

## 2. System Parameters

### 2.1. INTRODUCTION

As part of a statewide air transportation system, each airport performs at varying levels based on a variety of factors. The primary factors that affect an airport's ability to meet demand are the facility's infrastructure, service offerings, and location. Together, each system airport in the state of Vermont contributes to a functioning system within a regional, national, and international context. It is from this overarching perspective that this VTSASP addresses system-wide performance of Vermont aviation system airports.

To evaluate the Vermont aviation system's performance, the system planning process dictates that performance parameters be objective and impartial to the functioning of the current system. This means that the selection and development of performance parameters is based upon the State's vision and goals for their airport system – an exercise conducted prior to collection and documentation of airport data in the inventory process, and the evaluation of whether system airports meet such standards. In this way, the performance parameters in the VTSASP chart the course for the future of the statewide airport system. The final VTSASP presents the research, analysis, and framework of minimum facility infrastructure and service offerings standard for individual airports to adequately meet demand as part of the statewide system.

This Chapter provides an overview of the current Vermont Aviation System, defines the parameters that will be utilized to measure the current system's performance and identifies each airport's category and role. Each system airport role is a snapshot of conditions at this time (2017) and should be considered the baseline, or starting point for the system planning process.

### 2.2. AIRPORT CATEGORIES

All airports provide important access to their respective region, whether that access is utilized for recreation, business, or other purposes such as emergency medical or relief purposes. Recreational purposes include individual use for vacation travel, sightseeing, or to access second homes. Business uses include visits to satellite office locations, manufacturing operations, clients, government officials, and industry partners.

To reflect the various levels of airports in the Vermont Aviation System, it follows that each airport has a role in the system, which can be categorized based upon facility infrastructure and services offered. Defining these categories aids the system planning process by providing a benchmark of minimum facilities and services that enable each airport to meet the current and future demand of users that rely on them.

For the VTSASP, Vermont Aviation System airport roles are defined as follows:

- **Category 1 Airports:** Category 1 Airports are those facilities that provide a basic level of facilities and services that are best suited to serve single engine piston and light twin

engine aircraft. In Vermont, these airports may close during winter months or be attended for irregular hours, provide air access to vacation destinations such as ski resorts and golf courses, or communities that do not benefit from a nearby publicly-owned airport. Some of these airports have runways that are unpaved and services vary based on the discretion of the owner.

- **Category 2 Airports:** Category 2 Airports are facilities that offer a higher level of facilities and services than Category 1 Airports, supporting more operations as access points for more active operators in their host community and surrounding areas. Category 2 Airports typically have equipment that enhances safety of use during inclement weather, and complimentary facilities and services that may be able to accommodate smaller jet aircraft during favorable conditions.
- **Category 3 Airports:** Category 3 Airports are those airports that can accommodate jet activity during a broader range of weather conditions, and serve as regional gateways for activities such as corporate aviation, charter services and small cargo-feeder operations. These airports generally offer a greater variety of facilities, equipment, and services than Category 2 Airports that can service a more diverse base of regular operators and aircraft.
- **Category 4 Airports:** For the VTSASP, Category 4 Airports are those facilities with the most robust compliment of facilities, equipment, and services that can accommodate the full-range of aircraft in the active fleet – from small, single engine piston aircraft to passenger aircraft and airlines that operate them. Category 4 Airports offer 24-hour access during all weather conditions.

As described, the VTSASP airport categories progress from basic to more sophisticated, comprehensive, and robust.

The next section further defines these airport categories for the VTSASP by detailing a distinct set of minimum facility and service objectives for each category of system airport. Also included for each airport category are recommended facilities and services. The minimums serve as the primary factors for determining the category and role for each airport in the Vermont Aviation System.

### 2.2.1. Other Regional and National System Plans

It is important for the VTSASP to recognize and align with regional and national plans. The FAA completed a study of general aviation (GA) airports in 2012 that focused on the varied roles that GA airports serve. The FAA's *General Aviation Airports: A National Asset (ASSET)* produced four categories focused primarily on based aircraft and activity levels. ASSET categories and descriptions are:

- **Basic:** Moderate to low levels of activity.
- **Local:** Moderate levels of activity with some multi-engine propeller aircraft.
- **Regional:** High levels of activity with some jets and multi-engine propeller aircraft.
- **National:** Very high levels of activity with many jets and multi-engine propeller aircraft.

The VTSASP categories align with these ASSET categories, and provide an increased level of detail that reflects the general characteristics and nuances of GA activity in the state of Vermont.

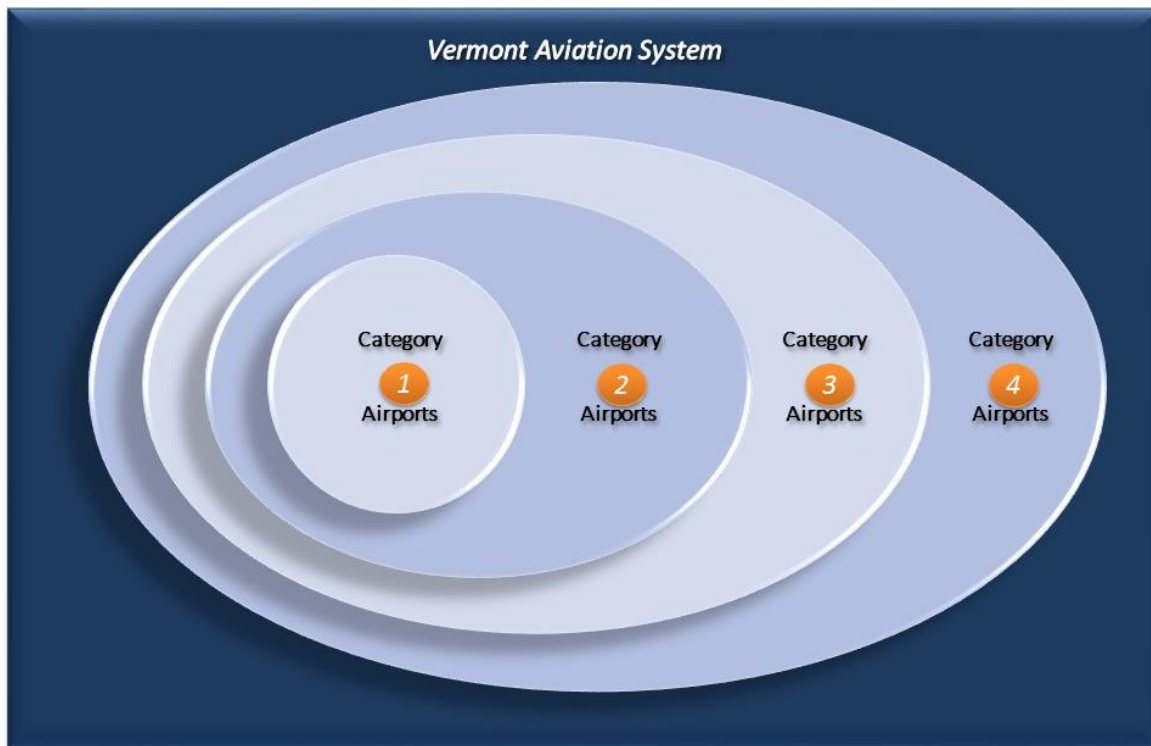
In addition to ASSET, the VTSASP categories are also consistent with those defined by the FAA for Burlington International Airport in the New England Regional Airport System Plan (NERASP). The focus of NERASP is scheduled passenger markets for domestic routes, and underscores the important role that Burlington International Airport plays in serving the region.

### 2.3. FACILITY AND SERVICE OBJECTIVES

This section presents minimum and recommended facility and service objectives for each category of system airport. The minimums serve as the primary factors for determining the category and role for each airport in the Vermont aviation system. Due to funding, local conditions, environmental, or other constraints, not all airports will be capable of meeting the minimum or recommended facility and service objectives. These constraints will be identified in master plans for each of the individual airports.

The design of minimum and recommended facility and service objectives for each VTSASP category of airport is cumulative, or additive. This means that as VTSASP categories progress from basic to sophisticated, so also do the minimum and recommended facility and service objectives become more robust. The result of this design for the Vermont Aviation System is that system airports must meet all minimums to be placed into a category. Therefore, each subsequent airport category includes the “lower-order” minimums from the previous airport category. This design is illustrated in **Figure 2-1**.

Figure 2-1: Vermont Aviation System Design



Source: McFarland Johnson, Inc. 2017.

2.3.1. Minimum and Recommended Facility and Service Objectives

As illustrated in **Figure 2-1**, Category 4 Airports in the Vermont aviation system have in place all minimum and recommended facility and service objectives defined in the previous section, with Category 3 Airports offering all minimum facility and service objectives of lower category airports, and so on.

Facility and service objectives established as part of this system plan update represent broad-system wide goals for the state’s integrated network of airports, and not the airport-specific demands or constraints as these are addressed as part of an airport master plan process. It is anticipated that some airports will have additional needs based on local market driven demands that are not captured as part of the broad system planning approach. In a similar fashion, constraints such as topography and environmental challenges are not identified on an airport by airport basis and may result in some objectives being financially infeasible or unrealistic to achieve. All projects, both system plan and master plan driven are subject to FAA funding priorities which will ultimately affect the implementation timeline.

**Tables 2-1** presents minimum and recommended facility and service objectives for the Category 1 Airports in the Vermont aviation system.

**Table 2-1: VTSASP – Category 1 Airports**

Minimum Facility & Service Standard	Recommended Facilities & Services
Primary Runway Length ( $\leq 2,500'$ ) - Paved or Turf	Primary Runway ( $\geq 4,000'$ ) - Paved
Part-Time Airport Manager on Site (Seasonal OK)	Full-Time Airport Manager on Site (Seasonal OK)
Mogas or 100LL Fuel on Site	100LL Self-Service Aviation Fuel on Site
Basic Terminal Building/Shelter	Part-time Operations Staff on Site or Contracted
	Single-Service SASO or Full-service FBO on Site at Least Part-Time
	Lighted Windsock
	GPS Instrument Approach Procedure

Source: McFarland Johnson Inc., 2017

Table 2-2 presents minimum and recommended facility and service objectives for the Category 2 Airports in the Vermont Aviation System.

**Table 2-2: VTSASP – Category 2 Airports**

Minimum Facility & Service Standard	Recommended Facilities & Services
Primary Runway (≥4,000') – Paved	Primary Runway (≥5,000')
100LL Self-Service Aviation Fuel on Site	100LL AND Jet-A Self-Service Aviation Fuel on Site
Full-Time Airport Manager on Site (Seasonal OK)	Full-Time Airport Manager on Site
Part-time Operations Staff on Site or Contracted	Full-Time Operations Staff on Site
Single-Service SASO or Full-service FBO on Site at Least Part-Time	One Full-Service FBO on Site Full-Time
Lighted Windsock	Runway and Taxiway Edge Lights
GPS Instrument Approach Procedure	GPS Instrument Approach Procedure with Vertical Guidance
	Terminal Building with Pilot and Visitor Amenities
	Own/Operate Snow-Removal Equipment
	Aircraft/Avionics Maintenance Services on Site
	Rotating Airport Beacon

Source: McFarland Johnson Inc., 2017



**Table 2-3** presents minimum and recommended facility and service objectives for the Category 3 Airports in the Vermont Aviation System.

**Table 2-3: VTSASP – Category 3 Airports**

Minimum Facility & Service Standard	Recommended Facilities & Services
Primary Runway (≥5,000')	On Site Concessions or Restaurant
Full-Time Airport Manager on Site	Precision Instrument Approach (ILS /CAT I)
Full-Time Operations Staff on Site	Rental Cars
Terminal Building with Pilot and Visitor Amenities	No system-wide recommended Facilities & Service Objectives related to Scheduled Passenger Service.
100LL AND Jet-A Self-Service Aviation Fuel on Site	
One Full-Service FBO on Site Full-Time	
Runway and Taxiway Edge Lights	
Rotating Airport Beacon	
Own/Operate Snow-Removal Equipment	
Aircraft/Avionics Maintenance Services on Site	
GPS Instrument Approach Procedure with Vertical Guidance	

Source: McFarland Johnson Inc., 2017

**Table 2-4** presents minimum and recommended facility and service objectives for the Category 4 Airports in the Vermont Aviation System.

**Table 2-4: VTSASP – Category 4 Airports**

Minimum Facility & Service Standard	Recommended Facilities & Services
Terminal Building - Full-Time Passenger and/or Cargo Handling Capabilities (TSA, Customs, etc.)	There are no system-wide recommended Facilities & Service Objectives for Category 4 Airports.  Most appropriate for Airport Master Plans to address requirements based on passenger service demand.
Scheduled Air Passenger/Cargo Service	
Intermodal Transportation Connections at/near Site	
On Site Concessions or Restaurant	
Airport Security Measures (SIDA, Badging, Staff etc.)	
Aircraft Rescue and Firefighting (ARFF)	
Precision Instrument Approach (ILS/CAT I)	
Aircraft/Avionics Maintenance Services on Site	
Rental Cars	

Source: McFarland Johnson, Inc.

#### 2.4. GEOGRAPHIC PERFORMANCE METRICS

A series of metrics were established to evaluate the performance of the existing Vermont Aviation System. In airport system planning, a common metric for evaluating a performance is geography, or geographic coverage. In this regard, each airport in a system has a primary geographic service area that attracts users (i.e., pilots, passengers, aircraft owners, businesses, etc.) located in proximity to each airport. Geographic service areas for airports can be defined by automobile drive times and nautical miles. For the VTSASP, both drive times and nautical mile service areas were utilized.

Geographic service areas are determined utilizing a Geographic Information System (GIS). GIS is a computer software package that can evaluate spatial relationships such as drive times or distances from each airport. Once the GIS determines these geographic service areas for each airport, these areas can be analyzed with other data indexed by geography, such as population, land area and employment centers.

For the VTSASP, geographic service areas were determined for airports based on ground access and air access, and represent each individual airport's "coverage" area. Ground access and air access geographic service – or coverage – areas are described in more detail as follows:

- **Ground Access:** The geographic service area for ground access identifies the area within which the airport is likely to be most effective in serving local user demand at the airport. A 30-minute drive time is used for each VTASP airport. The 30-minute drive time is consistent with guidance from the FAA used to evaluate a general aviation airport's eligibility for inclusion in the NPIAS per FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS).

Burlington International is considered to also have a 60-minute drive time geographic service area for scheduled passenger service, which reflects an industry standard average drive-time distance most passengers would be willing to make to utilize commercial airline services. In this way, the VTSASP evaluates the performance of Burlington International for general aviation operators and users, as well as the passenger service market.

Importantly, a distinction is made between scheduled passenger services offered at Burlington International and Rutland-Southern Vermont Regional. While Rutland does offer scheduled passenger service, direct non-stop flights are limited to Boston Logan International. Burlington International connects Vermont to cities across the U.S. with non-stop flights and more connecting opportunities to reach international destinations. Therefore, Rutland-Southern Vermont Regional is not considered to have a 60-minute drive time geographic service area.

The performance metrics utilized in the analysis of ground access coverage areas are:

- Land Area
  - Population
  - Employment Centers
- **Air Access:** The geographic service area for air access is determined using nautical mile distance from each airport, and is used to evaluate individual airport coverage and system-wide coverage for specific infrastructure, equipment, and services that are important for aircraft flying to a Vermont Aviation System airport whether it is intended or unintended (diversion/emergency).

For the VTSASP, a 15-nautical mile distance surrounding each airport was identified and analyzed for each airport and certain airport infrastructure, equipment, and services applicable to airborne aircraft where 30-minute drive time may not be the most accurate assessment (i.e. automated weather reporting systems).

The performance metrics utilized in the analysis of air access coverage measure land area, population, and employment center coverage by Vermont Aviation System airports with the following infrastructure, equipment, and service features:

- Airports with a primary runway length  $\geq$  4,000-feet
- Airports with a primary runway length  $\geq$  5,000-feet
- Airports with precision instrument approaches
- Airports with non-precision instrument approaches
- Airports with on-site weather reporting service/equipment
- Airports with AvGas (100LL) fueling services
- Airports with Jet A fueling services

It is important to note that the actual service area for every airport is not limited to the geographic service area shown. The VTSASP utilizes ground access and air access geographic service area coverage – whether drive-times or nautical miles - to facilitate an objective evaluation of performance. Airport use is at the discretion of the pilot in command and can be based on a variety of factors such as fuel prices, tie-down fees, familiarity, weather conditions, ground transportation, or general preferences.

## 2.5. SUMMARY

As described in the introduction of this Chapter, each airport in the Vermont Aviation System performs at varying levels based on a variety of factors. The primary factors that affect an airport's ability to meet demand are the facility's infrastructure, service offerings, and location.

Chapter 3, *Inventory*, presents data collected for the VTSASP that serves as the foundation of all analysis performed, and presented in Chapter 4, *Current System Performance*. Based on the analysis of system coverage, and the ability of system airports to meet minimum facility objectives both currently and under future demand conditions, recommendations will be presented that can enhance and sustain a viable Vermont Aviation System for the long term.

Importantly, statewide recommendations do not diminish the need for individual airport planning efforts. In this regard, local airport planning efforts such as airport master plans, environmental assessments, and/or development plans are crucial for determining airport-specific facility needs for each system airport. This VTSASP can, however, assist in validating elements of those plans and highlighting facility needs at a system level.