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 State Airport System (NHSASP). These options and recommendations respond to facility and service objective shortfalls and geographic gaps in service as presented in *Chapter 5, 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 New Hampshire, 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.

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 wellknown 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, 6AUG 2012

6.2 PURPOSE & RATIONALE FOR UPGRADED AIRPORT

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 New Hampshire 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.

Dillant-Hopkins Airport: Keene is the largest urban area in New Hampshire 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.

Moultonboro Airport: The Lakes Region of New Hampshire 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.



Dean Memorial Airport



Dillant-Hopkins Airport



Moultonboro Airport



Mt. Washington Regional Airport: The North Central portion of the White Mountain Region is the premier tourism center of New Hampshire with two reputable 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 New Hampshire 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) Maximize Economic Value of NH's Airport System
- 2) Provide a Safe, Secure, and Efficient Aviation System
- 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 New Hampshire 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 Commercial Service Airports	Runway Length > 7,000 Feet Pavement Strength (250,000 lbs, Dual Tandem Wheel) Medium Intensity Approach Light System with Sequential Flash- ers 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 New Hampshire 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:

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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.		

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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 Taxi- way 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 Commercial Service 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 Se- quenced Flashing Lights Air Traffic Control Tower 24/7 Scheduled Airline Passenger Service (Passenger/Bag- gage 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 New Hampshire 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:

- New Hampshire 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 New Hampshire will stabilize, and slow growth in activity is projected over the next twenty years. As New Hampshire lost the least amount of aviation activity out of all of the New England states, this represents a positive future for aviation in New Hampshire.

6.4 GEOGRAPHIC PERFORMANCE IMPROVEMENT OPTIONS

As described in *Chapter 4*, *Current Statewide Aviation System Performance*, the geographic analyses identified service gaps within New Hampshire'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- Minut	e 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 Commercial Service 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



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 New Hampshire State Airport System.

6.4.1 ADJACENT STATES' AIRPORTS

Prior to exploring options for New Hampshire to improve coverage of its existing airport system, it is informative to consider how airports in adjacent states currently serve areas of New Hampshire, 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
- Sanford Municipal

Utilizing the same methodology applied for New Hampshire, 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 systemwide gap areas identified for the NHSASP, to pinpoint the significance of services offered by these airports on areas of New Hampshire that are underserved today.

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

The result of this analysis yielded New Hampshire 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 New Hampshire State Airport System gaps adjacent states' airports serve.

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 New Hampshire	560 SQMI / 6%	139,436 / 10.6%	4 Top Employers
Drive Time Coverage of New Hampshire Gap Areas	130 SQMI / 1.4%	11,113 / 0.8%	N/A

Source: McFarland Johnson, Inc.

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

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 New Hampshire State Airport System, to pinpoint the significance of services offered by these airports on areas of New Hampshire 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 New Hampshire.





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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
Caledonia County	ver	Y	X	X		(X
Post Mills	X	X	X	X	X	X	X
Hartness State	./	./	X	./	X	./	./
	Massa	chuset	ts	\checkmark		V	\checkmark
Turners Falls	<u> </u>	Х	Х	\checkmark	Х	\checkmark	Х
Orange Municipal		Х	Х		Х		\checkmark
Gardner Municipal	Х	Х	Х	\checkmark	Х	\checkmark	
Fitchburg Municipal	\checkmark	Х	Х	\checkmark	\checkmark	\checkmark	\checkmark
Lawrence Municipal	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
	Ма	aine					
Steven A. Bean Municipal	\checkmark	Х	Х	\checkmark	\checkmark	\checkmark	\checkmark
Bethel Regional	\checkmark	Х	Х	Х	\checkmark	\checkmark	Х
Eastern Slope	\checkmark	Х	Х	\checkmark	\checkmark	\checkmark	\checkmark
Sanford Municipal	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark

Source: McFarland Johnson, Inc.

Note: $\sqrt{}$ = airport meets air access features X = airport does not meet air access features

The result of this analysis yielded New Hampshire land area, population, and employment center coverage for air access features at adjacent

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 New Hampshire	3,290 SQMI / 36.2%	680,774 / 51.7%	22 Top Employers
Air Access Coverage of New Hampshire Gap Areas	232 SQMI / 46.5%	12,870 / 94.5%	N/A

Source: McFarland Johnson, Inc.

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 New Hampshire. Within these areas, adjacent states' airports serve more than 680,700 New Hampshire 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 New Hampshire system airport.

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The drive time analysis of adjacent state's airports indicates that airports in Vermont, Massachusetts, and Maine do not serve significant portions of New Hampshire. 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 New Hampshire serves only 0.8 percent of population not fully served by the New Hampshire 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 Airport in Fryeburg, Maine.

Considering air access features, adjacent states' airports provide services to large portions of New Hampshire, 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 New Hampshire population not fully served by New Hampshire system airports. As with the drive time analysis, this coverage can be almost entirely attributed to services provided by Eastern Slope Airport.

A larger issue that affects New Hampshire 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 New Hampshire 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 New Hampshire. 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 New Hampshire 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 New Hampshire 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 New Hampshire 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

Table 0-7 - MIGAOT - Candidate Airports for 5,200 Foot Runways					
Candidate Airports					
NPIAS Airports					
Dean Memorial	Claremont Municipal				
	Non-NPIAS Airports				
Gifford	Twin Mountain	Plymouth Municipal			
Gorham	Franconia	Newfound Valley			

Table 6-7 – NHSASP – Candidate Airports for 3.200 Foot Runways

Source: McFarland Johnson, Inc.

airport in terms of gap area, population, and Top 50 employers served are listed in descending order by area.

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				

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

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 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 offers the greatest coverage in the existing gap area located in the East Central side of New Hampshire.

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 New Hampshire 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:

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.

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.

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	S 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			

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

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 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 New Hampshire.

■ Non-Precision Approach Gaps: To improve coverage by system airports with a non-precision approach, the New Hampshire 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.

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

Airport	Area(SQMI)	%	Population	%	Employers	%
		NPIA	S 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.

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 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 ystem airports, funding would be an obstacle.

Adjacent state airports currently serving areas of New Hampshire without access to no-precision approach capability include Eastern Slope (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 New Hampshire 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.

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.

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

Airport	Area(SQMI)	%	Population	%	Employers	%
		NPIAS A	irports			
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	S 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.

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.

Based upon activity projections for these airports provided in C , 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 New Hampshire 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 New Hampshire 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.

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

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

Source: McFarland Johnson, Inc.

As a NPIAS facility, Claremont Municipal Airport is the only candidate airport with access to federal funding for such an improvement. A 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 New Hampshire are Bethel Regional (ME), Eastern Slope (ME), and Hartness State (VT) Airports.

Airport	Area(SQMI)	%	Population	%	Employers	%	
		NPIAS A	irports				
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	

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

Source: McFarland Johnson, Inc.

AvGas Fuel Service Gaps: To improve coverage by system airports with AvGas (100LL) fueling, the New Hampshire 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 New Hampshire with access to AvGas include Bethel Regional (ME) and Eastern Slope (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 New Hampshire 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.

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	

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

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 iet 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 New Hampshire with

Airport	Area(SQMI)	%	Population	%	Employers	%			
		NPIAS A	irports						
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			

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

Source: McFarland Johnson, Inc.

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

6.5 SUMMARY&PRELIMINARYRECOMMENDATIONS

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

- 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 New Hampshire 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 Airport was found to have any significant impact on areas of New Hampshire that are currently underserved by the existing state airport system.

Table 6-21 – NHSASP – Geographic Performance ImprovementsSummary of Recommendations

Airport	% Land	% Population	# Employers			
Runways of 3,200 Feet or Greater						
Dean Memorial	39%	20%	N/A			
	Runways o	f 5,200 Feet or Greater				
Mt. Washington Regional	28%	17%	2			
	Non-Pre	cision Approaches				
N/A	N/A	N/A	N/A			
	Precis	sion Approaches				
N/A	N/A	N/A	N/A			
	On-Site	Weather Reporting				
Claremont Municipal	11%	13%	N/A			
	AvG	as 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.

