



Vermont State Airport System Plan | Vermont Aviation Advisory Council

March 12, 2018



Developed By
McFarland Johnson

Project Team



VTrans Staff

- Daniel Delabruere- Rail & Aviation Bureau Director
- Paul Libby- Senior Project Manager
- Costa Pappis– Planner

Consultant Team

- Rick Lucas – Project Manager
- Scott LeCount - Lead Planner
- Subconsultants
 - Randal Wiedemann - Economic Impact Study
 - Michael Webber (Webber Air Cargo) – Air Cargo Analysis

SASP Uses and Benefits

- Defines the System of Airports
- Identifies Baseline Performance
- Informs Capital Planning/Programming
- Develops Guidance and Policy
- Creates Tools and Resources for Airport System

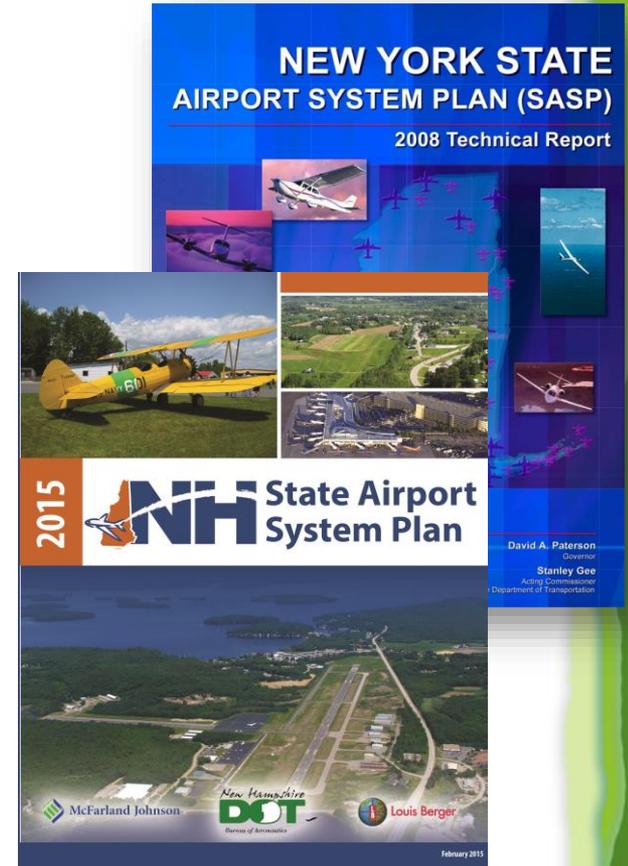


Previous SASP Roles

Project Elements



- Facility and Service Objectives
- Inventory/Data Collection and Forecast
- Existing/Future System Performance
- Develop Capital Needs and Funding Plan
- Economic Benefits Study
- Policy Guidance and Recommendations
- Resources:
 - FAA AC 150/5050-7: The Airport System Planning Process
 - Team Experience: VT, NY, NH, DE, AR, TX

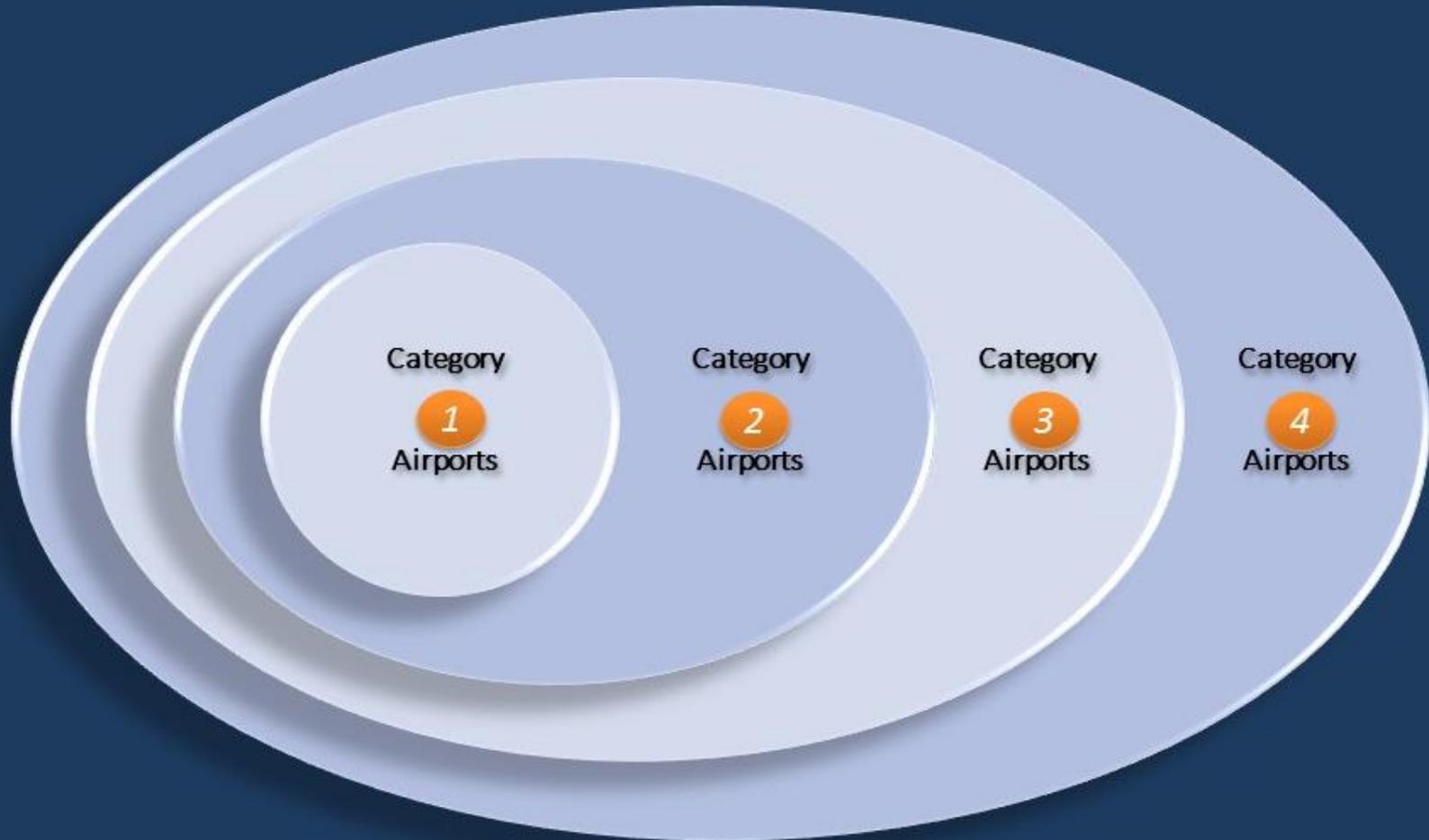


Airport Roles and Facility *Objectives*



Facility & Service Objectives

Vermont Aviation System



System Performance Model



Revised Screening Results

	A	C	I	K	M	O	Q	S	U	W	Y	AA	AC	AE	AG	AI	AK	AM
	EXISTING SYSTEM PERFORMANCE																	
	System Airport																	
Category / Minimum Facility & Service Objective	Basin Harbor	Burlington Int'l	Caledonia County State	Deerfield Valley Regional	Edward F. Knapp State	Franklin County State	Hartness State	John H. Boylan State	Middlebury State	Morrisville-Stowe State	Northeast Kingdom Int'l	Post Mills	Rutland - Southern Vermont	Shelburne	Warren Sugabush	William H. Morse State		
4 AIRPORT INFRASTRUCTURE																		
5 Minimum Facility Standards																		
6 SASP Category 1																		
7 Primary Runway Length (= \leq 2,500') - Paved or Turf	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
8 Part-Time Airport Manager on Site (Seasonal OK)	100	100	100	0	100	100	100	0	100	100	100	100	100	100	100	100	100	100
9 Basic Terminal Building/Shelter	0	100	100	0	100	100	100	0	100	100	100	0	100	100	100	100	100	100
10 Mogas or 100LL Fuel on Site	0	100	100	0	100	100	100	0	100	100	100	0	100	100	100	100	100	100
14	7	15	15	3	15	15	15	3	15	15	15	15	7	15	15	15	15	
15 SASP Category 2																		
16 Primary Runway (= \geq 4,200') - Paved	0	100	0	0	100	0	100	0	0	0	100	0	100	0	0	0	0	0
17 100LL Self-Service Aviation Fuel on Site	0	100	50	0	0	50	100	0	50	50	100	0	100	0	100	0	50	50
18 Full-Time Airport Manager on Site (Seasonal OK)	0	100	100	0	100	50	100	0	50	50	100	0	100	50	50	50	50	50
19 Part-time Operations Staff on Site or Contracted	0	100	50	50	100	50	100	50	50	50	100	0	100	50	50	50	50	50
20 Single-Service SASO or Full-service FBO on Site at Least Part-Time	0	100	0	0	100	50	100	0	0	50	100	0	100	50	50	50	50	50
21 Lighted Windsock	50	100	50	50	100	50	100	50	50	50	100	50	100	50	100	50	50	50
22 GPS Instrument Approach Procedure	0	100	100	50	100	50	100	0	0	50	100	0	100	0	100	0	0	50
27	9	41	29	9	37	27	41	7	23	27	41	9	41	23	25	25		
28 SASP Category 3																		
29 Primary Runway (= \geq 5,000')	0	100	0	0	100	0	100	0	0	0	100	0	100	0	0	0	0	0
30 Full-Time Airport Manager on Site	0	100	50	0	100	50	100	0	50	100	100	0	100	50	0	50	0	50
31 Full-Time Operations Staff on Site	0	100	50	0	100	50	100	0	50	50	100	0	100	50	0	50	0	50
32 Terminal Building with Pilot and Visitor Amenities	0	100	50	50	100	50	100	0	50	50	100	0	100	50	100	50	100	50
33 100LL AND Jet-A Self-Service Aviation Fuel on Site	0	100	50	0	0	50	50	0	0	50	100	0	100	0	0	0	0	50
34 One Full-Service FBO on Site Full-Time	0	100	50	0	100	50	100	0	50	50	100	0	100	50	50	50	0	0
35 Runway and Taxiway Edge Lights	0	100	50	50	100	50	100	0	0	50	100	0	100	0	0	0	0	50
36 Rotating Airport Beacon	0	100	0	0	100	50	100	0	0	50	100	0	100	0	100	0	0	50
37 Own/Operate Snow-Removal Equipment	0	100	0	50	100	100	100	0	50	50	100	0	100	50	0	50	0	50
38 Aircraft/Avionics Maintenance Services on Site	0	100	0	0	100	50	100	0	50	50	100	50	100	50	0	0	0	0
39 GPS Instrument Approach Procedure with Vertical Guidance	0	100	100	0	100	100	100	0	0	100	100	0	100	0	100	0	0	100
40	9	90	47	15	82	54	88	7	36	55	90	12	90	36	31	45		
41 SASP Category 4																		
42 Terminal Building - Full-Time Passenger and/or Cargo Handling Capabilities (TSA, Customs, etc.)	0	100	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
43 Network/Legacy Airline Service	0	100	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0
44 Intermodal Transportation Connections at/near Site	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45 ARFF	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46 Airport Security Measures (SIDA, Badging, Staff etc.)	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47 ATCT	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48 On Site Concessions or Restaurant	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49 Precision Instrument Approach Procedure (ILS and/or CAT I)	0	100	0	0	100	0	0	0	0	0	0	0	0	100	0	0	0	0
50 Aircraft/Avionics Maintenance Services on Site	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51 Rental Cars	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52 Weighted Scores	9	100	47	15	85	54	88	7	36	55	90	12	98	36	31	45		

Airport Scoring Results



<i>Airport</i>	Score	SASP Category
John H. Boylan State	7	1
Basin Harbor	9	1
Post Mills	12	1
Deerfield Valley Regional	15	1
Warren-Sugarbush	31	2
Middlebury State	36	2
Shelburne	36	2
William H. Morse State	45	3
Caledonia County State	47	3
Franklin County State	54	3
Morrisville-Stowe State	55	3
Edward F. Knapp State	85	3
Hartness State	88	3
Northeast Kingdom International	90	3
Rutland – Southern Vermont Regional	98	4
Burlington International	100	4

Inventory *of Existing System*



Inventory Process



- Comprehensive Data Survey

- Facilities, Services, Equipment

- Airside & Landside

- Reconcile 5010 Data vs. Actual

- Serves as a Official Data Record for Other Planning Efforts

- Baseline Data for SASP Analysis



Airport Inventory & Data Survey

Vermont State Airport System Plan

VTRANS, Aviation Program requests your participation in this airport inventory and data survey. This information will be used as the basis for developing the Vermont State Airport System Plan, which is now underway.

Thank you! Your contributions to the Vermont State Airport System and this System Plan are sincerely appreciated!

If you have questions about this survey or the Vermont State Airport System Plan, please contact Scott LeCount of McFarland-Johnson, Inc. (slecount@mjinco.com; 607-238-6470.)

3-letter FAA ID:	BTV	Airport Name:	Burlington International
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SURVEY COMPLETED BY	
Organization Name:	
Name: Kelly Colling	Title/Position: Director of Operations
Telephone: 802-863-2874 ext 206	Mobile Phone: 802-316-2061
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GENERAL AIRPORT INFORMATION	
General Data (in addition to Airport 5010 data)	
Airport Ownership (Name)	City of Burlington

AIRPORT SERVICE & ACCOMMODATIONS	
Fixed Base Operator (FBO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Multiple # FBOs: 1
Courtesy Vehicle/Crew Car	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Based Flight Instruction	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Full-Time <input type="checkbox"/> Part-Time
Airframe Repairs	<input checked="" type="checkbox"/> Turbine <input checked="" type="checkbox"/> Piston <input type="checkbox"/> None
Power Plant Repairs	<input checked="" type="checkbox"/> Turbine <input checked="" type="checkbox"/> Piston <input type="checkbox"/> None
Avionics Repair	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
FAA Part 145 Repair Station	<input type="checkbox"/> Yes <input type="checkbox"/> No
Aircraft Sales	
Aircraft Deicing	
Aircraft Lavatory Disposal	
On-Airport Ground Transportation Access	
Notes:	

AIRCRAFT OPERATIONS ACTIVITY						
Category	Daily	Weekly	Monthly	Seasonal	Never	
Air Taxi	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	
Aircraft Charter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	
Air Cargo	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	
Corporate/Business Activities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	
Emergency Medical	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	
Charity Flights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> When: _____	<input checked="" type="checkbox"/>	
Agricultural Flights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> When: _____	<input checked="" type="checkbox"/>	
Law Enforcement	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	
Skydiving/Banner Tow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> When: _____	<input checked="" type="checkbox"/>	
Flight Training	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	
Military	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	
Search and Rescue/CAP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	
Aerial Inspection	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	
State/Federal Govt. Flights	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> When: _____	<input type="checkbox"/>	

■ Runways

- 5 Runways $\geq 5,000'$
- 5 Paved Crosswind Runways (1 Turf)
- 4 Primary Runways Turf (Island Pond State-Owned)
- 2 Privately-Owned Paved Runways
 - (Deerfield Valley & Warren-Sugarbush)

■ Taxiways

- 3 Airports with Full Parallels, 4 Airports with Partial Parallels
- 5 Airports Connectors/Stubs to Aprons
- 5 Turnarounds

■ Lighting

- 10 Airports Runway Lighting, 8 Airports with REIL, 1 MITL

- **Precision Approaches & Approach Lighting**
 - Burlington International, Edward F. Knapp State, Rutland-Southern Vermont Regional
- **GPS Non-Precision Approaches**
 - 5 Airports
- **Visual Approach Only**
 - 7 Airports
- **Vertical Guidance**
 - 8 Airports with Vertical Guidance Systems (PAPI/VASI)
- **Weather Reporting**
 - 10 Airports with On-Site Equipment (AWOS/ASOS)
- **Visual NAVAIDs**
 - 8 Airports with Rotating Beacons
 - 16 Airports with Wind Indicators (8 Lighted)
 - 10 Airports with Segmented Circles

Landside Facilities & Services



- **Hangars**
 - T-Hangars (42) (Privately-Owned - 97%)
 - Conventional “Box” Hangars (154) (Privately-Owned - 91%)
- **Tie-Downs**
 - 324 Total Spaces (60% Reported for Based Aircraft)
- **Hangar Waiting Lists**
 - 4 Airports Report Waiting Lists (45 Aircraft)
 - Burlington, Franklin County, Middlebury, Morrisville-Stowe
- **Fueling**
 - AvGas/100LL (11); Jet-A (8); None (4)
 - 11 Airports offer After Hours Fuel Service (Self Serve/On-Call)
- **Terminal (12); FBO (10)**
- **Other: Flight Training (8) Maintenance (9) Avionics (4)**

Activity – Based Aircraft



Airport Name	Single Engine	Multi-Engine	Jet	Helo	Other	Military	Total ^{1/}
Basin Harbor	-	-	-	-	-	-	0
Burlington International	62	3	14	1	-	28	79
Caledonia County State	18	-	-	-	-	-	18
Deerfield Valley Regional	5	2	-	7	-	-	7
Edward F. Knapp State	50	2	-	1	-	-	52
Franklin County State	68	1	-	-	5	-	69
Hartness State	19	-	-	-	8	-	19
John H Boylan State	3	-	-	-	2	-	3
Middlebury State	32	1	1	1	1	-	34
Morrisville- Stowe State	18	1	-	-	8	-	19
Northeast Kingdom International	19	1	-	-	-	-	20
Post Mills	-	-	-	-	9	-	0
Rutland - Southern Vermont Regional	29	-	-	-	1	-	29
Shelburne	53	-	-	-	4	-	53
Warren-Sugarbush	-	-	-	-	50	-	0
William H. Morse State	23	2	-	1	6	-	25
Total	399	13	15	11	94	28	427

Activity – Operations



Airport Name	Air Carrier	Air Taxi	GA Local	GA Itinerant	Military	Total
Basin Harbor	-	-	-	2,120	62	2,182
Burlington International	12,972	12,131	19,720	19,736	6,241	70,800
Caledonia County State	-	-	5,800	1,280	300	7,380
Deerfield Valley Regional	-	-	1,800	1,300	-	3,100
Edward F. Knapp State	-	625	14,500	8,000	1,000	24,125
Franklin County State	-	-	5,780	2,815	1,500	10,095
Hartness State	-	222	3,752	2,487	150	6,611
John H Boylan State	-	-	127	264	12	403
Middlebury State	-	-	7,200	2,900	800	10,900
Morrisville- Stowe State	-	127	5,023	954	254	6,358
Northeast Kingdom International	-	-	7,234	1,980	238	9,452
Post Mills	-	10	2,920	1,400	-	4,330
Rutland - Southern Vermont Regional	-	1,104	6,187	5,061	30	12,382
Shelburne	-	-	3,820	416	-	4,236
Warren-Sugarbush	-	-	16,520	1,100	-	17,620
William H. Morse State	-	-	5,625	8,627	125	14,377
Total	12,972	14,219	106,008	60,440	10,712	204,351

Forecasts of Aviation Demand



Airport Past/Future Performance



■ Airport Performance Metrics

- Population; Based Aircraft; Fuel Sales (100LL and Jet A)

■ Vermont State Performance vs. National Trends

- Fuel Sales; Based Aircraft; Hours Flown Benchmark

■ High Growth

- Franklin County (FSO), Northeast Kingdom Int'l (EFK), Burlington Int'l (BTV), Morrisville-Stowe (MVL), and Middlebury (6B0)

■ Baseline Growth

- Hartness (VSF), Shelburne (VT8), John Boylan (5B1), Post Mills (2B9), Deerfield Valley (4V8)

■ Lower Growth

- Caledonia (CDA), Rutland (RUT), William H. Morse (DDH), Basin Harbor (B06), Warren-Sugarbush (0B7)

■ Historic Trends

- -1.33% - 12 year Trend (2005: 581 -> 2017: 448)
- -1.7% - Nationwide 2010-2016 Piston (Single/Multi)

■ Future Projections

- -0.8% Average Annual Growth in Piston
- 1.9% Average Annual Growth in Turbine/Jet

■ Notable Disproportionate Aircraft Type Breakdown

- 33/501 (6.5%) are Jet or Multi, Remainder Single/Glider/Ultralight

Left Unchanged, Vermont Tax Policy Expected to Limit
Turbine/Jet Growth

Fuel Sales Trends (Operations)



■ Jet-A

- 1.43% Statewide 2013-2016 (GA VTrans Airports Only)
- -3.9% Statewide 2006-2016
- Top Performers: FSO, EFK, MVL
- Greatest Declines: DDH, VSF, BTV (Airline Related)

■ Avgas

- 0.64% Statewide 2013-2016 (GA VTrans Airports Only)
- -3.24% Statewide 2006-2016
- Top Performers: VSF, MVL, EFK, BTV, MPV, FSO
- Greatest Declines: CDA, RUT

VT vs. FAA National Forecast



Historic	Vermont	FAA Aerospace
100LL	0.025%	-1.00%
Jet A	-0.01%	0.40%
Based AC	-1.33%	-1.70%

(pistons)

Projected	Vermont	FAA Aerospace
100LL	0.038%	-0.40%
Jet A	0.048%	1.90%
Based AC	-0.626%	-0.80%

(pistons)

VT Aircraft Mix
Consistent with VT
Performance vs.
National Trends
(Higher Piston/100LL)

FAA Aerospace Forecast

- Hours Flown: Piston -0.60%, Turbine 2.4%
- GA Aircraft: Piston -0.80%; Turbine 1.9%

Industry Trends
Favor Jet and
Turbine Growth

Proposed SASP Growth Rates



Operations		
Base		0.42%
High		0.84%
Low		0.21%

Flying Clubs and Fractional Ownership in GA Aircraft Will Allow Operations to Increase While Based Aircraft Decrease

Based Aircraft		
Base		-0.62%
High		0.79%
Low		-1.24%

Decline Represents Retirement or Elimination of Older, Typically Less-Active Aircraft

Based AC W/ Tax Reform		
Base		0.38%
High		1.79%
Low		-0.24%

Current System *Performance*



System Performance Analysis



Minimum Facility & Service Objectives Performance

System Goals

Identifies Facility Targets within each VTSASP Category that Align with System Goals and Highlights Deficits



Geographic Service/Coverage Area Performance

Performance "Reach"

Identifies Land Area, Population, and Economic Centers Served and Highlights Towns/Regions, People, and Businesses of State that May be Underserved

System-Wide Airside & Landside Priorities



Airside

Runways
Taxiways
Lighting
NAVAIDS
Approaches



Landside

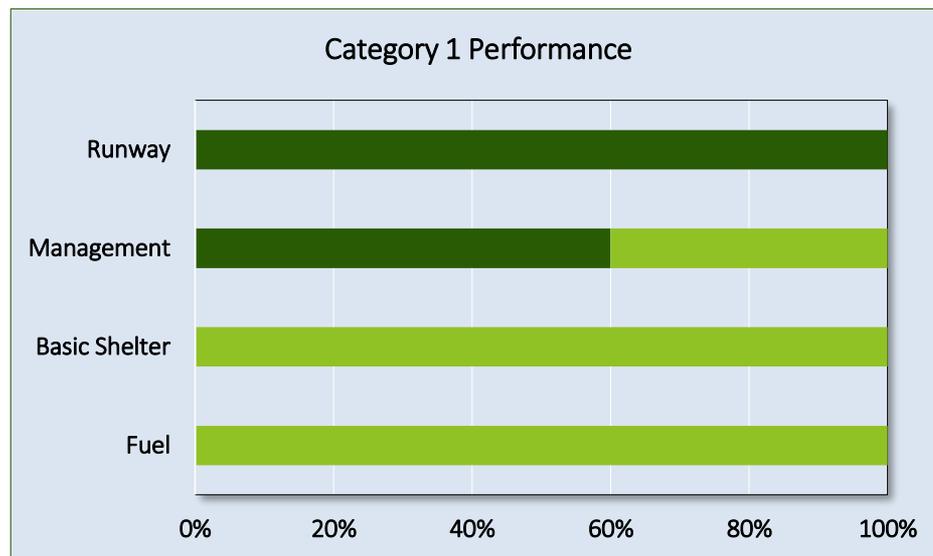
Terminal(s)
Management/Staffing
Aeronautical
Businesses/Services

Current System Performance



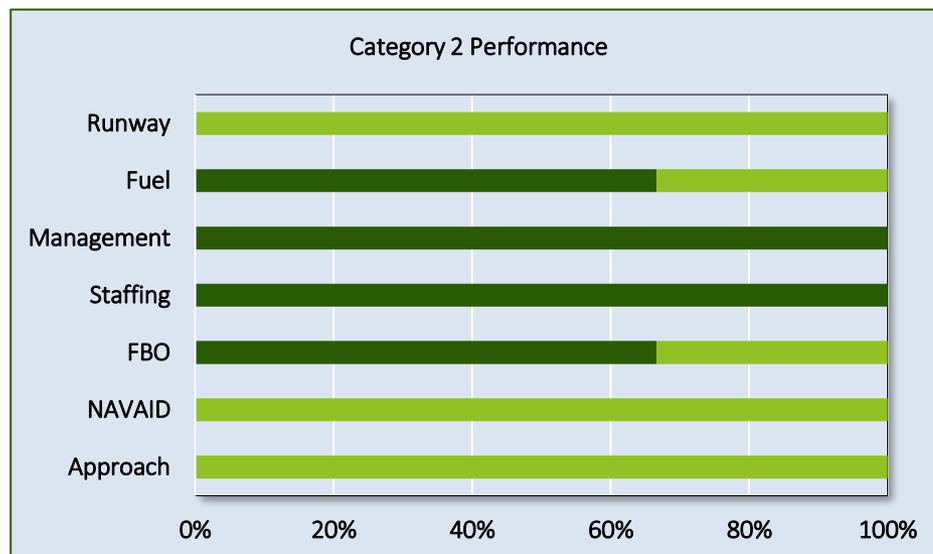
■ Category 1 Airports

- Meet Runway Requirement
- 2 Meet Management Requirement



■ Category 2 Airports

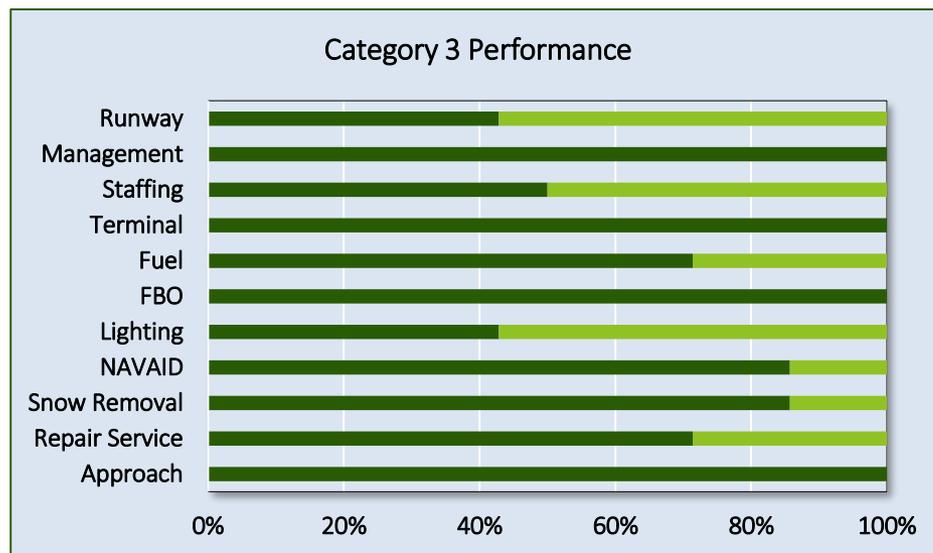
- Meet Management & Staffing Requirements
- 2 Meet Fuel & FBO Requirements



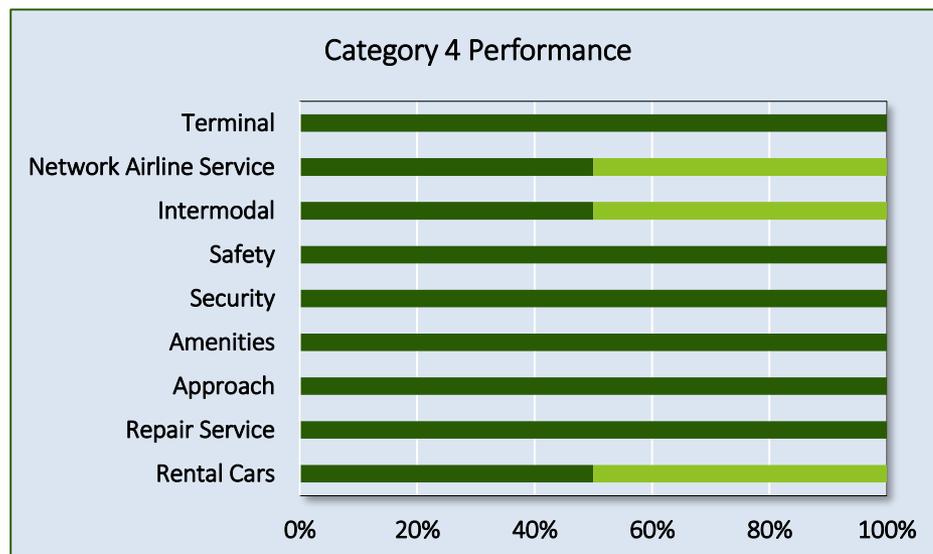
Current System Performance



- **Category 3 Airports**
 - Meet Management, Terminal, FBO, Approach Requirements



- **Category 4 Airports**
 - Burlington International Meets all Requirements

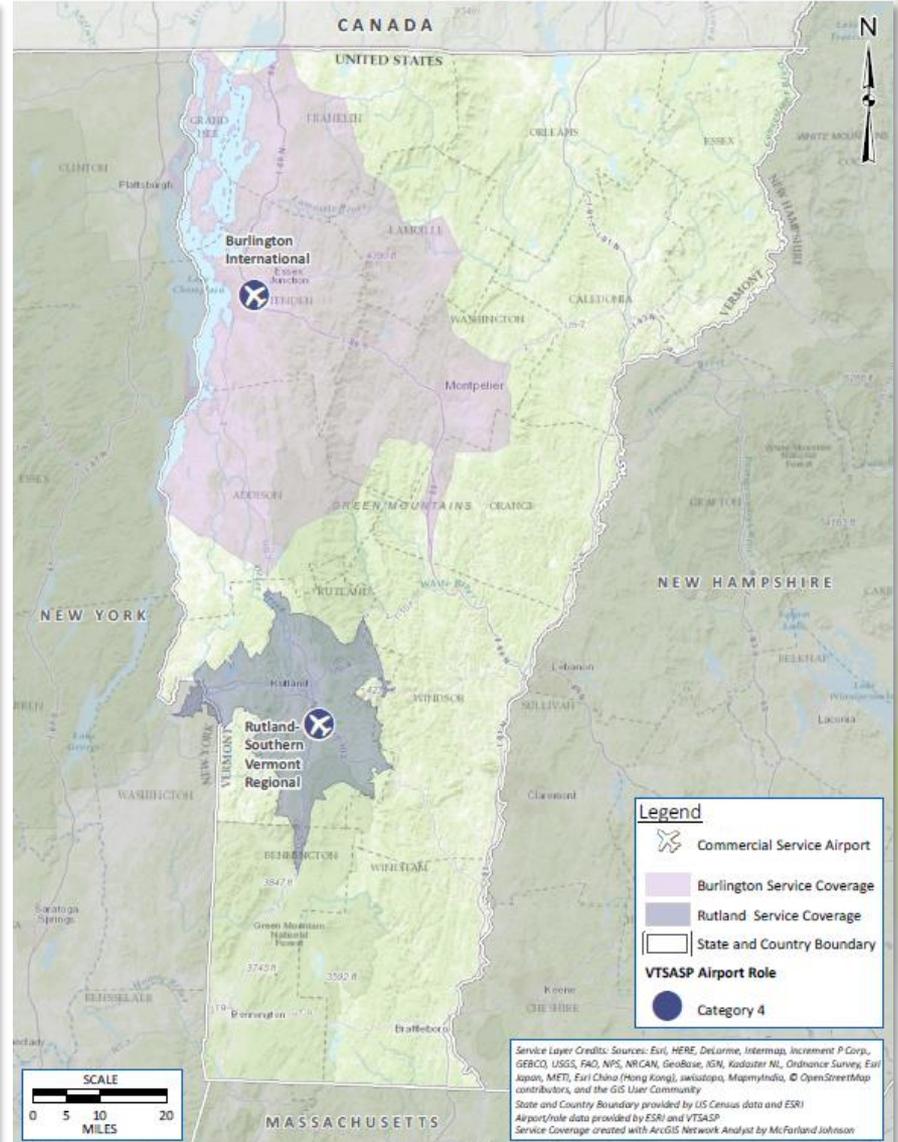
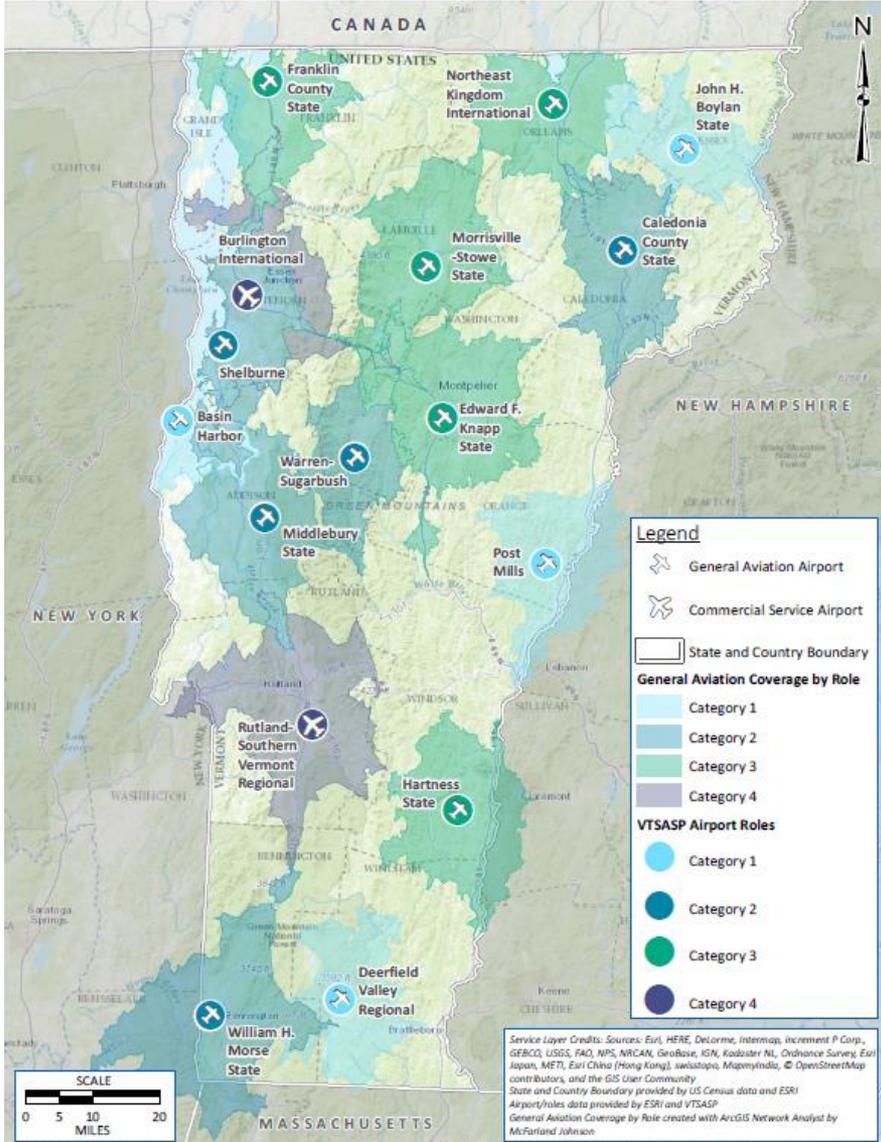


Current System Performance

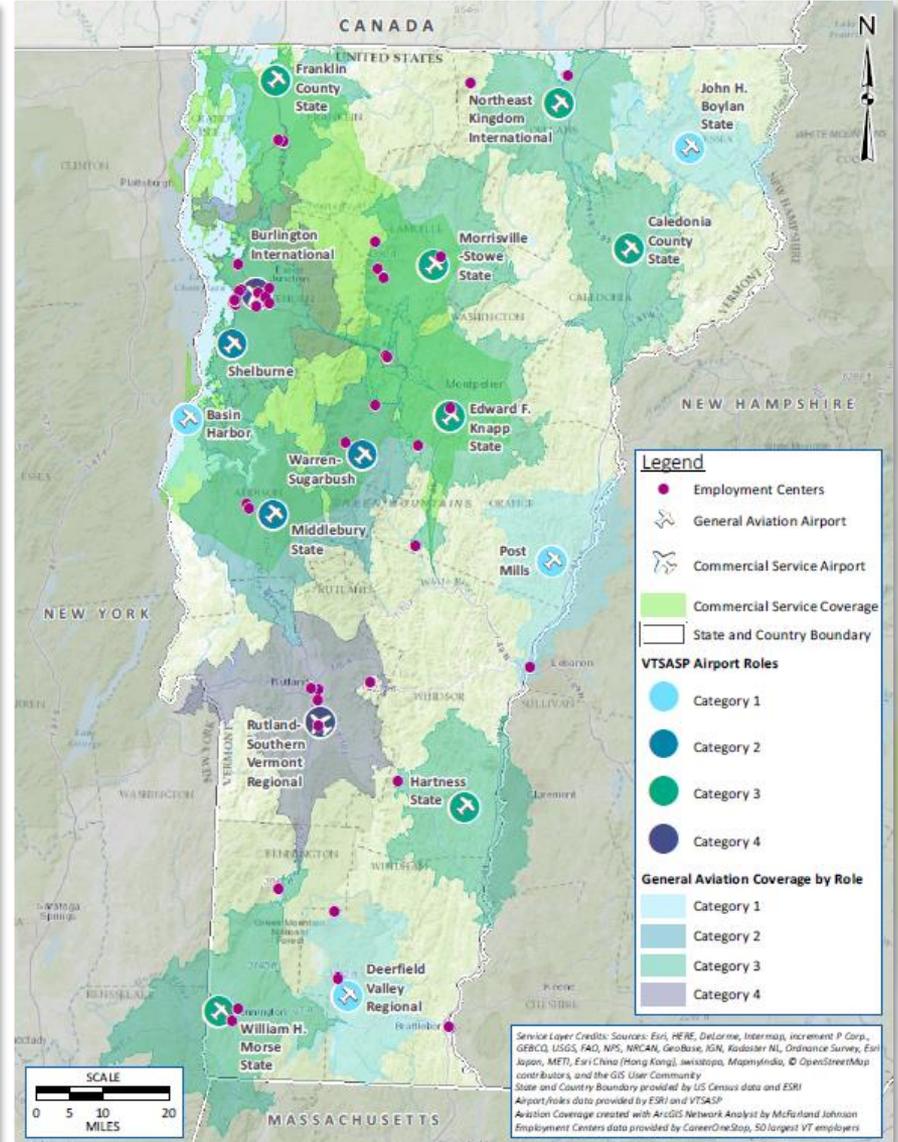
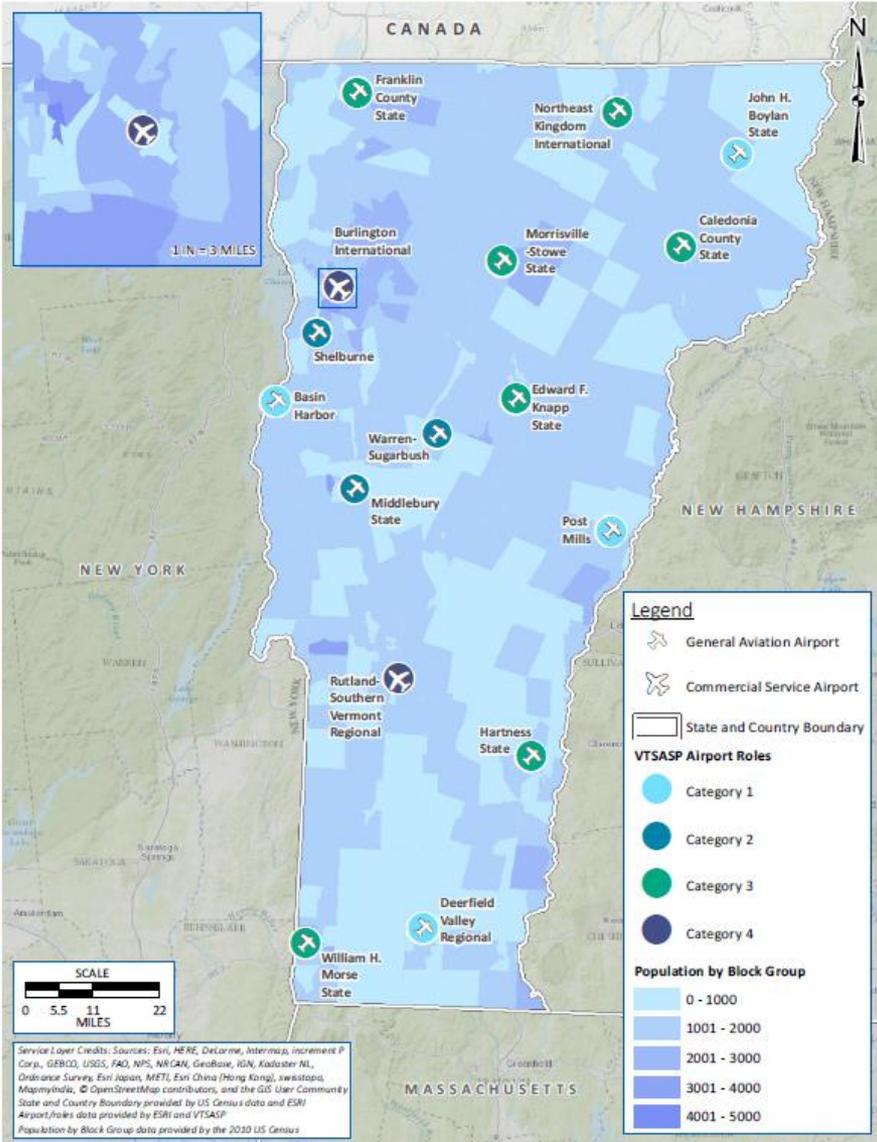


Airport Category	Coverage	Coverage (% Total)
Land Area (SQMI)		
Category 1 Airports	1,070	11%
Category 2 Airports	1,008	10%
Category 3 Airports	2,892	30%
Category 4 Airports	1,019	11%
Burlington International	2,257	23%
All VTSASP Airports (30-Minute Drive Time)	5,475	57%
Population		
Category 1 Airports	73,560	12%
Category 2 Airports	216,636	35%
Category 3 Airports	288,690	46%
Category 4 Airports	263,423	42%
Burlington International	328,090	52%
All VTSASP Airports (30-Minute Drive Time)	583,356	93%
Employment Centers		
Category 1 Airports	3	6%
Category 2 Airports	19	38%
Category 3 Airports	18	36%
Category 4 Airports	23	46%
Burlington International	28	56%
All VTSASP Airports (30-Minute Drive Time)	44	88%

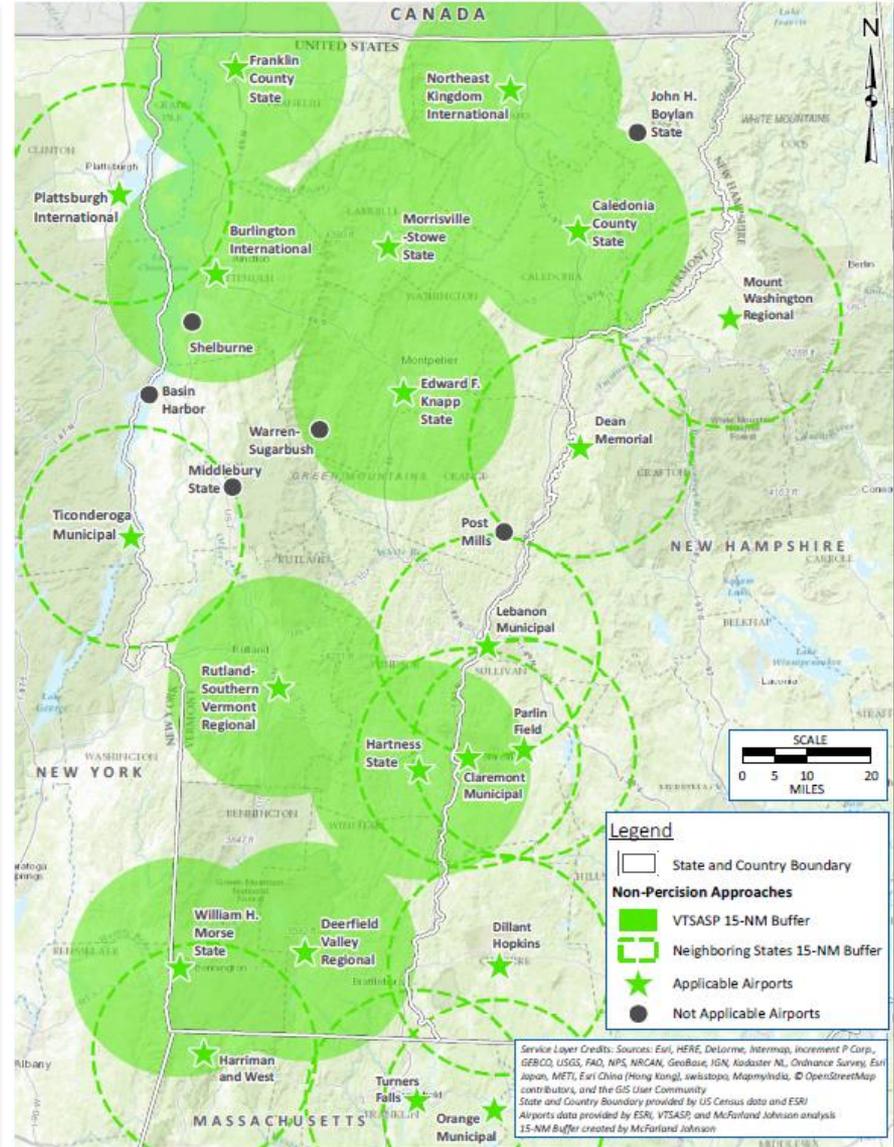
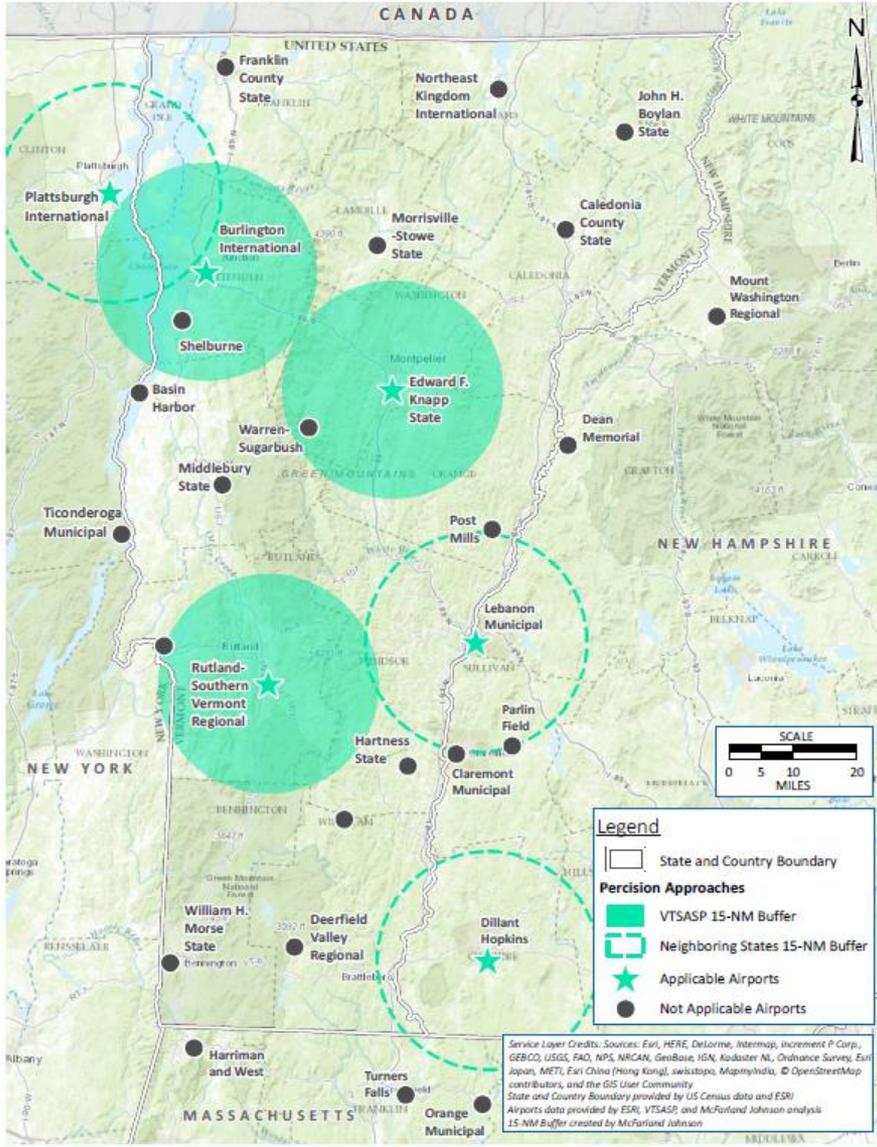
System Performance - Drivetimes



System Performance Analysis



Analysis Snapshot - Approaches



Next Steps



- **Future System Performance** **Spring 2018**
- **Economic Benefits Assessment** **Spring/Summer 2018**
- **Recommendations and Policy** **Fall 2018**
- **Project Completion** **Winter 2019**
- **Public/User Engagement Opportunities:**
 - VAAC Briefings (Quarterly)
 - Spring Public Meeting (May/June)
 - E-mail/Written Comments (RLucas@MJinc.com)
 - Summary Public Meetings (Fall 2018)

Questions?



Project Contacts

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