

CHAPTER 9: ECONOMIC CONTRIBUTION

9.1 INTRODUCTION

Comprised of three commercial service and 22 general aviation airports, the New Hampshire State Airport System Plan (NHSASP) consists of 25 public use facilities that serve the air transportation needs of over 1.3 million New Hampshire (NH) residents, business users, leisure travelers, and military aviation. The system is an important contributor to state and local economies by supporting thousands of jobs throughout the state while generating millions of dollars in state tax revenue.

In addition to quantitative economic benefits, the system also provides a wide range of qualitative benefits, and impacts that simply cannot be measured such as health and safety benefits that contribute to the overall welfare of the state. Among others, services such as medical transport and evacuation, search and rescue operations, law enforcement flights, military exercises, and flight training all contribute directly to the quality of life of those who live and work in NH.

This report provides an assessment of the economic contribution and benefits of the NH state airport system to NH and its local communities in 2013. The following types of effects have been assessed:

- On-airport Economic Activity
- Off-airport Economic Activity, supported by:
 - Airport Capital Expenditures
 - Airport and Airport Tenant Operations and Maintenance Spending
 - Visitor Spending
 - Travel Time Savings of General Aviation Business Travelers
 - Community Benefits of General Aviation

This report provides an overview of the contribution of the 25 airports included in the system. The airport-specific contribution of each of the 12 NPIAS airports is provided in **Appendix 9-A**.

9.1.1 NEW HAMPSHIRE STATE AIRPORT SYSTEM

As presented in the chapters that precede this economic assessment, the 25 airports in the system have been classified into one of five airport categories. Based primarily on size and function, these categories include: primary, national, regional, local and basic. The airports that fall within each particular category are presented below as of 2014 and shown in **Figure 9-1**.

Primary Commercial Service Airport: The state's three primary airports include: Manchester-Boston Regional Airport, Lebanon Municipal Airport and Portsmouth International Airport at Pease.

General Aviation National Airports: Boire Field (Nashua) is the state's only national airport.

General Aviation Regional Airports: Concord Municipal Airport, Dillant-Hopkins (Keene) Airport and Laconia Municipal Airport have been identified as the state's regional airports.

General Aviation Local Airports: Berlin Regional, Claremont Municipal, Mt. Washington Regional, Parlin Field, Hampton, and Skyhaven Airports make up the local airports in NH.

General Aviation Basic Airports: The basic airports in the system include: Alton Bay, Dean Memorial, Errol, Franconia, Gifford, Gorham, Hawthorne Feather, Jaffrey Airport-Silver Ranch, Moultonboro, Newfound Valley, Plymouth Municipal, and Twin Mountain.

Twelve of the airports in the system are included in the 2013-2017 National Plan of Integrated Airport Systems (NPIAS) (**Table 9-1**). The plan identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and eligible to receive Federal grants under the Airport Improvement Program (AIP). The individual economic contribution of each of the 12 NPIAS airports is presented in **Appendix 9-A**; the economic contribution of the 13 non-NPIAS is presented in aggregate form.

Table 9-1 - Study Airports

	Airports in 2013-2017 NPIAS: Individual Economic Contribution presented in this report	Airports NOT in 2013-2017 NPIAS: Economic Contribution presented in aggregate form only
Primary Airports	<ul style="list-style-type: none"> Manchester-Boston Regional Airport Lebanon Municipal Airport Portsmouth International Airport at Pease 	
National Airports	<ul style="list-style-type: none"> Boire Field 	
Regional Airports	<ul style="list-style-type: none"> Concord Municipal Airport Dillant Hopkins Airport Laconia Municipal Airport 	
Local Airports	<ul style="list-style-type: none"> Berlin Regional Airport Claremont Municipal Airport Mt. Washington Regional Airport Skyhaven Airport 	<ul style="list-style-type: none"> Parlin Field Hampton Airfield
Basic Airports	<ul style="list-style-type: none"> Dean Memorial Airport 	<ul style="list-style-type: none"> Alton Bay Airport (Ice Rwy/Seaplane Base) Errol Airport Franconia Airport Gifford Airport Gorham Airport Hawthorne Feather Airport Jaffrey Airport Silver-Ranch Moultonboro Airport Newfound Valley Airport Plymouth Municipal Airport Twin Mountain Airport

Source: Chapter 3, State Airport System Plan

Figure 9-1 - New Hampshire State Airport System



Source: The Louis Berger Group

Primary Commercial Service Airports

Manchester-Boston Regional Airport, owned by the City of Manchester, is NH's largest airport and is classified as a primary commercial service airport. The airport is located in Manchester on the border between Hillsborough and Rockingham counties about 50 miles to the north of Boston. With regard to passenger volume, Manchester's annual enplanements of 1.2 million in 2013 make it the fourth largest airport in New England. Manchester-Boston Regional Airport is the third largest in New England in terms of cargo with 167.3 million pounds of enplaned and deplaned cargo in 2013. General aviation, not including air taxi, accounted for 21 percent of the airport's operations in 2013 (**Table 9-2**).

Lebanon Municipal Airport is a city-owned airport in Lebanon, in Grafton County near the Vermont border. The Lebanon area is home to Dartmouth-Hitchcock Medical Center, the state's only academic medical center and only Level 1 Trauma Center. Dartmouth College, a private university with enrollment of more than 6,000 students is located in the neighboring town of Hanover. Lebanon Airport is one of only four airports in the state with an air traffic control tower and had 8,347 commercial service air taxi operations in 2013. In the same year, general aviation, not including air taxi operations, accounted for 75 percent of the airport's total operations. Major tenants at the airport include:

- Cape Air, the airport's commercial service provider;
- Granite State Air, a full-service fixed based operator; and
- Sharky's Helicopter, the largest helicopter dealer in the world, offering helicopter sales, maintenance, and flight training.

As one of the premier general aviation airports in NH, Lebanon provides air access and services for corporate aircraft that regularly use the airport. The airport is also a critical resource for Dartmouth-Hitchcock Advanced Response Team (DHART) whose crews provide air medical transportation services to the medical communities of Northern New England and respond to public safety agency requests for medical evacuation of trauma patients from scenes of injury.

Portsmouth International Airport at Pease is located on the former Pease Air Force Base, in Rockingham County and the I-95 seacoast corridor. The former military base was closed as part of the first Base Realignment and Closure Commission (BRAC) round in 1995 and was redeveloped as a civilian airport with the NH Air National Guard (ANG) remaining at the site. Military operations accounted for 21 percent of the operations at Pease Airport in 2013. Created as part of the ongoing redevelopment of the Pease Air Force Base, the site also includes the Pease International Tradeport (Tradeport), a business park with 2.1 million of square feet of industrial space and 1.2 million of square feet of office space, and the Pease Golf Course. The Pease Airport, Tradeport and golf course are managed and operated by the Pease Development Authority (PDA), which is an independent state agency. While commercial service was suspended several years ago, at the end of 2013 Allegiant Air started offering multiple flights per week to Florida from Pease. In 2013 the

number of enplanements on air taxi and commercial service was 22,543, a 66.8 percent increase compared to the 2012. General aviation, not including air taxi operations, accounted for 61 percent of the airport's operations in 2013. The airport is home to a number of corporate flight departments, and two FBOs (Premier and Port City Air) that service a variety of customers from, construction companies, to auto dealers, and fractional jet operators. Notably, the airport is home to Plane Sense, a fractional aircraft-ownership company with the largest civilian fleet of Pilatus PC-12 aircraft in the world.

General Aviation National Airports

Operated and maintained by the Nashua Airport Authority, Boire Field is located in Nashua, the second most populous city in the state, in Hillsborough County. The airport does not have any scheduled commercial air service; however, it is equipped with one of the only four air traffic control towers in the state, operated by Midwest ATC. Nashua is home to a number of corporate flight departments and air charter operators, two full-service fixed based operators, helicopter sales, maintenance, and training facility, a pilot shop, and an airport restaurant. In 2013, local and itinerant operations made up 95 percent of the airport's operations, while general aviation air taxi operations accounted for 5 percent. With over 50,000 operations in 2013, Boire Field is the state's busiest general aviation airport.

General Aviation Regional Airports

The three regional airports in the system are located throughout the state and include the following:

Concord Municipal Airport is located in Concord the state's capital the third most populous city in NH, in Merrimack County. The airport has one fixed base operator, Concord Aviation Services, which offers aircraft services and fueling. Vehicle rental services are available on-airport.

Concord Municipal Airport is also home to the NH Air National Guard and the NH State Police Aviation unit. In 2013 General aviation accounted for 88 percent of the airport operations, 5 percent of which included air taxi. Military operations accounted for 12 percent of the airport's total operations. The airport does not have scheduled commercial service. However with nearly 50,000 annual operations; Concord is the second busiest general aviation airport in the state and is utilized regularly by financial corporations, the forest industry, utility and construction companies, local private schools, and race teams, due to the airport's proximity to the NH Motor Speedway.

Laconia Municipal Airport is located in Gilford, in Belknap County with exclusively general aviation activity in 2013. As the third busiest general aviation airport in the state, Laconia serves a wide range of general aviation aircraft who utilize the airport for both business and recreation. Primary users of the airport include major retail corporations, local colleges, and fractional aircraft operators. The airport experiences a significant amount of traffic from travelers that consider Laconia Municipal airport as a destination due to its proximity to area private schools, summer camps, and the NH Motor Speedway. As the premier

airport in the NH Lakes Region, the airport is home to two full service fixed base operators and tenants offering helicopter, seaplane, biplane and aerial photography, and scenic flight services.

Dillant-Hopkins Airport, the fourth busiest general aviation airport in the state is located in Keene, in Cheshire County. In 2013, general aviation accounted for 93 percent of the airport's operations, 15 percent of which was air taxi. Military operations accounted for 7 percent. The airport is the base of flight operations for a wholesale grocery distribution corporation whose headquarters are located in Keene. In addition, the airport is home to one full service fixed based operator (FBO, and and aircraft maintenance facility. The majority of flying activities at the airport include corporate business, recreational, and flight training.

General Aviation Local Airport

There are five local airports in the NH system, four of which are part of the NPIAS. These four local airports combined for nearly 50,000 general aviation operations in 2013.

As part of this economic assessment, the four local NPIAS airports include: Berlin Regional Airport located in Berlin, the only city in Coos County, Claremont Airport, located in Claremont, in Sullivan County, Mt. Washington Regional Airport, located in Whitefield in Coos County, and Skyhaven Airport owned and operated by the Pease Development Authority, located in Rochester, in Strafford County. The fifth existing local airport is Parlin Field, located in the Dartmouth-Lake Sunapee region of the state in the Town of Newport in Sullivan County.

General Aviation Basic Airports

The system includes 13 basic airports. Most of these airports are located in the northern counties: Coos, Grafton and Carroll. Only one basic airport has been specifically assessed as part of this study since the other basic airports are not part of the 2013-2017 NPIAS.

Dean Memorial Airport is located in Haverhill in Grafton County. All operations in 2013 were general aviation. Although, the airport does not have a full service FBO the airport does provide self-serve 100LL fuel, and aircraft storage and tie-downs, as well as a facility for military training stop-overs.

Table 9-2 - Operations by Airport

Airport	System Role	Total Ops	Air Carrier	Air Taxi (Itinerant)	GA (Itinerant)	GA (Local)	Military
Manchester-Boston Regional	Primary/ NPIAS	63,955	31,457	19,711	10,332	2,319	136
Lebanon Municipal	Primary /NPIAS	34,533	-	8,347	12,187	13,665	334
Portsmouth Intl at Pease	Primary/ NPIAS	36,328	617	5,956	2,344	19,699	7712
Biore Field	National/ NPIAS	55,764	-	318	26,286	26,624	26
Concord Municipal	Regional/NPIAS	60,000	-	3,000	30,000	20,000	7000
Dillant-Hopkins	Regional/ NPIAS	49,027	-	7,204	7,455	31,053	3314
Laconia Municipal	Regional/ NPIAS	43,725	-	427	3,710	39,483	105
Skyhaven	Local /NPIAS	17,000	-	-	5,000	12,000	0
Berlin Regional	Local/ NPIAS	12,200	-	100	4,000	8,000	100
Claremont Municipal	Local /NPIAS	10,500	-	-	4,600	5,900	0
Mt. Washington Regional	Local/ NPIAS	7,030	-	20	4,000	3,000	10
Dean Memorial	Basic/ NPIAS	1,300	-	-	260	1,040	0
Various Airports	Local and Basic/ Non-NPIAS	67,465	-	1,075	21,650	44,450	280
Grand Total		458,827	32,074	46,158	131,824	227,233	19,017

Source: Chapter 3, State Airport System Plan

9.1.2 OUTLINE OF THE REPORT

This report begins with an overview of the methodology that was employed to conduct the study. A summary of the demographic and economic characteristics of the State of NH and each of its counties follows, which provides context for the economic contribution assessment. The economic contribution assessment includes on-airport employment as well as the off-airport economic activity indirectly supported by the system. Economic activity that is indirectly supported, or multiplier effects triggered by the four following expenditures are quantified: (1) airport capital expenditures; (2) airport operation and maintenance expenditures; (3) airport tenant expenditures; and (4) visitor spending by passengers and pilots. The economic effects of the state system are expressed in terms of jobs, labor income and output or sales revenue and tax revenues. The report also assesses the travel time savings obtained by business travelers using general aviation airports. Finally, community benefits are discussed. In addition to statewide analysis, a separate analysis is presented for each of the 12 airports that are part of the NPIAS in **Appendix 9-A**.

Methodology

At the start of the study, the project team conducted an extensive data collection effort that focused on the airports that are part of NPIAS. One exception was Manchester-Boston Regional Airport, which was subject of a study published in 2009¹. As part of this current study, the data collection effort was limited and supplemented with 2009 data that was extrapolated to 2013. The data collection effort included personal

¹City of Manchester, Manchester Economic Impact Study for 2008, 2009

interviews with airport management, an airport tenant survey, a visiting pilot survey, personal interviews with state economic development staff and a review of existing public federal, state and local data sources. The data collected provided an initial overview of the airport system's direct contribution to the state and local economies. The data also provided insight into the wider economic benefits and impacts beyond conventional measurement generated by the NH's airports. These include but are not limited to increased mobility, quality of life benefits, and the critical services that general aviation airports offer.

Input-output modeling techniques were used to estimate the multiplier effect triggered by spending by airport management, tenants, employees and visitors. The multiplier effect is the ripple effect that occurs when purchases from in-state vendors and payments to local employees trigger additional economic activity at other businesses throughout the state. The IMPLAN input-output modeling system was used to quantify the multiplier effect. IMPLAN was originally created by the US Forest Service to help it gauge the effects of its policies on regional economies and is currently owned by IMPLAN Group LLC. The spending impact is expressed in terms of jobs, labor income and output (or sales revenue) and tax revenues. Tax revenue sources estimated as part of this study include business profit tax, business enterprise tax and meals and rooms tax.

In addition to on-airport jobs and multiplier effects, travel time savings for business travelers relying on general aviation were estimated and monetized. Additional benefits to the community were discussed qualitatively. More detailed qualitative benefits for each of the system airports are provided in **Appendix 9-A** where individual airport economic impacts are presented. A detailed explanation of the methodology used to determine the economic impact of the NH state airport system is available in **Appendix 9-B**.

- AIRPORT MANAGEMENT → Jobs operating and maintaining the airports
- AIRPORT TENANTS → Jobs at fixed based operators, aircraft maintenance providers, airlines, government agencies, retail and ground transportation companies
- MULTIPLIER EFFECT OF SPENDING BY the AIRPORT, its TENANTS, their EMPLOYEES and VISITORS arriving by air
 - Capital Expenditures → Jobs in construction, engineering and supplying industries throughout the state
 - O&M Expenditures → Jobs at vendors supplying on-airport businesses and their suppliers throughout the state
 - Employee Household Spending → Jobs in education, health care, retail, transportation, entertainment, food production and other industries serving households throughout the state
 - Visitor Spending → Jobs at hotels, restaurants, car rental, retail and supporting industries serving visitors throughout the state
- TRAVEL TIME SAVINGS → Shorter travel time to customers, suppliers and business partners and cost savings for local businesses
- COMMUNITY BENEFITS → Improved quality of life for local residents, making NH more attractive place to live as well as critical community access, emergency preparedness

Demographic and Economic Profile

Forty percent of NH's 1.3 million residents live in rural areas. About 450,000 residents, or 34 percent of the state's population, live in places with a population of more than 10,000 while the remaining 66 percent live in places with population of less than 10,000 (**Table 9-3**). NH's main population and employment centers are located along two corridors in the southern half of the state: the I-93 corridor and the I-95 corridor/seacoast.

The I-93 Corridor includes Manchester, the state's largest city in terms of population as well as its most densely populated. Manchester is located in Hillsborough County. Also located in Hillsborough county is Nashua, the state's second largest city in terms of population. To the north of Hillsborough county, along the I-93 Corridor, is Merrimack County, which includes Concord, NH's third most populous city.

The I-95 Seacoast Corridor includes Portsmouth, which is in Rockingham County. Also in Rockingham County is the Pease International Tradeport, an industrial and business park created as part of the redevelopment of the Pease Air Force Base. Portsmouth and the Tradeport account for 3.8 million square feet of office space, almost half of the total 8.1 million square feet in office space in the corridor. Located along the I-95 corridor in Strafford County are Dover and Rochester, the state's fifth and sixth most populous cities respectively, as well as Hampton and Skyhaven Airports.

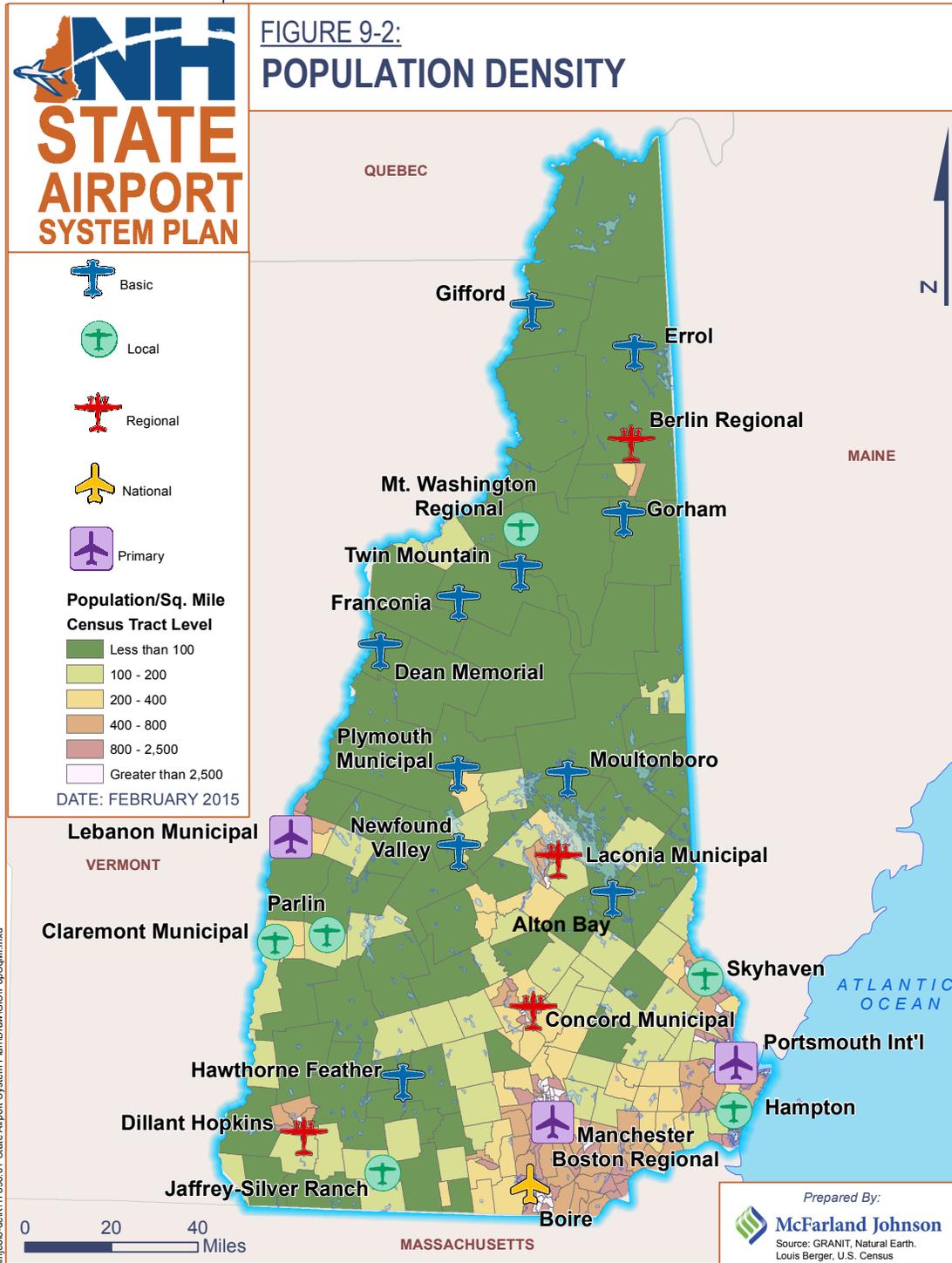
Figure 9-2 shows the distribution of population across the state; **Figure 9-3** shows the distribution of employment.

Table 9-3 - Population in Main Population Centers in New Hampshire, 2010

Place Name	County	Population
Manchester City	Hillsborough	109,565
Nashua City	Hillsborough	86,494
Concord City	Merrimack	42,695
Dover City	Strafford	29,987
Rochester City	Strafford	29,752
Keene City	Cheshire	23,409
Derry CDP	Rockingham	22,015
Portsmouth City	Rockingham	20,779
Laconia City	Belknap	15,951
Claremont City	Sullivan	13,355
Lebanon City	Grafton	13,151
Somersworth City	Strafford	11,766
Londonderry CDP	Rockingham	11,037
Durham CDP	Strafford	10,345
Berlin City	Coos	10,051
Total Population in Places above		450,352

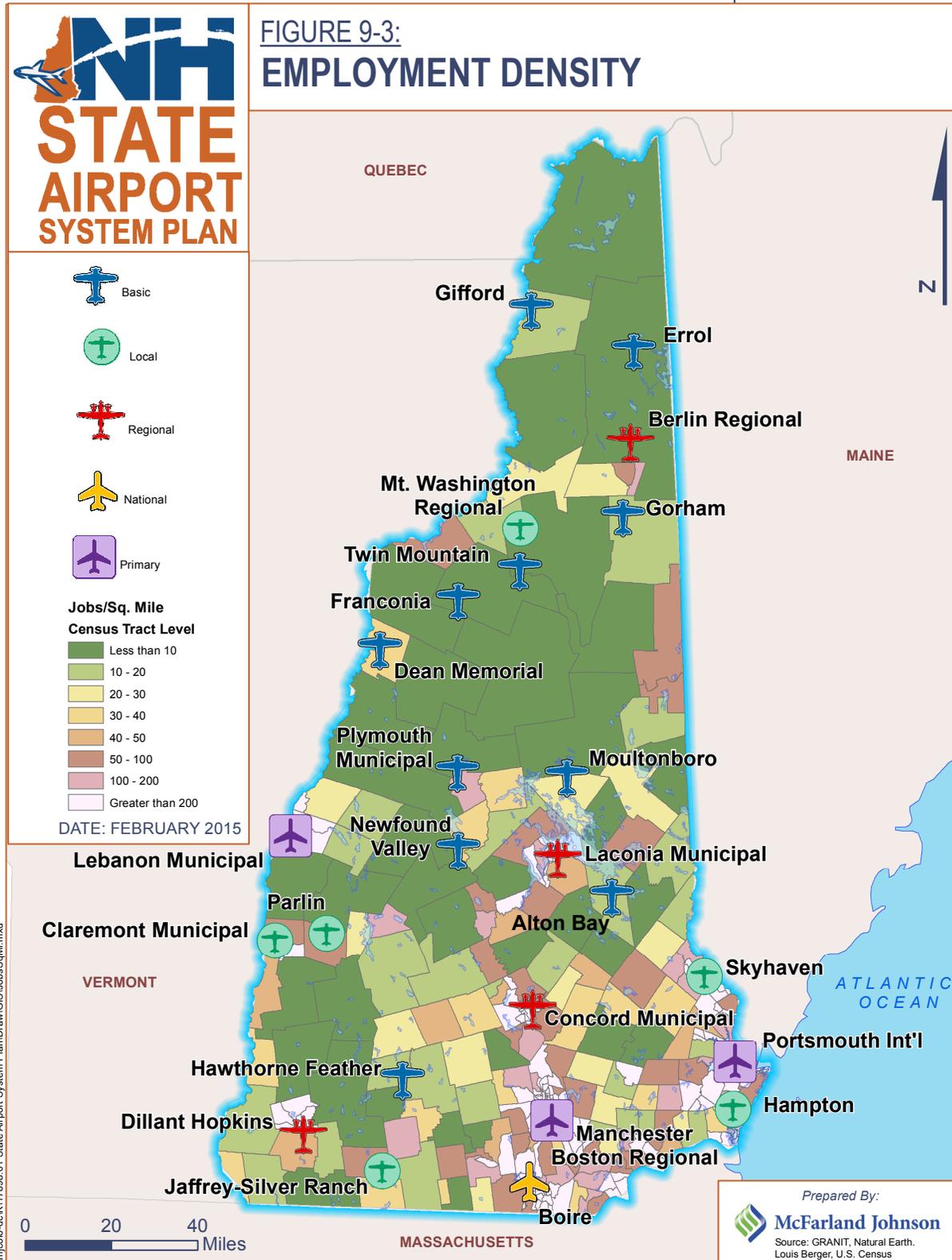
Source: Census 2010, Places with Population of more than 10,000 in 2010

Figure 9-2 - Population Density



Source: The Louis Berger Group

Figure 9-3 - Employment Density



Source: The Louis Berger Group

Population

Over half of the NH population lives in Hillsborough and Rockingham County (**Table 9-4**). These two counties are also the most densely populated counties in the state. The least populated counties, Carroll and Coos, account for 30 percent of the land area and 6 percent of the state's population. Access to general aviation airports is critical for residents of these remote, sparsely populated areas since emergency aviation services would otherwise be unavailable without air access.

Table 9-4 - Population and Population Density by County, 2012

County	Population	Percent of Total Population	Land Area in Square Miles	Percent of Total Land Area	Population Density (pop/sqm)
Hillsborough County	400,721	30%	876	10%	457
Rockingham County	295,223	22%	695	8%	425
Merrimack County	146,445	11%	934	10%	157
Strafford County	123,143	9%	369	4%	334
Grafton County	89,118	7%	1,709	19%	52
Cheshire County	77,117	6%	707	8%	109
Bellknap County	60,088	5%	400	4%	150
Carroll County	47,818	4%	931	10%	51
Sullivan County	43,742	3%	537	6%	81
Coos County	33,055	3%	1,795	20%	18
Total Population	1,316,470	100%	8,953	100%	147

Source: American Community Survey, 2008-2012

Historically, the largest populated counties have experienced a faster population growth than the state as a whole (**Table 9-5**). Between 2010 and 2012, population of several other counties experienced a decline, especially Coos County, the most northern county bordering both Maine and Vermont.

Table 9-5 - Annual Population Change by County, 1980-2012

County	1980-1990	1990-2000	2000-2010	2010-2012
Hillsborough County	2.00%	1.30%	0.50%	0.30%
Rockingham County	2.60%	1.20%	0.60%	0.40%
Merrimack County	2.00%	1.30%	0.70%	0.10%
Strafford County	2.00%	0.70%	0.90%	0.40%
Grafton County	1.30%	0.90%	0.90%	0.00%
Cheshire County	1.20%	0.50%	0.40%	-0.20%
Belknap County	1.40%	1.20%	0.80%	0.20%
Carroll County	2.40%	2.10%	0.90%	-0.30%
Sullivan County	0.70%	0.50%	0.80%	-0.80%
Coos County	-0.10%	-0.50%	0.00%	-1.50%
State Total	1.90%	1.10%	0.60%	0.20%

Source: NH Employment Security, Community Profiles <http://www.nhes.nh.gov/elmi/products/cp/>

Based on the most recent projections from State of NH, Office of Energy and Planning Regional Planning Commissions, NH's population has a projection of 1,427,098 by 2040, with an increase of 110,628 between 2010 and 2040 or a growth rate of 2.3 percent per year (**Table 9-6**). Annual growth is projected to be 0.3 percent between 2010 and 2020; 0.4 percent between 2020 and 2030; and 0.1 percent between 2030 and 2040.

Following a nationwide trend, NH's population is aging. However, by 2040, every NH County is projected to experience a natural decline, which means that the number of deaths will exceed the number of births and that any potential population growth will come from immigration. Between 2030 and 2040, population growth is projected to slow down in every county.

The population of Hillsborough County is projected to grow at the statewide average rate in every decade while Rockingham County's population is projected to grow faster than state average between 2010 and 2020. Beyond 2020 Rockingham county is expected to grow at the state average. Carroll County, which was the fastest growing county in the past three decades, is projected to continue to grow faster than the state average. Its neighbor to the south, Belknap County, is also projected to grow faster than the state average.

Table 9-6 - Population Projections by County, 2010-2040

County	Growth Rate		
	2010-2020	2020-2030	2030-2040
Hillsborough County	0.30%	0.40%	0.10%
Rockingham County	0.40%	0.40%	0.10%
Merrimack County	0.30%	0.40%	0.10%
Strafford County	0.40%	0.40%	0.20%
Grafton County	0.30%	0.30%	0.10%
Cheshire County	0.10%	0.20%	0.10%
Belknap County	0.40%	0.50%	0.20%
Carroll County	0.50%	0.70%	0.30%
Sullivan County	0.40%	0.50%	0.30%
Coos County	-0.40%	-0.40%	-0.80%
State Total	0.30%	0.40%	0.10%

Note: Compound Annual Growth Rate (CAGR)

Source: <http://www.nh.gov/oep/data-center/documents/2013-projections-state-counties.pdf>

Household Income

Based on the most recent data, household income was the highest in the Rockingham and Hillsborough counties (**Table 9-7**).

Table 9-7 - Household Income Distribution by County, 2012

County	Less than \$25,000	\$25,000 to \$49,999	\$50,000 to \$74,999	\$75,000 to \$149,999	\$150,000 or more	Median Household Income
Rockingham	19.5%	23.4%	21.7%	27.0%	8.3%	\$ 77,939
Hillsborough	19.2%	29.7%	22.3%	22.2%	6.5%	\$ 70,472
Merrimack	20.0%	24.7%	20.1%	28.0%	7.2%	\$ 65,487
Statewide	29.5%	29.8%	19.2%	18.2%	3.3%	\$ 64,925
Strafford	20.7%	26.1%	18.1%	25.6%	9.5%	\$ 58,538
Belknap	15.5%	19.5%	17.8%	33.4%	13.8%	\$ 57,163
Cheshire	16.7%	21.6%	18.4%	33.4%	9.9%	\$ 56,062
Sullivan	12.2%	18.1%	17.4%	35.9%	16.5%	\$ 53,821
Grafton	18.9%	23.9%	18.7%	29.0%	9.5%	\$ 53,386
Carroll	20.5%	25.7%	20.2%	27.8%	5.8%	\$ 50,865
Coos	16.7%	21.7%	18.5%	31.3%	11.8%	\$ 41,774

Source: American Community Survey, 2008-2012 (in 2012 dollars)

Employment

Hillsborough and Rockingham counties accounted for 53 percent of the employment in 2013 (**Table 9-8**). Rockingham, Strafford and Grafton counties experienced the strongest employment growth during the 2002-2007 expansion, with an annual growth rate of 1.2 percent. Strafford and Grafton counties also experienced less employment decline than the state as a whole during the recession from 2007 to 2010.

Table 9-8 - Employment by County, 2013

County	Employment Level		Annual Employment Growth (CAGR)	
	2013	% of Total	2002-2007 (Expansion)	2007-2010 (Recession)
Hillsborough County	190,607	31.0%	0.9%	-2.3%
Rockingham County	137,500	22.0%	1.2%	-1.6%
Merrimack County	73,498	12.0%	0.6%	-0.6%
Grafton County	52,166	8.0%	1.2%	-0.9%
Strafford County	45,392	7.0%	1.2%	-1.0%
Cheshire County	31,929	5.0%	0.8%	-2.1%
Belknap County	25,519	4.0%	0.9%	-2.9%
Carroll County	19,968	3.0%	0.6%	-0.9%
Sullivan County	13,791	2.0%	0.1%	-1.9%
Coos County	12,513	2.0%	0.2%	-2.6%
State Total*	618,781	100%	0.90%	-1.60%

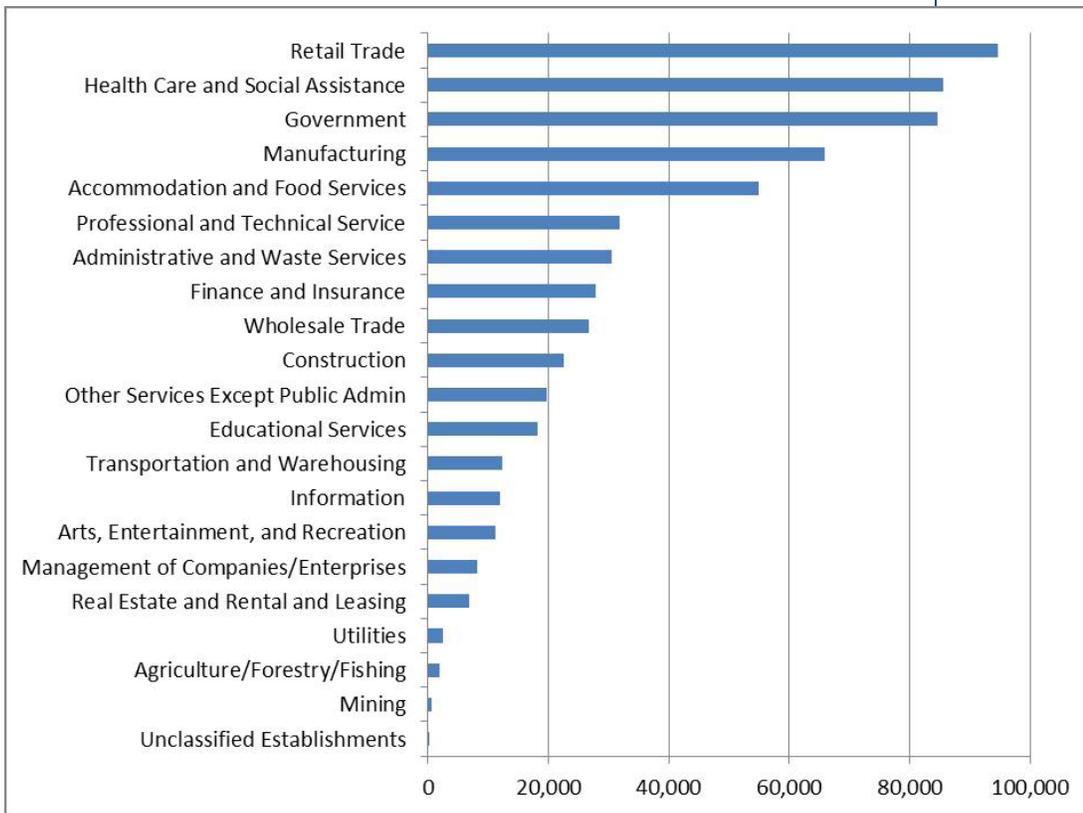
Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

* discrepancy due to NHDOL non-disclosure

I-93 Corridor submarkets, Manchester and Nashua in Hillsborough County, and Concord in Merrimack County accounted for two thirds, or 13.9 million, of the corridor's total 21.1 million square feet of office space. Portsmouth and the Tradeport accounted for 3.8 million square feet which is nearly half of the total 8.1 million square feet in office space in the I-95/Seacoast submarket.

Retail, health care and government are the largest sectors in NH (**Figure 9-4**). Accounting for 31 percent of all employment, Hillsborough County's industry pattern mirrors that of the state as a whole (**Table 9-9**). Bordered by the seacoast and I-95 corridor on the eastern side and the I-93 corridor on the west, Rockingham County has proportionally more jobs in transportation and warehousing. Sullivan County, which is on the border with Vermont, has proportionally more employment in manufacturing than the rest of the state. With the White Mountain National Forest, Coos and Carroll counties are important for tourism with proportionally more employment in recreation, entertainment and accommodation. Ski areas and hotels are among the largest employers in these two counties. With Dartmouth-Hitchcock Medical Center, the state's largest hospital with 6,652 workers, Grafton County has proportionally more of its employment in health care than the rest of the state.

Figure 9-4 - Employment by Industry (Jobs), 2013



Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Table 9-9- Employment by Industry and County, 2013

Industry	Belknap	Carroll	Cheshire	Coos	Grafton	Hillsborough	Merrimack	Rockingham	Strafford	Sullivan	State
Goods-Producing Industries	13.8%	10.4%	18.9%	13.2%	12.9%	16.2%	12.9%	14.2%	14.0%	26.9%	14.7%
Agriculture/Forestry/ Fishing	0.2%	-	-	1.6%	0.5%	0.1%	0.6%	0.2%	0.4%	-	0.3%
Mining	0.2%	-	-	0.2%	0.1%	-	0.2%	0.1%	0.1%	-	0.1%
Construction	4.3%	4.9%	4.3%	5.9%	2.3%	3.3%	4.1%	3.9%	2.7%	3.6%	3.6%
Manufacturing	9.1%	5.0%	14.0%	5.6%	9.9%	12.8%	8.0%	10.1%	10.9%	22.1%	10.7%
Service-Providing Industries	69.7%	74.5%	65.7%	63.2%	74.3%	72.7%	65.8%	75.4%	65.7%	55.6%	71.6%
Utilities	0.5%	0.4%	-	0.8%	0.3%	0.2%	0.5%	0.7%	-	0.5%	0.4%
Wholesale Trade	1.8%	1.2%	3.6%	1.5%	1.7%	3.8%	5.2%	4.7%	2.4%	2.7%	4.3%
Retail Trade	19.7%	18.4%	16.6%	14.0%	13.8%	14.7%	12.9%	18.5%	13.9%	16.6%	15.3%
Transportation and Warehousing	1.8%	1.0%	1.8%	2.4%	1.3%	1.9%	1.5%	3.0%	1.7%	1.4%	2.0%
Information	1.2%	1.3%	1.2%	0.5%	1.2%	2.7%	0.8%	2.2%	2.4%	0.6%	1.9%
Finance and Insurance	1.7%	2.4%	4.3%	1.6%	1.7%	5.3%	5.4%	4.0%	8.0%	3.1%	4.5%
Real Estate and Rental and Leasing	1.2%	1.2%	0.8%	0.7%	0.9%	1.2%	1.1%	1.2%	0.8%	0.8%	1.1%
Professional and Technical Service	2.7%	2.0%	2.0%	1.0%	3.5%	6.5%	3.8%	5.6%	3.0%	2.4%	5.1%
Mgmt of Companies/ Enterprises	2.0%	0.9%	-	1.0%	-	1.7%	0.6%	1.2%	-	-	1.3%
Administrative and Waste Services	3.9%	2.9%	3.3%	1.4%	1.8%	5.3%	2.9%	6.3%	4.2%	5.9%	4.9%
Educational Services	1.4%	-	2.7%	-	-	2.6%	2.6%	1.9%	1.3%	2.2%	3.0%
Health Care and Social Assistance	13.3%	13.1%	12.2%	17.7%	21.3%	14.2%	16.0%	11.0%	14.5%	10.3%	13.8%
Arts, Ent'ment, and Recreation	2.5%	4.1%	1.0%	3.4%	2.2%	1.3%	2.3%	2.1%	1.3%	0.9%	1.8%
Accommodations and Food Services	12.8%	21.2%	8.1%	15.0%	10.0%	7.7%	6.3%	9.9%	8.3%	6.2%	8.9%
Other Services ExPublic Admin	3.0%	2.4%	4.5%	1.7%	2.3%	3.6%	3.8%	2.9%	3.3%	2.1%	3.2%
Unclassified Establishments	-	-	-	-	-	-	-	-	-	-	-
Total Private	83.5%	84.9%	84.6%	76.4%	87.2%	88.9%	78.6%	89.6%	79.7%	82.5%	86.3%
Federal Government	0.5%	0.6%	0.5%	2.8%	1.0%	2.0%	1.1%	0.7%	0.7%	0.6%	1.2%
State and Local Government	15.9%	14.5%	14.9%	20.7%	11.9%	9.1%	20.3%	9.7%	19.6%	16.9%	12.5%
Grand Total (in thousands)	25.5	20.0	31.9	12.5	52.2	190.6	73.5	137.5	45.4	13.8	618.8

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

AVIATION MANUFACTURING

Manufacturing accounted for nearly 11 percent of the state's total employment in 2013 according to the Bureau of Labor Statistics. Several of the largest manufacturers in the state produce aircraft parts and auxiliary equipment. The following manufacturers' production includes, or consists solely of, aviation related items:

- BAE Systems Electronic System is a major producer of aircraft self-protection systems as well tactical surveillance and intelligence systems for all branches of the armed forces. BAE employs 4,500 employees in Nashua and is the largest manufacturer in NH.
- GE Aviation, which manufactures parts for commercial, military and general aviation airlines, employs 800 workers in Hooksett.
- Albany Engineered Composites, a company with headquarters in Rochester, designs, develops, and manufactures advanced composite components for aerospace, defense, and other high-performance applications. They employ 450 workers.
- Elbit Systems Ltd. is an Israeli international defense electronics company with a plant in Merrimack that employs 500.
- Timken Aerospace develops super precision bearings and employs 410 in Lebanon and another 400 in Keene.
- Titeflex aerospace is a British company that manufactures components for aerospace and semi-conductor industries and employs 335 in Laconia.

In 2012, manufacturing of aircraft, aircraft engines, other aircraft parts and auxiliary systems accounted for 1,276 jobs in the state. Labor income in these industries averaged \$90,400 per employee. Because of the high wages as well as because of the concentration of aviation manufacturers in NH, these industries generate high multiplier effects. Multiplier effects are additional economic activity at other businesses that is triggered by in-state purchases made by manufacturers and their employees (see Appendix for more discussion on multiplier effects). Using the IMPLAN input-output modeling system, the total number of jobs supported by aviation manufacturing at other businesses throughout the state was estimated at 2,390, bringing the total impact of the aviation manufacturing industry in NH to 3,670 jobs.

NEW HAMPSHIRE'S AEROSPACE AND DEFENSE CLUSTER

Aerospace and defense are identified by the U.S. Cluster Mapping Project (a partnership between Harvard Business School's Institute for Strategy and Competitiveness, U.S. Department of Commerce and U.S. Economic Development Administration) as the state's fifth largest traded cluster. Clusters are formed when the economic activities in a set of related industries in a given location reach critical mass that positively affects the performance of companies. Traded clusters are clusters that serve markets beyond the region in which they are located and thus function as their region's economic engine. Based on the U.S. Cluster Mapping Project, a total of about 8,500 employees worked in the aerospace and defense sector in 2012 in NH. Aerospace is concerned with both aviation and space flight. The cluster ranks seventh in terms of statewide employment, ranked behind:

- Business services,
- Distribution and e-commerce,
- Hospitality,
- Education,
- Insurance and;
- Information Technology.

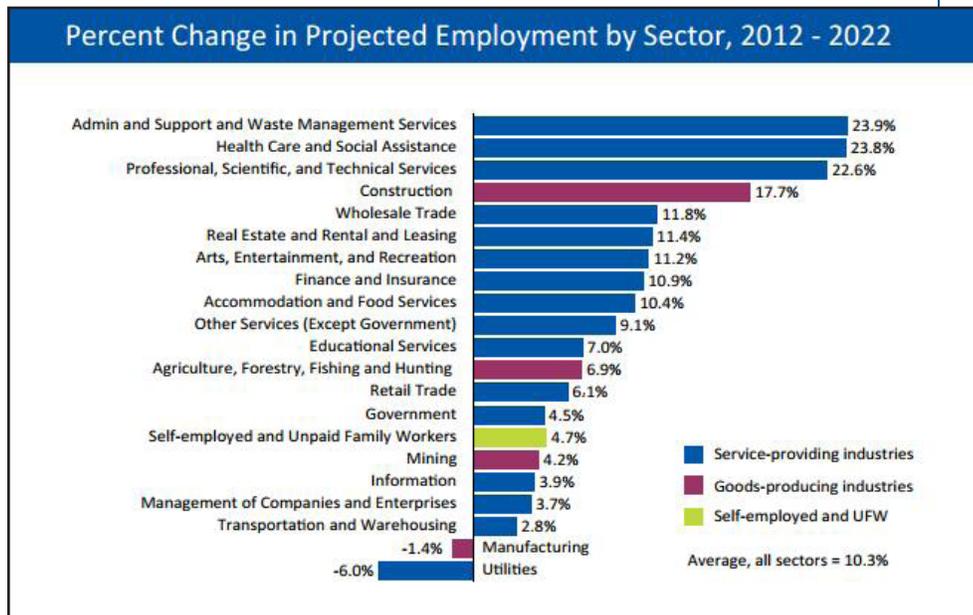
In 2013 the International Trade Resources Center at the State Division of Economic Development founded the NH Aerospace and Defense Consortium (NHADEC) to help the 300 businesses involved in aerospace and defense reach their full export market potential. In early 2013, NHADEC announced a partnership between Albany Engineered Composites, located in Rochester, and Safran Aerospace Composites, a multinational aircraft and rocket engine, aerospace component and security company. The two companies are partnering to manufacture light-weight airplane engine blades. The production plant in Rochester opened in March 2014. At the end of 2013 NHADEC signed a partnership agreement with Aero Montreal, a similar Quebec based organization, which made a first step in creating a New England –Quebec aerospace corridor.

The New Boston Air Force Station, part of the 50th Space Wing, a component of Air Force Space Command is located in the towns of New Boston, Bedford, Amherst, and Mt. Vernon, Hillsborough County, NH. The 2,826-acre property is currently owned by the U.S. Air Force (USAF), and consists of developed areas, including a Satellite Communications terminal, antenna systems, engineering, maintenance, security, and administration systems. The mission of the 50th Space Wing is to command and control operational Department of Defense satellites and manage the worldwide Air Force Satellite Control Network.

According to the most recent NH Employment Projections from the NH Economic and Labor Market Information Bureau, total employment in NH is anticipated to grow by 10.3 percent between 2012 and 2022, a growth rate of just under one percent per year². The state's projected employment growth rate is slightly less than the national employment growth for the same period, which was projected at 10.8 percent. Every sector with the exception of Manufacturing and Utilities is projected to grow (**Figure 9-5**). Almost 30 percent of the projected new jobs between 2012 and 2022 will be in the health and social services sector in NH. Another 20 percent will be in Administrative Support and Waste Management Services and Professional, Scientific, and Technical Services.

The General Aviation survey data used to produce the FAA Aerospace Forecasts showed that between 2010 and 2012 the number of active GA aircraft based on aircraft registration figures went down by 6.4 percent, from 223,370 to 209,034. During that same time period, NH experienced a 4.3 percent decline of registered aircraft from 1,173 to 1,122. From 2012 to 2013 NH saw a 5.4 percent decline. The FAA Aerospace forecast indicates that between 2012 and 2011 the total national general aviation fleet declined by roughly 3 percent, from 209,034 to 202,865.

Figure 9-5 - Percent Change in Projected Employment by Sector, 2010-2012 Projections, 2012-2022



Source: New Hampshire Employment Security; Economic and Labor Market Information Bureau <http://www.nhes.nh.gov/elmi/products/proj.htm#longterm>

Tax Revenue

NH is one of two states in the U.S. without personal income tax and sales tax. The three primary sources of state tax revenue in NH are: business profit tax, enterprise tax and meals and rooms tax.

Business profit tax – 8 percent tax on income from conducting business activity within the state, and a portion of the income for multi-state businesses.

²New Hampshire Employment Projections by Industry and by Occupation <http://www.nhes.nh.gov/elmi/products/documents/projections.pdf>

Business enterprise tax – 0.75 percent on the enterprise value tax base, which is defined as the sum of all compensation paid or accrued, interest paid or accrued, and dividends paid, after special adjustments and apportionment.

Meals and rooms tax – 9 percent tax on hotels, campsites, motor vehicle rentals, and restaurant meals.

Together these three tax revenue streams accounted for 65 percent of the total tax revenue in FY2013 (**Table 9-10**).

Table 9-10 - Tax Revenue Sources, FY2013

Tax Revenues	FY13	Percent
Business Profits Tax	321,155,285	26.7%
Business Enterprise Tax	221,388,011	18.4%
Meals and Room Tax	239,794,701	19.9%
Other	421,856,811	35.0%
Total Tax Revenue	1,204,194,808	100%

Source: New Hampshire Department of Revenue Administration

Economic Contribution

The economic contribution of the airport system to the State of NH and local communities consists of on-airport employment as well as jobs at businesses located throughout the state that are supported by the multiplier effect. The multiplier effect created by the system is triggered by capital and operation and maintenance (O & M) expenditures by airport management and tenants and by visitor spending at local and statewide businesses. General aviation airports (not including primary airports) also generate travel time savings for local businesses and provide emergency preparedness, critical community access, quality of life improvements, and other benefits to local communities.

On-Airport Employment

The airport system also supports permanent jobs throughout the state. In 2013, an estimated 2,591 full-and part-time year-round employees worked at system airports. This includes a total of 132 employees (113 full-time and 19 part-time workers) who were employed by the airports to manage and operate the facilities and an estimated additional 2,459 persons employed by airport tenant businesses. Tenant businesses at Manchester Boston-Regional Airport, include commercial passenger airlines, cargo airlines, concessionaires/terminal services, ground transportation and rental car services, government agencies and FBOs.³ At Portsmouth International Airport at Pease, the largest employer is the 157th Air Refueling Wing (157ARW) of the NH Air National Guard (ANG). Largely due to the level of operations, Lebanon Municipal Airport and the general aviation airports have fewer tenants. Examples of tenants are fixed base operators (FBOs), airlines, flight schools, aircraft sales, aircraft maintenance, car rental agency and airport restaurants.

³ Tenant employment at Manchester Boston Regional airport were estimated by proportionally reducing the 2009 Manchester Airport economic impact study's 2008 employment numbers based on the decline in passengers, general aviation operations and cargo volumes between 2008 and 2013.

Table 9-11 - On Airport Employment, 2013

	Airport Management	Airport Tenants	Total Jobs
Primary Airports	115	2,210	2,325
General Aviation Airports	17	249	266
Total	132	2,459	2,591

Source: The Louis Berger Group

Spending Impacts

Spending impacts, or multiplier effects, account for a major part of the system's contribution to the state's economy. Multiplier effects are generated when NH businesses purchase inputs from other NH businesses and when their employees purchase household goods and services within the state. In the context of the NH Airport System, multiplier effects are triggered by four activities: (1) airport capital expenditures; (2) airport operation and maintenance expenditures; (3) airport tenant expenditures; and (4) visitor spending by passengers and pilots. As airports and their tenants, employees and visitors make purchases within the state, they support jobs, income, and sales revenues at other businesses throughout the State of NH and contribute to state tax revenues. The magnitude of these multiplier effects were estimated using input-output modeling techniques and the IMPLAN modeling system as described in the methodology **Appendix 9-B**.

Airport Capital Expenditures

Every year, NPIAS airports are eligible to receive federal funding for airport planning and development projects as part of the Airport Improvement Program (AIP), Title 49 of the United States Code (U.S.C.). The Federal share is 90% of AIP eligible costs. This funding structure applies to small primary, non-primary, relievers, and general aviation airports. The State, and in some cases, the local government, and the airport sponsor fund the remaining 10 percent of project costs. The highest cost projects at primary airports in NH in recent years include the installation of solar panels and terminal ramp replacement, both at Manchester Airport (\$3.5 million in FY2011 budget and \$4.2 million in the FY2012 budget, respectively). Recently completed key projects at the general aviation airports include the runway reconstruction at Boire Field in Nashua (i.e., total project cost of \$18.9 million included in the FY2011 budget) and at Dillant-Hopkins Airport in Keene (i.e., total project cost of \$5.0 million included in the FY2012 budget). AIP funds are also used for the statewide pavement maintenance program.

Funded amounts vary widely from year to year. Total actual project cost at NH System general aviation airports was \$9.0 million in FY2010, \$21.0 million in FY2011 and \$5.7 million in FY2012, which corresponds to an average of \$11.9 million per year (**Table 9-12**). Based on the FY2010-2012 data, the cost of capital projects at primary airports averaged \$8.5 million per year.

Table 9-12 - Airport Improvement Program (AIP) Project Cost, FY2010-2012

	FY2010	FY2011	FY2012	Average
Primary Airports				
Manchester-Boston Regional Airport	4,867,172	9,314,291	6,601,896	6,927,786
Portsmouth International Airport at Pease	2,123,669	991,606	715,216	1,276,830
Lebanon Municipal Airport	70,000	150,205	681,930	300,712
Subtotal Primary Airports	7,060,841	10,456,102	7,999,041	8,505,328
General Aviation Airports	9,007,630	21,023,811	5,704,867	11,912,103
Grand Total	16,068,471	31,479,913	13,703,908	20,417,431

Source: NHDOT

Airport development projects generate jobs in the construction industry and related industries. Based on the average project cost per year between 2010 and 2012, an average of 167 jobs in the construction, engineering and related industries per year are directly supported by AIP projects. Purchase of construction materials and other supplies by contractors and household spending by the construction workers supports additional jobs throughout the state through the multiplier effect.

Taking into account the multiplier effect, the total economic contribution of system capital expenditures equals 276 jobs, \$15.3 million in labor income, and \$36.2 million in output in the State of NH (Table 9-13). State tax revenues associated with these impacts, more specifically business profit tax and business enterprise tax, are estimated at \$0.15 million.

Table 9-13 - Estimated Annual Contribution of Airport Capital Programs (in \$million)

	Number of Airports	Jobs	Labor Income	Output	Taxes
Primary Airports	3	106	\$5.96	\$13.79	\$0.06
General Aviation Airports	22	171	\$9.34	\$22.39	\$0.09
Total	25	276*	\$15.30	\$36.18	\$0.15

Source: The Louis Berger Group Note: The contribution presented in this table includes the direct effect of the construction projects (i.e. construction jobs) as well as the indirect and induced effects (i.e., jobs at other NH businesses supported by purchases made by construction contractors and their employees).

* Rounding discrepancy

Airport Operation and Maintenance Expenditures

Based on the airport management survey conducted for this study, non-labor operations and maintenance (O&M) expenditures for the 12 NPIAS airports in 2013 totaled \$20.38 million, (Table 9-14).

Expenditures associated with O & M included building-related expenditures such as electricity and maintenance, as well as non-building expenditures. In that same year, labor expenditures, including fringe benefits, for the 132 permanent employees and the 82 seasonal employees who were employed by the airports totaled \$10.52 million. Manchester Boston-Regional Airport accounted for the largest share of operations and maintenance spending.

Table 9-14 - O&M Spending by Airport Management (in \$millions), 2013

	Number of Airports	Labor	Non-Labor
Primary Airports	3	\$9.33	\$18.64
General Aviation Airports	9	\$1.19	\$1.74
Total	12	\$10.52	\$20.38

Source: The Louis Berger Group

The airports' labor and non-labor expenditures trigger additional economic activity at other businesses in the state. As airport vendors and employees use a portion of their income to make purchases at other NH businesses, additional economic activity (i.e., multiplier effects) is generated throughout the state. Taking into account the multiplier effects, the estimated economic contribution of the 12 airports' operations and maintenance expenditures equals 142 jobs, \$6.8 million in labor income, and \$19.7 million in output in the State of NH (**Table 9-15**). State tax revenues, and more specifically business profit tax and business enterprise tax associated with these expenditures was estimated at \$0.08 million.

Table 9-15 - Multiplier Effect of Operations and Maintenance Spending by Airport Management, (in \$millions), 2013

	Number of Airports	Jobs	Labor Income	Output	Taxes
Primary Airports	3	128	\$6.10	\$17.76	\$0.08
General Aviation Airports	9	14	\$0.66	\$1.95	<\$0.01
Total	12	142	\$6.76	\$19.72*	\$0.08

Source: The Louis Berger Group. Note: The multiplier effect includes the jobs at other NH businesses supported by purchases made by airport management and their employees (indirect and induced effect).

* Rounding discrepancy

Airport Tenant Operations and Maintenance Expenditures

Airport tenants account for the majority of the on-airport employment. Of the 2,591 on-airport jobs, 2,459 are jobs at airport tenant businesses. Using industry average wages, the estimated compensation for these employees is \$114.8 million. These tenants and their employees purchase goods and services at other NH business, which generates additional economic activity through the multiplier effect.

Taking into account the multiplier effect, the spending by the on-airport tenants and their employees supports 2,086 jobs, \$92.37 million in labor income and \$285.62 million in output at other businesses located throughout the State (**Table 9-16**). Business profit and enterprise state tax revenue associated with these expenditures are estimated as \$1.21 million.

Table 9-16 - Multiplier Effect of Operations and Maintenance Spending by Airport Tenants, (in \$millions), 2013

	Number of Airports	Jobs	Labor Income	Output	Taxes
Primary Airports	3	1,915	\$84.11	\$264.95	\$1.12
General Aviation Airports	9	171	\$8.26	\$20.67	\$0.09
Total	12	2,086	\$92.37	\$285.62	\$1.21

Source: The Louis Berger Group Note: The multiplier effect includes the jobs at other NH businesses supported by purchases made by airport tenants and their employees (indirect and induced effect)

Visitor Expenditures

Airports play a major role in tourism. Commercial air passengers generally spent money on a variety of goods and services, including lodging, transportation, food and beverages and entertainment. While more limited, general aviation airports also attract visitors to the state. When visitors purchase goods and services at off-airport businesses, they support jobs at these businesses. Multiplier effects are generated as the vendors and vendor employees make additional purchases at businesses throughout NH.

Commercial Service

The majority of the out-of-market visitors arriving by air use commercial service. By definition, commercial service is available at the three primary service airports in the system. However, since commercial service was only offered at Pease during the last few months of 2013 and was limited to flights to Florida, Pease had a limited number of commercial air visitors in 2013.

An estimated 1.2 million passengers landed at Manchester-Boston Regional Airport in 2013. Based on the 2009 study of the economic impact of Manchester Airport, it was assumed that an estimated 44 percent of passengers at Manchester Airport were visitors⁴. This corresponds to an estimated total of 822,000 visitors in 2013. Adjusting the visitor spending pattern of the 2009 study for inflation, visiting air passengers spend nearly \$500 on food, lodging and other purchases per visitor per trip in 2013 (Table 9-17).

Table 9-17 - Average Visitor Spending, Commercial Service (MHT 2009)

Average Expenditures per visitor per trip	
Lodging	\$283
Food and Beverages	\$142
Retail	\$50
Other	\$23
Total	\$498

Source: 2009 Manchester Economic Impact Study, adjusted for inflation

⁴ Visitors was defined as defined as persons not residing in Vermont, New Hampshire, Massachusetts or Maine

Enplanements at Lebanon Municipal Airport in 2013 totaled 10,953. Using the same assumptions to estimate the visitor spending as for Manchester Airport, the total spending by visitors arriving by commercial aircraft at Manchester and Lebanon in 2013 was estimated at \$264.54 million (**Table 9-18**).

Table 9-18 - Annual Visitor Spending, Commercial Service, 2013

	Enplanements 2013	Visitors 2013	Total spending 2013 (in \$millions)
Manchester Boston-Regional Airport	1,190,082	526,016	\$ 262.1
Lebanon Airport	10,953	4,841	\$ 2.4
Total	1,201,035	530,857	\$ 264.54

Source: The Louis Berger Group

General Aviation

The 25 airports in the system reported a combined 149,200 general aviation itinerant operations. Itinerant operations are operations outside of the airport's local area; they can be made by based aircraft or by visiting aircraft. Unlike airports with air traffic control towers that have the ability to record actual itinerant operations, itinerant operations at general aviation airports are more or less an estimated guess. Therefore, a review of similar studies throughout New England was conducted to better understand the level of general aviation itinerant operations and their values were considered in making assumptions for this NH study. Based on a review of similar airports in neighboring states, it was assumed that 65 percent of itinerant general aviation operation at primary and national airports was by visitors coming from out-of-state or out-of-market area. For regional, local and basic airports, it was assumed that 33 percent of itinerant operations were made by visitors. This is typical of activity levels found in New England states and the nation.

The average number of passengers per aircraft is dependent on the type of aircraft and differs by airport role since local and basic airports are typically used by smaller aircraft and have fewer passengers in general. Average number of visitors per aircraft estimated based on information obtained from the survey and studies in neighboring states is presented in **Table 9-19**.

Table 9-19 - Average Number of Visitors per Aircraft

Airport Role/ Classification	Average Number of Visitors per Aircraft
Primary	2.8
National	2.8
Regional	2.3
Local	2.0
Basic	1.7

Source: The Louis Berger Group

The average spending per visitor is expected to vary with the level and type of economic activity surrounding the airport. Average spending per visitor estimated based on the survey program and on a review of studies at comparable airports in New England is presented in **Table 9-20**.

Table 9-20 - Average Spending per Visitor

Airport Role/ Classification	Average Spending per visitor
Primary	\$220
National	\$220
Regional	\$155
Local	\$113
Basic	\$77

Source: The Louis Berger Group

Based on assumptions above, the total spending by visitors arriving by general aviation is estimated as \$16.51 million (**Table 9-21**).

Table 9-21 - Annual Visitor Spending, General Aviation, 2013

	Total Number of Airports	General Aviation		Visitors	Visitors Spending (in \$millions)
		Itinerant Operations	Visiting Aircraft		
Primary Airports	3	30,095	9,781	27,386	\$6.02
GA Airports	9	96,380	20,159	54,110	\$9.99
Non-NPIAS Airports	13	22,725	3,750	6,374	\$0.49
Total	25	149,200	33,690	87,870	\$16.50

Source: The Louis Berger Group

Multiplier Effect of Commercial and General Aviation Visitor Spending

Visitor spending supports businesses throughout the state through the multiplier effect. Taking into account the multiplier effect, the total economic contribution of visitor spending, including visitors arriving at commercial airports and those arriving at general aviation airports equals 4,131 jobs, \$139.65 million in labor income and \$429.31 million in output (**Table 9-22**). State tax revenues associated with these expenditures, consisting of business profit tax, business enterprise tax, and meals and room tax, are estimated at \$23.62 million.

Table 9-22 - Contribution Visitors Spending (in \$millions), 2013

	Number of Airports	Jobs	Labor Income	Output	Taxes
Primary Airports	3	3,977	\$134.45	\$413.30	\$22.61
GA Airports	9	147	\$4.96	\$15.26	\$0.96
Non-NPIAS Airports	13	7	\$0.24	\$0.75	\$0.05
Total	25	4,131	\$139.65	\$429.31	\$23.62

Source: The Louis Berger Group Note: The contribution includes the, jobs at other NH businesses supported by purchases made by visitors (direct effect of visitor spending) and by businesses serving visitors and their employees (indirect and induced effect).

Summary Spending Impacts

Spending by airport management, tenants, employees and visitor supports an estimated 6,635 jobs at other businesses throughout the state (**Table 9-23**). Taking into account both the on-airport activity and the multiplier effect, the total economic contribution of the NHSAS is 9,226 jobs, \$379.41 million in labor income, \$1.16 billion in output and \$26.55 million in tax revenue.

Table 9-23 - Overview of Multiplier Effect, All Airports

	Jobs	Labor Income (in \$ millions)	Output (in \$ millions)	Taxes (in \$ millions)
On-Airport Spending Impact	2,591	\$125.33	\$384.84	\$1.49
Airport Management Spending	142	\$6.76	\$19.72	\$0.08
Capital Spending	276	\$15.30	\$36.18	\$0.15
Tenant Spending	2,086	\$92.37	\$285.62	\$1.21
Visitors Spending	4,131	\$139.65	\$429.31	\$23.62
Subtotal Spending Impact	6,635	\$254.08	\$770.83	\$25.06
Total	9,226	\$379.41	\$1,155.67	\$26.55

Source: The Louis Berger Group

The three primary airports have a larger economic contribution than the other airports since they employ more people, have more tenants and have larger operations and maintenance budgets (**Table 9-24**). However, general aviation airports also make a significant contribution to the NH economy supporting 769 jobs, \$38.02 million in labor income, \$100.33 million in output and \$1.31 million tax revenues (**Table 9-24**). While the airports not part of the NPIAS are small airports, usually without employees or tenants, they do bring visitors into the state (**Table 9-25**). Spending by these visitors supports an estimated 7 jobs throughout the state.

Table 9-24 - Overview of Multiplier Effect, Primary Airports

	Jobs	Labor Income (in \$ millions)	Output (in \$ millions)	Taxes (in \$ millions)
On-Airport	2,325	\$110.53	\$344.78	\$1.33
Spending Impact				
Airport Management Spending	128	\$6.10	\$17.76	\$0.08
Capital Spending	106	\$5.96	\$13.79	\$0.06
Tenant Spending	1,915	\$84.11	\$264.95	\$1.12
Visitors Spending	3,977	\$134.45	\$413.30	\$22.61
Subtotal Spending Impact	6,126	\$230.62	\$709.80	\$23.87
Total	8,451	\$341.15	\$1,054.58	\$25.20

Source: The Louis Berger Group

Table 9-25 - Overview of Multiplier Effect, General Aviation Airports in System

	Jobs	Labor Income (in \$ millions)	Output (in \$ millions)	Taxes (in \$ millions)
On-Airport	266	\$14.80	\$40.06	\$0.16
Spending Impact				
Airport Management Spending	14	\$0.66	\$1.95	\$0.01
Capital Spending	171	\$9.34	\$22.39	\$0.09
Tenant Spending	171	\$8.26	\$20.67	\$0.09
Visitors Spending	147	\$4.96	\$15.26	\$0.96
Subtotal Spending Impact	503	\$23.22	\$60.27	\$1.15
Total	769	\$38.02	\$100.33	\$1.31

Source: The Louis Berger Group

Table 9-26 - Overview of Multiplier Effect, System Airports not included in NPIAS

	Jobs	Labor Income (in \$ millions)	Output (in \$ millions)	Taxes (in \$ millions)
Visitors Spending	7	\$0.24	\$0.75	\$0.05
Total	7	\$0.24	\$0.75	\$0.05

Source: The Louis Berger Group

Travel Time Savings

General aviation airports are important assets to local businesses and provide benefits to the state economy beyond the on-airport employment and spending impacts described above. General aviation provides business travelers with the flexibility to choose departure times that fit their schedule, flying from one of the many airports located throughout the state and the ability to choose a destination among the more than 3,000 general aviation airports throughout the country.⁵ General aviation allows travelers to avoid security screenings and carry-on limitations associated with commercial air service. For business located in the north of the State where commercial service is not available and far removed

⁵ FAA, General Aviation: A National Asset, p1. http://www.faa.gov/airports/planning_capacity/ga_study/media/2012assetreport.pdf

from major commercial centers, general aviation airports provide a vital connection to customers, suppliers and business partners. Furthermore, a recent study by the National Business Aviation Association (NBAA) and the General Aviation Manufacturers Association (GMAA) found that business travelers on general aviation aircraft are more likely to spend their in-vehicle travel time (i.e., in flight time) productively compared to travelers using most other modes.

The travel time savings provided by general aviation constitute cost savings for the businesses that have employees traveling on-the-clock (i.e. employees who are paid during the time they travel). Business owners pass the cost savings on to customers, reinvest them into their business, or treat them as profit.

The benefits of travel time savings are typically quantified using the standard value of time (VOT) metric, which is an estimate of the amount the average traveler is willing to pay for one hour of travel time savings. For business trips during which the traveler is paid for his time spent traveling, travel time savings constitute a benefit to the individual traveler as well as for the employer. To estimate the cost savings reduced travel time creates for employers, the VOT was defined based on the average wage of business travelers, which is assumed to be 2.5 higher than the overall average wage. Using an average annual pay in NH of \$48,963 as reported by the Bureau of Labor Statistics and multiplied by a factor of 2.5 to take into account higher average incomes of business air travelers, the average VOT was estimated as \$59.⁶ Assuming that general aviation business travelers save two hours in each direction, the combined travel time savings for travelers throughout the state in 2013 was 238,791 hours, which translates into a benefit of \$14.09 million (**Table 9-27**).

Table 9-27 -Overview of Multiplier Effect, General Aviation Airports in System

	Number of Business Aviation Flights*	Number of Passengers**	Travel Time Savings (in hours)	Travel Time Savings
Commercial	9,029	30,697	61,394	\$3.62
National	7,981	27,136	54,272	\$3.20
Regional	15,539	52,832	105,664	\$ 6.23
Local	2,338	7,949	15,898	\$ 0.94
Basic	230	781	1,563	\$0.09
Total	35,116	119,396	238,791	\$14.09

Source: The Louis Berger Group

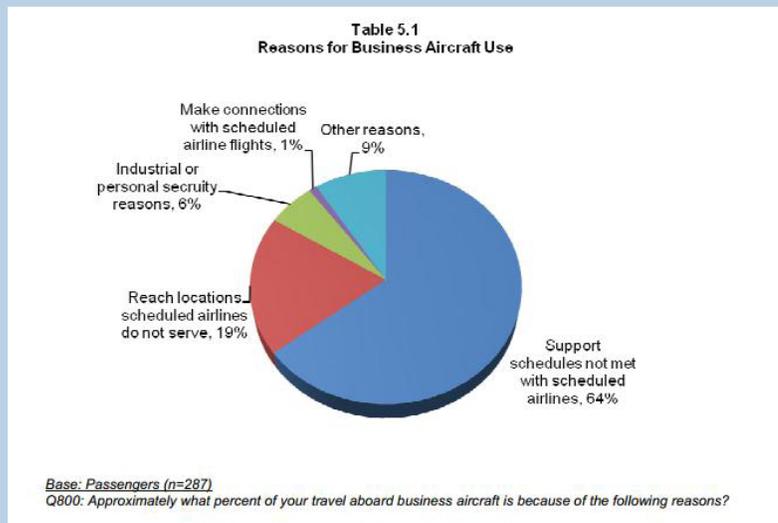
Note: *The percent of the itinerant operations that are business for business purposes was based on the airport management survey. For airports for which no data on the trip purpose of general aviation airports was received, assumptions about the proportion of business flights were made based on the completed surveys for other airports.

** Assumes 3.4 passengers per business aircraft based on 2009 General Aviation survey prepared for the National Business Aviation Association and the General Aviation Manufacturers Association

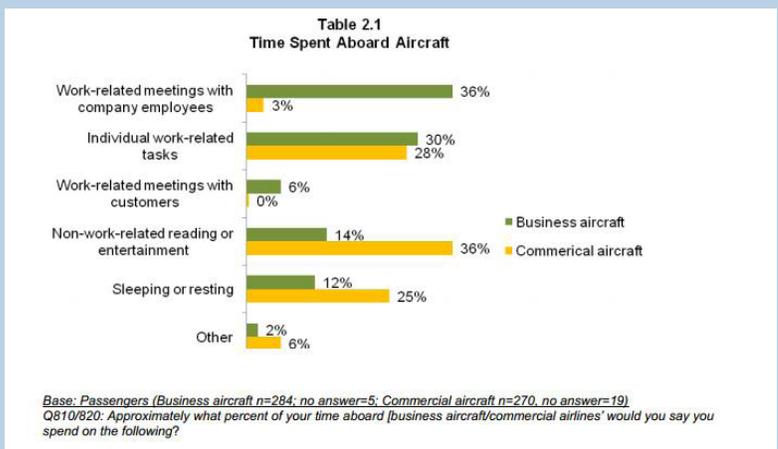
⁶ (\$48,963 (average annual pay 2013 dollars)* 2.5(adjustment for higher average income of business air travelers))/2080(number of work hours in one year).

A 2009 study prepared for the National Business Aviation Association and the General Aviation Manufacturers Association examined general aviation business travel. The researchers interviewed 305 pilots and flight department managers and 289 passengers on business aircraft. The study report included the following findings:

- Small companies operate 90 percent of business aircraft.
- The primary reason for using business aircraft is to support schedules that cannot be met solely with commercial airlines. The figure below shows the reasons for business aircraft use.
- Nationwide an estimated 40 percent of general aviation business trips are to airports in communities where there never was any commercial service.



- Nationally, business aircraft are typically used by mid-level staff with management accounting for 50% of trips and technical, sales or service staff another 20%. Top-level management accounts for 22% of trips.
- Average number of passengers is 3.4.
- Employees use their time onboard company aircraft more productively and more effectively than when on commercial flights and even than when in the office. The figure below presents the different ways that passengers spent their time aboard business aircraft.



Community Benefits

In addition to on-airport job creation, spending impacts and travel time savings for businesses outlined in the sections above, airports provide benefits to residents and businesses that are not easily quantifiable. A 2012 study by the Federal Aviation Administration provided an overview of the many roles general aviation airports play in the National Air Transportation System based on an 18-month review of the nearly 3,000 general aviation airports in the U.S. Functions range from emergency preparedness and response, to the transportation of people and freight, and commercial applications, such as aerial surveying (**Figure 9-6**). Additional community benefits include:

- Preserving history
- Managing open space
- Search and rescue
- Medivac
- State Police Aviation
- Job Training/Flight Training

Emergency Preparedness and Response Functions

General aviation airports are often used to transport patients in need of specialized or immediate medical care. **Figure 9-7** shows that air ambulances were flown to several general aviation airports in NH. General aviation airports also function as an emergency diversion network. The extensive network of airports provides pilots with immediate alternatives to their intended destination in case of an emergency or bad weather. The FAA report illustrates the function with an example of an aircraft that was flying from Pittsfield Municipal Airport in Massachusetts to Caledonia County Airport in Vermont when its engine stopped working and that was diverted to Concord Municipal Airport in NH. The extensive general aviation airport network also provides a staging area for disaster relief efforts.

Critical Community Access Functions

General aviation airports connect remote areas with activity centers throughout the U.S.⁷ For many residents and businesses in remote areas of the northern counties, general aviation is the only alternative to time-consuming long distance car, bus or train travel if they need to reach major urban centers or travel out-of-state.

General aviation airports often have air taxi service to transport passengers from areas without scheduled service to one of the 3,000 general aviation airports. Several of the general aviation airports in the state system reported air taxi operations in 2013 including, Nashua, Keene, Concord, Laconia, Berlin and Mt. Washington. Several of the airports not included in the NPIAS also reported air taxi operations: Jaffrey, Moultonboro, Parlin Field and Alton Bay.

⁷ FAA, General Aviation Airports: A National Asset. http://www.faa.gov/airports/planning_capacity/ga_study/media/2012assetreport.pdf

Other Aviation Specific Functions

Flight instruction takes place almost exclusively at general aviation and private use airports. There are 14 system airports that offer some level of flight training via schools or free-lance. Personal flying which includes flight training and personal travel accounts for 30 percent of private flying in the US. Nearby general aviation airports contribute to the quality of life to many of the 3,825 registered pilots in NH.

Table 9-28 - Flight Schools in New Hampshire

Type of Airport	Airport	Flight School
Primary	Manchester Airport	Nashua Flight Sim
Primary	Portsmouth International Airport	Seacoast Helicopters
National	Boire Field	Air Direct Airways
National	Boire Field	East Coast Aero Club
National	Boire Field	Brouillette Aviation Training
National	Boire Field	C-R Helicopters
National	Boire Field	Harvest Aviation
Regional	Dillant-Hopkins Airport	Monadnock Aviation
Regional	Dillant-Hopkins Airport	Green River
Regional	Laconia Municipal Airport	Emerson Aviation
Regional	Concord Municipal Airport	Concord Aviation Services
Local	Sky Haven Airport	Rochester Aviation
Basic	Hampton Airfield	Hampton Airfield

Source: Economic Inventory

Commercial, Industrial and Economic Activity Functions

Many businesses rely on NH's system of airports for the transportation of goods or persons. The degree of dependency varies among businesses and is difficult to measure. In some cases, this dependency may be critical such that the business would not be located in the region if access to a nearby airport was unavailable. Many local businesses use the airports on a daily basis to transport key personnel and clients. General aviation airports also provide access to freight shipping, Aerial surveying and observation is used by infrastructure and utility companies to inspect and manage facilities. Municipalities often use aerial observation flights to document tax maps and plan infrastructure.

Key airport users at primary, national and regional airport in the system reported as part of the airport tenant survey included educational and health care institutions, large retailers and financial services firms (**Table 9-29**).

Table 9-29 - Frequent Off-Airport Business Users

Type of Airport	Airport Name	Types of Frequent off-airport business users
Primary	Lebanon Municipal Airport	Education, Healthcare, Non profit, air transportation Finance, Transportation
National	Boire Field	Retail, Manufacturing
Regional	Concord Municipal Airport	Education, Finance, Transportation, Entertainment, Wholesale
Regional	Laconia Municipal Airport	Entertainment, Education, Transportation, Retail, Real Estate

Source: *Economic Inventory*

Destination and Special Functions

General aviation airports provide access to remote areas of the state. During special events, general aviation airports are used by charter carriers and private operators to supplement commercial air service at primary airports or to bring visitors closer to the event. For instance, during the two NASCAR race weekends that are held in July and September at the NH Motor Speedway in Loudon, race teams and spectators are flying into Laconia Municipal Airport and Concord Municipal Airports which are the closest public-use airports to Loudon.

The NH Motor Speedway in Loudon has hosted National Association for Stock Car Racing (NASCAR) racing since the early 1990's and is one of eight tracks owned by Speedway Motorsports. With a capacity of almost 105,500 spectators, the facility is the largest sports facility in New England.

Two NASCAR Sprint Cup races are held at the NH track during two long weekends in July and September. The Sprint Cup is the premier motorsports event in North America. Both races regularly sell out and exceed the NFL Superbowl game in terms of attendance. The organization of the event as well as off-site spending by spectators and race teams on lodging, food and other expenditures generates economic activity throughout NH. The Southern NH University reported in 2011 that the economic impact of the two Sprint Cup races held at NH Motor Speedway supports 2,500 jobs, \$179 million in spending and \$103 million in income.

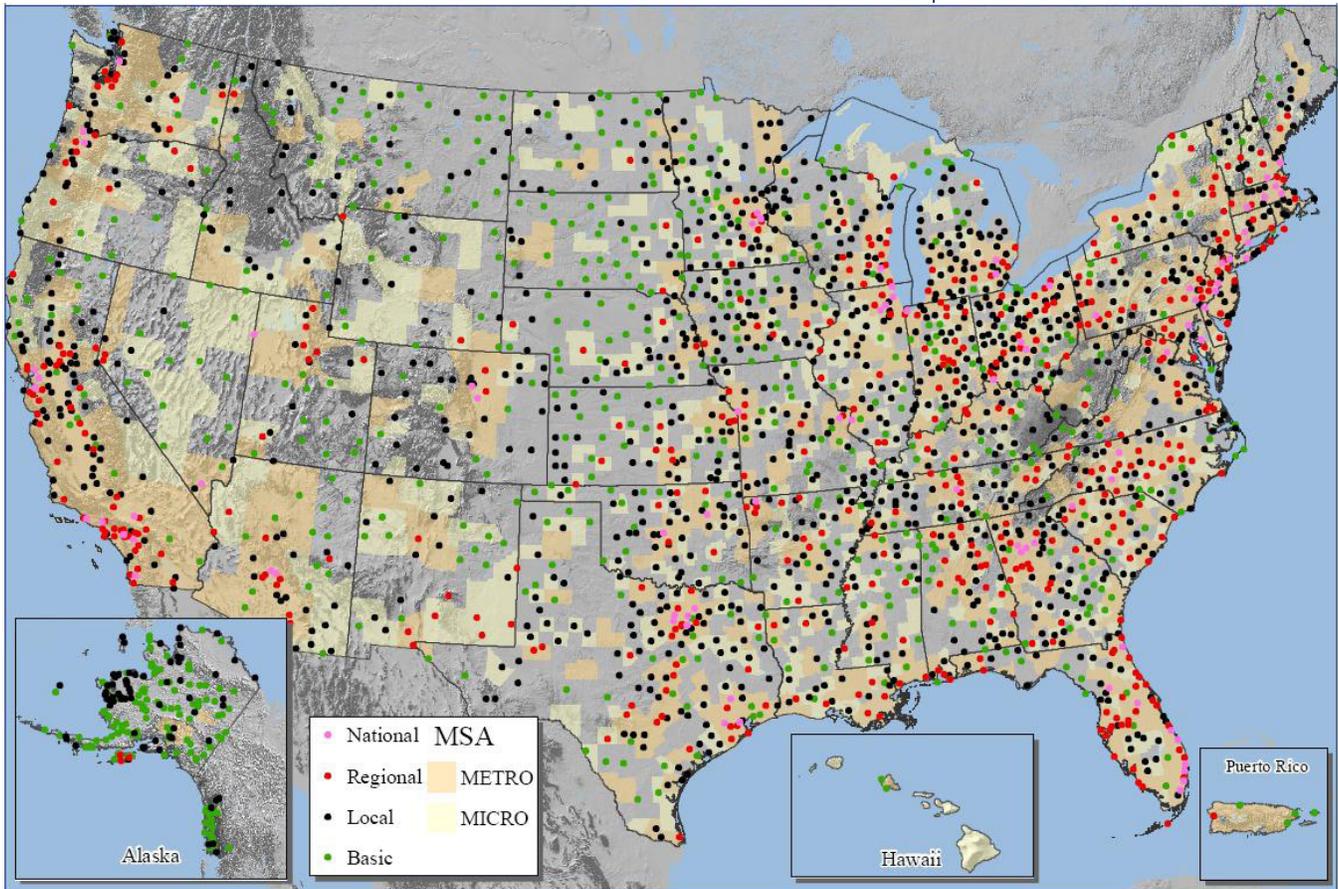
The NH system of airports plays an important role in the success of this event. In NH, as in other locations that host NASCAR racing, many race teams arrive by general aviation aircraft. During race weekends, which are Thursdays to Sundays, race teams and fans fly into Laconia and Concord Airports. Helicopter service is available between the airport and the speedway, which has four helipads. A recent article estimated a total of 100 flights related to a NASCAR race and about half staying overnight. These aircraft typically get fueled and serviced by the airports and FBO's they visit. Pre-race events also draw additional business for these airports.

Figure 9-6 - Functions of General Aviation Airports

<p>Emergency Preparedness and Response</p>	<ul style="list-style-type: none"> ▪ Aeromedical Flights ▪ Law Enforcement/National Security/Border Security ▪ Emergency Response ▪ Aerial Fire Fighting Support ▪ Emergency Diversionary Airport ▪ Disaster Relief and Search and Rescue ▪ Critical Federal Functions 	
<p>Critical Community Access</p>	<ul style="list-style-type: none"> ▪ Remote Population/Island Access ▪ Air Taxi/Charter Services ▪ Essential Scheduled Air Service Cargo 	
<p>Other Aviation Specific Functions</p>	<ul style="list-style-type: none"> ▪ Self-Piloted Business Flights ▪ Corporate ▪ Flight Instruction ▪ Personal Flying ▪ Charter Passenger Services ▪ Aircraft/Avionics Manufacturing/Maintenance ▪ Aircraft Storage ▪ Aerospace Engineering/Research 	
<p>Commercial, Industrial, and Economic Activities</p>	<ul style="list-style-type: none"> ▪ Agricultural Support ▪ Aerial Surveying and Observation ▪ Low-Orbit Space Launch and Landing ▪ Oil and Mineral Exploration/Survey ▪ Utility/Pipeline Control and Inspection ▪ Business Executive Flight Service ▪ Manufacturing and Distribution ▪ Express Delivery Service ▪ Air Cargo 	
<p>Destination and Special Events</p>	<ul style="list-style-type: none"> ▪ Tourism and Access to Special Events ▪ Intermodal Connections (rail/ship) ▪ Special Aeronautical (skydiving/airshows) 	

Source: Federal Aviation Administration, *General Aviation Airports: A National Asset, 2012*, Accessed from http://www.faa.gov/airports/planning_capacity/ga_study/media/2012assetreport.pdf

Figure 9-7 - General Aviation Airports serving Aeromedical Flights



Source: Federal Aviation Administration, *General Aviation Airports: A National Asset*, 2012, Accessed from http://www.faa.gov/airports/planning_capacity/ga_study/media/2012assetreport.pdf

Conclusion

The NH state airport system supported an estimated 9,226 jobs and \$1.16 billion in output throughout the state in 2013. The system also generates \$27.66 million in tax revenue in that same year, including business enterprise tax, business profit tax, meal and lodging tax and aircraft registration taxes.

The majority of the impact of the system is generated by commercial air service. However, general aviation airports, those both part of the NPIAS and those not part of the NPIAS supported 789 jobs, and resulted in \$100.33 million in output.

Businesses using general aviation airports generate \$15.08 million of cost savings due to reduced travel times. The network of general aviation airports also provides many unquantifiable benefits including emergency preparedness, critical community access, quality of life improvements and other benefits to local communities.

While not directly tied to the system, manufacturing of aircraft engines and other aircraft parts and auxiliary systems are key contributors to the state economy. Several of the largest manufacturers in the state

Total Economic Contribution of the New Hampshire State Airport System

- 9,230 jobs in New Hampshire
- \$1.16 billion in output or revenues for New Hampshire businesses
- \$27.7 million in State tax revenues

Total Economic Contribution of Aviation (Airport System and Aircraft/Aerospace Industry):

- 12,900 jobs and \$2.16 billion in output or revenues for New Hampshire businesses
- \$31.9 million in State tax revenues

produce aircraft parts and auxiliary equipment, such as BAE Systems Electronic System, GE Aviation, Albany Engineered Composites, Elbit Systems Ltd., Timken Aerospace and Titeflex aerospace. An estimated total of 3,670 jobs⁸ throughout the state were directly or indirectly supported by aviation-related manufacturing.

Including aviation-related manufacturing, the combined total of the impact aviation in NH was estimated at 12,900 jobs, \$2.16 billion in output and \$31.9 million in tax revenue (**Table 9-30**).

Table 9-30 - Aviation in New Hampshire, 2013

	New Hampshire Businesses			NH State Tax Revenues (\$ millions)
	Output (\$ millions)	Jobs	Travel Time Savings (\$ millions)	
Primary Airports	\$1,054.58	8,451	\$3.62	\$25.20
General Aviation Airports*	\$100.84	776	\$10.47	\$1.34
Aircraft Registration				\$1.10
Total NHSAS	\$1,155.42	9,227	\$14.09	\$27.64
Aircraft Manufacturing	\$998.90	3,671		\$4.23
Grand Total	\$2,154.32	12,898	\$14.09	\$31.87

*Note: *General Aviation in this table includes airports that are not part of NPIAS. Total exceeds sum of national, regional, local and basic airports because of the impact of the statewide Pavement Maintenance Program*

⁸ Louis Berger Group analysis with IMPLAN data

APPENDIX 9-A



APPENDIX 9-B