

CHAPTER 8: SYSTEM RECOMMENDATIONS

This chapter of the New Hampshire (NH) State Airport System Plan (NHSASP) presents recommendations that provide the NH Department of Transportation (NHDOT) Bureau of Aeronautics (BOA) with guidelines to manage, support, and improve the system of 25 airports in NH over the next twenty years. These guidelines address system needs, define funding requirements, and develop policies to protect, operate, and maintain the airport system and maximize aviation access within the state.

This chapter is organized as follows:

- Summary of NHSASP Recommendations
- Funding the NHSASP
- Policy Recommendation and Tools

8.1 SUMMARY OF NHSASP RECOMMENDATIONS

Chapter 7, Airport Facility Recommendations, focused on projects that meet the minimum and recommended facility needs to fulfill the airport's defined role and meet future system performance needs. This section presents issues and considerations that were identified as part of the overall system performance analysis. As part of this analysis, recommendations, guidelines, and policy options are explored to provide guidance and options for the BOA as the system recommendations are implemented in the future. The intent of the recommendations discussed here should not be taken as absolutes, but rather options that provide flexibility to help the BOA manage and maintain the system in the face of dynamic challenges within aviation.

8.1.1 ADOPTION OF NHSASP RECOMMENDATIONS

The enhancement of the current system of airports will be based upon several factors as the BOA considers the implementation of projects outlined in the NHSASP.

The recommendations in the NHSASP represent the goals of the BOA to maintain and enhance a safe and efficient aviation system and as such, these projects are supported for additional consideration. However, implementation of the recommended projects is determined by the airport specific justification as well as the financial ability and will of the Airport Sponsor.

It is recognized that the ability of an airport to incorporate minimum or recommended projects identified in the NHSASP will be based on the

“Without a comprehensive network of reliever (medium) and general aviation (small) airports, the hundreds of thousands of pilots, families, doctors, farmers, and businesses which rely on this network would be forced to operate solely from commercial (large) airports. Further, this would leave many communities without a vital lifeline for disaster relief efforts...and other important emergency services which aviation access provides across America.” – Letter from Congress, General Aviation Caucus, 28 SEP 2009

physical ability of the airport to construct the project due to environmental considerations, physical terrain issues, financial issues, or political issues. As a result, if an airport is unable to incorporate projects that would address a gap in services, the BOA must weigh options for providing improvement to regional access via aviation. In such cases, the BOA has three options:

- Continue to work with an individual airport to incorporate improvements in the future.
- Identify another airport that could provide the necessary coverage gap and either assign a role upgrade or project to meet system needs.
- Maintain the gap in services in that region.

Maintaining the aviation system is vital to NH's transportation system. The NHSASP provides a roadmap that defines the needs and options to manage and support the aviation system. Implementation of the NHSASP recommendations will be a collaborative effort between the BOA, the airports, and the municipalities or owners that operate the airports.

Recommendation: The BOA should conduct a comprehensive review of the NHSASP recommendations every three to five years to identify potential changes needed to maintain or enhance the state airport system.

8.1.2 AIRPORT ROLE UPGRADES AND GAP COVERAGE

Chapter 6 – Future Statewide Airport System Performance assessed the performance of the airport system and made several recommendations for enhancements to the system through upgrades to several airports' roles within the system and several suggestions to address gap coverage. These recommendations are summarized in the following sections.

Airport Role Changes

Four airports were identified for a change in their role. Elevating the airport system role addressed one or several of these criteria:

- **Expanded Capacity for the NH State Airport System:** Upgrading a system airport's role may be warranted to provide expanded airport infrastructure that can better accommodate anticipated growth or change in aviation activity locally as well as regionally.
- **Enhanced Service to Employers & Economic Centers:** Upgrading a system airport's role may be warranted to provide improved services to general employment centers and/or clusters of employers that drive year-round economic activity and jobs.
- **Enhanced Service to Geographic Gap Areas:** Upgrading a system

airport's role may be warranted to provide improved services to areas of the state where particular air access features are not present at existing system airports.

The four airports recommended for a role change included Mt. Washington Regional Airport, Dean Memorial Airport, Dillant Hopkins Airport and Moultonboro Airport. In addition to meeting one or several of the criteria noted above, the role upgrades also satisfied a number of service gaps identified in the analysis such as fuel availability or runway length. The recommended role upgrades would be undertaken at the local level. These recommendations are made with an eye towards strengthening the airport system in the state. The bullets below summarize the recommendations to change the roles of four airports in the system to better serve aviation within the state:

- **Mt. Washington Regional Airport** – Upgrading this airport from Local to Regional has several major benefits that support both the recreational and business components of this unique region in NH. Mt. Washington is the only other public-use airport outside of Berlin Regional Airport and north of Franconia and Crawford Notches that is capable of accommodating a wide range of aircraft, including some corporate jet aircraft. In addition, both airports complement each other; when one airport is not available due to weather or another issue, the other airport provides an alternate option for pilots/users. The airports are about a 40 minute drive time apart, thus allowing aircraft passengers access to the towns within the region without significant loss of time if the alternate airport is used. In the mountainous areas of northern NH, having compatible public-use airports provides the needed alternatives to pilots during emergencies or when the weather alters their plans.

The recommendations to potentially add Jet-A fuel and extend the runway to 5,000' with an upgraded instrument approach using satellite-based technology would ensure that access to this region is consistently available. Although terrain is an issue for approaches at Mt. Washington Regional Airport, satellite based approaches are maturing and in the next several years, the Localizer Performance with Vertical Guidance approaches are expected to meet precision or near precision approach standards, which will significantly enhance poor weather access in the region.

Mt. Washington Regional Airport also serves tourism in the region, especially for pilots and passengers staying at the Mountain Grand View Hotel, the Omni Mount Washington Resort or other nearby lodging options. Based on discussions with the airport manager, there is an influx of aircraft during the summer; however, without Jet-A and the longer runway, access and reliability is limited.

Wetlands are a significant constraint to expanding the runway. However, any potential lengthening of the runway, even if not to 5,000', and the addition of Jet-A fuel, will benefit the region by allowing aircraft that currently use the airport to operate more efficiently while also offering other aircraft that do not use the airport today the opportunity to do so in the future. This is important as Berlin and



Mt. Washington Regional Airport



Dean Memorial Airport

Mt. Washington Regional Airports are the primary public-use airports serving the economic and transportation needs in the northern part of NH.

- **Dean Memorial Airport** – The 2003 NHSASP identified Dean Memorial Airport as a candidate airport for inclusion into the National Plan of Integrated Airport System (NPIAS). That recommendation was realized March 18, 2010 when the Federal Aviation Administration (FAA) accepted the airport into the NPIAS program. Entering the NPIAS program allowed the airport to accept federal grants for eligible projects.

In this NHSASP, Dean Memorial Airport was recommended to be upgraded from Basic to Local as the airport continues to be a key aviation facility serving this region. The airport is the only paved runway airport in this region and serves not only Haverhill, but also Littleton, which is a growing business center in this part of NH and a few towns in Vermont. One of the primary benefits of this role upgrade would be the potential extension of the runway to 3,200', which would enhance operations of small twin-engine business and recreational aircraft to operate more efficiently at the airport. The airport's strategic location allows it to support the overall economic development within the region. There are current issues to achieve the 3,200' runway, including available land; however, should conditions change, the future may allow an incremental extension and the BOA would support up to a 3,200' runway.

In the future, Dean Memorial could also consider providing Jet-A fuel to support greater use of the airport by corporate turboprop aircraft. Outside of recommending Jet-A at Mt. Washington Regional Airport, the closest airports with Jet-A would include Berlin Regional, Laconia Municipal, and Lebanon Municipal Airports, all of which are not proximate to Dean Memorial Airport. Although the runway, existing or proposed, is short, there are a number of smaller turboprop and even Jet-Aircraft poised to serve short runways in the future. The aircraft that could operate on Dean Memorial's runway most efficiently is the Pilatus PC-12 series aircraft, which is a single engine turboprop aircraft that is becoming a very popular business aircraft over other traditional twin turboprop aircraft such as the Beech King Air series aircraft. Combined with a 3,200' runway, offering Jet-A fuel would provide further flexibility to access this part of the state by corporate aircraft.



Dillant-Hopkins Airport

- **Dillant-Hopkins Airport** – Dillant-Hopkins Airport serves the southwest region of the state and is located in the city of Keene. The NHSASP recommends an upgrade to the role of the airport from Regional to National for a variety of reasons. The city of Keene is relatively isolated from a transportation perspective as there is no immediate access to major interstates, rail or commercial air service. However, the city and the region is a major business center in this part of the state. In addition, Keene State College, Antioch College, Cheshire Medical Center, the Keene Pumpkin Festival and Mount Monadnock State Park make Keene the busiest cultural center in this region of NH. As the airport's facilities and services meet many of the requirements for the National Airport role, recommending the role

upgrade will allow the airport to further serve the region by providing an accessible and efficient transportation facility.

- **Moultonboro Airport** – The recommendation to upgrade the role of Moultonboro Airport recognizes the airport’s role in serving the Lakes region of NH. Laconia Municipal Airport on the south side of Lake Winnepesaukee serves as the primary airport for tourism in the region, as well as second/third home owners who fly to the airport during the spring, summer and fall months. As there is a large second and third home market on the north side of the Lake, Moultonboro Airport is positioned to support such growth in the future. Changing the role from Basic to Local identifies facilities that will support future aviation activity from an aviation system perspective. However, as the airport is a privately owned, public-use airport, funding such development will be difficult as there is no state grant program currently funded that the airport could access for future capital projects.

Air Access Gap Recommendations

The performance analysis presented in *Chapter 4, Existing Statewide Airport System Performance*, addressed four critical access components to provide reliable air access to the airports within the state. A number of gaps were identified in that analysis, most of which are covered by the airport role upgrades discussed in the previous section. The remaining air access gaps can be addressed as follows:

- **Instrument Approaches** – Instrument approaches provide airport access during poor weather conditions, which ensures that aircraft, especially aircraft used for charter and business whose need for reliable airports is high, are able to utilize the state airport system when the weather is poor. Two types of instrument approaches were considered in the performance analysis: non-precision approaches which use ground-based and satellite technology, and precision approaches which currently use the ground-based Instrument Landing System (ILS).

The performance analysis determined that the non-precision coverage within the state is adequate and no further recommendations are needed. The precision approach analysis shows a major gap within the White Mountain and Great North Woods Regions of the state. The terrain in this part of the state is challenging and negates the benefits of an ILS system. Furthermore, the FAA is no longer funding ILS systems at airports and will eventually phase out the ILS system for satellite-based Localizer Performance with Vertical Guidance (LPV) approaches that will have the ability to provide cloud height and visibility minimums near that of the ILS system. As such, it was recommended to forego an ILS system in the northern part of the state and for airports in this region to pursue satellite-based approaches using new or revised obstruction surveys in order to maximize the approach minima.

- **Weather** – The Automated Weather Observation System (AWOS) and other similar weather observation systems (ASOS, AWSS) provide pilots with live weather data that aids pilots when departing or arriving at an AWOS equipped airport. Coverage within the state is very good, but there is a gap in the Dartmouth-Lake Sunapee region.



Moultonboro Airport

**Bi-State
Authority**
The BOA should evaluate
the opportunity to
maximize the Eastern
Slope Regional Airport's
contribution to NH.

As such, an AWOS was recommended for Claremont Municipal Airport. An AWOS at Claremont Municipal Airport would also help support that airports non-precision instrument approach and provide additional weather data for pilots using Parlin Field's future instrument approach as well.

Recommendation: The BOA should work with each airport to review potential projects that can be implemented and would support both the local aviation needs of the airports as well as the needs of the airport system. Projects considered for implementation at the airport level that are identified in the NHSASP will be supported by the BOA.

8.1.3 NORTHERN NH COVERAGE GAPS

There were several gaps identified during the existing and future performance gap analysis that do not have airport coverage. The first gap exists in the very northern portion of NH north of Errol and Colebrook. This part of the state is very sparsely populated and primarily forested land that is actively logged. The area, however, has outdoor activity enthusiasts (hunting, fishing, snowmobiling, etc.) who from time to time need help (search and rescue, air ambulance). Based on the analysis, the need to provide new aviation facilities was not recommended. Errol Airport, Berlin Regional Airport and Gifford Field provide the necessary aviation infrastructure that can serve the very northern areas of NH. The emergency helipads at Berlin Regional Airport and Errol Airport can cover emergencies that occur within this part of the state. The BOA and NHDOT can also identify roadway improvements within this area that would allow better access to these airports to serve emergency evacuation options to the three airports located in this region. The state should continue to ensure that aviation facilities exist that can aid in emergencies as well as business development in Coos County.

The second major gap identified in the analysis was in-state airport coverage in Mt. Washington Valley in the White Mountain region. The primary reason for the airport service gap is the mountainous terrain in this region, limiting the potential for an airport in this area. However, when analyzing the coverage of bordering airports, Eastern Slope Regional Airport in Maine, across the border from North Conway, NH, serves NH's aviation services in this region.

The reason for this is that in the 1960s, the NH and Maine Departments of Transportation agreed to demolish the White Mountain Airport located in North Conway if a new airport was created in Fryeburg, ME to allow economic development and air access in this region. A bi-state authority was developed to manage the airport with representatives from both states serving on the Authority. However, the Sponsor recognized by the FAA is the town of Fryeburg and as such, NH does not contribute any state funding to this airport, but continues to receive all the benefits at the expense of others.

The airport serves many of NH's aviation needs. During the winter, the airport accommodates flights that access the ski resorts and second homes located in this part of the state. Limited funding availability has meant that the airport is limited to the existing facilities. The airport has

adequate number of facilities and is currently searching to replace Fixed Based Operator services. The pavements are also in good condition. The cost alone to maintain the existing infrastructure limits any potential to extend the runway to better accommodate aircraft that use the airport today, including corporate turboprop and jet aircraft.

The BOA has several options to participate financially in improvements that would enhance economic development and tourism to NH and safety for the pilots flying into this area of the state.

- **Option 1:** This option would be to maintain the current structure of the bi-state authority. Gains have been made by the NH towns that participate on the bi-state authority to fund the airport's operational budget in recent years. However, the BOA does not fund federal projects at the airport. This provides an incremental benefit to NH, but without further facility improvements, the airport will remain as-is for the foreseeable future.
- **Option 2:** This option is for the BOA to develop a bi-state agreement to fund projects at the airport. Such an agreement is currently in place to maintain and improve bridges between NH and Maine. There is also a bi-state agreement between NH and VT for Advance Transit, which allows improvements by NH for infrastructure in VT. The recommendation would be to consider development of a bi-state agreement similar in nature to the bridge agreements. As part of the agreement, similar to the bridge agreements, a percentage of participation on federally funded projects, be it 50%/50% or some other arrangement, should be determined. Non-federally funded projects would continue to be funded as they are today through individual town contributions when available, with participation from both ME and NH through the operational budget.
- **Option 3:** The third option that exists is to build a new airport. The problem with building a new airport is that the terrain in this region is mountainous and finding a flat area to place an airport is limited. Terrain would also affect instrument approaches, likely eliminating the potential for low minima approaches. The cost would also be high; general construction costs for a runway, taxiway, apron and hangar would cost between \$20 to \$30 million dollars at minimum for a basic facility. If environmental factors are present (wetlands or endangered species), then the costs are much higher. As such building a new airport is not a practical option.
- **Option 4:** The final option would be to designate an existing airport to upgrade such as Moultonboro Airport or Gorham Airport to provide similar services in the region as the airport in Fryeburg. With Moultonboro's upgrade, the airport's distant proximity to the North Conway area does not practically support aviation in this region. Upgrading the role of Gorham Airport and developing the airport to serve the gap in North Conway would not be viable as the airport overlies the town's aquifer and cannot be expanded further. As such, the option to upgrade other regional airports is not well suited to serving NH aviation in the North Conway area.

Recommendation: The BOA should pursue discussions with the state of Maine to determine the potential for a bi-state agreement to fund federal projects at Eastern Slope Regional Airport in Maine. If both states agree to work collaboratively, discussions with the FAA should ensue.

8.1.4 EXTERNAL DEMAND FACTORS

An analysis was completed to address the influence of the border state influences on airports and activity in NH. The analysis looked at two issues affecting activity and competition between NH and the bordering states, registration fees and fuel taxes. The issues associated with each are discussed in the following sections.

Registration Fees

The primary issue identified during the inventory process was that users of larger corporate aircraft were choosing to base their aircraft out of state due to the costs of registering those aircraft in NH, especially if the aircraft were new. As such, the registration fees for each state adjacent to NH were researched and are presented in **Table 8-1**.

As seen in this table, registration fees in Vermont and Massachusetts offer less expensive alternatives for registering a heavy, expensive, and new aircraft. For example, a 2014 Gulfstream G-V would cost \$293,500 to register in NH, a little less in ME, and \$300 in MA and no money in VT. Tenants at Portsmouth Intentional Airport at Pease, Manchester-Boston Regional, and Boire Field noted that the disparity of the registration fees place NH in an uncompetitive position with neighboring states. However, the cyclical nature of changes to other state aircraft registration programs

Table 8-1 – Aircraft Registration Fee Calculation Comparison

State	Registration Formula
NH	AC Registration In-State: \$48 AC Registration Out of State: \$63 Operating Fee: \$0.01/lbs + millage/dollar ^{1/}
Vermont	None
Maine	List Price Millage ^{2/} (Property Tax)
Massachusetts	0 – 2,000 lbs: \$100 2,001 – 3,500 lbs: \$165 3,501 – 12,500 lbs: \$230 Over 12,500 lbs: \$300

^{1/} NH Mill Formula - Current Year = 6 mills. Descends to 1 mill in 5th-10th year. \$15 minimum plus weight formula

^{2/} ME Mill Formula - Current Year = 9 mills. Descends to 3 mill in 5th and all succeeding years.

Source: McFarland Johnson, States of NH, VT, ME and MA

over the past 20 years has either made NH less expensive to register an aircraft or more expensive at one time or another. However, given the current programs, it appears that NH has the advantage for the smaller aircraft between the states, but at significant disadvantage in terms of larger, new, and more expensive aircraft such as corporate turboprop and corporate jet aircraft that generate most of the revenue.

The loss of accommodating these aircraft can be valued to NH airports as lost hangar and fuel revenues for the airport and basing staff (pilots, flight attendants, mechanics, etc.) within NH who would contribute to the overall local economy. As this focuses on a small group of aircraft that potentially generate significant fees, there are several options that could be explored by the BOA such as a flat fee for this group of aircraft or some other method that might be more competitive with other neighboring states. The potential reduction in registration fees (including the one-fourth turnback) could be offset through the revenue generation derived from housing these aircraft in NH.

The BOA should consider the following actions to assess potentially modifying the aircraft registration program:

Develop a white paper defining the issue, researching the issue at several airports within the state:

- As part of the effort, evaluate the surrounding border state aircraft registration programs and provide a comparison based upon the findings, determine if the NH program could be adjusted.
- Assess other state's registration fee programs to identify potential modifications.
- Evaluate the revenue impact (gain or loss) on the aircraft registration program.
- Determine how competition between border states would change and the financial gains seen at the local airport level (lease revenues, hangar rentals, fuel revenues, etc.).
- Recommendation based upon white paper analysis.

This effort will provide the BOA with an understanding of the issues, the potential gain or loss of revenue, and potential benefits for the state, the local airports and the aircraft owners.

Recommendation: The BOA should develop a white paper assessing the potential benefits of modifying the current aircraft registration fees to attract and retain the larger corporate aircraft at NH airports and offer proposed legislation, as appropriate.

Fuel Taxes

A number of airports, including Claremont Municipal Airport, noted that fuel prices at proximate border state airports were competitive with NH airports and aircraft would fly to the border airports to purchase fuel. They did, however, note that this was cyclical and that minor changes in prices, due either to local discounts or changes in state fuel taxes would affect fuel prices favoring NH airports. But the converse is also possible should changes to the fuel taxes change in the other states.

The difference in fuel taxes between the states is not significant. Avgas taxes for NH and VT are \$0.04/gallon and \$0.05/gallon respectively, and \$0.30/gallon for ME and MA. This would favor NH and VT airports, but would not create competition between NH and VT.

The BOA should evaluate the opportunities to revise the aircraft registration fees to attract and retain larger corporate aircraft within NH and options to generate more revenue through the aviation fuel tax.

For Jet-A fuel, NH and MA are \$0.02 (charter and privately owned turbine aircraft)/\$0.005/gallon (airlines) and \$0.034/gallon respectively. VT applies a 6% charge while ME is \$0.151/gallon. In this instance, NH has the lowest tax on Jet-A.

Based on taxes alone, NH appears to be the lowest among the other states and offering the least fuel tax on aviation fuels. However, as the state only generates about \$300,000 per year, should the BOA modify their taxes to generate more revenues? The BOA should explore the options to see if a minor change could enhance revenues without creating an uncompetitive situation for NH airports that lie along the three state borders. With a small number of gallons sold every year compared to other states, NH must remain competitive with fuel taxes on aviation fuels. Airlines must also base part of their decision to serve an airport by the fuel costs compared to their bottom line. If it is found possible, then the BOA should implement the change.

Recommendation: The BOA should evaluate options to change the aviation fuel taxes such that revenues can be increased while minimizing the potential for competition among the border airports.

8.1.5 COMMERCIAL AIR SERVICE

The analysis of the NHSASP did not identify the need for additional commercial air service in NH. The three existing commercial air service airports, Lebanon Municipal Airport, Manchester-Boston Regional Airport, and Portsmouth International Airport at Pease provide commercial air service to the majority of NH residents. The analysis indicated that these airports, categorized as Primary Airports by role, cover 80% population and 41 of the top 50 employers in the state. The remaining area not directly covered (greater than 60-minute drive) is the northern part of the state.

As the industry's flight schedules are not regulated by the FAA, the gauge and frequency provided by commercial airlines represents a business decision and, outside of the Essential Air Service (EAS) Program, airlines fly routes of their choosing based on their goals as a private business. None of the remote northern communities in NH are eligible for airline service under EAS to the areas lacking desired coverage. Commercial air service airports in Vermont (Burlington International Airport) and Maine (Portland International Airport) may provide additional options for commercial air service for residents north of the Lakes region. However, as Manchester-Boston Regional Airport offers legacy and low cost carrier airlines, residents in Northern NH can just as easily travel to Manchester-Boston Regional Airport, albeit with a longer drive of two hours.

Recommendation: The coverage area provided by Primary (commercial service) airports encompasses the vast majority of the state's population and key employers. Primary airports should continue to market themselves for expanded service on new and incumbent airlines to maximize service to NH. In cases where new service would be supported by business travelers, airports should partner with key employers, Chamber of Commerce, NH Department of Resources and Economic Development and other economic agencies to promote the new service opportunity to NH. Airports are also encouraged to

evaluate enhancements to improve the customer experience by offering such things as self check-in kiosks, valet parking, pet care and bag drops. By making it easier for the airlines passengers to move through the airport and making their experience more pleasurable, airports can continue to attract in-state and out-of-state passengers.

8.1.6 AVIATION FUEL

The analysis found that fueling services were adequate for 100 low lead (100 LL), which is the most common aviation fuel used by small single- and multi-engine piston aircraft. In fact, many of the smaller airports have fuel tanks with self-serve capabilities, which allows the pilot to fuel their aircraft independently and without the need of Fixed Base Operator (FBO) staff.

The issue related to 100LL fuel is that it contains lead and its use is becoming more politically charged on the national level. It is expected that the Environmental Protection Agency (EPA) will rule on the national level to phase out 100LL fuel. As it is considered a “boutique” fuel, there are only a few oil refineries that are manufacturing the fuel and the cost to do so is increasing, which is having a negative effect on General Aviation (GA) operational costs. As a result of these issues, the fuel industry is looking into options to remove the lead from the fuel or develop an all new drop in fuel with limited impact to existing fueling infrastructure. The government has awarded several grants for manufacturers to develop new fuels. This research is ongoing.

Engine manufacturers have approached the issue from another perspective. They have been researching the use of diesel engines, which will use Jet-A fuel, which is abundant and also less expensive. Continental Motors has developed this engine technology and Lycoming, the second major aircraft piston engine manufacturer, also has developed diesel engine technology. Cessna Aircraft now offers new model 172 and 182 aircraft with diesel engines and has stated that demand for these aircraft is increasing.

Until a fuel replacement is approved by the FAA or diesel engine technology becomes the preferred option to replace GA aircraft engines, aircraft owners will continue to fly their aircraft, albeit less due to the current cost of 100LL. During the Planning Advisory Committee meetings for the project, an interim option was discussed regarding the use of 80 octane automobile gasoline for older aircraft engines, which are capable of using this fuel with minor modifications to the engines. The availability of this fuel from the manufacturers is limited and only a few airports in NH have access to provide the fuel.

Regardless of whether a replacement fuel is developed quickly or engine replacement with diesel engines becomes the preferred option, there will be a period during which the continued use of 100LL or 80 octane fuel will be required.

The effects on the NHSASP are limited. The 100LL coverage is very good and as such, no further recommendations were necessary. However, the use of 80 octane may be an option for aircraft owners in the interim, especially since the aircraft fleet in NH is older and able to use this fuel. As such, the BOA has the option to discuss with various

The BOA should monitor the replacement of General Aviation Avgas (100LL) and potential effects on aviation within NH and evaluate options for 80 octane fuel at airports in the future.

airports, especially the smaller airports that have the older aircraft, the option to carry 80 octane fuel. This option, however, is strictly the decision of the local airport and their ability to store and make a viable profit providing 80 octane fuel.

The recommendation for the BOA is to query airports to determine the logistical and financial issues to acquire, store, and distribute 80 octane fuel. Fuel distributors may also provide some additional information on the cost of equipment to store the fuel. If it is found that carrying this fuel is economically viable, the BOA should support airports considering the option and determine if there are state funding mechanisms that could defray the cost of installation. NH RSA 422:34 may also need to be amended to reflect the storage and dispensing of 80 octane fuel and should be reviewed.

Recommendation: The BOA should monitor the leaded avgas issue and its potential effects on system activity. Once an approved product (fuel or equipment) is available to replace leaded avgas, the BOA will have a better understanding of the potential effects and act upon them accordingly. For 80 octane fuel, the BOA should query airports as to the viability of accommodating this fuel. If there is interest, the BOA and airports should discuss with fuel distributors the overall cost to acquire the equipment necessary and determine options to fund a portion or all of the cost through existing aviation and non-aviation grant programs.

8.1.7 WHITE MOUNTAIN AND GREAT NORTH WOODS AIRSPACE AND COMMUNICATIONS

During the last Planning Advisory Committee meeting held December 2014, the issue of airspace and communication needs in the White Mountain and Great North Woods regions were discussed. The primary issue is the high and rugged terrain, which limits radar coverage. Radar coverage is available between 5,000' to 7,000' depending upon location and given that there are no air traffic control towers at airports in the Great North Woods, only one aircraft is able to use an instrument approach at an airport, all other aircraft must wait until that aircraft has landed or departs altogether.

The resolution to these issues lies with the FAA providing additional radar facilities to expand the current radar coverage below the mountain peaks. The BOA has limited jurisdiction on this subject to recommend the addition of equipment. However, the BOA does maintain and protect the safety of aviation activity within NH.

Recommendation: The BOA should develop a white paper to address the ongoing issues, highlighting the capacity, safety and financial issues related to the current radar limitations, and present the results to the FAA.

The BOA should discuss with the FAA opportunities to enhance radar coverage in the northern part of the state.

8.2 FUNDING THE NHSASP

This section discusses funding the NHSASP and addresses the following elements:

- Summary of NHSASP Funding Needs
- How NHSASP Airports are Funded
- Available Funding Programs

8.2.1 SUMMARY OF NHSASP FUNDING NEEDS

Chapter 7, *Airport Facility Recommendations* generated the capital development costs of the 25 airports to meet the needs of the state aviation system. The overall cost of projects was \$77.5 million dollars. The costs will be paid for with the following funding sources:

- Federal grant funding (federal share)
- BOA share of 5% of the federal projects (state share)
- The remaining 5% by the 12 federally funded airports (local share) and;
- The 13 non-federally funded airport would be self funded at 100% (local share)

Table 8-2 summarizes the funding breakdown for the 20-year total for the NHSASP projects.

Table 8-2 – Twenty Year System Funding Needs

Airport	Federal Share	State Share	Local Share
Basic	\$0	\$0	\$1,176,000
Local	\$9,841,500	\$546,750	\$22,727,750
Regional	\$13,172,400	\$731,800	\$731,800
National	\$6,967,800	\$387,100	\$387,100
Total System Funding Need			\$77,457,000
Total	\$48,690,000	\$2,705,000	\$26,062,000

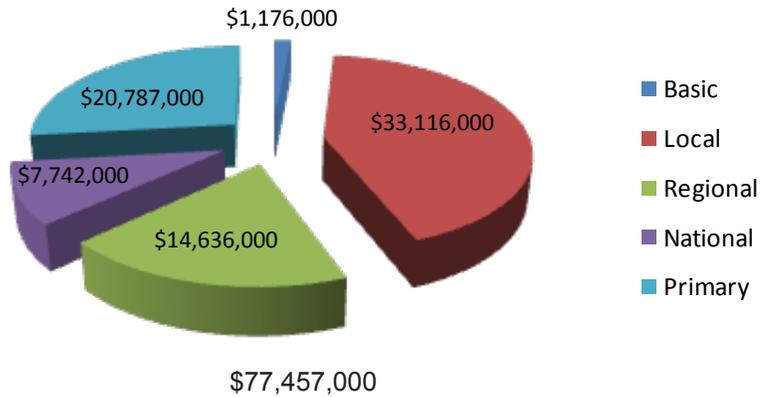
Source: McFarland Johnson, Inc.

Figure 8-1 presents a breakdown of total system funding needs presented above. The breakdown is presented by airport role and by five categories of projects. As shown in **Figure 8-1**, Local and Primary Airports account for 69% of the 20-year project costs by airport role. Basic Airports require the least amount of funding over the twenty years, as they are small facilities that already meet many of their minimum requirements. The airports also have the ability to complete projects more cost effectively as they are not bound to federal procurement requirements associated with FAA grant assurances. A further breakdown of project costs indicates about 71% of the development costs are for airside and landside facility development.

Figure 8-2 presents a breakdown of projects costs by phase and airport role. Projects were phased such that minimum objective projects were proposed for Phase I (first five years), and recommended objective projects proposed for Phase II (second five years) and Phase III (remaining 10 years). As seen in **Figure 8-2**, each phase represents about a third of the overall costs for the development costs, with Phase I being slightly higher than Phases II and III.

Figure 8-1 - Breakdown of Development Costs by Airport Role

20-Year Project Cost By Airport Role



20-Year Project Cost By Project Type

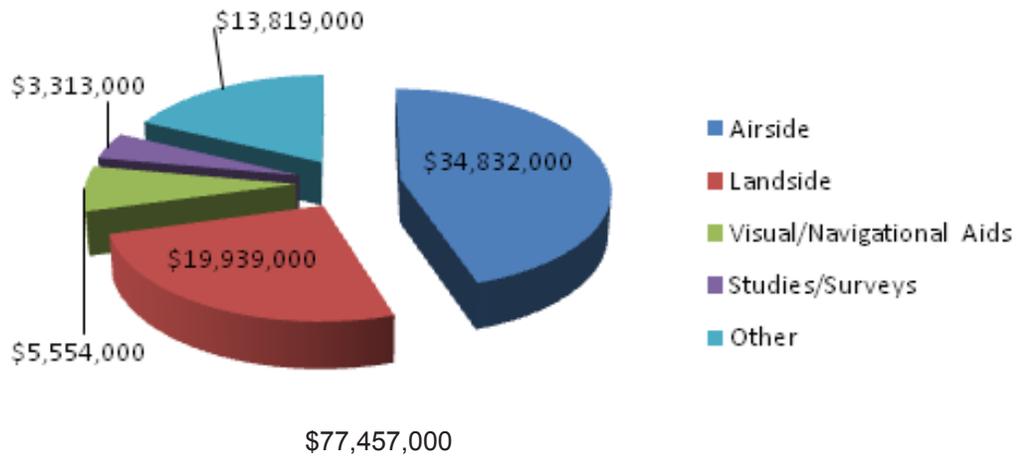
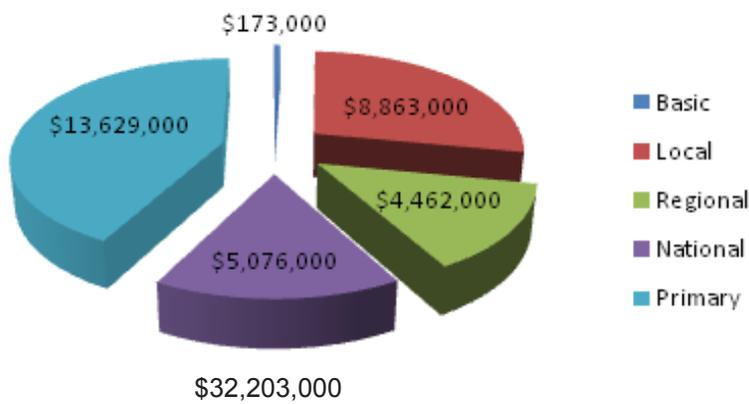
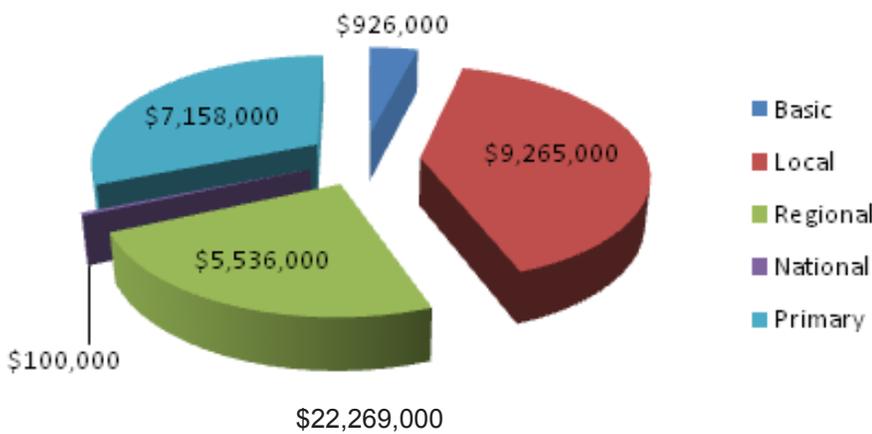


Figure 8-2 - Breakdown of Projects Costs by Phases and Airport Role

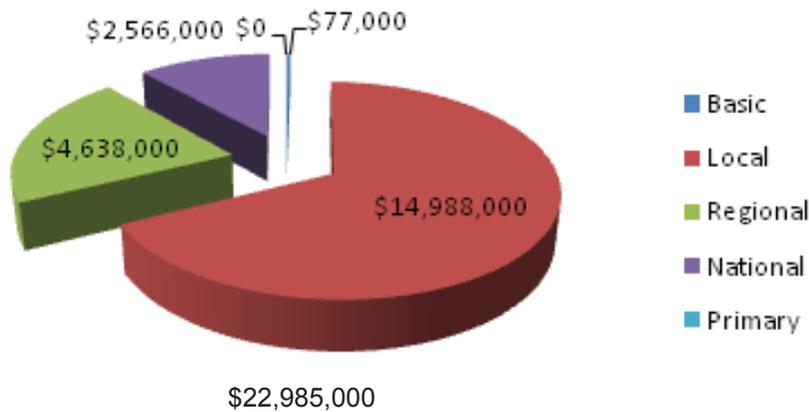
Phase I (0-5 Years) Project Costs By Airport Role



Phase II (6-10 Years) Project Costs By Airport Role



Phase III (11-20 Years) Project Costs By Airport Role



Outside of the NHSASP costs, there are other costs that must be taken into consideration in the overall funding requirements for local airport project needs that the BOA is committed to funding over the next 20-years. They include the following:

- Funding of 12 federally eligible airport capital programs - \$138 million for the three Primary Airports, \$94.4 million for the 9 GA airports, totaling \$372.3 million.
- Pavement Maintenance of the paved areas of 18 of 25 airports which was estimated at \$51.5 million over the twenty years.
- Planning, environmental and specialty studies for all of the airports of \$8 million.

Added together with the NHSASP cost of \$77.5 million, the overall cost to maintain the airport system is estimated to be about \$509 million. About \$435 million would be federally eligible while \$74 million would be covered by state and local funding over the 20 years. Approximately \$25.7 million of the state and local funding is comprised of NHSASP and pavement maintenance project costs for the non-NPIAS airports.

8.2.2 FUNDING NPIAS AND NON-NPIAS AIRPORTS

The BOA funds airport development through federal and state funding sources. There are 12 publicly owned, public-use airport in the NHSASP that are identified in the FAA's NPIAS and qualify for federal funding. The remaining 13 airports are comprised of a mix of publicly and privately owned, public-use airports. For purposes of this discussion, the 12 FAA eligible airports are referred to as the NPIAS airports while the 13 state eligible airports are referred to as non-NPIAS airports. As the airports have been defined by airport role throughout the report, **Table 8-3** provides the reference between airport role and NPIAS/non-NPIAS status

The next sections describe the funding sources for each group of airports.

Table 8-3 – NPIAS/non-NPIAS and Airport Role Reference

Airport Role ^{1/}	NPIAS Status	Non-NPIAS Status
Basic	0	9
Local	3	4
Regional	4	0
National	2	0
Primary	3	0
Total	12	0

1/ Airport Role represents the future system with airport role changes

Source: McFarland Johnson, Inc.

8.2.3 BOA BUDGET FOR PROJECTS

This section summarizes how the BOA is funded and generates financial resources used to support airport development needs. The funding is described in the following sections:

BOA Budget

The BOA has two budgets, an operational budget funding the operation of the BOA and capital projects for non-NPIAS airports, and a capital budget, which is used for the state match of federally funded projects. Both budgets are funded through the General Fund, which in turn is funded in part through fuel tax revenue and aircraft registration fees. For the BOA's capital budget, the state uses bonds to fund the capital budget.

The research on other state programs did not identify major differences between states. In fact, it was found that the funding components of the BOA's budget are similar to other states including Idaho, Florida, Massachusetts, California, and Pennsylvania. Idaho, for example, funds all of the projects and the aeronautics group through a dedicated fund solely financed through aviation fuel taxes while Massachusetts uses both aviation fuel taxes and funding from the general fund.

Aviation Fuel Taxes

The current aviation fuel taxes are defined in RSA 422:34 Airways Toll, that defines a tax of \$0.04 per gallon of avgas, \$0.02 per gallon of Jet-A for corporate or privately owned turbine aircraft and \$0.005 per gallon for airlines. **Table 8-4** below provides the historic aviation fuel revenues.

Table 8-4 – Historical Fuel Tax Revenues

Year	Fuel Tax Revenues
2002	\$274,100
2003	\$311,200
2004	\$299,700
2005	\$325,300
2006	\$294,600
2007	\$314,600
2008	\$335,500
2009	\$268,900
2010	\$262,400
2011	\$265,900
2012	\$267,100
2013 ^{1/}	\$248,900
2014 ^{1/}	\$234,100

^{1/} Jet fuel data for State Fiscal Year 2013 and 2014 not finalized.

Source: NHDOT BOA

Revenues generated by the BOA include Aviation Fuel Taxes and Aircraft Registration fees.

As seen in **Table 8-4**, there has not been a large fluctuation in the revenues as aviation in the state is relatively stable. The fluctuations represent national economic trends as well as commercial service trends at the Primary Airports.

Based on an analysis of other state aviation fuel taxes provided by the BOA, NH's aviation fuel taxes are some of the lowest taxes in the country. Although the taxes are similar to other states, the size of the state, number of based aircraft and only one large air carrier airport, the overall revenue is small. Preliminary information fiscal year 2013 revenues are at about \$300,000.

Adjustment of the taxes is possible to generate more revenue, however, careful research would be necessary to identify the overall benefits as well as unintended consequences. It is possible that adjusting the taxes could give an adjacent state a fuel price advantage and lure aircraft away from the state. For Jet-A fuel, airlines are extremely sensitive to any changes in fuel tax increases and an adjustment could potentially reduce fuel sales significantly. As such, any adjustment would need to be researched to ensure that an increase revenue stream could be obtained with no competitive loss.

Aircraft Registration Fees

Aircraft receive registration certificates annually in NH if the aircraft owners have paid a two-part aircraft registration fee. The first part is called a state registration fee and is less for in-state residents than for out-of-state residents. In CY 2014, \$57,657.58 were collected for this fee. The second part is called an aircraft operating fee that also has two components: a descending millage plus a fee based on the weight of the aircraft. In CY 2014, the aircraft operating fee collected by the BOA was \$707,367.25. NH RSA 422:36 states that, "one-quarter of the aircraft operating fees collected (i.e., \$176,842.46 in CY 2014) must be disbursed amongst the public-use airports for aeronautical purposes."

There are a number of states, including Maine, that use similar formulas for aircraft registration fees. However, there are states such as Massachusetts that use a flat fee for aircraft based on weights. The use of registration fees provides an additional revenue source for the states. Outside of the Aeronautical Fund discussed later in this chapter, there are no other unique funding programs found in other states that could be considered for NH, the current formula for NH will continue to be utilized for the current and near term funding programs in place. As with fuel taxes, research on the effects of adjusting the formula should be considered to determine if a revenue increase would be beneficial and what if any, are unintended consequences could exist.

Recommendations: The BOA's operational and capital needs are funded similarly to other states and through several different sources. The need to consider revising the current funding programs should be evaluated by the BOA to determine the potential increase in revenues, allowing the state to be more self-sufficient.

The BOA should consider options to enhance the current funding programs allowing the state to be more self-sufficient.

8.2.4 NPIAS AIRPORT FUNDING

The FAA determines which airports are needed in NH to provide for a complete National Airspace System. The 12 NPIAS airports represent a range of airports from small GA facilities such as Dean Memorial Airport that serves small business and recitation aircraft operation to Manchester-Boston Regional Airport, which serves large corporate aircraft and airline and cargo service.

They accommodate and offer service to a diverse range of aircraft and are located throughout the state. They provide access for tourism, business, emergency services, and ground infrastructure inspection to name a few. Each region of the state is served by at least one of these airports. These airfields are also important transportation facilities that provide air access to the municipalities they serve, and as such, contribute to the overall transportation infrastructure of the municipality, region, and the state.

Funding

The airports within this group of airports have eligible capital improvement projects primarily through FAA grants for eligible safety and capacity projects. Federal grants offer 90% of the total project cost; the remaining 10% is evenly split between the state and the municipality that owns the airport. Projects that are not eligible are funded at 100% either by the airport owner or built with private funding. The BOA, as a designated block grant state by the FAA, administers and manages the federal grant program for FAA for 9 of these 12 airports. The historical federal funding levels are presented in **Table 8-5**.

10%
Of the six states that makes up the FAA's New England region, NH receives an average of 10% of FAA grant funds within the region.

Table 8-5 – NH Federal AIP Grants 2009 - 2014

Year	NH FAA Funding	FAA Regional Funding	NH Share
2009	\$14,132,143	\$189,589,035	7%
2010	\$13,398,809	\$163,594,839	8%
2011	\$30,051,041	\$172,613,372	17%
2012	\$17,102,149	\$133,166,552	13%
2013	\$13,446,127	\$137,179,209	10%
2014	\$7,375,125	\$145,256,111	5%
Average/Year	\$15,917,566	\$156,899,853	10%

Source: Federal Aviation Administration Grant History

As seen in **Table 8-5**, the state has received an average of about \$15M over the six-year period, which represents about 10% of the total federal grant money available within New England. NH has about 11% of the federally eligible airports within New England. Also, the amount that NH has received has fluctuated and is due to prioritization by FAA New England region, which balances the overall capital improvement needs of the region as well as the number and types of projects requested in NH. The amount of federal funding historically has not met the overall capital project needs of the federally funded airports within the state or the nation. As a result, projects tend to be phased over multiple years.

Non-NPIAS

airports provide a number of functions including a support system of the NPIAS airports, allowing local and regional access for emergency services, and supporting flights associated with recreation or tourism.

As such, the federal funding gap will remain and likely increase with the projected federal share of the system costs of \$350 Million over the next 20 years with little options for future increases.

During the inventory process, many of the airports noted that the money they receive from the ¼ return of registration fees is important for their operational and capital budgets and they rely on that turn back. The airports are also eligible for the Grants to Airport Sponsor state program for operational and maintenance projects. Historically, only 10% of the total monies available in this state funding program went to the NPIAS airports. This program is discussed in more detail in the next section.

8.2.5 NON-NPIAS AIRPORTS

The non-NPIAS airports are comprised of small GA airports, most of which are privately owned, public-use facilities. These airports are not eligible to receive federal funding for their capital improvement needs. Many of the privately owned airports have been in existence for better than 30 years and are family operated facilities such as Jaffrey Airport - Silver Ranch and Twin Mountain Airport. They offer access to less populated regions of the state and may not be proximate to a NPIAS airport.

Airport Function

An important finding of the NHSASP is that many of the non-NPIAS airports support the NPIAS airports. For instance, Jaffrey Airport - Silver Ranch is an alternate airport when there is poor weather or fog at Dillant-Hopkins Airport in Keene. In 2014, Keene's main runway was reconstructed and for two weeks during construction, closed to aircraft activity. A number of aircraft from Dillant-Hopkins Airport temporarily relocated to Jaffrey Airport -Silver Ranch, and other airports, to remain operational. As Jaffrey is proximate to Keene, the impact to aircraft owners was limited as the drive to Jaffrey was not significant.

Another combination of airports, Moultonboro Airport and Laconia Municipal Airport operate in a similar fashion. However, the one additional aspect is that Moultonboro Airport, located on the northerly side of Lake Winnepesaukee, also accommodates aircraft that are visiting second homes in the region. As the sales of second homes expands on the northern side of the lake, Moultonboro Airport will continue to serve aircraft flying to the region for recreation and second homes. The airport also accommodates amphibious aircraft that can land on water as well as land without a reconfiguration of the aircraft.

The non-NPIAS airports also serve an important emergency service role within the state. Errol Airport had built a helipad to provide emergency access for the Dartmouth Hitchcock Advanced Response Team (DHART) helicopters to serve the northern portion of NH. This is especially critical during the winter, where snowmobile or all-terrain vehicle (ATV) accidents may require quick extraction of critically injured patients.

The non-NPIAS airports also serve a tourism function within the state. Parlin Field, is a good example of an airport that draws pilots and tourists to the airport. The airport is staffed with a part time airport manager and a strong cadre of volunteers that maintain the airport year round. As the airport is not federally funded, the volunteers organize various fund raising efforts through the year to raise funds for maintenance and capital projects. The airport also markets itself through monthly newsletters and an extensive website providing information about the airport and links to local attractions. One large draw is the on-site restaurant that attracts pilots from NH, VT, and other states. To address transportation needs, the airport has courtesy bicycles that can be used and with nearby bicycles trail and close proximity to town, allows people flying in to explore the town offerings.

Funding

The non-NPIAS airports are primarily self-funded facilities that have been historically supported by several state funding programs under the BOA. Only one of the five programs, Aircraft Operating Fee Return, currently provides small revenues while the remaining four programs are not funded by the legislature. The programs are as follows:

- Aircraft Operating Fee Return is an annual disbursement of one-fourth of revenue from the aircraft operating fees for aircraft based at the non-NPIAS airport.
- Grants to Airport Sponsors is a line item within the BOA's operational budget that funds airports for the operation and maintenance of the public-use airports. This program is not currently funded, but when funded in the past, 90% of the grant monies went to the non-NPIAS airports and the remainder went to publicly owned, public-use airports.
- State-Local Grant Program is a grant program that is a line item within the BOA operational budget that is specifically designed for the non-NPIAS airports. The program was changed from a 50-50 split to an 80-20 split in 2012. The grants are for the capital projects at these airports. This program is currently not funded.
- Airport Property Tax Reimbursement Program is defined under Chapter 423, Section 423-A Airport Property Tax Base Sharing and is a program for privately owned, public-use airports and is used to offset some or all of the local property taxes these airport owners must pay on the portion of their property that is used to support a public airport. This program is also currently not funded.
- State Aeronautical Fund(NH RSA 422:35) was enacted by the legislature in 2010 to provide a dedicated aviation revenue source available to all public-use airports. The sources of revenue for this fund are donations, gifts and surplus equipment. The dedicated fund, as of January 2015, has \$1,100 available to be disbursed.

The BOA provided historical information on three of the programs described above, the tax reimbursement program, the grants to airport sponsors, and state level grant programs. **Table 8-6** presents this information.

NH pilots fly relief supplies to hurricane victims

December 18, 2012 by GAN Staff

By Carol Lee Anderson

NEW HAMPSHIRE — The significance of local general aviation airports and the role they play during an emergency situation often go unnoticed by most, but victims of Hurricane Sandy quickly realized their importance after the Super Storm.

Within hours of calls for help from people in New York and New Jersey, efforts within the aviation community were well underway. During these situations, even the smallest local airport quickly becomes part of a much larger aviation system. Many times air-borne relief efforts are the only way to get supplies to victims as roads are often blocked after storms or earthquakes. Local commercial airports aid in the transport of supplies to and from more rural locations, expanding the areas donations can reach.

Vital supplies bound for storm-damaged parts of New York and New Jersey fly high above the Connecticut River as general aviation pilots from NH recently helped in the relief efforts for the victims of Hurricane Sandy.

NH's aviation relief efforts were organized by AERObridge, a national organization comprised of experienced aviation specialists that coordinate the emergency response of the aviation community during natural disasters, both here and abroad. When AERObridge needed pilots to fly donated supplies from NH to the areas hardest hit by the hurricane, there was no lack of pilots willing to donate their time, airplanes, and fuel to fly donations into Republic Airport on Long Island, N.Y. The donations, once delivered, were distributed to relief organizations and then directly to the victims.

Pilots Jim Murphy and John Wilson, connected to each other by AERObridge, agreed to meet at Nashua Airport. Murphy had put out a call for donations and was very quickly overwhelmed with the amount coming in. They used Wilson's plane to load 900 pounds of supplies, including diapers, wipes, and food and took off towards the storm-damaged areas.

Adding to the list of NH pilots donating their time were 10 pilots who came together in a team effort at Parlin Field in Newport. Lou Edmonds of Edmonds Aircraft Service was quick to donate the use of his hangar to house the donations as they came into the airport. Edmonds and his wife, Sherry, along with Parlin Airport Manager Heath Marsden, and wife, Angie, worked to bag and weigh the 1,500 pounds of donations the night before their flight to New York. Former manager Russ Kelsea and his wife, Judy, prepared the remaining donations on the morning of the flight. Due to the number of donations, not all were flown in the first round of relief flights. A helicopter pilot from Parlin Field flew the remaining donations a few days later.

One of the pilots, Rick Kloepfel, recently described the experience, telling of how the air traffic controllers at Boston-Logan International Airport were notified ahead of time of the mission of the

flights. Controllers had received a full briefing on the “compassion flights” and worked to get all six airplanes through the heavily-congested airspace around the airport as directly and as quickly as possible.

Kloeppel was amazed at the efforts of everyone involved, saying, “We loaded the machines so fast and were so busy at Parlin, then, at Republic Airport, the ground team was all over the inbound airplanes. They were very, very efficient! Frankly, I was stunned that we were able to make any of it happen on two days’ notice, but Heath, our manager, understands fully how to reach out to the community, whether it is through social media or by finding the right organizations that are able to get the message out. The local Chamber of Commerce and fraternal groups responded way faster than I imagined. The folks at Republic were very accommodating and efficient.”

Diane Cooper, airport manager of Laconia Municipal Airport located in Gilford, NH, is well-aware of the importance of the 24 public-use of airports in NH as well as those located throughout the country. Cooper is a member of the outreach committee of the Granite State Airport Management Association. The organization works tirelessly to educate the public’s understanding of aviation and the value of the state’s aviation system.

“Most people don’t realize that the relief efforts for disasters, such as Hurricane Sandy, often begin at our local airports,” she explained. “Small airports can immediately turn into donation centers where the public can drop off much-needed disaster supplies. These supplies can then be sent immediately to where they are needed, mostly by mercy flights that are donated by general aviation pilots with their aircraft.

Reprinted with permission from *General Aviation News*.

<http://generalaviationnews.com/2012/12/18/new-hampshire-pilots-fly-relief-supplies-to-hurricane-victims/>

Table 8-6 – Historical State Grant Program Funding

Year	Tax Reimbursement Program	Grants to Airport Sponsors	State Local Grant Program	Total
1997	\$9,029	\$31,110	\$14,182	\$54,321
1998	\$9,677	\$42,022	\$23,898	\$75,597
1999	\$6,966	\$51,518	\$23,898	\$82,382
2000	\$7,877	\$51,518	\$23,898	\$83,293
2001	\$9,995	\$51,518	\$23,898	\$85,411
2002	\$10,000	\$49,808	\$23,898	\$83,706
2003	\$9,997	\$45,218	\$23,898	\$79,113
2004	\$10,000	\$51,518	\$23,898	\$85,416
2005	\$12,500	\$51,518	\$23,898	\$87,916
2006	\$12,500	\$55,568	\$23,900	\$91,968
2007	\$15,500	\$32,890	\$23,900	\$72,290
2008	\$17,500	\$0	\$5,000	\$22,500
2009	\$0	\$0	\$20,000	\$20,000
2010	\$0	\$0	\$5,668	\$5,668
2011-2014	\$0	\$0	\$0	\$0

Source: Federal Aviation Administration Grant History

2008

The Recession of 2008 was the main reason grant funding for public-use airports was lost. The non-NPIAS airports are the most affected as state funding was the primary source of capital funds.

As seen in this table, there was steady and increasing funding available to the non-NPIAS and public-use airports up to about 2007 and then funding was cut in the various programs through 2011. The loss of funding was a direct result of the economic recession, which started in late 2007 and continued through 2008 and beyond. The highest amount totaled \$85,411 annually in 2001, but decreased to just over \$72,000 in 2007. However, the fact is between 1997 and 2010, the privately owned airports had capital development resources to conduct maintenance and improvement projects whereas today, they have no capital development resources. This has placed a significant financial burden on the airports and many are having difficulty maintaining their airports, especially routine maintenance of runway, taxiway and apron pavements, which if allowed to continue, will make these airports unsafe due to pavement failures.

8.2.6 FUNDING SHORTFALLS

Funding shortfalls exist for NH aviation today and will be further exacerbated over the next 20 years. As discussed in Section 8.2.4, NH receives about 10% of the FAA grants within the FAA New England region and that average is unlikely to change with the number of federally eligible airports within the state system. Federal funding does not provide all of the financial resources required for NPIAS airports to maintain and grow their facilities. The estimated federal portion of all of the projects needed over the 20-year period (NHSASP projects, local level airport capital projects, pavement maintenance, and studies) presented in Section 8.2.1 was estimated at \$435 million. Annualizing the overall cost over 20 years, the estimated overall annual federal shortfall less the \$15M the state receives in grants, is \$6.8M per year.

At the state level, Section 8.2.1 estimated the projected state and local funding needs was \$74 million over the next 20 years. Of this total, \$25.7M represents the projects costs for the NHSASP and pavement maintenance required for the non-NPIAS airports. Annualizing this number over the 20 years, \$12.8M would be needed annual for the non-NPIAS airports. Applying the 2007 funding of \$70,000 available to the non-NPIAS airports, the annual funding shortfall for would be \$12.76 million.

The estimated shortfalls at both the federal and state levels hinder the full implementation of projects supporting the NHSASP and NH aviation's ability to move the state's economy forward. The potential to gain more FAA funding over the foreseeable future is not likely as the FAA grant program is funded at specific levels defined under current Airport Improvement Program which ends September 2015. New legislation to reauthorize the Airport Improvement Program over the next four years is ongoing and a new federal program for airports is expected in October 2015. Various national aviation organizations are lobbying Congress to increase funding for airports; however, the outcome is uncertain.

In terms of state funding shortfalls, the lack of funding for the Grants to Airport Sponsors Program, the Tax Reimbursement program, and the State Local Grant Program, which primarily serves the non-NPIAS airports, has major implications on the NHSASP. The lack of funding makes it very difficult for the non-NPIAS airports to maintain their facilities and provide safe and efficient airport environment. Discussions with a number of non-NPIAS indicated that without the availability of future funding mechanisms, maintaining their airports will become increasingly financially difficult resulting quite possibly in the closure of he airport. The loss of one or several non-NPIAS airports will have a significant impact on the NHSASP.

The loss of any of the non-NPIAS airports will have an effect on the efficiency of the NH airport system and the ability of the system to provide air access and services to aviation users. The non-NPIAS airports play an integral role within the NHSASP. They serve as a secondary system of airports within the system, supporting activity at the larger NPIAS airports as well as provide air access for business, tourism, recreation and emergency services serving their communities and regions.

Without a restoration of program funding, the BOA has limited options available to preserve the non-NPIAS airports. A lack of funding may produce any one of the following results:

- Allowing non-NPIAS airports to close and not replace that function within the system.
- Consider a reduced role within the system if not already a Basic Airport.
- Identify a non-NPIAS airport critical to maintaining a safe and efficient system as a candidate for inclusion as a NPIAS airport if the NPIAS criteria can be met.
- Delay implementation of the NHSASP recommendations.
- Delay critical maintenance within the NHSASP.

25

**The 25 airports that
comprise the system
of airports within NH
generate collectively \$1.15
billion of economic output
and 9,200 jobs.**

The economic impact of the 25 system airports in NH generates \$1.16 billion dollars of economic output, 9,200 jobs, and \$27.9 million dollars of tax revenues to NH annually. Evaluating this from another perspective, the \$509 million 20-year cost to maintain and operate the system of the airports in NH represent one half of the total economic output the airport system provides NH in only one year.

- Assist in funding a new owner willing to be responsible for the airport.
- If a privately owned public-use airport becomes available, the state can purchase the airport and run it (NH RSA 422:19) or purchased by another public entity.

An important element to consider is the economic benefits the system of airports provides to NH.

The economic analysis completed for this study in *Chapter 9 – Economic Study* calculated that the system of 25 airports generated annually; \$1.16 billion dollars of economic output to NH, over 9,200 jobs in the state and generated \$27.9 million in tax revenues to the state. The non-NPIAS airports provide a small, but noteworthy impact of \$750,000, 7 jobs and \$50,000 of tax benefits. The 25 airports generate about 2% of the state's overall economic output of about \$60 billion annually, a measurable contribution to the state's overall annual economic generation capacity. Evaluating this from another perspective, the \$509 million 20-year costs identified in Section 8.2.1 represents one half of the total economic impact output the airport system provides NH for only one year. Stated another way, airports generate twice the benefit of what they take. Compared at the national level, the President's FY 2016 budget proposal noted that the funding request for aviation was partly based on "an investment in the future of aviation, an industry that accounts for more than 5 percent of our Nation's gross domestic product."

As such, funding the needs of airports in NH is critical for the BOA to maintain a safe and efficient airport system that serves to support the state's transportation infrastructure and economic health. The BOA should consider the following:

- Continue to seek increased federal funding to meet the needs of the NPIAS airports.
- Continue to make every effort to have the legislative bodies' reinstate the Grants to Airport Sponsors, Tax Reimbursement program, and the State-Local Grant programs at the 2007 level in order to provide funding sources for future projects at non-NPIAS airports. However, the final level of funding to be requested will be dependent upon several factors including the status of the state budget and the needs of the aviation system.
- As part of reinstating the state funding programs, the BOA should identify critical projects at each of the airports and develop an initial phase capital program for the non-NPIAS airports. This provides an understanding of the overall financial needs and will help define future funding levels.

Recommendation: Maintaining and improve the 25 airports within the state is a priority for the BOA. The BOA should continue to seek increased federal funding for the NPIAS airports and work to reinstate state-level funding programs for the non-NPIAS airports so they can maintain safe and efficient facilities supporting the overall air access transportation infrastructure in NH.

8.3 POLICY RECOMMENDATIONS AND TOOLS

This section provides additional guidance to the BOA on the operation and management of the NH airport system. There are a number of issues that face the BOA including outdated statutes, staffing needs, monitoring other states' aviation issues and their programs, and providing relevant information to the airports comprising the NH airport system. This section touches upon various considerations for the BOA to address; changes that will enhance safety, improve aviation operations within the state, and strengthen the overall aviation system for NH.

8.3.1 BOA STAFFING

The BOA is organized under the Division of Aeronautics, Rail, and Transit within the NHDOT. The BOA administers the FAA Block Grant State program at airports without airline service for the FAA. The BOA is responsible for managing civil aviation within the state, administering both federal and state grants, overseeing the development of airports at the state and local level, performing airport inspections, managing the aircraft registration program, and representing the state in aircraft accident investigations. The BOA also manages staff and provides maintenance services for state-owned navigational aids.

Prior to 1986, the BOA was staffed with 11 people, but was reduced to 8 staff members in 1996. The BOA is now staffed with 5 full-time employees and one part-time. Managing the aviation program with this staffing structure is challenging, especially with the administrative requirements associated with the block grant state designation. However, the BOA has been able to utilize other staff expertise from within NHDOT to fill any gaps. Still, the BOA has been unable to add staff to manage daily operations, thus limiting the effectiveness of the BOA.

The Federal Highway Administration has grant programs which, when adopted by the governing state DOT, allow for temporary or permanent staff positions through the grant. There do not appear to be similar aviation programs that would fund additional staffing for the BOA. However, the BOA does have the potential to provide internships that could support daily operations on a temporary basis. Below are several options the BOA could consider:

- Through the FAA, explore the intern program to provide additional staffing needs on a temporary basis.
- Work with the NH Aviation Historical Society to obtain an intern over the summer to provide temporary staffing needs.
- Coordinate with Daniel Webster College or other local colleges to hire interns to provide temporary staffing needs.

Recommendations: The BOA should explore options to obtain interns from local colleges or the NH Aviation Historical Society to provide temporary staffing needs. In addition, the BOA should continue to request full-time and/or part-time positions to more efficiently manage the current workload.

8.3.2 SUCCESSION PLANNING FOR PRIVATELY OWNED, PUBLIC-USE AIRPORTS

The evaluation of the current airport system identified a concern for the privately owned, public-use airports. As many of these airports are owned by individuals, the question is who will run the airport when the current owner decides to retire or move away? There have been a number of airports that have closed over the past 20 years, Wolfboro Airport being the most recent to close in the early 2000s. Currently, there are no privately owned airports expected to close in the near term; however, there are a number of owners who have expressed an interest in retirement within the next five to ten years and the disposition of their airports is unknown.

NH's airport system provides air access to 86% of its citizens in 2014 (86% are within a 30-minute drive to a system airport). This metric was used as it is one of the guiding principles that were established by FAA to define an adequate National Airspace System (Federal Airport Act of 1946). Each public-use airport plays a unique role within the system providing the variety of services and facilities to meet the needs of pilots and customers. The loss of any one of these airports would strain the system as it tries to accommodate the demand with fewer airports. The BOA recognizes the value that each airport provides to the system and works to assist each of these airports.

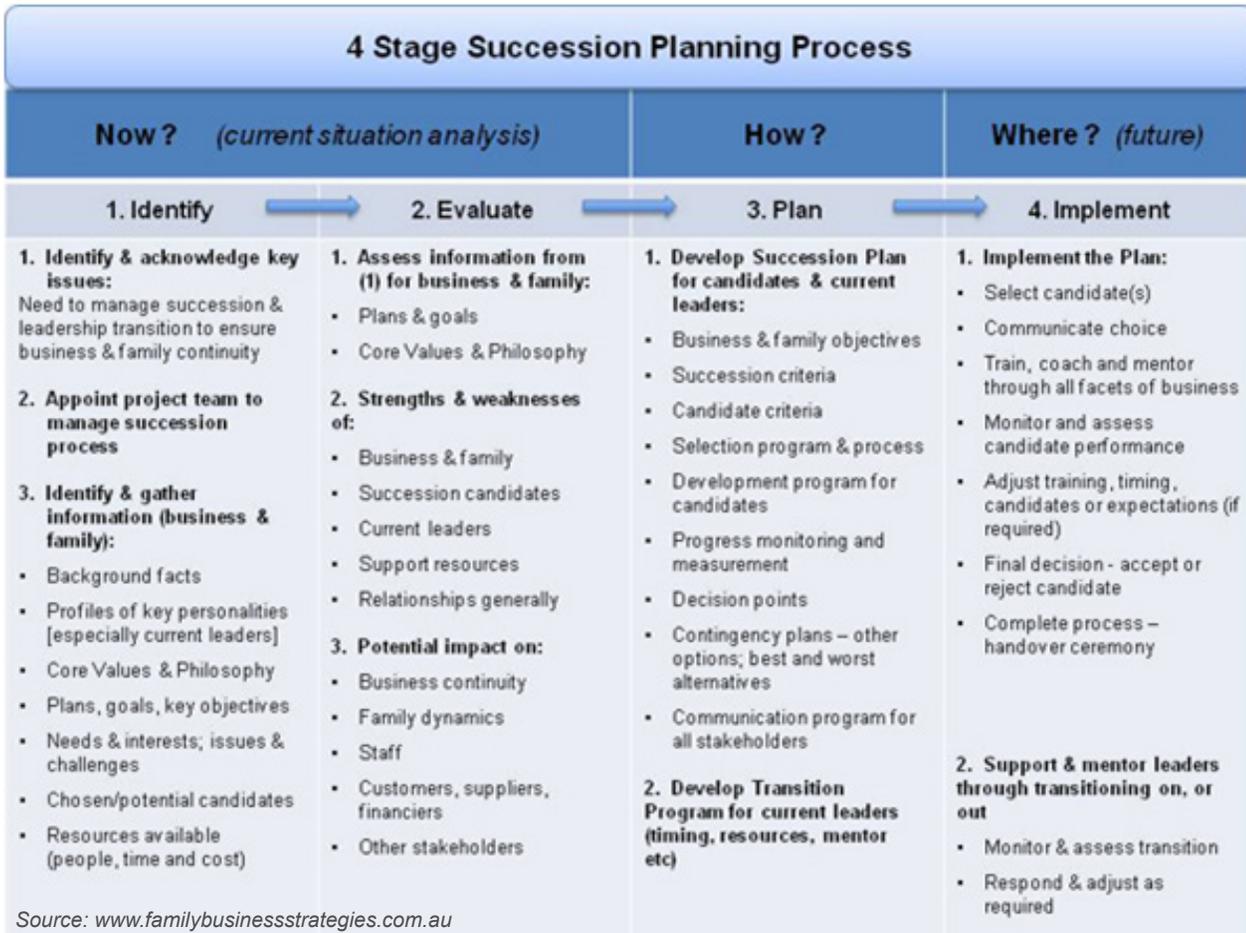
Airport Cooperative Research Program (ACRP) Report 44 - A Guidebook for the Preservation of Public-Use Airports (<http://www.trb.org/Main/Blurbs/165624.aspx>) describes why public-use airports close, and identifies measures and strategies that can be undertaken to potentially help preserve and prevent an airport closure. The report notes that part of the failure of privately owned airports is that there is no succession planning completed.

To get a better understanding of the future of the privately owned public-use airports in NH, the BOA should accomplish the following steps:

1. Discuss with the owners of each of the privately owned public-use airports what they expect to do with the airports once they decide to retire or leave the aviation community.
2. Identify which airports could or will be operated by future entities, whether family or another private entity.
3. For those airports that do not have a succession plan, discuss with the owner the possible options for continued support of the airport.

The following figure provides a typical process on how succession planning is done. Although this may be directed toward larger businesses, the model can be adapted to any airport.

The loss of one or several airports in the state will have an effect on the overall ability of the airport system to serve the aviation needs of NH and its citizens. This NHSASP allows the BOA to evaluate the potential impact and possible options to address the effects.



There are also various guides available on the internet. One such document is a guide for small to medium businesses developed by Kent State University entitled “An Owners Guide to Succession Planning” (<http://dept.kent.edu/oeoc/spp/OwnersGuide.pdf>) and documents the process of conducting a succession planning effort, including various forms to help owners with documenting the analysis and outcomes.

Once the BOA determines that the succession of a privately owned public-use airport may not occur, the BOA has several options. The first option is to do nothing. The second is to assess the impact of losing the airport and its impact on system performance, then act on it as appropriate.

The analysis presented in this NHSASP allows the BOA to understand what a particular airport covers in terms of drive time and air access gap analysis. If it is determined that the airport will have a significant impact to the system or to the region the airport serves, the BOA can discuss these impacts with the owner and determine if there is an alternate option available. A number of options were previously discussed in Section 8.2.6.

If there are no alternatives available through the owner, the BOA has the option of purchasing the airport through the current RSA legislation. However, such an option may not be feasible and will require extensive analysis to further consider this course of action.

Airport business plans provide an airport with a valuable tool to enhance revenues, identify revenue generating opportunities and best management practices to strengthen the airport's financial position and continued economic contribution to the local and regional economy.

The loss of a privately owned public-use airport within the NHSASP will have some impact on the aviation transportation infrastructure, however, it would fall to other surrounding airports to assume the aircraft and services that the privately owned airport had if they had the capacity to do so. Nevertheless, any economic benefits provided by the airport to the community would be lost, as well as air access for its citizens. The BOA should be able to quantify the particular impact and determine what, if any, further actions may be necessary to fill the gap created by the loss of a privately owned public-use airport.

Recommendation: The BOA should actively discuss the future of the privately owned public-use airports with their owners and determine which airports may not have a clear future. Once identified, the BOA should discuss with the owners a potential succession plan for the airport and work with the owners to further those discussions. If an airport does not have a succession plan, the BOA should use the analyses presented in this NHSASP to determine the potential impact of the airport and determine options for the airport to remain operational.

8.3.3 BUSINESS PLANNING

A business plan provides an agency, community, or organization with a clear assessment of their current situation, helps to identify potential opportunities as well as obstacles, and defines the actions necessary to achieve specific goals. The business plan establishes the direction for short- and long-term economic development, helps to guide future land use decisions with economic development implications, and outlines the strategies required to help with economic development, retention, expansion, and attraction efforts. A business plan can help these entities take advantage of opportunities as they arise rather than forgo the opportunity.

The focus of an airport business plan should be the development of goals and objectives intended to improve the financial and operational sustainability of the airport, along with the identification of specific actions to be taken in support of achieving those goals. The airport business plan should be clear, concise, and actionable, with an emphasis on brevity to encourage stakeholders to read and enact the plan, as they channel their efforts toward building and sustaining the airport as an economic engine for their town and region. When used and implemented correctly, an airport business plan can be an effective management and decision-making tool.

A number of states including New York, Vermont, and Connecticut developed business plans for their airports to provide guidance, enhance their financial position, and remain/become self-sufficient. The purpose of the business plans was to provide the airport owners with opportunities to increase overall revenues at the airport through enhancing current fee structures, lease agreements, and evaluate the use of available land for aviation and non-aviation development. In general, these efforts were intended to help airports operate more like a business rather than public infrastructure.

The outcomes of these business plans were successful for the state of Vermont. The state developed individual business plans for the six state-owned airports as well as a business plan for maintaining their system of state-owned airports. The later focused on standardizing the operation of the airports and fees for fuel, lease agreements, and other financial considerations. The results of these actions allowed each airport to become financially self-sufficient and operate at a profit rather than a deficit, and take full advantage of their uniqueness and ability to serve both based and itinerant aircraft activity.

A basic business planning guide for airports to reference is provided in ACRP Report 77 – Guidebook for Developing General Aviation Airport Business Plans. The guidebook provides an in-depth look at the importance of airport business plans, *Chapter 2*, as well as a detailed manual on how to create, implement, and evaluate an airport business plan, *Chapters 3, 4, and 5*. Since the ACRP Report is meant to serve as a general template, the wide-ranging components found within can be, and should be, modified to meet the unique business needs and situations of an airport; however, the overall elements and processes should remain the same. **Appendix 8-A** provides a template checklist that can be used as a guide to develop a business plan.

In addition to the ACRP Report, there are numerous online examples of completed airport business plans that should be used to facilitate the business planning process.

Recommendation: The BOA should fund two airport business plans, one for a NPIAS airport and one for a non-NPIAS airport, as pilot projects for exploring the business plan process, its value, and its implementation. Once completed, the BOA should evaluate the efficiency and effectiveness of these processes and then implement their own guidelines for preparing and implementing airport business plans within NH.

8.3.4 COMPLIANCE WITH AIRPORT DESIGN STANDARDS

The FAA's Advisory Circular (AC) 150-5300-13A – Airport Design, provides guidance on the design of civilian airports, focusing on safety and efficient operations. In regard to safety, the FAA has, over the past five years, begun to focus on certain areas on the airport that must meet FAA standards, specifically Runway Safety Areas (RSAs) and Runway Protection Zones (RPZs).

The RSA is a rectangular area surrounding the runway and enhances the safety of aircraft that undershoot, overrun, or veer off the runway, and provides access for firefighting and rescue equipment. The FAA no longer provides modification of standards for RSAs, thus all airports that receive federal grant funds from FAA must meet RSA dimensional standards for their runways.

The RPZ is a trapezoidal-shaped area beyond the end of the runway that enhances the protection of people and property on the ground, and the FAA recommends ownership or control within the RPZ. The FAA has continued to focus on the RPZ and has provided supplemental guidance on land uses within the RPZ.

Meeting all FAA design standards ensures the highest level of safety for an airport. The BOA should work with the NPIAS airports to ensure they meet these standards.

Some of the non-NPIAS airports have, or will have, airport layout plans showing their existing facility and future development plans. Having an airport layout plan for the remaining nine airports will allow the airports and the BOA to discuss and develop future planning needs.

Given the FAA's focus on these two areas, the BOA should inventory the NPIAS airports to determine if their RSAs are in compliance. If not, the BOA should work with the airport to determine the best option to meet those standards and where applicable, support funding in the short term to correct the deficiency.

The new guidance for land uses within the RPZ has created concern among airports regarding ownership and potential incompatible land uses within the RPZs. The FAA is allowing the current uses in the RPZ until an action occurs, be it a runway rehabilitation or some other project, that would trigger a review of the RPZ. The BOA should work with the NPIAS airports to evaluate their RPZs against the current guidance, if they have not already, to determine the land uses within their RPZs. If there are issues found, the BOA should work with the airports to determine the best strategy to address the issue.

Recommendation: The BOA should work with the NPIAS airports to evaluate the current status of their RSAs and RPZs and document any deficiencies. A strategy should be developed with the airports to prioritize projects that would correct the deficiency and support funding for those projects in the short term. Correcting the deficiencies would significantly enhance safety for the airports and their users.

8.3.5 NON-NPIAS AIRPORT LAYOUT PLANS

The BOA has proposed airport layout plans (ALPs) for non-NPIAS airports (Plymouth Municipal Airport, Parlin Field, Alton Bay Ice Runway/Seaplane Base, Hampton Airfield), which means that nine non-NPIAS airports do not have information on future planning for these airports. Capital projects were discussed for these airports when funding for non-NPIAS airports was available. Given the nature of these airports and the lack of succession plans by the current owners, the BOA should have an understanding of the facilities and an ALP will help to provide much of this missing information. The ALP graphically demonstrates the value and capabilities of the airport, which is important during succession planning efforts.

The BOA developed a basic ALP for the Alton Bay Ice Runway/Seaplane Base, incorporating various features such as safety areas, runway protection zones, and separation standards between the runway, taxiway, and apron areas. The effort for that was unique given that the runway is made of ice, but now the BOA and the airport have a layout of the facilities during the winter which serves as a guide for airport operations during the winter season. This includes standardized plowing and aircraft parking, which in turn increase the overall safety at the airport.

Basic ALPs can be developed using Geographic Information Systems (GIS) and can provide graphics depicting the airport property and other associated FAA design requirements. Although these ALPs may not meet all of the FAA requirements, there should be enough information to detail key data (runway length, width, approaches, etc.) on the airports and provide a baseline layout to identify future development opportunities. The ALPs can be developed as follows:

- As available, obtain the GIS data for each municipality where an airport is located. The data will have basic parcel data. This data will provide a basis for land ownership and airport infrastructure.
- Obtain aerial photography from state GIS information and overlay on the parcel data.
- Develop a basic sketch including the runway, taxiway, apron, buildings, and the following FAA design standards or clearance surfaces: Runway Safety Area, Runway Object Free Area, the Runway Protection Zone and the Airport Property Line.
- Work with each airport to determine any future projects and incorporate into the ALP.
- Develop basic data tables with relevant airport facility information and incorporate into the ALP.

Once these are complete, the BOA will have the basic airport information for each airport. Should a non-NPIAS airport in danger of closing, the BOA will have information to make informed decisions regarding potential acquisition and future development needs to meet FAA standards as well as to mitigate impacts to the airport system. Alternately, the document can be passed to a new owner and maintained into the future.

Recommendation: The BOA should develop ALPs for the non-NPIAS airports that provide information on existing facilities and future development proposals using GIS and its readily available information.

8.3.6 AVIATION POLICIES FOR AIRSPACE PROTECTION, LAND USE, AND ZONING

Protection of airports is accomplished through several methods. The most common option is the adoption of land use and zoning regulations that protect the airport’s environs from incompatible land use development near the airport and protect the airspace to maintain safe airways for airports.

NH RSA 424 addresses several elements of zoning policy and includes the following:

- Prevent airport hazards or obstructions through the development of airport approach plans for all public-use airports.
- Adoption and implementation of zoning by municipalities, including acquisition of acquisition of land in fee or easement.
- Limited guidance on land use recommendations.

Comparing NH RSA 424 to Federal Aviation Regulation Part 77 – Objects Affecting Navigable Airspace (Part 77) FAA airport design requirements, and FAA airport grant assurances, it is clear that the state’s regulations need a significant update based on the following observations:

Several of the state statutes on airspace protection and zoning need to be updated to incorporate current FAA airspace protection requirements and provide more comprehensive zoning and land use information and reporting to the municipalities and their neighbors.

- The initial statute dates back to 1941 and is seemingly outdated. The latest updates to certain sections were in 1985 and recodified 2001, during which time several sections were also repealed.
- There is no mention of the relationship to the standards for Federal Aviation Regulation Part 77 or United States Terminal Instrument Procedures (TERPS).
- There is no guidance on land use (Section 424:5).
- There are no clear reporting requirements to the BOA.

NH RSA 424 zoning regulations largely delegate responsibilities to local municipalities and zoning boards and with little guidance on aeronautical standards, create a lack of consistency in processes and outcomes. A key deficiency is that the existing airport zoning statute makes no mention of the FAA's policies and guidance regarding airspace protection. Additionally, while the state legislation requires local municipalities and zoning boards to adopt and implement some degree of airport zoning, there is no information on the compliance, or effectiveness, thereof. Moreover, the bulk of the state zoning statutes emphasize obstructions to airspace (a reactive approach), rather than focusing on airport-compatible land uses on the ground (a proactive approach). Finally, the state's current legislation does not address overflight issues such as aircraft noise, which can affect the public's perception and support of local airport operations and development.

Table 8-7 presents a basic "gap" analysis to identify what and where the deficiencies exist.

Table 8-7 - Summary of Legislative Analysis*

Legislative Issue	Existing Deficiencies	Recommendation	Bridging Actions	Resources and Considerations
Airspace Obstructions	- Local jurisdiction - No adherence to FAA obstruction evaluation requirements and airspace analysis	- Standardized airspace protection laws and processes across the state and compatibility with federal laws	- Revise NH statutes to provide comprehensive airspace protection - Include Part 77 drawings in ALP sets - Update states airspace drawings	- Provide notice and continuing guidance to local municipalities - Consider airspace analyses as recommended
Land Use and Zoning	- Lack of standardization - Devoid of sensitive topics (noise, odor, etc.)	- Comprehensive and standardized airport and use and zoning laws and processes across the state	- Revise NH statutes to foster compatible aeronautical and non-aeronautical land uses around airports; - Standardize regulations and processes across the state	- Utilize existing legislation from other states as examples - Provide notice and continuing guidance to local municipalities with and without airports

*This methodology is a GAP analysis, which is intended to evaluate a system's current and existing conditions against potential and desired outcomes. The purpose is to bridge the gap between the differing ends of the performance spectrum by identifying explicit actions and processes to be applied.
Source: McFarland Johnson, Inc. NHDOT BOA

As seen in this table, it is recommended that the BOA review its airport land use and zoning laws for opportunities to incorporate more comprehensive components, as well as to provide more thorough guidance for municipalities and zoning boards functioning at the regional and local levels. Research was done to identify unique or informative materials that could guide the BOA in updating NH RSA 424.

- The California Airport Land Use and Planning Handbook provides a comprehensive guide to inform the general public, elected officials, and decision-makers on the importance of appropriate and responsible land use planning to prevent encroachment and preserve the state's aviation system, an integral part of the transportation network. This comprehensive guide encompasses many topics including how to form airport land use commissions (unique to California municipalities), creating land use plans, current regulations surrounding FAA airspace and noise compatibility, developing land use compatible policies, and fostering inter-agency coordination. Implementation of the planning guidelines can be incorporated into the municipal zoning, either modifying the zoning language, or developing/revising an airport overlay to address the needs. The California guide provides the BOA, as well as the municipalities, with comprehensive information on developing land use requirements as well as policies regarding noise, overflight, safety and airspace protection. The land use handbook can be found at: <http://www.dot.ca.gov/hq/planning/aeronaut/documents/alucp/AirportLandUsePlanningHandbook.pdf>
- Florida Department of Transportation Aviation and Spaceports has extensive information on the aviation program in Florida. Reviewing their available information, they have an comprehensive compatible land use webpage (<http://www.dot.state.fl.us/aviation/compland.shtm>) that has a number of resources that can be used when considering updating NH RSA 424. A key document is Florida's Airport Compatible Land Use Handbook, which has significant amounts of information on airport zoning and land use. Section One of this handbook provides the principles underlying land use compatibility requirements and discusses the areas to protect around airports (FAR Part 77) for noise and safety. The handbook continues with information on statutes, regulations and processes governing land use compatibility and a section dedicated to reviewing development applications.

Both of these handbooks can provide the BOA with information that can be used to update NH RSA 424 as well as provide valuable information to the municipalities and airports within the state.

A major component missing today in NH RSA 424 is a reporting mechanism to the BOA on land use and zoning issues. Unless an airport or local zoning board informs the BOA of an issue, there is no way in which the BOA can be proactive with the various municipalities in the state to address needs or evaluate issues. Discussions with the Massachusetts Department of Transportation Aeronautics Division indicate that they rely on the building inspectors within the municipalities that have airports to inform them of proposed projects. The BOA should determine what the best option is for reporting requirements and incorporate them into the revised statute.

The BOA is currently working to develop Administrative Rules associated with the Tall Towers statute.

Another concern is that some neighboring municipalities do not have airport related zoning to protect an airport in the adjacent town. This is problematic in that efforts to maintain clear airspace and land use around and airport by the host municipality are undermined by no protection for the airport in the adjacent town. This should also be addressed as part of this process to ensure that airports are protected.

Recommendation: The BOA should consider revising state statutes on zoning and land use NH RSA 424 which would strengthen airport protection and preservation. Updating the statutes should also provide educational information for municipalities to develop or update effective land use and zoning practices.

8.3.7 TALL TOWER PROTECTION

NH RSA 422-B addresses tall tower protection of airspace. As with the zoning statute, this statute is also outdated and does not address Part 77 or TERPS requirements. The statute does touch upon when permits are required, heights upon which to report, marking and lighting the objects, and reviews by the BOA. Given the limited information in the statute, proponents may not be aware of all issues they need to address as part of their proposals. As there is a lack of a formal reporting program detailed in the statute, the BOA is currently drafting administrative rules including application/reporting requirements. The discussion below provides some additional guidance or considerations in the preparation of these administrative rules:

There needs to be a coordinated effort to require submission to the FAA (Form 7460) and obtain a copy for tracking purposes as well as evaluation of the tall tower and the resulting finding. Some states complete an analysis separate from the FAA ensuring that there are no effects on the airport, since the FAA evaluates national airspace only. This could also serve as a future revenue generator for the state by requiring a fee for the submission and review.

From a reporting perspective, discussions with the Massachusetts Department of Transportation Aeronautics Division indicated that they rely on building inspectors within the municipalities to report proposed tall towers. It is recommended that the BOA also consider a collaborative approach with the local municipalities to address these needs.

A good example of the requirements that trigger the need to submit a permit form is provided on the Minnesota Department of Transportation Aeronautics and Aviation website (<http://www.dot.state.mn.us/aero/talltowers.html>). The website page defines the criteria for submission under the FAA requirements including Form 7460 as well as the criteria for submission to the state. A brief two page brochure was also developed detailing the process, which is a valuable tool that can be used by the local airports to inform their municipalities of the requirements as well as proponents considering locations for tall tower structures.

Recommendation: Complete the Administrative Rule process to address the application and report needs as identified in NH RSA 422-B.

There should also be an informational campaign to educate developers, landowners, and municipal officials of the requirements of this important state statute.

8.3.8 INTERMODAL INTEGRATION

The 2003 System Plan Update addressed intermodal opportunities for the airports and made a number of recommendations. In looking at the aviation system within NH and its integration within the overall transportation infrastructure, airports are more connected today than they were in 2003. Below is a summary of findings gained during the development of the NHSASP.

The three Primary Airports are interconnected with other modes through their transportation infrastructure. Lebanon Municipal, Portsmouth International at Pease, and Manchester-Boston Regional Airports are the most modally interconnected airports within the state. The airports can be accessed through a number of taxi and limousine companies, local and regional bus services, and are interconnected with the Lebanon Transit Terminal, the Portsmouth Transportation Center, and the bus terminal in downtown Manchester, respectively. Manchester-Boston Regional and Portsmouth International at Pease both have shuttles to and from NH park and ride facilities as well. Bus service to and from these airports is also provided to a number of regional park and ride facilities. The airports are also served by local hotel shuttles serving the various facilities located near each of the airports. The airports also have many of the major rental car companies providing services to their passengers. Each airport is discussed in more detail below.

- Lebanon Municipal Airport has local bus and taxi service to and from the airport. There is also an Amtrak station in White River Junction, VT across the state border that has passenger rail service and can be accessed via local taxi or limousine companies.
- Portsmouth International Airport at Pease has local and regional bus service serving the airport. The Portsmouth Transportation Facility, which is a regional bus hub and NH park and ride facility, is on the airport and can be accessed via a shuttle to and from the terminal. The airport has access to local and regional taxi and limousine services as well.

The airport handles and clears international cargo, but has not become a regional hub for small package or outsized cargo. However, the long runway does allow a niche for clearing large cargo aircraft flying from Europe and will continue to serve this niche well into the future.

- Manchester-Boston Regional Airport is also a regional cargo hub for Federal Express and United Parcel Service, both of which have extensive cargo facilities on and around the airport. Cargo is also handled through intermodal shippers through airline belly cargo. There are a number of regional trucking warehouses around the airport that transfer cargo to and from the airport.

There are opportunities for airports to enhance their intermodal connectivity and it does not stop at cars, busses and trains; courtesy bicycles provide the same opportunities at Parlin Field.

There is no rail service (cargo or passenger) with stops at any of the 25 public-use airports in NH, however; studies have been done to connect the Primary Airports with future regional commuter rail service. A plan for a stop in Manchester near the new access road was proposed in which passengers would be bussed to and from the airport. That program is not expected to be implemented in the short term, but the foundation has been developed to connect the airport with rail service as some point in the future.

The GA airports also have intermodal connections in a number of ways. Many of the airports have arrangements with the local car rental companies or automobile dealerships to provide rental cars for passenger flying into the airports. In addition to rental vehicles, many of the airports can be accessed via local taxi, limousine, or hotel shuttle services and some of the airports have courtesy cars available from either the FBO or the airport. The state continues to offer access to surplus vehicles for airports to purchase and use as courtesy vehicles (via NH state surplus). It is suggested that the BOA continue to offer airports this access in the future as this is an affordable option for airports to provide good transportation services to their customers.

Several GA airports have local bus routes running near the airport, such as Boire Field and Concord Municipal Airport. There are a number of GA airports that are also served by local car rental companies or car dealerships that will either drop off a car or pick up passengers at the airports. Generally, passengers flying to many of the GA airports in NH can obtain ground transportation services with little difficulty.

The recent introduction of internet based ridesharing may have a positive effect on GA airports in the future. These rideshare services are now being used for transportation to many of the commercial service airports throughout the nation. Such services, as these programs become more popular, could be used to get passengers to and from the airports.

Cargo is not a major element for NH GA airports. In most cases, small cargo is handled by charters flying to and from these airports. That cargo includes small parts, medical organ transport, or animal transport from shelters in New England and the nation. Manchester-Boston Regional Airport has an FBO that supplements feeder service for Federal Express and United Parcel Service, but that is unique among the 25 airports. There are no recommendations to place cargo at these airports as there is no outstanding demand for this service at this time.

Finally, there is a unique example of providing ground transportation at Parlin Field. The airport provides courtesy bicycles to use on the nearby bicycle trails where visitors can ride into town, have lunch, or just take in the local sites. This is a good example of marketing an airport and attracting visitors to the airport and to the area.

Recommendations: The system of airports in NH is well connected in terms of intermodal transportation opportunities and visitors are able to travel to their destinations once at the airport. The BOA should also continue to provide access to state surplus vehicles, which offers a low cost option for airports to obtain vehicles that can be used by visitors.

With the advent of internet based rideshare services, GA airports may also benefit and should consider linking the airport with one of these services to provide an additional ground transportation mode made available to airport passengers.

8.3.9 SUSTAINABLE STRATEGIES

Sustainable development and construction has become common in buildings across the nation. Developed by the U.S. Green Building Council (USGBC), Leadership in Energy and Environmental Design (LEED) is intended for building owners and operators to be environmentally responsible and use resources efficiently. This concept has now trickled down to airport development such as terminals and FBO hangars in particular. As the movement continues to stretch resources and minimize impacts on the environment, sustainable development is becoming an important element in infrastructure development. Public Law 112-95, FAA Modernization and Reform Act of 2012, in fact, identified recycling as an element to be addressed in airport planning projects.

The concept of sustainable development covers four areas: operational efficiency, social responsibility, natural resource conservation, and economic viability. Together, they reduce the overall impact of facilities on the environment, reduce the overall needs of non-renewable resources and enhance the operational economics by reducing energy consumption.

This can be applied to airports as well. As mentioned above, terminal facilities and support buildings are the primary facilities that airports can focus on. However, they can also look at other areas where sustainable practices can be attained and implemented.

A number of commercial service airports in the nation have developed sustainability plans for their airports. The focus has been on water conservation, use of solar farms to supplement electricity needs, and use of natural gas powered buses, work vehicles and in a number of cases, ground service equipment. There are also a number of GA airports that are conducting sustainability plans in the New England region, including Danbury Municipal Airport in Connecticut.

The basic structure of a sustainability plan is structured as follows:

- Sustainability Framework
- Sustainability Baseline Analysis
- Sustainability-Related Alternatives Screening Criteria
- Develop Implementation and Monitoring Plan

The general areas that are assessed include energy resource use, water, waste recycling, and greenhouse gas emissions. Some examples include replacing incandescent lights with light emitting diode (LED) lights within buildings and runway and taxiway lighting, energy efficient windows, new heating systems in building renovation projects, and reclamation and reuse of pavement tailings in other projects on the airport.



Airports are starting to evaluate and implement sustainable plans to reduce their overall environmental impact and manage and conserve resources in the future. This will have a significant and positive impact on the environment while also generating financial savings over time in the operation of the airport.

Some of the more common environmental issues that airports must address in NH and nationally include wetlands, endangered species, historic structures or sites, and stormwater runoff.

Implementation of such programs does need to be assessed for their practicality and location. For example, solar panels installed on top an automobile parking garage inadvertently created a solar glare issue for the FAA air traffic control tower. The issue has been resolved. Also, LED lighting is an electrical costs savings measure for airports. However, use of those lights for obstruction lights has been a concern because aircraft fitted with night vision goggles, such as emergency helicopters, cannot see the lights as they do not have a heat signature, which is the primary technology used for night vision goggles and certain high-end avionics.

As the use of sustainable equipment and construction techniques are improved over the next several years, the overall benefit of airport sustainability planning will result in reduced impacts on the surrounding community in terms of energy and resource consumption, air emissions, and water usage. It also serves to reduce the long-term costs of operating the airport which places the airport in a better financial position.

Recommendation: The BOA should build upon sustainability planning that has been completed at other airports and identify a pilot program to complete a sustainable master plan within the state. The BOA should also consider developing a pilot program to complete a sustainability study for one or two airports in the state in order to further understand sustainable practices airports can implement to foster their environmental stewardship.

8.3.10 ENVIRONMENTAL PERMITS AND CLEARANCES

Many airport activities and projects require permits or approvals from federal, state, or local agencies. Projects such as adding pavement, doing earthwork, altering infrastructure, even certain maintenance and operations work, can trigger permit requirements. The specific permits and approvals needed depend on what resources are present, the nature of the activities or projects that impact these resources, and the sources of funding.

This section provides a guide for airports to understand what permits may be required and where more information regarding the individual permits can be found. Projects to be undertaken by airports in the NHSASP will determine, in part, the type of environmental action that is needed. The non-NPIAS airports are subject to a range of state and federal environmental programs for any particular project. However, the NPIAS airports are subject to the National Environmental Policy Act (NEPA), which is a federal standardized environmental process that is a comprehensive review of a range of environmental considerations (noise, wetlands, parks, etc.) that must be followed as a condition of federal grants.

For example, work in wetlands requires approvals from both the NH Department of Environmental Services (NHDES) and U.S. Army Corps of Engineers (ACOE). Alterations in pavement areas may require stormwater permits from both NHDES and the U.S. Environmental Protection Agency (EPA). Ground-disturbing activities over one acre in size also require EPA approval, while any ground disturbance of any

kind would require coordination with the state historic preservation office. Finally, any project with federal funding must meet the requirements of NEPA, which covers a broad range of resource categories.

Table 8-8 describes the most common kinds of resources and associated permit programs encountered that would apply to airport projects. Following the table, there are more detailed descriptions of NEPA, wetland permitting, rare species issues, and historic resource approvals, which are some of the more common permits airports will have to address.

Table 8-8 - Permitting Programs

Regulated Resources	Types of Airport Actions that Might Be Involved	Federally Permit or Approval Program (and Agency)	State Permit or Approval Program (and Agency)
Wetlands	Any project that impacts wetlands or surface waters	Section 404 of the Clean Water Act (Army Corps of Engineers)	NH RSA 482-A Fill and Dredge in Wetlands (NHDES)
Rare plants and animals	Any project that involves other federal permits (such as a wetland permit) requires compliance with U.S. Endangered Species Act	Federal Endangered Species Act (U.S. Fish and Wildlife Service)	Wetland and Alteration of Terrain permits require consideration (NHDES)
Historic sites, structures, or districts, including potential archeological resources	Any project that involves other federal permits (such as a wetland permit) requires compliance with Section 106.	Section 106 of the National Historic Preservation Act (State Historic Preservation Office - NHDHR)	
Historic sites, parks, and wildlife refuges	All Federally Funded Projects and Permits	Section 4(f) (FAA) Section 106	
River or lake shorelands	Certain activities within 250 feet of shorelines		NH RSA 483-B Comprehensive Shoreland Water Quality Protection Act (NHDES)
Stormwater runoff (non-construction)	New paved areas, buildings, or other "impervious" surfaces	National Pollutant Discharge Elimination System (EPA) for construction site runoff	Alteration of Terrain (NHDES)
Stormwater runoff (operations)	Runoff from existing airport facilities	National Pollutant Discharge Elimination System (EPA) for industrial site runoff	

Source: McFarland Johnson, Inc.

National Environmental Policy Act (NEPA)

NEPA was enacted to ensure information on possible environmental impacts from any federal (or federally funded) action is made available to public officials and citizens before decisions are made and actions are taken. NEPA requires that the federal funding agency project sponsor, which is normally FAA for airport projects, document potential impacts to a broad range of resources. NEPA also requires that the “significance” of impacts be determined. Significance is based on the context and intensity of the activity and the impact to environmental resources. The kinds of documentation required include the following:

- A project is “categorically excluded” from further NEPA documentation if the project falls within specific categories of actions outlined in FAA Order 5050.4B or 1050.1E. The findings are documented in a Categorical Exclusion, which can take one of two formats: simple statement or a full checklist submission. In 2014, FAA issued a Standard Operating Procedure with standardized guidance and format for Categorical Exclusions. It may be found here: <http://www.faa.gov/airports/resources/sops/media/arp-SOP-500-catex.pdf>.
- If the significance of impacts is uncertain or likely to exist, an Environmental Assessment (EA) is prepared. Guidance for preparing EAs is provided in the following FAA documents:
 - Order 5050.4B: National Environmental Policy Act Implementing Instructions for Airport Projects
 - Order 1050.1E: Environmental Impacts: Policies and Procedures
 - The FAA’s Airport Environmental Desk Reference provides comprehensive guidance for compliance with federal environmental requirements for airport actions. It also provides the requirements for whether an impact is significant or not. It does not address state and local permitting. The Environmental Desk Reference may be found at this link: http://www.faa.gov/airports/environmental/environmental_desk_ref/media/desk_ref.pdf
- If the project is expected to result in significant impacts, an Environmental Impact Statement (EIS) is prepared. Guidance for preparing this document is available in FAA Orders 5050.4B and 1050.1E cited above.

The range of resources that must be considered in preparing FAA NEPA documents includes:

- Air quality
- Coastal resources
- Compatible land use

- Construction impacts
- Farmland soils
- Fish, wildlife and plants
- Rare species
- Floodplains
- Hazardous materials
- Pollution prevention
- Solid waste
- Historical, architectural, and archeological resources
- Light emissions and visual impacts
- Natural resources and energy supply
- Noise
- Secondary (induced) impacts
- Socioeconomic impacts
- Environmental justice
- Children’s health and safety risks
- Water quality
- Wetlands
- Wild and scenic rivers

Wetland Permitting

Wetlands are aquatic and semi-aquatic environments such as forested swamps, marshes, and bogs. Wetlands need not have standing water to be regulated under state and federal laws. Wetlands, streams, rivers, ponds, and lakes are all regulated under various laws. In NH, only a “Certified Wetland Scientist” (certified by the NH Joint Board of Licensure) is qualified to delineate (define the borders of) wetlands.

Impacts to these resources may occur during construction of airport facilities, tree clearing, or during any disturbance of the ground. Replacement of existing culverts will typically require some kind of permit. Airport management should be aware of wetland areas on their airport and ensure that any disturbance to the wetland are kept to a minimum except where required for safety and permits have been first obtained.

State Wetland Permit

Wetlands are regulated under federal (Clean Water Act) and NH (RSA 482-A, Fill and Dredge in Wetlands) law. Some municipalities regulate wetlands, wetland setbacks, and vegetated swales through zoning. The NH Department of Environmental Services (NHDES) implements the state wetlands law and issues permits where appropriate for dredge and fill activities in wetlands. There is no minimum threshold for impacts to wetlands that require a permit under state law. NH state wetland permits are categorized as “minimum,” “minor,” or “major,” based on size and on certain other criteria, such as the presence of rare species or stream crossings over a certain size. Size thresholds are listed below.

Permit Type	Size Threshold	Fee
Minimum	<3,000 sf	\$200 flat fee
Minor	3,000 sf < 20,000 sf	\$0.20/sf
Major	>20,000 sf	\$0.20/sf

Source: NHDES

Waiting time between application submission and permit issuance is set by law at 75 calendar days for projects with under an acre of impact and 105 days for projects with over an acre, from the time NHDES formally accepts a complete application. These deadlines are extended if NHDES needs additional information to complete their review.

NH also allows municipalities to designate wetlands as “prime wetlands” based on a thorough analysis of features such as a wetland’s size, functional value, presence of rare species, or other factors. Once NHDES approves the designation, prime wetlands receive a higher level of protection than other wetlands. Activities within the 100-foot buffer zone around prime wetlands are also regulated. Wetland areas have been given this designation at several airports in the state. For example, Laconia Municipal Airport has not been able to complete the closure of their security/wildlife fence near the Runway 26 end as the wetland area at this end of the runway has been designated as a prime wetland. As such, people and wildlife are able to get onto the runway and taxiway areas, creating a safety hazard and security issue for the airport.

Mitigation

In NH, wetland impacts over 10,000 square feet, inclusive of all major impact projects, require mitigation under state law. Mitigation may take the form of restoration or creation of new wetlands, preservation of existing wetlands, or payment into an “Aquatic Resource Mitigation” Fund that is managed by NHDES in lieu of other options. Airports must attempt to fund creative, restoration, and /or preservation mitigation before the in lieu payment to the Aquatic Resource Mitigation (ARM) fund can be accepted.

Federal Wetland Permit (Section 404)

In general, projects involving less than three acres of wetland impact are permitted under a State Programmatic General Permit (SPGP) with the U.S. Army Corps of Engineers (ACOE), the federal agency that regulates wetlands. Projects permitted under the SPGP do not require a separate submission to the ACOE. Projects with over three acres of impact, or that exceed certain other criteria, require an individual application be submitted to the ACOE.

Information about the state wetland permitting program can be found here: <http://des.nh.gov/organization/divisions/water/wetlands/index.htm>

The NH Programmatic General Permit issued by the ACOE can be found here: <http://www.nae.usace.army.mil/Portals/74/docs/regulatory/StateGeneralPermits/NHPGPAug2013.pdf>

Rare Species

Rare species are protected in NH under state and federal laws. NH RSA 217-A and 212-A protect several hundred plants, insects, fish, reptiles, amphibians, mammals, and birds from taking (a.k.a. killing), transporting, possessing, or sale. Airport projects that could affect rare species include airport construction or tree clearing, for example. There is no stand-alone state permit for state-listed rare species. Projects that involve wetland or Alteration of Terrain permits from the NH Department of Environmental Services (NHDES) require clearance from the NH Natural Heritage Bureau (NHNHB), which tracks occurrences of rare plant and animal species. For rare animals, impacts to animal habitat may be regulated in addition to direct impacts to animal species. This is also true for rare plants.

NHNHB maintains an online database that can be checked to verify whether or not rare species have been known to occur at the site. If a rare species is known to occur at the site, a \$25 payment is required to acquire additional information about the species occurrence. If no rare species are known to occur, a letter can be printed clearing the project from impacts to rare plant and animal species. The NH Fish and Game Department non-game program tracks rare wildlife and provides recommendations when a rare animal is known to be present at a site where a project is planned. The NHNB website is: <http://www.nhdfi.org/about-forests-and-lands/bureaus/natural-heritage-bureau/services/>

In addition to state laws, the federal Endangered Species Act of 1973 (ESA) protects species that are rare throughout the United States. The U.S. Fish and Wildlife Service (USFWS) manages the ESA for both rare plants and animals. An online tool developed by USFWS provides users a means for identifying federally listed species that might be in project area: <http://ecos.fws.gov/ipac/wizard/chooseLocation!prepare.action>

There are 11 federally listed plants and animals in NH, and many more state-listed species. All those that are federally listed are also state-listed. Federally listed species are listed by town at the following website: <http://www.fws.gov/newengland/pdfs/NH%20species%20by%20town.pdf>

Projects that would involve impacts to federally listed species require additional steps such as preparation of a Biological Assessment. Typically, a botanist, wildlife specialist, or other natural resource consultant would complete the consultation process associated with a Biological Assessment.

Concord Municipal Airport provides a unique example of how airports can support rare and endangered species. The airport maintains grass areas on the airport for the endangered Karner Blue butterfly. Working with NHDES, the grasslands are maintained and only mowed during certain times to allow lupine plants, which are a necessary part of the Karner Blue butterfly's life cycle, to grow. The airport and NHDES have been successful in maintaining the Karner Blue butterfly population.

Historic Resource Approvals

Historic resources may include bridges, buildings, structures, objects, sites, archeological resources, and historic districts that are at least 50 years old or meet certain other criteria. Archeological resources include both pre-contact Native American resources and more recent agricultural or industrial archeological artifacts and sites. The significance of historic resources may be recognized nationally by being on the "National Register of Historic Places," an official list of historic places that have been deemed worthy of preservation. Resources with statewide significance may be included on the "State Register of Historic Places." The National Historic Preservation Act (16 USC 470) provides for the preservation of historic resources, even those that are not on the Register, but are eligible for listing on the Register, which must be evaluated for federally funded airport projects. Section 106 of the law requires that federal undertakings (actions involving federal funding, permits, or property) must take into account the effect on historic properties. Because all wetland impacts involve a federal wetland permit, anything that requires a wetland permit also requires clearance under Section 106, at least for those parts of the project that involve wetland impacts. A project does not need to have federal funding to require clearance under Section 106.

Section 106 is administered in NH by the State Historic Preservation Officer, housed at the NH Division of Historic Resources (NHDHR). There is no permit issued for Section 106 compliance. The procedure for determining Section 106 compliance is as follows:

- Determine what the Area of Potential Effect (APE) is. The APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.
- Identify properties listed on or eligible to be listed on the National Register (NR-eligible) within the APE. Procedures for this step are detailed in 36 CFR 800.4. In NH, NHDHR has developed a "Request for Project Review" form that helps expedite this process. In most cases, properties must

be at least 50 years old to be NR-eligible. The form can be found here: <http://www.nh.gov/nhdhr/review/rpr.htm>. Before submitting the form, NHDHR also requires a visit to NHDHR's office to review files for known historic resources. NHDHR responds to the Request for Project Review within one month.

- Determine if there are any effects to NR-eligible properties. If there are no effects, either because there are no NR-eligible properties or no effects to properties that are NR-eligible, a recommended finding of No Historic Properties Affected is made by the SHPO to the federal sponsor (typically FAA, for FAA funded projects). No further review under Section 106 is necessary. The SHPO will prepare and sign a memo document their findings.
- If there are effects to NR-eligible properties proposed, determine if they are adverse. "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." (36 CFR 800.5) If there are effects, but the effects are not adverse, a finding of No Adverse Effect is made. The finding may include conditions that must be met for there to be no adverse effect, for example, precautions that must be taken during construction. It is the responsibility of Airport Block Grant Program, FAA and the airport to ensure that such conditions are met. The SHPO will prepare and sign a memo document their findings.
- If there are adverse effects proposed, a finding of Adverse Effect is made. The Airport must evaluate alternatives that would avoid adverse effects. If no such alternatives exist, the Airport must minimize or mitigate the adverse effect. Typically, a Memorandum of Agreement is signed by Airport Block Grant Program, FAA, the Airport, and SHPO, that stipulates mitigation measures for the adverse effects.

Historic resources are also protected under Section 4(f) of the Department of Transportation Act of 1966. Section 4(f) protects historic resources, parks, and wildlife refuges. More information can be found in FAA's Environmental Desk Reference: http://www.faa.gov/airports/environmental/environmental_desk_ref/media/desk_ref.pdf.

Recommendation: The information presented in this section is of use to the NHASAP airports and provides a general understanding of the process and can be shared with the airports through various presentations by the BOA or NH airport associations. Additionally, the BOA should work with the airports to ensure that any wetlands mapping they have is up to date and if not, work with the airports to update the wetland delineation. Finally, the BOA should investigate the potential to develop rules that exempt safety related projects within prime wetlands. The BOA should promote a balanced approach that meets regulatory requirement while maintaining safety for airports.

The BOA should work with the system airports to ensure their environmental information is up to date. The BOA should also investigate the potential to exempt safety related projects in wetland that have been designated as prime wetlands.

8.3.11 AIRPORT SELF INSPECTIONS

Maintaining and ensuring airfield safety requires a successful airport self-inspection program. Regular inspections are the main method used to identify and address issues on the airfield that should be resolved to ensure proper safety. Inconsistencies in an airport's physical condition are often the most common airport safety shortfall and most of these items can be avoided through basic preventative maintenance schedules and proper self-inspection procedures. Therefore, regular self-inspections are integral to maintaining airfield safety and ensuring compliance with standards. **Appendix 8-A** provides a scalable guide to assist airports in effectively conducting self-inspections. During inspections of the airfield, airport employees who conduct self-inspections inspect physical facilities, such as: Pavement, Runway Safety Areas, Pilot Visual Aids, Wind Direction indicators, NAVAIDS, construction areas, and nighttime conditions. It is recommended that these inspections be performed daily or weekly (depending on the complexity of the facility) and recorded in an airport logbook to provide standardized documentation such that airport maintenance personnel can review the checklists and take corrective action. Doing so helps minimize risk to both airport users and sponsors. Within **Appendix 8-A** are thorough descriptions on the type of inspections to be performed, specific areas that should be addressed, and how often, or when, self-inspections should take place.

Airport self inspection tools are provided in Appendix 8-A to assist airports in their day-to-day operations of the airport.

Appendix 8-A also includes tools made up of checklists for use by airports. Since the self-inspection appendix and the associated checklists will be distributed to all of the airports within the state, and the individual airports vary in size and function, it is likely that some of the items on the checklists may not apply to every system airport. The checklists have been developed in a manner that allows them to be tailored as necessary.

Recommendation: The BOA should distribute the Airport Self Inspection tool among airport system managers and encourage them to tailor the checklist according to their specific airport.

8.3.12 AIRPORT MANAGEMENT TYPES AND BEST PRACTICES

Airports have a particularly unique role in serving the public good and as public entities, are subject to budget restraints, regulation standards, and stringent public safety requirements that must be met at all times. The constant development, regulatory changes, and operational variations of the airport system can further complicate aviation management because it is controlled not only by federal, state, and local governance entities, but also by the overall economy and a comprehensive set of regulations, laws, statutes, and funding restraints. Therefore, the dynamic nature of airports, including operations and commerce, creates an environment that requires proper oversight to remain viable. Consequently, airport management must be prepared to respond to change accordingly.

Throughout their development, airports in the United States have traditionally been operated by municipal or state governments on a non-profit basis (i.e. not managed by, or as, a private business) with the intention of providing a service to the public. Their operational funding is typically broadly characterized as airside or landside, and a portion of capital program funding generally comes in the form of project grants.

Over the last 20 years, however, this relatively easy model has become more complex. First, many communities have acknowledged that not only do their airports represent a necessary component of transportation infrastructure, but also that the airport is a contributor to local jobs and positive economic impacts to the communities they serve. A second major complexity is that revenue and funding sources necessary to maintain and improve an airport have become more difficult to understand and manage. With these complexities, and needing to be more responsive to changes in the industry, many municipalities seek ways to organizationally position their airports to be as responsive to the free marketplace as possible. This often includes assessing and changing their airport governance model, and finding ways to secure highly qualified airport managers that possess the skills necessary to manage today's complex airport operating environment.

From financial management to the oversight of contracts and leases, airport safety and security, community relations, and compliance with federal grant assurances, facility maintenance, and capital improvements, managers within the NH state airports system are responsible for a wide range of activities. However, these managers have varying degrees of experience and a range of backgrounds. Although some management guidance is available for their use, much of it is dated, focused on specific issues, or intended for larger airports. In 2009 the Airport Cooperative Research Program (ACRP) published a guidebook to provide operators and managers of small airports with current, comprehensive advice on resources and techniques that can be applied to meet their responsibilities. This can be found at: http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_016.pdf

Appendix 8-A applies information found within the ACRP report and provides various airport management scenarios/structures in a matrix format to help individual airports assess their current model and identify potential ways to implement airport best practices.

Recommendation: The BOA should encourage system airport managers to assess their current management structure and practices on a regular basis and review the Airport Management Best Practices tool and consider models or techniques that could be implemented to improve airport management effectiveness at their facilities. They should also take advantage of emerging technologies and remain flexible to be able to address local and industry needs.

8.3.13 UNMANNED AERIAL SYSTEMS (UAS)

Unmanned Aerial Systems (UAS), often referred to as Unmanned Aerial Vehicles (UAVs), remotely piloted aircraft, or more commonly drones, are remotely piloted vehicles equipped with sensors and monitors, and are the fastest growing aerospace technology in the world today. Presently, unmanned aircraft are flying in the national airspace system under very controlled conditions, performing border and port surveillance by the Department of Homeland Security, helping with scientific research and environmental monitoring by National Aeronautics and Space Administration and National Oceanographic and Atmospheric Administration, supporting public safety by law enforcement agencies, helping state universities conduct research, and supporting various other missions for public entities.

The efficiency of operating an airport is embedded in the management structure of the airport.

The BOA and airports should continue to monitor UAS development and identify action or opportunities as change occurs in regulating and operating UAS' with the National Airspace System.

Operations range from ground level to above 50,000 feet, depending on the specific type of aircraft. However, UAS operations are currently not authorized in Class B airspace, which exists over major urban areas and contains the highest density of manned aircraft. The use of UAS is a rapidly evolving and dynamic sector of aviation. In recent years, UAS have become an emerging field in civil and commercial applications. Their need in industries such as: surveillance, reconnaissance, mapping, cartography, homeland security, traffic monitoring, inspection, rescue, fire detection, and agricultural imaging, are just a few of the many application domains that UAS can significantly impact. When first introduced, these systems were primarily utilized in military operations, but today these systems have been adapted for civilian application with unlimited potential for their use.

There are currently three types of unmanned aircraft system operations: Civil, Public, and Model Aircraft. Obtaining a Special Airworthiness Certificate in the experimental category for a particular UAS is currently the only way civil operators of unmanned aircraft can access the National Airspace System. Experimental certificate regulations preclude carrying people or property for compensation or hire, but do allow operations for research and development, flight and sales demonstrations, and crew training.

Certificates of Authorization are also available to public entities that want to fly a UAS in civil airspace. Common uses today include law enforcement, firefighting, border patrol, disaster relief, search and rescue, military training, and other government operational missions. To allow the FAA to evaluate a proposed operation to see if it can be conducted safely, applicants can make their request through the FAA website at: <https://ioeaaa.faa.gov/oeaaa/Welcome.jspevaluates>.

Recreational use of airspace by model aircraft is covered by FAA Advisory Circular 91-57, which generally limits operations for hobby and recreation to below 400 feet, away from airports and air traffic, and within sight of the operator. In June 2014, the FAA published a federal register notice on its interpretation of the statutory special rules for model aircraft in the FAA Modernization and Reform Act of 2012. The law is clear that the FAA may take enforcement action against model aircraft operators who operate their aircraft in a manner that endangers the safety of the national airspace system.

In today's aviation industry, approved commercial UAS operations are tightly controlled and primarily involve the smallest category UAS; but, as government application and access expands, it will pave the way for a broader and more lucrative non-government UAS marketplace. **Appendix 8-A** provides the BOA and individual airport managers with a tool that provides information, guidelines, and suggested practices relating to UAS. A key component to the tool is a checklist that presents a list of questions that should be considered when inquiries are made (either to the state or a specific airport) to conduct UAS operations.

The FAA has been working for several months to implement the provisions of Section 333 of the FAA Modernization and Reform Act of

2012, “Special Rules for Certain Unmanned Aircraft Systems,” which will allow for commercial operations in low-risk, controlled environments. Since it is anticipated that by the end of 2015 fiscal year, the FAA will publish clearly outlined rules for UAS operations, it is likely that this tool will need to be updated accordingly to include FAA criteria and procedures.

Recommendation: The BOA should distribute the UAS tool among airport system managers and encourage them to familiarize themselves with the evolution of UAS and implement the UAS checklist as necessary.

8.3.14 AIRPORT EMERGENCY PLANS

Airports differ in complexity, and each has unique features. Some are basic facilities serving a more rural environment, while others are more complex and located in more densely populated settings that serve larger communities and major metropolitan areas with residential, industrial, and commercial installations. Airports within the state are either operated by the local government such as a city or county, or are privately owned and open to the public. However, one thing they have in common is that they are all subject to emergencies and incidents.

According to FAA Advisory Circular (AC) 150/5200-31C, Airport Emergency Plan, the FAA identifies an airport emergency as, “any occasion or instance, natural or man-made that warrants action to save lives and protects property and public health.” An airport emergency can occur anywhere, at any time, day or night, under any weather condition, and in varying degrees of magnitude; it can occur instantaneously or develop slowly; it can last only a few minutes or last for days. Emergencies may be caused by a natural occurrence, such as a hurricane or earthquake, or it can be “man-made,” such as a hazardous materials spill, civil unrest, terrorism, major fire, or power outage. Moreover, emergencies of the same type can differ widely in severity, depending on factors such as degree of warning, duration, and scope of impact. The important thing to remember is that while emergencies can seldom be exactly predicted, they can be anticipated and prepared for.

It is likely that many, if not most, of NH’s state airports have experienced emergencies associated with aircraft accidents, power failures, fuel spills, floods, or other adverse events that result from natural processes. Therefore, the state encourages all airports to prepare a written plan that is focused on response and recovery. A template has been developed to help the system airports prepare such a plan. The template can be found in **Appendix 8-A**.

Recommendation: The BOA should encourage system airport managers to assess their current Airport Emergency Plan and utilize the Airport Emergency Template provided in **Appendix 8-A** to update or create an airport emergency plan according to their facility. The plan should be kept readily available and its implementation practiced periodically.

Airport Emergency Plans provide a guide to responding to emergencies. The tool provided in Appendix 8-A will assist airports in developing or enhancing tier airport emergency plans.

8.3.15 TSA GENERAL AVIATION SECURITY GUIDELINES

Since GA airports differ significantly in terms of their perceived security risks, including those emergencies mentioned above, mitigation strategies should be tailored to the likelihood and severity of those perceived risks. By using a risk analysis, a variety of options may exist for mitigating security threats specific to GA airports and flight operations. These include surveillance and monitoring; airport access controls; background checks and vetting of pilots, airport workers, and others having access to GA facilities and aircraft; and physical protections for airports and aircraft.

In 2001, the Transportation Security Administration (TSA) published Security Guidelines for General Aviation Airports to provide owners, operators, sponsors, and other entities charged with oversight of GA airports a set of federally endorsed security enhancements and a method for determining when enhancements may be appropriate. TSA, working collaboratively with key stakeholders, launched this project to develop and disseminate appropriate security guidelines for general aviation airports. A Working Group was established under the Aviation Security Advisory Committee (ASAC) to compile a list of recommended security best practices used throughout the industry. The ASAC delivered its recommendations to TSA in November 2003, upon which all of the ASAC recommendations were incorporated for publication.

The document offers an extensive list of scalable options, ideas, and suggestions for the airport operator, sponsor, tenant, and/or user to choose from when considering security enhancements for GA facilities. Access to this document can be found at: http://www.tsa.gov/sites/default/files/assets/pdf/Intermodal/security_guidelines_for_general_aviation_airports.pdf

Recommendation: In order to promote GA safety, the BOA should encourage system airport managers to review and implement the guidance and procedures found in the links above as appropriate. The BOA should also encourage airport to take advantage of NH's Department of Homeland Security, which offers a free screening of airports for potential security threats and documenting their findings in a letter back to the airport for use when implementing security improvements.

8.3.16 ON-AIRPORT BEST SAFETY PRACTICES

Critical to the effective day-to-day management of any airport is safely conducting activities in aircraft movement areas while minimizing impacts on flight operations. Since many necessary operational, maintenance, and construction activities occur in or near aircraft movement areas, and since many of these activities cannot be eliminated or deferred to time periods when the airfield is not in operation, various practices are available to help ensure the safety of employees and the flying public when these activities occur.

In 2014 the Airport Cooperative Research Board (ACRP) published a Best Practices Manual For Working In or Near Airport Movement Areas. This manual can be found at: http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_101.pdf

NH's TSA will evaluate an airport's security protocol and provide a detailed analysis and recommendations for the airport to implement in the future.

Further, the American Association of Airport Executives (AAAE) has available, an Accredited Airport Executive program committed to the advancement of aviation professionals by granting the A.A.E. designation to those who have demonstrated their ability to handle the responsibilities of airport management, regardless of airport size.

Candidates enrolling in the Accredited Airport Executive program are required to meet a number of pre-requisites and complete three phases. Each phase is carefully designed to test knowledge, comprehension and understanding of aviation management. Study materials, such as the Body of Knowledge modules, can be found electronically for free at: http://www.aaae.org/training_professional_development/professional_development/accredited_airport_executive_program/program_study_materials/bodyofknow.cfm

In addition to study materials, AAAE offers accreditation candidates various review courses and workshops to assist candidates in completing each phase of the program.

A prospective accreditation candidate must:

- Be at least 21 years old;
- Have current affiliate membership in AAAE;
- Have worked full time for at least one consecutive year at a public-use airport (Candidates with prior military experience may be exempt).
- Have either a four-year college degree or eight years of civil airport management experience.

In addition to ACRP and AAAE resources, the FAA has acknowledged the need to make greater efforts and adopt new measures to continue to improve airport and aviation safety. Through the use of what is called Safety Management Systems, or SMS, airports can identify problems before they result in accidents or incidents. Although the implementation of SMS is mostly intended for larger Part 139 airports, airports of varying size and function may find it helpful to review the lessons learned in SMS pilot studies and implement risk mitigation strategies tailored to their specific facility. SMS resources can be found at: http://www.faa.gov/airports/airport_safety/safety_management_systems/

Recommendation: In order to promote on-airport best safety practices, the BOA should encourage system airport managers to review the ACRP, AAAE, and SMS materials; implement the guidance and procedures found in the links above; and consider enrolling in the AAAE accreditation program.

There are a number of publications available to the BOA and airports that provide guidance for on-airport best safety practices. They should be reviewed and incorporated to enhance safety of the system airports.

APPENDIX 8-A