

Chapter 4: Airfield Demand/Capacity

4.1 Airfield Demand/Capacity

In order to ensure that Burlington International Airport (BTV) is capable of supporting the expected increase in aviation activity, evaluations must be conducted to ensure that the recommendations of this Master Plan will adequately accommodate existing and anticipated activity levels. The purpose of this chapter is to identify the Airport's airfield development needs over the 20-year planning horizon based on capacity levels. Using the preferred aviation activity forecast presented in Chapter 3, the Airport's airfield needs were determined which will form the basis of the airfield development concepts discussed in later chapters.

The airport demand, design standards, and the overall airfield capacity at BTV were evaluated using guidance contained in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*.

4.2 Planning Factors

Before the airfield capacity for BTV could be determined, it was necessary to establish the Planning Activity Levels (PALs) based on the preferred forecasts, the design aircraft family, and the appropriate airport, runway, and taxiway classifications that are associated with FAA design standards. These parameters are discussed in the following subsections.

4.2.1 Planning Activity Levels (PALs)

Since aviation activity is highly susceptible to fluctuations in economic conditions and industry trends, identifying recommended airfield improvements based solely on specific years can be a challenge. The timeline associated with the preferred forecast is representative of the anticipated timing of demand (in 5-year increments – 2023, 2028, 2033, and 2038). The actual timing of demand can vary; therefore, Planning Activity Levels (PALs), rather than calendar years, were established to identify significant demand thresholds for airfield enhancement projects. Disassociating the predetermined timeline from the recommended airfield improvements provides the Burlington Board of Airport Commissioners with the flexibility to advance or slow the rate of development in response to actualized demand. If the preferred forecast proves conservative (i.e. the high growth forecast scenarios is realized because of successful airport marketing and route development initiatives, etc.), some recommended improvements may be advanced in schedule. In contrast, if demand occurs at a rate that is slower than the preferred forecast projects, the improvements should be deferred accordingly. As actual activity levels approach a PAL and trigger the need for an airfield improvement, sufficient lead time for planning, design and construction must be also given to ensure that the facilities are available for the impending demand.

Table 4-1 identifies the PALs used for this study, which correspond with the preferred aviation activity forecast for the base year of 2018 and the planning horizon years 2023, 2028, 2033, and 2038. **Figure 4-1** presents a graphical representation of how the PALs for passengers were established (discussed in **Chapter 3**). The graphic helps to depict the relative time range during which each PAL could be reached if the forecast scenario is actualized.

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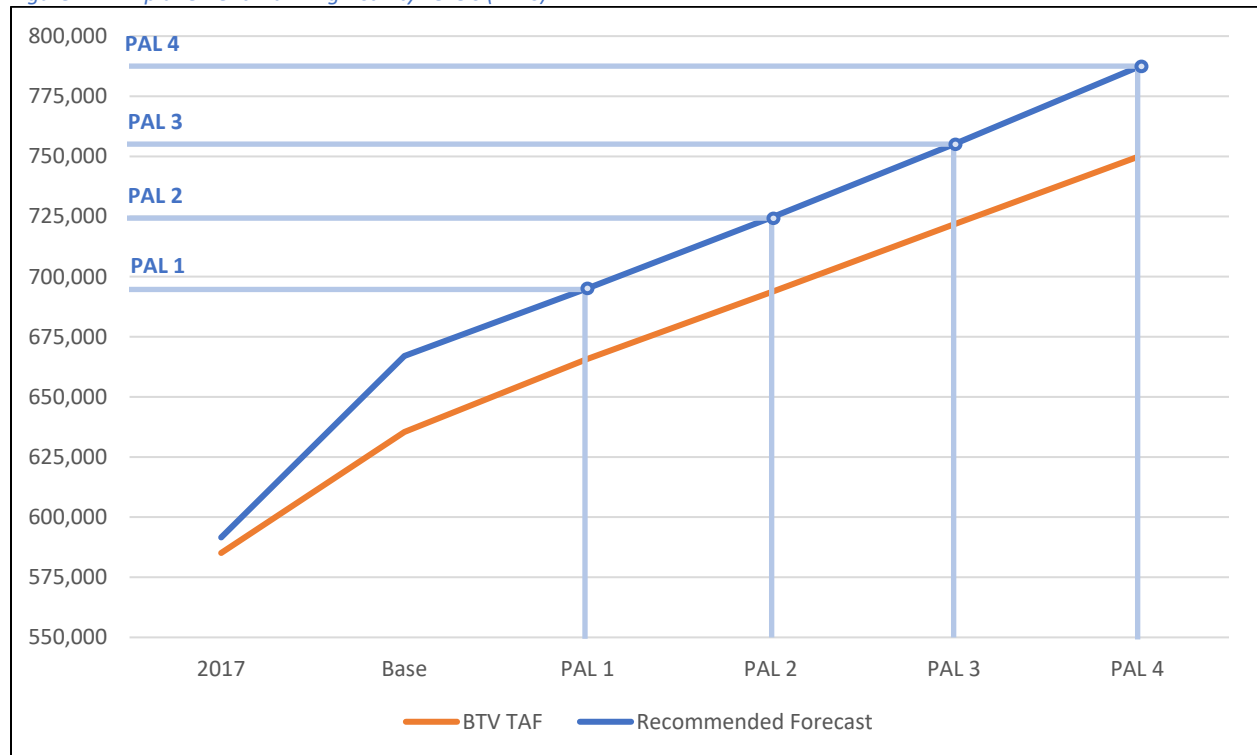
Table 4-1: Planning Activity Levels (PALs)

		Passenger Activity					
Enplanements		2017	Base	PAL 1	PAL 2	PAL 3	PAL 4
Annual		591,558	667,004	695,171	724,528	755,124	787,012
Peak Month		58,215	65,640	68,412	71,300	74,311	77,450
Average Day		1,878	2,117	2,207	2,300	2,397	2,498
Peak Hour*		710	801	835	870	907	945
Category	Activity	2017	Base	PAL 1	PAL 2	PAL 3	PAL 4
Commercial Aviation	Annual	21,467	24,082	24,480	24,899	25,340	25,804
	Peak Month	2,003	2,247	2,284	2,323	2,364	2,408
	Average Day	65	72	74	75	76	78
	Peak Hour	11	12	13	13	13	13
General Aviation	Annual	37,332	37,655	39,449	41,263	43,101	45,063
Military Aviation	Annual	8,567	8,567	5,954	5,954	5,954	5,954
Cargo Operations	Annual	1,396	1,422	1,563	1,717	1,886	2,071
TOTAL Operations	Annual	68,762	71,727	71,446	73,832	76,281	78,892
	Peak Month	6,797	7,090	7,063	7,299	7,541	7,799
	Average Day	219	229	228	235	243	252
	Peak Hour	22	23	23	23	24	25

Note: The Peak Hour for Enplanements was determined to be between 5:55 am and 7:25 am on weekdays

Source: CHA, 2018

Figure 4-1: Enplanement Planning Activity Levels (PALs)



Source: CHA, 2018

4.2.2 Current and Projected Critical Aircraft

Evaluating the Airport’s current fleet mix and determining the current design aircraft, as well as the projected design aircraft, are important aspects of the Master Plan Study. The design aircraft (commonly referred to as the “critical aircraft”) determination is a key consideration in FAA decision making on project justification. Classification criteria and the applicability of the criteria are presented in **Table 4-2**

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and **Table 4-3**, respectively. These classifications are used to determine the appropriate FAA standards (per AC 150/5300-13A) for airfield facilities.

Table 4-2 : Aircraft Classification Criteria: AAC & ADG

Aircraft Approach Category (AAC)			
Approach Category	Air Speed (knots)		Example Aircraft
A	<91		Cessna Caravan, Pilatus PC-12
B	91 ≤ 121		Bombardier CRJ-700, Cessna Citation X
C	121 ≤ 141		McDonnell Douglas MD-80, Boeing 737-7, Airbus A320
D	141 ≤ 166		Boeing 737-8/9, Boeing 767-4, Gulfstream G650
E	166+		Military Fighter Jets
Airplane Design Group (ADG)			
Design Group	Tail Height (ft.)	Wingspan (ft.)	Example Aircraft
I	<20	<49	Cessna 152, Citation CJ1 (Model C525)
II	20-<30	49 ≤ 79	Bombardier CRJ-2/4, Cessna Caravan
III	30-<45	79 ≤ 118	McDonnell Douglas MD-80, Boeing 737-7
IV	45-<60	118 ≤ 171	Boeing 757-2, Boeing 767-4
V	60-<66	171 ≤ 214	Airbus A330-3
VI	66-<80	214 ≤ 262	Airbus A380-800, Boeing 787

Source: FAA AC 150/5300-13A Airport Design, CHA, 2018

Table 4-3: Applicability of Aircraft Classifications

Aircraft Classification	Related Design Components
Aircraft Approach Speed (AAC)	Runway Safety Area (RSA), Runway Object Free Area (ROFA), Runway Protection Zone (RPZ), runway width, runway-to-taxiway separation, runway-to-fixed object
Airplane Design Group (ADG)	Runway, Taxiway, and apron Object Free Areas (OFAs), parking configuration, taxiway-to-taxiway separation, runway-to-taxiway separation
Taxiway Design Group (TDG)	Taxiway width, radius, fillet design, apron area, parking layout

Source: FAA AC 150/5300-13A Airport Design, CHA, 2018

The “design aircraft” or “design aircraft family” represent the most demanding aircraft or grouping of aircraft with similar characteristics (relative to AAC, ADG, TDG), that are currently using or are anticipated to use an airport on a regular.³⁰ basis. While the Study is not limited to planning for the design aircraft, they must still be considered when planning airfield and landside facilities as they may require specific facility design accommodations within their designated areas of operation. As discussed in **Chapter 3**, the current and future critical aircraft for planning purposes at BTV is the Boeing 757-200 (AAC C-IV, TDG-4).

³⁰ According to FAA AC 150/5000-17, *Critical Aircraft and Regular Use Determination*, the terminology of “regular use” is defined as 500 annual operations, including itinerant and local operations but excluding touch-and-go operations. An operation is either a takeoff or landing.

4.3 Airfield Capacity Requirements

Airfield capacity refers to the maximum number of aircraft operations an airfield can accommodate in a specified amount of time. An assessment of the airfield’s current and future capacity was performed using methods described in FAA AC 150/5060-5, *Airport Capacity and Delay*. This evaluation helps determine any capacity-related improvements or expansions that may be needed in order to support flight activity levels. The estimated capacity of the airfield at BTV can be expressed through:

- Hourly Capacity – The maximum number of aircraft operations an airfield can safely accommodate under continuous demand in a one-hour period. This expression calculates for Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) conditions and is used to identify any peak-period constraints on a given day.
- Annual Service Volume (ASV) – The maximum number of aircraft operations an airfield can accommodate in a one-year period without excessive delay. This calculation is typically used in long-range planning and referenced for capacity-related improvement project approval.
- Aircraft Delay – The average number of minutes an aircraft is delayed on the airfield and total hours of delay incurred over a one-year period.

4.3.1 Capacity Calculation Factors

To calculate these three measurements of capacity and delay, several key factors and assumptions specific to BTV were defined. Consistent with the guidance provided in AC 150/5060-5, these include:

- Aircraft Fleet Mix Index – a ratio of the various classes of aircraft serving an airport
- Runway-Use Configuration – the number and orientation of the active runways
- Percentage of Aircraft Arrivals – the ratio of landing operations to total operations
- “Touch and Go” Factor – the ratio of landings with an immediate takeoff to total operations
- Location of Exit Taxiways – the number of taxiways available to an aircraft within a given distance from the arrival end of a runway
- Meteorological Conditions – the percentages of times an airfield experiences VFR, IFR, and Poor Visibility Conditions (PVC) conditions

4.3.1.1 Aircraft Fleet Mix Index

Due to varying performance features, the types of aircraft operating at an airport can have significant impacts on an airfield’s capacity. The FAA dictates that the heavier the aircraft, the greater the spacing in-flight path is needed between aircraft to avoid wake turbulence. The size and operational frequency of aircraft determines the airport’s fleet mix. To identify the aircraft mix index (a ratio of the various classes of aircraft serving an airport), AC 150/5060-5 *Airport Capacity and Delay* has established four categories in classifying an aircraft by its maximum takeoff weight (MTOW), as depicted in **Table 4-4**.

Table 4-4: Aircraft Capacity Classifications

Aircraft Class	MTOW (lbs)	Number of Engines	Wake Turbulence
A	<12,500	Single	Small (S)
B	<12,500	Multi	Small (S)
C	12,500 – 300,000	Multi	Large (L)
D	>300,000	Multi	Heavy (H)

Source: FAA AC 150/5060-5, CHA, 2018

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The aircraft mix index is calculated using the formula $\%(C + 3D)$, the letters corresponding with the aircraft class. This product falls into one of the FAA-established mix index ranges for use in capacity calculations listed below:

- 0 to 20
- 21 to 50
- 51 to 80
- 81 to 120
- 121 to 180

The current facilities at the Airport can accommodate all four aircraft classes. The following operations percentages for aircraft categories C and D were gathered from a review of base year operations:

- Class C = 67.9% of the Airport's operations
- Class D = 2.0% of the Airport's operations

As such, the base year aircraft mix index is 74.0, calculated by $67.9 + 3(2.0) = 74.0$. While the actual mix index for the Airport is subject to variations given changes in air traffic operations, the likelihood of the Airport's mix index to grow beyond the fourth mix index grouping of 51-80 over the planning period is low. Based on the fleet mix changes described in **Chapter 3** for commercial, cargo, and general aviation operations, the aircraft fleet mix index is anticipated to increase lightly from 74.0 in 2017 to 78.5 by PAL 4. See **Table 4-5** for each planning period's Aircraft Mix Index.

Table 4-5: Aircraft Mix Index

Year	Aircraft Mix Index
2017	74.0
Base	75.0
PAL 1	75.0
PAL 2	76.1
PAL 3	77.2
PAL 4	78.5

Source: FAA AC 150/5060-5, CHA, 2018

4.3.1.2 Runway Use Configuration

The principle determinants of an airfield's layout or configuration are the number and orientation of runways. The efficiency and functionality of the runways, used in conjunction with the taxiways and aprons during the various levels of aviation activity, directly affects an airport's operational capacity.

If an airfield layout consists of more than one runway, those runways can be termed as either "independent" or "dependent" of each other. An independent runway is one that is not operationally affected by the other runways during normal operations (e.g. parallel runways). A dependent runway is one that is configured in such a way that aircraft must wait for operations to complete on another runway before resuming (e.g. intersecting runways). Due to this wait time, airfields with dependent runway systems are inherently limited compared to independent runways. The intersecting runways at BTV are thus dependent.

Runway 15/33 has a northwest/southeast orientation and serves as the primary runway for all airport operations. In addition to this runway, Runway 1/19, which also has a northwest/southeast orientation,

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serves as the general aviation runway. The inner angle of the intersecting runways is greater than 15 degrees but less than 90 degrees. Because the Airport primarily utilizes the two-main runway ends for takeoff and landing (arrival and departure) operations, the usage rates of each runway (15 and 33) were evaluated. These conclusions were established considering the combined VFR and IFR conditions and are depicted in **Table 4-6**.

Table 4-6: Runway Usage

Runway End	Runway End Utilization	Runway Utilization
15	40.6%	79.9%
33	39.3%	
1	6.3%	20.1%
19	13.8%	

Source: FAA Windrose File Generator, FAA Wind Analysis, Burlington Airport Commission, CHA, 2018

4.3.1.3 Percentage of Aircraft Arrivals

Arriving aircraft usually contribute more to delay than departing aircraft. This percentage is the ratio of landing operations to total operations at an airport during a specified period and is generally assumed to be equal to the percentage of departing operations; therefore, a factor of 50 percent will be used for the capacity calculations for the Airport.

4.3.1.4 Percentage of Touch-and-Go Operations

Because a touch-and-go (T&G) is representative of two operations (i.e. a landing and takeoff performed consecutively during local flight training operations), an airfield with a higher percentage of T&Gs typically has a greater airfield capacity than one with a higher percentage of air carrier operations.

Operational statistics provided by the BTV Air Traffic Control Tower (ATCT) identified very little local or T&G operations (less than 1 per day) at BTV. With the assumption that these operations are T&Gs and that local operations will not experience a significant growth over the planning horizon, a percentage range of zero to 20 percent is used in the capacity calculations. Based on FAA figures, this percentage equates to a T&G factor of 1.0.

4.3.1.5 Location of Exit Taxiways

The location and number of exit taxiways affect the capacity of an airport's runway system because they directly relate to an aircraft's runway occupancy time. Runway capacities are highest when they are complimented with full-length, parallel taxiways, ample runway entrance and exit taxiways, and no active runway crossings. These components reduce the amount of time an aircraft remains on the runway. FAA AC 150/5060-5 identifies the criteria for determining taxiway exit factors based on the mix index and the distance the taxiway exits are from the runway threshold and other taxiway connections. As the Airport's existing mix index range was calculated to be 51-80 over the planning period, only exit taxiways that are between 3,500 and 6,500 feet from the threshold and spaced at least 750 feet apart contribute to the taxiway exit factors. By combining the mix index, percent of aircraft arrivals, and the number of exit taxiways within the specified range, a taxiway exit factor can be calculated as 0.92 VFR/1.0 IFR, respectively.

4.3.1.6 Meteorological Conditions

Meteorological conditions at and around an airport also have significant impacts on the capacity of an airfield. The runway use percentages, as previously discussed in **Section 4.2.1.2**, are a result of prevailing winds, which dictate what runway an aircraft should use for takeoff and landing operations.

Three measures of cloud ceiling and visibility are recognized by the FAA and used to calculate capacity. These include:

- **Visual Flight Rules (VFR)** – Cloud ceiling is greater than 1,000 feet above ground level (AGL) and visibility is at least three statute miles.
- **Instrument Flight Rules (IFR)** – Cloud ceiling is at least 500 feet AGL but less than 1,000 feet AGL and/or the visibility is at least one statute mile but less than three statute miles.
- **Poor Visibility conditions (PVC)** – Cloud ceiling is less than 500 feet AGL and/or the visibility is less than one statute mile.

BTV experiences VFR conditions 72.3 percent of the time, IFR conditions 11.4 percent of the time, and PVC conditions 16.2 percent of the time. These are approximate percentages derived from the historical data from the Airport’s ASOS.

4.3.1.7 Summary of Capacity Calculation Factors

Table 4-7 summarizes these parameters calculated for BTV, which were used to define the hourly capacity (in VFR and IFR conditions), the ASV, and average delay for the Airport.

Table 4-7: Calculated Capacity Parameters

Factor	2017
Aircraft Fleet Mix Index	74.0
Runway-Use Configuration	Intersecting/Crosswind
Percentage of Aircraft Arrivals	50%
Touch and Go Factor (VFR / IFR)	1.0/1.0
Taxiway Exit Factor (VFR / IFR)	0.92 / 1.0
Meteorological Conditions (VFR / IFR)	72.3% / 27.6%

Note: VFR/IFR percentages were derived via FAA OPSNET Air Traffic Activity System (ATADS): Airport Operations (Accessed on November 14, 2108)

Source: FAA Operations Network (OPSNET), FAA AC 150/5060-5, CHA, 2018

4.3.2 Current Airfield Capacity (Crosswind Runway)

4.3.2.1 Hourly Capacity

Hourly capacity for the airfield is a measurement of the maximum number of aircraft operations (VFR and IFR) that an airfield can support in an hour based on runway configuration. Using graphs provided in AC 150/5060-5, VFR and IFR hourly capacity bases were established by applying the given VFR and IFR operational capacities for the runway use configuration, the aircraft mix index, and percentage of aircraft arrivals. Once the hourly capacity bases are identified, they were multiplied by the touch-and-go factors and taxiway exit factors to determine the hourly capacities. This equation is expressed as:

$$\text{Hourly Capacity} = C^* \times T \times E$$

C = Hourly Capacity Base*

T = Touch-and-Go Factor

E = Taxiway Exit Factor

Table 4-8 shows the results of the hourly capacity for 2017, the base year, and for PALs 1 through 4. Note that as the mix index increases from 74.0 (2017) to 78.5 (PAL 4), the operational capacities decrease.

Table 4-8: Calculation of Hourly Capacity (Current Airfield Configuration)

Factors	2017	Base	PAL 1	PAL 2	PAL 3	PAL 4
	VFR / IFR	VFR / IFR	VFR / IFR	VFR / IFR	VFR / IFR	VFR / IFR
Hourly Capacity Base	80.0/56.5	80.0/56.5	80.0/56.5	79.5/57.0	79.5/57.5	79.5/57.5
Touch-and-Go Factor	1.0 / 1.0	1.0 / 1.0	1.0 / 1.0	1.0 / 1.0	1.0 / 1.0	1.0 / 1.0
Taxiway Exit Factor	0.92 / 1.00	0.92 / 1.00	0.92 / 1.00	0.92 / 1.00	0.92 / 1.00	0.92 / 1.00
Calculated Hourly Capacity	73.6/56.5	73.6/56.5	73.6/56.5	73.1/57.0	73.1/57.5	73.1/57.5

Note: FAA AC 150/5060-5 [VFR (Figure 3-6), IFR (Figure 3-45)]

Source: FAA AC 150/5060-5, CHA, 2018

4.3.2.2 Annual Service Volume

Annual Service Volume (ASV) is an expression of the total number of aircraft operations that an airfield can support annually. The formula for estimating an airport’s ASV is based on the ratio of annual operations to average daily operations during the peak month, multiplied by the ratio of average daily operations to average peak hour operations during the peak month. The product of these values is then multiplied by the *weighted* hourly capacity to determine the ASV.

Weighted hourly capacity accounts for the varying operating conditions at the airport, which are applied to the hourly capacity determined in the previous section. The formula for weighted hourly capacity is expressed as:

$$C_w = \frac{(C_{n1} \times W_{n1} \times P_{n1}) + (C_{n2} \times W_{n2} \times P_{n2})}{((W_{n1} \times P_{n1}) + (W_{n2} \times P_{n2}))}$$

C_w = Airfield weighted hourly capacity

n = Number of runway-use configurations. Due to the operational limitations of the intersecting runways, the airfield operates as a single runway with two configurations: VFR and IFR.

C = Hourly Capacity of each configuration. **(2017) VFR/IFR = 73.6/56.5**

W = FAA ASV weighting factor, based on mix index & percentage and hourly capacity. **VFR/IFR = 15/25**

P = Percent of time the Airport operates in each configuration.

For BTV, this applies as VFR and IFR conditions. **VFR/IFR = 72.3%/27.7%**

Applying the 2017 BTV data to this equation yields the following:

$$C_w = \frac{(73.6 \times 15 \times 72.3) + (56.5 \times 25 \times 27.7)}{((15 \times 72.3) + (25 \times 27.7))}$$

C_w = 66.9

The ASV formula accounts for a variety of conditions that occur at an airport, including low- and high-volume activity periods, and is expressed as:

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$$ASV = C_w \times D \times H$$

C_w = Weighted Hourly Capacity.

D = Daily Demand Ratio (ratio of annual operations to average daily operations during peak month).

H = Hourly Demand Ratio (ratio of average daily operations to average peak hour operations during peak month)

Table 4-9 identifies the daily and hourly demand ratios for 2017 through PAL 4.

Table 4-9: Demand Ratios

Factor	2017	Base	PAL 1	PAL 2	PLA 3	PAL 4
Annual Operations	68,762	71,727	71,446	73,832	76,281	78,892
Av. Daily Operations (in Peak Month)*	219	229	228	235	243	252
Av. Peak Hour (in Peak Month)*	22	23	23	23	24	25
Daily Demand Ratio (D)	313.6	313.6	313.6	313.6	313.6	313.6
Hourly Demand Ratio (H)	10.1	10.1	10.1	10.1	10.1	10.1

Source: FAA AC 150/5060-5, CHA, 2018.

*Note: Denotes rounded numbers.

The ASV equation for 2017 is therefore:

$$ASV = 66.9 \times 313.6 \times 10.1$$

$$ASV = 212,345$$

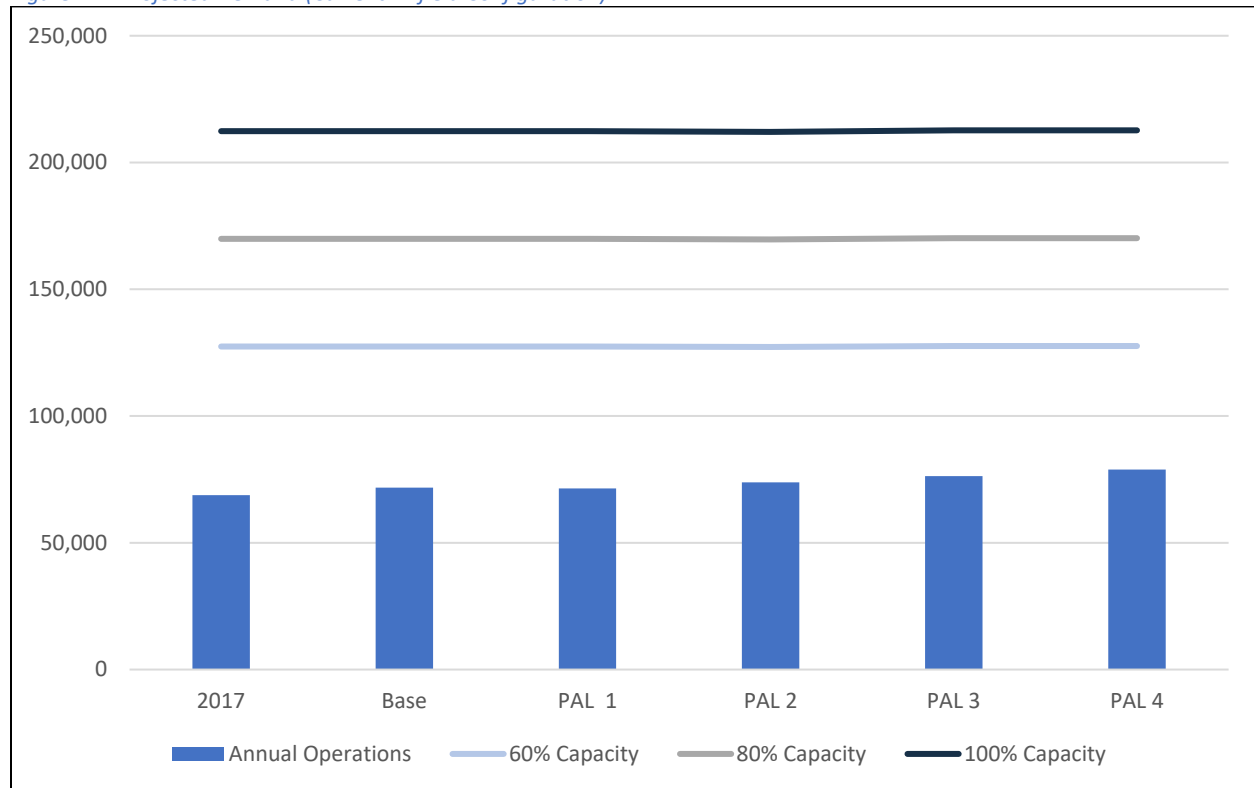
If the annual operations exceed the ASV, the airport is likely to see significant delays. However, at BTV it is determined that annual capacity of approximately 212,345 operations, is well above the PAL 4 operations of annual approximately 78,892. It should be understood, however, that an airport can still experience delays before capacity is reached. As stated in the FAA Order 5090.3C *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*, an airport is eligible to secure funding for capacity-enhancing projects once it has reached 60 percent of its annual capacity. This allows an airport to make necessary improvements and avoid delays before they are anticipated to occur. To better understand BTV's current and projected operational capacity levels, base year and PAL 1 through 4 demands are compared to their respective annual service volumes in **Table 4-10**. The capacity levels are depicted in **Figure 4-2**.

Table 4-10: Annual Service Volume (Current Airfield Configuration)

Factor	2017	Base	PAL 1	PAL 2	PAL 3	PAL 4
Annual Operations	68,762	71,727	71,446	73,832	76,281	78,892
Annual Service Volume	212,345	212,345	212,345	212,073	212,691	212,691
Capacity Level	32.4%	33.8%	33.6%	34.8%	35.9%	37.1%

Source: FAA AC 150/5060-5, CHA, 2018

Figure 4-2: Projected Demand (Current Airfield Configuration)



Source: Burlington Airport Commission, CHA, 2018

4.3.2.3 Airfield Capacity Conclusion

Based on the airfield capacity calculations and discussions with airport staff and ATCT, airfield capacity should not be an issue at BTV through PAL 4. Neither the forecast annual activity or peak hour activity will approach 60 percent of capacity.

However, that is not to say that the Airport will not experience delays during inclement weather conditions or briefly during periods of peak activity. The efficiency of the Airport should be continuously monitored to appropriately determine any changes or improvements the airfield may need in order to maintain a high level of customer service and reduce the potential for delay.

4.3.3 Runway Configuration Alternative: Single Runway (Runway 15/33)

After completing the airfield capacity analysis for the existing conditions and layout, an airfield capacity analysis was evaluated for a single runway configuration, with the following conditions and assumptions applied:

- Runway 1/19 will no longer be in operation
- The new runway configuration will be a single runway (Runway 15/33)
- The Aircraft Mix Indexes did not change from the current use analysis (See **Table 4-5**)
- The demand ratios did not change from the current-use configuration analysis (See **Table 4-9**)

4.3.3.1 Hourly Capacity

Table 4-11 shows the results of the hourly capacity for 2017, the base year, and for PALs 1 through 4.

Table 4-11: Calculation of Hourly Capacity (Single Runway Configuration)

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Factors	2017 VFR / IFR	Base VFR / IFR	PAL 1 VFR / IFR	PAL 2 VFR / IFR	PAL 3 VFR / IFR	PAL 4 VFR / IFR
Hourly Capacity Base	58.5/55.0	58.5/55.0	58.5/55.0	58.0/54.5	58.0/54.5	58.0/54.0
Touch-and-Go Factor	1.0/10	1.0/10	1.0/10	1.0/10	1.0/10	1.0/10
Taxiway Exit Factor	0.91/0.91	0.91/0.91	0.91/0.91	0.91/0.91	0.91/0.91	0.91/0.91
Calculated Hourly Capacity	53.2/50.1	53.2/50.1	53.2/50.1	52.8/49.6	52.8/49.6	52.8/49.1

Note: FAA AC 150/5060-5 [VFR (Figure 3-3), IFR (Figure 3-43)]

Source: FAA AC 150/5060-5, CHA, 2018

4.3.3.2 Annual Service Volume

When conducting the single-use runway airfield capacity analysis, 52.0 was determined to be the weighted hourly capacity (C_w) in 2017. The weighted hourly capacity was calculated for each planning level (**Table 4-12**). The ASV for each planning level was then calculated using the weighted hourly capacity and the demand ratios, assuming they have not changed (see **Table 4-9**). The ASVs throughout the planning period that resulted from these calculations are shown in **Table 4-13**. To better understand the projected operational capacity levels for a single runway, the 2017, base year, and PALs 1 through 4 demands are compared to their respective annual service volumes. The capacity levels are also depicted in **Figure 4-3**.

Table 4-12: Annual Weighted Capacity (Single Runway Configuration)

Factor	2017	Base	PAL 1	PAL 2	PAL 3	PAL 4
Weighted Capacity	52.0	52.0	52.0	51.5	51.5	51.4

Source: FAA AC 150/5060-5, CHA, 2018

Table 4-13: Annual Service Volume (Single Runway Configuration)

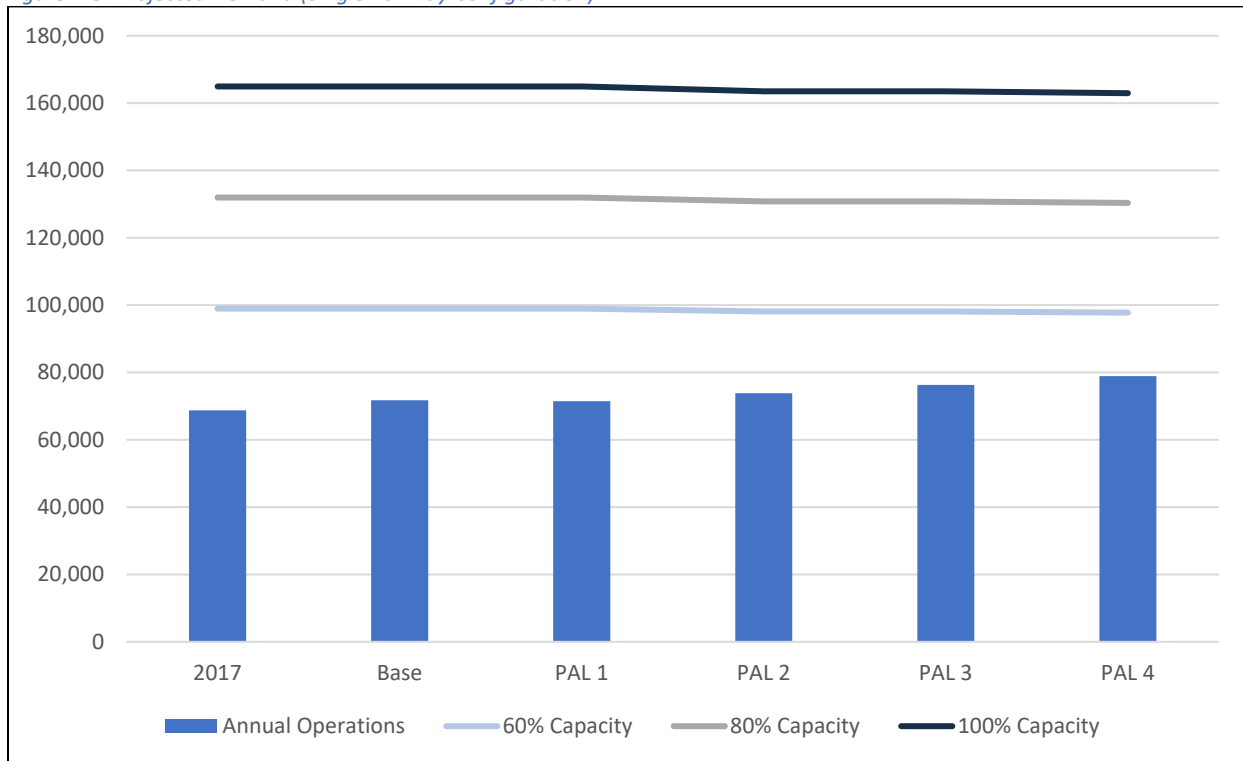
Factor	2017	Base	PAL 1	PAL 2	PAL 3	PAL 4
Annual Operations	68,762	71,727	71,446	73,832	76,281	78,892
Annual Service Volume	164,943	164,943	164,943	163,499	163,499	162,937
Capacity Level	41.7%	43.5%	43.3%	45.2%	46.7%	48.4%

Source: FAA AC 150/5060-5, CHA, 2018

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Figure 4-3: Projected Demand (Single Runway Configuration)



Source: NAA, CHA, 2018

4.3.3.3 Airfield Capacity Conclusion

Based on the airfield capacity calculations for a single runway configuration, airfield capacity should not be an issue at BTV through PAL 4. Neither the forecast annual activity or peak hour activity will approach 60 percent of capacity.