

6. Future System Performance

6.1. INTRODUCTION

This chapter presents the options and recommendations to improve the performance of the Vermont State Airport System (VASP). These options and recommendations respond to facility and service objective shortfalls and geographic gaps in service as presented in *Chapter 5, Current System Performance*, and are described in the following sections:

- Facility and Service Objective Improvement Options
- Geographic Coverage Performance Improvement Options
- Systemwide Improvement Recommendations
- Future System Performance

As described in *Chapter 5, Current System Performance*, system airports have been measured against the minimum facility and service objectives established for their respective roles.

As described in the sections that follow, this chapter presents options and recommendations for airport-specific and system role improvements that align with the goals and objectives for the VASP.

6.1.1. Forecast Implications

The forecast chapter was reviewed to identify trends and projected growth patterns that may inform or change an airport's role in the future. For the state, operations and based aircraft have been stagnant or slightly declining over the past 10 years. Airports like Franklin County, Morrisville-Stowe, and Northeast Kingdom/Newport have displayed more positive trends relative to some of their peers; however, from a system planning perspective, it is not anticipated that any of these airports would achieve the criteria necessary to have category 4 airport recommendations.

6.1.2. Future Performance Methodology

As presented in Chapter 4, the analysis of statewide aviation system airports utilized a weighted sum model to measure the performance of each system airport for the VASP. A weighted sum model is a commonly used method for evaluating a set of data attributes or alternatives based upon multiple criteria. It is well-suited to measure the performance of VASP airports and facility and service objectives criteria established for each VASP Category.

The weighted sum model is designed such that each facility and service objective within each VASP Category is assigned a relative weight that corresponds to the importance of the objective within each Category. **Table 6-1** illustrates the design of the weighted model, and how the relative weight of each objective is used with an assigned value to produce a score for each VASP airport. The points for each airport are the product of the assigned value given to the airport multiplied by the objective's weight.

Table 6-1: System Performance Model Design

Facility or Service Objective ^{1/}	Weight ^{1/}	Assigned Value Range Options			Assigned Value	Points
		Yes	No	Partial		
Runway Length	4%	100	0	50	Yes = 100 →	Yes = 4
					No = 0	No = 0
Full Time Management & Operations Staff On-Site	3%	100	0	50	Yes = 100 →	Yes = 3
					No = 0	No = 0
Full-Service FBO On-Site	5%	100	0	50	Yes = 100 →	Yes = 5
					No = 0	No = 0

Source: McFarland Johnson, 2017.

^{1/} Facility or Service Objectives and Weights shown for illustrative purposes.

When aggregated, the facility and service objectives’ weights for the entire statewide system sum to 100 percent. The performance model then produces point values for each system airport, such that an airport that meets all objectives will score 100 points, with all system airports scoring along the point scale from zero to 100.

Just as this system was used to score the existing performance, it can be used in the same way to model future performance and prioritize projects. The future performance methodology takes the missing points/weight from their category and translates them into system plan recommended projects.

6.2. FACILITY AND SERVICE OBJECTIVE IMPROVEMENT OPTIONS

Utilizing the weighted sum model to measure performance, each VASP airport was placed into one of the four VASP airport role categories. In this way, each role category represents a performance range where each Airport’s score places them in the system. The VSASP performance model scoring ranges are summarized in Table 6-2.

Table 6-2: VASP - Performance Model Score Range

VASP Role	System Performance Model - Score Range	
	Low	High
Category 1 Airports	0	15
Category 2 Airports	16	41
Category 3 Airports	42	90
Category 4 Airports	91	100

Source: McFarland Johnson Analysis, 2018.

Qualitative Adjustments

Also described in *Chapter 5, Current System Performance*, once the system performance analysis was completed, some qualitative adjustments to the assigned values were deemed necessary to reflect the relative value of certain facility and/or service objectives at airports within Categories 2, 3, and 4. The adjustments to certain assigned values for airports in Categories 2, 3, and 4 are required because the minimum facility and service objectives become more demanding in those Categories, and are measured among a greater number of system airports, which have a wider variety of infrastructure, equipment, services, and operational characteristics. One example of qualitative adjustments made to Category 2 airports is to assign partial value (i.e., 50) for airports that have, say, a full-service FBO, full-time airport management, and self-serve fuel but do not meet the minimum runway length requirement of 4,000 feet. Conversely, airports that have a minimum runway length of 5,000 feet are assigned a full value of 100. In this way, the performance model captures the difference between system airports that are a result of having a complimentary mix or combination of facilities and services that – on a statewide basis, and within particular VASP Categories – have a greater impact to the Vermont State Airport System’s performance. The quantitative analysis alone does not account for the unique combination of facilities, services, and operational nuances that truly distinguish some VASP airports from each other and create different levels of value and impact for the statewide system.

The following sections summarize options to improve future performance of the Vermont State Airport System by way of improvements to each category if VASP airport based upon minimum facilities and service objectives that are not currently met.

6.2.1. Category 1 Airports

Table 6-3 provides a summary of Category 1 Airports current performance score, future performance recommendations, which are minimum facilities and services that are not met and points *not* scored, and a future performance score if minimums are met.

Table 6-3: VASP – Category 1 Airports - Minimum Facility and Service Objective Shortfalls

Category 1 Airport	Score
John H. Boylan State Current System Performance Score	7
<u>Future Performance Recommendation</u>	
<ul style="list-style-type: none"> • Basic Terminal Building/Shelter • Part-Time Airport Manager On-Site (Seasonal OK) 	8
<u>Facility and Service Objectives Not Included:</u>	
<ul style="list-style-type: none"> • MoGas or 100LL On-Site – <i>Review Economic Feasibility</i> 	
Future Performance Score	15
Basin Harbor Current System Performance Score	9
<u>Future Performance Recommendation</u>	
<ul style="list-style-type: none"> • Basic Terminal Building/Shelter 	4
<u>Facility and Service Objectives Not Included:</u>	
<ul style="list-style-type: none"> • MoGas or 100LL On-Site - <i>Review Economic Feasibility</i> 	
Future Performance Score	13

Post Mills	12
<u>Future Performance Recommendation</u> • Basic Terminal Building/Shelter	4
<u>Facility and Service Objectives Not Included:</u> • MoGas or 100LL On-Site - <i>Review Economic Feasibility</i>	
Future Performance Score	16

Source: McFarland Johnson Analysis, 2018.

As shown, John H. Boylan State, Basin Harbor, and Post Mills Airports all have a need for a basic shelter/terminal building, and at least seasonal, part-time management on-site would be of value for John H. Boylan State. Additionally, no Category 1 Airport meets the minimum facility objective of having MoGas or 100LL fuel services on site.

6.2.2. Category 2 Airports

Table 6-4 provides a summary of Category 2 Airports current performance score, shortfalls in terms of minimum facilities and services that are not met and points *not* scored, and a future performance score if minimums are met.

Table 6-4: VASP – Category 2 Airports - Minimum Facility and Service Objective Shortfalls

Category 2 Airport	Score
Deerfield Valley Regional Current System Performance	17
<u>Future Performance Recommendation</u> • 100LL Self-Service Aviation Fuel on Site • Full-Time Airport Manager On-Site (Seasonal OK) • Single-Service SASO or Full-service FBO on Site at Least Part-Time	12
<u>Future Performance Improvements (Previous Partial Deficit/Credit)</u> • Part-Time Operations Staff On-Site or Contracted • GPS Instrument Approach Procedure	4
<u>Facility and Service Objectives Not Included:</u> • Primary Runway (≥4,000') – <i>Review Economic and Environmental Feasibility</i>	
Future Performance Score	33
Warren Sugarbush Current System Performance	31
<u>Future Performance Recommendation</u> • GPS Instrument Approach Procedure	4
<u>Future Performance Improvements (Previous Partial Deficit/Credit)</u> • 100LL Self-Service Aviation Fuel on Site • Full-Time Airport Manager On-Site (Seasonal OK) • Part-Time Operations Staff On-Site or Contracted • Single-Service SASO or Full-service FBO on Site at Least Part-Time • Lighted Windsock	4 (Half Credit Unless Year-Round Ops)
<u>Facility and Service Objectives Not Included:</u> • Primary Runway (≥4,000') – <i>Review Economic and Environmental Feasibility</i>	

Future Performance Score		39
<hr/>		
Shelburne	Current System Performance	36
<u>Future Performance Recommendation</u>		
<ul style="list-style-type: none"> • None 		
<u>Future Performance Improvements (Previous Partial Deficit/Credit)</u>		3
<ul style="list-style-type: none"> • Full-Time Airport Manager On-Site (Seasonal OK) • Part-Time Operations Staff On-Site or Contracted • Single-Service SASO or Full-service FBO on Site at Least Part-Time • Lighted Windsock 		(Half Credit Unless Year-Round Ops)
<u>Facility and Service Objectives Not Included:</u>		
<ul style="list-style-type: none"> • Primary Runway (≥4,000') – Paved • 100LL Self-Service Aviation Fuel on Site - <i>Review Economic Feasibility</i> • GPS Instrument Approach– <i>Limited Practicality w/ Turf Runway & Seasonality</i> 		
Future Performance Score		39
<hr/>		
Middlebury State	Current System Performance	40
<u>Future Performance Recommendation</u>		7
<ul style="list-style-type: none"> • Primary Runway (≥4,000') – Paved • GPS Instrument Approach Procedure 		
<u>Future Performance Improvements (Previous Partial Deficit/Credit)</u>		9
<ul style="list-style-type: none"> • 100LL Self-Service Aviation Fuel on Site • Full-Time Airport Manager On-Site (Seasonal OK) • Part-Time Operations Staff On-Site or Contracted • Single-Service SASO or Full-service FBO on Site at Least Part-Time • Lighted Windsock 		
Future Performance Score		56

Source: McFarland Johnson Analysis, 2018.

Both Warren-Sugarbush and Shelburne have the ability and robust peak season to support additional facilities and services as demand warrants; however, as seasonal facilities, improvements are shown as half-credit to reflect the part-time nature of each airport. Should these improvements result in year-round operations, the balance of the points would be awarded. It is anticipated that only Warren Sugarbush has the potential to be a year-round facility in the future as Shelburne does not have a paved landing surface.

6.2.3. Category 3 Airports

Table 6-5 provides a summary of Category 3 Airports current performance score, shortfalls in terms of minimum facilities and services that are not met and points *not* scored, and a future performance score if minimums are met.

Table 6-5: VASP – Category 3 Airports - Minimum Facility and Service Objective Shortfalls

Category 3 Airport	Score
William H. Morse State	Current System Performance 54
<u>Future Performance Recommendation</u>	8
<ul style="list-style-type: none"> • Full-Service FBO On-Site Full Time (Enhanced Service) • Maximize Runway Length (Future Partial Credit) 	
<u>Future Performance Improvements (Previous Partial Deficit/Credit)</u>	14
<ul style="list-style-type: none"> • Full-Time Operations Staff On-Site • Terminal Building with Pilot and Visitor Amenities • 100LL and Jet-A Self Service Aviation Fuel on Site • Runway and Taxiway Edge Lighting • Aircraft /Avionics Maintenance Services On-Site 	
<u>Facility and Service Objectives Not Included:</u>	
<ul style="list-style-type: none"> • Primary Runway (≥5,000') - Review Economic/Environmental Feasibility 	
Future Performance Score	76
Caledonia County State	Current System Performance 54
<u>Future Performance Recommendation</u>	8
<ul style="list-style-type: none"> • Aircraft/Avionics Maintenance Services On-Site • Maximize Runway Length (Future Partial Credit) 	
<u>Future Performance Improvements (Previous Partial Deficit/Credit)</u>	14
<ul style="list-style-type: none"> • Full-Time Airport Manager On-Site • Full-Time Operations Staff On-Site • Terminal Building with Pilot and Visitor Amenities • 100LL and Jet-A Self Service Aviation Fuel on Site • Full Service FBO On-Site Full-Time • Runway and Taxiway Edge Lighting 	
<u>Facility and Service Objectives Not Included:</u>	
<ul style="list-style-type: none"> • Primary Runway (≥5,000') - Review Economic/Environmental Feasibility 	
Future Performance Score	76
Morrisville-Stowe State	Current System Performance 59
<u>Future Performance Recommendation</u>	3
<ul style="list-style-type: none"> • Maximize Runway Length (Future Partial Credit) 	
<u>Future Performance Improvements (Previous Partial Deficit/Credit)</u>	16
<ul style="list-style-type: none"> • Full-Time Operations Staff On-Site • 100LL and Jet-A Self Service Aviation Fuel on Site • Full Service FBO On-Site Full-Time • Runway and Taxiway Edge Lighting 	

<ul style="list-style-type: none"> Rotating Airport Beacon Own/Operate Snow Removal Equipment Aircraft /Avionics Maintenance Services On-Site 		
<u>Facility and Service Objectives Not Included:</u>		
<ul style="list-style-type: none"> Primary Runway (≥5,000') - <i>Review Economic/Environmental Feasibility</i> 		
Future Performance Score		78
<hr/>		
Franklin County State	Current System Performance	59
<u>Future Performance Recommendation</u>		
<ul style="list-style-type: none"> Maximize Runway Length (Future Partial Credit) 		3
<u>Future Performance Improvements (Previous Partial Deficit/Credit)</u>		
<ul style="list-style-type: none"> Full-Time Airport Manager On-Site Full-Time Operations Staff On-Site Terminal Building with Pilot and Visitor Amenities 100LL and Jet-A Self Service Aviation Fuel on Site Full Service FBO On-Site Full-Time Runway and Taxiway Edge Lighting Aircraft /Avionics Maintenance Services On-Site 		16
<u>Facility and Service Objectives Not Included:</u>		
<ul style="list-style-type: none"> Primary Runway (≥5,000') - <i>Review Economic/Environmental Feasibility</i> 		
Future Performance Score		78
<hr/>		
Edward F. Knapp State	Current System Performance	84
<u>Future Performance Recommendation</u>		
<ul style="list-style-type: none"> 100LL AND Jet-A Self-Service Aviation Fuel on Site 		4
Future Performance Score		88
<hr/>		
Hartness State	Current System Performance	90
<u>Future Performance Recommendation</u>		
<ul style="list-style-type: none"> None 		-
Future Performance Score		90
<hr/>		
Northeast Kingdom International	Current System Performance	90
<u>Future Performance Recommendation</u>		
<ul style="list-style-type: none"> None 		-
Future Performance Score		90

Source: McFarland Johnson Analysis, 2018.

Much of improvements for Category 3 Airports consist of improved facilities and services that currently partially meet the facility and service objectives. All of the airports that currently do not meet the 5,000-foot runway length objective have the opportunity and system plan recommendation to maximize runway length in the future to get as close to the objective as economically and environmentally feasible.

6.2.4. Category 4 Airports

Table 6-6 provides a summary of Category 3 Airports current performance score, shortfalls in terms of minimum facilities and services that are not met and points *not* scored, and a future performance score if minimums are met.

Table 6-6: VASP – Category 4 Airports - Minimum Facility and Service Objective Shortfalls

Category 4 Airport	Score
Rutland – Southern Vermont Regional	Current System Performance 97
<u>Future Performance Recommendation</u>	1
<ul style="list-style-type: none"> • Intermodal Transportation Connections at/near Site • Airport Security Measures (SIDA, Badging, Staff etc.) • Aircraft/Avionics Maintenance Services on Site • Rental Cars 	
<u>Future Performance Improvements (Previous Partial Deficit/Credit)</u>	
<ul style="list-style-type: none"> • ARFF • On-Site Concessions or Restaurant • Precision Instrument Approach Procedure (ILS and/or CAT I) 	
<u>Facility and Service Objectives Not Included:</u>	
<ul style="list-style-type: none"> • ATCT – <i>Limited Operations Counts</i> • Improvements to Network/Legacy Airline Service – <i>Currently Limited by EAS Bid</i> 	
	Future Performance Score 98
Burlington International	Current System Performance 100
<u>Future Performance Recommendation</u>	-
<ul style="list-style-type: none"> • None 	
	Future Performance Score 100

Source: McFarland Johnson Analysis, 2018.

There are no specific system plan recommendations for Burlington International Airport. The ongoing (2019) Burlington International Airport Master Plan Update will contain the airport-specific needs. Much of the recommendations for Rutland-Southern Vermont Regional consists of improved ground transportations options.

6.3. GEOGRAPHIC COVERAGE PERFORMANCE IMPROVEMENT OPTIONS

As described in *Chapter 4, Current System Performance*, system airports were also measured in terms of geographic coverage or reach. The geographic coverage is a metric that approximates each airport’s service area, which is defined by 30-minute automobile drive-times (ground access) for general aviation airports and services and a 60-minute drive time coverage for Burlington International. The service area is quantified in terms of land area covered and population and employment centers served. The larger service area for Burlington International recognizes the further distance that the traveling public will drive to utilize scheduled passenger service.

Additionally, as described in *Chapter 2. System Parameters*, performance of the Vermont Aviation System is evaluated by utilizing a 15-nautical mile service area for certain airport infrastructure, equipment, and services available to airborne aircraft. Termed air access coverage in this VSASP, the particular infrastructure coverage evaluated includes runway length, approach capability, weather reporting, and fuel type availability.

Together, the geographic service areas and reach of the Vermont State Airport System represents a performance metrics that can identify any significant gaps that may be addressed by recommendations from this Plan for future airport infrastructure and service improvements.

6.3.1. Ground Access Coverage

As described in *Chapter 4, Current System Performance*, the Vermont State Airport System performs at a high level, reaching approximately 93 percent of the state’s population and 44 (88 percent) of the top 50 employers in the state. **Table 6-7** shows ground access for each VASP Airport Category, combined coverage for the statewide system of all airports, and the impact of coverage by neighboring state airports.

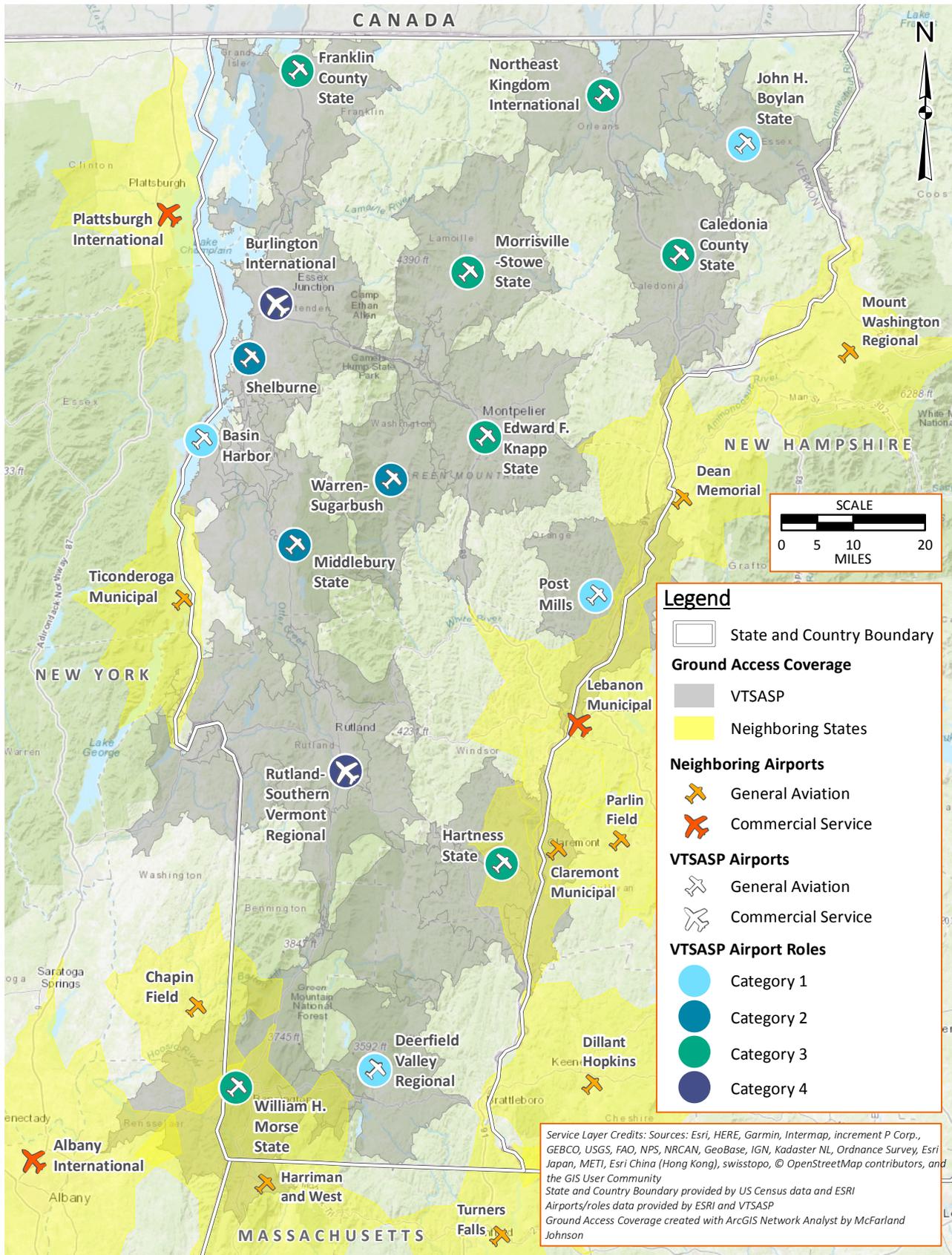
Table 6-7: Ground Access Coverage by VASP Airports and Neighboring State Airports

Airport Category	Land Area Coverage (% Total)	Population Coverage (% Total)	Employment Center Coverage (# of Top 50)
Category 1 Airports	11%	12%	3
Category 2 Airports	10%	35%	19
Category 3 Airports	30%	46%	18
Category 4 Airports	11%	42%	23
VASP Airport Coverage	57%	93%	44
Neighboring State Airport Coverage	5%	6%	1
VASP & Neighboring State Airport Coverage	62%	99%	90%

Source: McFarland Johnson Analysis, 2018.

Ground access coverage by VASP airports and neighboring state airports is illustrated in **Figure 6-1**.

Figure 6-1: Ground Access Coverage



Document Path: K:\VTRANS\18026.12 Vermont SASP\Draw\GIS\Figure 6-1 Ground Access Coverage Even.mxd

As shown by **Figure 6-1**, the airports that have the greatest reach into Vermont in terms of serving underserved areas, people, and employment centers are Dean Memorial and Lebanon Municipal in New Hampshire. While all neighboring state airports combine to serve 1,000 square miles, more than 81,100 Vermont residents, and 4 of the state’s top 50 employers, much of these areas are served by existing VASP airports. Therefore, neighboring state airports provide some duplicate, or competing general aviation services in these areas.

Ground Access Coverage Improvements

Based upon the analysis of ground access provided by VASP airports, the location of and access to VASP airports adequately services statewide population and employment centers. Overall, this means that most residents and businesses are within 30-minutes of a VASP airport. Due to the comprehensive geographic coverage of VASP airports, there appears no immediate need for the introduction of new airport facilities to the statewide system.

Among the areas of the state that are not within 30-minutes of a VASP airport, the most populated area of White River Junction/Hartford is within 30-minutes of Lebanon Municipal Airport in New Hampshire. As such, activity at Lebanon Municipal should be monitored and supported to ensure that services continue such that Vermont residents and business have access to general aviation facilities and services in that area of the state. Should the market demand for airport services or facilities in that part of Vermont increase, Hartness State Airport may be able to expand offerings to capture that demand.

6.3.2. Air Access Coverage

Access to key infrastructure, equipment, and services for airborne aircraft is important because it offers insight into the quality of facilities and services provided to the broader regional and national aerospace system. As such, it is an indication of the system’s usability by a broader range of aircraft in the national fleet (not just those based and operated in Vermont) during all weather conditions. **Table 6-8** shows air access coverage these specific key infrastructure elements.

Table 6-8: Air Access Coverage by VASP Airports

Air Access Coverage Metric	Land Area Coverage (% Total)	Population Coverage (% Total)	Employment Center Coverage (# of Top 50)
VASP Airports - Runway Length ≥ 4,000-feet	42%	57%	31
VASP Airports - Runway Length ≥ 5,000-feet	42%	57%	31
VASP Airports - Precision Instrument Approach	27%	46%	29
VASP Airports - Non-Precision Approach	70%	75%	44
VASP Airports - On-Site Weather Reporting Service/Equipment	73%	78%	42
VASP Airports - AvGas (100LL) Fueling Services	73%	79%	43
VASP Airports - Jet A Fueling Services	57%	69%	39

Source: McFarland Johnson Analysis, 2017.

Figures 6-2 through 6-8 are included from Chapter 4 to illustrate coverage for each key infrastructure component, equipment, or service provided by VASP and neighboring states. Future air access coverage improvement options are summarized in the sections that follow.

Runway Length

Table 6-8 shows that land area coverage for VASP Airports with runways of greater than or equal to 4,000-feet is less than 50 percent of the state. Coverage by Airports with runways of 4,000-5,000 or greater feet is illustrated in Figures 6-2 and 6-3, respectively. These are the same airports.

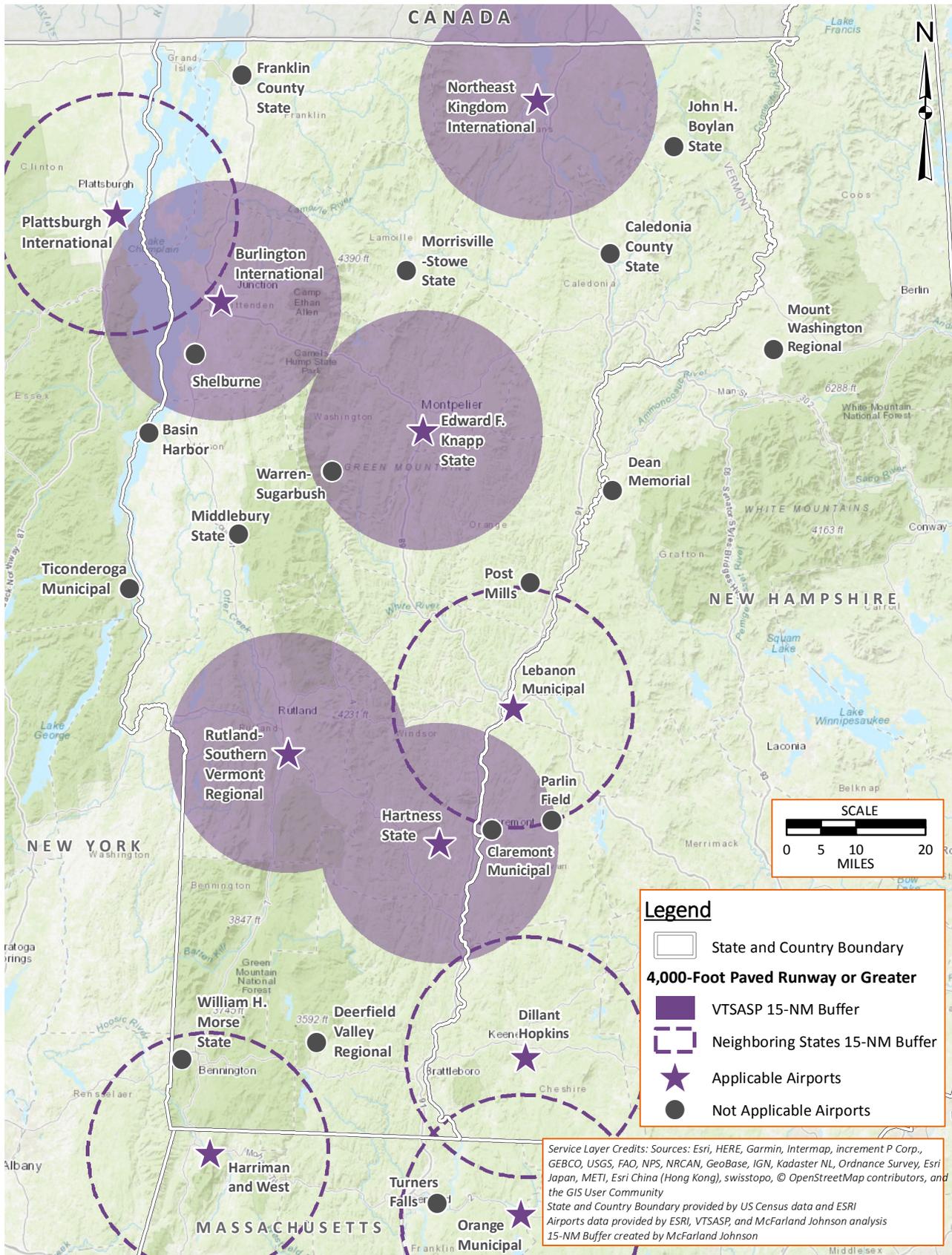
While covering less than half of the state, VASP airports provide service to more than half the population and 62 percent of major employment centers. Additionally, coverage into Vermont by neighboring airports providing these runways (primarily Lebanon Municipal, Harriman-and-West in North Adams Massachusetts, and Dillant-Hopkins in Keene) offers support to residents and businesses. VASP Airports that could be options for improving runway length coverage are summarized in Table 6-9. The table indicates whether the improvement is required by the VASP Airport’s category/role and provides commentary regarding improvement considerations.

Table 6-9: VASP Airport Options/Candidates for Improved Runway Coverage

Runway Length Coverage & VASP Airport	VASP Role Requirement	Coverage Improvement Considerations
Runway Length ≥ 4,000-feet		
<u>Airport Options for Improving Coverage:</u> <ul style="list-style-type: none"> • Caledonia County State • Basin Harbor • Warren-Sugarbush • William H. Morse State 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ 	<ul style="list-style-type: none"> • Shortest extension would be at William H. Morse State (296 feet), which serves a greater variety of based aircraft than other airports listed. • Basin Harbor is closed 6 months/year, there are no based aircraft, and the existing runway is not paved. • Warren-Sugarbush is closed 6 months/year, pavement strength is only 8,500 pounds.
Runway Length ≥ 5,000-feet		
<u>Airport Options for Improving Coverage:</u> <ul style="list-style-type: none"> • Franklin County State • Morrisville-Stowe State • Caledonia County State • William H. Morse State 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ 	<ul style="list-style-type: none"> • Franklin County State would require the longest extension (1,999 feet). • Morrisville-Stowe and William H. Morse State airports each would require about 1,300-foot extensions. • Morrisville-Stowe and William H. Morse serve a greater variety of based aircraft, including multi-engine and helicopters. • Franklin County State services predominantly based single-engine aircraft and ultralights. • Caledonia County State airport serves the fewest existing based aircraft.

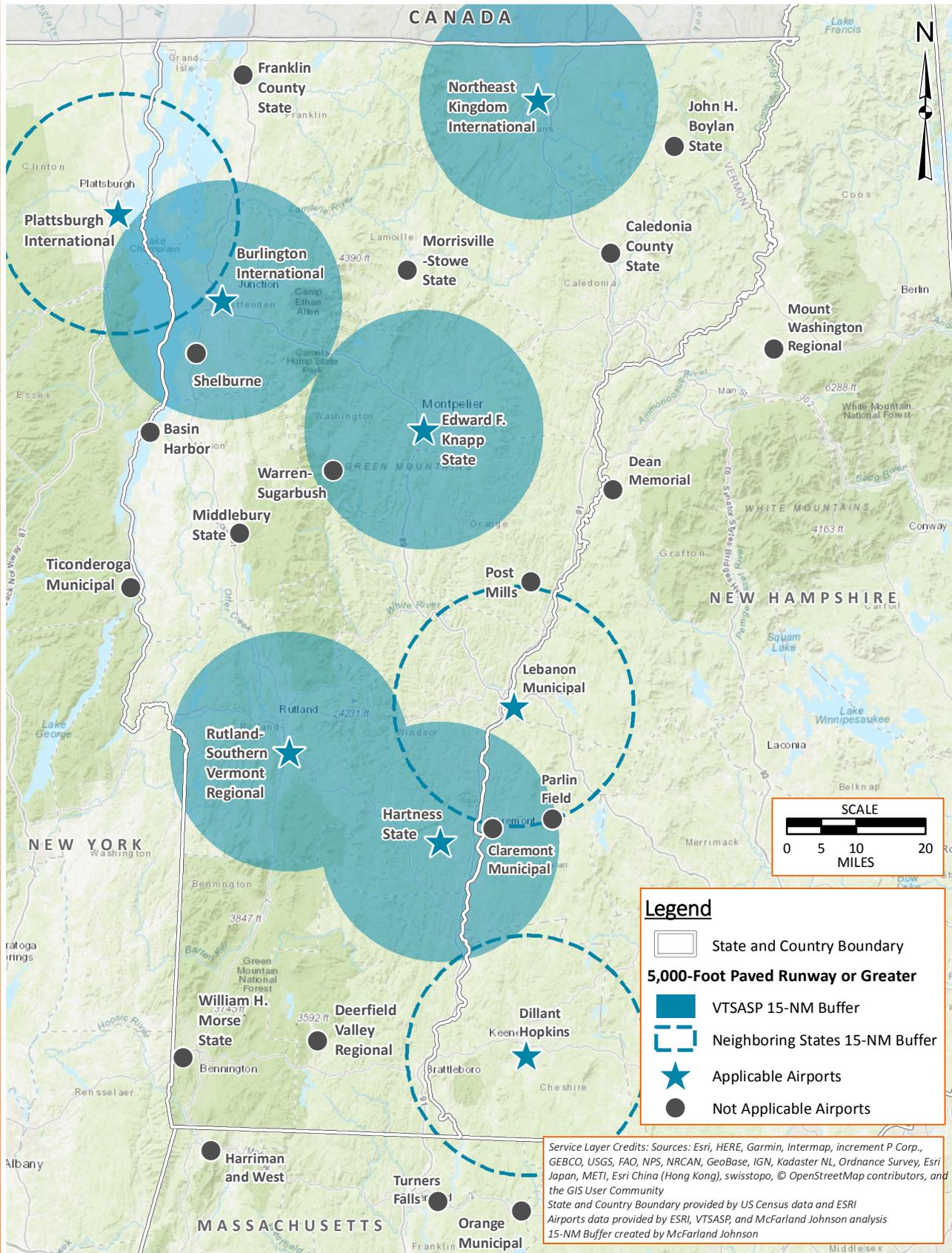
Source: McFarland Johnson Inc., Analysis, 2018.

Figure 6-2: Airports with 4,000-Foot Paved Runway or Greater



Document Path: K:\VTRANS\18026.12 Vermont SASP\Draw\GIS\Figure 6-2 Air Access Coverage 4000.mxd

Figure 6-3: Airports with 5,000-Foot Paved Runway or Greater



Document Path: K:\VTRANS\18026.12 Vermont SASP\Draw\GIS\Figure 6-3 Air Access Coverage 5000.mxd

Approach Capability

Table 6-8 indicates that air access to non-precision approaches provided by the Vermont State Airport System performs very well, serving 70 percent of Vermont, 75 percent of residents, and 88 percent of major employment centers. However, coverage by VASP Airports with precision approach capability is just 27 percent of the state, 46 percent of the population, and just 58 percent of major employment centers. Figures 6-4 and 6-5 illustrate this coverage.

Support provided by neighboring state airports with precision approach capability is offered primarily by Lebanon Municipal, whose service area extends west to Rutland-Southern Vermont Regional. To a lesser extent, precision approaches provided by Dillant-Hopkins and Plattsburgh may be of some benefit to aircraft operating in those regions of the State. VASP Airports that could be options for improving approach capability coverage are summarized in Table 6-10. The table indicates whether the improvement is required by the VASP Airport’s category/role and provides commentary regarding improvement considerations.

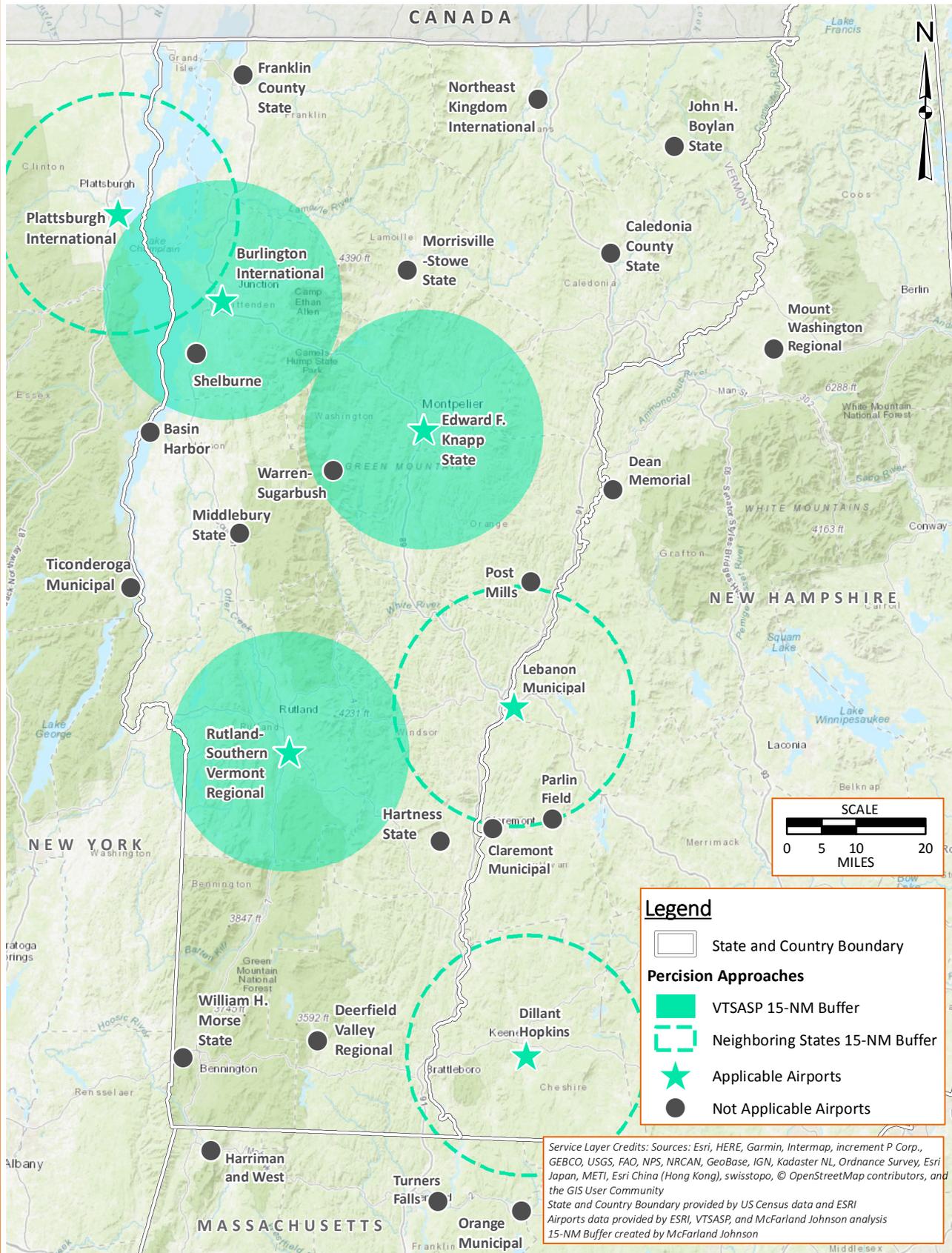
Table 6-10: VASP Airport Options/Candidates for Improved Approach Capability Coverage

Approach Capability Coverage & VASP Airport	VASP Role Requirement	Coverage Improvement Considerations
Non-Precision Approach		
<u>Airport Options for Improving Coverage:</u> <ul style="list-style-type: none"> • Shelburne • Warren-Sugarbush • Middlebury State 	<ul style="list-style-type: none"> ✓ ✓ ✓ 	Aircraft operating in the area of each VASP airport shown at left are in proximity to non-precision approaches offered by adjacent airports, as follows: <ul style="list-style-type: none"> • Shelburne - Burlington International • Warren-Sugarbush - Edward F. Knapp State • Middlebury State - Ticonderoga Municipal and Edward F. Knapp State
Precision Approach		
<u>Airport Options for Improving Coverage:</u> <ul style="list-style-type: none"> • Franklin County State • Northeast Kingdom Int’l. • Morrisville-Stowe State • John H. Boylan State • Caledonia County State • Shelburne • Basin Harbor • Warren-Sugarbush • Middlebury State • Post Mills • Hartness State • William H. Morse State • Deerfield Valley Regional 	Not Required to Meet VASP Category Minimums	While no VASP airport is required to have a precision approach to meet minimum facilities and services established for their category, the low number of VASP airports offering precision approaches (three) indicates a need. A primary consideration for selecting which VASP airports are most appropriate for precision approaches and/or comparable visibility and decision altitude minimums is the critical aircraft and runway length. As defined by the FAA, critical aircraft is the most demanding aircraft type/group that make regular use of the airport. ^{1/} Among the VASP airports at left, Northeast Kingdom has the longest runway (5,300 feet).

Source: McFarland Johnson Inc., Analysis, 2018.

^{1/} Federal Aviation Administration, Advisory Circular 150/5000-17

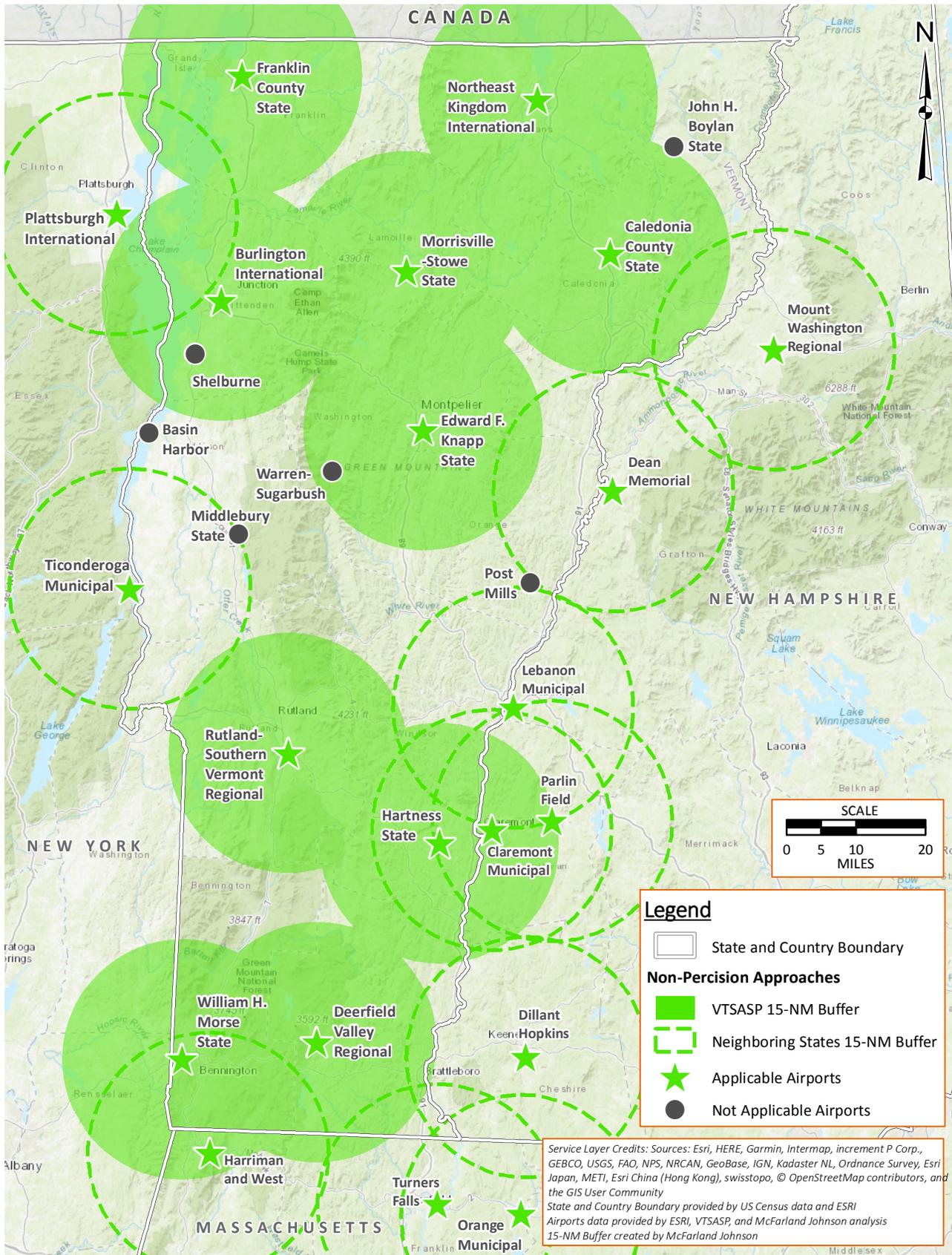
Figure 6-4: Airports with Precision Approaches



Document Path: K:\VTRANS\18026.12 Vermont SASP\Draw\GIS\Figure 6-4 Air Access Coverage Precision Approaches.mxd

Figure 6-5: Airports with Non-Precision Approaches

Document Path: K:\V\TRANS\T-18026.12 Vermont SASP\Draw\GIS\Figure 6-5 Air Access Coverage Non-Precision.mxd



On-Site Weather Reporting

Similar to non-precision approach capability coverage, data shown in Table 6-8 indicates that the Vermont State Airport System performs very well, serving 73 percent of the state, 78 percent of Vermont residents, and 84 percent of major employment centers.

Of the remaining areas unserved, Lebanon Municipal provides the greatest reach of all neighboring state airports. VASP Airports that could be options for improving on-site weather reporting coverage are summarized in **Table 6-11**. The table indicates whether the improvement is required by the VASP Airport’s category/role and provides commentary regarding improvement considerations.

Table 6-11: VASP Airport Options/Candidates for Improved Weather Reporting Coverage

Weather Reporting Coverage & VASP Airport	VASP Role Requirement	Coverage Improvement Considerations
On-Site Weather Reporting		
<u>Airport Options for Improving Coverage:</u> <ul style="list-style-type: none"> • Post Mills • Deerfield Valley Regional • John H. Boylan State 	Not Required to Meet VASP Category Minimums	While no VASP airports are required to have on-site weather reporting to meet minimum facilities and services established for their category, the addition of on-site weather reporting at John H. Boylan State, Post Mills, and Deerfield Valley Regional would improve coverage for airborne aircraft those areas of the state.

Source: McFarland Johnson Inc., Analysis, 2018.

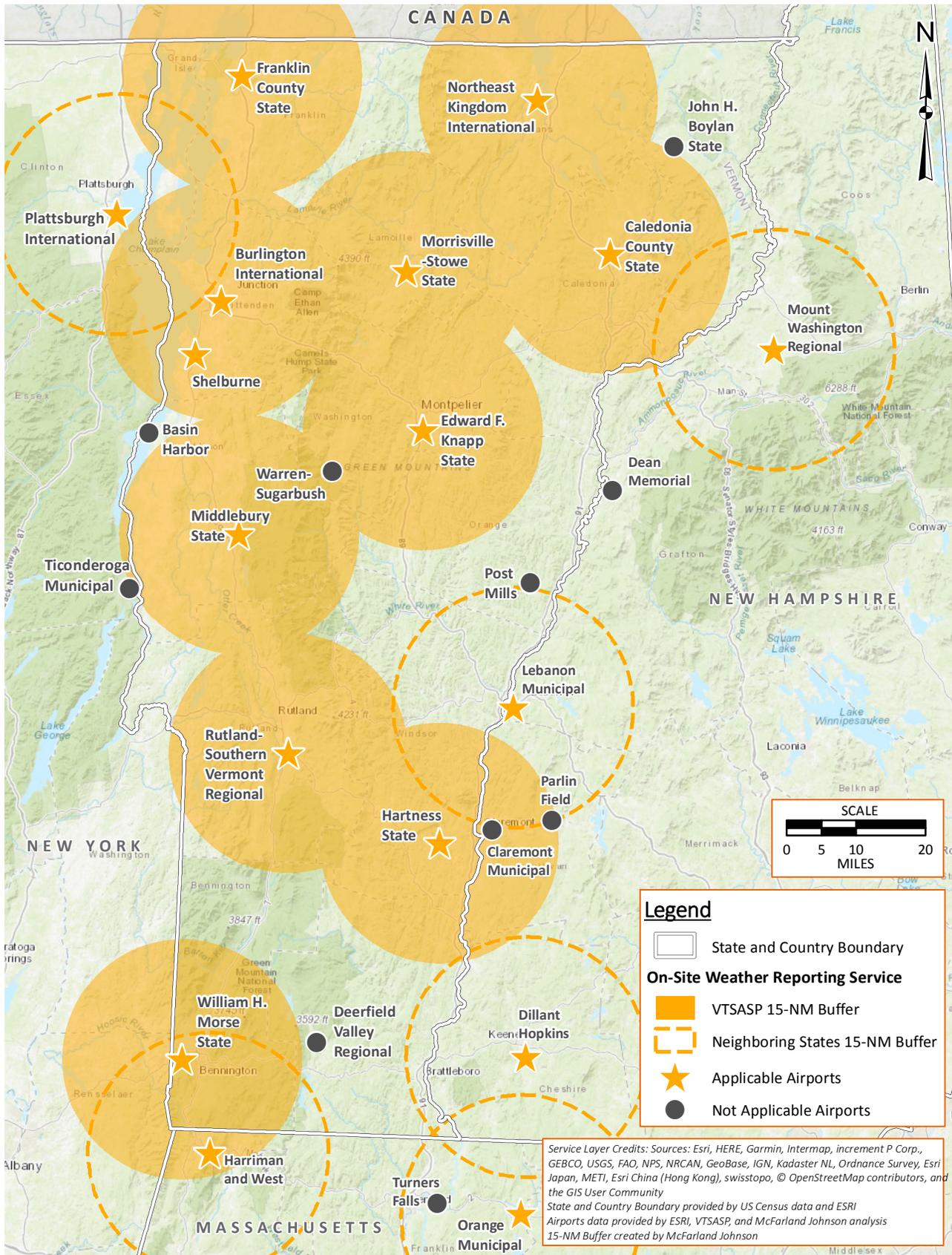
Figure 6-6 illustrates this coverage by VASP Airports providing on-site weather reporting services.

Fueling Services

Finally, data shown in **Table 6-8** shows that air access coverage by VASP airports offering AvGas/100LL fuel service is significant, reaching 73 percent of the State, 79 percent of Vermont residents, and 86 of major employment centers. Five VASP Airports do not offer fueling: Basin Harbor, Shelburne, John H. Boylan State, Post Mills, and Deerfield Valley. However, coverage by other VASP Airports and by neighboring state airports providing 100LL fuel services (primarily Dean Memorial, Lebanon Municipal, and to a lesser extent Harriman-and-West, Turners Falls, Orange Municipal, and Dillant-Hopkins) offers support to residents and businesses that leaves very few areas of the state unserved.

Air access coverage to Jet-A fuel service provided by VASP Airports is provided to 57 percent of the state, 69 percent of residents, and 78 percent of major employment centers. Support provided by neighboring state airports with Jet-A fuel service is offered primarily by Lebanon Municipal, whose service area extends west to Rutland-Southern Vermont Regional and overlaps with Hartness State. To a lesser extent, the southeast corner of the state is supported by service provided by Dillant-Hopkins and Orange Municipal.

Figure 6-6: On-Site Weather Reporting Service



Document Path: K:\VTRANS\18026.12 Vermont SASP\Draw\GIS\Figure 6-6 Air Access Coverage Weather.mxd

VASP Airports that could be options for improving fuel service coverage are summarized in Error! Reference source not found. The table indicates whether the improvement is required by the VASP Airport’s category/role and provides commentary regarding improvement considerations.

Table 6-12: VASP Airport Options/Candidates for Improved Fuel Service Coverage

Fuel Service Coverage & VASP Airport	VASP Role Requirement	Coverage Improvement Considerations
100LL/AvGas Fuel Service		
<u>Airport Options for Improving Coverage:</u> <ul style="list-style-type: none"> • John H. Boylan State • Shelburne • Basin Harbor • Post Mills • Deerfield Valley 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ ✓ 	A primary consideration for selecting which VASP airports are most appropriate for the addition of 100LL/AvGas fuel service is the level of demand that can justify the capital expense and operating and maintenance costs of a fuel farm or mobile fuel truck. The following are the operating schedules of each VASP airport shown at left: <ul style="list-style-type: none"> • Basin Harbor – Open May - October • John H. Boylan State – Unattended • Shelburne – Open daily^{1/} • Post Mills – Irregular schedule • Deerfield Valley Regional - Unattended
Jet-A Fuel Service		
<u>Airport Options for Improving Coverage:</u> <ul style="list-style-type: none"> • Franklin County State • Morrisville-Stowe State • Caledonia County State • William H. Morse State 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ 	Each of the VASP airports shown at left are also candidates for improving coverage by 5,000-foot runways; however, Morrisville-Stowe and William H. Morse serve a greater variety of based aircraft than Franklin County and Caledonia County State airports, including multi-engine and helicopters.

Source: McFarland Johnson Inc., Analysis, 2018.

^{1/}Shelburne Airport provides MoGas, (motor vehicle fuel), which is generally less expensive than AvGas.

Figures 6-7 and 6-8 illustrates fuel services coverage by VASP Airports providing 100LL/AvGas and Jet-A fueling.

Figure 6-7: AvGas/100LL Fuel Service

Document Path: K:\VTRANS\T-18026.12 Vermont SASP\Draw\GIS\Figure 6-7 Air Access Coverage 100LL.mxd

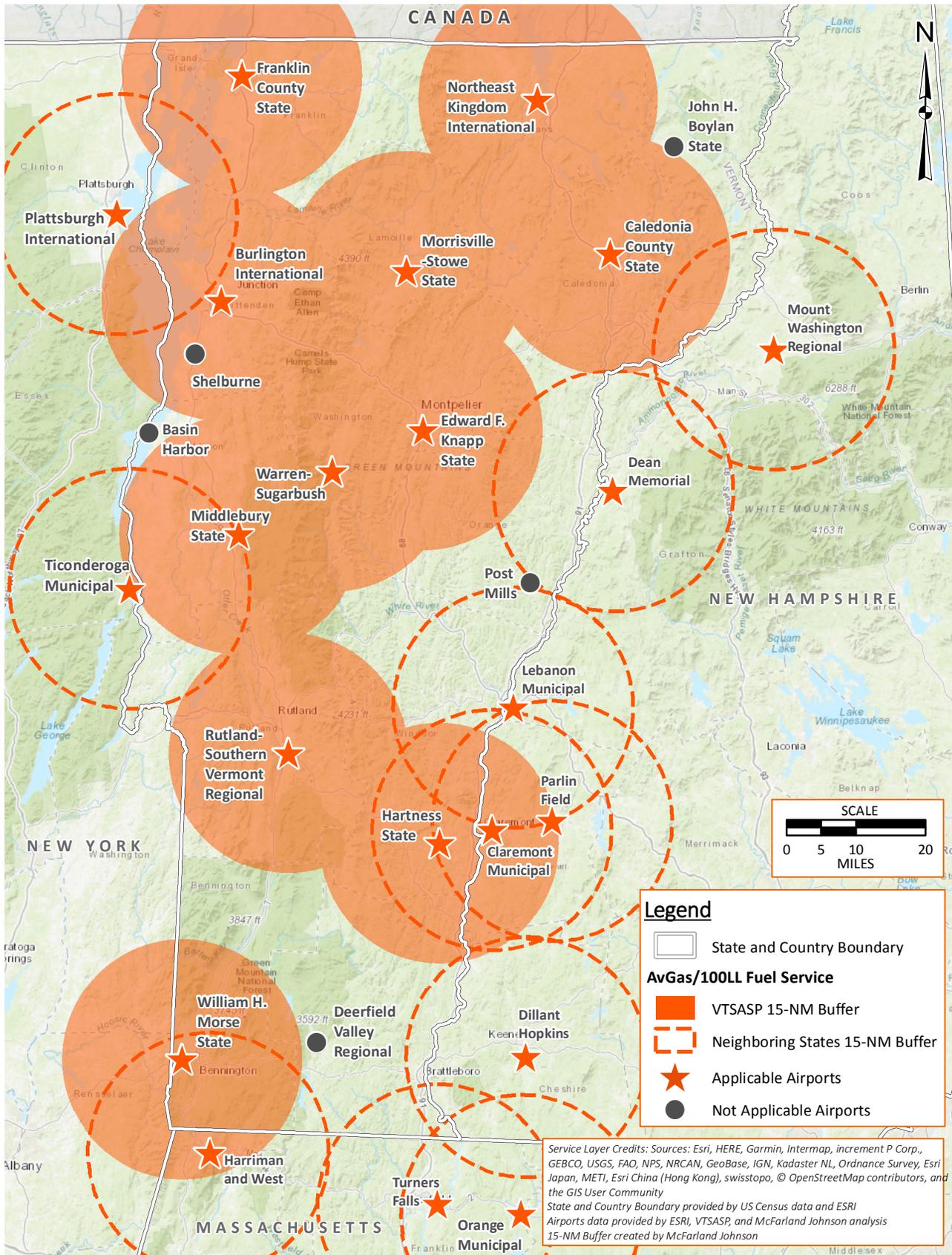
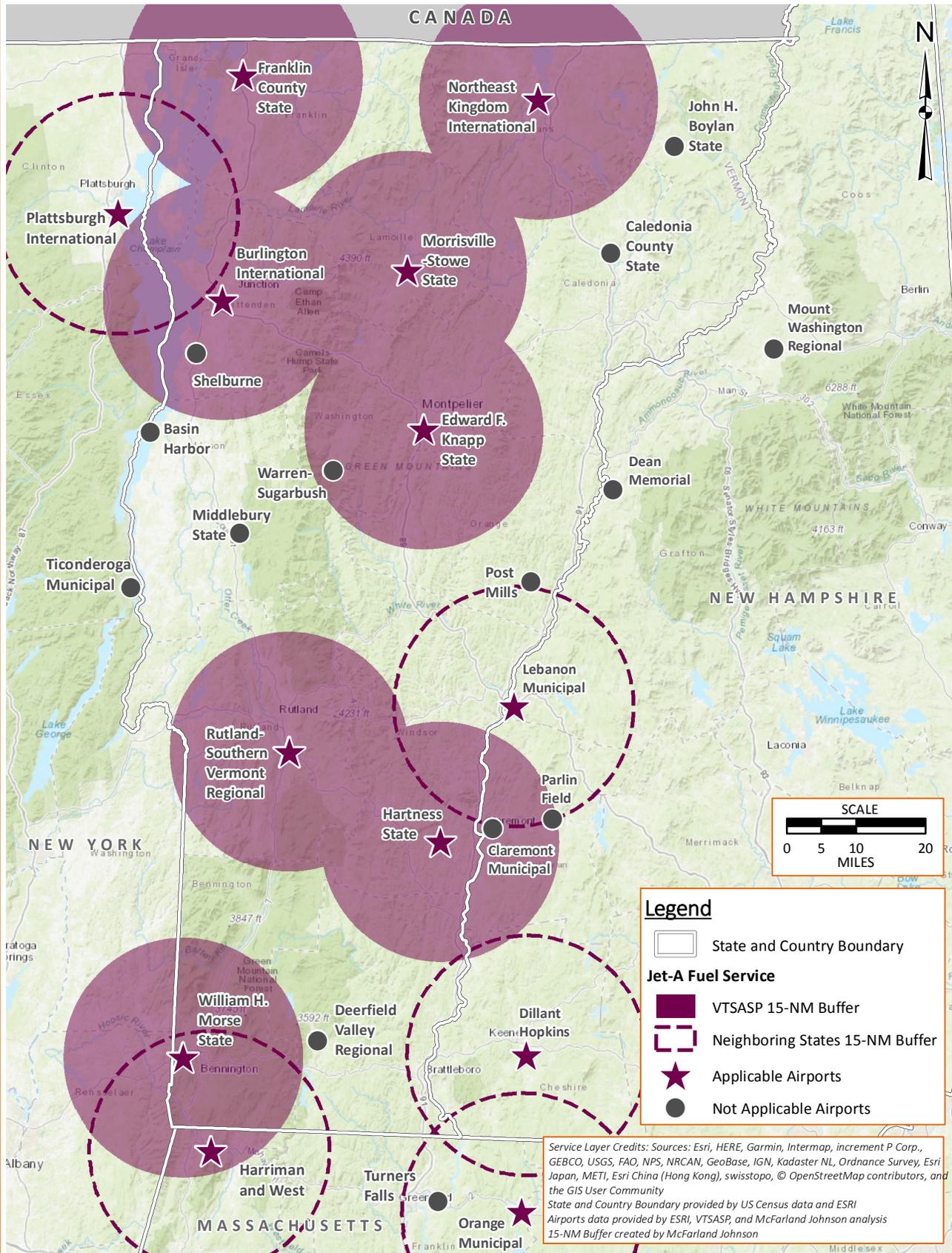


Figure 6-8: Jet-A Fuel Service



Document Path: K:\VTRANS\18026.12 Vermont SASP\Draw\GIS\Figure 6-8 Air Access Coverage JetA.mxd

6.4. SYSTEMWIDE IMPROVEMENT RECOMMENDATIONS

The future performance of the Vermont State Airport System can be enhanced and expanded by making improvements to facilities and services at VASP airports. Generally, the improvement required start with minimum facilities and services established at the outset of this VASP. In this regard, *Chapter 2, System Parameters* set forth minimum facility and services minimums for each airport based upon their VASP category. Beyond these minimums, *Chapter 3 Current System Performance* measured performance by considering the geographic coverage of facilities and services important to aircraft operators and airborne aircraft using the State Airport System. Together, the provision of minimum facilities and services and geographic coverage represents the desired future condition of the State Airport System. However, some improvements require more investment than others, and some improvements should incorporate private investment and leadership – especially at VASP airports that are privately owned.

For these reasons, this section presents an aggregate list of improvements prioritized into three groups based upon the following thresholds as guidance:

- **Top Priority:** Top priority projects are those that place prime importance for each VASP airport to meet facility and service minimums for their respective VASP Category.
- **Mid-Term Priority:** Mid-term priority projects are those that represent a fine-tuning of minimum facility and service minimums, those that improve customer service but are often driven by market demand. For mid-term priority projects that require larger investment, a stronger demand case for the project may be required, or an expanded statewide funding program that can accommodate the provision of expanded facilities and services.
- **Long Term/Ultimate Improvements:** Long term/ultimate improvement projects are those that will require the largest commitment from state and local stakeholders to accomplish, such as terminal buildings, extensive airfield lighting or precision approach projects, runway extensions, ARFF facilities among other large-ticket items. Additionally, long-term/ultimate improvements also include runway extensions at privately-owned airports that are required to meet VASP minimum facility and service requirements but will be difficult to fund without federal funding support.

VASP Top Priority Improvements

Table 6-13: VASP Future Performance Improvements – Top Priority

Airport	Projects to Improve Future Performance
Basin Harbor	<ul style="list-style-type: none"> • Basic Terminal Building/Shelter
Burlington International	<ul style="list-style-type: none"> • To be Determined from Master Plan Update
Caledonia County State	<ul style="list-style-type: none"> • Runway Extension – Maximize Runway Length
Deerfield Valley Regional ^{1/}	<ul style="list-style-type: none"> • Full-Time Airport Manager On-Site (Seasonal OK)
Edward F. Knapp State	<ul style="list-style-type: none"> • N/A
Franklin County State	<ul style="list-style-type: none"> • Runway Extension – Maximize Runway Length
Hartness State	<ul style="list-style-type: none"> • N/A
John H. Boylan State	<ul style="list-style-type: none"> • Basic Terminal Building/Shelter • Part-Time Airport Manager On-Site (Seasonal OK)
Middlebury State	<ul style="list-style-type: none"> • Non-Precision Approach Capability
Morrisville-Stowe State	<ul style="list-style-type: none"> • Runway Extension - Maximize Runway Length • Jet-A Fuel Service
Northeast Kingdom International	<ul style="list-style-type: none"> • Precision Approach Capability
Post Mills ^{1/}	<ul style="list-style-type: none"> • Basic Terminal Building/Shelter
Rutland-Southern Vermont Regional	<ul style="list-style-type: none"> • N/A
Shelburne ^{1/}	<ul style="list-style-type: none"> • Non-Precision Approach Capability
Warren-Sugarbush ^{1/}	<ul style="list-style-type: none"> • Non-Precision Approach Capability
William H. Morse State	<ul style="list-style-type: none"> • Runway Extension – Maximize Runway Length

Source: McFarland Johnson Inc., Analysis, 2018.

^{1/}Privately owned



VASP Mid-Term Priority Improvements

Table 6-14: VASP Future Performance Improvements – Mid-Term Priority

Airport	Projects to Improve Future Performance
Basin Harbor	<ul style="list-style-type: none"> • N/A
Burlington International	<ul style="list-style-type: none"> • To be Determined from Master Plan Update
Caledonia County State	<ul style="list-style-type: none"> • Aircraft/Avionics Maintenance Services On-Site • Full-Time Airport Manager On-Site • Full-Time Operations Staff On-Site • 100LL and Jet-A Self Service Aviation Fuel on Site • Full Service FBO On-Site Full-Time
Deerfield Valley Regional ^{1/}	<ul style="list-style-type: none"> • 100LL Self-Service Aviation Fuel on Site • Single-Service SASO or Full-service FBO on Site at Least Part-Time • Part-Time Operations Staff On-Site or Contracted • GPS Instrument Approach Procedure
Edward F. Knapp State	<ul style="list-style-type: none"> • 100LL and Jet-A Self Service Aviation Fuel on Site
Franklin County State	<ul style="list-style-type: none"> • Full-Time Airport Manager On-Site • Full-Time Operations Staff On-Site • 100LL and Jet-A Self Service Aviation Fuel on Site • Full Service FBO On-Site Full-Time • Aircraft /Avionics Maintenance Services On-Site • Full-Time Airport Manager On-Site
Hartness State	<ul style="list-style-type: none"> • N/A
John H. Boylan State	<ul style="list-style-type: none"> • MoGas or 100LL On-Site
Middlebury State	<ul style="list-style-type: none"> • GPS Instrument Approach Procedure • 100LL Self-Service Aviation Fuel on Site • Full-Time Airport Manager On-Site (Seasonal OK) • Part-Time Operations Staff On-Site or Contracted • Single-Service SASO or Full-service FBO on Site at Least Part-Time • Lighted Windsock
Morrisville-Stowe State	<ul style="list-style-type: none"> • Full-Time Operations Staff On-Site • 100LL and Jet-A Self Service Aviation Fuel on Site • Full Service FBO On-Site Full-Time • Aircraft /Avionics Maintenance Services On-Site
Northeast Kingdom International	<ul style="list-style-type: none"> • N/A
Post Mills ^{1/}	<ul style="list-style-type: none"> • MoGas or 100LL On-Site
Rutland-Southern Vermont Regional	<ul style="list-style-type: none"> • Airport Security Measures (SIDA, Badging, Staff etc.) • Aircraft/Avionics Maintenance Services on Site • Rental Cars • On-Site Concessions or Restaurant

Shelburne ^{1/}	<ul style="list-style-type: none"> • Full-Time Airport Manager On-Site (Seasonal OK) • Part-Time Operations Staff On-Site or Contracted • Single-Service SASO or Full-service FBO on Site at Least Part-Time • Lighted Windsock • 100LL Self-Service Aviation Fuel on Site
Warren-Sugarbush ^{1/}	<ul style="list-style-type: none"> • GPS Instrument Approach Procedure • 100LL Self-Service Aviation Fuel on Site • Full-Time Airport Manager On-Site (Seasonal OK) • Part-Time Operations Staff On-Site or Contracted • Single-Service SASO or Full-service FBO on Site at Least Part-Time • Lighted Windsock
William H. Morse State	<ul style="list-style-type: none"> • Full-Service FBO On-Site Full Time (Enhanced Service) • Full-Time Operations Staff On-Site • 100LL and Jet-A Self Service Aviation Fuel on Site • Aircraft /Avionics Maintenance Services On-Site

Source: McFarland Johnson Inc., Analysis, 2018.

^{1/}Privately owned



VASP Long-Term/Ulimate Improvements

Table 6-15: VASP Future Performance Improvements – Long-Term/Ulimate Improvements

Airport	Projects to Improve Future Performance
Basin Harbor	<ul style="list-style-type: none"> • MoGas or 100LL On-Site
Burlington International	<ul style="list-style-type: none"> • To be Determined from Master Plan Update
Caledonia County State	<ul style="list-style-type: none"> • Terminal Building with Pilot and Visitor Amenities • Runway and Taxiway Edge Lighting • Runway Extension – Maximize Runway Length
Deerfield Valley Regional ^{1/}	<ul style="list-style-type: none"> • Runway Extension – Maximize Runway Length
Edward F. Knapp State	<ul style="list-style-type: none"> • N/A
Franklin County State	<ul style="list-style-type: none"> • Terminal Building with Pilot and Visitor Amenities • Runway and Taxiway Edge Lighting • Runway Extension – Maximize Runway Length
Hartness State	<ul style="list-style-type: none"> • N/A
John H. Boylan State	<ul style="list-style-type: none"> • N/A
Middlebury State	<ul style="list-style-type: none"> • Runway Extension – Maximize Runway Length
Morrisville-Stowe State	<ul style="list-style-type: none"> • Runway and Taxiway Edge Lighting • Rotating Airport Beacon • Own/Operate Snow Removal Equipment • Runway Extension – Maximize Runway Length
Northeast Kingdom International	<ul style="list-style-type: none"> • N/A
Post Mills ^{1/}	<ul style="list-style-type: none"> • N/A
Rutland-Southern Vermont Regional	<ul style="list-style-type: none"> • Intermodal Transportation Connections at/near Site • ARFF Capability • Precision Approach Capability • ATCT • Improvements to Network/Legacy Airline Service
Shelburne ^{1/}	<ul style="list-style-type: none"> • Runway Extension - Maximize Runway Length
Warren-Sugarbush ^{1/}	<ul style="list-style-type: none"> • Runway Extension – Maximize Runway Length
William H. Morse State	<ul style="list-style-type: none"> • Terminal Building with Pilot and Visitor Amenities • Runway and Taxiway Edge Lighting • Runway Extension – Maximize Runway Length

Source: McFarland Johnson Inc., Analysis, 2018.

^{1/}Privately owned

6.5. FUTURE SYSTEM PERFORMANCE

Table 6-16 presents the future performance scores of VASP airports.

Table 6-16: Future Performance Scores and VASP Category

Airport	Current VASP Category	Current Performance Score	Future Performance Score	Future VASP Category
John H. Boylan State	1	7	15	1
Basin Harbor	1	9	13	1
Post Mills	1	12	16	2
Deerfield Valley Regional	2	17	33	2
Warren Sugarbush	2	31	39	2
Shelburne	2	36	39	2
Middlebury State	2	40	56	3
William H. Morse State	3	54	76	3
Caledonia County State	3	54	76	3
Morrisville-Stowe State	3	59	78	3
Franklin County State	3	59	78	3
Edward F. Knapp State	3	84	88	3
Hartness State	3	90	90	3
Northeast Kingdom International	3	90	90	3
Rutland – Southern Vermont Regional	4	97	98	4
Burlington International	4	100	100	4

Source: McFarland Johnson Inc., Analysis, 2018.

