergency Plan

– XX Airport –

Prepared By:

XX Airport

Publication Date:

Insert Date as Appropriate

Revision Date:

Insert Date as Appropriate

Insert the following --- a letter or form signed by the Airport's governing body, giving the AEP an official status and providing both authority and responsibility for all individuals and organizations involved in the AEP to perform their assigned tasks. The letter should also briefly describe the process and responsibilities for those tasked individuals and organizations with standard operating procedures that explain how the tasks will be completed.

Insert the following --- a signature page with signatures of the AEP planning team (i.e. all parties that are involved in the AEP and have contributed to its development and are committed to its effective implementation).

This page could also act as a checklist (i.e. Record of Distribution) for each AEP planning team member showing evidence that all parties involved in the AEP have had the opportunity to read the AEP and understand all their respective duties. The record may show a date of transmittal and the date of which receipt is confirmed.

AEP Planning Team	Contact Name	Contact #	Signature of Participation
Local Agencies			
Airport Manager	xx	xxx-xxx-xxxx	
Airport Maintenance Department	xx	xxx-xxx-xxxx	
Airport Operations Department	xx	xxx-xxx-xxxx	
XX Fire Department	xx	xxx-xxx-xxxx	
XX Police Department	xx	xxx-xxx-xxxx	
Red Cross	xx	xxx-xxx-xxxx	
Civil Air Patrol	xx	xxx-xxx-xxxx	
State Agencies			
NH Bureau of Aeronautics	xx	xxx-xxx-xxxx	
NH State Police	xx	xxx-xxx-xxxx	
NH Emergency Management Agency	xx	xxx-xxx-xxxx	
Office of the Chief Medical Examiner	xx	xxx-xxx-xxxx	
Department of Environmental Protection	xx	xxx-xxx-xxxx	
Federal Agencies			
National Transportation Safety Board (NTSB)			
Federal Aviation Administration (FAA) - Airports	xx	xxx-xxx-xxxx	
FAA Flight Standards District Office	xx	xxx-xxx-xxxx	
FAA Regional Operations Center	xx	xxx-xxx-xxxx	
Transportation Security Agency	xx	xxx-xxx-xxxx	
Federal Bureau of Investigation	xx	xxx-xxx-xxxx	
Hospitals			
XX Hospital	xx	xxx-xxx-xxxx	
XX Hospital	xx	xxx-xxx-xxxx	

Airport Emergency Plan Revision Log

Insert the following --- a table (similar to the one below) that will be used to record any changes/modifications to the document.

Page	Revision Date	Amendment Title
2	12/2/2014	Revised airport emergency contact phone numbers
x	x/x/xxxx	xxx

Table of Contents

Chapter 1 - Base Plan

This chapter provides a general overview or summary of the AEP. Provide a summary description of the chapters or sections that are included in the overall plan. These typically include the following.

- Airport Emergency Plan (AEP) purpose;
- Specific hazards addressed in the Plan ;
- The airport's overall approach to an emergency situation, i.e. what should happen, when, and at whose direction;
- A list of organizations that may be involved in the AEP;
- Availability of services and support for all types of emergencies, general policies for managing resources, and mutual aid agreements;
- Maintenance of the plan; and
- A list of any laws, statutes, ordinances, regulations and formal agreements regarding emergency response.

Each subsequent chapter will provide more detailed information. However, The Base Plan section should be an executive summary of the overall plan.

The following identifies some sample language that could be included in this section:

This chapter summarizes the airport's overall plan and briefly identifies XX Airport's strategy to respond to emergencies and incidents to minimize the possibility and extent of personal injury and property damage.

The following sections outline the plan's **purpose** such as what the AEP is meant to do; **situations and assumptions** such as particular hazards the AEP addresses; **operational plan** or details to the airport's overall approach to an emergency situation, i.e. what should happen, when, and at whose direction; **organization and assignment of responsibilities** such as organizations that could be involved in the Emergency Plan and their responsibilities in an emergency situation; **administration and logistics** such as the availability of services and support for all types of emergencies, general policies for managing resources, and mutual aid agreements; **plan development and maintenance** identifying who is responsible for maintaining the AEP and how often it will be maintained; and **authorities and references** highlighting any laws, statutes, ordinances, regulations and formal agreements regarding emergency response.

Purpose

In this section of the Base Plan, the airport should summarize the overall plan and provide a general statement of what the AEP is meant to do.

The following identifies some sample language that could be included in this section:

The Airport Emergency Plan (AEP) for XX Airport was developed according to Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, and Title 14, Code of Federal Regulations (CFR) Part 139.325 in an effort to provide a plan for prompt response to all emergencies to minimize the possibility and extent of personal and property damage on the airport.

The Airport has developed this plan to provide emergency response to aircraft sizes up to and including xxx [add aircraft data here based on the airport's critical aircraft].

This plan considers coordination with local agencies responsible for emergency response and offers guidance and direction to those personnel required to perform under emergency conditions. It defines the responsibilities the airport and any mutual aid agencies to provide assistance under the provisions of this AEP.

The Airport Manager of XX Airport, or his/her representative, shall exercise authority over all emergency personnel, including airport units and those providing service through mutual assistance or letters of agreement. The Airport Manager has the overall responsibility for carrying out the requirements and coordinating the activities prescribed by this Airport Emergency Plan. It is recognized that all emergency situations cannot be foreseen; therefore, the Airport Manager will provide the control, guidance, and assistance deemed necessary in situations that are not specifically covered by this plan to minimize loss of life and property and to restore normal airport operations.

The chain of command during the active phases, i.e., life safety, property preservation, and hazard mitigation, of any incident described in this manual shall be based upon the "National Incident Management System (NIMS)" model of emergency response command, and shall be specifically defined for each type of airport emergency or other model as the airport sees fit [this is typical language but modify as necessary depending on the system your airport plans on using].

The type of incident shall define the command structure, as follows:

Type of Emergency	Active Phases: Incident Commander
Aircraft Incidents and Accidents	Fire Officer in Charge (OIC)
Acts of Terrorism	xxx
Structural Fires, Fuel Farms and Fuel Storage Areas	xxx
Natural Disasters	xxx
Hazardous Materials Incidents	xxx
Sabotage, Hijack and Unlawful Interference with Operations	xxx
Failure of Power for Movement Area Lighting	xxx
Water Rescue Situations	xxx
Crowd Control	xxx
Xxx [add additional as deemed appropriate	xxx

The Airport conducts a review of the AEP at least once every xx consecutive calendar months or whatever is deemed appropriate for the airport with all of the parties with whom the plan is coordinated. In addition, a full-scale AEP exercise is held at least once every xx consecutive calendar months [only if appropriate for the airport].

Situation and Assumptions

This section of the Base Plan summarizes the basic functional sections and narrows the scope of the AEP by outlining what hazards this particular AEP addresses; what particular characteristics exist at the airport that may affect response activities and how; and what information used in preparing the AEP must be treated as assumption rather than fact.

Typically, this section would briefly identify any mutual aid support/agreements that may be included in the airports emergency response plan; assuming that the airport may need assistance and help during an incident/accident.

The following identifies some sample language that could be included in this section:

The XX Airport is not capable of handling all emergencies that occur at the Airport. Minor aircraft incidents and accidents, acts of terrorism, fires, natural disasters, hazmat and medical incidents are handled by the airport or mutual aid fire, airport operations and maintenance departments. However, large-scale accidents, involving multiple victims can quickly overwhelm the limited emergency staff at the Airport. To assist with large-scale incidents, the Airport has entered into a mutual aid agreement with XX [identify mutual aid agencies or the city or town where arrangements have been made]. Through this agreement additional fire, medical and police resources are available to the Airport on an as needed basis.

Functional Sections

This section of the Base Plan should briefly identify generic functional responsibilities that may be applied to all emergencies. The functional sections typically address the critical services necessary to manage, communicate, respond, and mitigate airport-related emergency situations. They cover such topics as communications protocol and alert notifications, i.e. critical components of the AEP since these functions enable an airport to cope with and respond to unforeseen emergencies.

This section of the Base Plan should provide a summary of the functional sections included in the AEP for your particular airport. The number of sections included in the AEP is dependent on the Airport. You may have only one or two functional sections highlighted for a small general aviation airport such as communications and alert notifications, however other functional areas could include: command and control, emergency public information, protective actions, law enforcement and security, firefighting and rescue, health and medical, resource management, and operations and maintenance. It is the responsibility of each individual airport to provide what they determine is most appropriate for their facility.

The following identifies some sample language that could be included in this section:

The xx [identify the number of functional sections within the airport's plan] functional sections of this AEP, as outlined and explained in further detail in Chapter 3 provide detailed information about the core functions necessary to successfully handle an emergency situation for XX Airport. These are generic functional responsibilities and may be applied to all emergencies. Functional Sections typically include such things as command and control, communications, health and medical, and etcetera and are operationally oriented.

The xx [identify the number of functional sections within the airport's plan] functions include: xx [identify the functional sections that are highlighted in your plan. Below is a potential list of functional sections that you could include in an AEP.

- Command and Control;
- Communications;
- Alert Notification and Warning;
- Emergency Public Information;
- Protective Actions;
- Law Enforcement/Security;
- Firefighting and Rescue;
- Health and Medical;
- Resource Management; and
- Airport Operations and Maintenance.

Hazard Specific Sections

This section of the Base Plan should summarize and briefly identify the Airport's possible hazards that warrant planning attention.

The list below identifies hazards typically covered within an AEP. However, it is each individual airport's responsibility to provide what is most applicable for their facility. For instance, if your airport is not located next to a water source than you will not need to cover water rescue situations within your AEP. However, if your airport experiences severe weather conditions, such as thunderstorms during the summer months that create high winds, hail, flooding, tornados, and etc., it should be mentioned here. Below is a potential list of hazards that you may choose to include in your AEP.

- Aircraft Incidents;
- Terrorism Incidents;
- Structural Fires, Fuel Farms and Fuel Storage Areas;
- Natural Disasters;
- Hazardous Materials Incidents;
- Sabotage, Hijack and Unlawful Interference with Operations;
- Failure of Power for Movement Area Lighting;
- Water Rescue Situations; and
- Crowd Control.

The following identifies some sample language that could be included in this section:

The Airport faces numerous hazards given its location and the nature of its daily operations. The hazard specific sections, located in Chapter 4 of the AEP, address the incidents most likely to occur at the Airport as indicated through the hazard analysis, i.e. the identification of those hazards and disasters specific to an airport that warrant planning attention. The hazards outlined in Chapter 4 include:

- XXX;
- XXX;
- XXX; and
- XXX

Authority for Emergency Operations

This section of the Base Plan should summarize how the AEP was established; who developed it or who was on the planning committee; what federal and local guidance was used in its creation; etc.

The following identifies some sample language that could be included in this section:

The AEP is founded on the basis of Federal Aviation Regulations and the Comprehensive Emergency Management Plans of the Town and/or City of XX and/or XX County [this is where you would identify any other emergency plans such as plans created for the airport's city, town, or county]. The Airport is responsible for emergency response on the Airport. Emergency support is also provided by xxx [identify mutual aid agencies or the city or town where arrangements have been made].

Operational Plan

This section of the Base Plan summarizes the airport's overall operational approach to an emergency situation, i.e. what should happen, when, and at whose direction, to include potential inter-jurisdictional responsibilities. It should include steps from the initial notification of an incident/accident to the return to normal operations.

Notification

A subsection of the Operational Plan is the Notification section. In this section, the Airport should identify the standard notification sequence to be followed in an emergency situation. For instance, the Airport should identify the overall means of notification, emergency phone numbers to be used, communications network, types of emergencies to report, and etc.

The following identifies some sample language that could be included in this section:

Means of Notification

Initial notification of an emergency typically occurs in one of the following situations [insert the notification sequence for your airport using something similar to the example below].

- Air Traffic Control (ATC) activates the ring-down telephone line to notify Aircraft Rescue and Fire Fighting (ARFF) of an aircraft emergency.
- ATC sends out an emergency telephone call to alarm airport management, operations and maintenance.
- An airport employee reports an incident directly to a law enforcement officer or firefighter.

Emergency Telephone Numbers

In this section the Airport should identify emergency telephone numbers here.

- Air Traffic Control Tower: via direct interphone (Crash Net), local intercom, or 911.
- 24/7 alternate number – xxx-xxx-xxxx
- 911 telephone calls are received by emergency dispatchers at the Town/City of XX Police Department. The dispatchers have phone communications with the Airport, off airport fire mutual aid, law enforcement, xxx

Communications Network

In this section the airport should identify communications protocol between the airport and response units whether it is on-airport units or off-airport mutual aid units.

Emergency Incidents to Report

In this section the airport should identify the type of emergencies that shall be reported such as:

- Aircraft emergencies and fires;
- Structural fires and non-structural fires;
- Fires at Fuel Farms;
- Bomb threats;
- Hijackings/threats of terrorism/hostage-takings;
- Fuel spills;
- Vehicle fires and accidents;
- Medical emergencies;
- Hazardous materials incidents;
- Floods and other natural disasters;
- Unusual odors or conditions;
- Suspicious behavior; and
- Suspicious packages.

Press and Media Support

In this section the airport should identify how the press and media will be handled and how they will get information regarding the incident/accident.

Response

Another subsection of the Operational Plan is the Response section. In this section, the Airport should identify the standard response to be followed in an emergency situation. For instance, the airport should identify the responsibilities for initial responders. The airport should insert the response for your airport using something similar to the example below.

- Fire Department Alarm / Dispatch Centers will begin prompt notifications to all agencies required by the emergency, by radio or telephone.
- ARFF responds and assesses the situation. The Airport Manager will request mutual aid assistance as needed.
- Airport Operations responds and determines which airport movement areas need to be closed to ensure aircraft safety and to establish an access route for emergency responders.
- ARFF will begin firefighting and rescue operations, as required.

Extended Operations

Another subsection of the Operational Plan is the Extended Operations section. In this section, the Airport should identify the standard operations to be followed in an emergency situation. For instance, will an airport command post be set up to deal with the situation until recovery and normal operations can be resumed? The airport should insert details in this section that pertain to extended operations using something similar to the example below.

- The ARFF OIC will assume the role of incident commander and establish an incident command post.
- Airport Operations initiates notification to airport staff, government agencies and airport tenants, as required.
- Airport Operations and police will assist with access control and provide escorts to incident command post.
- On arrival of senior airport staff, the Emergency Operations Center will be activated and emergency staff positions will be filled.
- Airport employees and tenants will stand-by and provide assistance as needed.

Recovery

Another subsection of the Operational Plan is the Recovery section. In this section, the Airport should identify the recovery sequence following an emergency situation. In this section the airport should insert details pertaining to recovery operations using something similar to the example below.

- Airport Operations and Airport Maintenance will conduct a damage assessment and Foreign Object Debris (FOD) sweep.
- Airport Maintenance will commence airfield repair operations if necessary.
- Upon release of wreckage, Airport Operations with coordinate removal operations with the aircraft owner.

Return to Normal Operations

Another subsection of the Operational Plan is the Return to Normal Operations section. In this section, the Airport should identify the process that the Airport will take to return the airport to a normal operational condition. In this section the airport should insert details using something similar to the example below.

- Airport Operations and Airport Facilities Maintenance will conduct a final safety inspection.
- Closed areas of the airport will be re-opened (cancel NOTAMS).

Assignment of Responsibilities

This section of the Basic Plan should provide a list of organizations that could be involved in the Emergency Plan as well as a brief description of their responsibilities. It includes a listing by position and organization responsibilities, along with related tasks to be performed. Such a list helps with a quick understanding of who does what without a lot of the procedural details that are found in the Functional Section.

The following identifies possible organizations to be included in an Airport's AEP. However, each airport is unique and may perhaps have more or fewer organizations than the ones mentioned here.

The following identifies some sample language that could be included in this section:

- Air Carrier(s)/Aircraft Operator(s)
  - Provide full details of aircraft related information, as appropriate, to include number of persons, fuel, and dangerous goods on board.
  - Coordinate transportation, accommodations, and other arrangements for uninjured passengers.

  - Coordinate utilization of their personnel and other supplies and equipment for all types of emergencies occurring at the airport.
  - Perform duties in accordance with air carrier's Aviation Disaster Family Act plan.

- Air Traffic Control
  - Contact ARFF service regarding aircraft incidents/accidents and providing them information relevant to the emergency. Provide ARFF vehicle operators with information regarding the last known position of the accident aircraft, the best estimate of the accident.
  - Coordinate the movement of non-support aircraft away from any area on the airport, which may be involved in an emergency.
  - Coordinate the movement of support aircraft to/from the emergency scene.

- Airport/Management
  - Assume responsibility for overall response and recovery operations once life, property and safety matters have been mitigated. Until such time the Fire Chief or designee will be the Incident Commander.
  - Establish, promulgate, coordinate, maintain, and implement the AEP, to include assignment of responsibilities.
  - Coordinate the closing of the airport when necessary and initiate the dissemination of relevant safety-related information to the aviation users (NOTAMs).

- Airport Tenants
  - Coordinate the use of their available equipment and supplies.
  - Coordinate the use of their manpower that may have knowledge of the airport, aircraft, and other technical knowledge.

- Animal Care/Control
  - The movement of animals through the airport as cargo or pets accompanying their owners is fairly routine. Animal Care professionals should be included in AEP development and provide professional assistance during emergencies. This can be assigned to a governmental animal control department or contract with a non-profit or volunteer organization, such as the Humane Society or Society for the Prevention of Cruelty to Animals (SPCA).
  - Coordinate the services and assistance provided to the animal victims impacted by the emergency.
  - Removal and care of wildlife involved in collision with aircraft.

- Coast Guard/Harbor Patrol
  - Provide primary rescue and other support services in large bodies of water on or adjacent to the airport, as appropriate.
  - Coordinate their services with other mutual aid rescue services.

- Communications Services
  - Identify and designate private and public service agencies, personnel, equipment, and facilities that can be used to augment the airport's communications capabilities.
  - Identify repair capability avail-able under emergency conditions.
  - Coordinate and establish communications protocols, including frequency utilization, for use during emergency conditions.

- Coroner: coordinating and providing body identification and other investigative activities.

- Emergency Management Services (EMAs)
  - Coordinate local Emergency Operations Plans (EOP) with the AEP.
  - Consider role airport may have in support of state or regional defense or disaster response plans.

- Emergency Medical Services
  - Provide emergency medical services to the airport during emergency conditions to include triage, stabilization, first aid, medical care, and the transportation of injured.
  - Coordinate planning, response, and recovery efforts with hospitals, fire and police departments, American Red Cross, Airport operator, etc.

- State or Local Environmental Agency: provide response and recovery support for environmental and other hazardous material emergencies as defined by statute.

- Federal Aviation Administration (FAA)
  - Certify and uphold the practices and procedures of the aviation industry.
  - Provide investigation service in support of improving safety and enforcement of the regulations, as necessary.

- Federal Bureau of Investigation (FBI)
  - Investigate any alleged or suspected activities that may involve federal criminal offenses (usually related to bomb threats, hijackings, hostages, and dignitaries).
  - Assumes command in response to certain hijack and other criminal situations.

- Aircraft Rescue and Firefighting (Fire Department): managing and directing firefighting and rescue operations until life, property and safety matters have been mitigated.

- Hazardous Material Response Team: provide response and recovery support for hazardous material emergencies as defined by statute.

- Health and Medical: coordinate overall planning, response and recovery efforts with hospitals, EMS, fire and police departments, American Red Cross, Airport Operator, and others to ensure practicality and interoperability.

- Hospital(s): coordinate the hospital disaster plan with the airport and community EOP.

- Mental Health Agencies: provide coordinated programs for survivors, relatives, eyewitnesses and emergency response personnel for dealing with the possible long-term effects of the emergency.

- Military/National Guard: where a military facility is located on or in the vicinity of an airport, integrate and coordinate personnel, supplies, and equipment capabilities into the AEP.

- Mutual Aid Agencies
  - Coordinate and integrate emergency services into the AEP through mutual aid agreements and Standard Operating Procedures (SOPs).
  - In some locations there are regulations or laws governing mutual aid activities and agreements.

- National Weather Service
  - Provide related technical support information in support of emergency response and recovery operations.
  - Assist with alert and warning processes, particularly with weather related emergencies.

- National Transportation Safety Board (NTSB): conduct and control all accident investigations involving civil aircraft, or civil and military aircraft, within the United States, its territories, and possessions.

- Police/Security: managing law enforcement resources and directing traffic control and law enforcement operations.

- Public Information/Media: gathering, coordinating and releasing factual information.

- Public Works/Engineering
  - Manage public works resources and direct public works operations (e.g. road maintenance, debris/trash removal, etc.).
  - Coordinate with private sector utilities (e.g. power and gas) on shutdown and service restoration.
  - Coordinate with private sector utilities and contractors for use of private sector resources in public works-related operations.

- Red Cross: coordinating and providing support services to victims, their families, and to emergency responders.

- Search and Rescue: coordinate and provide search and rescue services as needed, usually for off-airport aircraft emergencies.

- All Tasked Individuals/Organizations
  - Maintain current internal personnel notification rosters and SOPs to perform assigned tasks.
  - Analyze need and determine specific communications resource requirements.
  - Identify potential sources of additional equipment and supplies.
  - Provide for continuity of operations by taking action to:
    - Ensure that lines of succession for key management positions are established to ensure continuous leadership and authority for emergency actions and decisions in emergency conditions.
    - Protect records, facilities, and organizational equipment deemed essential for sustaining operational capabilities and conducting emergency operations.
    - Protect emergency response staff:
      - ✓ Provide appropriate protective clothing and respiratory devices.
      - ✓ Ensure adequate training on equipment and procedures.
      - ✓ Provide security.
      - ✓ Rotate staff or schedule time off to prevent burnout.
      - ✓ Make stress counseling available.
      - ✓ Ensure the functioning of communication and other essential equipment.

Note: The following table is an example that can be used in an airport's AEP in the organization and assignment of responsibilities section providing a list of different local, state and federal agencies with their contact numbers. Keep in mind that this table might be different for different airports, as there could be more or less agencies depending on the location of the airport.

Local Agencies	Contact Number
Local Fire Department(s)	xxx-xxx-xxxx
Local Police Department	xxx-xxx-xxxx
Airport Maintenance	xxx-xxx-xxxx
Red Cross	xxx-xxx-xxxx
NH Army National Guard Facility Commander	xxx-xxx-xxxx
Local/Nearest Flight Service Station	xxx-xxx-xxxx
Civil Air Patrol	xxx-xxx-xxxx
Local Airport Management	xxx-xxx-xxxx
Local Sherriff Department (if applicable)	xxx-xxx-xxxx
State Agencies	**Contact Number**
NH Bureau of Aeronautics	xxx-xxx-xxxx
NH State Police	xxx-xxx-xxxx
Department of Environmental Protection	xxx-xxx-xxxx
NH Division of Forest and Lands	xxx-xxx-xxxx
NH Bureau of Emergency Management	xxx-xxx-xxxx
Country Emergency Management Agency	xxx-xxx-xxxx
Office of Chief Medical Examiner	xxx-xxx-xxxx
Federal Agencies	**Contact Number**
Local Air Traffic Control Tower	xxx-xxx-xxxx
FAA Flight Standards Districts Office	xxx-xxx-xxxx
FAA Regional Operations Center	xxx-xxx-xxxx
Transportation Security Agency	xxx-xxx-xxxx
Federal Bureau Investigation	xxx-xxx-xxxx
US Coast Guard	xxx-xxx-xxxx
National Transportation Safety Board	xxx-xxx-xxxx

Optional/Additional agencies in the table above may include (but are not limited to):

- County Agencies
- Medical Agencies
- Utility Companies
- Wrecker and Crane Services
- Religious and Counseling Agencies
- Operating Frequencies

Administration and Logistics

In this section of the Base Plan, the airport should think of incorporating information related to the availability of services and support for all types of emergencies, general policies for managing resources, mutual aid agreement references among organizations involved in the AEP, the airport's general policies on finance record keeping and reporting and tracking resources needed during emergencies.

The following identifies some sample language that could be included in this section:

- Availability of services and support for all types of emergencies
  - Police, Fire and Medical support is available to the Airport through a mutual aid agreement with surrounding jurisdictions. See Exhibit XX, Mutual Aid Agreement for additional information.
  - Emergency Food and Beverages are available through a letter of understanding with XXX. See Exhibit XX, Letter of Understanding, Emergency Food/Beverages Services.

- General policies for managing resources
  - Each department is responsible for managing its own resources.
  - Shared resources shall be managed through the Airport Purchasing Department and Warehouse.

- Mutual Aid Agreement
  - The Airport has entered into a mutual aid agreement with XXX. Through this agreement the Airport can request additional law enforcement, fire/rescue and medical services. See Exhibit XX, Mutual Aid Agreement.

- Augmenting Staff
  - During an emergency the Airport may elect to augment staff with airport tenant employees for functions in which they are trained and/or qualified to perform.
  - Volunteer organizations such as the Red Cross or Civil Air Patrol may be used at the discretion of the Airport Manager or Incident Commander.

- Record Keeping
  - Financial recording functions are conducted by the Finance/Administration Department. All financial records, invoices, and purchase requests shall be forwarded to the Finance/Administration Department for recording and tracking purposes.
  - Financial reporting functions are conducted by the Finance and Administration Department. All departments shall forward financial information and reports to the Finance and Administration Department.
  - Each department is responsible for tracking its own resources. Shared airport resources are tracked by the Airport Warehouse in the Purchasing Department.

- Airport Personnel Contact Information
    - See Exhibit XX, Airport Personnel

- Airline Representative Contact Information
    - See Exhibit XX, Airline/Tenant Contact Information

Plan Development and Maintenance

In this section of the Base Plan, the Airport should identify basic maintenance of the plan. The airport should include the following.

General

In this section, the Airport should identify how the airport will update the AEP. This section should identify how personnel should periodically review AEP policies, procedures, and related information. Information about training that covers changes in policies, procedures, resource availability, and etcetera should be provided to ensure that all personnel stay familiar with current information.

The following identifies some sample language that could be included in this section:

The Airport Operations Department is responsible for maintaining the Airport Emergency Plan. The plan will be reviewed periodically and updated on an as needed basis.

Pre-incident introductory, recurrent, and specialized training on the plan is provided through classroom sessions, tabletop exercises, and drills for those who have a role in the plan.

Post-incident events, drills and exercises are evaluated and critiqued to realize successes and areas needing improvement. Information received from the critiques is used to validate the effectiveness of the plan and to highlight necessary improvements and recommended changes.

Schedule of Review

In this section, the Airport should develop a schedule for reviewing each part of the AEP. A suggested schedule for some of the key elements is:

- Telephone numbers contained in the AEP should be reviewed quarterly for accuracy by actually calling the individuals/ organizations listed. Changes should be noted, particularly in the procedures of the individual(s)/organization(s) tasked with making the calls during an emergency.
- Radio frequencies used in support of the AEP should be tested at least monthly. If these frequencies are used on a day-to-day basis, documentation to that effect should be provided.

- Emergency resources should be inspected routinely. The frequency of inspection may vary depending on the type of equipment and supplies. Consideration should be given to placing these resources on the daily or periodic Airport Self-Inspection Program.
- Personnel assignments to include descriptions of duties and responsibilities should be reviewed semi-annually.
- Mutual aid agreements should be reviewed annually or as specified in the agreement.
- Off-airport activity should be reviewed on an on-going basis. Maintain an open dialogue with off-airport agencies, such as utilities, public works departments, etc. to learn of activity that may affect the airport's emergency response effort, i.e. road construction and closures, major utility work, etc.

The following identifies some sample language that could be included in this section:

- The Airport Operations Department with check telephone numbers in the AEP quarterly.
- The Airport Operations Department will check radio frequencies, alert, and warning systems on a monthly basis.
- The entire manual will be reviewed on an annual basis for errors and changes in policy and procedure.
- Mutual aid agreements will be reviewed annually or as specified in the agreement.
- As policies and procedures change, the manual will be updated on an as needed basis.

Training, Drills and Exercises

In this section, the Airport should develop a schedule for overall training, drill, and exercise program. As training, drills, and exercises are conducted, it is important that a functional critique/feedback program be in place. These "lessons learned" should be incorporated back into the planning process. A description of the airport's training, drill, and exercise program should be included in this portion of the plan.

The following identifies some sample language that could be included in this section:

- Airport tenants receive training on how to report emergencies during routine training presentations provided by the airport. Tenants are also invited to participate in all table-top exercises and live emergency drills.
- The airport conducts annual emergency tabletop exercises that involve all airport tenants and mutual aid organizations. The airport presents an emergency situation and solicits input from all participating organizations.
- Every three years the airport conducts a full scale disaster exercise. All airport tenants and mutual aid agencies are invited to participate. Emergency procedures are discussed and performed by tasked individuals. Third party evaluators observe overall exercise activity and provide feedback following the exercise.

Authorities and References

In this section of the Base Plan, the airport should indicate the legal basis for emergency operations. Laws, statutes, ordinances, regulations, and formal agreements relevant to emergencies should be listed, along with any authority that has been delegated. Citing reference materials - including local Emergency Operations Plans (EOPs) - can be valuable for indicating what has influenced the writing of the AEP. References can also reduce the size of the AEP by directing the user to the full text of other documents.

The following identifies some sample language that could be included in this section:

XX Airport will organize in accordance with the National Incident Management System, under the Incident Command System to manage on scene emergency operations.

The development of an Airport Emergency Plan (AEP) was done by a team consisting of individuals/organizations having a potential role in the airport's emergency response program. Apart from the requirements established by the Federal Aviation Administration in **14 CFR Part 139** and the **Advisory Circular (AC) 150/5200-31C**, the AEP Planning team reviewed additional documents addressing other applicable regulations, standards, and guidance related to emergency preparedness. The list of additional documents includes, but is not limited to, the following:

1. Federal Emergency Management Administration(www.fema.gov)
    - National Incident Management System (NIMS)
    - National Response Framework (NRF)
    - SLG (101), *Guide for All-Hazard Emergency Operations Planning*
2. National Fire Protection Association (NFPA) 424, *Airport/Community Emergency Planning*
3. 49 CFR part 1542, *Airport Security* (formerly 14 CFR part 107)
4. 49 CFR part 1544, *Aircraft Operator Security* (formerly 14 CFR part 108)
5. 49 CFR part 1546, *Foreign Air Carrier Security*
6. 49 CFR part 1548, *Indirect Air Carrier Security* (formerly 14 CFR part 109)
7. State and Local Regulations
8. ICAO Technical Instructions
9. International Air Transportation Association, *Dangerous Goods Regulations Manual*
10. Department of Transportation, *The Public Transportation System Security and Emergency Preparedness Planning Guide*
11. National Response Team (NRT-1), *Hazardous Materials Emergency Planning Guide*
12. Airport Joint Use Agreements with the Department of Defense
13. *U.S. Coast Guard Addendum to the National SAR supplement* (CGADD)
14. FAA Order 7210.3, *Facility Operation and Administration* [1]

This template is designed in accordance with the appropriate Advisory Circular referring to all the documents above, and the necessary elements from these documents have been incorporated into this model. For further clarification and additional references, please refer to Advisory Circular (AC) 150/5200-31C.

[1] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, June 19, 2009, p. 10-11.

Chapter 2 – Functional Sections

The Functional Sections typically include:

- Command and Control;
- Communications;
- Alert Notification and Warning;
- Emergency Public Information;
- Protective Actions;
- Law Enforcement/Security;
- Firefighting and Rescue;
- Health and Medical;
- Resource Management; and
- Airport Operations and Maintenance.

What is included in a particular airport's AEP is dependent on the airport. However, we have included the following Functional Sections that seem to have appeared in most general aviation type airport AEP's: Command and Control Section, Communications Section, and Alert Notification Section.

The Command and Control Section should provide an overview of how incidents/accidents will be directed and controlled. It should provide for critical actions essential to saving lives, protecting property, and restoring normal operations to the Airport. Command and Control is the most critical element of the emergency management function. Effective central control of the situation is essential to manage an incident, provide for up/down communications, lateral functional support, and the central control of resources.

The Communications Section should provide information on establishing, using, maintaining, enhancing, and providing redundancy for all types of communications devices needed during emergency response operations.

The Alert Notification Section should address the processes used to notify and warn emergency response agencies, airport employees and tenants, and the general public of potential or actual emergency situations. This alert and warning process is essential for it ensures the timely notification to emergency organizations and the response of emergency forces as well as ensuring that the public has adequate time to take appropriate protective actions to avoid death, injury, and/or damage to property.

Command & Control

The information developed for this section should address centralized Command and Control for all types of emergencies. It may be also used as the baseline upon which detailed centralized Command and Control information is developed for each hazard-specific section.

Emergency response organizations (ARFF, law enforcement, EMS, public works, etc.) normally execute their respective services as a joint effort during emergencies. However, difficulties often arise in the overall management of an emergency when other agencies, disciplines, or organizations, not accustomed to working together merge to provide collateral support. This is particularly true for aircraft emergencies where, in addition to the normal airport response organizations (ARFF, law enforcement, operations, public works, EMS, air carrier, etc.) and local off-airport emergency response agencies and media, there may well be a significant number of additional agencies (e.g., Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA), National Transportation Safety Board (NTSB), Federal Aviation Administration (FAA), Federal Bureau of Investigation (FBI), Environmental Protection Agency (EPA), etc.) arriving at the scene. Many of these responders do not normally work together, much less under emergency conditions, yet they all have defined responsibilities. It is, therefore, essential that all responders have an understanding of who is responsible for what during each type of emergency.

Because difficulties often arise in the overall management of an emergency when agencies from different disciplines have to work together to provide collateral support, a clearly defined central authority responsible for managing the overall response strategy to the emergency is essential. Additionally, the command structure should be designed with common terminology, standards and procedures due to the gathering of agencies from different disciplines. The Incident Command System is an element of the Federal Emergency Management Agency (FEMA) National Incident Management System (NIMS), which is a management system design to enable effective and efficient domestic incident management by integrating a common organizational structure. Therefore, all airport emergency responders should operate within the NIMS and abide by its rules and procedures.

Each kind of emergency will have an Incident Commander, who will manage the incident by planning, organizing, directing, coordinating, controlling, communicating, delegating, and evaluating the incident. Therefore, this chapter should clearly define the command and control structure for the airport based on the type of incident or hazard that has occurred. For instance, the Incident Commander in charge of a fire or hazardous materials situation would most likely be the Fire Officer whereas an aircraft bomb or hijacking situation would typically identify Law Enforcement as the Incident Commander.

This section should be able to identify the different types of Incident Commanders and mention the types of emergencies they are responsible for.

Some of the language above can be reused as an introduction to this section while the following identifies some sample language that could be included to fill in the remainder of this section:

Purpose

The Command and Control section provides an overview of how incidents will be directed and controlled. It provides for critical actions essential to saving lives, protecting property, and restoring normal operations to the Airport. Because agencies from different disciplines have to work together to provide collateral support, a clearly defined central authority responsible for managing the overall response strategy to the emergency is essential. Therefore, the Command and Control of an incident at XX Airport follows the Incident Command System, an element of the Federal Emergency Management Agency (FEMA) National Incident Management System (NIMS), which is a management system design to enable effective and efficient domestic incident management by integrating a common organizational structure. Emergency response organizations will use this generally accepted national standard for on-scene Command and Control.

Situations and Assumptions

In this section the airport should describe the situations and conditions that would initiate the notification and the mobilization of response personnel.

Emergencies that shall be reported include the following:

- Aircraft emergencies and fires;
- Structural fires and non-structural fires;
- Fires at Fuel Farms;
- Bomb threats;
- Hijackings/threats of terrorism/hostage-takings;
- Fuel spills;
- Vehicle fires and accidents;
- Medical emergencies;
- Hazardous materials incidents;
- Floods and other natural disasters;
- Unusual odors or conditions;
- Suspicious behavior; and
- Suspicious packages.

Operations

In this section the airport should describe the Command and Control relationships of tasked individuals/organizations or agencies responding to an emergency. The overall incident command structure should be identified, specifying who will be in charge during each phase of emergency operations.

The type of incident shall define the command structure, as follows:

Type of Emergency	Incident Commander
Aircraft Accidents and Incidents (Crashes/Fire)	Fire Officer in Charge
Terrorism	Police Officer in Charge
Bomb Incidents	Police Officer in Charge
Non-structural/Vehicle Fire	Fire Officer in Charge
Fires at Fuel Farms/Storage Areas	Fire Officer in Charge
Structural Fire Incidents	Fire Officer in Charge
Natural Disasters	Airport Manager
Hazardous Materials/Fuel Spills	Fire Officer in Charge
Power Failure	Airport Manager
Water Rescue Situations (if applicable)	Fire Officer in Charge
Crowd Control/Evacuation	Police Officer in Charge
Sabotage/Hijack/Interference of Operations	Police Officer in Charge

An Emergency Operations Center (EOC) shall be established at the scene of the emergency. The EOC will be used to facilitate policy making, coordination, and overall direction of responding forces in emergency situations. Airport Management, Airport Rescue and Fire Fighting (ARFF), Town/City Fire, Town/City Police and
EMS agencies representatives will be directed to this area.

All personnel will be identified with reflective vests, ID badges or other media to identify emergency function and ensure personnel safety.

Emergency Response Organizations

Emergency response organizations will use the generally accepted national standard for on-scene Command and Control. This national standard is the Incident Command System (ICS).

The ICS was developed and designed to accommodate an "all hazards approach," from a minor aircraft incident/accident of a blown tire with no injuries to significant events such as earthquakes and or tornados that could close the airport. The basic concepts and principles of ICS include: common terminology, modular organization, integrated communications, unified command structure, consolidated action plan, manageable span of control, designated incident facilities, and comprehensive resource management. While there are several different ICS structures, varying in complexity and flexibility, most begin with the following modules which are based on five functions that should be performed at every emergency incident:

- Incident Commander.
- Operations.
- Planning.
- Logistics.
- Finance/Administration.

As identified in the previous section, the Incident Commander is scene specific. However, the function of the Incident Commander in all scenarios is the same: to direct and control personnel and equipment, as well as to provide overall management at a specific incident site, including public safety and public information.

Incident Command Staff Positions

- **Incident Commander** - The Incident Commander will be in charge of the incident/accident and shall exercise authority over all emergency forces, including airport units and those providing service through mutual assistance or letters of agreement. The Incident Commander is also responsible for scene safety, coordination with outside agencies, and dissemination of information to the news media.

- **Operations Section Chief** – The Operations Section Chief is responsible for coordinating the operations function including tactical operations at the incident scene such as developing staging areas and coordinating activities on behalf of the Incident Commander for mutual aid responders (EMS, Fire, Law Enforcement).

- **Planning Section Chief** – The Planning Section Chief is responsible for coordinating the planning function including the collection, evaluation, dissemination and use of information regarding the incident, as well as the status of resources used and needed at the incident scene.

- **Logistics Chief** – The Logistics Chief is responsible for coordinating the logistics function including the facilities, services, personnel, equipment, and material required to support the incident.

- **Finance Chief** – The Finance Chief is responsible for coordinating the finance/administration function including incident cost tracking, cost analysis, evaluation of other financial considerations and assuring appropriate reimbursement processes are initiated.

- **Safety Officer** – The Safety Officer is responsible for monitoring and assessing the safety hazards, unsafe situations response personnel may be exposed to, and develop and enforce measures to ensure their safety.

- **Public Information Officer** – The Public Information Officer is responsible for interfacing with the media and other appropriate agencies, including developing and disseminating complete and accurate information applicable to the incident.

- **Liaison Officer** – The Liaison Officer is responsible for serving as a point of contact with assisting or coordinating agencies to help avoid duplication of efforts and to ensure each agency is allowed to perform what it does best.

Assignment of Responsibilities

In this section the airport should describe the specific direction and control responsibilities that are assigned to each tasked organization or agency that may provide support during an airport incident/accident.

The following identifies some sample language that could be included in this section but more specific detail of responsibilities may be identified in the hazard specific section:

- Airport Manager
  - Ensure closure of the Airport, or sections thereof, when necessary.
  - Initiate proper notification and directs all responding agencies to ensure appropriate response in accordance with established plans and procedures.
  - Establish adequate records of the emergency.
  - Provides overall direction of response operations until an emergency scene is established and an Incident Commander assumes this responsibility.
  - Designates an Incident Commander to direct operations at the emergency scene, as appropriate.
  - Ensure safe continued airfield operations. The airport, or portions of the airport, that are closed during the emergency, will not be reopened until all provisions.
- Aircraft Rescue and Firefighting (ARFF)
  - When notified of an emergency, responds to the incident scene with appropriate personnel and firefighting/rescue equipment in accordance with standard operating procedures.
  - Identifies an initial Incident Commander and establishes an Incident Command Post, if appropriate; assigns appropriate personnel to Incident Command staff functions.
  - Performs Incident Command duties at the scene of the incident, as appropriate.
  - Manages fire/rescue resources, directs fire operations, conducts necessary rescue operations, and determines the need to evaluate the area in the vicinity of the scene or to initially shelter in place.
  - Alerts emergency response personnel of the presence of hazards at the scene.
- XX City/Town Police Department

  - Identifies an initial Incident Commander and establishes an incident command post, if appropriate; assigns appropriate personnel to Incident Command staff functions.
  - Performs Incident Command duties at the scene of the incident, as appropriate.
  - The XX Police Department will provide security for the airport and will ensure that all accident scenes are maintained to the original crash condition(s) except when removal of the entire aircraft, parts, or contents may be necessary to protect public safety. The NTSB has complete responsibility and authority for the accident scene after public safety issues have been resolved to the satisfaction of the Incident Commander.
  - Manages law enforcement resources and directs law enforcement operations, such as: Traffic control, evacuation assistance, scene access control, scene security, damage assessment.
- Public Information Officer
  - Performs interface with media regarding the emergency.
- Airport Tenants
  - In the event of an emergency response to an airfield incident, the airport tenant shall report to the Incident Commander or other designated official. Once liaison has been established with the XX Police Department, the tenant/FBO representative will, in the company of the XX Police personnel assigned as liaison, report to the Incident Commander.
  - The tenant representative will be responsible for providing the Incident Commander with a complete listing of passengers and crew and a complete cargo manifest noting the presence of any hazardous materials on board.
  - The tenant representative shall also have responsibility for the safety, security, and evacuation of the non-injured, injured, and fatalities, to proper areas upon release by the Incident Commander or his/her representative. It will also be the tenant's responsibility, with the consent and direction of Airport Management and the investigating agencies, to promptly remove the aircraft and have the area restored to its natural condition. The tenant is also responsible for implementing their family assistance plan and coordinating with Airport Management to assume responsibility for family assistance programs already under way.
- Add any additional as necessary

Administration and Logistics

In this section the airport should describe the administration and logistics support requirements of the Command and Control function.

- Administrative Support - this section should describe the records that are required to be maintained and describes the frequency and types of reports that are necessary. Examples include:
    - Reports relating to specific agencies' expenditures and obligations during emergency conditions.
    - Requirement to submit reports to the various levels of emergency management agencies (very often, reimbursement of expenditures is dependent upon report submission).
- Logistics Support - this section addresses the support arrangements (food, water, emergency power, fuel, equipment, supplies, etc.) of the organizations performing the direction and control functions. Letters of Agreement, if developed, should be referenced.

The following identifies some sample language that could be included in this section:

- Reporting of Expenditures
    - Each department shall thoroughly record all fuel, equipment, supplies and capital consumed during a disaster for reimbursement purposes.
    - All damage to airport facilities and equipment shall be thoroughly documented via photo, video for reimbursement and insurance claim purposes. If sufficient notification of a disaster exists, airport facilities shall be documented prior to the event.
    - All records of damaged equipment and facilities, resource consumption, and invoices shall be forwarded to the Finance and Administration Department for tracking.
- Reporting to Emergency Management Agencies
    - All events related to the emergency shall be chronologically logged by each responding department and agency. The information reported in the logs shall be forwarded to the appropriate emergency response agency, as required.
    - Routine and emergency status reports from field operations personnel shall be reported to the appropriate emergency response agency, as required. Status information shall be forwarded to other emergency management organizations, as required.
    - Airport status updates shall be submitted to the FAA, TSA, NTSB, NH Bureau of Aeronautics and FEMA as required.
    - Mutual aid agencies shall report status updates and coordinate response efforts with their respective emergency response agency, as required.
- Support Arrangements

- The airport has entered into a mutual aid agreement with XXX. Through this agreement the airport can request additional law enforcement, fire/rescue and medical services. The mutual aid agreement is provided in Exhibit XX.
- Emergency access to food and beverages is available through a letter of understanding with XXX. See Exhibit XX.
- Emergency fuel, equipment, and generators are available through the XXX.
- The airport terminal building, airfield lighting vault, airport fire station, air traffic control tower, and navigation aids are all equipped with back-up electrical generators.

Plan Development and Maintenance

In this section the airport should describe who is responsible for coordinating the revision of the Command and Control Section, including attachments and SOPs.

Authorities and References

In this section the airport should list all authorities and references. These should include, but not be limited to:

- Mutual Assistance Agreements (MAA)
- Memorandum of Understanding (MOU)
- Service Support Contracts (SSC)
- Implementation Plans

Communications

The information developed for this section should address the processes used to reliably and efficiently transfer, delineate, and disseminate information from one point to another during emergency situations.

The following identifies some sample language that could be included to fill in the remainder of this section.

Purpose

The purpose of the Communications Section is to provide information on establishing, using, maintaining, enhancing, and providing redundancy for all types of communications devices needed during emergency response operations.

The purpose of this section is to instruct Airport employees on how to report emergencies and identify the means of notifying emergency responders that an emergency condition exists.

Situations and Assumptions

Activation of emergency communication systems can occur during any type of airport emergency. Each type of emergency requires different types of communications systems to address the emergency. The Alert Notification Section should detail the types of situations that warrant activation of emergency communications. Most alert notification and warning systems can also serve as emergency communication systems.

Operations

In this section the airport should describe the methods used to communicate between the Emergency Operations Center (EOC), field forces at a specific incident scene (operating under an Incident Command System or other direction and control system), control centers of emergency response organizations (e.g., fire, police, EMS dispatch centers), radio/TV stations, hospitals, amateur communications networks, adjacent communities, military installations, and other private and public sector organizations.

It should address provisions for redundancy (sometimes termed primary and secondary backup systems) and integration in all areas of information flow, including equipment and the people that will operate that equipment. For example you can use the following text:

- Communications
  - Communications between the EOC, Incident Command Post, and field units are primarily conducted through the 800mhz radio system. Radio frequencies (CT, CTAF, FSS, etc…)
  - Crash phone in the Air Traffic Control Tower
  - As an alternate, cellular phones and runners may be used when necessary.
- Redundancy
  - In the event the XX Airport trunking radio system fails, or if radios are out of range, they can operate on a conventional direct non-trunking mode.
  - Channels XX, XX, XX are designated as non-trunking channels for law enforcement, fire, EMS and Government.
- Terminology
  - All responding units shall use plain language in all radio communications.
  - Specialized terminology in including 10 codes, police, fire and aviation jargon will be avoided whenever possible.
- Interoperability
  - Channels XX through XX and XX through XX are the same on all XX City/Town public safety agency radios.

Assignment of Responsibilities

In this section the airport should describe the specific communications responsibilities that are assigned to tasked organizations. The following identifies some sample language that could be included to fill in the remainder of this section:

- Airport Manager
    - Designate a Communications Coordinator to report to the EOC when required.
    - Ensure adequate and appropriate communications systems are in place.
- Communications Coordinator
    - Manage the communications section in the EOC and supervises all personnel assigned to it.
    - Supports media center communications, as needed.
    - Ensures communications section in the EOC has the capability to sustain operations around the clock.
    - Maintains a chronological event log.
    - Establishes a secondary communications center.
- Tasked Organizations
    - Maintain existing equipment and follow established procedures for communicating with their organization personnel performing field operations.
    - Keep the EOC informed of their respective operations at all times.
    - Ensure redundant and interoperable communications capability.
    - Clear, repair, and perform maintenance on all equipment before returning to normal operations or storage.

Alert Notification

The Alert Notification section addresses the processes used to notify and warn emergency response agencies, airport employees and tenants, and the general public of potential or actual emergency situations.

The following identifies some sample language that could be included to fill in the remainder of this section.

Purpose

In this section the airport should provide information which identifies the methods and sequences to be used in notifying all appropriate airport personnel of an emergency situation on, or in the vicinity of, the airport. It describes the various alert and warning systems and equipment available at the airport, how and under what conditions they are to be used, and who is responsible for them, to include activation/de-activation and testing/maintenance.

Situations and Assumptions

In this section, the airport should describe the general kinds of conditions that could warrant the activation of an alert and warning system. It should also describe the special conditions present at the airport which may impact system design or use, i.e., emergency access doors leading to the Air Operations Area or other security area. It may also describe those situations where coordination with off-airport agencies is necessary and beneficial.

The following identifies some sample language that could be included to fill in the remainder of this section.

The various alert notification and warning systems at the XX Airport are designed for use in emergency and non-emergency situations. The systems are capable of handling airport emergencies without substantial limitation.

Typically, the following emergencies should be reported:

- Aircraft Emergencies and Fires
- Structural and non-structural fires
- Fires at Fuel Farms
- Bomb threats
- Hijackings/Threats of terrorism/hostage-takings
- Fuel Spills
- Vehicle fires and accidents
- Medical emergencies
- Hazardous Material incidents
- Natural Disasters
- Unusual odors or conditions
- Suspicious behavior
- Suspicious packages

Operations

In this section the airport should provide general information on the process of how the alert and warning system is to be used at the airport. The following identifies some sample language that could be included to fill in the remainder of this section.

The responsibility to notify essential personnel and agencies is largely dependent on the type and severity of an incident. The airport should provide a list of typical notification responsibilities based on common airport emergencies.

Assignment of Responsibilities

Once an emergency situation is identified, quick notification and exchange of information is crucial. This section should describe specific responsibilities that are assigned to tasked organizations for each type of emergency.

- Airport Manager
  - Identifies individuals who have the specific responsibility and authority to initiate manually activated alert and warning systems.
  - Ensures preparation of contingency plans to provide alert and warning if the established system fails to work.

- All Tasked Organizations. Upon receipt of an alert signal or warning message, initiate internal notification procedures to:
  - Notify all employees and other volunteers assigned to emergency response duties of the emergency situation.
  - As appropriate to the situation:
    - Suspend or curtail normal business activities.
    - Notify and recall essential off-duty employees.
    - Send non-critical personnel home.
    - Evacuate the organization's facilities.
  - If appropriate, augment the alert and warning effort through the use of vehicles or personnel equipped with public address systems to deliver the alert signal and warning message.

Chapter 3 – Hazard Specific Sections

The Hazard Specific Sections are designed to meet the specific planning needs of a particular hazard. In this section, airports should include unique response actions that pertain to a specific type of emergency. These sections should be treated as stand alone documents such that they can be pulled out of the AEP and used alone without referring to the Basic Plan.

The responsibility of deciding what should be included in this section of the AEP relies on the Airport Planning Team.

This section of the template contains checklists describing the actions and tasks each organization involved in the emergency will have to perform. This information comes straight from the Advisory Circular (AC) 150/5200_31C.

The list below identifies hazards typically found under this section of the AEP; however, again, it is up to each individual airport to determine what should be included in their AEP.

- Aircraft Incidents
- Terrorism Incidents
- Structural Fires, Fuel Farms and Fuel Storage Areas
- Natural Disasters
- Hazardous Materials Incidents
- Sabotage, Hijack and Unlawful Interference with Operations
- Failure of Power for Movement Area Lighting
- Water Rescue Situations

The following identifies elements typically found in the response to each kind of hazard:

- General Information (if applicable)
- Purpose
- Operations (if applicable)
- Responsibilities of individuals and organizations involved as well as actions to be taken by each of them.

Aircraft Incidents/Accidents

General Information

In this section, airports should include aircraft accident and incident related definitions as well as any other general information they deem important in helping with the understanding of this particular emergency.

The following identifies some sample language that could be included in this section.

An **Aircraft Accident** is any occurrence associated with the operation of an aircraft that takes place between the time a person boards the aircraft with the intention of flight and the time such person has disembarked, in which a person suffers death or serious injury as a result of the occurrence or in which the aircraft, including cargo aircraft, receives substantial damage. [2]

An **Aircraft Incident** is an occurrence other than an accident that affects or could affect the safety of operations. [3]

Airport Operators should have an emergency plan for airport accidents or incidents that could occur on or off the airport.

Purpose

In this section, airports should define responsibilities of individuals and agencies involved in the event of an aircraft accident or incident that affects the safety of operations at an airport.

The following identifies some sample language that could be included in this section.

Operations

In this section, airports should give an explanation with respect to the manner in which an aircraft accident or incident will be dealt with. Typically, upon being notified about the emergency (either by the Pilot-in-Command or the Aircraft Owner or anyone else involved in the aircraft emergency), Air Traffic Control should instantly notify the Incident Commander (in this case it would be the Fire Officer in charge) from either Aircraft Rescue Fire Fighting or the Local Fire Department, who will then take proper action in dealing with the emergency situation and will notify all the other organizations involved.

[2] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, June 19, 2009, p. 109
[3] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, June 19, 2009, p. 109

When calling the Fire Department, the following information is usually provided:

- Aircraft Identification
- Aircraft Type
- Fuel on Board
- Nature of emergency
- Number or crew/passengers aboard
- Location/Runway to be used
- Unusual hazards on board such as explosives, munitions, radioactive materials, etc.
- Wind direction and velocity

A classification system is typically developed in order to help understand the urgency of the situation. The following is a sample classification that the AEP Planning team can use as a guideline to develop their own classification system:

- **Alert I (Local Standby Alert):** An aircraft that is known or suspected to have an operational defect that should not normally cause serious difficulty in achieving a safe landing. This is notification only. No response is required. All units involved will be manned and will standby in quarters.
- **Alert II (Full Emergency Alert):** An aircraft that is known or is suspected to have an operational defect that affects normal flight operations to the extent that there is danger of an accident. All units respond to pre-designated positions.
- **Alert III (Aircraft Accident Alert):** An aircraft incident/accident has occurred on or in the vicinity of the airport. All designated emergency response units proceed to the scene in accordance with established plans and procedures.[4]

Assignment of Responsibilities

In this section, airports should describe actions to be taken by all parties involved in the event of an aircraft accident or incident on the airport or within its vicinity. The following are examples of those responsibilities, duties and actions as drawn from Advisory Circular AC 150/5200_31C.

- Airport Traffic Control Tower
  - Activate the appropriate alarm notification system.
  - Issue appropriate NOTAMs as requested by the airport operator or as established by Letter of Agreement.
  - Control aircraft and ground vehicle operations on the airport in support of the emergency response, if the airport remains open.
  - Control airspace in the vicinity of the incident/accident to ensure other aircraft do not interfere with emergency response activities.

[4] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, June 19, 2009, p. 110

  - Make appropriate FAA notifications.
  - Use of a Discrete Emergency Frequency during in-flight emergencies whenever possible provides precise communications between the ARFF IC and emergency aircraft.

- Firefighting and Rescue.
  - Respond to aircraft incident/ accident location in accordance with established policies and procedures.
  - Assume lead in Incident/Unified Command System for initial fire and rescue operations in accordance with established policies and procedures.
  - Ensure appropriate mutual aid emergency response organizations have been notified and are taking appropriate action.

- Law Enforcement/Security.
  - Initiate and maintain appropriate Traffic and Access Control.
  - Provide scene support and security.
  - Assist with/provide AOA access control and escort.
  - Ensure appropriate mutual aid organizations have been notified and are taking appropriate action.
  - Provide necessary investigative support.

- Emergency Medical Services.
  - Provide necessary triage and on-scene initial treatment of casualties.
  - Ensure appropriate mutual aid organizations have been notified and are taking appropriate action.
  - Provide for the movement (land, water, air) of casualties to appropriate treatment facilities as expeditiously as possible.
  - Maintain an accurate list of casualties and their respective destination treatment facilities.
  - Coordinate with the involved air carrier the transportation of the uninjured to the designated holding area.
  - Arrange for restocking of medical supplies, as necessary.

- Airport Operator.
  - Designate hangars or other key buildings on the airport or in the communities it serves that will be used to accommodate uninjured, injured, and deceased persons.
  - Activate the EOC, as needed.
  - Ensure all appropriate notifications have been made, including:
    - National Transportation Safety Board (NTSB).
    - FAA.
    - Airport response personnel.
    - FEMA, FBI, Military Services, etc.
  - Provide emergency support services, as requested, through the EOC.

- Ensure emergency response personnel have received appropriate equipment and training.
- Ensure that supporting emergency response agencies (fire, medical, law enforcement, etc.) have responded.
- Coordinate response actions, with the ATCT.
- Determine need to totally/ partially close the airport and issue appropriate NOTAMs.

- Aircraft Owner/Operator or Designated Representative.
  - Provide pertinent information to Incident Commander, to include:
    - Number of persons on board.
    - The presence and location of any dangerous goods.
  - Provide EOC representation.
  - Make necessary notifications, to include the FAA and NTSB.
  - Arrange for appropriate passenger services6, to include:
    - The transportation of uninjured passengers/crew members.
    - Adequate holding facilities for uninjured passengers/crew members.
    - Commissary items, telephone facilities, clothing, and additional medical services, as needed.
    - Facilities for friends and families of victims/passengers.
    - Passenger/crew accountability and tracking.
    - Hotel and/or other alternative travel arrangements for passengers.

Disabled Aircraft Removal Procedures

In this section, airports should help establish the responsibilities and procedures for the removal of disabled aircraft from a local Airport that may directly or indirectly interfere with safe flight operations. Aircraft may be immobilized on airport surfaces for reasons such as engine failure, failed tire(s), brake malfunction, damage due to landing, takeoff or taxiing accident, etc… If an aircraft is damaged during the accident or incident, an investigation will be required. The aircraft or its parts should not be moved until released by an authorized representative of the appropriate investigative agency.

The National Transportation Safety Board (NTSB), FAA Flight Standards District Office (FSDO), and the NH Bureau of Aeronautics take care of the required investigations.

The following identifies some sample language that could be included in this section.

Preservation of Aircraft Wreckage, Mail, Cargo, and Records

The operator of an aircraft is responsible for preserving to the extent possible all aircraft wreckage, cargo, and mail aboard the aircraft and all records, including those of flight recorders, pertaining to the operation and maintenance of the aircraft, and to airmen involved in an accident or incident for which notification must be given until the NTSB or its authorized representative takes custody.

Prior to the time the NTSB or its authorized representative takes custody of aircraft wreckage, mail, or cargo, such wreckage, mail, and cargo may be disturbed or moved only to the extent necessary:

- To remove persons injured or trapped.
- To protect the wreckage from further damage, or
- To protect the public from injury.

Where it is necessary to disturb or move aircraft wreckage, mail, or cargo; sketches, descriptive notes, and photographs shall be made, if possible, of the accident locale, including original position and condition of the wreckage and any significant impact marks.

Custody of the Aircraft

The FSDO, when delegated, will take custody of the aircraft and its contents from the time the accident occurs until their full investigation is completed or a release is given. In most cases the NTSB or FSDO will, after their initial investigation of the accident, authorize the removal of the damaged aircraft to a selected place for further investigation. Custody of the aircraft is still retained by the two agencies. It is important that any secondary damage (damage experienced during recovery) be recorded by the operator for investigation purposes. Following its full investigation, or at any given time determined by the NTSB, the NTSB will issue a "Release" of the aircraft to the operator. That is, the NTSB releases its custody of the aircraft, freeing the operator to move the aircraft or make arrangements for its removal.

Aircraft Removal

Once cleared by the FAA/NTSB, if applicable, the tenant, operator, or pilot of an aircraft involved in any accident shall be responsible for the prompt removal of the damaged aircraft. In the event of failure to comply with such directions, such damaged or disabled aircraft and parts may be removed by direction of the Airport Manager at the operator’s expense and without liability for damage that may result in the course of such removal. Aircraft recovery/removal will be coordinated with the Airport Manager.

Aircraft Removal Responsibilities

- Airport Management
    - Airport Management will determine if the disabled aircraft, due to its location, is jeopardizing safety of flight operations and if necessary will close all or any part of the airport where hazardous conditions prevail to ensure continued safety.
    - Close Airport runways and / or affected surfaces as required.
    - Ensure proper notifications, to include federal agencies, if applicable.
    - Coordinate all field operations with the Air Traffic Control Tower for continuance of flight operations where possible.
    - Arrange for escorts or transportation of passengers and crew if required.

- City Police Department
    - Provide security at the emergency site
    - Provide liaison for the airline or tenant

- Tenant/FBO
    - The tenant/FBO company must have a basic recovery plan ready to meet such an emergency.
    - The tenant will designate one official with the capacity and authority to make all decisions, technical and financial, necessary to promptly remove and recover the aircraft.
    - The company recovery official will coordinate with Airport management for the implementation of the airline's plan for prompt removal of the aircraft.
    - The prompt removal of the aircraft and all costs associated with the recovery, including contractor charges, airline rental, service company equipment charges, and airport property damage, etc., is the responsibility of the airline involved.

- General Aviation Aircraft Owners / Pilot's Responsibility
    - Designate one person with the capacity and authority to make all decisions, technical and financial, necessary to promptly remove and recover the aircraft. He must have all required company facilities, including personnel and equipment, made available to him.

- The responsible party will coordinate with Airport management and the fixed base operator to develop a comprehensive plan for the prompt removal of the aircraft.
- The fixed base operator must have a basic recovery plan ready to meet such an emergency.
- The prompt removal of the aircraft and all costs associated with the recovery, including contractor charges, airline rental and service company equipment charges, airport property damage, etc., is the responsibility of the aircraft owner or operator.

Terrorism

General Information

Though this is not mandatory, airports may include a general statement about terrorism incidents. Every airport is a potential target for a terrorism threat. The threat can be received against the airport, an aircraft, an aircraft owner/operator, or any other agency operating at the airport. This hazard section should address two types of terrorist threats: **Aircraft Bomb Threat** and **Building Bomb Threat**.

Purpose

In this section, airports should define responsibilities of individuals and agencies involved in the event of a terrorism incident.

The following identifies some sample language that could be included in this section.

Operations

With respect to terrorism, the Chief Police Officer in Charge will be the Incident Commander, and he/she solely has the right to make an independent declaration of emergency.

Upon receiving news about a bomb threat, the following organizations will be notified:

- Local Police Department
- Transportation Security Administration
- Federal Bureau of Investigation
- Fire Department
- Aircraft Owner/Operator (in case of an Aircraft Bomb Threat)
- Air Traffic Control
- County/Town Emergency Management

With a Bomb Threat Situation, the following questions should be asked when dealing with the situation:

- When is the bomb going to explode?
- Where is it right now?
- What does it look like?
- What kind of bomb is it?
- What will cause it to explode?
- Did you place the bomb?
- What is your address?
- What is your name?

- What is the exact wording of the threat?
- What is the exact sex, race, and age of the caller?
- What was the length in time of the call?
- What was the number at which the call was received?
- What time and date was the threat received?
- Was the caller's voice familiar? If so, who did he sound like?
- Was the caller's voice calm, angry, excited, slow, rapid, soft, loud, laughter, crying, normal, distinct, slurred, nasal, stutter, lisp, raspy, deep, ragged, clearing throat, deep breathing, cracking, disguised, accent, familiar, or whispered?
- Did you hear any background sounds?
- Was the threat language well spoken, foul, irrational, incoherent, taped or read like a rehearsed message?

Assignment of Responsibilities

In this section, airports should describe actions to be taken by all parties involved in the response to a terrorism incident, whether it is an aircraft bomb threat or a building bomb threat. The following are examples of those responsive actions as described in the Advisory Circular 150/5200_31C:

Aircraft Bomb Threat

The **Airport Director** or Tenant should do the following:

- Establish an isolation zone on the airport and clear it of all unauthorized personnel
- Passengers should leave baggage and cargo on the aircraft, and all persons should be detained until cleared by the designated law enforcement personnel
- Notify the Bomb Squad and Police Department by telephone (911 or XXX-XXX-XXXX), the FBI (XXX-XXX-XXXX), as well as the TSA (XXX-XXX-XXXX)
- Notify the person(s) or firm in ownership of the aircraft
- Issue appropriate NOTAM(s)

The **Police Department** should do the following:

- Call assistance for explosive technicians and dog team
- Ensure that Airport Management and all other component of Fire Department are notified
- Provide police officers for scene security and enforce public safety requirements
- Provide escort and communication support to airport Tenant/FBO

The **Fire Department** should do the following:

- Stage fire station

- Provide assistance for aircraft evacuation and search of explosives
- If bomb detonation occurs, assume role of Incident Commander and be responsible for fire suppression and rescue procedures.

Building Bomb Threat

The **Airport Tenant/FBO** should do the following:

- Tenant/FBO receiving a bomb threat should first complete as much of the Bomb Threat Checklist b) Call 911 and pass along all pertinent information utilizing the Bomb Threat Checklist.
- Notify owner/operator of building.
- After consultation with local Police Department, make decision whether or not to evacuate and search premises and so notify agencies concerned.

The **Owner/Operator** of the Building should do the following:

- After consultation with the local Police, make decision whether or not to evacuate and search all or portion of building and so notify agencies above.
- Advise Police when evacuation and search is complete.

The local **Fire Department** should do the following:

- Stage the fire station.
- If a bomb detonation results, assume role as Incident Commander.

The local **Police Department** should do the following:

- Dispatch police officers to scene to establish perimeter and assist with investigation.
- The local Police senior officer of rank should establish command post with Fire Department and Airport Management personnel.
- Dispatch bomb technicians and explosives detecting canines. Only bomb technicians and bomb K-9 handlers/K-9s will operate in the "hot zone" of a suspected explosive device.
- Evacuation perimeters and explosives-rendered-safe procedures will be at the direction of the Police Officer in Charge.
- Notify FBI and TSA.
- If a bomb detonation occurs, comply with structural fire procedures under the direction of the Fire Department

Structural Fires, Fuel Farm and Fuel Storage Areas

General Information

In this section, airports may include definitions and other general information related to structural fire, fuel farm, and fuel storage areas incidents similar to the text below.

Structural fires are fires occurring at or in airport properties, structures, facilities, buildings, equipment, and or infrastructure support systems.

Fuel farm and **fuel storage area fires** are fires occurring in fuel storage facilities.[5]

Purpose

In this section, airports should define the responsibilities and actions to be taken in the event of a structural fire.

Operations

In this section, airports may include a description of the overall approach to the structural fire emergency. Airports must mention the Fire Officer in charge will be the Incident Commander, and emphasize that he will be guiding the entire emergency response.

Assignment of Responsibilities

In this section, airports should describe actions to be taken by all parties involved in the response to a structural fire. The following are examples of those actions and responsibilities as described by the Advisory Circular AC 150/5200_31C:

- Airport Traffic Control Tower
  - If involved in a fire emergency, inspect FAA owned/operated/maintained facilities for damage and operability.
  - Provide information and directions to aircraft operators, as appropriate.
  - Provide necessary air and ground traffic control support for emergency response activities, as necessary.
  - Issue appropriate NOTAM if requested by authorized airport personnel.

- Airport Operator
  - Provide notification to appropriate agencies.
  - Implement protective actions for the public and employees, when necessary.
  - Coordinate response activities with airport tenants and local jurisdictions, as needed.

[5] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, June 19, 2009, p. 130.

  - Coordinate/provide news releases and other interface with the media, as needed.
  - Activate the EOC, as needed.

- Firefighting and Rescue
  - Respond to alarms/fires in accordance established policies and procedures.
  - Provide Incident Command at fires involving airport structures.
  - Determine need to evacuate, or perform other public protective action, for the occupants of any facility impacted by the fire.
  - Apply appropriate firefighting agents to any fire involving fuel, if requested by the Incident Commander.

- Law Enforcement/Security
  - Provide crowd and traffic control, as needed.
  - Provide continued law enforcement and security services on the airport, as needed, including those prescribed in the Airport Security Program required by 49 CFR Part 1542, Airport Security.

- Emergency Medical Services - Provide emergency medical services, as needed.

- Airport Maintenance.
  - Assist/provide critical services, including utility support (activation/cut-off), as needed.
  - Provide safety inspections, as needed.
  - Assist in facility restoration.

- Airport Public Information/Community Relations
  - Interface with the media, as conditions warrant.
  - Provide news releases relative to the airport's operational capability.
  - Assist with the interface with other airport tenants.

- Airport Tenants - Provide assistance on a voluntary basis or in accordance with established agreements.

Natural Disasters

General Information

In this section, airports should include any definitions and other general information related to natural disaster emergencies.

The following identifies some sample language that could be included in this section.

A **hurricane** is a severe tropical storm that has sustained winds of 74 miles per hour (mph) or greater and primarily occurs along the United States gulf coast, the eastern Atlantic seaboard, and the Pacific west coast, Hawaii, in the Caribbean, or in the Pacific and along the west coast of Mexico. They are often referred to as cyclones or typhoons in other parts of the world. The hurricane season runs from the first of June until the end of November, however, a hurricane can happen in any month.[6]

An **earthquake** is a sudden, violent shaking or movement of part of the earth's surface caused by the abrupt displacement of rock masses, usually with the upper 10 to 20 miles of the earth's surface and can occur in any portion of the world.[7]

A **tornado** is a violent storm phenomenon that consists of violent whirling wind accompanied by a funnel-shaped cloud. Usually, tornadoes are associated with severe weather conditions such as thunderstorms and hurricanes. Tornadoes can be extremely destructive. The average width of a tornado is 300 to 500 yards. Their path may extend up to fifty miles, and the funnel cloud moves at ground speeds between 10 and 50 mph. The wind speed within the funnel cloud has been estimated at between 100 and 500 mph.

Roughly two percent of all tornadoes are "violent" tornadoes, with wind speeds of 300 mph or more, an average path width of 425 yards, and an average path length of 26 miles. Tornado season runs from March to August in the United States, with peak activity from April to June; however, tornadoes can occur year-round.[8]

A **flood** occurs when normally dry land becomes inundated with water. Sources of the water may be the result of natural bodies of water overflowing their banks, including artificial ones like dams or levees; structural failure of dams and levees, rapid accumulation of runoff or surface water; hurricane-caused storm surges or earthquake-caused tsunamis; or erosion of a shoreline.

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[6] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, June 19, 2009, p. 136
[7] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, June 19, 2009, p. 150
[8] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, June 19, 2009, p. 160

Floods are the results of a multitude of naturally occurring and human-induced factors, but they all can be defined as the accumulation of too much water in too little time in a specific area. Several types of floods can occur. These include regional, flash, storm-surge, dam and levee-failure, and debris, landslide, and mudflow floods. [9]

Purpose

In this section, airports should include a statement defining the responsibilities to be taken in the event of an emergency caused by a natural disaster, whether it is a hurricane, an earthquake, or a tornado.

Operations

In this section, airports can explain the overall approach to this particular emergency situation, giving details about what should be done, who should be in charge, and so on.

Assignment of Responsibilities

In this section, airports should include and describe all the actions to be taken by the individuals and organizations involved in the response to a natural disaster emergency. The following are examples of those responsibilities for each type of natural disaster mentioned above, taken straight from the Advisory Circular AC 150/5200_31C:

Hurricane

- Airport Traffic Control Tower
    - Inspect FAA owned/operated/ maintained facilities for damage and operability.
    - Restrict aircraft operations on the airport until the runway(s), taxiways, and ramps have been inspected by the airport owner/operator.
    - Issue appropriate Notice to Airmen (NOTAM) upon receipt of information from authorized airport personnel, if requested.

- Firefighting and Rescue
    - Conduct fire suppression and rescue operations, as needed.
    - Assist in providing emergency medical assistance, as needed.
    - Check for petroleum leaks and other potential HAZMAT problems.
    - Survey ARFF property to:
        - Determine integrity of building(s).
        - Assess status of gas, electricity, water, and sanitation.
        - Test all telephones and notification systems.
        - Test apparatus mounted radios.
        - Test station and portable radios.

[9] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, June 19, 2009, p. 177

        - Test alerting system(s).
        - Prepare sand bags to prevent entry of water into key station areas.
        - Secure outside storage areas and equipment.
    - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
    - Review personnel requirements and adjust accordingly.
    - To the degree communications systems will permit, coordinate activities with local community fire departments, if necessary.
    - Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Law Enforcement/Security
    - Provide for overall traffic control in support of evacuation operations, as needed.
    - Provide continued law enforcement and security services on the airport, as needed, including those required by 49 CFR part 1542, Airport Security.
    - Survey law enforcement property, to:
        - Determine integrity of building(s).
        - Assess status of gas, electricity, water, and sanitation.
        - Test all telephones and notification systems.
        - Test apparatus mounted radios.
        - Test station and portable radios.
        - Test alerting system(s).
        - Prepare sand bags to prevent entry of water into key building areas.
        - Secure outside storage areas and equipment.
    - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
    - Review personnel requirements and adjust accordingly.
    - To the degree communications systems will permit, coordinate activities with local community law enforcement agencies, if necessary.
    - Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Emergency Medical Services
    - Organize the necessary action for triage and treatment of any casualties.
    - Provide for the transportation (air, land, or water) of casualties to designated medical facilities.
    - Survey EMS property, to:
        - Determine integrity of building(s).
        - Assess status of gas, electricity, water, and sanitation.
        - Test all telephones and notification systems.
        - Test apparatus mounted radios.
        - Test station and portable radios.
        - Test alerting system(s).
        - Prepare sand bags to prevent entry of water into key facility areas.

        - Secure outside storage areas and equipment.
    - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
    - Review personnel requirements and adjust accordingly.
    - To the degree communications systems will permit, coordinate activities with local community EMS units, if necessary.
    - Maintain an accurate list of the casualties to include names and addresses.
    - Provide medical analysis of walking wounded or traumatized patients.
    - Provide for the restocking of medical supplies, as needed.
    - Provide Critical Incident Stress Management support, as appropriate.
    - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.

- Airport Operator
    - Operations
        - Conduct airfield inspections, as needed.
        - Issue appropriate NOTAM(s), if conditions warrant and permit.
        - Activate the Airport Emergency Operations Center (EOC), as appropriate.
        - Provide emergency support services through the EOC.
        - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
        - Review personnel requirements and adjust accordingly.
        - To the degree communications systems will permit, coordinate activities with local community emergency management agencies, if necessary.
        - Coordinate activities with the ATCT, as needed.
        - Interface with, coordinate, and utilize as needed, the resources made available by other airport tenants, including air carriers.
        - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
    - Maintenance
        - Assist/provide critical services, including utility support (activation/cut-off), as needed.
        - Provide safety inspections, as needed.
        - Assist in facility restoration.
        - Provide sanitation support services.
        - Assist in the provision of required resources.
        - Participate in EOC operations.
        - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
    - Administration
        - Provide procurement services.
        - Provide appropriate budgeting, payment, and cost recovery authorization and services.
        - Provide personnel services.

        - Participate in EOC operations.
    - Public Information/Community Relations
        - Interface with the media, as conditions warrant.
        - Provide news releases relative to the airport's operational capability.
        - Assist with the interface with other airport tenants.
        - Participate in EOC activities.

- Aircraft Owners/Operators
    - Provide EOC representation, as needed.
    - Provide for the initial notification to families of casualties.
    - Provide for passenger casualty tracking.
    - Inspect tenant owned, operated, or maintained facilities for damage and operability.

- Airport Tenants
    - Provide assistance on a voluntary basis or in accordance with established agreements.
    - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
    - Inspect tenant owned, operated, or maintained facilities for damage and operability.

Earthquake

- Airport Traffic Control Tower
    - Inspect FAA owned, operated, or maintained facilities for damage and operability.
    - Restrict aircraft operations on the airport until the runway(s), taxiways, and ramps have been inspected by the airport owner/ operator.
    - Issue appropriate Notice to Airmen (NOTAM) upon receipt of information from authorized airport personnel, if requested.

- Firefighting and Rescue
    - Move equipment outside.
    - Conduct fire suppression and rescue operations, as needed.
    - Assist in providing emergency medical assistance, as needed.
    - Check for petroleum leaks and other potential hazardous materials problems.
    - Survey ARFF property, to:
        - Determine integrity of building(s).
        - Assess status of gas, electricity, water, and sanitation.
        - Test all telephones and notification systems.
        - Test apparatus mounted radios.
        - Test station and portable radios.
        - Test alerting system(s).

- Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
- Review personnel requirements and adjust accordingly.
- To the degree communications systems will permit, coordinate activities with local community fire departments, if necessary.
- Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Law Enforcement/Security
  - Provide for overall airport security as soon as possible.
  - Provide for overall traffic control, including coordination with mutual aid law enforcement agencies.
  - Provide continued law enforcement and security services on the airport, as needed, including those required by 49 CFR part 1542, Airport Security.
  - Survey law enforcement property, to:
    - Determine integrity of building(s).
    - Assess status of gas, electricity, water, and sanitation.
    - Test all telephones and notification systems.
    - Test apparatus mounted radios.
    - Test station and portable radios.
    - Test alerting system(s).
  - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
  - Review personnel requirements and adjust accordingly.
  - To the degree communications systems will permit, coordinate activities with local community law enforcement agencies, if necessary.
  - Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Emergency Medical Service
  - Move equipment outside.
  - Organize the necessary action for triage and treatment of the casualties.
  - Provide for the transportation (air, land, or water) of casualties to designated medical facilities.
  - Survey EMS property, to:
    - Determine integrity of building.
    - Determine status of gas, electricity, water, and sanitation.
    - Test all telephones and notification systems.
    - Test apparatus mounted radios.
    - Test station and portable radios.
    - Test alerting system(s).
  - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
  - Review personnel requirements and adjust accordingly.

- To the degree communications systems will permit, coordinate activities with local community EMS units, if necessary.
- Maintain an accurate list of the casualties to include names and addresses.
- Provide medical analysis of walking wounded or traumatized.
- Provide for the restocking of medical supplies, as needed.
- Provide Critical Incident Stress Disorder support, as appropriate.
- Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Airport Operator
    - Operations
        - Conduct airfield inspections, as needed.
        - Issue appropriate NOTAM(s), if conditions warrant and permit.
        - Activate the Airport Emergency Operations Center (EOC), as appropriate.
        - Provide emergency support services through the EOC.
        - Assist in support operations, to include search, inspections, personnel account-ability, and protective action implementation.
        - Review personnel requirements and adjust accordingly.
        - To the degree communications systems will permit, coordinate activities with local community emergency management agencies, if necessary.
        - Coordinate activities with the ATCT, as needed.
        - Interface with, coordinate, and utilize as needed, the resources made available by other airport tenants, including air carriers.
        - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
    - Maintenance
        - Assist/provide critical services, including utility support (activation/cut-off), as needed.
        - Provide safety inspections, as needed.
        - Assist in facility restoration, including debris removal.
        - Provide sanitation support services.
        - Assist in the provision of required resources.
        - Participate in EOC operations.
        - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
    - Administration
        - Provide procurement services.
        - Provide appropriate budgeting, payment, and cost recovery authorization and services.
        - Provide personnel services.
        - Participate in EOC operations.
    - Public Information/Community Relations
        - Interface with the media, as conditions warrant.
        - Provide news releases relative to the airport’s operational capability.

        - Assist with the interface with other airport tenants.
        - Participate in EOC activities.

- Aircraft Owners/Operators
    - Provide EOC representation, as needed.
    - Provide for the initial notification to families of casualties, if appropriate.
    - Provide for passenger casualty tracking.
    - Inspect facilities owned/operated or maintained by these tenants.

- Airport Tenants
    - Provide assistance on a voluntary basis or in accordance with established agreements.
    - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
    - Inspect facilities owned/operated or maintained by these tenants

Tornado

- Airport Traffic Control Tower
    - Inspect FAA owned, operated, and maintained facilities for damage and operability.
    - Restrict aircraft operations on the airport until the runway(s), taxiways, and ramps have been inspected by the airport owner/ operator.
    - Issue appropriate Notice to Airmen (NOTAM) upon receipt of information from authorized airport personnel, if requested.

- Firefighting and Rescue
    - Conduct fire suppression and rescue operations, as needed.
    - Assist in providing emergency medical assistance, as needed.
    - Check for petroleum leaks and other potential hazardous materials problems.
    - Survey ARFF property, to:
        - Determine integrity of building(s).
        - Assess status of gas, electricity, water, and sanitation.
        - Test all telephones and notification systems.
        - Test apparatus mounted radios.
        - Test station and portable radios.
        - Test alerting system(s).
    - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
    - Review personnel requirements and adjust accordingly.
    - To the degree communications systems will permit, coordinate activities with local community fire departments, if necessary.
    - Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Law Enforcement/Security
    - Provide continued law enforcement and security services on the airport, as needed, including those required by 49 CFR part 1542, Airport Security.
    - Survey law enforcement property, to:
        - Determine integrity of building(s).
        - Assess status of gas, electricity, water, and sanitation.
        - Test all telephones and notification systems.
        - Test apparatus mounted radios.
        - Test station and portable radios.
        - Test alerting system(s).
    - Assist in support operations, to include search, inspections, personnel account-ability, and protective action implementation.
    - Review personnel requirements and adjust accordingly.
    - To the degree communications systems will permit, coordinate activities with local community law enforcement agencies, if necessary.
    - Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Emergency Medical Service
    - Organize the necessary action for triage and treatment of any casualties, as necessary. Provide for the transportation (air, land, or sea) of casualties to designated medical facilities.
    - Survey EMS property, to:
        - Determine integrity of building.
        - Determine status of gas, electricity, water, and sanitation.
        - Test all telephones and notification systems.
        - Test apparatus mounted radios.
        - Test station and portable radios.
        - Test alerting system(s).
    - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
    - Review personnel requirements and adjust accordingly.
    - To the degree communications systems will permit, coordinate activities with local community EMS units, if necessary.
    - Provide Critical Incident Stress support, as appropriate.
    - Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Airport Operator
    - Operations
        - Conduct airfield inspections, as needed.
        - Issue appropriate NOTAM(s), if conditions warrant and permit.
        - Activate the Airport Emergency Operations Center (EOC), as appropriate.
        - Provide emergency support services through the EOC.

        - Assist in support operations, to include search, inspections, personnel account-ability, and protective action implementation.
        - Review personnel requirements and adjust accordingly.
        - To the degree communications systems will permit, coordinate activities with local community emergency management agencies, if necessary.
        - Coordinate activities with the ATCT, as needed.
        - Interface with, coordinate, and utilize as needed, the resources made available by other airport tenants, including air carriers.
        - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
    - Maintenance
        - Assist/provide critical services, including utility support (activation/cut-off), as needed.
        - Provide safety inspections, as needed.
        - Assist in facility restoration.
        - Provide sanitation support services.
        - Assist in the provision of required resources.
        - Participate in EOC operations.
        - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
    - Administration
        - Provide procurement services.
        - Provide appropriate budgeting, payment, and cost recovery authorization and services.
        - Provide personnel services.
        - Participate in EOC operations.
    - Public Information and Community Relations
        - Interface with the media, as conditions warrant.
        - Provide news releases relative to the airport's operational capability.
        - Assist with the interface with other airport tenants.
        - Participate in EOC activities.

- Aircraft Owners/Operators
    - Provide EOC representation, as needed.
    - Provide for the initial notification to families of casualties, as appropriate.
    - Provide for passenger/casualty tracking.
    - Inspect facilities owned/operated or maintained by these tenants.

- Airport Tenants
    - Provide assistance on a voluntary basis or in accordance with established agreements.
    - Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.
    - Inspect facilities owned/operated or maintained by these tenants.

Flood

- Airport Traffic Control Tower
    - Inspect FAA owned, operated, and maintained facilities for damage and operability.
    - Restrict aircraft operations on the airport until the runway(s), taxiways, and ramps have been inspected by the airport owner/ operator.
    - Issue appropriate NOTAM upon receipt of information from authorized airport personnel, if requested.

- Firefighting and Rescue
    - Move equipment to higher ground, if necessary.
    - Assist in providing emergency medical assistance, as needed.
    - Check for petroleum leaks and other potential hazardous materials problems.
    - Survey ARFF property, to include:
        - Determine integrity of building.
        - Determine status of gas, electricity, water, and sanitation.
        - Test all telephones and notification systems.
        - Test apparatus mounted radios.
        - Test station and portable radios.
        - Test alerting system(s).
    - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
    - Review personnel requirements and adjust accordingly.
    - To the degree communications systems will permit, coordinate activities with local community fire departments, if necessary.
    - Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Law Enforcement/Security
    - Move equipment to higher ground, if necessary.
    - Provide for overall airport security as soon as possible.
    - Provide for overall traffic control, including coordination with mutual aid law enforcement agencies.
    - Provide continued law enforcement and security services on the airport, as needed, including those required by Airport Security, 49 CFR 1542.
    - Survey law enforcement property, to:
        - Determine integrity of building.
        - Determine status of gas, electricity, water, and sanitation.
        - Test all telephones and notification systems.
        - Test apparatus mounted radios.
        - Test station and portable radios.
        - Test alerting system(s).

- Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
- Review personnel requirements and adjust accordingly.
- To the degree communications systems will permit, coordinate activities with local community law enforcement agencies, if necessary.
- Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Emergency Medical Services
  - Move equipment to higher ground, if necessary.
  - Provide emergency medical assistance, as needed.
  - Survey EMS property, to include:
    - Determine integrity of building.
    - Determine status of gas, electricity, water, and sanitation.
    - Test all telephones and notification systems.
    - Test apparatus mounted radios.
    - Test station and portable radios.
    - Test alerting system(s).
  - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
  - Review personnel requirements and adjust accordingly.
  - To the degree communications systems will permit, coordinate activities with local community EMS units, if necessary.
  - Provide Post Traumatic Stress Disorder support, as appropriate.
  - Participate in Incident Command/ Unified Command System in accordance with pre-established protocols.

- Airport Operator
  - Operations
    - Conduct airfield inspections, as needed.
    - Issue appropriate NOTAM(s), if conditions warrant and permit.
    - Activate the Airport Emergency Operations Center (EOC), as appropriate.
    - Provide emergency support services through the EOC.
    - Assist in support operations, to include search, inspections, personnel accountability, and protective action implementation.
    - Review personnel requirements and adjust accordingly.
    - To the degree communications systems will permit, coordinate activities with local community emergency management agencies, if necessary.
    - Coordinate activities with the ATCT, as needed.
    - Interface with, coordinate, and utilize as needed, the resources made available by other airport tenants, including air carriers.
    - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
  - Maintenance

        - Assist/provide critical services, including utility support (activation/cut-off), as needed.
        - Provide safety inspections, as needed.
        - Assist in facility restoration, including debris removal.
        - Provide sanitation support services.
        - Assist in the provision of required resources.
        - Participate in EOC operations.
        - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
    - Administration
        - Provide procurement services.
        - Provide appropriate budgeting, payment, and cost recovery authorization and services.
        - Provide personnel services.
        - Participate in EOC operations.
    - Public Information and Community Relations.
        - Interface with the media, as conditions warrant.
        - Provide news releases relative to the airport's operational capability.
        - Assist with the interface with other airport tenants.
        - Participate in EOC activities.

- Aircraft Owners/Operators
    - Provide EOC representation, as needed.
    - Relocate aircraft, as needed.
    - Inspect facilities owned/operated and maintained by these tenants.

- Airport Tenants
    - Provide assistance on a voluntary basis or in accordance with established agreements.
    - Participate in Incident Command/Unified Command System in accordance with pre-established protocols.
    - Inspect facilities owned/operated and maintained by these tenants.

Hazardous Materials Incidents

General Information

In this section, airports should include general information about Hazardous materials incidents. This information can include definitions and explanations with respect to the risks that these incidents involve and the need for preparedness in dealing with them.

The following identifies some sample language that could be included in this section.

A definition of Hazardous Materials would be any substance or material that, when involved in an accident and released in sufficient quantities, poses a risk to people's health, safety, and/or property. These substances and materials include explosives, radioactive materials, flammable liquids or solids, combustible liquids or solids, poisons, oxidizers, toxins, and corrosive materials.[10]

Purpose

In this section, airports should define responsibilities and actions to be taken by all parties involved in the response to this type of emergency.

Operations

In this section, airports can explain the overall approach to dealing with hazardous materials incidents. The airport should clearly state that the Incident Commander will be the Fire Officer in charge, and what he or she should do in dealing with the emergency.

Assignment of Responsibilities

In this section, airports should describe the responsibilities and actions to be taken by all parties involved in case of a hazardous material incident. The following are examples of those responsibilities, duties and actions as drawn from the Advisory Circular AC 150/5200_31C:

- Airport Traffic Control Tower (ATCT)
  - Provide relevant information (fuel, persons-on-board, composite hazardous cargo) and directions to aircraft operators.
  - Provide necessary air and ground traffic control support for emergency response activities.

- Firefighting and Rescue
  - Respond to fuel spills and other hazardous materials incidents in accordance with established policies and level of training.

[10] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular (AC) 150/5200-31C, *Airport Emergency Plan*, June 19, 2009, p. 187

  - Provide response and recovery support in accordance with level of training and established airport policies and procedures.
  - Determine need for, and initiate as needed, local Hazardous Materials Response Team response.
  - Assist in Alert and Warning process in the event a Protective Action is required.
  - Provide Hazardous Materials Response Team personnel with appropriate personal protective equipment.

- Law Enforcement/Security
  - Assist with scene security as requested by the Incident Commander.
  - Assist in Alert and Warning process in the event a Protective Action is required.
  - Provide for overall traffic control, including coordination with mutual aid law enforcement agencies.
  - Assist with Air Operations Area escort services, as needed.
  - Provide crowd control, as needed.
  - Provide continued law enforcement and security services on the airport, including those required by 49 CFR part 1542, Airport Security.

- Emergency Medical Services (EMS)
  - Provide on-scene emergency medical services in accordance with established plans and procedures to include the following:
    - Collect, triage, and treat casualties.
    - Transport to, and coordinate with, appropriate medical care facilities.
    - Provide for the deceased.
    - Restock of medical supplies, as needed.
    - Initiate Critical Incident Stress Management debriefing support, as needed.
  - Initiate and coordinate as needed, mutual aid EMS support.

- Airport Operator
  - General
    - Activate EOC, as needed.
    - Participate in response and recovery operations as training levels permit.
    - Provide emergency support services, as requested, through the EOC.
    - Prepare for, and accomplish, return to normal operations.
    - Ensure airport response personnel have received appropriate training.
  - Airport Operations
    - Provide scene representation, to include participation in the Incident Command System.
    - Coordinate Protective Actions, as needed.
    - Make required notifications, including NOTAMs, as needed.
    - Conduct airfield inspections, as needed.
    - Participate in EOC operations.
    - Coordinate operations with the ATCT, as needed.
    - Monitor, and coordinate as required, other concurrent airport activities.

        - Interface with, coordinate, and utilize resources made available by airport tenants.
    - Maintenance
        - Assist/provide critical services, including utility support (activation/cut-off), as needed.
        - Assist in the implementation of protective actions (e.g. shutting off air circulation systems for affected facilities if in-place sheltering is recommended).
        - Provide safety inspections, as needed.
        - Provide sanitation services for extended operations.
        - Assist in the provision of required resources.
        - Participate in EOC operations.
        - Assist in facility restoration.
    - Administration
        - Provide budgeting, payment, and cost recovery support.
        - Provide procurement services.
        - Provide personnel services.
        - Participate in EOC activities.
        - Form a Policy Group for the overall administration of the event, to include approval of airport media releases, when appropriate.
    - Public Information and Community Relations
        - Interface with the media, as well as any emergency response organization on-scene public relations personnel.
        - Provide news releases relative to the airport's responsibilities and activities.
        - Participate in EOC operations.

- Aircraft Operator or designated representative. If an aircraft is directly involved in the incident, the aircraft operator or designated representative should do the following:
    - Provide on-scene support, as requested by the Incident Commander.
    - Participate in EOC operations.
    - Provide for timely news releases.

- Airport Tenants. Airport tenants may provide assistance on a voluntary basis.

Sabotage, Hijack and Unlawful Interference with Operations

General Information

In this section, airports may include any general, introductory information they may have with respect to unlawful interferences of operations such as sabotages, hijacks, and others.

The following identifies some sample language that could be included in this section.

Sabotage is by nature, a surprise attack against life or property. Therefore, no formal procedures can be established. The only deterrent to such an act is adequate fixed (walls, fences) and variable (patrols) security.

Sabotage attacks can either be material (attack on a building, equipment, etc) or human (taking of hostages, etc).

Purpose

In this section, airports should define the responsibilities and actions to be taken in the event of sabotage, hijack or any other form of unlawful interference with operations incident occurs.

Operations

In this section, airports should explain the overall approach to dealing with unlawful interference with operations such as sabotages, hijacks and others. The airport should clearly state who will be the Chief Police Officer in charge will be the Incident Commander, and elaborate on how the latter will coordinate with all the other parties involved in dealing with this emergency. Airports should also mention the establishment of a command post, a designated area, and key personnel and agencies who will help with this emergency.

Assignment of Responsibilities

In this section, airports should describe the responsibilities and actions to be taken by all parties involved in the event of an unlawful interference with operations.

- Air Traffic Control Tower - Notify the Local City Police Department via telephone at 911 and provide all available information, including the following if possible:
    - Nature of threat
    - Tenant/FBO
    - Type of Aircraft
    - Aircraft Identification

  - Number of passengers on board, crew on board
  - Estimated time of arrival (ETA) if inbound
  - International or domestic flight
  - Location that aircraft is to be parked
  - Nature of services required
  - Specific radio frequencies being used to allow for FBI monitoring.

- Airport and City Fire Department
  - Standby status, ready to respond
  - Send Command Officer to the Command Post to serve as Fire /EMS coordinator
  - Make ARFF Station available to TSA, FBI, and City Police Department.
  - If assistance is required, ensure that the Police or FBI have secured the area prior to responding to the location.
  - Direct Fire Department personnel in protecting life and property.
  - Upon determination that support units are required, take necessary actions to acquire those units.

- Tenant/FBO - The tenant/FBO involved will send a senior representative to the Command Post. This representative shall stand by with the equipment and personnel ready for response to requests from the TSA and the FBI.

- City Police Department
  - The city Police Officer–in–Charge shall assume the role of Incident Commander and assure the basic responsibility for the protection of life and property.
  - Provide assistant to federal agency representatives.

Failure of Power for Movement Area Lighting

General Information

In this section, airports may choose to include any introductory information related to failure of power for movement area lighting, if they have any. If not, they may simply proceed to the next section.

The following identifies some sample language that could be included in this section.

Purpose

In this section, airports should define responsibilities and actions to be taken in the event of a failure of power for movement area lighting.

Operations

In this section, airports should explain the overall approach to dealing with a failure of power for movement area lighting. The airport should clearly state that the Incident Commander will be the Fire Officer in charge, describe what he or she should do in dealing with the emergency, and also describe how all other parties will participate in dealing with the emergency.

Assignment of Responsibilities

In this section, airports should describe the responsibilities and actions to be taken by all parties involved in the event of a failure of power for movement area lighting. As mentioned in the Advisory Circular AC 150/5200_31C, examples of such responsibilities and duties include:

- Airport Traffic Control Tower
  - Issue appropriate NOTAM.
  - Notify appropriate maintenance personnel.
  - Keep aviation users informed of the situation, as necessary.
- FAA Facilities/Maintenance
  - Conduct routine/preventive maintenance.
  - Conduct/document regular tests.
  - Operate generator, as necessary.
  - After the emergency, determine cause and take corrective action.
- Airport Maintenance
  - Conduct routine/preventive maintenance.
  - Conduct/document regular tests.
  - Operate generator, as necessary.
  - After the emergency, determine cause and take corrective action.
- Airport Operations.
  - Ensure that power generator and circuit resistance tests are being conducted.

- Ensure required NOTAMs are issued.

Water Rescue Situations

General Information

In this section, airports should may any general information with respect to rescue situations over significant bodies of water or marsh lands that affect them. If they do not have any general information for this section, they can move on to the next section.

The following identifies some sample language that could be included in this section.

Purpose

In this section, airports should define responsibilities and actions to be taken in the event an aircraft accident occurs over significant bodies of water or marsh lands within the vicinity of an airport.

Operations

In this section, airports should describe the overall approach in dealing with this type of emergency, explaining what should when happen, when it should happen, who should be the Incident Commander, and so on.

Assignment of Responsibilities

In this section, airports should describe the responsibilities and actions of all the parties involved in dealing with this type of emergency. The following are examples of those responsibilities and actions, as taken from the Advisory Circular AC 150/5200_31C:

- Airport Traffic Control Tower
  - Activate the appropriate alarm system, as appropriate.
  - Issue appropriate NOTAMs as requested by the airport operator or as established by Letter of Agreement.
  - Control aircraft and ground vehicle operations on the airport in support of the emergency response, if the airport remains open.
  - Control airspace in the vicinity of the incident/accident to ensure other aircraft do not interfere with emergency response activities.
  - Make appropriate FAA notifications.

- Firefighting and Rescue
  - Respond to aircraft incident/ accident location in accordance with established policies and procedures.

  - If the airport is the primary response agency, assume lead in Incident/Unified Command System for initial fire and rescue operations in accordance with established policies and procedures.

  - Ensure appropriate mutual aid emergency response organizations have been notified and are taking appropriate action.

- Law Enforcement/Security
  - Initiate and maintain appropriate Traffic and Access Control in accordance with established policies and procedures.
  - Provide scene support and security if within jurisdictional authority.
  - Assist with/provide AOA access control and escort, as necessary.
  - Ensure appropriate mutual aid organizations have been notified and are taking appropriate action.
  - Provide necessary investigative support.

- Emergency Medical Services
  - Provide necessary triage and on-scene initial treatment of casualties.
  - Ensure appropriate mutual aid organizations have been notified and are taking appropriate action.
  - Provide for the movement (land, water, air) of casualties to appropriate treatment facilities.
  - Maintain an accurate list of casualties and their respective destination treatment facility.
  - Coordinate with the involved air carrier the transportation of the uninjured to the designated holding area.
  - Arrange for restocking of medical supplies, if necessary.

- Airport Operator
  - Designate each hangar or other building on the airport or in the communities it serves that will be used to accommodate uninjured, injured, and deceased persons.
  - Activate the EOC, as needed.
  - Ensure all appropriate notifications have been made, including:
    - National Transportation Safety Board (NTSB).
    - FAA.
    - Airport response personnel.
    - US Coast Guard
  - Provide emergency support services, as requested, through the EOC.
  - Ensure emergency response personnel have received appropriate training.

- Aircraft Owner/Operator or Designated Representative
  - Provide pertinent information to Incident Commander, to include:
  - Provide EOC representation.

- Make necessary notifications, to include the FAA and NTSB.
- Arrange for appropriate passenger services, to include:
  - Transportation of uninjured passengers/ crew members.
  - Adequate holding facilities for uninjured passengers/crew members.
  - Commissary items, telephone facilities, clothing, and additional medical services, as needed.
  - Facilities for friends and families.
  - Passenger/crew accountability/ tracking.
  - Hotel and/or other alternative travel arrangements for passengers.
  - Critical Incident Stress Management support.
- Implement approved plan in compliance with the requirements established in the AFDAA.
- Coordinate news releases with Airport Community/Public Relations personnel.
- Provide for the timely removal of the wrecked or disabled aircraft as soon as authorized by the appropriate authority.

Crowd Control

General Information

In this section, airports should include any general information they may have about Crowd Control. If they have none, they may skip this section and move on to the next one.

The following identifies some sample language that could be included in this section.

Purpose

In this section, airports should define the responsibilities and actions in the event a crowd control incident or problem occurs.

Operations

In this section, airports should describe the overall approach in dealing with a crowd control problem, while explaining what should when happen, when it should happen, who should be the Incident Commander, and so on.

Assignment of Responsibilities

In this section, airports should describe the responsibilities and duties of all parties involved in dealing with a crowd control incident. The following are examples of those responsibilities and duties, as mentioned in the Advisory Circular AC 150/5200_31C:

- Airport Traffic Control Tower (ATCT)
    - (1) Provide relevant information and directions to aircraft operators.
    - (2) Provide necessary air and ground traffic control support for emergency response activities.

- Airport Operator
    - Friendly Crowds. In some situations, airport operators know in advance that a situation is likely to bring friendly crowds to the airport. Through proper planning and experience, appropriate steps may be taken to minimize the effort required to control a friendly crowd.
    - Hostile Assemblies. For hostile situations, it is difficult to determine in advance the degree of disturbance that may result at the airport. Therefore, before any specific steps are taken to increase security, intelligence information, which has been received from all reliable sources, must be evaluated. With that input, operators can make decisions concerning the kind and extent of security measures to take.

- Intelligence. Typically there is advance warning or lead time with the assembly of large crowds. In times of civil disorder or international tension, airport operators should be especially alert to dissidents. While trained saboteurs will operate with great secrecy, untrained dissidents usually talk, threaten, or boast, and their plans either become known in detail or can be predicted.

- Briefings. If appropriate, airport operators should brief air carrier representatives and other tenants on the actions airport security will take to deal with the anticipated demonstration. The briefing should specify the actions that the airport operator, other agencies, and tenants should take to insure both the safety of the public and continued operation of the airport.

- Vulnerable locations. The following locations are potentially vulnerable:
  - Apron entrances and exits. All apron entrances and exits should be closed. One entrance or exit may be kept open depending upon the degree of security required. A security guard with radio communications will be stationed at access and other critical points for surveillance.
  - Fuel farms. If an assembly is anticipated to be hostile, fuel farms should be secured until the period of expected violence and the potential for a fire hazard has passed.
  - Areas between parking lots and terminals. It is advisable to control the automobile parking lots and the pathways between the lots and the terminal(s).

- Lighting. Lighting should be provided around buildings that house critical facilities. At entrance gates, the lighting should be bright enough to permit guards to identify persons and inspect identification cards. Controls and power sources should be installed where they are inaccessible to unauthorized persons. Floodlights mounted on airport emergency or service vehicles may be used for patrolling fences in times of disorder. Authorized personnel should regularly check that field, ramp, taxiway, terminal, and roadway lighting is functioning properly. Portable floodlights may be used to provide positive surveillance capability at those areas used on an infrequent or temporary basis.

- Building and apron security
  - Emergency entrances. All apron emergency entrances should be secured.
  - Gates. Gates should be locked except during actual enplaning and deplaning operations. In critical areas, guards should be posted. Only properly identified and authorized persons such as air carrier personnel, owners or pilots of general aviation aircraft on the field, airport staff, security, emergency response personnel, and passengers should be permitted to pass through check points.

  - Alarm systems. Alarm system specifications have been developed by various manufacturers. Information on any installed alarm system should be closely controlled.

- Firefighting and Rescue. Observe law enforcement problems closely for possible development into fire problems; the time interval between law enforcement and fire problems may be a matter of an hour or days.

- Law Enforcement/Security
    - Assume primary responsibility for crowd control actions.
    - Give due consideration to the rights of individuals and the protection of private property.
    - Coordinate with mutual aid organizations, as necessary.
    - Augment security forces if intelligence reports and type of demonstration warrant.

- Emergency Medical Services. Monitor the situation and provide services as required. For anticipated large crowds, an airport should set up extra first aid, medical booths, and have ambulances standing by.

- Airport Tenants. Tenant security should be increased commensurate with the anticipated problem. All office doors should be closed and, if practical, locked when tenant employees are working inside. During off-duty hours, all doors should be locked.

GENERAL AVIAITON SECURITY TOOL

New Hampshire DOT
Bureau of Aeronautics

AIRPORT SECURITY

In the document **Security Guidelines for General Aviation Airports (2004)**, the TSA reports that, "the most efficient and cost-effective method of instituting security measures into any facility or operation is through advance planning and continuous monitoring" (p. 14). Security plans can range in size and complexity depending on the airport and threat. Typical airport security plans cover communications, access control, perimeter control, and procedures, but can include much more.

Since each General Aviation airport is unique, the TSA Security Guidelines provides an Airport Characteristics Measurement Tool to help airports determine the appropriate level of security. The measurement tool provides a means for broadly characterizing general aviation airports by assessing the airports location; based aircraft mix; runway information; and operational mix of activity. Airport operators are encouraged to measure the existing security posture of their facilities by utilizing the TSA self-assessment tool and security guidelines found at:

http://www.tsa.gov/sites/default/files/assets/pdf/Intermodal/security_guidelines_for_general_aviation_airports.pdf

NHDOT reminds general aviation aircraft and airport owners and operators to review the security measures contained in the TSA Information Publication, Security Guidelines for General Aviation Airports, the Aircraft Owners and Pilots Association's Airport Watch Program materials and the Transportation Research Board (TRB) Airport Cooperative Research Program (ACRP) Synthesis 3: General Aviation Safety and Security Practices. The TRB document can be found at:

http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_003.pdf

AIRPORT SECURITY TOOL

In addition to the TSA Security Guidelines, and the other resources mentioned in this document, the TSA has implemented many programs to improve GA security. These programs include the Twelve-Five Rule; Private Charter Rule; GA Hotline; and Flight School Awareness Training Program.

Twelve-Five Rule

The Twelve-Five rule requires that certain aircraft operators using aircraft with a Maximum certificated Take-Off Weight (MTOW) of 12,500 pounds or more carry out a security program. These operators are required to register with the TSA and file their security program for TSA approval prior to operating. The details of the program are only shared with registered users. Operators were required to be in compliance with the program effective April 1, 2003.

Private Charter Rule

The Private Charter rule is similar to the Twelve- Five rule but adds additional requirements for aircraft operators using aircraft with a Maximum certificated Take-Off Weight (MTOW) of greater than 45,500 kg (100,309.3 pounds) or with a seating configuration of 61 or more. Operators were required to be in compliance with the program effective April 1, 2003.

GA Hotline

The TSA developed and implemented a GA hotline in partnership with the National Response Center. 866-GA-SECURE (1-866-427-3287) was launched on December 2, 2002 and is fully operational.

The GA Hotline serves as a centralized reporting system for general aviation pilots, airport operators, and maintenance technicians wishing to report suspicious activity at their airfield. The hotline was developed in coordination with the Aircraft Owners and Pilots Association (AOPA) to complement the AOPA Airport Watch Program. This program will enlist the support of some 550,000 general aviation pilots to watch for and report suspicious activities that might have security implications. AOPA has distributed Airport Watch materials to 5,400 public-use general aviation airports pilot groups and individual pilots. To build on the success of these local efforts the program includes special materials including a video to train pilots to be alert for sinister people or activities on the airport.

GENERAL AVIAITON
SECURITY TOOL

New Hampshire DOT
Bureau of Aeronautics

Flight School Security Awareness Training

The TSA developed a Flight School Security Awareness (FSSA) Training Module to work in conjunction with the flight training community to raise general aviation security awareness of those working in flight training. The TSA website states: “In accordance with 49 CFR 1552, Flight Schools and Flight Training Centers are required to provide security awareness training to their employees. Under this legislation, Flight School and Flight Training Center operators have two choices, they can develop their own in-house training program in accordance with the guidelines set forth in 49 CFR 1552, or they may use this TSA program to meet the mandate. This program is a pro-active response from TSA to offer an alternative to each school having to develop their own program. Regardless of which method the operator chooses, both programs must meet the established mandates outlined in 49 CFR 1552.”

As mentioned, AOPA has partnered with the Transportation Security Administration (TSA) to develop a nationwide Airport Watch Program that uses the more than 600,000 pilots as eyes and ears for observing and reporting suspicious activity. The Airport Watch Program includes warning signs for airports, informational literature, and a training video to teach pilots and airport employees how to enhance security at their airports.

In addition AOPA offers a General Aviation Security online course, a free, interactive course that provides practical suggestions to help secure airports and aircraft from crime and possible terrorist exploitation, and to protect general aviation’s reputation by employing industry best practices.

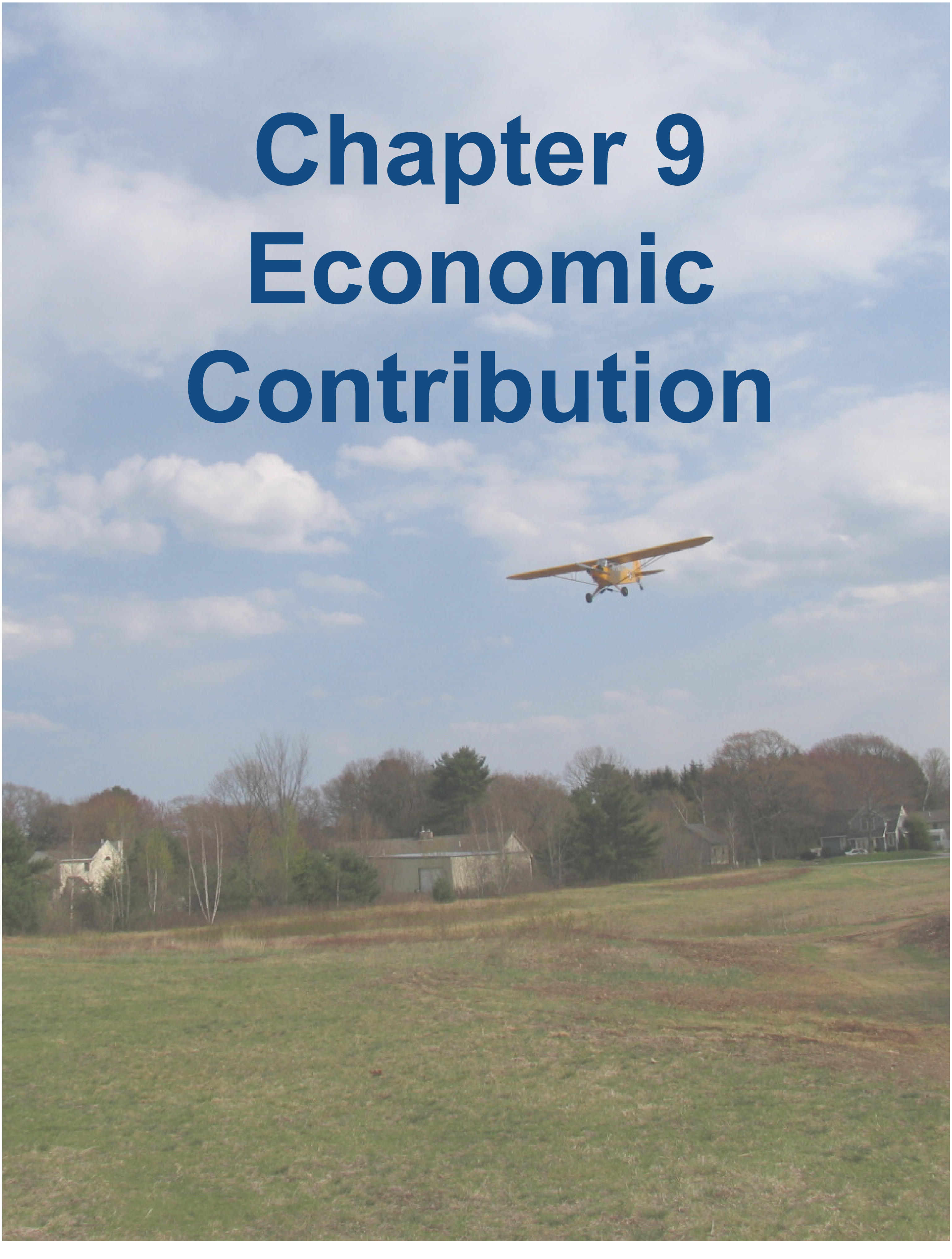
The online course can be found at:

http://flash.aopa.org/asf/gasecurity/gasecurity.cfm?_ga=1.105223875.1990800397.1422304435

In addition, GA aircraft and airport owners and operators are encouraged to consider the following:

- Secure unattended aircraft to prevent unauthorized use.
- Verify the identification of crew and passengers prior to departure.
- Verify that baggage and cargo are known to the persons on board.
- Where identification systems are in place, encourage employees to wear proper identification and challenge persons not wearing proper identification.
- Be alert/aware of and report persons masquerading as pilots, security personnel, emergency medical technicians, or other personnel using uniforms and/or vehicles as methods to gain access to aviation facilities or aircraft.
- Be alert/aware of and report aircraft with unusual or unauthorized modifications.
- Be alert/aware of and report persons loitering in the vicinity of aircraft or air operations areas – as well as persons loading unusual or unauthorized payload onto aircraft.
- Be alert/aware of and report persons who appear to be under stress or the control of other persons.
- Be alert/aware of and report persons whose identification appears altered or inconsistent.
- Ensure home facility perimeter security with effective
- fencing, lighting, security patrols (as appropriate), gates,
- and limited access areas.
- Ensure street-side gates and doors are closed and locked at all times.
- Require positive access control for all external gates and doors.
- Close and lock hangar doors when that area is unattended.
- Secure all key storage areas (food and liquor, parts and tools, etc.).
- Have an access control management system for keys and passes.
- Confirm the identity and authority of each passenger, vendor, and visitor before allowing access to facilities and aircraft.
- Escort all visitors on the ramp and in the hangar area.
- Use a government issued photo ID to verify the identity of any visitor or vendor.
- Post emergency numbers prominently around your facility.
- Ensure easy access to phones or “panic buttons” in various facility locations (break room, hangar bay, etc.).
- Confirm security of destination facilities.
- Be aware of your surroundings and do not be complacent—challenge strangers.

Chapter 9 Economic Contribution



CHAPTER 9: ECONOMIC CONTRIBUTION

9.1 INTRODUCTION

Comprised of three commercial service and 22 general aviation airports, the New Hampshire (NH) State Airport System Plan (NHSASP) consists of 25 public use facilities that serve the air transportation needs of over 1.3 million NH residents, business users, leisure travelers, and military aviation. The system is an important contributor to state and local economies by supporting thousands of jobs throughout the state while generating millions of dollars in state tax revenue.

In addition to quantitative economic benefits, the system also provides a wide range of qualitative benefits, and impacts that simply cannot be measured such as health and safety benefits that contribute to the overall welfare of the state. Among others, services such as medical transport and evacuation, search and rescue operations, law enforcement flights, military exercises, and flight training all contribute directly to the quality of life of those who live and work in NH.

This report provides an assessment of the economic contribution and benefits of the NH state airport system to NH and its local communities in 2013. The following types of effects have been assessed:

- On-airport Economic Activity
- Off-airport Economic Activity, Supported By:
    - Airport Capital Expenditures
    - Airport and Airport Tenant Operations and Maintenance Spending
    - Visitor Spending
    - Travel Time Savings of General Aviation Business Travelers
    - Community Benefits of General Aviation

This report provides an overview of the contribution of the 25 airports included in the system. The airport-specific contribution of each of the 12 federally funded National Plan of Integrated Airports (NPIAS) airports is provided in **Appendix 9-A**.

9.1.1 NEW HAMPSHIRE STATE AIRPORT SYSTEM

As presented in the chapters that precede this economic assessment, the 25 airports in the system have been classified into one of five airport categories. Based primarily on size and function, these categories include: primary, national, regional, local and basic. The airports that fall within each particular category are presented below as of 2014 and shown in **Figure 9-1**.

Primary Airports: The state's three primary airports include: Manchester-Boston Regional Airport, Lebanon Municipal Airport and Portsmouth International Airport at Pease.

General Aviation National Airports: Boire Field (Nashua) is the state's only national airport.

General Aviation Regional Airports: Concord Municipal Airport, Dillant-Hopkins (Keene) Airport and Laconia Municipal Airport have been identified as the state's regional airports.

General Aviation Local Airports: Berlin Regional, Claremont Municipal, Mt. Washington Regional, Parlin Field, Hampton, and Skyhaven Airports make up the local airports in NH.

General Aviation Basic Airports: The basic airports in the system include: Alton Bay, Dean Memorial, Errol, Franconia, Gifford, Gorham, Hawthorne Feather, Jaffrey Airport-Silver Ranch, Moultonboro, Newfound Valley, Plymouth Municipal, and Twin Mountain.

Twelve of the airports in the system are federally funded and included in the 2013-2017 National Plan of Integrated Airport System (NPIAS) (**Table 9-1**). The plan identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and eligible to receive federal grants under the Airport Improvement Program (AIP). The individual economic contribution of each of the 12 NPIAS airports is presented in **Appendix 9-A**; the economic contribution of the 13 non-NPIAS is presented in aggregate form.

Table 9-1 - Study Airports

	Airports in 2013-2017 NPIAS: Individual Economic Contribution presented in this report	Airports NOT in 2013-2017 NPIAS: Economic Contribution presented in aggregate form only
Primary Airports	• Manchester-Boston Regional Airport • Lebanon Municipal Airport • Portsmouth International Airport at Pease	
National Airports	• Boire Field	
Regional Airports	• Concord Municipal Airport • Dillant Hopkins Airport • Laconia Municipal Airport	
Local Airports	• Berlin Regional Airport • Claremont Municipal Airport • Mt. Washington Regional Airport • Skyhaven Airport	• Parlin Field • Hampton Airfield
Basic Airports	• Dean Memorial Airport	• Alton Bay Airport (Ice Rwy/Seaplane Base) • Errol Airport • Franconia Airport • Gifford Airport • Gorham Airport • Hawthorne Feather Airport • Jaffrey Airport Silver-Ranch • Moultonboro Airport • Newfound Valley Airport • Plymouth Municipal Airport • Twin Mountain Airport

Source: Chapter 3, State Airport System Plan

Figure 9-1 - NH State Airport System

Source: The Louis Berger Group

Primary Airports

Manchester-Boston Regional Airport, owned by the city of Manchester, is NH's largest airport and is classified as a primary airport. The airport is located in Manchester on the border between Hillsborough and Rockingham counties about 50 miles to the north of Boston. With regard to passenger volume, Manchester's annual enplanements of 1.2 million in 2013 make it the fourth largest airport in New England in terms of enplanements. Manchester-Boston Regional Airport is the third largest in New England in terms of cargo with 167.3 million pounds of enplaned and deplaned cargo in 2013. General aviation, not including air taxi, accounted for 21 percent of the airport's operations in 2013 (**Table 9-2**).

Lebanon Municipal Airport is a city-owned airport in Lebanon, in Grafton County near the Vermont border. The Lebanon area is home to Dartmouth-Hitchcock Medical Center, the state's only academic medical center and only Level 1 Trauma Center. Dartmouth College , a private university with enrollment of more than 6,000 students is located in the neighboring town of Hanover. Lebanon Airport is one of only four airports in the state with an air traffic control tower and had 8,347 commercial service air taxi operations in 2013. In the same year, general aviation, not including air taxi operations, accounted for 75 percent of the airport's total operations. Major tenants at the airport include:

- Cape Air, the airport's commercial service provider;
- Granite Air Center, a full-service fixed based operator; and
- Sharky's Helicopter, the largest helicopter dealer in the world, offering helicopter sales, maintenance, and flight training.

As one of the premier general aviation airports in NH, Lebanon Municipal Airport provides air access and services for corporate aircraft that regularly use the airport. The airport is also a critical resource for Dartmouth-Hitchcock Advanced Response Team (DHART) whose crews provide air medical transportation services to the medical communities of Northern New England and respond to public safety agency requests for medical evacuation of trauma patients from scenes of injury.

Portsmouth International Airport at Pease is located on the former Pease Air Force Base, in Rockingham County and the I-95 seacoast corridor. The former military base was closed as part of the first Base Realignment and Closure Commission (BRAC) round in 1995 and was redeveloped as a civilian airport with the NH Air National Guard (ANG) remaining at the site. Military operations accounted for 21 percent of the operations at Pease Airport in 2013. Created as part of the ongoing redevelopment of the Pease Air Force Base, the site also includes the Pease International Tradeport (Tradeport), a business park with 2.1 million of square feet of industrial space and 1.2 million of square feet of office space, and the Pease Golf Course. The airport, Tradeport and golf course are managed and operated by the Pease Development Authority (PDA), which is an independent state agency. While commercial service was suspended several years ago, at the end of 2013 Allegiant Air started offering multiple flights per week to Florida from the airport.

In 2013 the number of enplanements on air taxi and commercial service was 22,543, a 66.8 percent increase compared to the 2012. General aviation, not including air taxi operations, accounted for 61 percent of the airport's operations in 2013. The airport is home to a number of corporate flight departments, and two FBOs (Premier and Port City Air) that service a variety of customers from, construction companies, to auto dealers, and fractional jet operators. Notably, the airport is home to PlaneSense, a fractional aircraft-ownership company with the largest civilian fleet of Pilatus PC-12 aircraft in the world.

General Aviation National Airports

Operated and maintained by the Nashua Airport Authority, Boire Field is located in Nashua, the second most populous city in the state, in Hillsborough County. The airport does not have any scheduled commercial air service; however, it is equipped with one of the only four air traffic control towers in the state, operated by Midwest ATC. Boire Field is home to a number of corporate flight departments and air charter operators, two full-service fixed based operators, helicopter sales, maintenance, and training facility, a pilot shop, and an airport restaurant. In 2013, local and itinerant operations made up 95 percent of the airport's operations, while general aviation air taxi operations accounted for 5 percent. With over 50,000 operations in 2013, Boire Field is the state's busiest general aviation airport.

General Aviation Regional Airports

The three regional airports in the system are located throughout the state and include the following:

Concord Municipal Airport is located in Concord the state's capital the third most populous city in NH, in Merrimack County. The airport has one fixed base operator, Concord Aviation Services, which offers aircraft services and fueling. Vehicle rental services are available on-airport.

Concord Municipal Airport is also home to the NH Army Air National Guard and the NH State Police Aviation unit. In 2013 General aviation accounted for 88 percent of the airport operations, 5 percent of which included air taxi. Military operations accounted for 12 percent of the airport's total operations. The airport does not have scheduled commercial service. However with nearly 50,000 annual operations; Concord is the second busiest general aviation airport in the state and is utilized regularly by financial corporations, the forest industry, utility and construction companies, local private schools, and race teams, due to the airport's proximity to the NH Motor Speedway.

Laconia Municipal Airport is located in Gilford, in Belknap County with exclusively general aviation activity in 2013. As the third busiest general aviation airport in the state, Laconia Municipal Airport serves a wide range of general aviation aircraft who utilize the airport for both business and recreation. Primary users of the airport include major retail corporations, local colleges, and fractional aircraft operators. The airport experiences a significant amount of traffic from travelers that consider Laconia Municipal airport as a destination due to its proximity to area private schools, summer camps, and the NH Motor Speedway.

As the premier airport in the NH Lakes region, the airport is home to two full service fixed base operators, and tenants offering helicopter, seaplane, biplane and aerial photography, and scenic flight services.

Dillant-Hopkins Airport, the fourth busiest general aviation airport in the state is located in Keene, in Cheshire County. In 2013, general aviation accounted for 93 percent of the airport's operations, 15 percent of which was air taxi. Military operations accounted for 7 percent. The airport is the base of flight operations for a wholesale grocery distribution corporation whose headquarters are located in Keene. In addition, the airport is home to one full service fixed based operator (FBO, and aircraft maintenance facility. The majority of flying activities at the airport include corporate business, recreational, and flight training.

General Aviation Local Airport

There are five local airports in the NH system, four of which are part of the NPIAS. These four local airports combined for nearly 50,000 general aviation operations in 2013.

As part of this economic assessment, the four local NPIAS airports include: Berlin Regional Airport located in Milan, the only city in Coos County, Claremont Airport, located in Claremont, in Sullivan County, Mt. Washington Regional Airport, located in Whitefield in Coos County, and Skyhaven Airport owned and operated by the Pease Development Authority, located in Rochester, in Strafford County. The fifth existing local airport is Parlin Field, located in the Dartmouth-Lake Sunapee region of the state in the town of Newport in Sullivan County.

General Aviation Basic Airports

The system includes 13 basic airports. Most of these airports are located in the northern counties: Coos, Grafton and Carroll. Only one basic airport has been specifically assessed as part of this study since the other basic airports are not part of the 2013-2017 NPIAS.

Dean Memorial Airport is located in Haverhill in Grafton County. All operations in 2013 were general aviation. Although, the airport does not have a full service FBO the airport does provide self-serve 100LL fuel, and aircraft storage and tie-downs, as well as a facility for military training stop-overs.

Table 9-2 - Operations by Airport

Airport	System Role	Total Ops	Air Carrier	Air Taxi (Itinerant)	GA (Itinerant)	GA (Local)	Military
Manchester-Boston Regional	Primary/ NPIAS	63,955	31,457	19,711	10,332	2,319	136
Lebanon Municipal	Primary /NPIAS	34,533	-	8,347	12,187	13,665	334
Portsmouth Intl at Pease	Primary/ NPIAS	36,328	617	5,956	2,344	19,699	7712
Boire Field	National/ NPIAS	55,764	-	318	26,286	26,624	26
Concord Municipal	Regional/NPIAS	60,000	-	3,000	30,000	20,000	7000
Dillant-Hopkins	Regional/ NPIAS	49,027	-	7,204	7,455	31,053	3314
Laconia Municipal	Regional/ NPIAS	43,725	-	427	3,710	39,483	105
Skyhaven	Local /NPIAS	17,000	-	-	5,000	12,000	0
Berlin Regional	Local/ NPIAS	12,200	-	100	4,000	8,000	100
Claremont Municipal	Local /NPIAS	10,500	-	-	4,600	5,900	0
Mt. Washington Regional	Local/ NPIAS	7,030	-	20	4,000	3,000	10
Dean Memorial	Basic/ NPIAS	1,300	-	-	260	1,040	0
Various Airports	Local and Basic/ Non-NPIAS	67,465	-	1,075	21,650	44,450	280
Grand Total		458,827	32,074	46,158	131,824	227,233	19,017

Source: Chapter 3, State Airport System Plan

9.1.2 OUTLINE OF THE REPORT

This report begins with an overview of the methodology that was employed to conduct the study. A summary of the demographic and economic characteristics of the state of NH and each of its counties follows, which provides context for the economic contribution assessment. The economic contribution assessment includes on-airport employment as well as the off-airport economic activity indirectly supported by the system. Economic activity that is indirectly supported, or multiplier effects triggered by the four following expenditures are quantified: (1) airport capital expenditures; (2) airport operation and maintenance expenditures; (3) airport tenant expenditures; and (4) visitor spending by passengers and pilots. The economic effects of the state system are expressed in terms of jobs, labor income and output or sales revenue and tax revenues. The report also assesses the travel time savings obtained by business travelers using general aviation airports. Finally, community benefits are discussed. In addition to statewide analysis, a separate analysis is presented for each of the 12 airports that are part of the NPIAS in **Appendix 9-A.**

Methodology

At the start of the study, the project team conducted an extensive data collection effort that focused on the airports that are part of NPIAS. One exception was Manchester-Boston Regional Airport, which was subject of a study published in 2009[1]. As part of this current study, the data collection effort was limited and supplemented with 2009 data that was extrapolated to 2013. The data collection effort included personal

[1]City of Manchester, Economic Impact Study for 2008, 2009

interviews with airport management, an airport tenant survey, a visiting pilot survey, personal interviews with state economic development staff and a review of existing public federal, state and local data sources. The data collected provided an initial overview of the airport system's direct contribution to the state and local economies. The data also provided insight into the wider economic benefits and impacts beyond conventional measurement generated by the NH's airports. These include but are not limited to increased mobility, quality of life benefits, and the critical services that general aviation airports offer.

Input-output modeling techniques were used to estimate the multiplier effect triggered by spending by airport management, tenants, employees and visitors. The multiplier effect is the ripple effect that occurs when purchases from in-state vendors and payments to local employees trigger additional economic activity at other businesses throughout the state. The IMPLAN input-output modeling system was used to quantify the multiplier effect. IMPLAN was originally created by the US Forest Service to help it gauge the effects of its policies on regional economies and is currently owned by IMPLAN Group LLC. The spending impact is expressed in terms of jobs, labor income and output (industry production) and tax revenues. Tax revenue sources estimated as part of this study include business profit tax, business enterprise tax and meals and rooms tax.

In addition to on-airport jobs and multiplier effects, travel time savings for business travelers relying on general aviation were estimated and monetized. Additional benefits to the community were discussed qualitatively. More detailed qualitative benefits for each of the system airports are provided in **Appendix 9-A** where individual airport economic impacts are presented. A detailed explanation of the methodology used to determine the economic impact of the NH state airport system is available in **Appendix 9-B**.

- AIRPORT MANAGEMENT → Jobs operating and maintaining the airports
- AIRPORT TENANTS → Jobs at fixed based operators, aircraft maintenance providers, airlines, government agencies, retail and ground transportation companies
- MULTIPLIER EFFECT OF SPENDING BY the AIRPORT, its TENANTS, their EMPLOYEES and VISITORS arriving by air
  - Capital Expenditures → Jobs in construction, engineering and supplying industries throughout the state
  - O&M Expenditures → Jobs at vendors supplying on-airport businesses and their suppliers throughout the state
  - Employee Household Spending → Jobs in education, health care, retail, transportation, entertainment, food production and other industries serving households throughout the state
  - Visitor Spending → Jobs at hotels, restaurants, car rental, retail and supporting industries serving visitors throughout the state
- TRAVEL TIME SAVINGS → Shorter travel time to customers, suppliers and business partners and cost savings for local businesses
- COMMUNITY BENEFITS → Improved quality of life for local residents, making NH more attractive place to live as well as critical community access, emergency preparedness

Demographic and Economic Profile

Forty percent of NH's 1.3 million residents live in rural areas. About 450,000 residents, or 34 percent of the state's population, live in places with a population of more than 10,000 while the remaining 66 percent live in places with population of less than 10,000 (**Table 9-3**). NH's main population and employment centers are located along two corridors in the southern half of the state: the I-93 corridor and the I-95 corridor/seacoast.

The I-93 corridor is the largest office space market in the state and includes Manchester, the state's largest city in terms of population as well as its most densely populated. Manchester is located in Hillsborough County. Also located in Hillsborough county is Nashua, the state's second largest city in terms of population. To the north of Hillsborough county, along the I-93 corridor, is Merrimack County, which includes Concord, NH's third most populous city.

The I-95 Seacoast corridor includes Portsmouth, which is in Rockingham County. Also in Rockingham County is the Pease International Tradeport, an industrial and business park created as part of the redevelopment of the Pease Air Force Base. Portsmouth and the Tradeport account for 3.8 million square feet of office space, almost half of the total 8.1 million square feet in office space in the corridor. Located along the I-95 corridor in Strafford County are Dover and Rochester, the state's fifth and sixth most populous cities respectively, as well as Hampton and Skyhaven Airports.

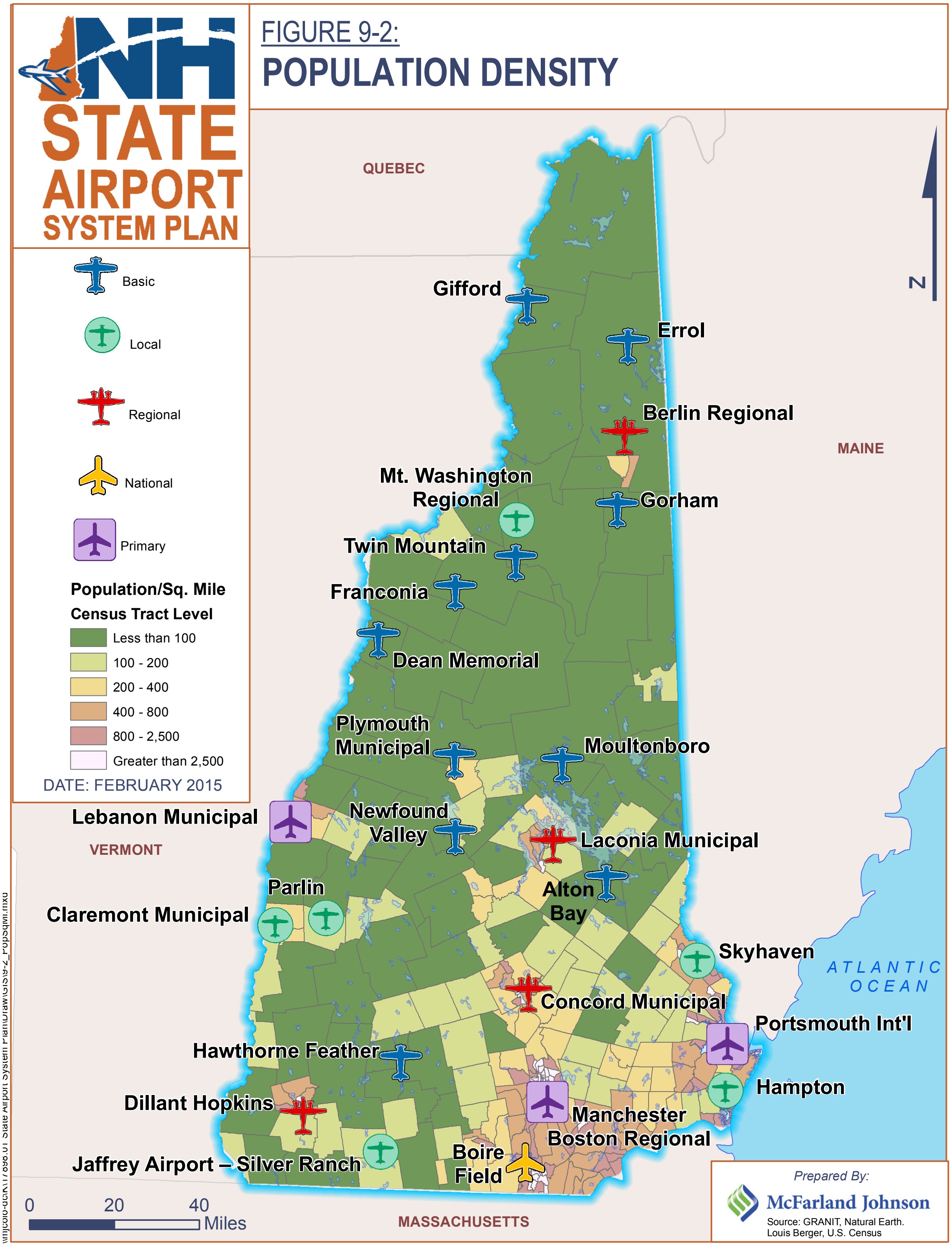
Figure 9-2 shows the distribution of population across the state; **Figure 9-3** shows the distribution of employment.

Table 9-3 - Population in Main Population Centers in NH, 2010

Place Name	County	Population
Manchester City	Hillsborough	109,565
Nashua City	Hillsborough	86,494
Concord City	Merrimack	42,695
Dover City	Strafford	29,987
Rochester City	Strafford	29,752
Keene City	Cheshire	23,409
Derry CDP	Rockingham	22,015
Portsmouth City	Rockingham	20,779
Laconia City	Belknap	15,951
Claremont City	Sullivan	13,355
Lebanon City	Grafton	13,151
Somersworth City	Strafford	11,766
Londonderry CDP	Rockingham	11,037
Durham CDP	Strafford	10,345
Berlin City	Coos	10,051
Total Population in Places above		450,352

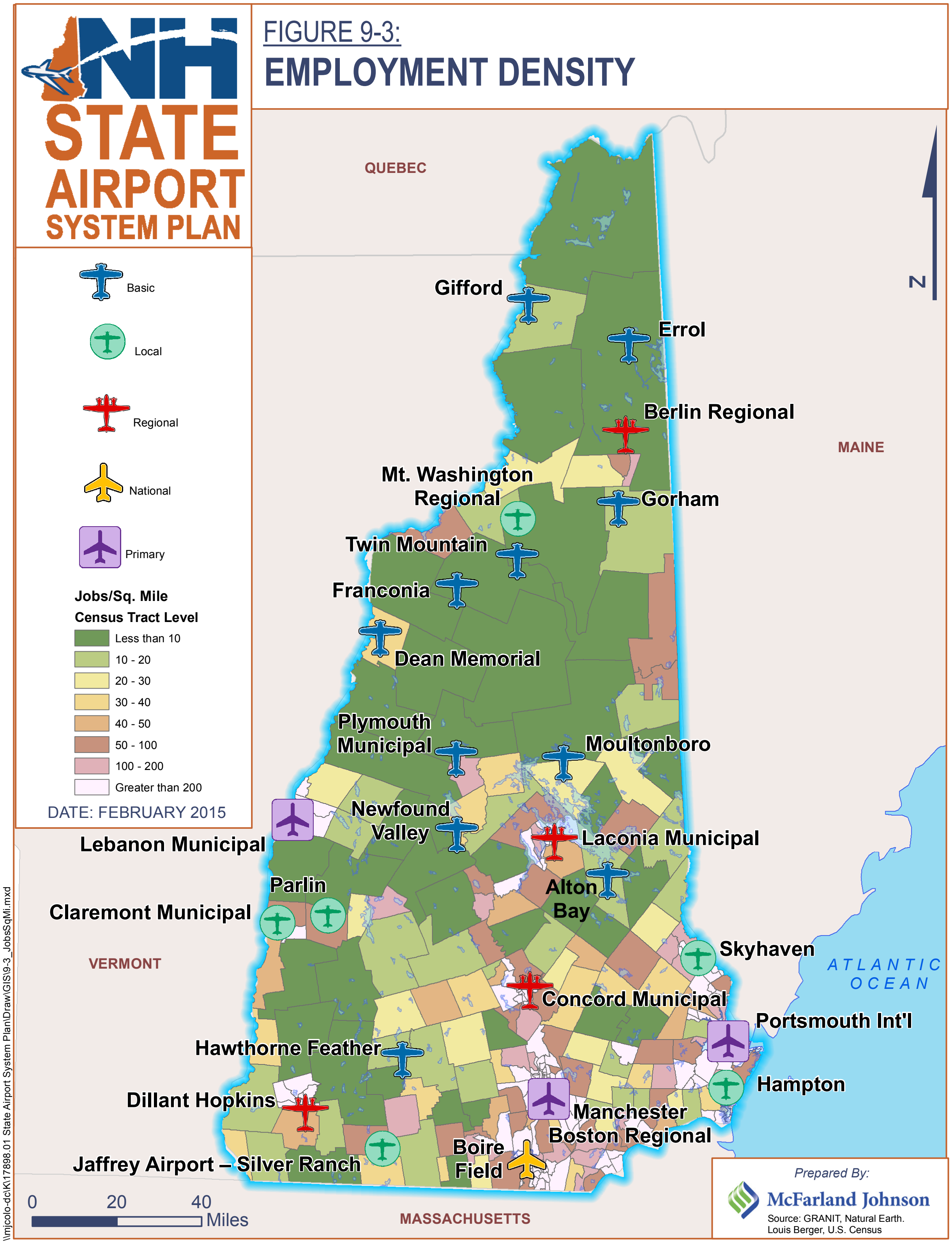
Source: Census 2010, Places with Population of more than 10,000 in 2010

Figure 9-2 - Population Density



Source: The Louis Berger Group

Figure 9-3 - Employment Density



Source: The Louis Berger Group

Population

Over half of the NH population lives in Hillsborough and Rockingham County (**Table 9-4**). These two counties are also the most densely populated counties in the state. The least populated counties, Carroll and Coos, account for 30 percent of the land area and 6 percent of the state's population. Access to general aviation airports is critical for residents of these remote, sparsely populated areas since emergency aviation services would otherwise be unavailable without air access.

Table 9-4 - Population and Population Density by County, 2012

County	Population	Percent of Total Population	Land Area in Square Miles	Percent of Total Land Area	Population Density (pop/ sqmi)
Hillsborough County	400,721	30%	876	10%	457
Rockingham County	295,223	22%	695	8%	425
Merrimack County	146,445	11%	934	10%	157
Strafford County	123,143	9%	369	4%	334
Grafton County	89,118	7%	1,709	19%	52
Cheshire County	77,117	6%	707	8%	109
Bellknap County	60,088	5%	400	4%	150
Carroll County	47,818	4%	931	10%	51
Sullivan County	43,742	3%	537	6%	81
Coos County	33,055	3%	1,795	20%	18
Total Population	1,316,470	100%	8,953	100%	147

Source: American Community Survey, 2008-2012

Historically, the largest populated counties have experienced a faster population growth than the state as a whole (**Table 9-5**). Between 2010 and 2012, population of several other counties experienced a decline, especially Coos County, the most northern county bordering both Maine and Vermont.

Table 9-5 - Annual Population Change by County, 1980-2012

County	1980-1990	1990-2000	2000-2010	2010-2012
Hillsborough County	2.00%	1.30%	0.50%	0.30%
Rockingham County	2.60%	1.20%	0.60%	0.40%
Merrimack County	2.00%	1.30%	0.70%	0.10%
Strafford County	2.00%	0.70%	0.90%	0.40%
Grafton County	1.30%	0.90%	0.90%	0.00%
Cheshire County	1.20%	0.50%	0.40%	-0.20%
Belknap County	1.40%	1.20%	0.80%	0.20%
Carroll County	2.40%	2.10%	0.90%	-0.30%
Sullivan County	0.70%	0.50%	0.80%	-0.80%
Coos County	-0.10%	-0.50%	0.00%	-1.50%
State Total	1.90%	1.10%	0.60%	0.20%

Source: NH Employment Security, Community Profiles http://www.nhes.nh.gov/elmi/products/cp/

Based on the most recent projections from state of NH, Office of Energy and Planning Regional Planning Commissions, NH's population has a projection of 1,427,098 by 2040, with an increase of 110,628 between 2010 and 2040 or a growth rate of 2.3 percent per year (**Table 9-6**). Annual growth is projected to be 0.3 percent between 2010 and 2020; 0.4 percent between 2020 and 2030; and 0.1 percent between 2030 and 2040.

Following a nationwide trend, NH's population is aging. However, by 2040, every NH County is projected to experience a natural decline, which means that the number of deaths will exceed the number of births and that any potential population growth will come from immigration. Between 2030 and 2040, population growth is projected to slow down in every county.

The population of Hillsborough County is projected to grow at the statewide average rate in every decade while Rockingham County's population is projected to grow faster than state average between 2010 and 2020. Beyond 2020 Rockingham county is expected to grow at the state average. Carroll County, which was the fastest growing county in the past three decades, is projected to continue to grow faster than the state average. Its neighbor to the south, Belknap County, is also projected to grow faster than the state average.

Table 9-6 - Population Projections by County, 2010-2040

	Growth Rate		
County	2010-2020	2020-2030	2030-2040
Hillsborough County	0.30%	0.40%	0.10%
Rockingham County	0.40%	0.40%	0.10%
Merrimack County	0.30%	0.40%	0.10%
Strafford County	0.40%	0.40%	0.20%
Grafton County	0.30%	0.30%	0.10%
Cheshire County	0.10%	0.20%	0.10%
Belknap County	0.40%	0.50%	0.20%
Carroll County	0.50%	0.70%	0.30%
Sullivan County	0.40%	0.50%	0.30%
Coos County	-0.40%	-0.40%	-0.80%
State Total	0.30%	0.40%	0.10%

Note: Compound Annual Growth Rate (CAGR)
Source: http://www.nh.gov/oep/data-center/documents/2013-projections-state-counties.pdf

Household Income

Based on the most recent data, household income was the highest in the Rockingham and Hillsborough counties (**Table 9-7**).

Table 9-7 - Household Income Distribution by County, 2012

County	Less than $25,000	$25,000 to $49,999	$50,000 to $74,999	$75,000 to $149,999	$150,000 or more	Median Household Income
Rockingham	19.5%	23.4%	21.7%	27.0%	8.3%	$ 77,939
Hillsborough	19.2%	29.7%	22.3%	22.2%	6.5%	$ 70,472
Merrimack	20.0%	24.7%	20.1%	28.0%	7.2%	$ 65,487
Statewide	29.5%	29.8%	19.2%	18.2%	3.3%	$ 64,925
Strafford	20.7%	26.1%	18.1%	25.6%	9.5%	$ 58,538
Belknap	15.5%	19.5%	17.8%	33.4%	13.8%	$ 57,163
Cheshire	16.7%	21.6%	18.4%	33.4%	9.9%	$ 56,062
Sullivan	12.2%	18.1%	17.4%	35.9%	16.5%	$ 53,821
Grafton	18.9%	23.9%	18.7%	29.0%	9.5%	$ 53,386
Carroll	20.5%	25.7%	20.2%	27.8%	5.8%	$ 50,865
Coos	16.7%	21.7%	18.5%	31.3%	11.8%	$ 41,774

Source: American Community Survey, 2008-2012 (in 2012 dollars)

Employment

Hillsborough and Rockingham counties accounted for 53 percent of the employment in 2013 (**Table 9-8**). Rockingham, Strafford and Grafton counties experienced the strongest employment growth during the 2002-2007 expansion, with an annual growth rate of 1.2 percent. Strafford and Grafton counties also experienced less employment decline than the state as a whole during the recession from 2007 to 2010.

Table 9-8 - Employment by County, 2013

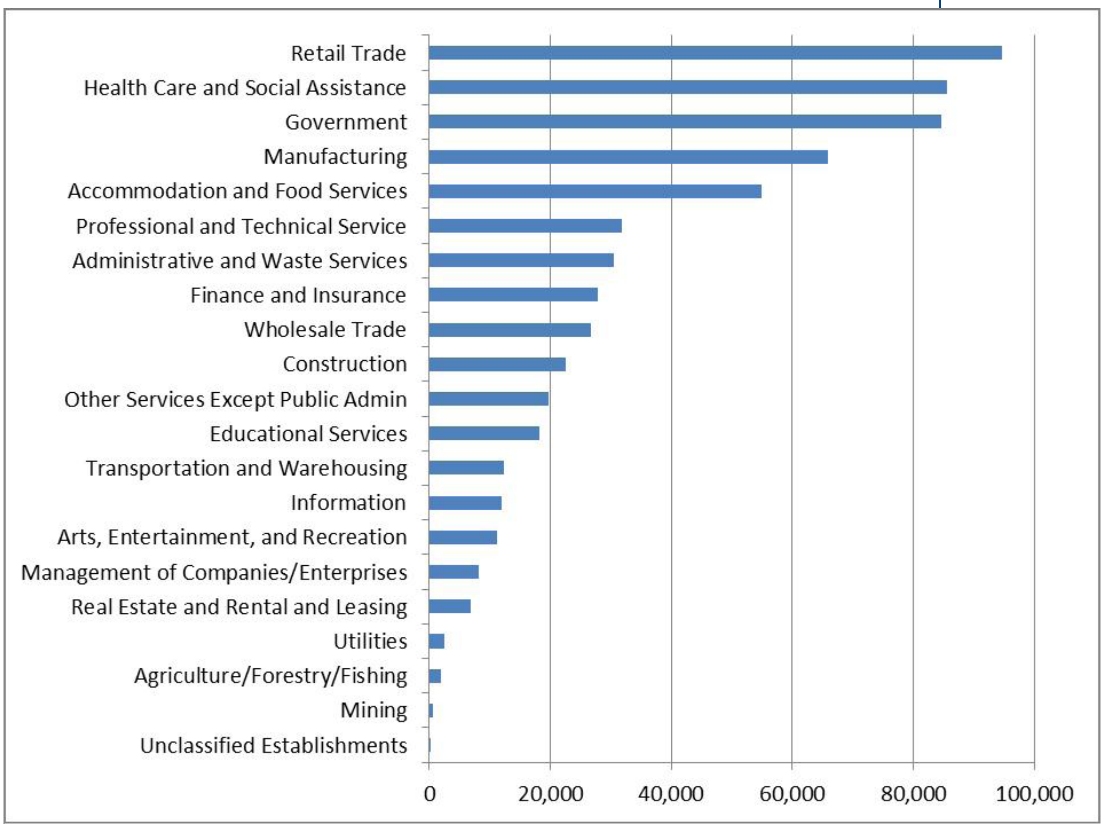
	Employment Level		Annual Employment Growth (CAGR)	
County	2013	% of Total	2002-2007 (Expansion)	2007-2010 (Recession)
Hillsborough County	190,607	31.0%	0.9%	-2.3%
Rockingham County	137,500	22.0%	1.2%	-1.6%
Merrimack County	73,498	12.0%	0.6%	-0.6%
Grafton County	52,166	8.0%	1.2%	-0.9%
Strafford County	45,392	7.0%	1.2%	-1.0%
Cheshire County	31,929	5.0%	0.8%	-2.1%
Belknap County	25,519	4.0%	0.9%	-2.9%
Carroll County	19,968	3.0%	0.6%	-0.9%
Sullivan County	13,791	2.0%	0.1%	-1.9%
Coos County	12,513	2.0%	0.2%	-2.6%
State Total*	618,781	100%	0.90%	-1.60%

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages
** Discrepancy due to NHDOL non-disclosure*

Retail, health care and government are the largest sectors in NH (**Figure 9-4**). Accounting for 31 percent of all employment, Hillsborough County's industry pattern mirrors that of the state as a whole (**Table 9-9**). Bordered by the seacoast and I-95 corridor on the eastern side and the I-93 corridor on the west, Rockingham County has proportionally more jobs in transportation and warehousing. Sullivan County, which is on the border with Vermont, has proportionally more employment in manufacturing than the rest of the state.

Tourism is an important source of employment in Coos and Carroll Counties. With the White Mountain National Forest, both counties have proportionally more employment in accommodation, recreation and entertainment. Ski areas and hotels are among the largest employers in these two counties. With Dartmouth-Hitchcock Medical Center, the state's largest hospital with 6,652 workers, Grafton County has proportionally more of its employment in health care than the rest of the state.

Figure 9-4 - Employment by Industry (Jobs), 2013



Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Table 9-9- Employment by Industry and County, 2013

Industry	Belknap	Carroll	Cheshire	Coos	Grafton	Hillsborough	Merrimack	Rockingham	Strafford	Sullivan	State
Goods-Producing Industries	13.8%	10.4%	18.9%	13.2%	12.9%	16.2%	12.9%	14.2%	14.0%	26.9%	14.7%
Agriculture/Forestry/ Fishing	0.2%	-	-	1.6%	0.5%	0.1%	0.6%	0.2%	0.4%	-	0.3%
Mining	0.2%	-	-	0.2%	0.1%	-	0.2%	0.1%	0.1%	-	0.1%
Construction	4.3%	4.9%	4.3%	5.9%	2.3%	3.3%	4.1%	3.9%	2.7%	3.6%	3.6%
Manufacturing	9.1%	5.0%	14.0%	5.6%	9.9%	12.8%	8.0%	10.1%	10.9%	22.1%	10.7%
Service-Providing Industries	69.7%	74.5%	65.7%	63.2%	74.3%	72.7%	65.8%	75.4%	65.7%	55.6%	71.6%
Utilities	0.5%	0.4%	-	0.8%	0.3%	0.2%	0.5%	0.7%	-	0.5%	0.4%
Wholesale Trade	1.8%	1.2%	3.6%	1.5%	1.7%	3.8%	5.2%	4.7%	2.4%	2.7%	4.3%
Retail Trade	19.7%	18.4%	16.6%	14.0%	13.8%	14.7%	12.9%	18.5%	13.9%	16.6%	15.3%
Transportation and Warehousing	1.8%	1.0%	1.8%	2.4%	1.3%	1.9%	1.5%	3.0%	1.7%	1.4%	2.0%
Information	1.2%	1.3%	1.2%	0.5%	1.2%	2.7%	0.8%	2.2%	2.4%	0.6%	1.9%
Finance and Insurance	1.7%	2.4%	4.3%	1.6%	1.7%	5.3%	5.4%	4.0%	8.0%	3.1%	4.5%
Real Estate and Rental and Leasing	1.2%	1.2%	0.8%	0.7%	0.9%	1.2%	1.1%	1.2%	0.8%	0.8%	1.1%
Professional and Technical Service	2.7%	2.0%	2.0%	1.0%	3.5%	6.5%	3.8%	5.6%	3.0%	2.4%	5.1%
Mgmt of Companies/ Enterprises	2.0%	0.9%	-	1.0%	-	1.7%	0.6%	1.2%	-	-	1.3%
Administrative and Waste Services	3.9%	2.9%	3.3%	1.4%	1.8%	5.3%	2.9%	6.3%	4.2%	5.9%	4.9%
Educational Services	1.4%	-	2.7%	-	-	2.6%	2.6%	1.9%	1.3%	2.2%	3.0%
Health Care and Social Assistance	13.3%	13.1%	12.2%	17.7%	21.3%	14.2%	16.0%	11.0%	14.5%	10.3%	13.8%
Arts, Ent'ment, and Recreation	2.5%	4.1%	1.0%	3.4%	2.2%	1.3%	2.3%	2.1%	1.3%	0.9%	1.8%
Accommodations and Food Services	12.8%	21.2%	8.1%	15.0%	10.0%	7.7%	6.3%	9.9%	8.3%	6.2%	8.9%
Other Services ExPublic Admin	3.0%	2.4%	4.5%	1.7%	2.3%	3.6%	3.8%	2.9%	3.3%	2.1%	3.2%
Unclassified Establishments	-	-	-	-	-	-	-	-	-	-	-
Total Private	83.5%	84.9%	84.6%	76.4%	87.2%	88.9%	78.6%	89.6%	79.7%	82.5%	86.3%
Federal Government	0.5%	0.6%	0.5%	2.8%	1.0%	2.0%	1.1%	0.7%	0.7%	0.6%	1.2%
State and Local Government	15.9%	14.5%	14.9%	20.7%	11.9%	9.1%	20.3%	9.7%	19.6%	16.9%	12.5%
Grand Total (in thousands)	**25.5**	**20.0**	**31.9**	**12.5**	**52.2**	**190.6**	**73.5**	**137.5**	**45.4**	**13.8**	**618.8**

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Aviation Manufacturing

Manufacturing accounted for nearly 11 percent of the state's total employment in 2013 according to the Bureau of Labor Statistics. Several of the largest manufacturers in the state produce aircraft parts and auxiliary equipment. The following manufacturers' production includes, or consists solely of, aviation related items:

- BAE Systems Electronic System is a major producer of aircraft self-protection systems as well tactical surveillance and intelligence systems for all branches of the armed forces. BAE employs 4,500 employees in Nashua and is the largest manufacturer in NH.
- GE Aviation, which manufactures parts for commercial, military and general aviation airlines, employs 800 workers in Hooksett.
- Albany Engineered Composites, a company with headquarters in Rochester, designs, develops, and manufactures advanced composite components for aerospace, defense, and other high-performance applications. They employ 450 workers.
- Elbit Systems Ltd. is an Israeli international defense electronics company with a plant in Merrimack that employs 500.
- Timken Aerospace develops super precision bearings and employs 410 in Lebanon and another 400 in Keene.
- Titeflex aerospace is a British company that manufactures components for aerospace and semi-conductor industries and employs 335 in Laconia.

In 2012, manufacturing of aircraft, aircraft engines, other aircraft parts and auxiliary systems accounted for 1,276 jobs in the state. Labor income in these industries averaged $90,400 per employee. Because of the high wages as well as because of the concentration of aviation manufacturers in NH, these industries generate high multiplier effects. Multiplier effects are additional economic activity at other businesses that is triggered by in-state purchases made by manufacturers and their employees (see Appendix for more discussion on multiplier effects). Using the IMPLAN input-output modeling system, the total number of jobs supported by aviation manufacturing at other businesses throughout the state was estimated at 2,390, bringing the total impact of the aviation manufacturing industry in NH to 3,670 jobs.

NH’s Aerospace and Defense Cluster

Aerospace and defense are identified by the U.S. Cluster Mapping Project (a partnership between Harvard Business School’s Institute for Strategy and Competitiveness, U.S. Department of Commerce and U.S. Economic Development Administration) as the state’s fifth largest traded cluster. Clusters are formed when the economic activities in a set of related industries in a given location reach critical mass that positively affects the performance of companies. Traded clusters are clusters that serve markets beyond the region in which they are located and thus function as their region’s economic engine. Based on the U.S. Cluster Mapping Project, a total of about 8,500 employees worked in the aerospace and defense sector in 2012 in NH. Aerospace is concerned with both aviation and space flight. The cluster ranks seventh in terms of statewide employment, ranked behind:

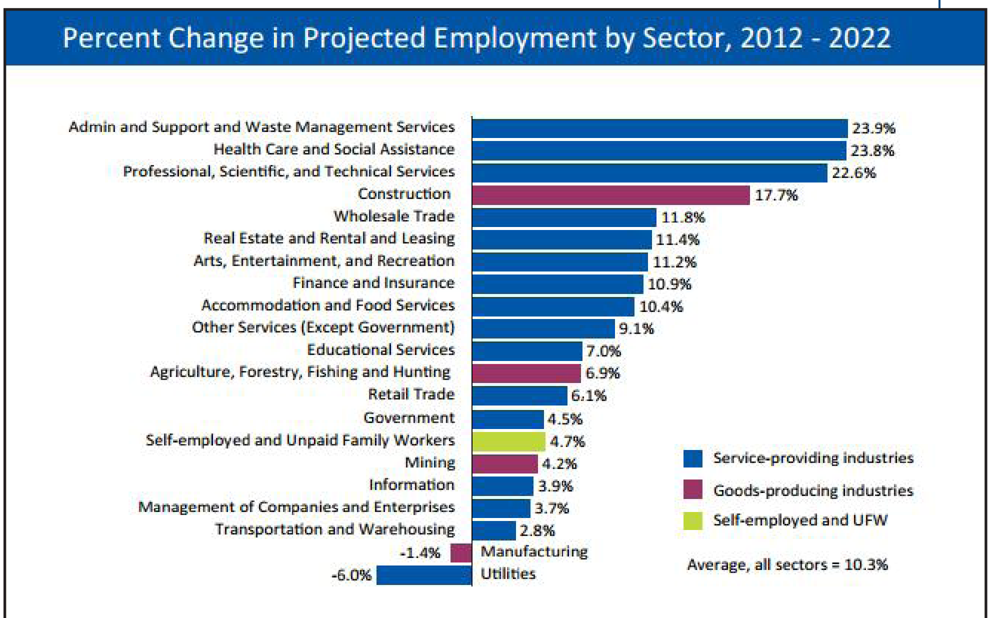
- Business services,
- Distribution and e-commerce,
- Hospitality,
- Education,
- Insurance and;
- Information Technology.

In 2013 the International Trade Resources Center at the State Division of Economic Development founded the NH Aerospace and Defense Consortium (NHADEC) to help the 300 businesses involved in aerospace and defense reach their full export market potential. In early 2013, NHADEC announced a partnership between Albany Engineered Composites, located in Rochester, and Safran Aerospace Composites, a multinational aircraft and rocket engine, aerospace component and security company. The two companies are partnering to manufacture light-weight airplane engine blades. The production plant in Rochester opened in March 2014. At the end of 2013 NHADEC signed a partnership agreement with Aero Montreal, a similar Quebec based organization, which made a first step in creating a New England –Quebec aerospace corridor.

The New Boston Air Force Station, part of the 50th Space Wing, a component of Air Force Space Command is located in the towns of New Boston, Bedford, Amherst, and Mt. Vernon, Hillsborough County, NH. The 2,826-acre property is currently owned by the U.S. Air Force (USAF), and consists of developed areas, including a Satellite Communications terminal, antenna systems, engineering, maintenance, security, and administration systems. The mission of the 50th Space Wing is to command and control operational Department of Defense satellites and manage the worldwide Air Force Satellite Control Network.

According to the most recent NH Employment Projections from the NH Economic and Labor Market Information Bureau, total employment in NH is anticipated to grow by 10.3 percent between 2012 and 2022, a growth rate of just under one percent per year[2]. The state's projected employment growth rate is slightly less than the national employment growth for the same period, which was projected at 10.8 percent. Every sector with the exception of Manufacturing and Utilities is projected to grow (**Figure 9-5**). Almost 30 percent of the projected new jobs between 2012 and 2022 will be in the health and social services sector in NH. Another 20 percent will be in Administrative Support and Waste Management Services and Professional, Scientific, and Technical Services.

Figure 9-5 - Percent Change in Projected Employment by Sector, Projections 2012-2022



Source: NH Employment Security; Economic and Labor Market Information Bureau http://www.nhes.nh.gov/elmi/products/proj.htm#longterm

Tax Revenue

NH is one of two states in the U.S. without personal income tax and sales tax. The three primary sources of state tax revenue in NH are: business profit tax, enterprise tax and meals and rooms tax.

Business profit tax – 8.5 percent tax on income from conducting business activity within the state, and a portion of the income for multi-state businesses.

Business enterprise tax – 0.75 percent on the enterprise value tax base, which is defined as the sum of all compensation paid or accrued, interest paid or accrued, and dividends paid, after special adjustments and apportionment.

[2] NH Employment Projections by Industry and by Occupation http://www.nhes.nh.gov/elmi/products/documents/projections.pdf

Meals and rooms tax – 9 percent tax on hotels, campsites, motor vehicle rentals, and restaurant meals.

Together these three tax revenue streams accounted for 65 percent of the total tax revenue in FY2013 (**Table 9-10**).

Table 9-10 - Tax Revenue Sources, FY2013

Tax Revenues	FY13	Percent
Business Profits Tax	321,155,285	26.7%
Business Enterprise Tax	221,388,011	18.4%
Meals and Room Tax	239,794,701	19.9%
Other	421,856,811	35.0%
Total Tax Revenue	1,204,194,808	100%

Source: NH Department of Revenue Administration

Economic Contribution

The economic contribution of the airport system to the state of NH and local communities consists of on-airport employment as well as jobs at businesses located throughout the state that are supported by the multiplier effect. The multiplier effect created by the system is triggered by capital and operation and maintenance (O & M) expenditures by airport management and tenants and by visitor spending at local and statewide businesses. General aviation airports (not including primary airports) also generate travel time savings for local businesses and provide emergency preparedness, critical community access, quality of life improvements, and other benefits to local communities.

On-Airport Employment

The airport system also supports permanent jobs throughout the state. In 2013, an estimated 2,591 full-and part-time year-round employees worked at system airports. This includes a total of 132 employees (113 full-time and 19 part-time workers) who were employed by the airports to manage and operate the facilities and an estimated additional 2,459 persons employed by airport tenant businesses. Tenant businesses at

Manchester Boston-Regional Airport, include commercial passenger airlines, cargo airlines, concessionaires/terminal services, ground transportation and rental car services, government agencies and FBOs.[3] At Portsmouth International Airport at Pease, the largest employer is the 157th Air Refueling Wing (157ARW) of the NH Air National Guard (ANG). Largely due to the level of operations, Lebanon Municipal Airport and the general aviation airports have fewer tenants. Examples of tenants are fixed base operators (FBOs), airlines, flight schools, aircraft sales, aircraft maintenance, car rental agency and airport restaurants.

[3] Tenant employment at Manchester Boston Regional airport were estimated by proportionally reducing the 2009 Manchester Airport economic impact study's 2008 employment numbers based on the decline in passengers, general aviation operations and cargo volumes between 2008 and 2013.

Table 9-11 - On Airport Employment, 2013

	Airport Management	Airport Tenants	Total Jobs
Primary Airports	115	2,210	2,325
General Aviation Airports	17	249	266
Total	132	2,459	2,591

Source: The Louis Berger Group

Spending Impacts

Spending impacts, or multiplier effects, account for a major part of the system's contribution to the state's economy. Multiplier effects are generated when NH businesses purchase inputs from other NH businesses and when their employees purchase household goods and services within the state. In the context of the NH Airport System, multiplier effects are triggered by four activities: (1) airport capital expenditures; (2) airport operation and maintenance expenditures; (3) airport tenant expenditures; and (4) visitor spending by passengers and pilots. As airports and their tenants, employees and visitors make purchases within the state, they support jobs, income, and sales revenues at other businesses throughout the state of NH and contribute to state tax revenues. The magnitude of these multiplier effects were estimated using input-output modeling techniques and the IMPLAN modeling system as described in the methodology **Appendix 9-B.**

Airport Capital Expenditures

Every year, NPIAS airports are eligible to receive federal funding for airport planning and development projects as part of the Airport Improvement Program (AIP), Title 49 of the United States Code (U.S.C.). The federal share is 90% of AIP eligible costs. This funding structure applies to small primary, non-primary, relievers, and general aviation airports. The state, and in some cases, the local government, and the airport sponsor fund the remaining 10 percent of project costs. The highest cost projects at primary airports in NH in recent years include the installation of solar panels and terminal ramp replacement, both at Manchester-Boston Regional Airport ($3.5 million in FY2011 budget and $4.2 million in the FY2012 budget, respectively). Recently completed key projects at the general aviation airports include the runway reconstruction at Boire Field in Nashua (i.e., total project cost of $18.9 million included in the FY2011 budget) and at Dillant-Hopkins Airport in Keene (i.e., total project cost of $5.0 million included in the FY2012 budget). AIP funds are also used for the statewide pavement maintenance program.

Funded amounts vary widely from year to year. Total actual project cost at NH System general aviation airports was $9.0 million in FY2010, $21.0 million in FY2011 and $5.7 million in FY2012, which corresponds to an average of $11.9 million per year (**Table 9-12**). Based on the FY2010-2012 data, the cost of capital projects at primary airports averaged $8.5 million per year.

Table 9-12 - Airport Improvement Program (AIP) Project Cost, FY2010-2012

	FY2010	FY2011	FY2012	Average
Primary Airports				
Manchester-Boston Regional Airport	4,867,172	9,314,291	6,601,896	6,927,786
Portsmouth International Airport at Pease	2,123,669	991,606	715,216	1,276,830
Lebanon Municipal Airport	70,000	150,205	681,930	300,712
Subtotal Primary Airports	7,060,841	10,456,102	7,999,041	8,505,328
General Aviation Airports	9,007,630	21,023,811	5,704,867	11,912,103
Grand Total	**16,068,471**	**31,479,913**	**13,703,908**	**20,417,431**

Source: NHDOT

Airport development projects generate jobs in the construction industry and related industries. Based on the average project cost per year between 2010 and 2012, an average of 167 jobs in the construction, engineering and related industries per year are directly supported by AIP projects. Purchase of construction materials and other supplies by contractors and household spending by the construction workers supports additional jobs throughout the state through the multiplier effect.

Taking into account the multiplier effect, the total economic contribution of system capital expenditures equals 276 jobs, $15.3 million in labor income, and $36.2 million in output in the state of NH (**Table 9-13**). State tax revenues associated with these impacts, more specifically business profit tax and business enterprise tax, are estimated at $0.15 million.

Table 9-13 - Estimated Annual Contribution of Airport Capital Programs (in $million)

	Number of Airports	Jobs	Labor Income	Output	Taxes
Primary Airports	3	106	$5.96	$13.79	$0.06
General Aviation Airports	22	171	$9.34	$22.39	$0.09
Total	**25**	**276***	**$15.30**	**$36.18**	**$0.15**

Source: The Louis Berger Group Note: The contribution presented in this table includes the direct effect of the construction projects (i.e.construction jobs) as well as the indirect and induced effects (i.e., jobs at other NH businesses supported by purchases made by construction contractors and their employees).

** Rounding discrepancy*

Airport Operation and Maintenance Expenditures

Based on the airport management survey conducted for this study, non-labor operations and maintenance (O&M) expenditures for the 12 NPIAS airports in 2013 totaled $20.38 million, (**Table 9-14**).

Expenditures associated with O & M included building-related expenditures such as electricity and maintenance, as well as non-building expenditures. In that same year, labor expenditures, including fringe benefits, for the 132 permanent employees and the 82 seasonal employees who were employed by the airports totaled $10.52 million. Manchester Boston-Regional Airport accounted for the largest share of operations and maintenance spending.

Table 9-14 - O&M Spending by Airport Management (in $millions), 2013

	Number of Airports	Labor	Non-Labor
Primary Airports	3	$9.33	$18.64
General Aviation Airports	9	$1.19	$1.74
Total	**12**	**$10.52**	**$20.38**

Source: The Louis Berger Group

The airports' labor and non-labor expenditures trigger additional economic activity at other businesses in the state. As airport vendors and employees use a portion of their income to make purchases at other NH businesses, additional economic activity (i.e., multiplier effects) is generated throughout the state. Taking into account the multiplier effects, the estimated economic contribution of the 12 airports' operations and maintenance expenditures equals 142 jobs, $6.8 million in labor income, and $19.7 million in output in the state of NH (**Table 9-15**). State tax revenues, and more specifically business profit tax and business enterprise tax associated with these expenditures was estimated at $0.08 million.

Table 9-15 - Multiplier Effect of Operations and Maintenance Spending by Airport Management, (in $millions), 2013

	Number of Airports	Jobs	Labor Income	Output	Taxes
Primary Airports	3	128	$6.10	$17.76	$0.08
General Aviation Airports	9	14	$0.66	$1.95	<$0.01
Total	**12**	**142**	**$6.76**	**$19.72***	**$0.08**

Source: The Louis Berger Group. Note: The multiplier effect includes the, jobs at other NH businesses supported by purchases made by airport management and their employees (indirect and induced effect).
** Rounding discrepancy*

Airport Tenant Operations and Maintenance Expenditures

Airport tenants account for the majority of the on-airport employment. Of the 2,591 on-airport jobs, 2,459 are jobs at airport tenant businesses. Using industry average wages, the estimated compensation for these employees is $114.8 million. These tenants and their employees purchase goods and services at other NH business, which generates additional economic activity through the multiplier effect.

Taking into account the multiplier effect, the spending by the on-airport tenants and their employees supports 2,086 jobs, $92.37 million in labor income and $285.62 million in output at other businesses located throughout the state (**Table 9-16**). Business profit and enterprise state tax revenue associated with these expenditures are estimated as $1.21 million.

Table 9-16 - Multiplier Effect of Operations and Maintenance Spending by Airport Tenants, (in $millions), 2013

	Number of Airports	Jobs	Labor Income	Output	Taxes
Primary Airports	3	1,915	$84.11	$264.95	$1.12
General Aviation Airports	9	171	$8.26	$20.67	$0.09
Total	**12**	**2,086**	**$92.37**	**$285.62**	**$1.21**

Source: The Louis Berger Group Note: The multiplier effect includes the, jobs at other NH businesses supported by purchases made by airport tenants and their employees (indirect and induced effect)

Visitor Expenditures

Airports play a major role in tourism. Commercial air passengers generally spent money on a variety of goods and services, including lodging, transportation, food and beverages and entertainment. While more limited, general aviation airports also attract visitors to the state. When visitors purchase goods and services at off-airport businesses, they support jobs at these businesses. Multiplier effects are generated as the vendors and vendor employees make additional purchases at businesses throughout NH.

Commercial Service

The majority of the out-of-market visitors arriving by air use commercial service. By definition, commercial service is available at the three primary service airports in the system. Commercial service was only offered at Portsmouth International Airport at Pease during the last few months of 2013 and was limited to flights to Florida.

An estimated 1.2 million passengers landed at Manchester-Boston Regional Airport in 2013. Based on the 2009 study of the economic impact of Manchester Airport, it was assumed that an estimated 44 percent of passengers at Manchester-Boston Regional Airport were visitors[4]. This corresponds to an estimated total of 822,000 visitors in 2013. Adjusting the visitor spending pattern of the 2009 study for inflation, visiting air passengers spend nearly $500 on food, lodging and other purchases per visitor per trip in 2013 (**Table 9-17**).

Enplanements at Lebanon Municipal Airport in 2013 totaled 10,953.

Enplanements at Portsmouth International Airport at Pease totaled 22,540 in 2013.

Table 9-17 - Average Visitor Spending, Commercial Service (MHT 2009)

	Average Expenditures per visitor per trip
Lodging	$283
Food and Beverages	$142
Retail	$50
Other	$23
Total	**$498**

Source: 2009 Manchester Economic Impact Study, adjusted for inflation

[4] Visitors was defined as defined as persons not residing in Vermont, NH, Massachusetts or Maine

Using the same assumptions to estimate the visitor spending as for Manchester-Boston Regional Airport, the total spending by visitors arriving by commercial aircraft at Manchester, Lebanon and Pease in 2013 was estimated at $269.50 million (**Table 9-18**).

Table 9-18 - Annual Visitor Spending, Commercial Service, 2013

	Enplanements 2013	Visitors 2013	Total spending 2013 (in $millions)
Manchester Boston-Regional Airport	1,190,082	526,016	$ 262.12
Lebanon Airport	10,953	4,841	$ 2.41
Portsmouth International at Pease	**22,540**	**9,963**	**4.96**
Total	**1,223,575**	**540,820**	**$ 269.50**

Source: The Louis Berger Group

General Aviation

The 25 airports in the system reported a combined 143,244 general aviation itinerant operations. Itinerant operations are operations outside of the airport's local area; they can be made by based aircraft or by visiting aircraft. Unlike airports with air traffic control towers that have the ability to record actual itinerant operations, itinerant operations at general aviation airports are more or less an estimated guess. Therefore, a review of similar studies throughout New England was conducted to better understand the level of general aviation itinerant operations and their values were considered in making assumptions for this NH study. Based on a review of similar airports in neighboring states, it was assumed that 65 percent of itinerant general aviation operation at primary and national airports was by visitors coming from out-of-state or out-of-market area. For regional, local and basic airports, it was assumed that 33 percent of itinerant operations were made by visitors. This is typical of activity levels found in New England states and the nation.

The average number of passengers per aircraft is dependent on the type of aircraft and differs by airport role since local and basic airports are typically used by smaller aircraft and have fewer passengers in general. Average number of visitors per aircraft estimated based on information obtained from the survey and studies in neighboring states is presented in **Table 9-19**.

Table 9-19 - Average Number of Visitors per Aircraft

Airport Role/ Classification	Average Number of Visitors per Aircraft
Primary	2.8
National	2.8
Regional	2.3
Local	2.0
Basic	1.7

Source: The Louis Berger Group

The average spending per visitor is expected to vary with the level and type of economic activity surrounding the airport. Average spending per visitor estimated based on the survey program and on a review of studies at comparable airports in New England is presented in **Table 9-20**.

Table 9-20 - Average Spending per Visitor

Airport Role/ Classification	Average Spending per Visitor
Primary	$220
National	$220
Regional	$155
Local	$113
Basic	$77

Source: The Louis Berger Group

Based on assumptions above, the total spending by visitors arriving by general aviation is estimated as $16.51 million (**Table 9-21**).

Table 9-21 - Annual Visitor Spending, General Aviation, 2013

	Total Number of Airports	General Aviation Itinerant Operations	Visiting Aircraft	Visitors	Visitors Spending (in $millions)
Primary Airports	3	30,095	9,781	27,386	$6.02
GA Airports	9	96,380	20,159	54,110	$9.99
Non-NPIAS Airports	13	22,725	3,750	6,374	$0.49
Total	**25**	**149,200**	**33,690**	**87,870**	**$16.50**

Source: The Louis Berger Group

Multiplier Effect of Commercial and General Aviation Visitor Spending

Visitor spending supports businesses throughout the state through the multiplier effect. Taking into account the multiplier effect, the total economic contribution of visitor spending, including visitors arriving at commercial airports and those arriving at general aviation airports equals 4,187 jobs, $141.53 million in labor income and $435.09 million in output (**Table 9-22**). State tax revenues associated with these expenditures, consisting of business profit tax, business enterprise tax, and meals and room tax, are estimated at $23.92 million.

Table 9-22 - Contribution Visitors Spending (in $millions), 2013

	Number of Airports	Jobs	Labor Income	Output	Taxes
Primary Airports	3	4,033	$136.33	$419.08	$22.91
GA Airports	9	147	$4.96	$15.26	$0.96
Non-NPIAS Airports	13	7	$0.24	$0.75	$0.05
Total	**25**	**4,187**	**$141.53**	**$435.09**	**$23.92**

Source: The Louis Berger Group Note: The contribution includes the, jobs at other NH businesses supported by purchases made by visitors (direct effect of visitor spending) and by businesses serving visitors and their employees (indirect and induced effect).

Summary Spending Impacts

Spending by airport management, tenants, employees and visitor supports an estimated 6,635 jobs at other businesses throughout the state (**Table 9-23**). Taking into account both the on-airport activity and the multiplier effect, the total economic contribution of the NH state airport system is 9,282 jobs, $381.29 million in labor income, $1.16 billion in output and $26.85 million in tax revenue.

Table 9-23 - Overview of Multiplier Effect, All Airports

	Jobs	Labor Income (in $ millions)	Output (in $ millions)	Taxes (in $ millions)
On-Airport	2,591	$125.33	$384.84	$1.49
Spending Impact				
Airport Management Spending	142	$6.76	$19.72	$0.08
Capital Spending	276	$15.30	$36.18	$0.15
Tenant Spending	2,086	$92.37	$285.62	$1.21
Visitors Spending	4,187	$141.53	$435.09	$23.92
Subtotal Spending Impact	6,691	$255.96	$776.61	$25.36
Total	**9,282**	**$381.29**	**$1,161.45**	**$26.85**

Source: The Louis Berger Group

The three primary airports have a larger economic contribution than the other airports since they employ more people, have more tenants and have larger operations and maintenance budgets (**Table 9-24**). However, general aviation airports also make a significant contribution to the NH economy supporting 769 jobs, $38.02 million in labor income, $100.33 million in output and $1.31 million tax revenues (**Table 9-25**). While the airports not part of the NPIAS are small airports, usually without employees or tenants, they do bring visitors into the state (**Table 9-26**). Spending by these visitors supports an estimated 7 jobs throughout the state.

Table 9-24 - Overview of Multiplier Effect, Primary Airports

	Jobs	Labor Income (in $ millions)	Output (in $ millions)	Taxes (in $ millions)
On-Airport	2,325	$110.53	$344.78	$1.33
Spending Impact				
Airport Management Spending	128	$6.10	$17.76	$0.08
Capital Spending	106	$5.96	$13.79	$0.06
Tenant Spending	1,915	$84.11	$264.95	$1.12
Visitors Spending	4,033	$136.33	$419.08	$22.91
Subtotal Spending Impact	6,182	$232.50	$715.58	$24.17
Total	**8,507**	**$343.03**	**$1,060.36**	**$25.50**

Source: The Louis Berger Group

Table 9-25 - Overview of Multiplier Effect, General Aviation Airports in System

	Jobs	Labor Income (in $ millions)	Output (in $ millions)	Taxes (in $ millions)
On-Airport	266	$14.80	$40.06	$0.16
Spending Impact				
Airport Management Spending	14	$0.66	$1.95	$0.01
Capital Spending	171	$9.34	$22.39	$0.09
Tenant Spending	171	$8.26	$20.67	$0.09
Visitors Spending	147	$4.96	$15.26	$0.96
Subtotal Spending Impact	503	$23.22	$60.27	$1.15
Total	**769**	**$38.02**	**$100.33**	**$1.31**

Source: The Louis Berger Group

Table 9-26 - Overview of Multiplier Effect, System Airports not included in NPIAS

	Jobs	Labor Income (in $ millions)	Output (in $ millions)	Taxes (in $ millions)
Visitors Spending	7	$0.24	$0.75	$0.05
Total	**7**	**$0.24**	**$0.75**	**$0.05**

Source: The Louis Berger Group

Travel Time Savings

General aviation airports are important assets to local businesses and provide benefits to the state economy beyond the on-airport employment and spending impacts described above. General aviation provides business travelers with the flexibility to choose departure times that fit their schedule, flying from one of the many airports located throughout the state and the ability to choose a destination among the more than 3,000 general aviation airports throughout the country.[5] General aviation allows travelers to avoid security screenings and carry-on limitations associated with commercial air service. For business located in the north of the state where commercial service is not available and far removed

[5] FAA, General Aviation: A National Asset, p1. http://www.faa.gov/airports/planning_capacity/ga_study/media/2012assetreport.pdf'

from major commercial centers, general aviation airports provide a vital connection to customers, suppliers and business partners. Furthermore, a recent study by the National Business Aviation Association (NBAA) and the General Aviation Manufacturers Association (GMAA) found that business travelers on general aviation aircraft are more likely to spend their in-vehicle travel time (i.e., in flight time) productively compared to travelers using most other modes.

The travel time savings provided by general aviation constitute cost savings for the businesses that have employees traveling on-the-clock (i.e. employees who are paid during the time they travel). Business owners pass the cost savings on to customers, reinvest them into their business, or treat them as profit.

The benefits of travel time savings are typically quantified using the standard value of time (VOT) metric, which is an estimate of the amount the average traveler is willing to the pay for one hour of travel time savings. For business trips during which the traveler is paid for his time spent traveling, travel time savings constitute a benefit to the individual traveler as well as for the employer. To estimate the cost savings reduced travel time creates for employers, the VOT was defined based on the average wage of business travelers, which is assumed to be 2.5 higher than the overall average wage. Using an average annual pay in NH of $48,963 as reported by the Bureau of Labor Statistics and multiplied by a factor of 2.5 to take into account higher average incomes of business air travelers, the average VOT was estimated as $59.[6] Assuming that general aviation business travelers save two hours in each direction, the combined travel time savings for travelers throughout the state in 2013 was 238,791 hours, which translates into a benefit of $14.09 million (**Table 9-27**).

Table 9-27 -Overview of Travel Time Savings, All Airports

	Number of Business Aviation Flights*	Number of Passengers**	Travel Time Savings (in hours)	Travel Time Savings
Commercial	9,029	30,697	61,394	$3.62
National	7,981	27,136	54,272	$3.20
Regional	15,539	52,832	105,664	$ 6.23
Local	2,338	7,949	15,898	$ 0.94
Basic	230	781	1,563	$0.09
Total	**35,116**	**119,396**	**238,791**	**$14.09**

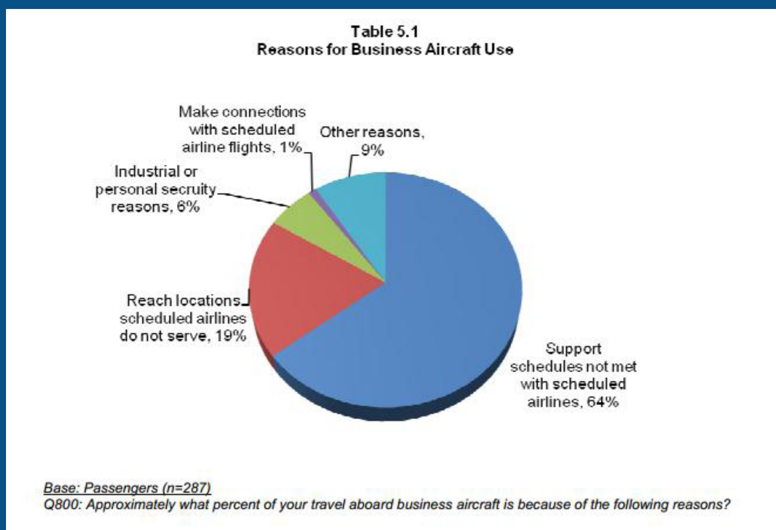
Source: The Louis Berger Group
*Note: *The percent of the itinerant operations that are business for business purposes was based on the airport management survey. For airports for which no data on the trip purpose of general aviation airports was received, assumptions about the proportion of business flights were made based on the completed surveys for other airports.*
*** Assumes 3.4 passengers per business aircraft based on 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association*

[6] ($48,963 (average annual pay 2013 dollars)* 2.5(adjustment for higher average income of business air travelers))/2080(number of work hours in one year).

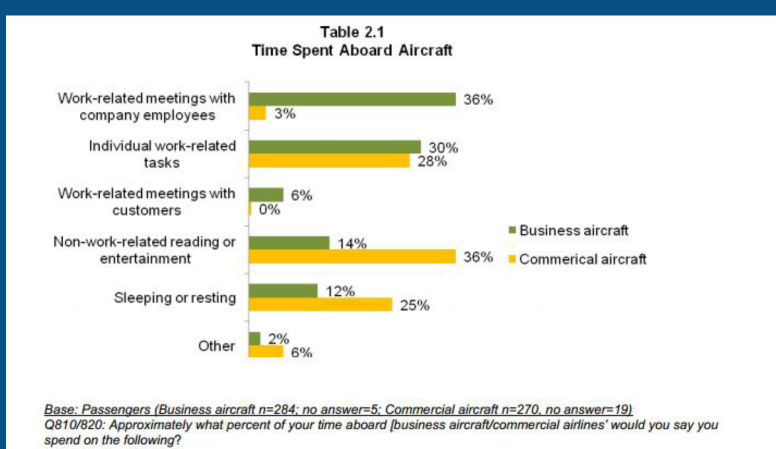
Business Aircraft Use and Traveler Productivity

A 2009 study prepared for the National Business Aviation Association and the General Aviation Manufacturers Association examined general aviation business travel. The researchers interviewed 305 pilots and flight department managers and 289 passengers on business aircraft. The study report included the following findings:

- Small companies operate 90 percent of business aircraft.
- The primary reason for using business aircraft is to support schedules that cannot be met solely with commercial airlines. The figure below shows the reasons for business aircraft use.
- Nationwide an estimated 40 percent of general aviation business trips are to airports in communities where there never was any commercial service.



- Nationally, business aircraft are typically used by mid-level staff with management accounting for 50% of trips and technical, sales or service staff another 20%. Top-level management accounts for 22% of trips.
- Average number of passengers is 3.4.
- Employees use their time onboard company aircraft more productively and more effectively than when on commercial flights and even than when in the office. The figure below presents the different ways that passengers spent their time aboard business aircraft.



Community Benefits

In addition to on-airport job creation, spending impacts and travel time savings for businesses outlined in the sections above, airports provide benefits to residents and businesses that are not easily quantifiable. A 2012 study by the Federal Aviation Administration provided an overview of the many roles general aviation airports play in the National Air Transportation System based on an 18-month review of the nearly 3,000 general aviation airports in the U.S. Functions range from emergency preparedness and response, to the transportation of people and freight, and commercial applications, such as aerial surveying (**Figure 9-6**). Additional community benefits include:

- Preserving history
- Managing open space
- Search and rescue
- Medivac
- State Police Aviation
- Job Training/Flight Training

Emergency Preparedness and Response Functions

General aviation airports are often used to transport patients in need of specialized or immediate medical care. **Figure 9-7** shows that air ambulances were flown to several general aviation airports in NH. General aviation airports also function as an emergency diversion network. The extensive network of airports provides pilots with immediate alternatives to their intended destination in case of an emergency or bad weather. The FAA report illustrates the function with an example of an aircraft that was flying from Pittsfield Municipal Airport in Massachusetts to Caledonia County Airport in Vermont when its engine stopped working and that was diverted to Concord Municipal Airport in NH. The extensive general aviation airport network also provides a staging area for disaster relief efforts.

Critical Community Access Functions

General aviation airports connect remote areas with activity centers throughout the U.S.[7] For many residents and businesses in remote areas of the northern counties, general aviation is the only alternative to time-consuming long distance car, bus or train travel if they need to reach major urban centers or travel out-of-state.

General aviation airports often have air taxi service to transport passengers from areas without scheduled service to one of the 3,000 general aviation airports. Several of the general aviation airports in the state system reported air taxi operations in 2013 including,Boire Field, Dillant-Hopkins, Concord Municipal, Laconia Municipal, Berlin Regional and Mt. Washington Regional. Several of the airports not included in the NPIAS also reported air taxi operations: Jaffrey Airport - Silver Ranch, Moultonboro, Parlin Field and Alton Bay.

[7] FAA, General Aviation Airports: A National Asset. http://www.faa.gov/airports/planning_capacity/ga_study/media/2012assetreport.pdf

Other Aviation Specific Functions

Flight instruction takes place almost exclusively at general aviation and private use airports. There are 14 system airports that offer some level of flight training via schools or free-lance (**Table 9-28**). Personal flying which includes flight training and personal travel accounts for 30 percent of private flying in the US. Nearby general aviation airports contribute to the quality of life to many of the 3,825 registered pilots in NH.

Table 9-28 - Flight Schools in NH

Type of Airport	Airport	Flight School
Primary	Manchester-Boston Regional Airport	Nashua Flight Sim
Primary	Portsmouth International Airport at Pease	Seacoast Helicopters
National	Boire Field	Air Direct Airways
National	Boire Field	East Coast Aero Club
National	Boire Field	Brouillette Aviation Training
National	Boire Field	C-R Helicopters
National	Boire Field	Harvest Aviation
Regional	Dillant-Hopkins Airport	Monadnock Aviation
Regional	Dillant-Hopkins Airport	Green River
Regional	Laconia Municipal Airport	Emerson Aviation
Regional	Concord Municipal Airport	Concord Aviation Services
Local	Skyhaven Airport	Rochester Aviation
Basic	Hampton Airfield	Hampton Airfield

Source: Economic Inventory

Commercial, Industrial and Economic Activity Functions

Many businesses rely on NH's system of airports for the transportation of goods or persons. The degree of dependency varies among businesses and is difficult to measure. In some cases, this dependency may be critical such that the business would not be located in the region if access to a nearby airport was unavailable. Many local businesses use the airports on a daily basis to transport key personnel and clients. General aviation airports also provide access to freight shipping, aerial surveying and observation is used by infrastructure and utility companies to inspect and manage facilities. Municipalities often use aerial observation flights to document tax maps and plan infrastructure.

Key airport users at primary, national and regional airport in the system reported as part of the airport tenant survey included educational and health care institutions, large retailers and financial services firms (**Table 9-29**).

Table 9-29 - Frequent Off-Airport Business Users

Type of Airport	Airport Name	Types of Frequent off-airport business users
Primary	Lebanon Municipal Airport	Education, Healthcare, Non profit, air transportation Finance, Transportation
National	Boire Field	Retail, Manufacturing
Regional	Concord Municipal Airport	Education, Finance, Transportation, Entertainment, Wholesale
Regional	Laconia Municipal Airport	Entertainment, Education, Transportation, Retail, Real Estate

Source: Economic Inventory

Destination and Special Functions

General aviation airports provide access to remote areas of the state. During special events, general aviation airports are used by charter carriers and private operators to supplement commercial air service at primary airports or to bring visitors closer to the event. For instance, during the two NASCAR race weekends that are held in July and September at the NH Motor Speedway in Loudon, race teams and spectators are flying into Laconia Municipal Airport and Concord Municipal Airports which are the closest public-use airports to Loudon.

New Hampshire Motor Speedway

The NH Motor Speedway in Loudon has hosted National Association for Stock Car Racing (NASCAR) racing since the early 1990's and is one of eight tracks owned by Speedway Motorsports. With a capacity of almost 105,500 spectators, the facility is the largest sports facility in New England.

Two NASCAR Sprint Cup races are held at the NH track during two long weekends in July and September. The Sprint Cup is the premier motorsports event in North America. Both races regularly sell out and exceed the NFL Superbowl game in terms of attendance. The organization of the event as well as off-site spending by spectators and race teams on lodging, food and other expenditures generates economic activity throughout NH. The Southern NH University reported in 2011 that the economic impact of the two Sprint Cup races held at NH Motor Speedway supports 2,500 jobs, $179 million in spending and $103 million in income.

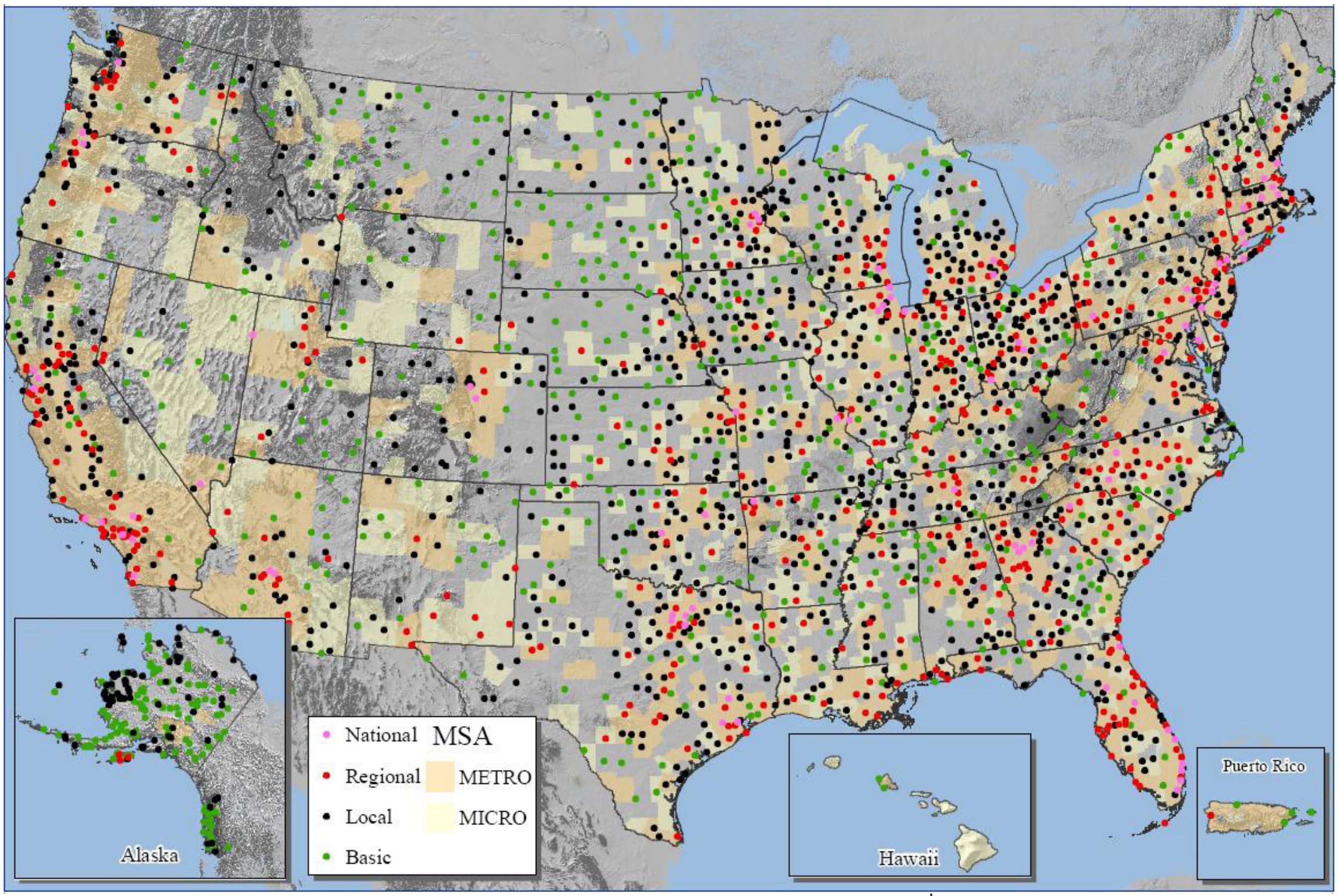
The NH system of airports plays an important role in the success of this event. In NH, as in other locations that host NASCAR racing, many race teams arrive by general aviation aircraft. During race weekends, which are Thursdays to Sundays, race teams and fans fly into Manchester- Boston Regional, Laconia Municipal and Concord Municipal Airports. Helicopter service is available between the airport and the speedway, which has four helipads. A recent article estimated a total of 100 flights related to a NASCAR race and about half staying overnight. These aircraft typically get fueled and serviced by the airports and FBO's they visit. Pre-race events also draw additional business for these airports.

Figure 9-6 - Functions of General Aviation Airports

Emergency Preparedness and Response	▪ Aeromedical Flights ▪ Law Enforcement/National Security/Border Security ▪ Emergency Response ▪ Aerial Fire Fighting Support ▪ Emergency Diversionary Airport ▪ Disaster Relief and Search and Rescue ▪ Critical Federal Functions	
Critical Community Access	▪ Remote Population/Island Access ▪ Air Taxi/Charter Services ▪ Essential Scheduled Air Service Cargo	
Other Aviation Specific Functions	▪ Self-Piloted Business Flights ▪ Corporate ▪ Flight Instruction ▪ Personal Flying ▪ Charter Passenger Services ▪ Aircraft/Avionics Manufacturing/Maintenance ▪ Aircraft Storage ▪ Aerospace Engineering/Research	
Commercial, Industrial, and Economic Activities	▪ Agricultural Support ▪ Aerial Surveying and Observation ▪ Low-Orbit Space Launch and Landing ▪ Oil and Mineral Exploration/Survey ▪ Utility/Pipeline Control and Inspection ▪ Business Executive Flight Service ▪ Manufacturing and Distribution ▪ Express Delivery Service ▪ Air Cargo	
Destination and Special Events	▪ Tourism and Access to Special Events ▪ Intermodal Connections (rail/ship) ▪ Special Aeronautical (skydiving/airshows)	

Source: Federal Aviation Administration, General Aviation Airports: A National Asset, 2012, Accessed from http://www.faa.gov/airports/planning_capacity/ga_study/media/2012assetreport.pdf

Figure 9-7 - General Aviation Airports serving Aeromedical Flights



Source: Federal Aviation Administration, General Aviation Airports: A National Asset, 2012, Accessed from http://www.faa.gov/airports/planning_capacity/ga_study/media/2012assetreport.pdf

Conclusion

The NH state airport system supported an estimated 9,282 jobs and $1.16 billion in output throughout the state in 2013. The system also generates $27.96 million in tax revenue in that same year, including business enterprise tax, business profit tax, meal and lodging tax and aircraft registration taxes.

The majority of the impact of the system is generated by commercial air service. However, general aviation airports, those both part of the NPIAS and those not part of the NPIAS supported 776 jobs, and resulted in $101.08 million in output.

Businesses using general aviation airports generate $14.09 million of cost savings due to reduced travel times. The network of general aviation airports also provides many unquantifiable benefits including emergency preparedness, critical community access, quality of life improvements and other benefits to local communities.

While not directly tied to the system, manufacturing of aircraft engines and other aircraft parts and auxiliary systems are key contributors to the state economy. Several of the largest manufacturers in the state produce aircraft parts and auxiliary equipment, such as BAE Systems

Total Economic Contribution of the NH State Airport System

- **9,280 jobs in NH**
- **$1.16 billion in output for NH businesses**
- **$28.0 million in state tax revenues**

Total Economic Contribution of Aviation (Airport System and Aircraft/Aerospace Industry):

- 12,950 jobs and $2.16 billion in output for NH businesses
- $32.2 million in state tax revenues

Electronic System, GE Aviation, Albany Engineered Composites, Elbit Systems Ltd., Timken Aerospace and Titeflex aerospace. An estimated total of 3,670 jobs[8] throughout the state were directly or indirectly supported by aviation-related manufacturing.

Including aviation-related manufacturing, the combined total of the impact aviation in NH was estimated at 12,954 jobs, $2.16 billion in output and $32.2 million in tax revenue (**Table 9-30**).

Table 9-30 - Aviation in NH, 2013

	NH Businesses			
	Output ($ millions)	Jobs	Travel Time Savings ($ millions)	NH State Tax Revenues ($ millions)
Primary Airports	$1,060.36	8,507	$3.62	$25.50
General Aviation Airports*	$101.08	776	$10.47	$1.34
Aircraft Registration				$1.10
Total NH state airport system	$1,161.44	9,283	$14.09	$27.96
Aircraft Manufacturing	$998.90	3,671		$4.23
Grand Total	$2,163.34	12,954	$14.09	$32.19

*Note: *General Aviation in this table includes airports that are not part of NPIAS. Total exceeds sum of national, regional, local and basic airports because of the impact of the statewide Pavement Maintenance Program*

[8] Louis Berger Group analysis with IMPLAN data

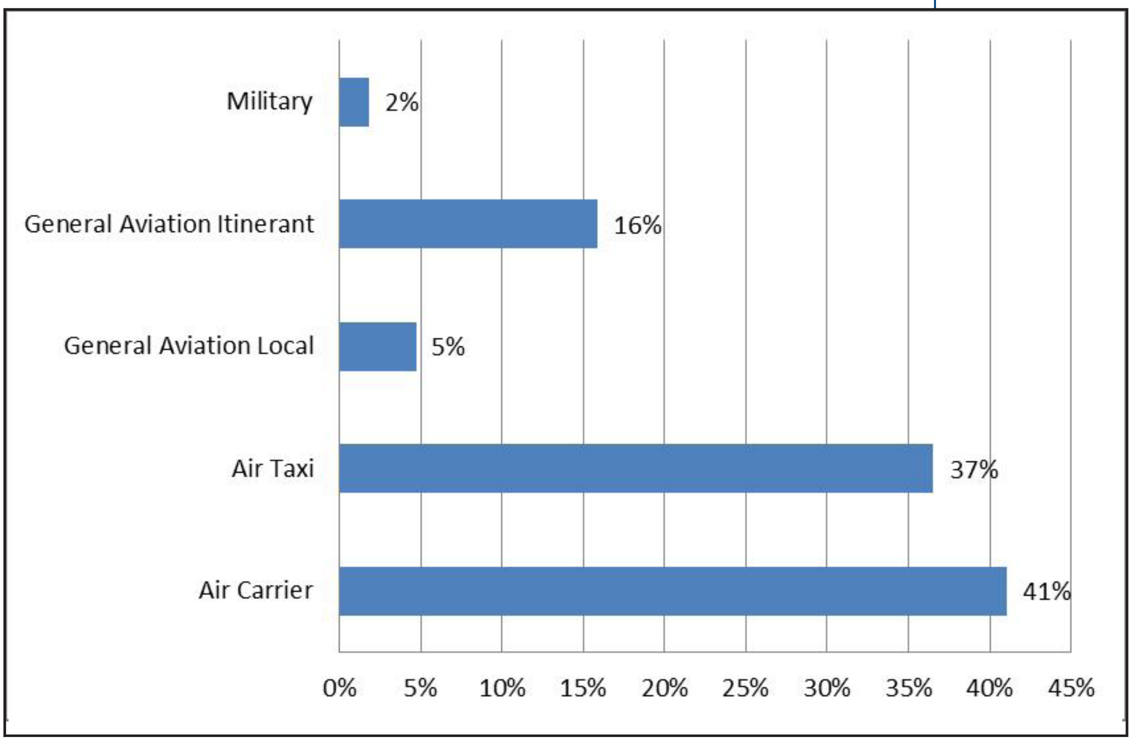
APPENDIX 9-A

APPENDIX 9-A: AIRPORT SPECIFIC SUMMARIES

A. 1. MANCHESTER-BOSTON REGIONAL AIRPORT

Manchester-Boston Regional Airport (Manchester Airport) is New Hampshire's largest airport and only airport classified as a primary commercial service airport in the state. With annual enplanements of 1.2 million in 2013, it is the fourth largest airport in New England in terms of passenger volume. Handling 167.3 million pounds of goods in 2013, Manchester Airport is also the third largest in New England in terms of air cargo. General aviation, not including air taxi operations, accounted for 21 percent of the airport's operations in 2013 (**Figure A1-1**).

Figure A1-1 - Total Operations Manchester-Boston Regional Airport



Source: Chapter 3 NHSASP

The airport is located in Manchester on the border between Hillsborough and Rockingham counties. With 110,209 residents in 2012, Manchester is the largest city in the state in terms of population. The largest employers are in the health services (Elliot Hospital and Catholic Medical Center), utilities (PSNH, Fairpoint Communications, Comcast), banking (TD Bank, Citizens Bank), and education (Southern New Hampshire University and Saint Anselm College) sectors.

Economic Contribution

Manchester-Boston Regional Airport contributes to the New Hampshire economy and its local community in several ways. Not only does the airport provide employment to airport staff, it also supports additional jobs at other businesses in the state through capital and operation and maintenance (O&M) expenditures by airport management and airport tenants, household spending by employees, and visitor spending (i.e., the multiplier effect). In addition to creating jobs, the airport's general aviation function contributes to the local economy by bringing local businesses closer to their customers and suppliers and allows business travelers to avoid the wait times for commercial flights, while still benefiting from the efficiencies of air travel.

Methodology

In 2009, Manchester Airport completed an economic impact study. The study's findings were based on a survey program of airport tenants and air passengers. The study reported that there were a total of 1,900 on-airport employees in 2008. Taking into account the multiplier effect of capital and O&M spending, the study reported a total economic impact of 3,820 jobs in Hillsborough, Rockingham, and Merrimack counties. The study estimated that visitors spent a total of $377.6 million in 2008 and that this spending supported a total of $752.8 million in sales revenue throughout the three-county region.

Figure A1-2 - Economic Impact Results Manchester Airport, 2008

DIRECT AND TOTAL ECONOMIC IMPACT BY TYPE OF ORGANIZATION IN 2008
Manchester-Boston Regional Airport

	Employment (jobs)		Payroll (millions)		Total expenditures (millions)	
Type of organization	Direct	Total	Direct	Total	Direct	Total
Passenger airlines	250	510	$6.9	$ 14.0	$ 17.2	$ 35.0
Cargo airlines	410	820	15.1	30.6	52.8	107.3
Rental car companies	190	320	5.6	9.5	26.2	44.4
Concessionaires/Terminal services	140	290	2.8	5.7	7.9	16.0
Fixed base operators/aviation support	140	280	5.7	11.6	20.4	41.5
Ground transportation	130	290	2.8	6.2	4.5	10.0
Government agencies	330	650	25.0	50.1	90.7	181.6
Other	310	660	11.9	25.2	22.7	47.5
Total	1,900	3,820	$75.8	$152.9	$242.4	$ 483.3
Air visitor expenditures *(a)*					377.6	752.8
Total expenditures in 2008					$620.0	$1,236.1

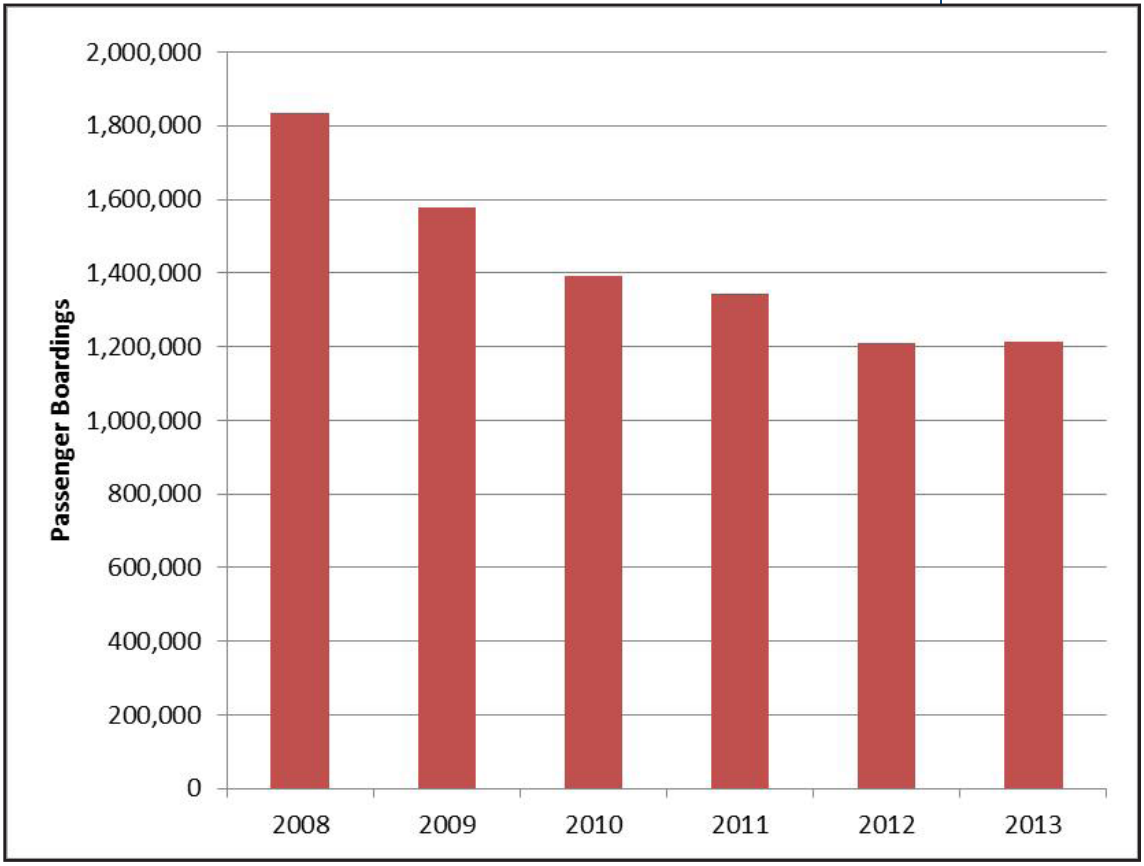
(a) Based on data contained in RKM Research and Communications, Inc., *Monthly Enplaning Passenger Survey*, June 2008.

Source: Jacobs Consultancy, July 2009, based on survey of on-Airport organizations conducted by RKM Research and Communications, Inc.

The 2009 report is the basis of the economic contribution estimates for the Manchester Airport reported in this study. The level of airport activity (i.e., passenger enplanements, general aviation operations, and cargo volumes) at Manchester has decreased significantly between 2008, the year that was analyzed for the 2009 study, and 2013, the year of analysis for this study (**Figures A1-3 and A1-4**). More specifically, between 2008 and 2013:

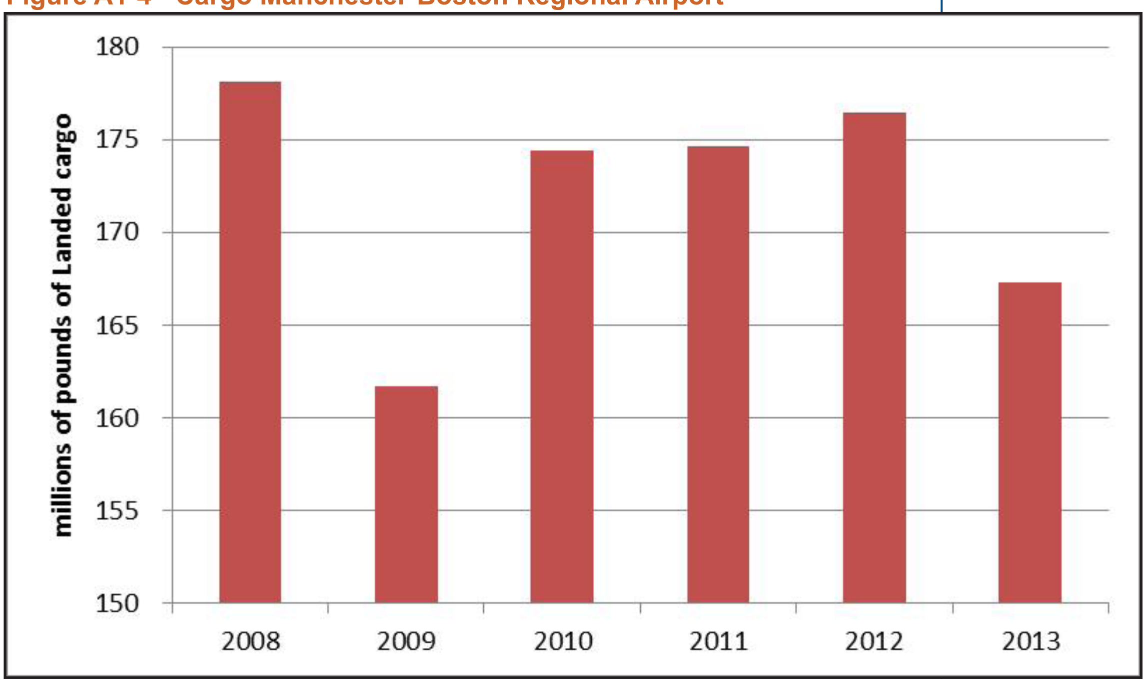
- The number of enplanements decreased by 35 percent
- The number of general aviation operations decreased by 16 percent
- Total cargo handled decreased by 6 percent

Figure A1-3 - Enplanement Manchester-Boston Regional Airport



Source: Manchester Airport

Figure A1-4 - Cargo Manchester-Boston Regional Airport



Source: Manchester Airport

To estimate 2013 on-airport employment, 2008 employment data reported in the 2009 study was adjusted proportionally to the change in enplanements, cargo, and overall New Hampshire employment (**Table A1-1**). The same approach was applied to estimate 2013 on-airport payroll and non-labor expenditures. The 2013 multiplier effect of on-airport activity was estimated by applying the multipliers from the 2009 study to the 2013 estimates.

Table A1-1 - 2013 Manchester-Boston Regional Airport On-Airport Job Estimates based on 2009 Study

	2008				2013	
	Direct Jobs	Total Jobs	2013/2008 Adjustment		Direct Jobs	Total Jobs
Passenger Airlines	250	510	0.65	*	163	332
Cargo Airlines	410	820	0.94	**	385	771
Concessionaires/Terminal Services	140	290	0.65	*	91	189
FBO/Aircraft Support	140	280	0.84	^	118	235
Rental Car Companies	190	320	0.65	*	124	208
Ground Transportation	130	290	0.65	*	85	189
Government Agencies	330	650	0.74	^^	244	481
Other Entities	310	660	0.98	◊	304	647
Total	1900	3820			1513	3050

Note: * 2013/2008 enplanements; ** 2013/2008 cargo volumes; ^ 2013/2008 general aviation; ^^ Average of 2013/2008 enplanements and 2013/2008 cargo volumes; ◊ 2013/2008 statewide employment. Source: The Louis Berger Group, 2009 Manchester Economic Impact Study

The 2009 Manchester Airport economic impact study reported that an estimated 51 percent of passengers at Manchester Airport were visitors, which was defined as persons not residing in Vermont, New Hampshire, Massachusetts, or Maine. The study reported that each visitor spent an average of $459 per trip in 2008. To estimate 2013 visitor spending, the visitor percentage from the 2009 study was applied to the 2013 passenger count, Average spending per visitors was estimated by adjusted the 2008 amount for inflation to $498. For adjusting the visitor spending pattern of the 2009 study for inflation, visiting air passengers spend nearly $500 on food, lodging, and other purchases per visitor per trip.

While the 2009 study provided the basis for an estimated number of airport tenant employees and the multiplier effect of spending by on-airport tenants, other components of the economic contribution of Manchester Airport were analyzed independently from the 2009 study. For the purpose of this study, airport management provided information about the number of persons that they employed in 2013, as well as their payroll and other expenditures. In addition, recent information was obtained about the Airport Improvement Program projects at Manchester Airport. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by capital spending and visitor spending. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for on-the-clock travel were also quantified as part of this study.

Findings

On-Airport Employment

In 2013 there were an estimated 1,513 jobs at Manchester Airport. Based on the management survey, 74 persons were employed by airport management. The remaining 1,439 on-airport employees work for airport tenant companies, including airlines, concessionaires, aircraft support, rental car companies, ground transportation, government agencies, and other entities.

Collectively, on-airport employees received an estimated $66.2 million in employee compensation in 2013.

Capital Spending

Between 2010 and 2012, Airport Improvement Program (AIP) project costs at Manchester Airport averaged $6.9 million per year. Project costs varied year to year, from $4.9 million in FY2010 to $9.3 million in FY2012. Major projects included building exhaust system modifications, drainage improvements, solar panel installation, and a terminal ramp replacement. AIP funds were also used for property acquisitions (e.g., runway 6 property acquisitions) and planning and assessments (e.g., wildlife hazard assessment, update of airport drainage plan and mitigation). Taking into account the multiplier effect, the airport's capital expenditures generated an average of 85 jobs per year, $4.7 million in labor income, $11.1 million in output, and $0.05 million in tax revenue in the State of New Hampshire.

Operations and Maintenance Spending by Airport Management and Tenants

Operations and Maintenance expenditures by airport management and airport tenants support additional economic activity at businesses throughout the state. Taking into account the multiplier effect, this spending supported an estimated 1,538 jobs, $66.1 million in labor income, $220.1 million in output at other businesses throughout the state, and $0.94 million in state business enterprise and business profit tax revenues.

Visitors

An estimated total of 1.2 million passengers arrived at Manchester Boston Regional Airport by commercial air service in 2013. An estimated 526,016 of these passengers were visitors and spent an estimated combined total of $262.13 million on lodging, dining, entertainment, transportation, and retail in the State in 2013.[1]

[1] Based on the 2009 economic impact study, visitors – defined as persons residing outside of New Hampshire, Vermont, Maine, and Massachusetts – are assumed to account for 44 percent of the total arriving passengers and spent an average of $498 (adjusted for inflation) per person per trip.

General aviation, not including air taxi, made up 21 percent of total operations at Manchester. An estimated 8,743 visitors spent an estimated $1.92 million on lodging, meals, entertainment transportation and retail in the State in 2013.[2]

Accounting for the multiplier effect, commercial and general aviation visitor spending combined supported 3,882 jobs, $131.22 million in labor income and $403.37 million in output, at businesses located throughout New Hampshire, as well as $22.01 million in business enterprise, business profit, and meals and room tax.

Travel Time Savings

An estimated 2,882 general aviation business flights, carrying an estimated 9,608 travelers, arrived or departed from Manchester in 2013. [3] Businesses using the general aviation airports generated an estimated combined $1.16 million in cost savings in 2013.

Summary

In 2013 Manchester-Boston Regional Airport supported an estimated total of 7,018 jobs, $268.13 million in labor income, $832.22 million in output, and $23.73 million in tax revenue in New Hampshire. The airport also generated an estimated total of $1.16 million in cost savings for local businesses relying on general aviation for business travel.

Table A1-2 - Overview Economic Contribution Manchester-Boston Regional Airport

	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	1,513	$66.12	$197.61	$0.73
Capital Spending	85	$4.72	$11.10	$0.05
Operations and Maintenance Spending	1,538	$66.07	$220.14	$0.94
Visitors Spending	3,882	$131.22	$403.37	$22.01
Subtotal Spending impact	5,505	$202.01	$634.61	$23.00
Grand total	7,018	$268.13	$832.22	$23.73

Source: 2009 Manchester Airport Economic Study/Consultant Calculations

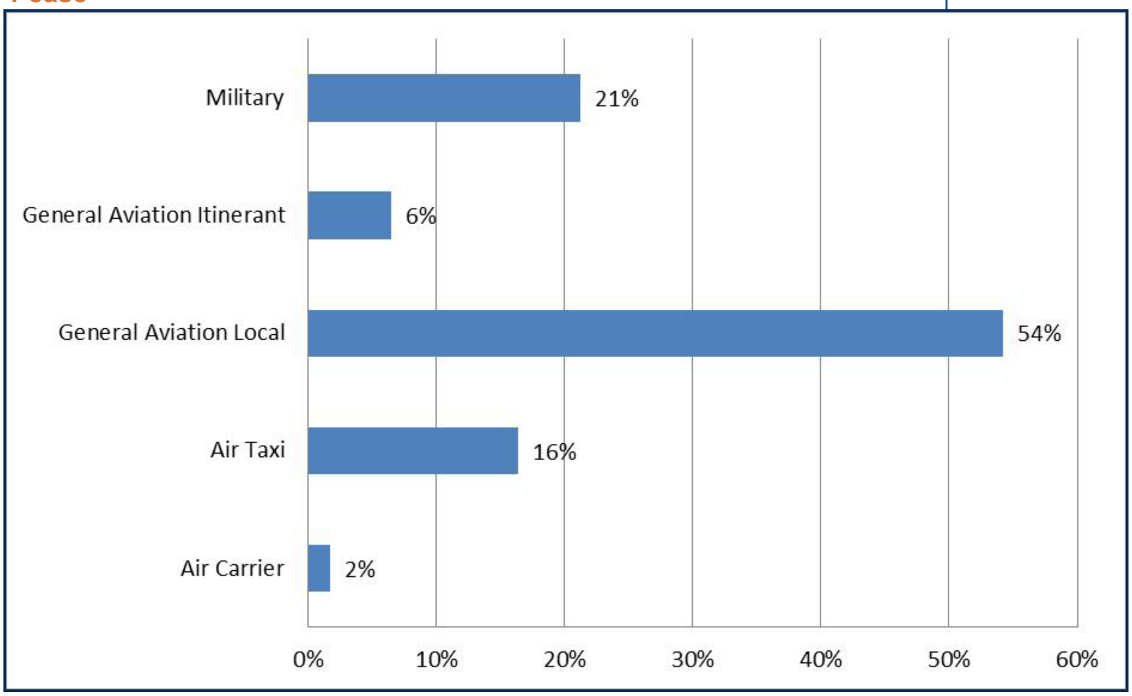
[2] Based on the survey conducted as part of this study and on data about similar airports in other New England states, it was assumed that 65 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 2.8 p, and that the average general aviation visitor spent a total of $220 per person per trip. More detailed information can be found in Appendix B.

[3] Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 30 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B.

A.2. PORTSMOUTH INTERNATIONAL AIRPORT AT PEASE

The Portsmouth International Airport at Pease is located on the former Pease Air Force Base, in the city of Portsmouth in Rockingham County. The former military base was closed as part of the first Base Realignment and Closure (BRAC) Commission's review in 1989 and was redeveloped as a civilian airport with the New Hampshire Air National Guard remaining at the site. In 2013, military operations accounted for 21 percent of the operations in 2013. Created as part of the ongoing redevelopment of Pease Air Force Base, the site also includes the Pease International Tradeport (Tradeport), which is both a business and industrial park, and the Pease Golf Course. The Portsmouth International Airport at Pease, the Tradeport, the Port of Portsmouth, and the golf course are managed and operated by the Pease Development Authority (PDA), which is an independent state agency capable of managing their transportation, business, and recreational facilities. At the end of 2013, commercial service was reinstated with Allegiant Air offering several flights per week to Florida. In 2013, the number of commercial service/air taxi enplanements was 22,543, a 66.8 percent from 2012. General aviation, not including air taxi operations, accounted for 60 percent of the airport's operations in 2013 (**Figure A2-1**).

Figure A2-1 - Total Operations Portsmouth International Airport at Pease



Source: Chapter 3 NHSASP

Based on the most recent census data, Portsmouth had 21,379 residents in 2012. In that same year, employment totaled 29,274. The largest employers are in government (US Department of State and municipality), insurance (Liberty Mutual), and health care (HCN Regional Hospital) sectors. Portsmouth is New Hampshire's only deep water port. Portsmouth also has an historic seaport and is a summer tourist destination.

Located adjacent to the airport, Pease International Tradeport has one of the largest office space submarkets in the I-95 corridor. Based on the a June 2014 report prepared by the City of Portsmouth, Pease International Tradeport and airport has 2.1 million square feet of industrial space and 1.2 million square feet of office space.[4] Vacancy rates are at a low, as follows: 2.6 percent for industrial and 7.4 percent for office space. The Tradeport has more than 250 tenants; almost 8,400 persons are employed at the Tradeport. An additional 60 acres is available for development at the Tradeport and 230 acres are available at the airport.

Economic Contribution

The Portsmouth International Airport at Pease contributes to the state and local economies in several ways. Not only does the airport provide on-airport employment, it supports additional jobs at other businesses in the state through capital and operation and maintenance (O&M) expenditures by airport management and airport tenants, household spending by employees and visitor spending (i.e., the multiplier effect). In addition to statewide job effects, the more than 250 businesses at the Tradeport benefit from their proximity to the airport. In addition to creating jobs, the airport contributes to the economy by bringing local businesses closer to their customers and suppliers and allows business travelers to avoid wait times of commercial flights while still benefiting from the efficiencies of air travel.

Methodology

Surveys were distributed to airport management and airport tenants to obtain information about on-site employment, payroll and other expenditures, and use of the airport for business purposes. Airport management, and five of seven major airport tenants at least partially completed the surveys that were distributed. In additional to specific general aviation airport visitor surveys, which were available at Port City Air for the duration of the economic data collection effort, FAA enplanement and operations data provided the basis for estimates of visiting air passengers and pilots. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by spending by the airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for were quantified as part of this study.

Findings

On-Airport Employment

In 2013 there were an estimated 746 jobs at Portsmouth International Airport at Pease. The largest employers were the Air National Guard, PlaneSense, a fractional share aircraft company, and Port City Air, a full service fixed base operator, offering flight training, aircraft maintenance, and hangar and tie-down aircraft storage. Thirty-six persons were employed by airport management. Collectively on-airport employees received an estimated $39.89 million in employee compensation in 2013.

[4] City of Portsmouth, Economic Development, June 2014, http://planportsmouth.com/masterplan/FinalPortsmouthEconomicDevelopmentBaseline.pdf

Capital Spending

Airport Improvement Program (AIP) project costs at Pease Airport averaged $1.28 million per year between 2010 and 2012. Project costs varied year to year, from $0.72 million to $2.21 million. Projects included airport marking and signage, designing and installing wildlife perimeter fencing, and the purchase of maintenance vehicles. Taking into account the multiplier effect, the airport's capital expenditures generate an average of 16 jobs per year, $0.98 million in labor income, $2.13 million in output, and $10,000 in tax revenue for the State of New Hampshire.

Operations and Maintenance Spending by Airport Management and Tenants

Operations and Maintenance (O & M) expenditures by airport management and airport tenants support additional economic activity at businesses throughout the state. Based on the multiplier effect, O&M spending by the airport and its tenants in 2013 supported 443 jobs, $21.16 million in labor income, and $54.96 million in output at businesses located throughout New Hampshire, as well as $0.24 million in business enterprise and business profit state tax revenue.

Visitors

An estimated total of 22,540 passengers arrived at Pease Airport by commercial air or air taxi service in 2013. An estimated 9,963 of these passengers were visitors and spent an estimated combined total of $4.96 million on lodging, dining, entertainment, transportation and retail in 2013. General aviation itinerant operations accounted for 6 percent of the operations at Pease. An estimated 2,133 general aviation visitors spent a total of $0.47 million in 2013[5].

Taking into account the multiplier effect, commercial and general aviation visitor spending combined supported 80 jobs, $2.70 million in labor income $8.30 million in output at businesses throughout New Hampshire as well as $0.46 million in business enterprise, business profit and meals and room tax.

Travel Time Savings

An estimated 2,490 general aviation business flights, carrying an estimated 8,466 travelers, arrived or departed from Pease in 2013.[6] Businesses using the general aviation airports generate an estimated combined $1.0 million in cost savings in 2013.

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5 Based on the survey conducted as part of this study and on data at similiar airports in other New England states, it was assumed that 65% of itinerant operations are visiting aircraft, that the average number of visitors per aircraft are 2.8, and that the average general aviation visitor spent a total of $220 per trip. More information can be found in Appendix B.

6 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 30 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B.

Summary

In 2013 Portsmouth International Airport at Pease supported an estimated total of 1,285 jobs, $64.82 million in labor income, $197.69 million in output and $0.95 million in tax revenue in New Hampshire. The airport also generated an estimated total of $1.0 million in cost savings for local businesses relying on general aviation for business travel.

Table A2-1 - Overview Economic Contribution Portsmouth International Airport at Pease

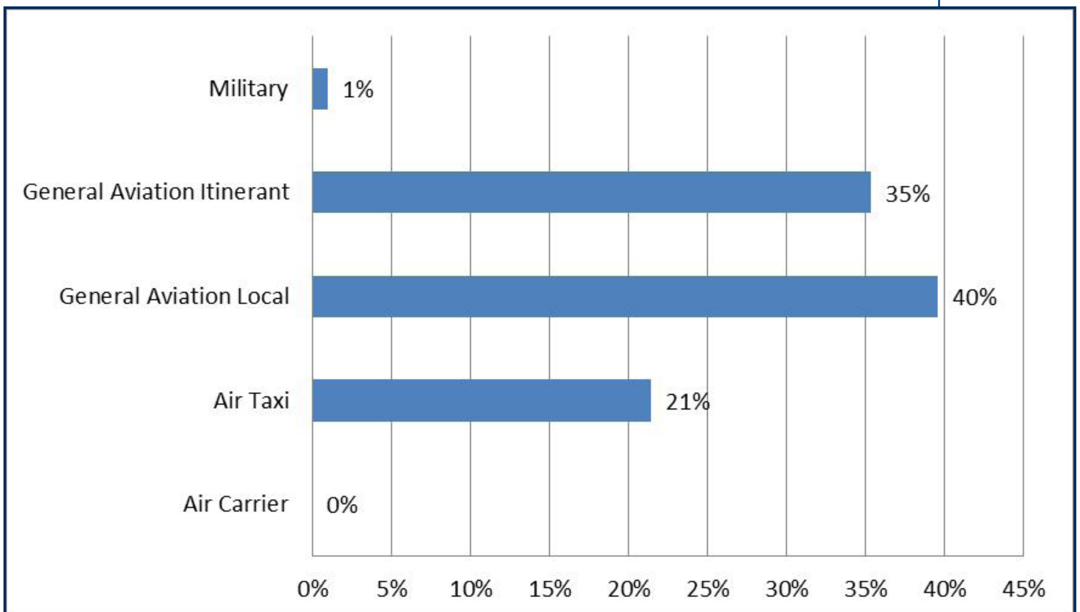
	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	746	$39.98	$132.30	$0.54
Capital Spending	16	$0.98	$2.13	$0.01
Operations and Maintenance Spending	443	$21.16	$54.96	$0.24
Visitors Spending	80	$2.70	$8.30	$0.46
Subtotal Spending impact	539	$24.84	$65.39	$0.71
Grand total	1,285	$64.82	$197.69	$1.25

Source: Consultant Calculations

A.3. LEBANON MUNICIPAL AIRPORT

Lebanon Municipal Airport is a city-owned airport located in Lebanon, NH, in Grafton County, near the Vermont border. The airport is in proximity to Dartmouth-Hitchcock Medical Center, the state's only academic medical center and Level 1 Trauma Center in Lebanon and Dartmouth College, which is a private university located in Hanover with an enrollment of more than 6,000. As one of four tower-controlled airports in New Hampshire, LEB offers daily commercial air service that connects passengers to Boston and White Plains, New York. LEB is also considered a hub for those traveling to the Upper Valley for business and vacation. Annual enplanements on air taxi/commercial service in 2013 totaled 10,614. The airport offers scheduled service to Boston and New York City (White Plains). General aviation, not including air taxi, accounted 75 percent of the 31,772 operations in 2013. General aviation flights routinely fly non-stop from Lebanon to Canada, the continental U.S., Central America and Western Europe.

Figure A3-1 - Total Operations Lebanon Municipal Airport



Source: Chapter 3 NHSASP

In 2012 there were 13,483 residents in Lebanon. In that same year, employment totaled 18,499. The largest employers are in the health care sector (Dartmouth-Hitchcock Medical Center and Alice Peck Day/ LifeCare) and manufacturing (Hypertherm and Timkin).

Economic Contribution

Lebanon Municipal Airport contributes to the New Hampshire economy and its local community in several ways. Not only does the airport provide on-airport employment, it supports additional jobs at other businesses throughout the state through capital and operation and maintenance (O&M) expenditures by airport management and airport tenants, household spending by employees, and visitor spending (i.e., the multiplier effect). In addition to creating jobs, the airport contributes to the economy by bringing local businesses closer to their customers and suppliers and allows business travelers to avoid the wait times for commercial flights, while still benefiting from the efficiencies of air travel.

Methodology

Surveys were distributed to airport management and airport tenants to obtain information about on-site employment, payroll, and other expenditures and use of the airport for business purposes. Airport management and seven airport tenants, at least partially, completed the surveys. FAA operations data provided the basis for estimates of visiting air passengers and pilots. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by spending by the airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for on-the-clock travel were quantified as part of this study.

Findings

On-Airport Employment

In 2013 there were an estimated 66 jobs at Lebanon Municipal Airport. Tenants include a regional airline, helicopter sales, and car rental. Five persons were employed by airport management. Collectively on-airport employees received an estimated $4.43 million in employee compensation in 2013.

Capital Spending

Airport Improvement Program (AIP) project costs at Lebanon Municipal Airport averaged $0.30 million per year between 2010 and 2012. Project costs varied year to year, from $0.07 million in FY2010 to $0.68 million in FY2012. Projects included runway pavement repairs, environmental assessments, architecture, and engineering fees related to building expansion. Taking into account the multiplier effect, the airport's capital expenditures generate the following impacts in New Hampshire: an average of 4 jobs per year, $0.26 million in labor income, $0.57 million in output and a small amount of state tax revenue.

Operations and Maintenance Spending by Airport Management and Tenants

O&M expenditures by airport management and airport tenants support additional economic activity at businesses throughout the state. O&M spending by the airport and its tenants in 2013 supported 62 jobs, $2.97 million in labor income, $7.60 million in output at business located throughout New Hampshire, as well as $0.03 million in business enterprise and business profit state tax revenue.

Visitors

An estimated total of 10,953 passengers arrived at Lebanon Municipal Airport by commercial air service in 2013. An estimated 4,841 of these passengers were visitors and spent an estimated combined total of $2.41 million on lodging, dining, entertainment, transportation, and retail in 2013.[7]

7 Based on the 2009 economic impact study, visitors – defined as persons residing outside of New Hampshire, Vermont, Maine, and Massachusetts – are assumed to account for 44 percent of the total arriving passengers and spent an average of $498 (adjusted for inflation) per person per trip.

General aviation accounted for 75 percent of the operations at Lebanon. An estimated 11,090 visitors spent a total of $2.44 million in 2013.[8] Taking into account the multiplier effect, commercial and general aviation visitor spending combined supported 36 jobs, $1.21 million in labor income, and $3.73 million in output at businesses throughout New Hampshire, as well as $0.24 million in business enterprise, business profit, and meals and room tax.

Travel Time Savings

An estimated 3,656 general aviation business flights, carrying an estimated 12,431 travelers, arrived or departed from Lebanon in 2013.[9] Businesses using the general aviation airports generate an estimated combined $1.47 million in cost savings in 2013.

Community Benefits

The Lebanon air traffic control tower controls all air traffic within its area and thereby provides a valuable service to the Dartmouth-Hitchcock Advance Response Team (DHART) helicopter, which operates out of the Dartmouth-Hitchcock Medical Center in Lebanon by providing traffic advisories to the DHART pilots.

Locals also benefit from the aircraft flight school and the nationally-recognized full-service helicopter flight school, maintenance, and service facility. Finally, the airport reported that there is a business based in the Upper Valley that flies frequently out of the airport to Bermuda.

Summary

In 2013 Lebanon Municipal Airport supported an estimated total of 168 jobs, $8.87 million in labor income, $26.77 million in output, and $0.33 million in tax revenue in New Hampshire. The airport also generated an estimated total of $1.47 million in cost savings for local businesses for local businesses relying on general aviation for business travel.

Table A3-1 - Overview Economic Contribution Lebanon Municipal Airport

	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	66	$4.43	$14.87	$0.06
Capital Spending	4	$0.26	$0.57	$0.00
Operations and Maintenance Spending	62	$2.97	$7.60	$0.03
Visitors Spending	36	$1.21	$3.73	$0.24
Subtotal Spending impact	102	$4.44	$11.90	$0.27
Grand total	168	$8.87	$26.77	$0.33

Source: Consultant Calculations

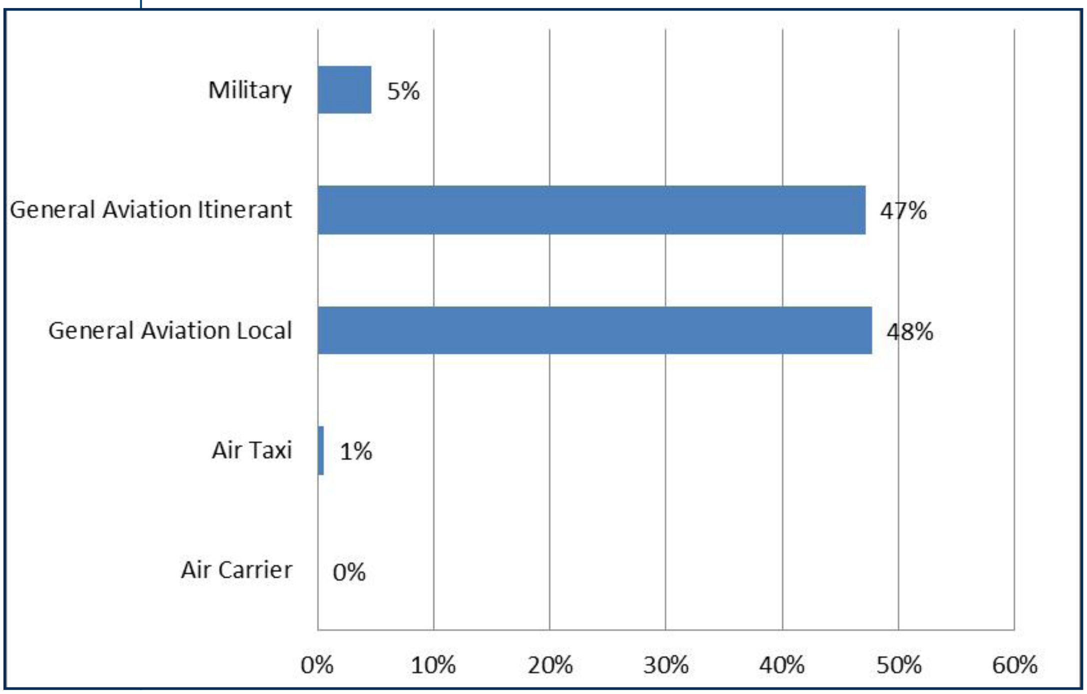
8 Based on the survey conducted as part of this study and about data on similar airports in other New England states, it was assumed that 65 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 2.8 p, and that the average general aviation visitor spent a total of $220 per person per trip. More detailed information can be found in Appendix B.

9 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 30 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B

A.4. BOIRE FIELD

Boire Field (ASH), located in Nashua (the second most populous city in the state) in Hillsborough County near the Massachusetts border, is one of the busiest general aviation facilities in the state. For many of the corporate business aircraft, the airport serves as an alternative to Boston, MA and Portland, ME. The airport is operated and maintained by the Nashua Airport Authority. As part of the National Plan of Integrated Airport Systems (NPIAS), the FAA has designated the airport as a reliever to Manchester-Boston Regional Airport and Boston Logan Airport. However, the airport does not have any scheduled commercial service. Most of the airport's 52,354 operations are general aviation activity.

Figure A4-1 - Total Operations Boire Field



Source: Chapter 3 NHSASP

In 2012, Nashua had a population of 86,933. That same year employment was 49,873. The largest employer was BAE Systems, a major producer of aircraft self-protection systems and tactical surveillance and intelligence systems for all branches of the armed forces. Other large industries in terms of employment were health care (Southern New Hampshire Medical Center, Saint Joseph Hospital and Trauma Center), education, municipal services, and FAA. The latter employed almost 600 persons in Nashua in 2012.

Economic Contribution

Boire Field contributes to the New Hampshire economy and its local community in several ways. Not only does the airport provide on-airport employment, it supports additional jobs at other businesses throughout the state through capital and operation and maintenance (O&M) expenditures by airport management and airport tenants, household spending by employees, and visitor spending (i.e., the multiplier effect). In addition to creating jobs, the airport contributes to the economy by bringing local businesses closer to their customers and suppliers and allows business travelers to avoid the wait times for commercial flights, while still benefiting from the efficiencies of air travel.

Methodology

Surveys were distributed to airport management and airport tenants to obtain information about on-site employment, payroll and other expenditures, and use of the airport for business purposes. Airport management and 8 out of 20 airport tenants, at least partially, completed the surveys. FAA operations data provided the basis for estimates of visiting air passengers and pilots. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by spending by the airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for on-the-clock travel were quantified as part of this study.

Findings

On-Airport Employment

In 2013 there were an estimated 90 jobs at Boire Field. Tenants include FBOs providing services, such as flight training, aircraft maintenance, and hangar storage and aircraft maintenance facilities. Six persons were employed by airport management. Collectively on-airport employees received an estimated $5.02 million in employee compensation in 2013.

Capital Spending

Airport Improvement Program (AIP) project costs at Boire Field averaged $6.91 million per year between 2010 and 2012. Project costs varied year to year, from $1.82 million in FY2010 to $18.92 million in FY2011, when a runway reconstruction took place. Taking into account the multiplier effect, the airport's capital expenditures generate an average of 100 jobs per year, $5.41 million in labor income, $13.13 million in output, and $0.06 million in tax revenue for the State of New Hampshire.

Operations and Maintenance Spending by Airport Management and Tenants

O&M expenditures by airport management and airport tenants support additional economic activity at businesses throughout the state. Through the multiplier effect, O&M spending by the airport and its tenants in 2013 supported 69 jobs, $3.34 million in labor income, and $8.43 million in output at business located throughout New Hampshire, as well as $0.04 million in business enterprise and business profit state tax revenue.

Visitors

General aviation accounted for 99 percent of the operations at Boire Field. An estimated 28,533 visitors spent a total of $6.28 million on lodging, meals, entertainment transportation, and retail in the State in 2013.[10] Taking into account the multiplier effect,

10 Based on the survey conducted as part of this study and on data about similar airports in other New England states, it was assumed that 65 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 2.8 p, and that

general aviation visitor spending supported 92 jobs, $3.12 million in labor income, and $9.59 million in output at businesses throughout New Hampshire, as well as $0.61 million in business enterprise, business profit, and meals and room tax.

Travel Time Savings

An estimated 7,981 general aviation business flights, carrying an estimated 27,136 travelers, arrived or departed from Boire Field in 2013.[11] Businesses using the general aviation airports generate an estimated combined $3.20 million in cost savings in 2013.

Summary

In 2013, Boire Field at Nashua supported an estimated total of 353 jobs, $14.99 million in labor income, $40.74 million in output and $1.32 million in tax revenue in New Hampshire. The airport also generated an estimated total of $3.20 million in cost savings for local businesses relying on general aviation for business travel.

Table A4-1 - Overview Economic Contribution Boire Field

	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	92	$3.12	$9.59	$0.61
Capital Spending	100	$5.41	$13.13	$0.06
Operations and Maintenance Spending	69	$3.34	$8.43	$0.04
Visitors Spending	92	$3.12	$9.59	$0.61
Subtotal Spending impact	261	$11.87	$31.15	$0.71
Grand total	353	$14.99	$40.74	$1.32

Source: Consultant Calculations

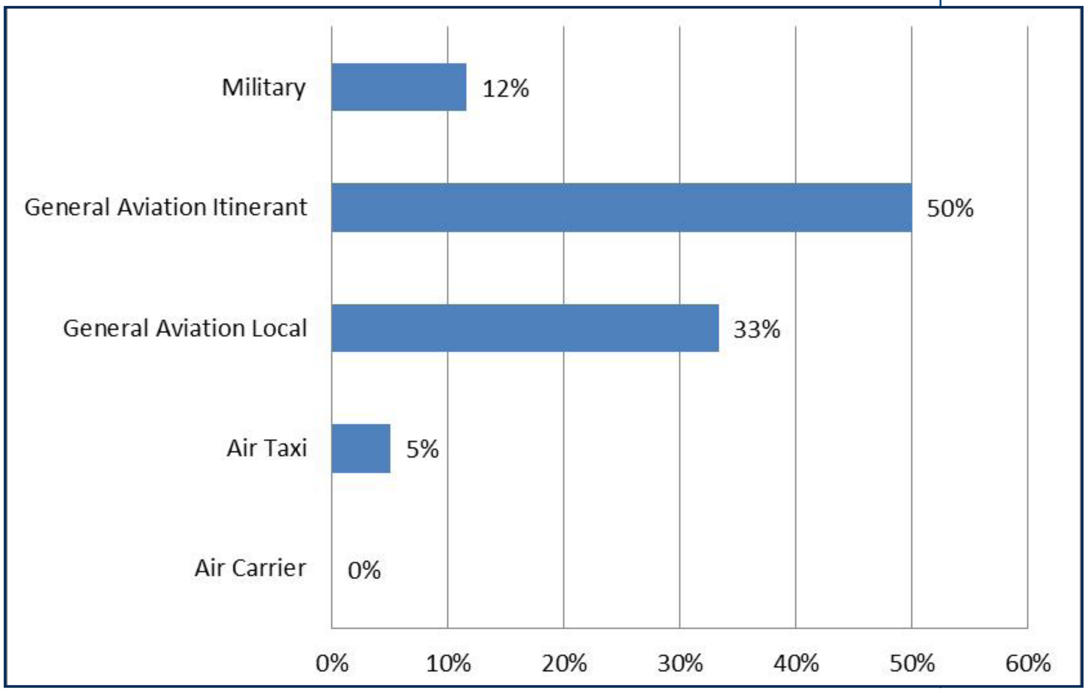
the average general aviation visitor spent a total of $220 per person per trip. More detailed information can be found in Appendix B.

11 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 30 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B.

A.5. CONCORD MUNICIPAL AIRPORT

Concord Municipal Airport is located in Concord, the state's third most populous city, and situated in Merrimack County. In 2013 General aviation accounted for 88 percent of the airport's reported 60,000 operations, while military operations accounted for 12 percent of the airport's total operations. The airport does not have scheduled commercial service.

Figure A5-1 - Total Operations Concord Municipal Airport



Source: Chapter 3 NHSASP

Based on the most recent census data, Concord had 42,630 residents in 2012. The city is ranked third in terms of population among New Hampshire's incorporated cities and towns. Average employment in 2012 was 39,575. The largest employers in Concord include state government, Concord Hospital, and Steeplegate Mall. Located 18 miles from Manchester and 68 miles from Boston, the Concord Airport contributes significantly to the economy by providing services and facilities to the academic, financial, and Nascar industry who, among others, comprise the regular users of the airport.

Economic Contribution

Concord Municipal Airport contributes to the New Hampshire economy and its local community in several ways. Not only does the airport provide on-airport employment, it supports additional jobs at other businesses throughout the state through capital and operation and maintenance (O&M) expenditures by airport management and airport tenants, household spending by employees, and visitor spending (i.e., the multiplier effect). In addition to creating jobs, the airport contributes to the economy by bringing local businesses closer to their customers and suppliers and allows business travelers to avoid wait times of commercial flights while still benefiting from the efficiencies of air travel.

Methodology

Surveys were distributed to airport management and airport tenants to obtain information about on-site employment, payroll, and other expenditures and use of the airport for business purposes. Airport management and two out of four airport tenants, at least partially, completed the surveys. FAA operations data provided the basis for estimates of visiting air passengers and pilots. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by the spending of airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for on-the-clock travel were quantified as part of this study.

Findings

On-Airport Employment

In 2013 there were an estimated 138 jobs at Concord Municipal Airport. Tenants include an FBO that provides maintenance, flight training, hangar and tie-down parking and fuel, the New Hampshire State Police, and the Army National Guard facility housing UH-60 Medevac helicopters. The municipality employed persons to operate the airport. Collectively on-airport employees received an estimated $2.36 million in employee compensation in 2013.

Capital Spending

Airport Improvement Program (AIP) project costs at Concord Municipal Airport averaged $0.25 million per year between 2010 and 2012. Project costs varied from year to year. Projects included environmental assessments and other studies. Taking into account the multiplier effect, the airport's capital expenditures generate an average of 4 jobs per year, $0.26 million in labor income, $0.48 million in outpu,t and a small amount of tax revenue in the State of New Hampshire.

Operations and Maintenance Spending by Airport Management and Tenants

O&M expenditures by airport management and airport tenants support additional economic activity at businesses throughout the state. Through the multiplier effect, O&M spending by the airport and its tenants supported 26 jobs, $1.28 million in labor income, and $3.13 million in output at business located throughout New Hampshire, as well as $0.01 million in business enterprise and business profit state tax revenue.

Visitors

General aviation accounted for 83 percent of the operations at Concord. An estimated 15,524 visitors spent a total of $1.94 million on lodging, meals, entertainment transportation, and retail in the State in 2013.[12] Taking into account the multiplier effect, general aviation visitor spending supported 29 jobs, $0.96 million in labor

12 Based on the survey conducted as part of this study and about data on similar airports in other New England states, it was assumed that 33 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 2.3 p, and that the average general aviation visitor spent a total of $155 per person per trip. More detailed information can be found in Appendix B.

income, and $2.96 million in output at businesses throughout New Hampshire, as well as $0.19 million in business enterprise, business profit and meals and room tax.

Travel Time Savings

An estimated 9,900 general aviation business flights, carrying an estimated 33,660 travelers, arrived or departed from Concord in 2013.[13] Businesses using the general aviation airports generate an estimated combined $3.97 million in cost savings in 2013.

Summary

In 2013 Concord Municipal supported an estimated total of 106 jobs, $4.86 million in labor income, $12.01 million in output, and $0.22 million in tax revenue in New Hampshire. The airport also generated an estimated total of $3.97 million in cost savings for local businesses relying on general aviation for business travel.

Table A5-1 - Overview Economic Contribution Concord Municipal Airport

	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	47	$2.36	$5.44	$0.02
Capital Spending	4	$0.26	$0.48	$0.00
Operations and Maintenance Spending	26	$1.28	$3.13	$0.01
Visitors Spending	29	$0.96	$2.96	$0.19
Subtotal Spending impact	59	$2.50	$6.57	$0.20
Grand total	106	$4.86	$12.01	$0.22

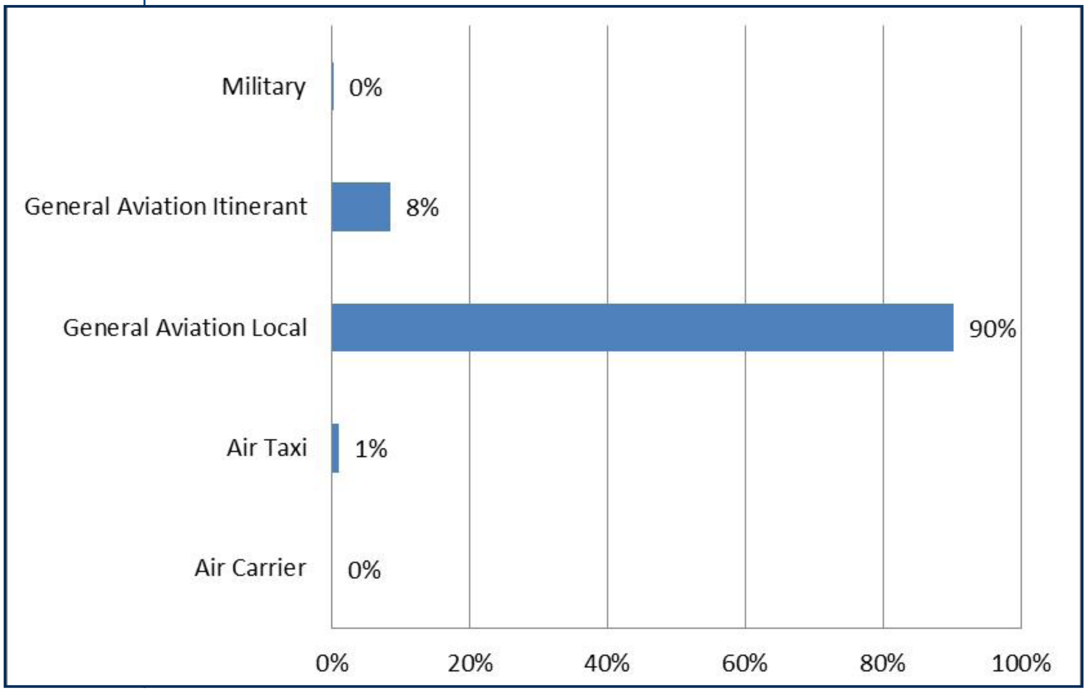
Source: Consultant Calculations

13 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 30 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B

A.6. LACONIA MUNICIPAL AIRPORT

Laconia Municipal Airport is located in Gilford, in Belknap County, which in the central region of the state. The airport's 43,725 operations were almost exclusively general aviation activity.

Figure A6-1 - Total Operations Laconia Municipal Airport



Source: Chapter 3 NHSASP

Gilford had a population of 7,136 in 2012. Employment was 3,006 in that same year. The largest employers are Gunstock Recreation Area and the Gilford school district. Neighboring Laconia had a population of 16,055 residents in 2012. In that same year, employment totaled 9,542. The largest employers are manufacturers, including Aavid Engineering Corp and New Hampshire Ball Bearings, Inc.

Economic Contribution

Laconia Municipal Airport contributes to the New Hampshire economy and its local community in several ways. In addition to the on-airport jobs and capital spending and operation and maintenance (O&M) expenditures by airport management and airport tenants, household spending by employees and visitor spending support jobs at other businesses throughout the state (i.e., the multiplier effect). In addition to creating jobs, the airport contributes to the economy by bringing local businesses closer to their customers and suppliers and allowing business travelers to avoid the wait times for commercial flights, while still benefiting from the efficiencies of air travel.

Methodology

Surveys were distributed to airport management and airport tenants to obtain information about on-site employment, payroll and other expenditures, and use of the airport for business purposes. Airport management and five out of seven airport tenants, at least partially, completed the surveys. FAA operations data provided the basis for estimates of visiting air passengers and pilots. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by spending by the airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for on-the-clock travel were quantified as part of this study.

Findings

On-Airport Employment

In 2013 there were an estimated 74 jobs at Laconia Municipal Airport. Tenants include two FBOs, a restaurant and a window repair company. Two persons were employed by airport management. Collectively on-airport employees received an estimated $3.71 million in employee compensation in 2013.

Capital Spending

Airport Improvement Program (AIP) project costs at Laconia Municipal Airport averaged $0.11 million per year between 2010 and 2012. Project costs varied year to year, from $0.87 million in FY2012 to $0.15 million in FY2011. Projects included wildlife perimeter fencing, permitting, and design and a master plan update. Taking into account the multiplier effect, the airport's capital expenditures generate an average of 2 jobs per year, $0.11 million in labor income, $0.23 million in output, and a small amount of tax revenue in the State of New Hampshire.

Operations and Maintenance Spending by Airport Management and Tenants

O&M expenditures by airport management and airport tenants support additional economic activity at businesses throughout the state. Through the multiplier effect, O&M spending by the airport and its tenants in 2013 supported 39 jobs, $1.86 million in labor income, and $4.72 million in output at business located throughout New Hampshire, as well as $0.02 million in business enterprise and business profit state tax revenue.

Visitors

General aviation accounted for 99 percent of the operations at Laconia. An estimated 1,570 visitors spent a total of $0.24 million on lodging, meal, entertainment transportation, and retail in the State in 2013.[14] Taking into account the multiplier effect, general aviation visitor spending supported four jobs, $0.12 million in labor income, and $0.37 million in output at businesses throughout New Hampshire, as well as $0.02 million in business enterprise, business profit, and meals and room tax.

14 Based on the survey conducted as part of this study and on data on similar airports in other New England states, it was assumed that 33 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 2.3 p, and that the average general aviation visitor spent a total of $155 per person per trip. More detailed information can be found in Appendix B.

Travel Time Savings

An estimated 1,241 general aviation business flights, carrying an estimated 4,220 travelers, arrived or departed from Laconia in 2013.[15] Businesses using the general aviation airports travel generate an estimated combined $0.50 million in cost savings in 2013.

Community Benefits

Laconia Airport hosts an annual open house for the public with free admission. In 2013 the open house was attended by a total of 3,000 persons. The event offers the public the opportunity to experience the general aviation airport up close and to learn about its benefits to the community through educational and fun exhibits. One of the most popular attractions was reasonably priced helicopter rides in a Robinson R-44 offered by C-R Helicopters from Nashua.

Other Benefits

During July and September two Sprint Cup races are held at the New Hampshire Motor Speedway in Loudon. Race teams and fans fly into Laconia Airport each year. The organization of the event as well off-site spending by spectators and race teams on lodging, food, and other expenditures generates economic activity throughout New Hampshire. The Southern New Hampshire University reported in 2011 that the economic impact of the two Sprint Cup races at New Hampshire Motor Speedway supports 2,500 jobs, $179 million in spending, and $103 million in income.

Summary

In 2013 Laconia Municipal Airport supported an estimated total of 119 jobs, $5.80 million in labor income, $12.06 million in output, and $0.07 million in tax revenue in New Hampshire. The airport also generates an estimated total of $0.50 million in cost savings for local businesses relying on general aviation for business travel.

Table A6-1 - Overview Economic Contribution Laconia Municipal Airport

	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	74	$3.71	$6.76	$0.03
Capital Spending	2	$0.11	$0.21	$0.00
Operations and Maintenance Spending	39	$1.86	$4.72	$0.02
Visitors Spending	4	$0.12	$0.37	$0.02
Subtotal Spending impact	45	$2.09	$5.30	$0.04
Grand total	119	$5.80	$12.06	$0.07

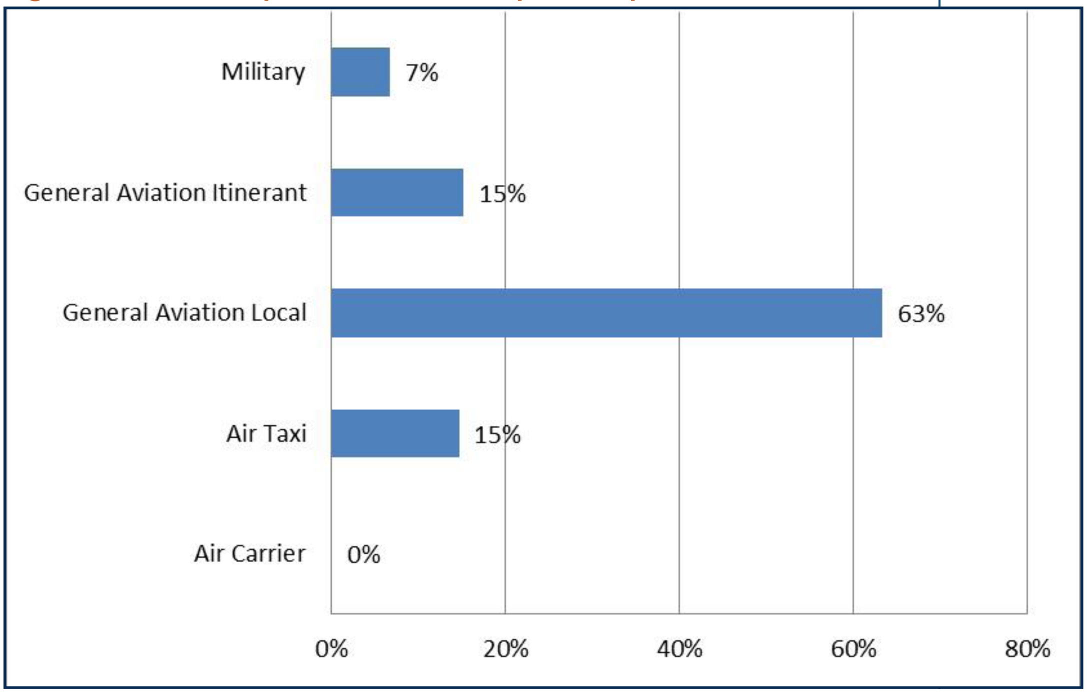
Source: Consultant Calculations

15 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 30 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B.

A.7. DILLANT-HOPKINS AIRPORT

Dillant-Hopkins Airport is a general aviation airport located in Keene, in Cheshire County, in the southwestern region of the state. General aviation accounted for the majority (93 percent) of the airport's 49,026 operations. Military accounted for 7 percent. The airport does not offer scheduled commercial service.

Figure A7-1 - Total Operations Dillant-Hopkins Airport



Source: Chapter 3 NHSASP

In 2012 Keene had a population of 23,272, which ranks it as the 11th most populous among New Hampshire's incorporated cities and towns. Employment in 2012 was 18,824. The largest employers are Cheshire Medical Center, C&S Wholesale Grocers, and Keene State College. Manufacturer Timken Super Precision is also located in Keene.

Economic Contribution

Dillant-Hopkins Airport contributes to the New Hampshire economy and local community in several ways. Not only does the airport provide on-airport employment, it supports additional jobs at other businesses throughout the state through capital and operation and maintenance (O&M) expenditures by airport management and airport tenants, household spending by employees, and visitor spending (i.e., the multiplier effect). In addition to creating jobs, the airport contributes to the economy by bringing local businesses closer to their customers and suppliers and allows business travelers to avoid wait times of commercial flights while still benefiting from the efficiencies of air travel.

Methodology

In 2011 the City of Keene completed an economic impact study of Dillant-Hopkins Airport.[16] The study's findings were based on a survey program of airport tenants with five out of seven tenants

16 Boyd Group International, Dillant-Hopkins Airport – Economic Impact and Opportunity Study, January 2012

responding to the survey. The study estimated the total on-airport employment in 2010 to be 47. The study also projected employment for 2011 and 2012 as 38 and 46, respectively. As part of the current study, surveys were distributed to airport management and airport tenants to obtain information about on-site employment, payroll and other expenditures, and use of the airport for business purposes. Airport management and two of the five airports, at least partially, completed the surveys, only one of which provided employment counts. Because of the low response rate, the 2012 projection from the 2011 study was used as the basis for the on-airport employment for the current study and it was assumed that employment remained stable between 2012 and 2013.

As part of the current study, input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by spending by the airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation were also quantified as part of this study.

Findings

On-Airport Employment

In 2013 there were an estimated 46 jobs at Dillant-Hopkins Airport. Three persons were employed to manage and maintain the airport; the remaining jobs were at airport tenant businesses. Tenants included a full service FBO and corporate flight department. Collectively on-airport employees received an estimated $3.25 million in employee compensation in 2013.

Capital Spending

Airport Improvement Program (AIP) project cost at Dillant-Hopkins Airport averaged $2.05 million per year between 2010 and 2012. Project cost varied year to year, from $0.35 million in FY2010 to $5.37 million in FY2012. Projects included runway rehabilitation and rehabilitation of a hazard beacon.Taking into account the multiplier effect, the airport's capital expenditures generated an average of 29 jobs per year, $1.58 million in labor income, $3.84 million in output, and $0.02 million in tax revenue in the State of New Hampshire.

Operations and Maintenance Spending

O&M expenditures by airport management and airport tenants support additional economic activity at businesses throughout the state. Through the multiplier effect, O&M spending by the airport and its tenants in 2013 supported 44 jobs, $2.12 million in labor income, and $5.48 million in output at business located throughout New Hampshire, as well as $0.02 million in business enterprise and business profit state tax revenue.

Visitors

General aviation accounted for 79 percent of the operations at Dillant-Hopkins. An estimated 5,563 visitors spent an estimated total of $0.86 million on lodging, meals, entertainment transportation, and retail in the State in 2013.[17] Taking into account the multiplier effect, general aviation visitor spending supported 13 jobs, $0.43 million in labor , and $1.32 million in output at businesses throughout New Hampshire, as well as $0.08 million in business enterprise, business profit, and meals and room tax.

Travel Time Savings

An estimated 4,498 general aviation business flights, carrying an estimated 14,952 travelers, arrived or departed from Dillant-Hopkins in 2013.[18] Businesses using the general aviation airports saved an estimated combined $1.76 million in 2013.

Community Benefits

C&S Wholesale Grocers, based in Keene, is one of the largest wholesale food distribution companies in the country. C&S uses their corporate aircraft based at Dillant-Hopkins Airport to connect with customers and vendors who are not located near commercial airports. The company has also been involved in humanitarian flying and disaster relief, including flights from to Haiti after the 2010 earthquake and to New Jersey following Superstorm Sandy in 2012.

Summary

In 2013 Dillant-Hopkins Airport supported an estimated total of 132 jobs, $7.38 million in labor income, $21.44 million in output, and $0.16 million in tax revenue in New Hampshire. By providing access to general aviation, Dillant-Hopkins also generated an estimated total of $1.76 million in cost savings for local businesses.

Table A7-1 - Overview Economic Contribution Dillant-Hopkins Airport

	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	46	$3.25	$10.80	$0.04
Capital Spending	29	$1.58	$3.84	$0.02
Operations and Maintenance Spending	44	$2.12	$5.48	$0.02
Visitors Spending	13	$0.43	$1.32	$0.08
Subtotal Spending impact	86	$4.13	$10.64	$0.12
Grand total	132	$7.38	$21.44	$0.16

Source: Consultant Calculations

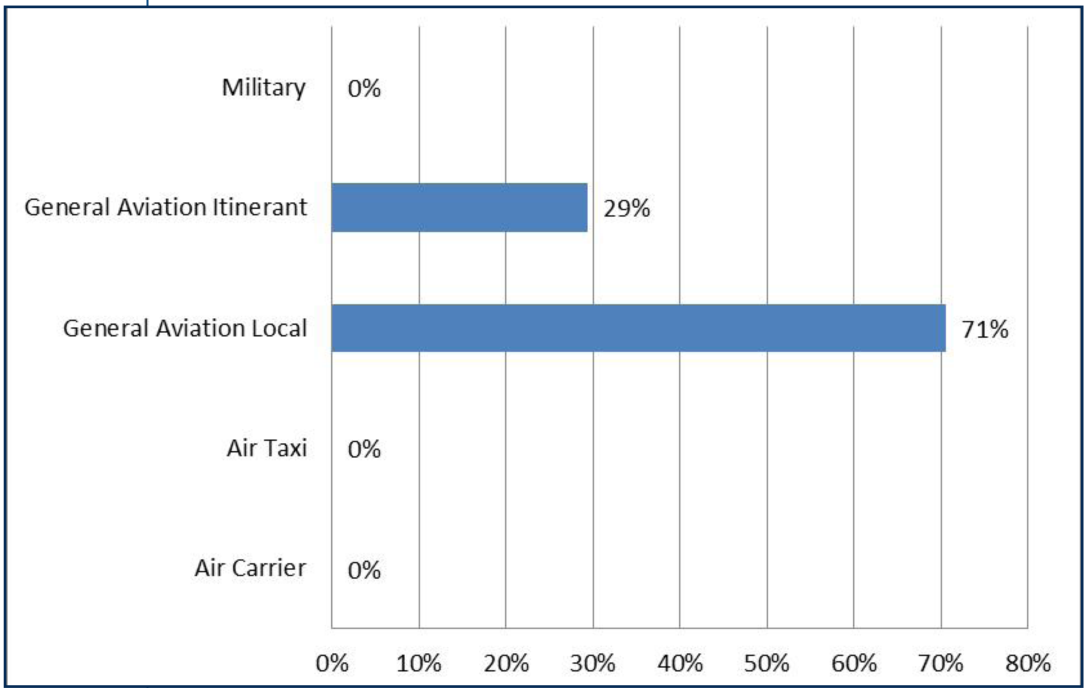
17 Based on the survey conducted as part of this study and on data about similar airports in other New England states, it was assumed that 33 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 2.3 p, and that the average general aviation visitor spent a total of $155 per person per trip. More detailed information can be found in Appendix B.

18 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 30 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B.

A.8. SKYHAVEN AIRPORT

Skyhaven Airport is located in the City of Rochester, in Strafford County. The airport is owned and operated by the Pease Development Authority. All of the airport's 17,000 operations are general aviation.

Figure A8-1 - Total Operations Skyhaven Airport



Source: Chapter 3 NHSASP

Rochester had 29,823 residents in 2012. It ranks sixth in terms of population among New Hampshire's incorporated cities and towns. Employment in 2012 was 10,732. The largest employers are the City (education and municipal services), Frisbie Memorial Hospital, supermarket distribution and warehouse centers, and Albany Engineered Products, an aerospace manufacturing company.

Economic Contribution

As a general aviation airport, Skyhaven provides many benefits to the community, ranging from emergency preparedness, to opportunities for businesses to travel to their customers and suppliers by general aviation, to recreational opportunities.

Methodology

Surveys were distributed to airport management and airport tenants to obtain information about on-site employment, payroll, and other expenditures and use of the airport for business purposes. Airport management, at least partially, completed the survey, but the tenants did not. FAA operations data provided the basis for the estimates involving visiting air passengers and pilots. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by spending by the airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for on-the-clock travel were quantified as part of this study.

Findings

On-Airport Employment

In 2013 there were an estimated 3 jobs at Skyhaven Airport. One person was employed by the Pease Development Authority to manage the airport. Tenants included an aircraft maintenance shop and flight school and employed an estimated two persons.

Capital Spending

The Airport Improvement Program (AIP) did not include any projects at Skyhaven Airport between 2010 and 2012, with the exception of land acquisition for the Runway 33 approach. Property acquisition does not generate employment.

Operations and Maintenance Spending by Airport Management and Tenants

Operations and maintenance (O&M) expenditures by airport management and airport tenants supported an additional 2 jobs at business located throughout New Hampshire.

Visitors

General aviation accounted for 100 percent of the operations at Skyhaven. An estimated 1,650 visitors spent an estimated total of $0.19 million on lodging, meals, entertainment transportation, and retail in the State in 2013.[19] Taking into account the multiplier effect, general aviation visitor spending supported 3 jobs, $0.01 million in labor income, and $0.28 million in output at businesses throughout New Hampshire, as well as $0.02 million in business enterprise, business profit, and meals and room tax.

Travel Time Savings

An estimated 250 general aviation business flights, carrying an estimated 850 travelers, arrived or departed from Skyhaven Airport in 2013.[20] Businesses using the general aviation airports saved an estimated combined $0.10 million in 2013.

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19 Based on the survey conducted as part of this study and on data about similar airports in other New England states, it was assumed that 33 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 2.0 p, and that the average general aviation visitor spent a total of $113 per person per trip. More detailed information can be found in Appendix B.

20 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 5 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B.

Summary

Skyhaven Airport supported 8 jobs, $0.33 million in labor income, $1.02 million in output and $0.04 million in business enterprise, business profit, and meal and room tax. By providing access to general aviation, Skyhaven also generated an estimated $0.10 million in cost savings for local businesses.

Table A8-1 - Overview Economic Contribution Skyhaven Airport

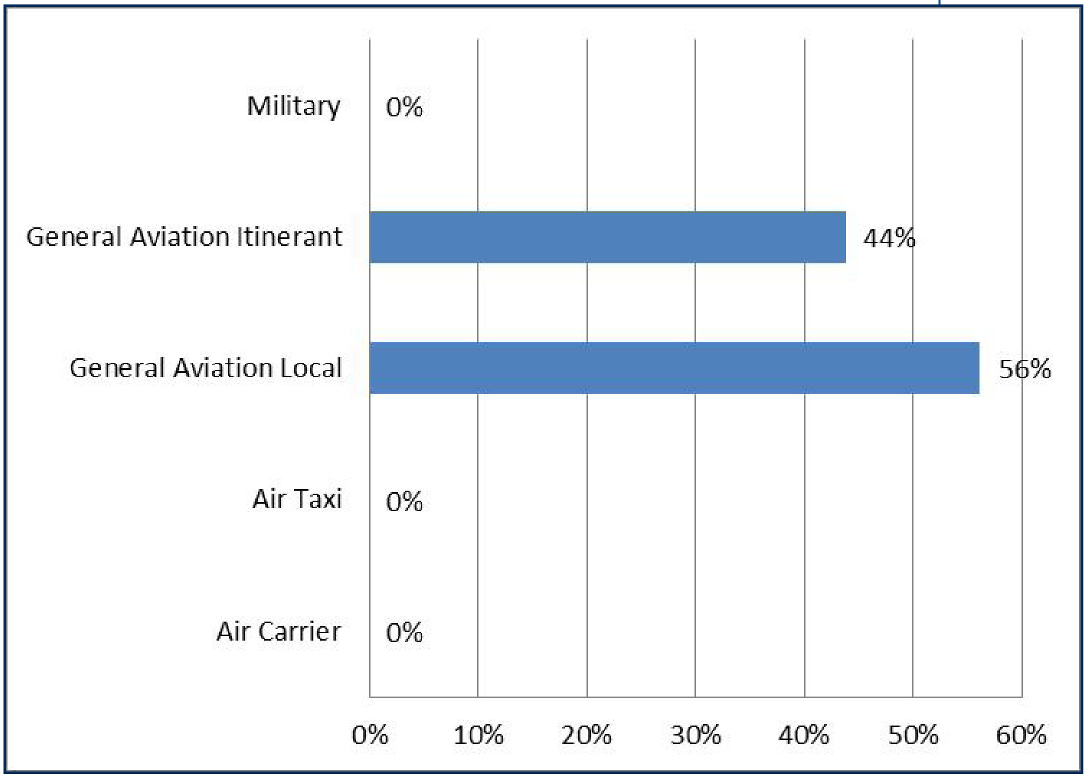
	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	3	*	*	$0.00
Capital Spending	0	$0.00	$ $0.00	$0.00
Operation and Maintenance Spending	2	*	*	$0.00
Visitors Spending	3	$0.10	$0.28	$0.02
Grand Total	8	$ 0.33	$ 1.02	$0.04

*Not disclosed
Source: Consultant Calculations

A.9. CLAREMONT MUNICIPAL AIRPORT

Claremont Municipal Airport is located in the City of Claremont, in Sullivan County, which is in the southwestern region of the state. All 10,500 operations are general aviation.

Figure A9-1 - Total Operations Claremont Municipal Airport



Source: Chapter 3 NHSASP

Based on the latest census data, Claremont had 13,077 residents in 2012. Average employment in 2012 was 5,899. The largest employers are the Claremont school district, Valley Regional Health Care, and Wal-Mart.

The southwestern region of the state had a population of 119,889 in 2012, accounting for 11 percent of the state's total population. The region's population growth since 1980 has been lower than that of the state as a whole in every decade with the exception of 2000 to 2010. Projections show that regional growth will continue to be slower than the state average, except for the 2030 to 2040 decade when the region is projected to grow faster. Employment in the southwestern region in 2013 was 45,720, which is 7 percent of total state employment. The southwestern region has proportionally more employment in manufacturing than the rest of the state.

Economic Contribution

As a general aviation airport, Claremont Municipal Airport provides many benefits to the community, ranging from emergency preparedness to opportunities for businesses to travel to their customers and suppliers by general aviation, as well as recreational opportunities.

Methodology

A survey was provided to airport management to obtain information about on-site employment, payroll and other expenditures, and use of the airport for business purposes and it was returned, at least partially, completed. FAA operations data provided the basis for estimates of visiting air passengers and pilots. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by spending by the airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for on-the-clock travel were quantified as part of this study.

Findings

On-Airport Employment

In 2013 one person was employed to manage the airport. Claremont Municipal Airport includes one fixed based operator who employs an estimated 2 employees

Capital Spending

Airport Improvement Program (AIP) project cost at Claremont Municipal Airport averaged $0.25 million per year between 2010 and 2012. Project cost varied year to year, from $0.08 million in FY2012 to $0.46 million in FY2010. Projects included design and structural study of the old hangar. Taking into account the multiplier effect, the airport's capital expenditures generated an average of four jobs per year, $0.20 million in labor income, $0.47 million in output, and a small amount in tax revenue for the State of New Hampshire.

Operations and Maintenance Spending by Airport Management and Tenants

Through the multiplier effect, operations and maintenance (O&M) spending by the airport supported 4 jobs at business located throughout New Hampshire.

Visitors

General aviation accounted for 100 percent of the operations at Claremont. An estimated 1,518 visitors spent an estimated total of $0.19 million on lodging, meals, entertainment transportation, and retail in the State in 2013.[21] Taking into account the multiplier effect, general aviation visitor spending supported three jobs, $0.09 million in labor income, and $0.28 million in output at businesses throughout New Hampshire, as well as $0.02 million in business enterprise, business profit, and meals and room tax.

21 Based on the survey conducted as part of this study and on data about similar airports in other New England states, it was assumed that 33 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 2.0 and that the average general aviation visitor spent a total of $113 per person per trip. More detailed information can be found in Appendix B.

Travel Time Savings

An estimated 46 general aviation business flights, carrying an estimated 156 travelers, arrived or departed from Claremont in 2013.[22] Businesses using the general aviation airports saved an estimated combined $0.02 million in 2013.

Summary

Claremont Municipal Airport supported 14 jobs, $0.57 million in labor income, $1.79 million in output, and $0.02 million in business enterprise, business profit, and meal and room tax. By providing access to general aviation, Claremont also generated an estimated $0.02 million in cost savings for local businesses.

Table A9-1 - Overview Economic Contribution Claremont Municipal Airport

	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	3	*	*	$0.00
Capital Spending	4	$0.20	$0.47	$0.00
Operations and Maintenance Spending	4	*	*	$0.00
Visitors Spending	3	$0.09	$0.28	$0.02
Grand total	14	$0.57	$1.79	$0.02

*Not disclosed

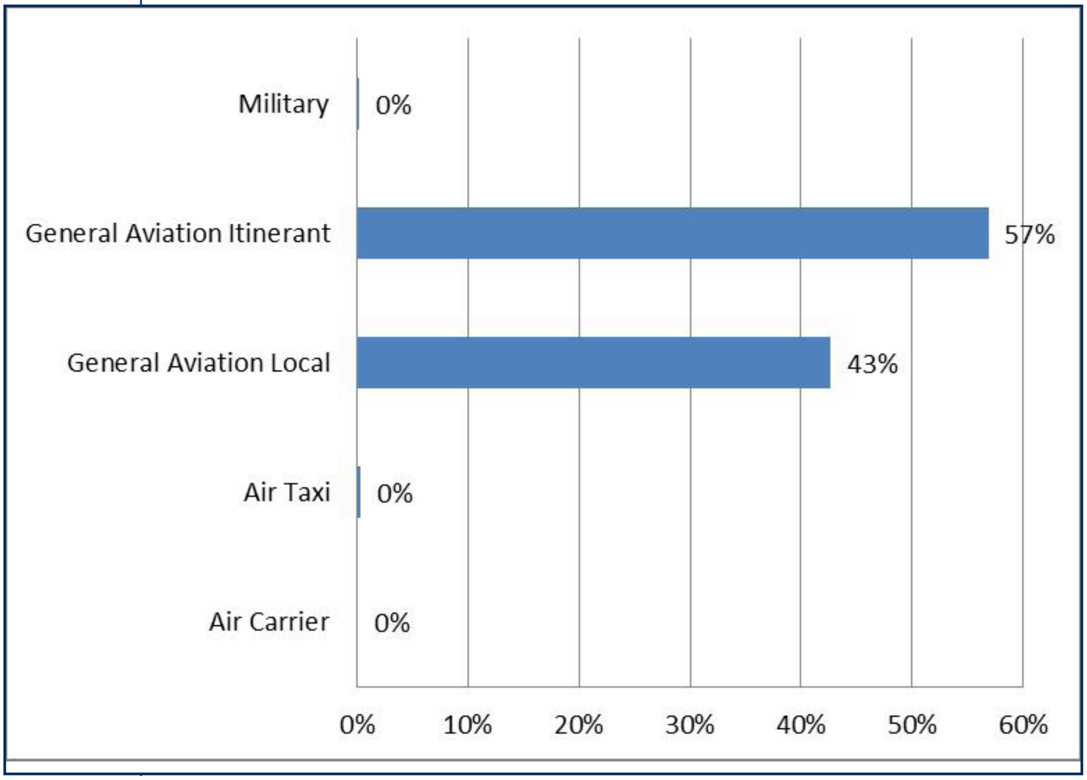
Source: Consultant Calculations

22 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 1 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B.

A.10. MOUNT WASHINGTON REGIONAL AIRPORT

Mount Washington Regional Airport is located in Whitefield in Coos County, which is in the northern region of the state. All 7, 030 operations are general aviation.

Figure A10-1 – Total Operations Mount Washington Regional



Source: Chapter 3 NHSASP

Airport

Whitefield had 2,247 residents in 2012. Employment in 2012 was 952 with Mountain View Grand hotel, the largest business in town, accounting for almost 20 percent of that employment.

Economic Contribution

As a general aviation airport, Mount Washington Regional Airport provides many benefits to the community, ranging from emergency preparedness to opportunities for businesses to travel to their customers and suppliers by general aviation, as well as recreational opportunities.

Methodology

A survey was provided to airport management to obtain information about on-site employment, payroll and other expenditures, and use of the airport for business purposes and was returned, at least partially, completed. FAA operations data provided the basis for estimates of visiting air passengers and pilots. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by spending by the airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for on-the-clock travel were quantified as part of this study.

Findings

On-Airport Employment

The airport is managed by a volunteer manager.

Capital Spending

Airport Improvement Program (AIP) project cost at Mount Washington Regional Airport averaged $0.44 million per year between 2010 and 2012. Projects included design and construction of storage building, reconstruction of aircraft parking apron, and environmental assessment in 2010. Taking into account the multiplier effect, the airport's capital expenditures generate a an average of seven jobs, $0.38 million in labor income, $0.86 million in output and $0.04 million in tax revenue for the State of New Hampshire.

Operations and Maintenance Spending by Airport Management and Tenants

The airport's operation and maintenance (O&M) spending in 2013 was minimal.

Visitors

General aviation accounted for 100 percent of the operations at Mount Washington Regional Airport. An estimated 1,327 visitors spent an estimated $0.15 million on lodging, meals, entertainment transportation, and retail in the State in 2013.[23] Taking into account the multiplier effect, general aviation visitor spending supported two jobs, $0.07 million in labor income and $0.23 million in output, at businesses throughout New Hampshire, as well as a minimal amount in business enterprise, business profit, and meals and room tax.

Travel Time Savings

An estimated 402 general aviation business flights, carrying an estimated 1,367 travelers, arrived or departed from Mount Washington Regional Airport in 2013.[24] Businesses using the general aviation airports saved an estimated combined $0.16 million in 2013.

23 Based on the survey conducted as part of this study and on data about similar airports in other New England states, it was assumed that 33 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 2.0 p, and that the average general aviation visitor spent a total of $113 per person per trip. More detailed information can be found in Appendix B.

24 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 10 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B.

Summary

Mount Washington Regional Airport supported 12 jobs, $0.55 million in labor income, $1.44 million in output, and a minimal amount of business enterprise, business profit, and meal and room tax. By providing access to general aviation, Mount Washington also generated an estimated $0.64 million in cost savings for local businesses.

Table A10-1 - Overview Economic Contribution Mount Washington Regional Airport

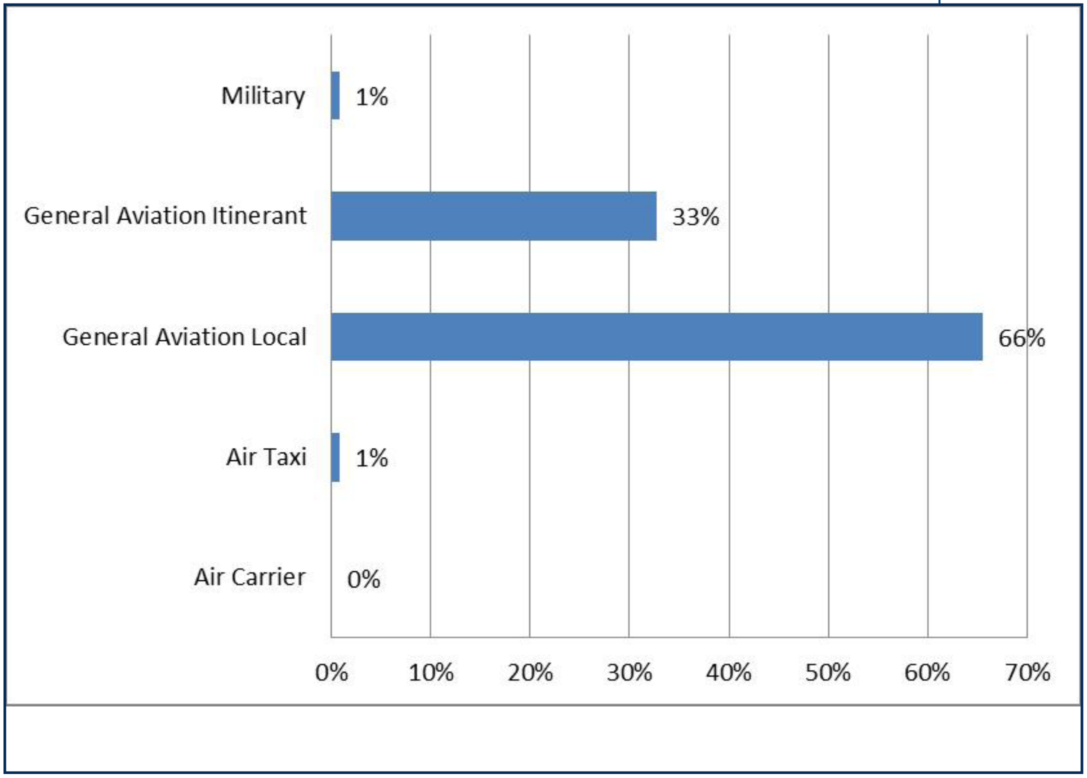
	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	-	$ -	$ -	$ -
Capital Spending	7	$0.38	$0.86	$0.00
Operation and Maintenance Spending	0	$0.01	$0.02	$0.00
Visitors Spending	2	$0.07	$0.23	$0.00
Subtotal Spending impact	9	0.46	1.11	0.001
Grand Total	9	0.46	1.11	0.001

Source: Consultant Calculations

A.11. BERLIN REGIONAL AIRPORT

Berlin Regional Airport is a public airport located in the city of Berlin, the only city in Coos County, which is in the northern region of the state. The airport's 12,200 operations in 2013 were almost exclusively general aviation.

Figure A11-1 - Total Operations Berlin Regional Airport



Source: Chapter 3 NHSASP

In 1960 the population of Berlin was 17,821; but, in 2012, the population of Berlin was 9,743. Berlin has experienced a large population decrease over the decades because the paper industry continued to decline and residents left the region. In 2012, the City counted 3,572 employees. Androscoggin Valley Hospital, the City of Berlin School System, and the Berlin Federal Correctional Institution are the largest employers.

Economic Contribution

As a general aviation airport, Berlin Regional Airport provides many benefits to the community, ranging from emergency preparedness to opportunities for businesses to travel to their customers and suppliers by general aviation, as well as recreational opportunities.

Methodology

Surveys were distributed to airport management and airport tenants to obtain information about on-site employment, payroll and other expenditures, and use by the airport for business purposes. Airport management, at least partially, completed the surveys. FAA data provided the basis for estimates of visiting air passengers and pilots. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by spending by the airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for on-the-clock travel were quantified as part of this study.

Findings

On-Airport Employment

In 2013 there were an estimated 3 jobs at Berlin Regional Airport. The tenant is an FBO providing flight training, scenic flights, and aircraft repair. Two persons were employed directly by the airport.

Capital Spending

Airport Improvement Program (AIP) project costs at Berlin Regional Airport averaged $0.13 million per year between 2010 and 2012. Taking into account the multiplier effect, the airport's capital expenditures generate an average of 2 jobs per year, $0.10 million in labor income, $0.25 million in output, and a small amount in tax revenue in the State of New Hampshire.

Operations and Maintenance Spending by Airport Management and Tenants

Through the multiplier effect, operation and maintenance (O&M) spending by the airport and its tenant supported an additional 2 jobs in the state.

Visitors

General aviation accounted for 98 percent of the operations at Berlin Regional Airport. An estimated 1,353 visitors spent an estimated total of $0.15 million on lodging, meals, entertainment transportation, and retail in the State in 2013.[25] Taking into account the multiplier effect, general aviation visitor spending supported 2 jobs, $0.08 million in labor income, and $0.23 million in output at businesses throughout New Hampshire, as well as $0.01 million in business enterprise, business profit, and meals and room tax.

Travel Time Savings

An estimated 1,640 general aviation business flights, carrying an estimated 5,440 travelers, arrived or departed from Berlin in 2013.[26] Businesses using the general aviation airports saved an estimated combined $0.66 million in 2013.

25 Based on the survey conducted as part of this study and on data about similar airports in other New England states, it was assumed that 33 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 2.0 p, and that the average general aviation visitor spent a total of $113 per person per trip. More detailed information can be found in Appendix B.

26 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 40 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B.

Summary

In 2013 Berlin Regional Airport supported an estimated total of 9 jobs, $0.34 million in labor income, $1.04 million in output, and $0.01 million in tax revenue in New Hampshire. By providing access to general aviation, Berlin Regional Airport also generated a total of $0.66 million in cost savings for local businesses.

Table A11-1 - Overview Economic Contribution Berlin Regional Airport

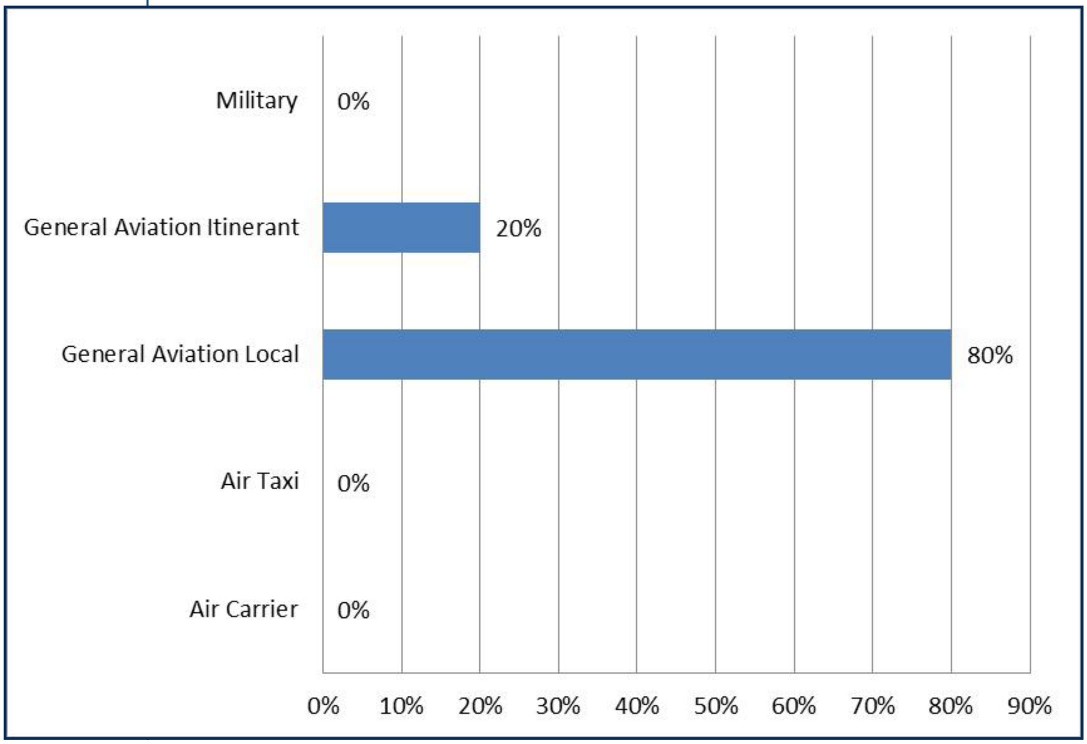
	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	3	*	*	$0.00
Capital Spending	2	$0.10	$0.25	$0.00
Operation and Maintenance Spending	2	*	*	$0.00
Visitors Spending	2	$0.08	$0.23	$0.01
Grand Total	9	$0.34	$1.04	$0.01

*Not disclosed
Source: Consultant Calculations

A.12. DEAN MEMORIAL AIRPORT

Dean Memorial Airport is a public use airport located in Haverhill, a town in Grafton County. All of the airport's 1,300 operations were general aviation.

Figure A12-1 - Total Operations Dean Memorial Airport



Source: Chapter 3 NHSASP

In 2012 Haverhill's population was 4,654. The number of jobs in that same year was 2,342, with the largest employer being the county.

Haverhill is located on the New Hampshire-Vermont border in the northern region of the state. The northern region had a population of 168,844 in 2012, accounting for 14 percent of the state's total population, and is the least densely populated region of the state. The region's population growth since 1980 has been lower than that of the state as a whole in every decade, with the exception of 2000 to 2010. Projections show the regional growth will continue to be lower than the state average. Employment in the northern region in 2013 was 84,647, which is 14 percent of total state employment. With the White Mountain National Forest as a regional attraction, the northern region of the state is important for tourism and there is proportionally more employment in recreation, entertainment, and accommodation. Ski areas and hotels are among the largest employers in Coos and Carroll counties. The north also has proportionally more jobs in health care because the state's largest hospital is located in Grafton County.

Economic Contribution

As a general aviation airport, Dean Memorial Airport provides many benefits to the community, ranging from emergency preparedness to opportunities for businesses to travel to their customers and suppliers by general aviation, as well as recreational opportunities.

Methodology

A survey was distributed to airport management to obtain information about on-site employment, payroll and other expenditures, and use by airport for business purposes. FAA operations data provided the basis for estimates of visiting air passengers and pilots. Input-output modeling techniques were used to estimate the additional economic activity (or multiplier effect) throughout the state triggered by spending by the airport management, tenants, employees, and visitors based on the data obtained from the surveys. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue), and tax revenues. Cost savings for local businesses using general aviation for on the clock travel were quantified as part of this study.

Findings

On-Airport Employment

In 2013 there was one person employed at Dean Memorial Airport. The airport does not have any tenants.

Capital Spending

Airport Improvement Program (AIP) project costs at Dean Memorial Airport averaged $0.01 million per year between 2010 and 2012 based on one obstruction analysis and property acquisition feasibility study in 2011 and no projects in the two other years. The economic impact of this project is minimal.

Operations and Maintenance Spending by Airport Management and Tenants

Operations and maintenance (O&M) expenditures by airport management supported one additional job in New Hampshire.

Visitors

General aviation accounted for 100 percent of the operations at Dean Memorial Airport. An estimated 73 visitors spent an estimated of $0.01 million on lodging, meals, entertainment transportation, and retail in the State in 2013.[27]

Travel Time Savings

An estimated 3 general aviation business flights, carrying an estimated 9 travelers, arrived or departed from Dean Memorial in 2013.[28] Businesses using the general aviation airports experienced travel time savings.

27 Based on the survey conducted as part of this study and on data about similar airports in other New England states, it was assumed that 33 percent of itinerant operations are visiting aircraft, that the average number of visitors per aircraft is 1.7 p, and that the average general aviation visitor spent a total of $77 per person per trip. More detailed information can be found in Appendix B.

28 Based on the survey conducted as part of this study and on the 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association, it was assumed that 1 percent of itinerant operations were business travel and that the average number of passengers for these flights was 3.4. More detailed information can be found in Appendix B.

Summary

In 2013 Dean Memorial Airport supported an estimated 2 jobs, $0.06 million in labor income, $0.18 million in output, and a small amount business enterprise, business profit, and meal and room tax.

Table A12-1 - Overview Economic Contribution Dean Memorial Airport

	Jobs	Labor Income (in $millions)	Output (in $ millions)	Tax
On-Airport	*	*	*	$0.00
Capital Spending	0	$0.01	$0.03	$0.00
Operation and Maintenance Spending	*	*	*	$0.00
Visitors Spending	0	$0.00	$0.01	$0.00
Grand Total	2	$0.04	$0.13	$0.00

*Not disclosed
Source: Consultant Calculations

APPENDIX 9-B

APPENDIX 9-B: METHODOLOGY

B.1 INTRODUCTION

This Appendix presents the methodology for estimating the economic contribution of the New Hampshire State Airport System (NHSASP) to the state and local economies in 2013. The economic contribution of the airport system includes three components that are quantified as part of this study.

- **On-airport economic activity** – The on-airport economic activity includes airport management and maintenance jobs as well jobs at airport tenant businesses.
- **Spending impacts or multiplier effect on State economy** – This off-airport effect is triggered by spending by airport management, airport tenants, airport and airport tenant employees, and visiting air passengers and pilots. As this spending is circulated throughout the state economy, additional jobs, labor income, output and tax revenues will be generated at other businesses throughout the state. These additional impacts were estimated using input-output modeling techniques and the IMPLAN modeling system.
- **Travel time savings for general aviation business travelers** – The travel time savings provided by general aviation constitute cost savings for the businesses with employees traveling on-the-clock. Business owners pass the cost savings on to customers, reinvest them into their business, or treat them as profit.

In addition to the three economic effects listed above, the airport provides benefits to residents and businesses that are not easily quantifiable. Functions range from emergency preparedness and response, to the transportation of people and freight and aerial surveying, to quality of life improvements such as access to recreational flying and space for community events.

The following narrative provides a description of data collection efforts and assumptions underlying the inputs for the analysis. Also provided is an overview of input-output modeling and of the methodologies employed to estimate tax revenues and to estimate and monetize travel time savings obtained by general aviation travelers.

B.1.1 DATA COLLECTION

At the start of this assessment, the study team conducted an extensive data collection effort that focused on the 12 airports that are part of the NPIAS. One exception was the Manchester-Boston Regional Airport where a limited data collection effort was undertaken and supplemented with information provided in an economic study completed by the airport in 2009. The data collection effort consisted of three components:

- Airport Management Survey and Interviews;
- Airport Tenant survey; and
- Visitor Survey

Airport Management Survey

The study team provided the 12 NPIAS airports with a detailed data request. The data request included questions about the airport operations and capital spending as well as information about airport tenants, airport users, and airport activities.

Data items requested include:

- Number of Employees, including full- and part-time employees; by employee county of residence;
- Employee Compensation, which includes salaries, wages and benefits; by employee county of residence;
- Airport operation and maintenance expenditures in 2010, broken down by product;
- Airport capital expenditures in 2008, 2009 and 2010;
- List of on-airport businesses;
- List of major airport users and off-airport dependent businesses; and
- Airport activities

Airport Tenant Survey

To supplement the airport tenant data provided by airport management, a separate survey of airport tenants was conducted to ascertain the characteristics of on-airport businesses. The survey questions gathered general data regarding revenues, payroll, and employment. In order to more accurately model the economic impact of the airport, in cases where data was either incomplete or unavailable, estimates were used based on similar businesses.

Visitor Survey

Spending by visitors arriving by general aviation supports jobs at businesses throughout the state. To estimate the jobs that are supported by general aviation visitors, a visitor survey was distributed. Information collected included: the primary reason for visit, general pilot and passenger information, and estimated expenditures.

Data Collection Summary

As described, the data collection effort included three separate surveys that targeted three specific groups: Airport management, airport tenants or businesses, and airport visitors. The response rate varied for each group. Outreach efforts included: scheduled airport management interviews, airport tenant visits to distribute tenant surveys, airport visitor surveys placed in high traffic locations, primarily at full service fixed base operators (FBOs), and posters which were made available in order to promote study participation. Tenant survey participation was low due in large part to the sensitivity of economic data and willingness to share it. Airport visitor data was also low, likely due to the data collection window falling within the winter season when most GA airports experience lower traffic volumes. Where data was limited or unavailable, similar economic studies conducted for state aviation departments were analyzed, adjusted for New Hampshire as necessary, and incorporated.

B.1.2 SOURCES AND ASSUMPTIONS

This section outlines the sources of the key inputs to the analysis and underlying assumptions. Key inputs include:

- On-airport employment;
- Airport capital spending;
- Airport and tenant operations and maintenance spending;
- Visitors and visitor spending; and
- Travel time savings

On-Airport Employment

On-airport employment obtained from the airport management and airport tenant surveys. The following assumptions were made for airports and airport tenants for which the number of employees was not provided:

- For Manchester-Boston Regional Airport, the employment estimates from the 2009 economic impact study were adjusted based changes in the level of passengers, general aviation operations and cargo since 2009.
- For Dillant-Hopkins Airport (Keene) the employment projections presented in the airport's 2012 economic impact study were used for the 2013 employment levels.
- For the other 10 NPIAS airports, the employment number was obtained from the airport management and airport tenant surveys. Where direct airport employment levels were unavailable, employment was estimated based on responses from system airports with similar levels of annual operations. Missing employment data at tenant business was estimated based on responses from similar businesses at airports of similar size and function.

Airport Capital Expenditures

The airport system contributes to the state and local economy through airport capital projects such as runway, taxiway, and apron rehabilitation and construction, hangar construction, and equipment purchase, as well as various airport related studies and assessments. Capital budgets for each of the 12 NPIAS airports for FY2010-2012 were obtained from NHDOT and from the airport management survey. Since airport capital expenditures vary from year to year, annual cost was estimated by averaging capital project cost in FY2010-2012.

Airport Operation and Maintenance Expenditures

Airport non-labor operation and maintenance (O&M) expenditures support jobs at airport vendors and supplying industries. Similarly, an airport's payroll is used by employees for household spending such as food, transportation, education, personal services, health services, and entertainment. Furthermore, this spending supports jobs at the businesses providing these goods and services, as well as their suppliers. Estimates of labor and non-labor O&M expenditures were obtained from the airport management survey. Where information was not provided by airport management, expenditures were estimated based on responses from airports in the system that were similar with regard to the level of operations.

Tenant Operation and Maintenance Expenditures

Like the airport itself, airport tenants support jobs at other businesses in the state through their labor and non-labor O&M expenditures. Labor and non-labor O&M expenditures were obtained from the airport tenant survey or estimated based on the number of on-airport employees by industry. The latter assumed that labor and non-labor expenditures per employee at on-airport tenant business are equal to the industry's statewide average.

Visitors Spending

Many tourists and other visitors arrive in New Hampshire by air. Their spending on lodging, food, entertainment and other goods and services supports jobs throughout the state. The majority of the visitors arrive by commercial air although general aviation also brings visitors to the state.

Visitors arriving by commercial air

Spending by visitors arriving by commercial air was based on the 2009 economic impact study of Manchester-Boston Regional Airport. In the study, visitors are assumed to account for 44 percent of the total arriving passengers. The study defined visitors as persons residing outside of New Hampshire, Vermont, Maine and Massachusetts. The 2009 Manchester economic impact study also reported visiting air passenger spent an average of about $500 (adjusted for inflation) per person per trip in New Hampshire on lodging, food and beverages, retail and other

Table B-1 - Average Visitor Spending, Commercial Service

	Average Expenditures per visitor per trip
Lodging	$283
Food and Beverages	$142
Retail	$50
Other	$23
TOTAL	$498

Source: 2009 Manchester Airport Economic Impact Study, BLS

expenditures (**Table B-1**).

The assumptions of the 2009 Manchester study were applied to air passenger arrival counts from the FAA for Manchester-Boston Regional Airport as well as for Lebanon Municipal Airport to estimate total visitor spending for these airports. While commercial service became once again available at Portsmouth International Airport at Pease in the fall of 2013, service was limited to Florida and is therefore likely to be mostly used by New England residents traveling to Florida.

Visitors arriving at general aviation airports

Spending by visitors arriving by general aviation airports was estimated making assumptions about the number of aircraft, number of visitors per aircraft, and the average spending per visitor per trip. The assumptions are presented in **Table B-2**.

Number of visiting aircraft

Based on a review of similar airports in neighboring states, it was assumed that 65 percent of itinerant general aviation operation at primary and national airports was by visitors coming from out-of-state or out-of-market area. For regional, local and basic airports, it was assumed that 33 percent of itinerant operations were made by visitors. The latter is based on the 2012 Massachusetts Economic Impact study, which estimates the impact of a comparable New England state system

Table B-2 - Data Inputs Visitor Spending Estimate

	Percent of Itinerant Operations that are Visitors	Visitors per aircraft	Spending per Visitor
Primary	65%	2.8	$220
National	65%	2.8	$220
Regional	33%	2.3	$155
Local	33%	2.0	$113
Basic	33%	1.7	$77

Source: Consultant Assumptions

with airports of similar size and function.

Average visitors per aircraft

The average number of passenger per aircraft is dependent on the type of aircraft and differs therefore by airport role; Local and basic airport are typically used by smaller aircraft. Based on the survey, the average number of visitors per aircraft was 2.8 at primary airports (Portsmouth) and 2.3 at regional airports (Concord). The 2009 economic impact study for Massachusetts presented averages that were similar, albeit slightly higher, for comparable airports. Since survey data was not available for local and basic airports, the average number of visitors per aircraft for these studies was estimated by reducing the averages reported in the Massachusetts study by roughly 5 percent, to account for the lower average number of passenger at New Hampshire airports.

Spending per visitor

The visitor survey ascertained off-airport expenditures: lodging, food and beverage, ground transportation, auto fuel, retail, entertainment, and other purchases. Based on survey responses, visitors to Portsmouth International Airport spent on an average of $220 per visitor per trip while Concord Airport visitors spent an average of $155 per trip. Where visitor information was unavailable at other similar system airports, the averages presented above were used. National and primary airports were assumed to be $220/visitor while regional airports were assumed to be $155/visitor. Visitor spending information at the basic and local airports was unavailable. In order to make reasonable assumptions for these facilities, an analysis of visitor spending presented in a 2012 Massachusetts report was performed and showed that New Hampshire visitors spent on average 10 percent less than Massachusetts visitors. Therefore, the spending used by visitors at local and basic in New Hampshire was based on similar Massachusetts airports and reduced by 10 percent. These assumptions are presented in the following table.

Table B-3 - Average Spending per General Aviation Visitor

	New Hampshire	Massachusetts
Primary	$220	$240
National	$220	$240
Regional	$155	$175
Local	$113	$125

Source: The Louis Berger Group (New HamphireHampshire); Massachusetts Economic Impact Study (Massachusetts)

Travel Time Savings

In most cases, general aviation airports enhance overall productivity for business travelers because they are more convenient and less restrictive. A survey conducted for the National Business Aviation Association (NBAA) and the General Aviation Manufacturers Association (GAMA) found that travelers on general aviation aircraft are more likely to spend their time productively compared to travelers using other modes.

The travel time savings are calculated based on the formula below and each of the variables are explained in more detail below.

*Number of Business Flights * Average Number of Passengers per Flight * Number of hours saved per Flight * Value of one hour saved*

Number of Business Flights

GA airports experience a certain level of operations conducted for business purposes by general aviation aircraft, big and small. The number of business travelers was estimated based on the number of itinerant operations at each of the airports. Assumptions about the proportion of itinerant operations that were for business purpose are presented in **Table B-4**.

Table B-4 - Business Travel

	Percent of Itinerant Operations that are Business Flights
Primary	30%
National	30%
Regional	30%
Local	10%
Basic	1%

Source: Consultant Assumptions

Inventory data collected from national and regional airports such as Nashua and Keene reported that an estimated 30 percent of itinerant operations were for business purposes. Local airports (Berlin, Skyhaven and Claremont) reported a percentage of business flights between

1 and 40 percent. This assessment conservatively assumes that 30 percent of itinerant operations at the primary, national and regional airports and 10 percent of the itinerant operations at local airports were for business purposes. Since non-NPIAS airports were not part of our survey program, data from basic airports was unavailable. However, based on the characteristics of basic airports, it was assumed that business activity is minimal. In these cases, the percentage of itinerant operations used for business was assigned a value of 1 percent.

Average Number of Passengers per Business Flight

Since data collected at system airports did not present a reliable estimate of passengers per business flight this assessment assigned a value based on a 2009 report from the NBAA and GAMA. It was assumed that the average number of passengers per business aircraft was 3.4.

Travel Time Savings

Without security check-in procedures and wait times for baggage and curbside transportation, general aviation airports provide a more convenient experience for business travelers. Most importantly, GA airports allow a customizable route between specific locations and saves valuable time. This assessment assumes that general aviation business travelers save an average of two hours to and from their destination.

Value of Travel Time

The value of the travel time savings are typically quantified using the value of time (VOT) metric, which is an estimate of the amount the average individual is willing to the pay for one hour of travel time savings. For business trips during which the traveler is paid for his time spent traveling, travel time savings constitute a benefit to the individual traveler as well as the employer. To estimate the cost savings for employers, VOT for business travelers is often set to equal hourly wage. Recent DOT guidelines recommend adjusting VOT of business air travelers by a factor of 2.5 to take into account the higher average income of business air travelers. Using the average annual pay in the state of $48,963 as reported by the Bureau of Labor Statistics multiplied by a factor of 2.5 to take into account the higher average income of business air travelers, the average VOT was estimated as $59.

Value of Travel Time Savings = (Average Annual Pay/Hours Worked per Year

- Average Annual Pay in New Hampshire of $48,963 as reported by the Bureau of Labor Statics
- 2,080 hours worked in one year

Input-output Modeling

IMPLAN was used to quantify the multiplier effect triggered by regional spending by the airport management, tenants, employees and visitors. IMPLAN is an input-output modeling system that was originally created by the US Forest Service to help it gauge the effects of its policies. This model has since grown in popularity for use in economic impact studies for a wide range of economic sectors. IMPLAN has undergone several rounds of refinements since its inception. The latest version was released in 2009 and includes the ability to conduct multi-regional analyses.

Multiplier Effect - The multiplier effect consists of three distinct effects presented below.

- The direct impact is the initial change in demand resulting from the project, investment, or business operation under study. The direct effect is the economic activity that triggers the rest of the multiplier effect. The direct effect of the NHSAS is the on-airport economic activity including the airport employment, employment at airport tenants.
- The indirect impact is the change in economic activity in those sectors that supply services, materials, and machinery necessary to support the directly affected industries. For example, an increase in orders for aircraft will result in an increased demand for aircraft parts. This increase in demand for aircraft parts will generate additional activity involved in providing raw materials, energy, and transportation for manufacturing parts, which in turn provides stimulus to the industries supplying those industries. This ripple effect stemming from a change in final demand for products and services in the directly affected industry is multiplied throughout the economy and can account for a significant amount of the total effect.
- The induced impact is the effect of increased consumer spending by wage earners in the directly and indirectly affected industries. The ripple effect from this spending can also be followed through the economy. For this report, the induced impact is composed of jobs supported by airport employees, other on-airport employees and employees of all the other directly and indirectly affected businesses.

Together, the direct, indirect and induced impacts constitute the multiplier effect, to the extent to which the direct impact results in other economic activity. Expressed numerically, a multiplier of 2.5 indicates that for every dollar directly generated by the industry under study, an additional $1.50 of ripple effects are felt within the state, for a total impact of $2.50.

Tax Methodology

New Hampshire is one of two states in the U.S. without personal income tax and sales tax. The three primary sources of state tax revenue are business profit tax, enterprise tax, and meal and rooms tax.

- **Business profit tax** – 8 percent tax on income from conducting business activity within the state as well as a portion of the income for interstate businesses.
- **Business enterprise tax** – 0.75 percent on the enterprise value tax base, which is defined as the sum of all compensation paid or accrued, interest paid or accrued, and dividends paid, after special adjustments and apportionment.
- **Meals and rooms tax** – 9 percent tax on hotels, campsites, motor vehicle rentals, and restaurant meals.

Business Profit and Enterprise Tax

To estimate Business Profit and Enterprise tax revenues directly and indirectly generated, an effective tax rate was developed for business profit tax and enterprise tax. The effective rate was estimated based on the historical relationship between tax revenue and total output. More specifically, it was calculated by dividing (1) the sum of 2012 business profit tax revenue and business enterprise tax revenue as reported by the New Hampshire Department of Revenue Administration by (2) the 2012 output included in the IMPLAN system.

Table B-5 - Business Profit and Enterprise Tax Effective Rate

	Tax Revenues and Effective Rate
Business Profit Tax Revenue (in $M)	$309.1
Business Enterprise Tax Revenue (in $M)	$195.9
Labor Income (in $M)	$119,140.7
Effective Combined Business Profit and Business Enterprise Tax Rate	0.42%

Source: Consultant Calculations

The resulting combined business profit and business enterprise tax is 0.42 percent. This rate is applied to the total economic output generated by the New Hampshire Airport System including the multiplier effect.

Meals and Room Tax

Meals and Room tax generated by air passenger and general aviation visitor spending was estimated by applying the 9 percent tax rate to spending on lodging and on food and beverages.

McFarland Johnson

New Hampshire DOT

Bureau of Aeronautics

Louis Berger