2015

NH State Airport System Plan

McFarland Johnson
New Hampshire DOT
Louis Berger

February 2015
New Hampshire State Airport System Plan

Technical Report and Appendices

February 2015

Prepared for:

New Hampshire Department of Transportation
Bureau of Aeronautics

Prepared By:

McFarland Johnson

Louis Berger
Project Management Team:

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

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

Louis Berger
Nicholas A. Stefaniak – Principal Planner

Planning Advisory Committee:

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

The preparation of this document was financed in part through a grant from the Federal Aviation Administration (Project Number SBG 33-08-2013) and with the financial support of the New Hampshire Department of Transportation Bureau of Aeronautics. The contents do not necessarily reflect the official views or policy of the FAA or the Bureau of Aeronautics. Acceptance of this report does not in any way constitute a commitment to fund the development described herein.
## Table of Contents

### CHAPTER ONE – INTRODUCTION
1.1 Introduction ............................................................... 1-1
1.2 System Plan Elements .................................................. 1-2
1.3 Goals and Objectives .................................................. 1-2
1.4 Referenced System Plans ............................................. 1-3

### CHAPTER TWO – FACILITY ROLES AND OBJECTIVES
2.1 Introduction .................................................................. 2-1
2.2 Airport Categories ...................................................... 2-3
2.3 Facility and Service Objectives ................................. 2-3
  2.3.1 General Aviation Basic Airports ................................. 2-3
  2.3.2 General Aviation Local Airports ................................. 2-5
  2.3.3 General Aviation Regional Airports ......................... 2-7
  2.3.4 General Aviation National Airports ............................. 2-9
  2.3.5 Primary Commercial Service Airports ........................ 2-10
2.4 Performance Metrics .................................................. 2-12
  2.4.1 Geographic Adjustments .......................................... 2-13
  2.4.2 Commercial Service Adjustments .............................. 2-13
  2.4.3 GIS Analysis Process ............................................. 2-14
2.5 Summary ...................................................................... 2-14

### CHAPTER THREE – SYSTEM INVENTORY
3.1 Introduction .................................................................. 3-1
3.2 Summary of Existing System ......................................... 3-1
  3.2.1 State Airports Summaries ....................................... 3-3
  3.2.2 Private Airports Not In System ................................ 3-13
  3.2.3 Review of Previous System Plan .............................. 3-13
3.3 Inventory Process ........................................................ 3-15
3.4 Airport Inventory Data ................................................. 3-16
  3.4.1 General Airport Information .................................... 3-17
  3.4.2 Airside Facilities ................................................... 3-17
  3.4.3 Landside Facilities and Services .............................. 3-23
  3.4.4 Airport Activity Data ............................................. 3-29
3.5 Commercial Service Overview .................................... 3-32
3.6 Summary ...................................................................... 3-33

### CHAPTER FOUR – CURRENT STATEWIDE AVIATION SYSTEM PERFORMANCE
4.1 Introduction .................................................................. 4-1
4.2 Facility and Service Objectives Performance .................. 4-2
  4.2.1 General Aviation Basic Airports ................................. 4-2
  4.2.2 General Aviation Local Airports ................................. 4-2
  4.2.3 General Aviation Regional Airports ......................... 4-3
  4.2.4 General Aviation National Airports ............................ 4-3
  4.2.5 Primary Airports .................................................... 4-3
  4.2.6 Analysis Summary ................................................. 4-9
4.3 Airport System Performance ......................................... 4-10
  4.3.1 Drive Time Service Area Coverage .......................... 4-11
  4.3.2 Population Coverage ............................................. 4-17
TABLE OF CONTENTS

CHAPTER FIVE – AVIATION FORECASTS
5.1 Introduction .................................................. 5-1
5.2 Historical Airport Data and Activity Measures
   5.2.1 Historical Based Aircraft .................................. 5-2
   5.2.2 New England Regional Trends ................................. 5-2
   5.2.3 Historical NH Trends ...................................... 5-3
   5.2.4 Historical Aircraft Operations ............................... 5-5
5.3 Airport Activity Forecasts ........................................... 5-8
   5.3.1 Forecasting Methodology .................................. 5-8
   5.3.2 Based Aircraft Forecast .................................. 5-9
   5.3.3 Aircraft Fleet Mix Forecast .................................. 5-35
   5.3.4 Statewide Based Aircraft Forecast Conclusion ............ 5-36
   5.3.5 Aircraft Operations Forecast .................................. 5-37
5.4 Summary of Forecasted System Activity ......................... 5-42

CHAPTER SIX – FUTURE STATEWIDE AVIATION SYSTEM PERFORMANCE
6.1 Introduction .................................................. 6-1
6.2 Purpose and Rationale for Upgraded System Roles ............. 6-2
6.3 Facility and Service Objective Improvement Options .......... 6-4
   6.3.1 Prioritization of Recommended Facility and Service Objectives ...................... 6-5
   6.3.2 Aviation Activity Demand and Forecast Implications ...................... 6-8
6.4 Geographic Performance Improvement Options .................. 6-9
   6.4.1 Adjacent States’ Airports .................................. 6-11
   6.4.2 Coverage Improvement Options ................................ 6-17
6.5 Summary and Preliminary Recommendations .................... 6-26

CHAPTER SEVEN – AIRPORT FACILITY RECOMMENDATIONS
7.1 Introduction .................................................. 7-1
7.2 Airport Facility Recommendations .................................. 7-3
   7.2.1 Alton Bay ........................................ 7-3
   7.2.2 Errol Airport ....................................... 7-4
   7.2.3 Franconia Airport ....................................... 7-5
   7.2.4 Gifford Field ........................................ 7-6
   7.2.5 Gorham Airport ........................................ 7-7
   7.2.6 Hawthorne Feather Airpark .................................. 7-8
   7.2.7 Newfound Valley Airport ............................... 7-9
   7.2.8 Plymouth Municipal Airport ............................... 7-10
   7.2.9 Twin Mountain Airport ............................... 7-11
   7.2.10 Claremont Municipal Airport ....................... 7-12
   7.2.11 Dean Memorial Airport ....................... 7-13
   7.2.12 Hampton Airfield ............................... 7-15
   7.2.13 Jaffrey Airport - Silver Ranch ....................... 7-17
   7.2.14 Moultonboro Airport ............................... 7-18
   7.2.15 Parlin Field ........................................ 7-20

TABLE OF CONTENTS

PAGE ii
CHAPTER NINE – ECONOMIC CONTRIBUTION

9.1 Introduction ........................................................................................................................................ 9-1
9.1.1 New Hampshire State Airport System ......................................................................................... 9-1
9.1.2 Outline of the Report ...................................................................................................................... 9-7

APPENDICIES

Appendix 3-A
Appendix 7-A
Appendix 8-A
Appendix 9-A
Appendix 9-B
Tables

CHAPTER ONE – INTRODUCTION

CHAPTER TWO - FACILITY ROLES AND OBJECTIVES
2-1 NHSASP - Airport Categories and Roles ................................................................. 2-2
2-2 NHSASP - General Aviation Basic Airports - Facilities and Service Objectives .......... 2-5
2-3 NHSASP - General Aviation Local Airports - Facilities and Service Objectives .......... 2-6
2-4 NHSASP - General Aviation Regional Airports - Facilities and Service Objectives .... 2-8
2-5 NHSASP - General Aviation National Airports - Facilities and Service Objectives ...... 2-9
2-6 NHSASP - Primary Commercial Service Airports - Facilities and Service Objectives. 2-11

CHAPTER THREE – SYSTEM INVENTORY
3-1 NHSASP - General Airport Information .................................................................. 3-18
3-2 NHSASP - Primary Runway and Taxiway Facilities ................................................... 3-19
3-3 NHSASP - Navigational Aids and Weather Reporting Capability ............................ 3-22
3-4 NHSASP - Fueling Services Available .................................................................... 3-24
3-5 NHSASP - Aircraft Storage Available .................................................................... 3-25
3-6 NHSASP – Operator and Passenger Services Available ........................................... 3-27
3-7 NHSASP – Based Aircraft ..................................................................................... 3-30
3-8 NHSASP – Operations .......................................................................................... 3-31

CHAPTER FOUR – CURRENT STATEWIDE AVIATION SYSTEM PERFORMANCE
4-1 NHSASP - Drive Time Coverage by Basic, Local, Regional and National Roles ........ 4-11
4-2 NHSASP - Drive Time Coverage by Primary Commercial Service Role .................. 4-12
4-3 NHSASP - Drive Time Population Coverage by Basic, Local, Regional and National Roles ........................................................................................................... 4-17
4-4 NHSASP - Drive Time Population Coverage by Primary Commercial Service Role ... 4-17
4-5 NHSASP - Top 50 Employers in New Hampshire ....................................................... 4-18
4-6 NHSASP - Drive Time Employment Center Coverage by Basic, Local, Regional and National Roles ........................................................................................................... 4-19
4-7 NHSASP - Drive Time Employment Center Coverage by Primary Commercial Service Role ........................................................................................................... 4-19
4-8 NHSASP - Nautical Mile Coverage by System Airports with 3,200-Foot Runways or Greater ........................................................................................................... 4-20
4-9 NHSASP - Nautical Mile Coverage by System Airports with 5,000-Foot Runways or Greater ........................................................................................................... 4-21
4-10 NHSASP - Nautical Mile Coverage by System Airports with Precision Approach Capability ........................................................................................................... 4-21
4-11 NHSASP - Nautical Mile Coverage by System Airports with Non-Precision Approach Capability ........................................................................................................... 4-21
4-12 NHSASP - Nautical Mile Coverage by System Airports with On-Site Weather Reporting Service ........................................................................................................... 4-26
4-13 NHSASP - Nautical Mile Coverage by System Airports with AvGas Fuel Service ...... 4-26
4-14 NHSASP - Nautical Mile Coverage by System Airports with Jet-A Fuel Service ...... 4-26
4-15 NHSASP - Service Gaps by Drive Times: Geographic, Population and Employment Center Gaps ........................................................................................................... 4-32
4-16 NHSASP - Service Gaps by Airport Role Drive Times: Geographic, Population and Employment Center Gaps ........................................................................................................... 4-32
4-17 NHSASP - Service Gaps by Runway Length ................................................................ 4-34

TABLE OF CONTENTS PAGE v
4-18 NHSASP - Service Gaps by Approach Capability ................................................. 4-35
4-19 NHSASP - Service Gaps by On-Site Weather Reporting Capability ..................... 4-35
4-20 NHSASP – Service Gaps by Fuel Service ............................................................. 4-35

CHAPTER FIVE - AVIATION FORECASTS
5-1 Forecasted Based Aircraft - All Airports ............................................................... 5-34
5-2 Forecasted State Aircraft Fleet - All Airports ......................................................... 5-35
5-3 Forecasted Based Aircraft by Airport Category ................................................. 5-36
5-4 NHSASP - Historical Based Aircraft ................................................................. 5-38
5-5 NHSASP - Historical Operations ..................................................................... 5-39
5-6 Operations per Based Aircraft (OPBA) ............................................................. 5-40
5-7 Forecasted Annual Operations ......................................................................... 5-41

CHAPTER SIX – FUTURE STATEWIDE AVIATION SYSTEM PERFORMANCE
6-1 NHSASP - Minimum Facility and Service Objective Shortfalls by Role .................. 6-5
6-2 NHSASP - Facility and Service Objective Priorities by Role .............................. 6-7
6-3 NHSASP - Service Gap Summary .................................................................. 6-10
6-4 NHSASP - Adjacent States’ Airports Drive Time Coverage Summary ............. 6-12
6-5 NHSASP - Adjacent States’ Airports Air Access Features ............................... 6-15
6-6 NHSASP - Adjacent States’ Airports Air Access Coverage Summary .............. 6-15
6-7 NHSASP - Candidate Airports for 3,200 Foot Runways .................................... 6-18
6-8 NHSASP - Candidate Airport Gap Coverage - 3,200 Foot Runways .............. 6-19
6-9 NHSASP - Candidate Airports for 5,000 Foot Runways .................................... 6-19
6-10 NHSASP – Candidate Airport Gap Coverage – 5,000 Foot Runways .......... 6-20
6-11 NHSASP – Candidate Airports for Non-Precision Approaches ....................... 6-21
6-12 NHSASP – Candidate Airport Gap Coverage – Non-Precision Approaches ...... 6-21
6-13 NHSASP – Candidate Airports for Precision Approaches .............................. 6-22
6-14 NHSASP – Candidate Airport Gap Coverage – Precision Approaches ............ 6-22
6-15 NHSASP - Candidate Airports for On-Site Weather Reporting Systems ........ 6-23
6-16 NHSASP - Candidate Airport Gap Coverage – On-Site Weather Reporting Systems 6-24
6-17 NHSASP - Candidate Airports for AvGas Fuel Service ................................... 6-24
6-18 NHSASP – Candidate Airport Gap Coverage – AvGas Fuel Service ............ 6-25
6-19 NHSASP - Candidate Airports for Jet-A Fuel Service .................................... 6-25
6-20 NHSASP – Candidate Airport Gap Coverage – Jet-A Fuel Service ............... 6-26
6-21 NHSASP – Geographic Performance Improvements – Summary of Recommendations ........................................................................................................ 6-28

CHAPTER SEVEN – AIRPORT FACILITY RECOMMENDATIONS
7-1 NHSASP - Recommendations - Errol Airport ...................................................... 7-4
7-2 NHSASP - Recommendations - Franconia Airport ............................................. 7-5
7-3 NHSASP - Recommendations - Gifford Field ...................................................... 7-6
7-4 NHSASP - Recommendations - Gorham Airport ............................................... 7-7
7-5 NHSASP - Recommendations - Hawthorne Feather Airpark ............................. 7-8
7-6 NHSASP - Recommendations - Newfound Valley Airport ............................... 7-9
7-7 NHSASP - Recommendations - Plymouth Municipal Airport ........................... 7-10
7-8 NHSASP - Recommendations - Twin Mountain Airport ................................... 7-11
7-9 NHSASP - Recommendations - Claremont Municipal Airport ......................... 7-12
7-10 NHSASP - Recommendations - Dean Memorial Airport ................................ 7-14
7-11 NHSASP - Recommendations - Hampton Airfield ........................................... 7-16
7-12 NHSASP - Recommendations - Jaffrey Airport - Silver Ranch ....................... 7-18

TABLE OF CONTENTS
CHAPTER EIGHT – SYSTEM RECOMMENDATIONS

8-1  Aircraft Registration Fee Calculation Comparison ................................. 8-8
8-2  Twenty Year System Funding Needs ....................................................... 8-13
8-3  NPIAS/non-NPIAS and Airport Role Reference ....................................... 8-16
8-4  Historical Fuel Tax Revenues ................................................................. 8-17
8-5  NH Federal AIP Grants 2009-2014 .......................................................... 8-19
8-6  Historical State Grant Program Funding ................................................. 8-24
8-7  Summary of Legislative Analysis ............................................................. 8-34
8-8  Permitting Programs .............................................................................. 8-41

CHAPTER NINE – ECONOMIC CONTRIBUTION

9-1  Study Airports ......................................................................................... 9-2
9-2  Operations by Airport .............................................................................. 9-7
9-3  Population in Main Population Centers in NH 2010 ............................... 9-9
9-4  Population and Population Density by County, 2012 ............................. 9-12
9-5  Annual Population Change by County, 1980-2012 ............................... 9-12
9-6  Population Projections by County, 2010-2040 .................................... 9-13
9-7  Household Income Distribution by County, 2012 ................................. 9-14
9-8  Employment by County, 2013 ............................................................... 9-14
9-9  Employment by Industry and County, 2013 ......................................... 9-16
9-10 Tax Revenue Sources FY2013 ............................................................... 9-20
9-11 On Airport Employment, 2013 .............................................................. 9-21
9-12 Airport Improvement Program (AIP) Project Cost FY2010-2012 .......... 9-22
9-13 Estimated Annual Contribution of Airport Capital Programs (in $millions) ................................................................. 9-22
9-14 O&M Spending by Airport Management (in $millions), 2013 ............. 9-23
9-15 Multiplier Effect of Operations and Maintenance Spending by Airport Management (in $millions), 2013 ................................................................. 9-23
9-16 Multiplier Effect of Operations and Maintenance Spending by Airport Tenants (in Millions), 2013 ................................................................. 9-24
9-17 Average Visitor Spending, Commercial Service (MHT 2009) .................. 9-24
9-18 Annual Visitor Spending, Commercial Service 2013 ............................ 9-25
9-19 Average Number of Visitors per Aircraft .............................................. 9-26
9-20 Average Spending per Visitor ............................................................... 9-26
9-21 Annual Visitor Spending, General Aviation 2013 ................................. 9-26
9-22 Contribution Visitors Spending (in $millions), 2013 ................................................................. 9-27
9-23 Overview of Multiplier Effect, All Airports .................................................................................. 9-27
9-24 Overview of Multiplier Effect, Primary Airports .......................................................................... 9-28
9-25 Overview of Multiplier Effect, General Aviation Airports in System ......................................... 9-28
9-26 Overview of Multiplier Effect, System Airports Not Included in NPIAS ..................................... 9-28
9-27 Overview of Travel Time Savings, All Airports ............................................................................ 9-29
9-28 Flight Schools in New Hampshire .................................................................................................. 9-32
9-29 Frequent Off-Airport Business Users ............................................................................................. 9-33
9-30 Aviation in New Hampshire 2013 .................................................................................................. 9-36
Figures

CHAPTER ONE – INTRODUCTION

CHAPTER TWO – FACILITY ROLES AND OBJECTIVES
2-1 System Airports ........................................................................................................... 2-4
2-2 NHSASP - GIS Input Data and Analysis ...................................................................... 2-14

CHAPTER THREE – SYSTEM INVENTORY
3-1 NPIAS Airports .......................................................................................................... 3-2

CHAPTER FOUR – CURRENT STATEWIDE AVIATION SYSTEM PERFORMANCE
4-1 NHSASP - Performance Report Card - General Aviation Basic Airports ...................... 4-4
4-2 NHSASP - Performance Report Card - General Aviation Local Airports .................... 4-5
4-3 NHSASP - Performance Report Card - General Aviation Regional Airports .............. 4-6
4-4 NHSASP - Performance Report Card - General Aviation National Airports .............. 4-7
4-5 NHSASP - Performance Report Card - Primary Airports ........................................ 4-8
4-6 30-Minute Drive Time: Basic, Local, Regional & National Airports ......................... 4-13
4-7 60-Minute Drive Time: Primary Airports ................................................................... 4-14
4-8 30-Minute Drive Time: All Airports ........................................................................... 4-15
4-9 30-Minute Drive Time: Basic, Local, Regional & National Airports
  60-Minute Drive Time: Primary Airports ........................................................................ 4-16
4-10 20 Nautical Miles: Primary Runways 3,200 Feet or Greater .................................... 4-22
4-11 20 Nautical Miles: Primary Runways 5,000 Feet or Greater .................................... 4-22
4-12 20 Nautical Miles: Precision Approaches ................................................................. 4-24
4-13 20 Nautical Miles: Non-Precision Approaches ......................................................... 4-25
4-14 20 Nautical Miles: On-Site Weather Reporting ......................................................... 4-27
4-15 20 Nautical Miles: AvGas Fueling ............................................................................ 4-28
4-16 20 Nautical Miles: Jet-A Fueling ............................................................................. 4-29
4-17 Drive Time Coverage Gaps: 30-Minute Drive Time: Basic, Local, Regional & National Airports 60-Minute Drive Time: Primary Airports ......................................................... 4-33
4-18 Air Access Coverage Gap: 20 Nautical Miles: Primary Runways 3,200 Feet or Greater ................................................................................................................................. 4-36
4-19 Air Access Coverage Gap: 20 Nautical Miles: Primary Runways 5,000 Feet or Greater ................................................................................................................................. 4-37
4-20 Air Access Coverage Gap: 20 Nautical Miles: Precision Approaches ....................... 4-38
4-21 Air Access Coverage Gap: 20 Nautical Miles: Non-Precision Approaches ................ 4-39
4-22 Air Access Coverage Gap: 20 Nautical Miles: On-Site Weather Reporting ................. 4-40
4-23 Air Access Coverage Gap: 20 Nautical Miles: AvGas Fueling .................................... 4-41
4-24 Air Access Coverage Gap: 20 Nautical Miles: Jet-A Fueling .................................... 4-42

CHAPTER FIVE – FORECAST OF AVIATION DEMAND
5-1 NH Historical Based Aircraft (2004-2013) ................................................................. 5-4
5-2 Based Aircraft Comparison (2004-2013) .................................................................. 5-4
5-3 Historical Operations (2003-2013) ............................................................................. 5-6
5-4 Historical Annual Operations per Based Aircraft at NH Towered Airports (2003-2013) 5-7
5-5 Forecasted State Aircraft Fleet - All Airports ............................................................. 5-36

CHAPTER SIX – FUTURE STATEWIDE AVIATION SYSTEM PERFORMANCE
6-1 30-Minute Drive Time: Adjacent States’ Airports ....................................................... 6-13
<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2</td>
<td>30-Minute Drive Time: Adjacent States' Airports Coverage of NHDrive Time Service Gaps</td>
</tr>
<tr>
<td>6.3</td>
<td>Air Access Coverage: Adjacent States' Airports</td>
</tr>
<tr>
<td>8.1</td>
<td>Breakdown of Development Costs by Airport Role</td>
</tr>
<tr>
<td>8.2</td>
<td>Breakdown of Projects Costs by Phases and Airport Role</td>
</tr>
<tr>
<td>9.1</td>
<td>System Airports</td>
</tr>
<tr>
<td>9.2</td>
<td>Population Density</td>
</tr>
<tr>
<td>9.3</td>
<td>Employment Density</td>
</tr>
<tr>
<td>9.4</td>
<td>Employment by Industry (Jobs) 2013</td>
</tr>
<tr>
<td>9.5</td>
<td>Percent Change in Projected Employment by Sector Projections, 2012-2022</td>
</tr>
<tr>
<td>9.6</td>
<td>Functions of General Aviation Airports</td>
</tr>
<tr>
<td>9.7</td>
<td>General Aviation Airports Serving Aeromedical Flights</td>
</tr>
</tbody>
</table>