

# CHAPTER 4: CURRENT STATEWIDE AIRPORT SYSTEM PERFORMANCE

## 4.1 INTRODUCTION

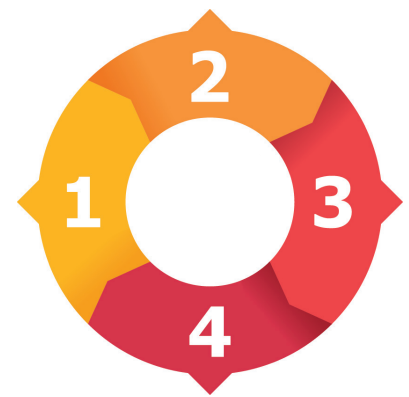
This chapter presents the analyses and results of evaluating the existing performance of New Hampshire’s State Airport System. As described in *Chapter 2, Facility Roles and Objectives*, the evaluation is based upon the following metrics:

- 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 commercial service 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 New Hampshire’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

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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*, 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 New Hampshire 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 New Hampshire 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 New Hampshire 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 New Hampshire 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 New Hampshire 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**

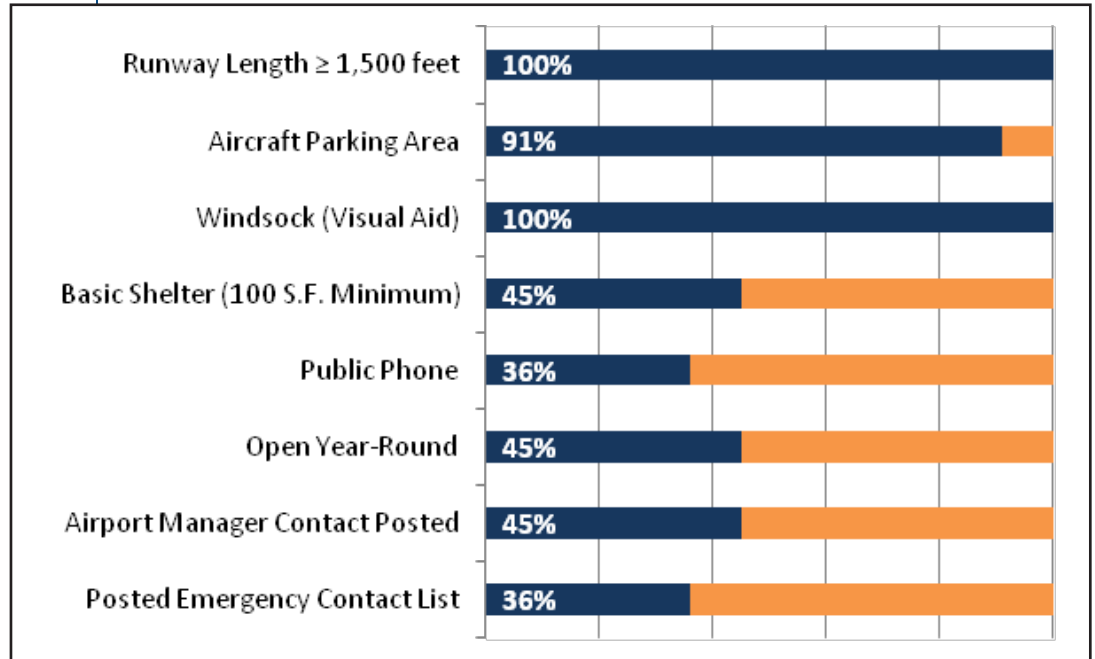
System airports categorized into the Primary Role were measured against minimum facility and service objectives for their role. The report card illustrated in **Figure 4-5** presents the current performance of Primary Airports in the New Hampshire State Airport System. Facility and service objectives 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.

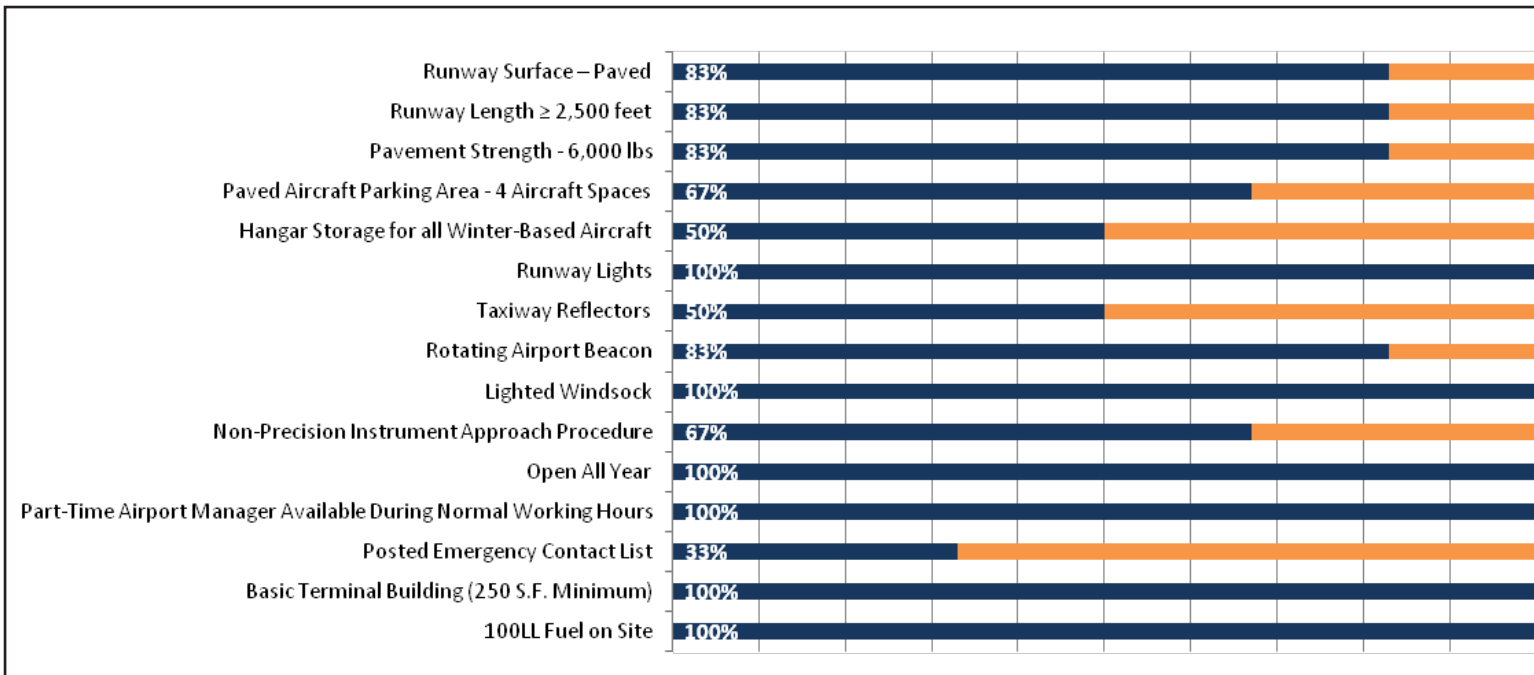
**Figure 4-1 NHSASP – Performance Report Card – General Aviation Basic Airports**



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.

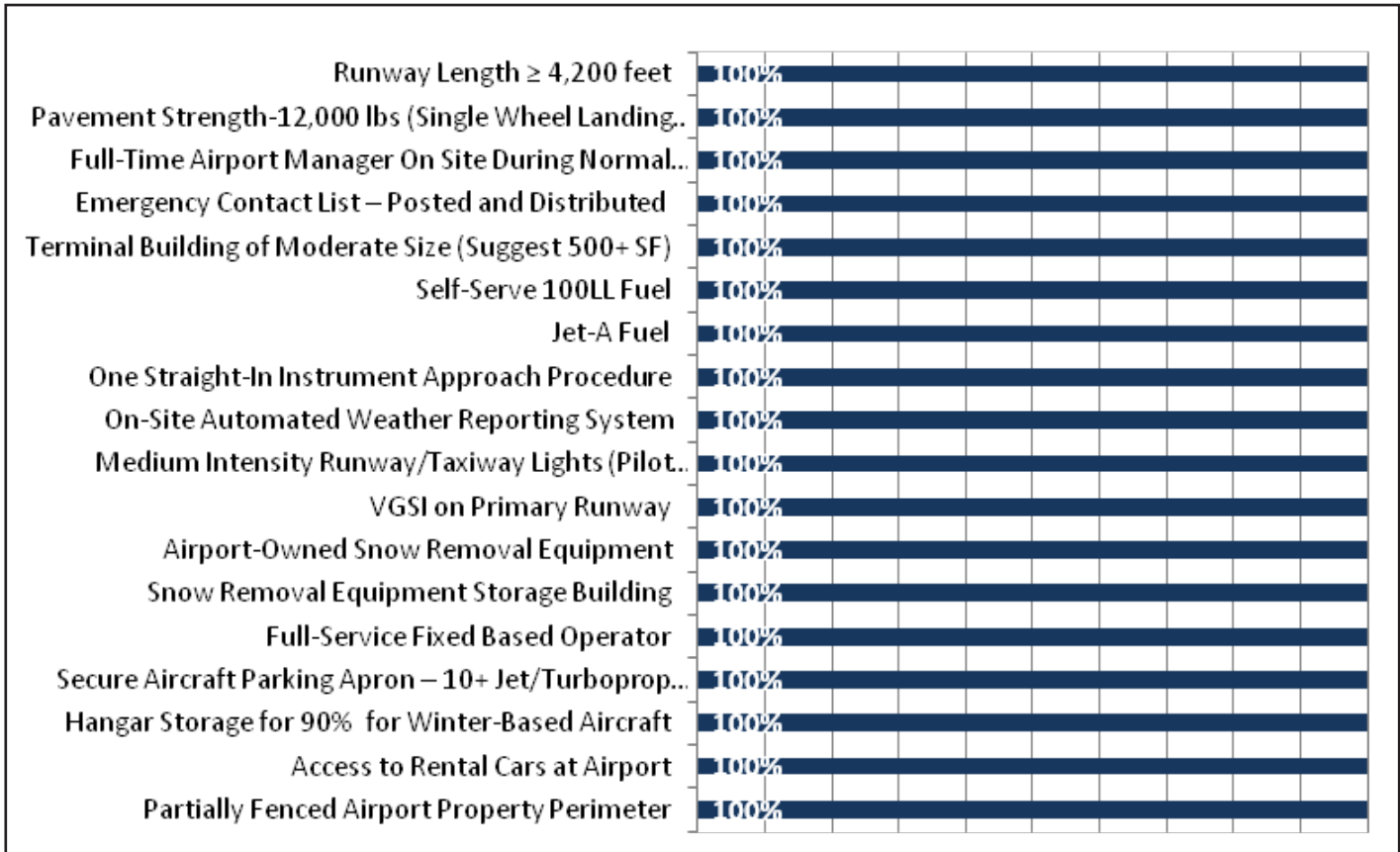
Figure 4-2 NHSASP – Performance Report Card – General Aviation Local Airports



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.

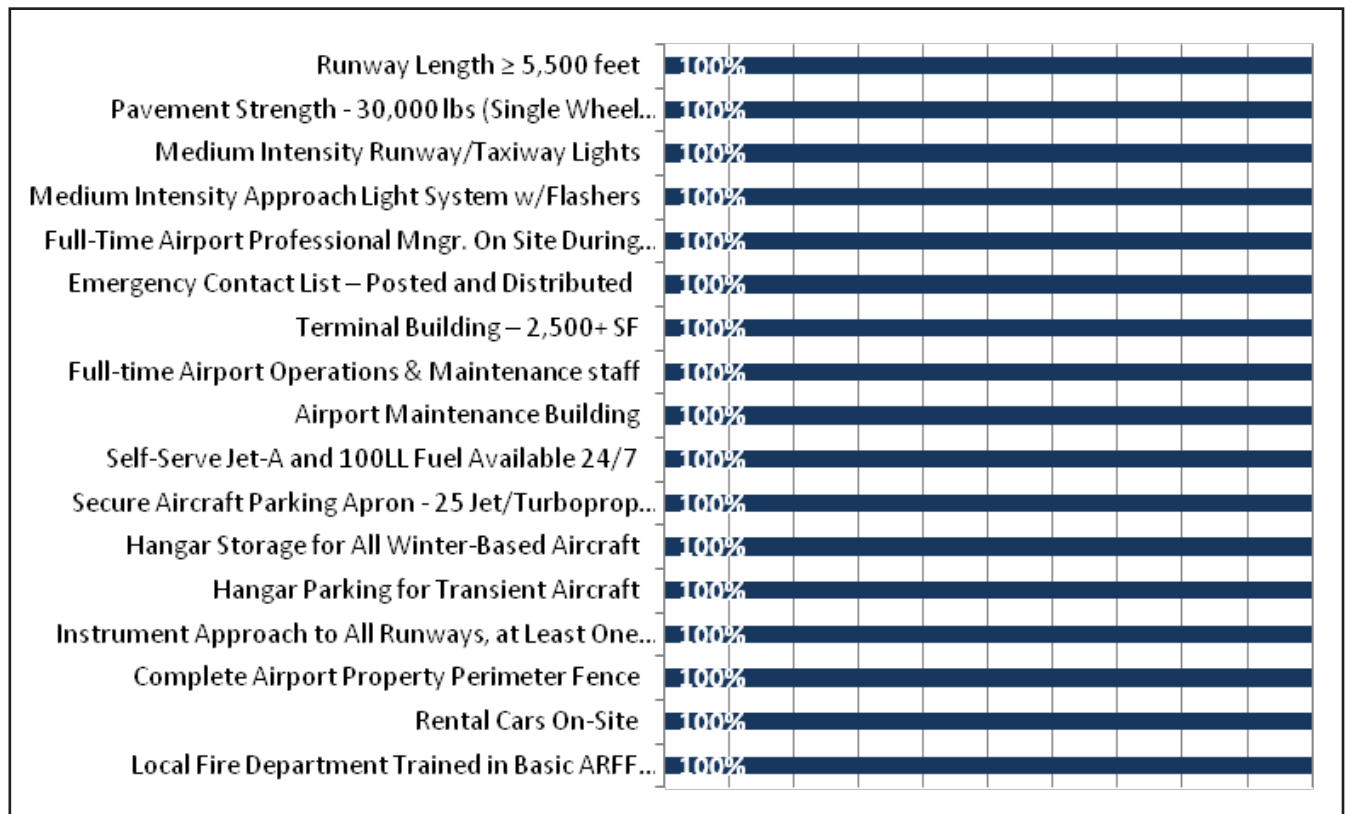
Figure 4-3 NHSASP – Performance Report Card – General Aviation Regional Airports



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.

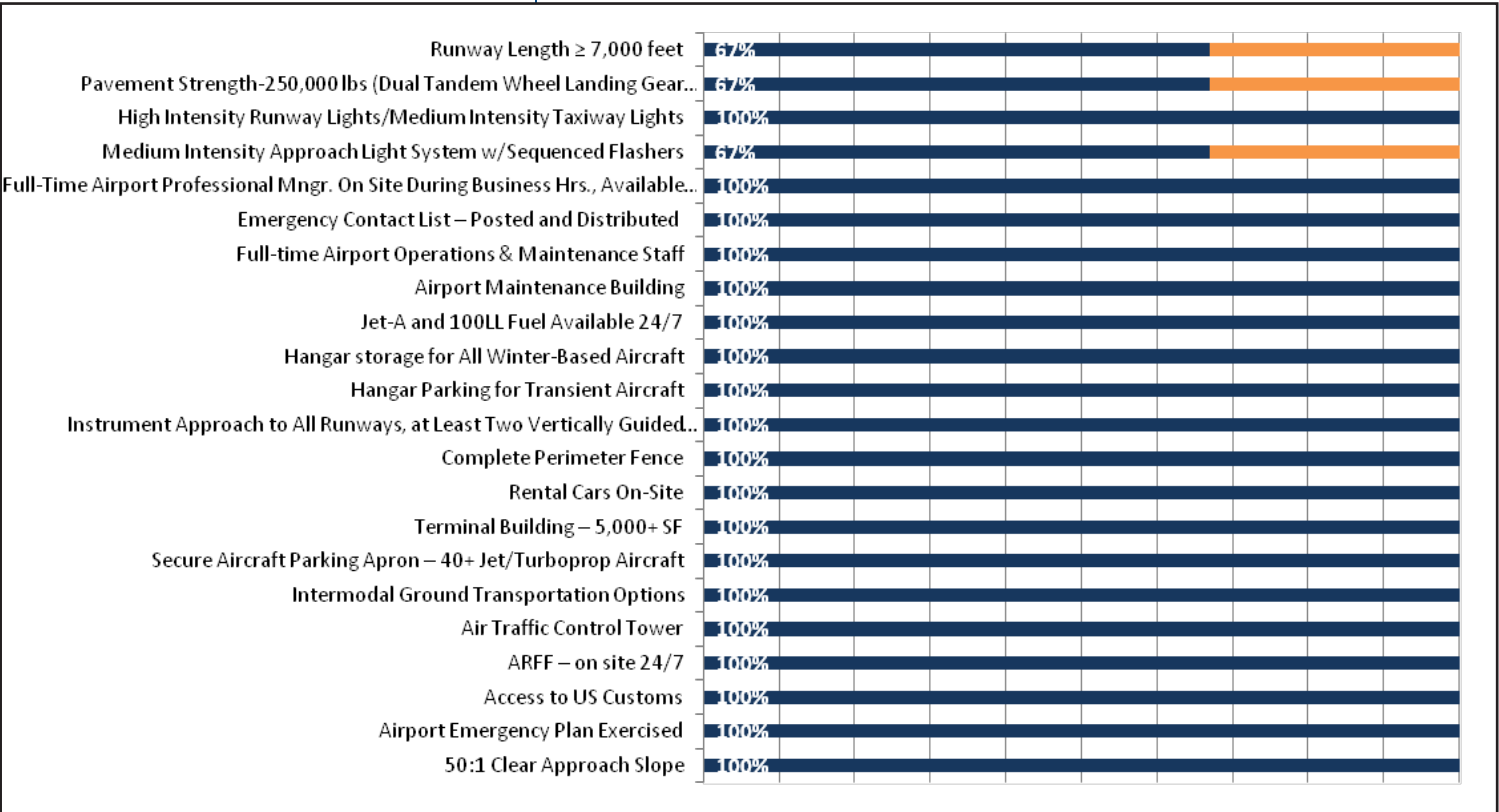
Figure 4-4 NHSASP – Performance Report Card – General Aviation National Airports



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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Portsmouth International	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	96%

Source: McFarland Johnson, Inc.



## 4.2.6 ANALYSIS SUMMARY

The evaluation of New Hampshire 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 Commercial Service 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**

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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 New Hampshire 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 Commercial Service Airports.

Additionally, 30-minute drive times were also applied to Primary Commercial Service 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 Commercial Service 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 4-1 – NHSASP – Drive Time Coverage by Basic, Local, Regional, and National Roles**

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 New Hampshire 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.

# NH STATE AIRPORT SYSTEM PLAN

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





**NH**  
**STATE**  
**AIRPORT**  
**SYSTEM PLAN**

- Primary
- Other Airports
- Neighboring State Airports
- 60 Min Drive Time: Primary

Date: July, 2014

**FIGURE 4-7:**  
**60 MINUTE DRIVE TIME: PRIMARY AIRPORTS**



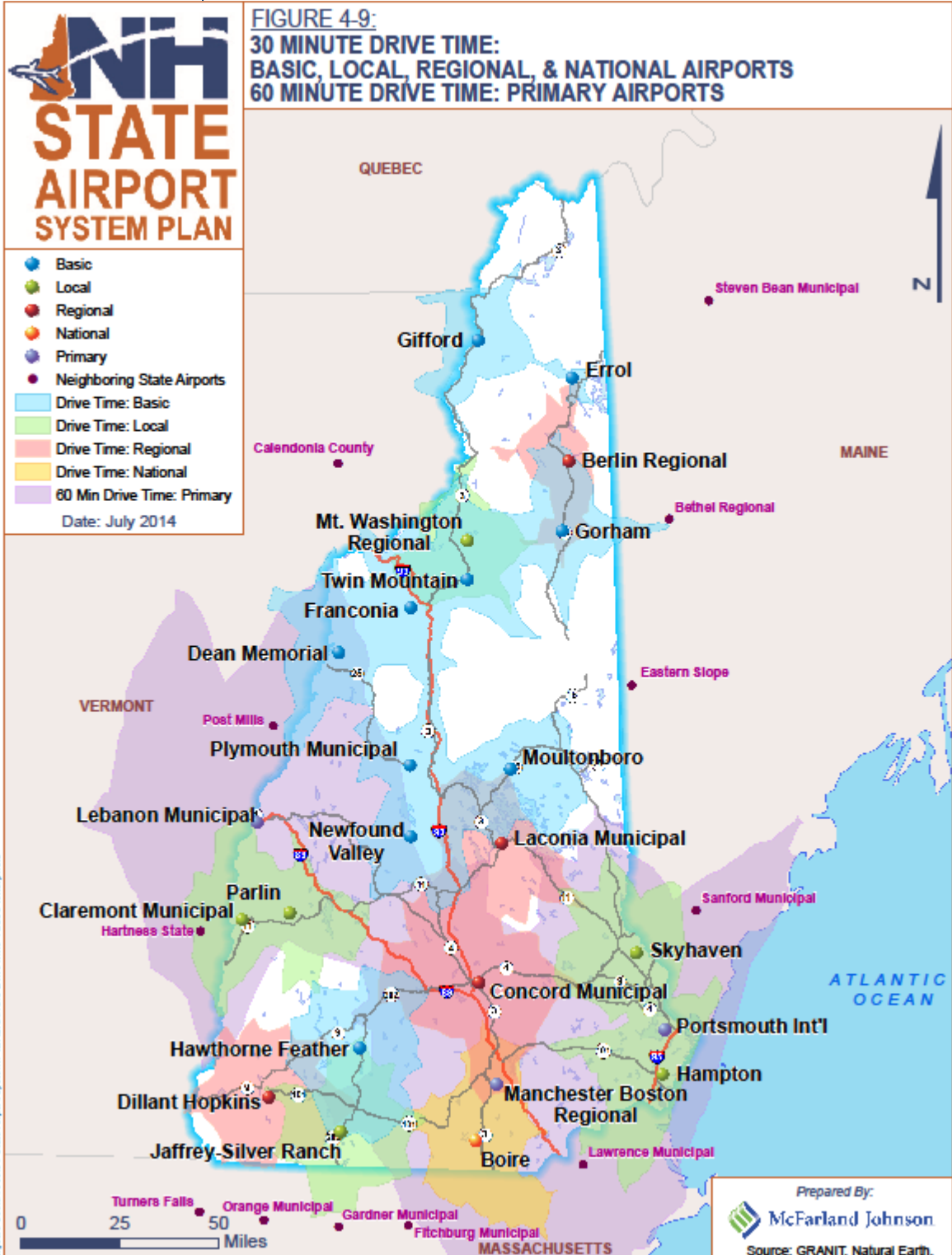
# NH STATE AIRPORT SYSTEM PLAN

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

- Basic
  - Local
  - Regional
  - National
  - Primary
  - Neighboring State Airports
  - Drive Time: Primary
  - Drive Time: Basic
  - Drive Time: Local
  - Drive Time: Regional
  - Drive Time: National
- Date: July 2014



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 New Hampshire 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 Commercial Service 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 New Hampshire’s top 50 employers and total employment by these top 50 employers within these industries provided by the Infogroup dataset.

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

**Table 4-5 – NHSASP – Top 50 Employers in New Hampshire**

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 New Hampshire 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, 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 New Hampshire 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 New Hampshire’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

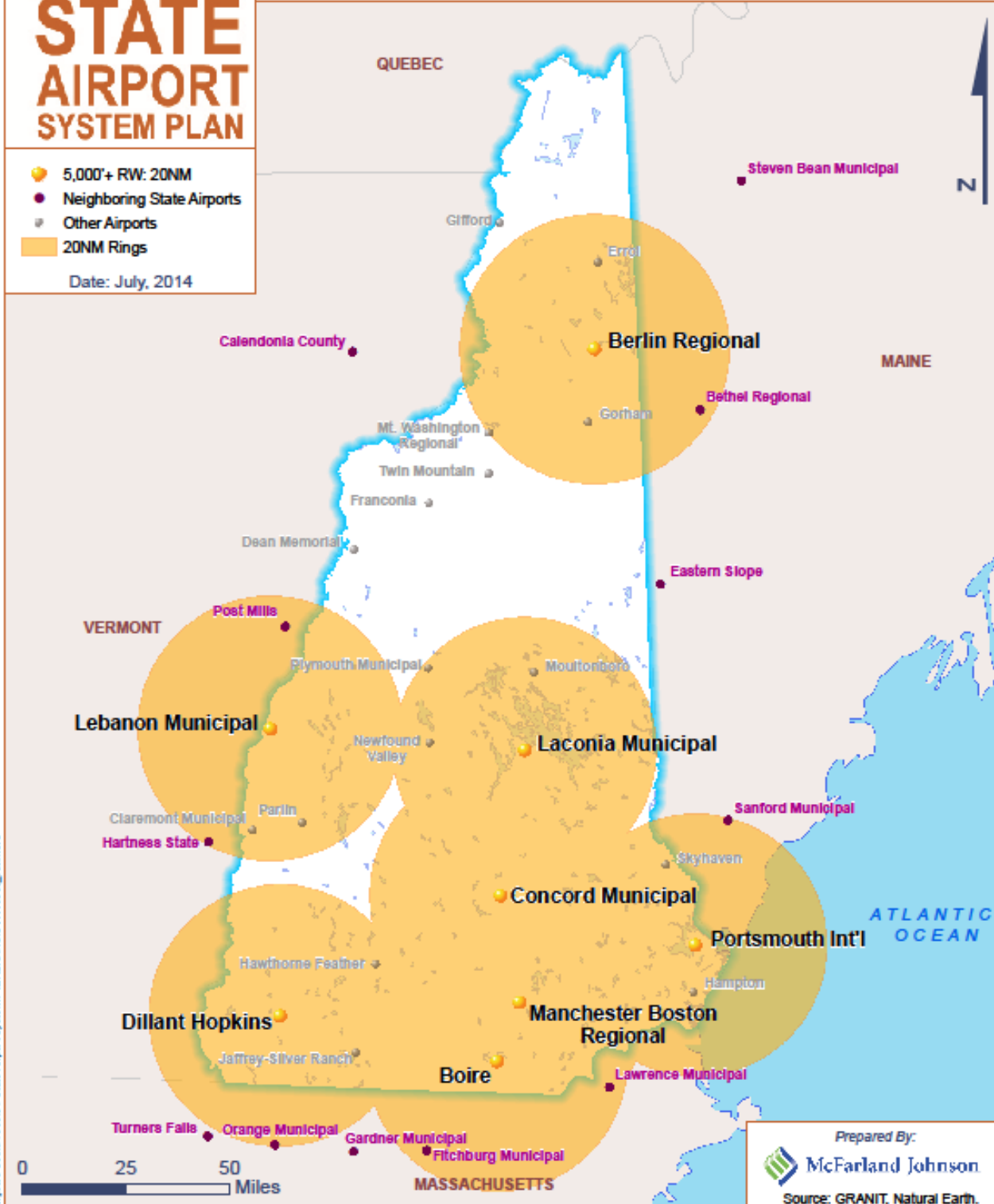
Source: McFarland Johnson, Inc.



# NH STATE AIRPORT SYSTEM PLAN

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

- 5,000'+ RW: 20NM
  - Neighboring State Airports
  - Other Airports
  - 20NM Rings
- Date: July, 2014









### 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.

# NH STATE AIRPORT SYSTEM PLAN

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

- 15 NM: Northern Airports
  - 20 NM: Southern Airports
  - Neighboring State Airports
  - ✈ No Weather Reporting
  - 15NM Rings
  - 20NM Rings
- Date: July, 2014



Prepared By:  
**McFarland Johnson**  
Source: GRANIT, Natural Earth.

**FIGURE 4-15:**  
**20 NAUTICAL MILES:**  
**AVGAS FUELING**

- Avgas or Both Fuels
  - Other Airports: NH
  - Neighboring State Airports
  - 20NM Rings
- Date: July, 2014



Prepared By:  
**McFarland Johnson**  
 Source: GRANIT, Natural Earth.

# NH STATE AIRPORT SYSTEM PLAN

**FIGURE 4-16:  
20 NAUTICAL MILES:  
JET A FUELING**

- Jet A Fuel: 20NM
  - Neighboring State Airports
  - Other Airports
  - 20NM Rings
- Date: July, 2014



### 4.3.5 ANALYSIS SUMMARY

The evaluation of New Hampshire 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 Commercial Service 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 commercial service 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 Commercial Service Airports Coverage:** System airports in Primary Commercial Service 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 New Hampshire’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 New Hampshire 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 Commercial Service 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 Commercial Service role. Additionally, gaps are also quantified for general aviation services, where Primary Commercial Service 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.

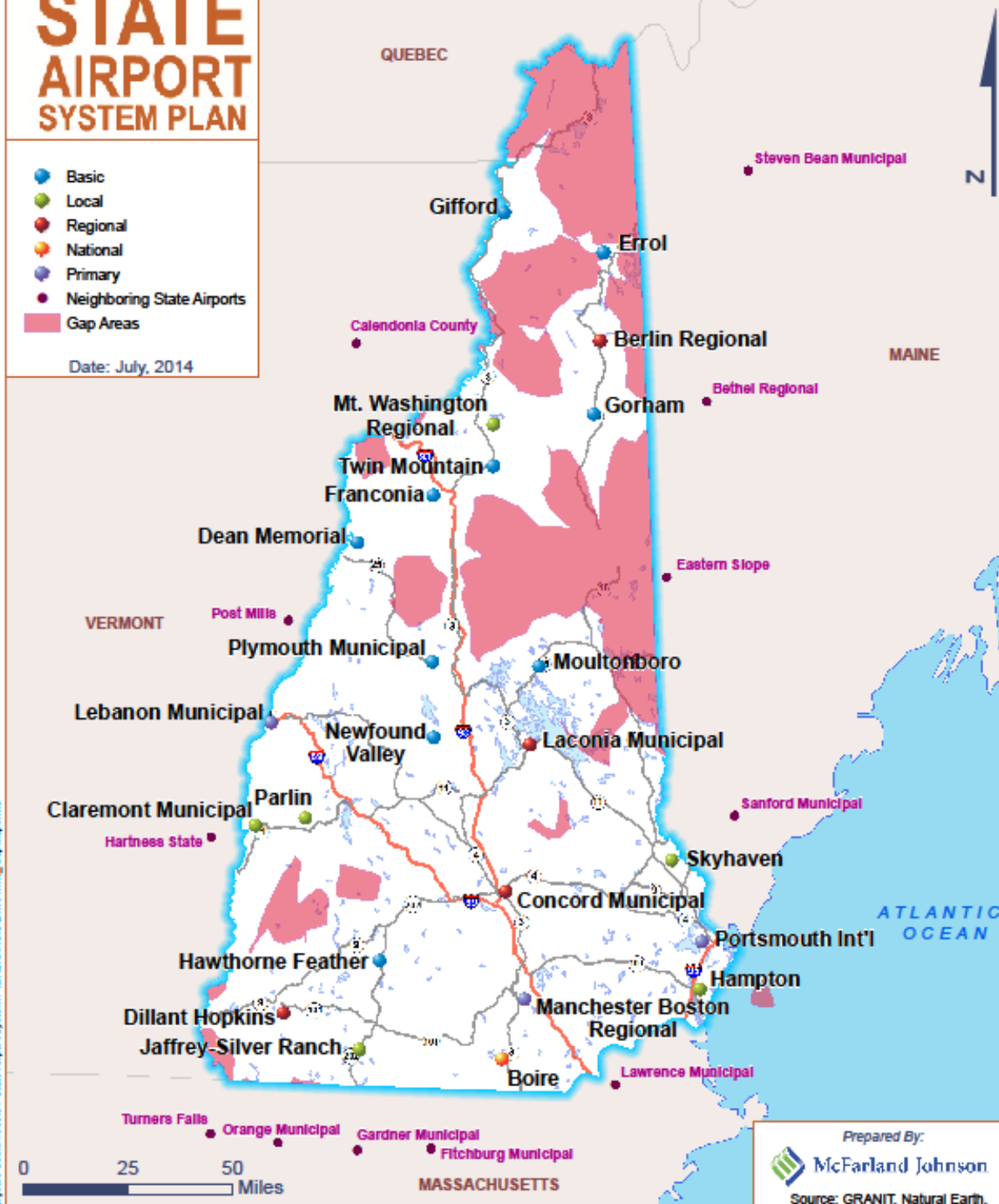


# NH STATE AIRPORT SYSTEM PLAN

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

- Basic
- Local
- Regional
- National
- Primary
- Neighboring State Airports
- Gap Areas

Date: July, 2014



Prepared By:  
**McFarland Johnson**  
 Source: GRANIT, Natural Earth.

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

- **General Aviation Airports Gap:** General aviation airports do not reach approximately 38 percent of New Hampshire 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 Commercial Service 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 Commercial Service 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.

**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.



ASOS



# NH STATE AIRPORT SYSTEM PLAN

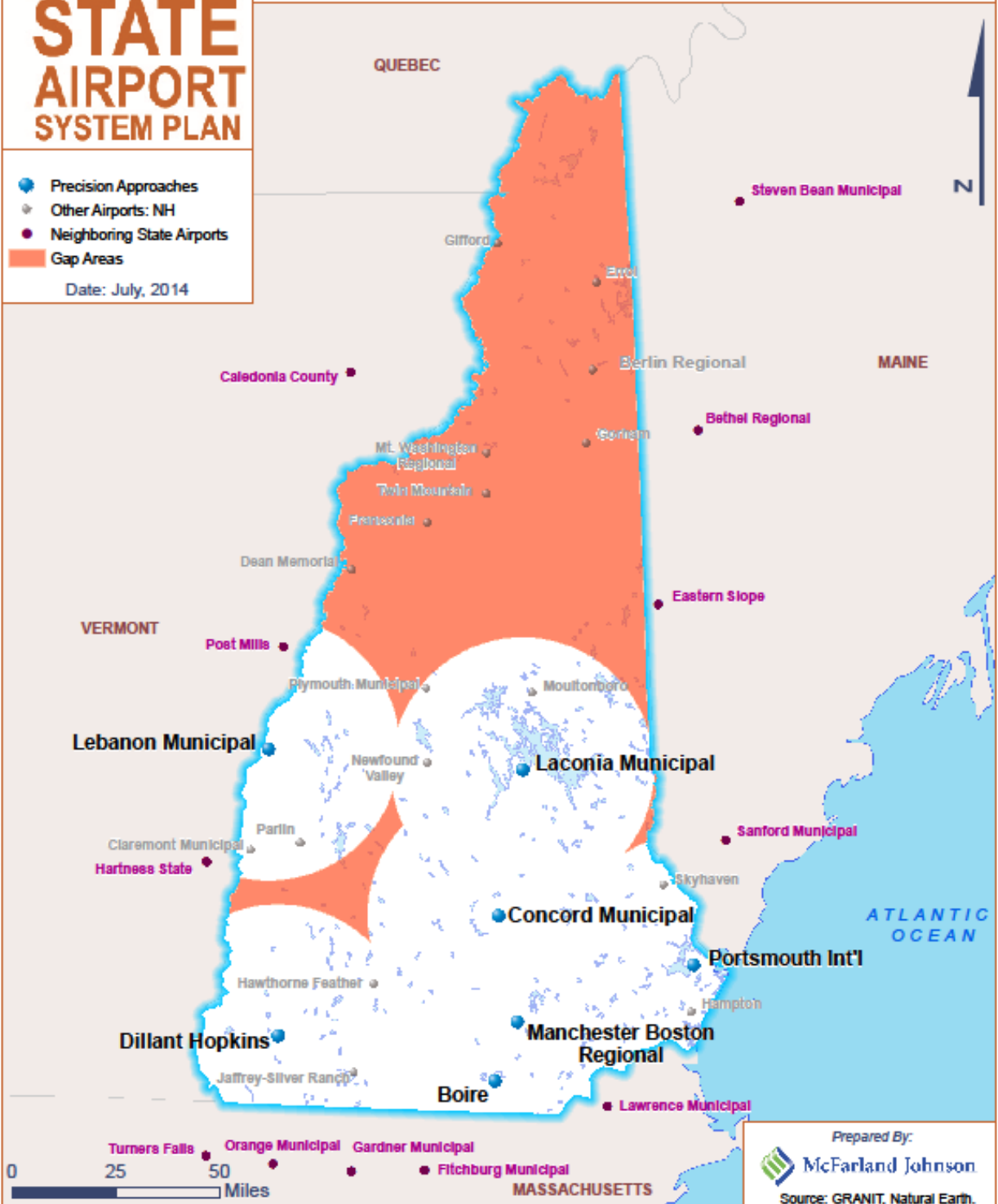
**FIGURE 4-19:**  
**AIR ACCESS COVERAGE GAPS:**  
**20 NAUTICAL MILES:**  
**PRIMARY RUNWAYS 5,000 FEET OR GREATER**

- Runway: 5,000'+
- ✈ Other Airports: NH
- Neighboring State Airports
- Gap Areas

July, 2014



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



# NH STATE AIRPORT SYSTEM PLAN

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









# NH STATE AIRPORT SYSTEM PLAN

**FIGURE 4-24:  
AIR ACCESS COVERAGE GAPS:  
20 NAUTICAL MILES:  
JET A FUELING**



## 4.4.2 ANALYSIS SUMMARY

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

- **Drive Time Gaps Evaluation:** The primary areas of New Hampshire 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 commercial service 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 Commercial Service Airports Coverage:** System airports in Primary Commercial Service 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 New Hampshire 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.