# FACILITY REQUIREMENTS

The purpose of the facility requirements analysis is to determine the airport's capacity and its ability to support the forecast demand. Facility requirements identify development, replacement, or modification of airport facilities to accommodate the existing and 20-year forecast demand.

The methodology used to determine facility requirements begins with an examination of the airport's major components:

- Airfield
- Airspace
- Buildings
- Landside/Surface Access

It is important to note that each of these system components should be balanced, in order to achieve system optimization. Any deficiencies in the airport facilities that encompass these four elements will be identified based upon standards presented in FAA *Advisory Circular 150/5300-13A – Airport Design, Change 1*[10] and FAA *Advisory Circular 150/5060-5 – Airport Capacity and Delay*.[11] Recommended improvements to facilities will be noted.

## 4.1 Airfield Capacity and Delay

Airport capacity and delay computations are used to design and evaluate airport development and improvements. As demand approaches capacity, individual aircraft delay is increased. Successive hourly demands exceeding the hourly capacity result in unacceptable delays. Even when hourly demand is less than the hourly capacity, aircraft delays can still occur if the demand within a portion of the time interval exceeds the capacity during that interval.

Airport capacity is governed by runway use configuration, percentage of arrivals, percentage of touch and go's, taxiway configuration, airspace limitations, and runway instrumentation. Annual service volume (ASV) is a reasonable estimate of an airport's annual capacity. It accounts for differences in runway use, aircraft mix, and weather conditions that would be encountered over a year's time.

[10]Federal Aviation Administration, "Advisory Circular 150/5300-13A – Airport Design; Change 1," February 26, 2014, <http://www.faa.gov/>, accessed February 14, 2018.
[11]Federal Aviation Administration, "Advisory Circular 150/5060-5 – Airport Design; Change 2," September 23, 1983, <http://www.faa.gov/>, accessed February 14, 2018.

The airfield operational capacity for the Concord-Padgett Regional Airport, as calculated in accordance with FAA *Advisory Circular 150/5060-5 – Airport Capacity and Delay*, is approximately 230,000 annual operations per year. A "mix index" analysis is performed, which reduces the ASV as the number of category C and D aircraft operations increases at an airport. The current mix index for the Concord-Padgett Regional Airport is approximately 15 percent, which is short of the 20 percent index required to lower the ASV.

The current airport configuration provides an 'hourly' runway capacity of 98 visual flight rules (VFR) operations and 59 instrument flight rules (IFR) operations. A comparison of future demand to current airfield operational capacities does not indicate the need for runway capacity-enhancement projects. Based on the forecasts for the Airport, the demand as a percentage of ASV is presented in Table 4.1-1.

**Table 4.1-1**
**Forecast Demand as Percentage of ASV**
**Concord-Padgett Regional Airport**

| Year | Forecast Annual Operations | Percentage of ASV |
|---|---|---|
| 2017 | 62,410 | 27.1% |
| 2018 | 62,785 | 27.3% |
| 2023 | 64,691 | 28.1% |
| 2028 | 66,655 | 29.0% |
| 2038 | 70,764 | 30.8% |

ASV – Annual Service Volume
Source: Talbert, Bright & Ellington, Inc., February 2018.

Table 4.1-1 indicates that the forecast total annual operations are expected to grow from 27.1 percent to 30.8 percent of the annual service volume by the end of the 20-year planning period. Industry and FAA guidelines recommend that capacity improvements be pursued when annual operations reach 60 percent of the theoretical ASV. Therefore, when actual annual operations reach 138,000, more detailed analysis should be performed to better determine the runway's capacity. Since the demand at JQF is not forecasted to reach the 60 percent threshold level within the 20-year planning period, no new runways are required to increase the Airport's capacity.

Hourly airfield capacity is a measure of the maximum number of aircraft operations, which can be accommodated on the airport or airport component in an hour. Hourly capacity is an important consideration, since this measure determines whether an airport can accommodate the projected peak hour operations during the 20-year planning period.

FAA *Advisory Circular 150/5060-5 – Airport Capacity and Delay* was used to estimate the hourly capacity of JQF. The VFR and IFR hourly capacity for a single runway airport with a full-length parallel taxiway

is 98 VFR and 59 IFR operations according to the FAA. The forecast demand as a percentage of VFR and IFR hourly capacity is presented in Table 4.1-2.

**Table 4.1-2**
**Forecast Demand as Percentage of Hourly Capacity**
**Concord-Padgett Regional Airport**

| Year | Forecast Peak Hour Operations (operations/hour) | VFR Percentage of Hourly Capacity (%) | IFR Percentage of Hourly Capacity (%) |
|---|---|---|---|
| 2017 | 32 | 32.7% | 54.2% |
| 2018 | 33 | 33.7% | 55.9% |
| 2023 | 34 | 34.7% | 57.6% |
| 2028 | 35 | 35.7% | 59.3% |
| 2038 | 37 | 37.8% | 62.7% |

Source: Talbert, Bright & Ellington, Inc., February 2018.

Similar to the runway capacity analysis, the actual/projected hourly demand is only expected to reach 37.8 percent of hourly VFR capacity and approximately 62.70 percent of hourly IFR capacity by the end of the 20-year planning period. Therefore, no runway capacity improvements are recommended.

## 4.2 Airport Service Level

The Concord-Padgett Regional Airport provides general aviation and commercial air service to the Charlotte-Concord-Gastonia Metropolitan Statistical Area (MSA). The population of this area was estimated to be 2.43 million in 2015 according to US Census Bureau data. The Airport also accommodates the majority of the race team aviation needs by providing a convenient, safe, and secure airport as an alternative to flights in and out of Charlotte-Douglas International Airport.

The current National Plan of Integrated Airport Systems (NPIAS)[12] lists the Concord-Padgett Regional Airport as a small/non-hub facility. Small hubs are defined in statute as airports that enplane 0.05 percent to 0.25 percent of total U.S. passenger enplanements and non-hubs enplane less than 0.05 percent of all commercial passenger enplanements but have more than 10,000 annual enplanements. There is no change required to the Airport NPIAS designation as it is anticipated that JQF will continue to serve as small/non-hub facility through the 20-year planning period.

[12]U.S. Department of Transportation Federal Aviation Administration (September 30, 2016), "Report to Congress National Plan of Integrated Airport Systems (NPIAS) 2017-2021," <https://www.faa.gov/airports/planning_capacity/npias/reports/>, accessed February 19, 2018.

## 4.3 Runway Design Code

The runway design code (RDC) is a measure of the approach speed and wingspan of the most critical aircraft that operates at an airport. The critical aircraft is therefore used to determine the required airport approach and layout dimensions. The aircraft approach categories are listed in Table 4.3-1 while the aircraft design groups are listed in Table 4.3-2.

**Table 4.3-1**
**Aircraft Approach Category**
**Concord-Padgett Regional Airport**

| Approach Category | Aircraft Approach Speed |
|---|---|
| Category A | Less than 91 knots |
| Category B | 91 knots or more but less than 121 knots |
| Category C | 121 knots or more but less than 141 knots |
| Category D | 141 knots or more but less than 166 knots |
| Category E | More than 166 knots |

Source: Federal Aviation Administration, "Advisory Circular 150/5300-13A – Airport Design; Change 1," February 26, 2014, <http://www.faa.gov/>, accessed February 14, 2018.

**Table 4.3-2**
**Aircraft Design Group**
**Concord-Padgett Regional Airport**

| Design Group | Aircraft Wingspan |
|---|---|
| Group I | Up to but not including 49' |
| Group II | 49' up to but not including 79' |
| Group III | 79' up to but not including 118' |
| Group IV | 118' up to but not including 171' |
| Group V | 171' up to but not including 214' |
| Group VI | 214" up to but not including 262' |

Source: Federal Aviation Administration, "Advisory Circular 150/5300-13A – Airport Design; Change 1," February 26, 2014, <http://www.faa.gov/>, accessed February 14, 2018.

The current RDC for the Concord-Padgett Regional Airport is C-III (Table 4.3-3). The current critical aircraft at JQF is the Airbus A320-214. The Airbus A320-214 is considered an approach category C and design group III aircraft. The proposed critical aircraft is the Boeing 737-800, which is an RDC D-III. Future facilities should be designed to meet RDC D-III standards. Table 4.3-4 illustrates runway length requirements for the critical aircraft ast JQF.

**Table 4.3-3**
**Critical Aircraft Forecast**
**Concord-Padgett Regional Airport**

| Aircraft Type and ARC | Wing-Span | Aircraft Length | Aircraft Height | Seating | Maximum Gross Takeoff Weight | Takeoff Distance (ISO) | Approach Speed |
|---|---|---|---|---|---|---|---|
| Airbus A320-214 (RDC C-III) (Current) | 117.4' | 123.3' | 38.6' | Up to 177 pax + 2 pilots | 172,000 lbs. | 6,900' | 130 KIAS |
| Boeing 737-800 (RDC D-III) (Future) | 117.4' | 129.5' | 41.2' | Up to 175 pax + 2 pilots | 174,200 lbs. | 7,598' | 141 KIAS |

Note: Takeoff weight indicates maximum takeoff and ramp weight, respectively.
ISO (International Standard Observation): 59°F @ 29.92"
pax – passengers
KIAS – knots indicated air speed
RDC – Runway Design Code
Critical Aircraft (Defined) – The largest aircraft within a family of FAA Runway Design Code (RDC) that conducts at least 500 annual itinerant operations per year at the airport. The FAA establishes airport design criteria in accordance with the airport's ARC designation, which provides minimum safety standards with respect to the performance characteristics of the family of aircraft represented by the airport's critical aircraft.
Source: Talbert, Bright & Ellington, Inc., November 2017.

**Table 4.3-4**
**Critical Aircraft Runway Length Requirements**
**Concord-Padgett Regional Airport**

| Aircraft | Maximum Takeoff Weight | Reference Code | Takeoff Distance | | | Dry Landing Distance from Manufacturer | Landing Distance Wet (15% increase) |
|---|---|---|---|---|---|---|---|
| | | | Manufacturer (ft.) | Adjusted Hottest Month | Adjusted Runway Gradient[1] | | |
| Airbus A320-214 | 172,000 lbs | C-III | 6,900' | 7,500' | 8,148' | 4,900' | 5,635' |
| Boeing 737-800 (BBJ2) | 174,200 lbs | D-III | 7,200' | 7,600' | 8,248' | 5,440' | 6,256' |

Length of Haul 500+ miles. Mean Daily Maximum Temperature 86°.
Adjusted 645.3 feet for runway gradient (10 feet for every 1-foot of change) – Table 4.4.2-2, page 73.
Source: Airbus A320 Aircraft Characteristics – Airport and Maintenance Planning Document Rev. June 01, 2012.
Boeing Commercial Airplanes 737 Airplane Characteristics for Airport Planning, October 2005.
Talbert, Bright & Ellington, Inc., April 2018.

The FAA TFMSC data was used to determine the approximate number of operations currently being conducted at JQF by category C-III and larger (faster) aircraft. This information is used to determine if the future critical aircraft needs to be upgraded from the existing designation of C-III. Approximately 0.02 percent of the total operations at JQF are conducted by C-III and greater aircraft. This percentage is anticipated to increase through the 20-year planning period to 0.07 percent. This results in an increase from 1,291 to 4,953 annual operations by 2038 (Table 4.3-5).

**Table 4.3-5**
**Forecast Critical Aircraft Operations**
**Concord-Padgett Regional Airport**

| Year | Forecast Annual Operations | Forecast Operations by C-III or Greater Aircraft (0.02% to 0.07% of Total Operations) |
|---|---|---|
| 2017 | 62,410 | 1,291 |
| 2018 | 62,785 | 1,884 |
| 2023 | 64,691 | 3,234 |
| 2028 | 66,655 | 3,999 |
| 2038 | 70,764 | 4,953 |

Source: Talbert, Bright & Ellington, Inc., February 2018.

# 4.4 Airport Geometry

This section presents the airport geometric design standards and recommendations to ensure the safety, economy, efficiency, and longevity of an airport. It is important for airport owners to look at both, the present and the future of the airport.

## 4.4.1 Runway Wind Coverage

Meteorological conditions play an important role in the operation of an airport and must be considered for future development. The orientation of runway(s) to the prevailing wind directions is critical to the safe operation of aircraft, especially small single-engine aircraft, which are more susceptible to crosswinds. Crosswinds are wind components perpendicular to the runway or path of an aircraft. The FAA recommends 95 percent wind coverage for various crosswind components. The 95 percent wind coverage is computed on the basis that a crosswind not exceed 10.5 knots for Airport Reference Code A-I and B-I, 13 knots for Airport Reference Code A-II and B-II, 16 knots for Airport Reference Code A-III, B-III, and C-I through D-III, and 20 knots for Airport Reference Codes A-IV through D-VI. The wind coverage for the Concord-Padgett Regional Airport is shown in Table 4.4.1-1 (page 72).

**Table 4.4.1-1**
**Runway Wind Coverage**
**Concord-Padgett Regional Airport**

| VFR Wind Rose | | IFR Wind Rose | |
|---|---|---|---|
| **Knots** | **RWY 02-20** | **Knots** | **RWY 02-20** |
| 10.5 | 97.07% | 10.5 | 99.08% |
| 13 | 98.55% | 13 | 99.27% |

Source: Talbert, Bright & Ellington, Inc., February 2018.

Based on the wind analysis, it is clear that the current runway orientation at JQF satisfies FAA requirements for wind coverage and an additional crosswind runway is not required at this time for crosswind coverage. The FAA recommends ten consecutive years of wind observation data for determining runway wind coverage. A wind rose analysis should be performed periodically to ensure that runway geometry meets the future needs of the airport users.

## 4.4.2 Runway Length Requirements

The following section describes the recommended runway length requirements for JQF. The planned or future, runway length is determined by:

- Performance requirements to satisfy the most demanding aircraft or family of aircraft utilizing the Airport
- Conformance with FAA recommended runway length standards per *FAA Advisory Circular 150/5325-4C, Runway Length Recommendations for Runway Design*[13]
- Airport and local interest commensurate with community competitiveness for retaining and attracting business and investment to the region.

FAA provides guidance for all airports receiving federal funding for determining future runway length requirements. As stated in paragraph 301 of FAA *Advisory Circular 150/5325-4C, Runway Length Recommendations for Runway Design*[14]: *The recommended runway length obtained for this category of airplanes (large airplanes and light jets) is based on using the performance charts published by airplane manufacturers (APMs) for individual airplanes.* There are five steps identified in FAA *Advisory Circular 150/5325-4C, Runway Length Recommendations for Runway Design* for determining the require runway length which are listed below.

- **Step #1.** Identify the critical aircraft takeoff and landing weights

[13]Federal Aviation Administration, "Advisory Circular 150/5325-4C – Runway Length Recommendations for Airport Design (DRAFT)," ND, <http://www.faa.gov/>, accessed February 21, 2018.
[14]*Ibid.*

- **Step #2.** Identify the critical aircraft flap setting
- **Step #3.** Identify airport specific parameters such as runway end elevation changes and mean daily maximum temperature.
- **Step #4.** Apply the procedures in this chapter to each APM to obtain separate takeoff and landing runway length recommendations.
- **Step #5.** Apply any takeoff and landing length adjustments, if necessary, to the resulting lengths.

FAA TFMSC data was used to determine the types of jet aircraft most frequently operating at JQF, as well as the most demanding aircraft operating at JQF. This data consists of aircraft that operated via an instrument flight plan to or from JQF for 2013 through 2017. Table 4.4.2-1 (page 74) depicts the annual jet operations as well as the number of operations by the existing (Airbus A320-214) and future (Boeing 737-800) critical aircraft or larger jet aircraft. The takeoff and landing distance requirements set by the manufacturers are also listed in Table 4.4.2-1 (page 72). These distances have been adjusted to account for the mean daily maximum temperature during the hottest month and the existing runway gradient (Table 4.4.2-2).

**Table 4.4.2-2**
**Runway Length Requirements**
**Concord-Padgett Regional Airport**

| | |
|---|---|
| Airport Elevation | 703.99' |
| Mean Maximum Temperature | 90.0°F |
| Runway 02 Elevation | 639.46' |
| Runway 20 Elevation | 703.99' |
| Δ Runway Centerline Elevation[1] | 64.53' x 10' = 645.30' |

[1]For airplanes from the APMs must be increased by 10 feet per foot of difference in centerline elevations between the high and low points of the runway centerline elevations.
**Source:** Federal Aviation Administration, "Advisory Circular 150/5325-4C – Runway Length Recommendations for Airport Design (DRAFT)," ND, <http://www.faa.gov/>, accessed February 21, 2018.

The current runway at JQF is currently 7,400 feet long; however, only 6,350 feet is available for landing on Runway 20.

**Table 4.4.2-1**
**Large Aircraft and Jet Operations**
**Concord-Padgett Regional Airport**

| Aircraft | Maximum Takeoff Weight (MTOW, in pounds) | Runway Design Code | Takeoff Distance from Manufacturer | Takeoff Adjusted for Maximum Temperature. and Runway Gradient | Landing Distance Wet (15% increase) | Annual Operations at JQF | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2013 | 2014 | 2015 | 2016 | 2017 |
| **Annual Large Aircraft and Jet Operations at JQF** | | | | | | | | | | |
| | | | | | **TOTAL** | **6,530** | **6,832** | **7,770** | **8,310** | **8,606** |
| **Reference Code C-III and Greater Jet Aircraft Currently Operating at JQF** | | | | | | | | | | |
| A319 - Airbus A319 | 166,500 | C-III | 4,800' | 5,445' | 5,405' | 0 | 0 | 0 | 8 | 2 |
| B734 - Boeing 737-400 | 150,000 | C-III | 7,600' | 8,245' | 5,405' | 98 | 126 | 154 | 160 | 75 |
| B737 - Boeing 737-700 | 154,500 | C-III | 6,180' | 6,825' | 5,037' | 2 | 0 | 97 | 2 | 0 |
| GL5T - Bombardier BD-700 Global 5000 | 87,700 | C-III | 5,000' | 5,645' | 3,070' | 4 | 4 | 4 | 6 | 2 |
| GLEX - Bombardier BD-700 Global Express | 95,000 | C-III | 6,170' | 6,815' | 3,070' | 14 | 17 | 20 | 6 | 12 |
| GLF5 - Gulfstream V/G500 | 90,500 | D-III | 6,100' | 6,745' | 2,553' | 101 | 124 | 107 | 147 | 134 |
| MD83 - Boeing (Douglas) MD 83 | 163,000 | D-III | 7,550' | 8,195' | 6,095' | 4 | 135 | 396 | 184 | 96 |
| MD88 - Boeing (Douglas) MD 88 | 160,000 | D-III | 6,650' | 7,295' | 6,210' | 0 | 8 | 72 | 39 | 9 |
| Airbus A320-214 (Existing Critical Aircraft) | 172,000 | C-III | 6,900' | 7,545' | 5,865' | 9 | 98 | 336 | 852 | 1,548 |
| Boeing 737-800 (Future Critical Aircraft) | 174,200 | D-III | 7,598' | 8,243' | 6,164' | 226 | 261 | 266 | 308 | 179 |
| | | | | | **TOTAL** | **458** | **773** | **1,452** | **1,712** | **2,057** |

Source: Federal Aviation Administration, "Traffic Flow Management System Counts (TFMSC) Repository, 2007-2017," <https://aspm.faa.gov/tfms/sys/main.asp>, accessed September 28, 2017.

Due to constraints, a runway extension is not recommended at this time. The runway threshold is currently displaced so that the runway protection zone (RPZ) meets FAA standards. It is however recommended that the stacker and silos belonging to Vulcan be moved to the back of the property so that 300 feet of runway can be made available to pilots landing on Runway 20. Discussions of potentially relocating Vulcan's equipment has been ongoing for several years but has been considered cost prohibitive. This would reduce the existing displaced threshold on Runway 20 allowing 7,050 feet available for landing on Runway 20.

### 4.4.3 Runway Numbering

Runway numbers are determined by the nearest tenth of a degree in magnetic heading. The constant shifting of magnetic north due to declination can cause runway designation numbers to change occasionally. The true runway heading (11.454 degrees [°]) at the Concord-Padgett Regional Airport plus the magnetic declination (7.442° West) equals the magnetic runway heading of 18.896° or 20° when rounded. The existing runway numbers of 02-20 will not need to be altered as part of this study. It is important to monitor declination changes so that the most accurate magnetic heading may be reflected through the runway designation numbers.

### 4.4.4 Runway Width

FAA *Advisory Circular 150/5300-13A – Airport Design, Change 1*[15] provides guidance for runway width standards based on RDC and wind coverage. For Categories C-III and D-III runways, a 150-foot width is recommended. Runway 02-20 at the Concord-Padgett Regional Airport is currently 100 feet wide. It is recommended that within the first five years of the 20-year planning period that the Runway 02-20 be widened to 150 feet with 25-foot pave shoulders to reduce the accumulation of foreign object debris (FOD) on the runway from rotor wash and jet blast.

### 4.4.5 Pavement Strength and Condition

Airport pavements are constructed to provide adequate support for the loads imposed by aircraft using the airport and to produce a firm, stable, smooth, year-round, and all-weather surface free from dust or other particulates that may be blown or picked up by propeller wash or jet blast. For a pavement to meet the requirements noted, it must have the strength and stability to withstand abrasive action, adverse weather, and other deteriorating influences. Braking performance on pavement surfaces becomes critical with increases in forecasted turbojet operations. Under certain conditions, hydroplaning or unacceptable loss of friction can occur resulting in poor braking performance and possible loss of directional control.

[15]Federal Aviation Administration, "Advisory Circular 150/5300-13A – Airport Design; Change 1," February 26, 2014, <http://www.faa.gov/>, accessed February 14, 2018.

As determined during the inventory of airport facilities, the existing runway and taxiway pavements were found to be in satisfactory condition. A pavement management study[16] conducted by the NCDOT-DOA in March 2016 determined the following (Appendix B):

- Overall (Network) Airport Pavement Condition Index (PCI): 76 (Satisfactory)
- The following provides the area-weighted average PCI based on branch use for all airside pavements at JQF:
    - Runway: 73 (Satisfactory)
    - Aprons: 75 (Satisfactory)
    - Taxiways: 83 (Satisfactory)

As of the preparation of this Master Plan Update, JQF is initiating the placement of three inches of P-401 bituminous concrete over the existing runway, taxiway, and apron system in order to strengthen the pavements to accommodate the commercial service aircraft that are currently using the facility. The strengthing of the runway, taxiway, and apron system is currently underway from 129,000-pound dual wheel gear to 171,000-pound dual wheel gear.

As part of the taxiway strengthening there is a section of Taxiway 'A' that connects to concrete taxiways at the concrete commercial service apron. This section of taxiway will not tie-into the existing concrete with three inches added. Therefore, the bituminous concrete will be removed by milling, and the aggregate base course will be treated with cement to strengthen the base course. Then the bituminous concrete will be placed on top of the strengthened base course to match the grades of the concrete taxiways. As part of the apron strengthening there will concrete hardstands installed at current parking locations for large aircraft (Airbus A320-214 and Boeing 737-800), so that the aircraft does not cause rutting in a static position. In addition, the taxilane rehabilitation will include milling out two inches of bituminous service and putting back two inches of P-401 bituminous concrete surface course.

It is recommended that within the first five to ten years of the 20-year planning period that the pavements be reevaluated to determine whether the pavement strength needs to be increased to accommodate the larger commercial service aircraft projected to use JQF.

### 4.4.6 Runway Protection Zones

The runway protection zone (RPZ) function is to enhance the protection of people and property on the ground. This is achieved through airport owner control over RPZs. Such control includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities. Control is preferably

[16]RDM International, Inc. and CH2M Hill, Inc. (March 2016), "Airport Pavement Management Study Update, Inspection Report for Concord-Padgett Regional Airport (JQF)," prepared for North Carolina Department of Transportation Division of Aviation.

exercised through acquisition of sufficient property interest in the RPZ. The geometrics of the RPZ vary depending upon the visibility minimums for the runway approach and the aircraft utilizing the airport. Table 4.4.6-1 depicts the existing and future RPZ sizes based on a non-precision 34:1 approach slope to Runway 02 and a precision 50:1 approach slope to Runway 20.

**Table 4.4.6-1**
**RPZ Requirements**
**Concord-Padgett Regional Airport**

| Runway Protection Zone | Existing Size (length x inner width x outer width) | Future Size (length x inner width x outer width) |
|---|---|---|
| Runway 02 Approach RPZ | 1,700' x 500' x 1,510' | 1,700' x 1,000' x 1,510' |
| Runway 02 Departure RPZ | 1,700' x 500' x 1,010' | Same |
| Runway 20 Approach RPZ | 2,500' x 1,000' x 1,750' | Same |
| Runway 20 Departure RPZ | 1,700' x 500' x 1,010' | Same |

Source: Federal Aviation Administration, "Advisory Circular 150/5300-13A – Airport Design; Change 1," February 26, 2014, <http://www.faa.gov/>, accessed February 14, 2018.

Vulcan Materials owns the land adjacent to JQF on the north side of Poplar Tent Road. The relocation of this facility would allow for the relocation of the Runway 20 approach RPZ, which would permit the removal of the displaced threshold on Runway 20. Currently two security/utility poles penetrate the FAA Part 77 surface approach slope criteria. Removal or lowering of these two poles would decrease the horizontal visibility minimums. Decreasing the visibility minimums enhances flight safety; therefore, the RPZ increases to support the lower approach minimums.

## 4.4.7 Runway Safety Area

A runway safety area (RSA) is defined as a surface surrounding the runway, which is suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway. The dimensional standards for the RSA at JQF are noted in Table 4.4.7-1 (page 78). In addition to the dimensional standards, the RSA should conform to the following design standards:

- Graded and cleared of hazardous items or surface variations
- Drained by grading or other conveyance to prevent water accumulation
- Capable of supporting airport and usage vehicles and the occasional passage of aircraft under dry conditions
- Free from objects except those fixed by function. Objects greater than 3 inches in height above grade shall be frangible

The Runway 20 RSA extends 1,000 feet beyond the far end of the runway. Aircraft operating on Runway 02 need a 1,000-foot RSA on that end while aircraft operating on Runway 20 require the full 1,000 feet on the Runway 02 end. In order to meet the FAA requirements for extended runway safety areas, declared distances have been published to define the amount of runway available for takeoff and landing on Runway 20 (Table 4.4.7-2).

**Table 4.4.7-1**
**RSA Dimensions and Design Standards**
**Concord-Padgett Regional Airport**

| Runway | RDC | RSA Width | RSA Length Prior to Threshold | RSA Length Beyond Departure End | Meets Design Standards |
|---|---|---|---|---|---|
| **Existing** | | | | | |
| 02 | C-III | 500' | 600' | 600' | No |
| 20 | C-III | 500' | 600' | 1,000' | Yes |
| **Future** | | | | | |
| 02 | D-III | 500' | 600' | 600' (EMAS) | Yes |
| 20 | D-III | 500' | 600' | 1,000' | Yes |

Source: Federal Aviation Administration, "Advisory Circular 150/5300-13A – Airport Design; Change 1," February 26, 2014, <http://www.faa.gov/>, accessed February 14, 2018.

**Table 4.4.7-2**
**Runway 02-20 Declared Distances**
**Concord-Padgett Regional Airport**

| | Existing | | Ultimate | |
|---|---|---|---|---|
| Runway | 02 | 20 | 02 | 20 |
| TORA | 7,400' | 7,400' | 7,400' | 7,400' |
| TODA | 7,400' | 7,400' | 7,400' | 7,400' |
| ASDA | 7,400' | 7,000' | 7,400' | 7,400' |
| LDA | 7,400' | 6,350' | 7,400' | 6,750' |

ASDA – Accelerated Stop Distance Available
LDA – Landing Distance Available
TODA – Takeoff Distance Available
TORA – Takeoff Run Available
Source: Talbert, Bright & Ellington, Inc., February 2018.

It is recommended that an engineered materials arresting system (EMAS) be installed on the Runway 02 approach end. This system is comprised of a bed of soft material, which slows an aircraft that might overrun the runway end and is used when a full 1,000-foot RSA is not available. An RSA study (Appendix C) was completed for the Concord-Padgett Regional Airport in 2009, which recommended

the previously mentioned solution for obtaining an FAA-compliant RSA at JQF. Table 4.3-4 (page 70) outlines the the runway length requirements for the critical aircraft at JQF and supports this recommendation.

## 4.4.8 Runway Obstacle Free Zone

The runway obstacle free zone (OFZ) clearing standards preclude taxiing and parked airplanes and object penetrations, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function. The runway OFZ, inner-approach OFZ, and inner-transitional OFZ comprise the obstacle free zone (OFZ).

- **Runway OFZ (ROFZ)** is a defined volume of airspace centered above the runway centerline. The ROFZ is the airspace above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The ROFZ extends 200 feet beyond each end of the runway. Its width varies depending on aircraft served. At the Concord-Padgett Regional Airport, Runway 02-20 serves aircraft weighing more than 172,000 pounds and therefore has an ROFZ width of 400 feet.
- **Inner-approach OFZ** is a defined volume of airspace centered on the approach area. The inner-approach OFZ begins 200 feet from the runway threshold at the same elevation as the runway threshold and extends 200 feet beyond the last light unit in the approach lighting system. Its width is the same as the ROFZ and rises at a slope of 50 (horizontal) to 1 (vertical) from its beginning. The inner-approach OFZ applies only to the approach end of Runway 20 at the Concord-Padgett Regional Airport due to the approach lighting system on this end. The inner-approach OFZ measures 2,500 feet in length.
- **Inner-Transitional OFZ** is a defined volume of airspace along the sides of the ROFZ and inner-approach OFZ. It applies only to runways with lower than ¾-statute mile approach visibility minimums. The inner-transitional OFZ at the Airport begins at the edges of the ROFZ and inner-approach OFZ and rises vertically based on the height of the critical aircraft and then slopes at 6:1 to a height of 150 feet AGL.
- **Precision OFZ (POFZ)** is a defined volume of airspace above an area beginning at the runway threshold, at the threshold elevation, and centered on the extended runway centerline, 200 feet long by 800 feet wide. The surface is in effect only when all of the following operational conditions are met:
    - Vertically guided approach
    - Reported ceiling below 250 feet and/or visibility less than ¾-statute mile (or Runway Visual Range [RVR] below 4,000 feet)
    - An aircraft on final approach within two miles of the runway threshold.

When the POFZ is in effect, a wing of an aircraft holding on a taxiway waiting for runway clearance may penetrate the POFZ; however, neither the fuselage nor the tail may infringe on the POFZ.

The POFZ at the Concord-Padgett Regional Airport aligns with the northern edge of Taxiway G. Aircraft may wait for departure on this taxiway as long as the fuselage or tail does not encroach upon the POFZ.

## 4.4.9 Runway Object Free Area

The runway object free area (ROFA) is an area on the ground centered on the runway centerline provided to enhance the safety of aircraft operations by having the area free of objects except objects that need to be located in the ROFA for air navigation or aircraft maneuvering purposes. The dimensional standards are noted in Table 4.4.9-1.

**Table 4.4.9-1**
**ROFA Dimensions and Design Standards**
**Concord-Padgett Regional Airport**

| Runway | RDC | Width | Length Beyond Runway End | Meets ROFA Clearing Requirements |
|---|---|---|---|---|
| **Existing** | | | | |
| 02 | C-III | 800' | 1,000' | Yes |
| 20 | C-III | 800' | 1,000' | Yes |
| **Future** | | | | |
| 02 | D-III | 800' | 1,000' | Yes |
| 20 | D-III | 800' | 1,000' | Yes |

Source: Federal Aviation Administration, "Advisory Circular 150/5300-13A – Airport Design; Change 1," February 26, 2014, <http://www.faa.gov/>, accessed February 14, 2018.

## 4.4.10 Runway Line of Sight

An acceptable runway profile permits any two points five feet above the runway centerline to be mutually visible for the entire runway length. However, if the runway has a full-length parallel taxiway, the runway profile may be such that an unobstructed line of sight will exist from any point five feet above the runway centerline for one-half the runway length. There are no obstructions or limitations to the line of sight within the visibility zone. No changes are required to meet runway visibility standards.

## 4.4.11 Runway Edge Lighting and Signage

Edge lights are used to outline usable operational areas of airports during periods of darkness and low visibility weather conditions. The Concord-Padgett Regional Airport is currently equipped with HIRLs. These lights were installed on Runway 20 for the inclement weather capabilities of the Airport. It is recommended that these lights be retrofitted so that the "high" setting may be accessed via pilot-controlled TDZ lighting to enhance inclement weather capability in the future.

A conversion of these lights to light emitting diode (LED) lights is recommended if and when the FAA approves LED lights for runway use. No other modifications are anticipated other than routine maintenance.

Existing airside signage consists of lighted guidance signs. These signs will require periodic maintenance but do not currently need to be replaced or upgraded.

## 4.4.12 Helipad

The Concord-Padgett Regional Airport is currently equipped with one helipad. While this existing helipad can accommodate all forecast helicopter operations over the planning period, the addition of two helipads on the north side of the apron area is recommended. These additional helipads would reduce the towing distance of helicopters, which are stored on the north side of the Airport. This will help reduce congestion and maximize aircraft flow on the apron. No other additions to these facilities are required. The Airport is equipped with dollies, which can be used to move helicopters to and from the helipad and apron/hangar storage areas. The new helipads would provide helicopter storage, as well as reduce the need to reposition between flights.

## 4.4.13 Taxiway Requirements

The minimum pavement widths, curve radii, and separations associated with airplane movement areas and airplane physical characteristics establish the taxiway system. Since the taxiway system is the transitional facility, which supports airport operational capacity, the capability to maintain an average taxiing speed of at least 20 mph is recommended, which is currently met by the existing taxiways at the Airport. Taxiway dimensional standards are categorized by separations, widths, curves, and fillets. In addition, the taxiway safety area shall be:

- Cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations
- Drained by grading or storm sewers to prevent water accumulation
- Capable, under dry conditions, of supporting snow removal equipment, ARFF equipment, and the occasional passage of aircraft without causing structural damage for the aircraft

- Free of objects except those which need to be located in the taxiway safety area because of their function. Objects higher than 3 inches above grade should be constructed on low impact resistant supports (frangible mounted structures) of the lowest practical height with the frangible point no higher than three inches above grade. Other objects, such as manholes, should be constructed at grade. In no case should their height exceed 3 inches above grade
- Taxiway are not allowed to have direct access from the parking aprons to the runway, but must be off-set to prevent runway incursions

## 4.4.14 Taxiway and Taxilane Object Free Areas

The taxiway and taxilane object free areas (OFAs) are centered on the taxiway and taxilane centerlines. The taxiway and taxilane OFA clearing standards prohibit service vehicle roads, parked airplanes, and aboveground objects except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. Vehicles may operate within the OFA provided they give right-of-way to oncoming aircraft by either maintaining a safe distance ahead or behind the aircraft or by exiting the OFA to let the aircraft pass. The taxiway and taxilane OFAs at JQF meet FAA standards, and no modifications are necessary.

## 4.4.15 Parallel Taxiways

A basic airport consists of a runway with a full-length parallel taxiway, an apron, and connecting transverse taxiways between the runway, parallel taxiway, and the apron. The Airport currently has a full-length parallel taxiway system connecting each end of the runway. This taxiway (Taxiway A) is connected to the runway via seven stub taxiways. The existing taxiways meet C-III design standards and are 50 feet wide. There are no changes required to this taxiway system. Bypass taxiways are located at each runway end. These will allow departing aircraft that have been cleared for takeoff to access the runway ends without waiting behind aircraft, which have not been cleared.

Connector taxiways should permit free flow to the parallel taxiway. The location of connector taxiways depends a great deal on the mix of aircraft, approach and touchdown speeds, point of touchdown, exit speed, rate of deceleration, dry or wet pavement, and number of exits. The FAA conducted a study evaluating the distance of connector taxiways from the threshold for various aircraft types. Under dry conditions, 100 percent of aircraft weighing less than 12,500 pounds can exit at 5,000 feet. Connector taxiways are located roughly every 1,360 feet at the Concord-Padgett Regional Airport. No additional runway/taxiway connectors are required.

## 4.4.16 Taxiway Edge Lighting and Signage

The taxiway edge lighting system is a configuration of lights that define the lateral and longitudinal limits of usable taxiway. Taxiway signage provides the airport users with guidance information for taxiing destinations and to assist in taxi route decision making upon exiting the apron area. The Concord-Padgett Regional Airport is currently equipped with medium intensity taxiway lighting

(MITL) and lighted taxiway signs. All of the taxiway lights at JQF are LED lights, which use a fraction of the power that regular quartz lights use. This change in the taxiway lights provides a "green" benefit to the Airport by reducing power consumption.. There are no other improvements required for these ground navigational aids.

### 4.4.17 Runway to Taxiway Separation

Runway to taxiway separation standards are predicated on the RDC and the existing/future visibility minimums expected. The higher the RDC and the lower the visibility minimums, the greater the runway to taxiway separation distances. For an airport with an RDC of C-III or D-III and runways with precision instrument approach visibility minimums, FAA *Advisory Circular 150/5300-13A – Airport Design, Change 1* recommends a 400-foot separation between the runway and taxiway. The Concord-Padgett Regional Airport currently meets and will meet this standard.

### 4.4.18 Taxilane System

The taxilanes, having access from the apron and taxiway system to hangar and ramp areas, should be designed in accordance with RDC D-III standards as specified in FAA *Advisory Circular 150/5300-13A – Airport Design, Change 1*. The taxilane strength should be commensurate with aircraft usage as needed between the airfield and associated hangar/ramp maneuvering areas. Hangar taxilanes should be of sufficient width to allow unencumbered wingtip clearance between fixed objects (hangars, fence, fueling facilities, light poles, etc.).

The taxilanes at the Concord-Padgett Regional Airport are used for aircraft maneuvering from the taxiways to and from the hangars and apron areas. Additional taxilanes will be required as more hangars are constructed at the Airport. These taxilanes will provide access to these new facilities. Existing taxilanes are currently undergoing rehabilitation and strengthening to accommodate frequent passage of heavier aircraft to and from existing hangars at JQF. There are no other modifications or improvements required at this time to the taxiway/taxilane network at the Concord-Padgett Regional Airport.

### 4.4.19 Airport Geometry Summary

Table 4.4.19-1 (page 84) summarizes the existing and future airfield design standards.

## 4.5 Airside Facility Requirements

This section identifies airfield facilities needed to satisfy the 20-year forecast of aviation demand at the Concord-Padgett Regional Airport. The identification of needed facilities does not constitute a requirement in terms of absolute design standards or goals, but rather an option for facility

improvements to resolve various types of facility or operational inadequacies or to make improvements as demand warrants. The facilities recommended as part of this Master Plan Update have been identified from inventory and forecast findings and planned in accordance with FAA airport design standards and airspace criteria.

**Table 4.4.19-1**
**Airfield Design Standards**
**Concord-Padgett Regional Airport**

| Runway Design Factors | Existing | Future (RDC D-III) Precision Approach Requirements |
|---|---|---|
| Runway Width | 100' | 150' |
| Runway Safety Area (RSA):<br>RSA width<br>RSA length beyond runway end | <br>500'<br>1,000' (600' RWY 20) | <br>500'<br>1,000' (600' EMAS) |
| Object Free Area (OFA):<br>OFA width<br>OFA length beyond runway end (Precision OFA) | <br>800'<br>1,000' | <br>800'<br>1,000' |
| Building Restriction Line (BRL) | 800' from centerline | 800' from centerline |
| Taxiway width | 50' | 50' |
| Runway to taxiway distance<br>Runway to parking distance<br>Taxiway to parking distance | 400'<br>500'<br>100' | 400'<br>500'<br>100' |
| Source: Federal Aviation Administration, "Advisory Circular 150/5300-13A – Airport Design; Change 1," February 26, 2014, <http://www.faa.gov/>, accessed February 14, 2018. | | |

The following analysis addresses seven major airport areas. The runway length has been addressed as part of the demand capacity study and is thus not included in the following analysis. The facility requirements section has been broken down into airside and landside facility requirements.

## 4.5.1 Aircraft Storage

General aviation aircraft parking and storage requirements can vary widely from airport to airport depending on the number of transient aircraft using the airport and the number of based aircraft owners who chose to tie down their aircraft on the ramp versus those who choose to use available hangar space. Table 4.5.1-1 (page 85) lists the existing storage percentages at the Concord-Padgett Regional Airport by aircraft type.

**Table 4.5.1-1**
**Based Aircraft Storage Ratios**
**Concord-Padgett Regional Airport**

| Aircraft Types | Apron Tie-Downs | T-Hangars | Conventional Hangars |
|---|---|---|---|
| Single-Engine | 26% | 49% | 25% |
| Multi-Engine | 20% | 60% | 20% |
| Turboprop | 0% | 0% | 100% |
| Jet | 12% | 0% | 88% |
| Rotorcraft | 0% | 0% | 100% |

Source: Concord-Padgett Regional Airport (September 2017).
Talbert, Bright & Ellington, Inc., February 2018.

## 4.5.2 T-Hangar Storage

General aviation airports most often utilize T-hangars as covered storage for small general aviation aircraft. JQF currently has 62 T-hangar units. Based on this ratio, a total of 63 T-hangar units will be required by 2038 as shown in Table 4.5.2-1. This equates to the possible need for one additional 8-unit T-hangar building at the Airport over the 20-year planning period.

**Table 4.5.2-1**
**T-Hangar Storage Requirements**
**Concord-Padgett Regional Airport**

| Aircraft Types | 2017 | 2023 | 2028 | 2038 |
|---|---|---|---|---|
| Single-Engine | 53 | 53 | 53 | 53 |
| Multi-Engine | 9 | 10 | 10 | 10 |
| Turboprop | 0 | 0 | 0 | 0 |
| Jet | 0 | 0 | 0 | 0 |
| Rotorcraft | 0 | 0 | 0 | 0 |
| Total T-Hangar Units | 62 | 63 | 63 | 63 |

Source: Talbert, Bright & Ellington, Inc., February 2018.

## 4.5.3 Conventional Hangar Storage

Conventional hangars represent the other most common method of covered aircraft storage. The following square footage requirements were used for calculating the total conventional hangar storage required at the Airport.

- Single-Engine – 1,000 square feet
- Multi-Engine – 3,000 square feet
- Turboprop – 6,000 square feet
- Jet – 8,000 square feet
- Helicopter – 4,000 square feet

The existing conventional hangar storage area at JQF totals 264,000 square feet, which includes hangar office space and bay areas. Table 4.5.3-1 depicts the number of aircraft per hangar type over the 20-year planning period. A total of 394,000 square feet of conventional hangar storage will be needed by 2038 as shown in Table 4.5.3-2. This accounts for all conventional hangar requirements accommodating single, multi, turboprop, jet, and rotorwing aircraft, as well as additional space for aircraft maintenance and office functions.

**Table 4.5.3-1**
**Conventional Hangar Storage Requirements by Number of Aircraft**
**Concord-Padgett Regional Airport**

| Aircraft Types | 2017 | 2023 | 2028 | 2038 |
|---|---|---|---|---|
| Single-Engine | 27 | 27 | 27 | 27 |
| Multi-Engine | 3 | 3 | 3 | 3 |
| Turboprop | 8 | 9 | 9 | 11 |
| Jet | 20 | 23 | 26 | 33 |
| Rotorcraft | 5 | 6 | 6 | 7 |
| Source: Talbert, Bright & Ellington, Inc., February 2018. | | | | |

**Table 4.5.3-2**
**Conventional Hangar Storage Requirements by Total Size (Square Feet)**
**Concord-Padgett Regional Airport**

| Aircraft Types | 2017 | 2023 | 2028 | 2038 |
|---|---|---|---|---|
| Single-Engine | 27,000 | 27,000 | 27,000 | 27,000 |
| Multi-Engine | 9,000 | 9,000 | 9,000 | 9,000 |
| Turboprop | 48,000 | 54,000 | 54,000 | 66,000 |
| Jet | 160,000 | 184,000 | 208,000 | 264,000 |
| Rotorcraft | 20,000 | 24,000 | 24,000 | 28,000 |
| Total Conventional Hangar Space | **264,000** | **298,000** | **322,000** | **394,000** |
| Source: Talbert, Bright & Ellington, Inc., February 2018. | | | | |

## 4.5.4 Apron Area

Existing aircraft parking apron and hangar taxilane areas include:

- General aviation – 109,018 square yards
- Commercial service – 19,042 square yards
- Hangar access taxilanes – 50,893 square yards
- Private apron – 1,234 square yards

Apron areas are used for outside aircraft storage. There are 104 individual tie-down spaces accounting for a total itinerant and storage apron size of 109,018 square yards currently at the Airport. The following square footage requirements were used for calculating the total apron area required at the Airport. Table 4.5.4-1 lists the based aircraft apron requirements in square yards.

- Single-Engine – 1,000 square yards
- Multi-Engine – 2,000 square yards
- Turboprop – 3,000 square yards
- Jet – 4,000 square yards
- Helicopter – 4,000 square yards

**Table 4.5.4-1**
**Based Aircraft Apron Area Requirements by Total Size (Square Yards)**
**Concord-Padgett Regional Airport**

| Aircraft Types | 2017 | 2023 | 2028 | 2038 |
|---|---|---|---|---|
| Single Engine Piston | 28,000 | 28,000 | 28,000 | 28,000 |
| Multi Engine Piston | 6,000 | 6,000 | 6,000 | 8,000 |
| Turboprop | 0 | 0 | 0 | 0 |
| Business Jet | 12,000 | 12,000 | 16,000 | 20,000 |
| Rotorcraft | 0 | 0 | 0 | 0 |
| Total Apron Area | **46,000** | **46,000** | **50,000** | **56,000** |

Source: Talbert, Bright & Ellington, Inc., February 2018.

These calculations account for taxilanes, as well as the ingress and egress of aircraft to and from the apron parking spaces. While the current demand calculations may be less than the current apron space available, an expansion should be considered for the near-term (first five years of the planning period) development to accommodate future growth and reduce aircraft congestion on days when operations

are higher due to race team flights. An additional 84,747 square yards of apron will be required during the first phase of the proposed airport development.

## 4.5.5 Transient Aircraft Storage

Transient aircraft parking requirements typically make up the largest demand for apron space requirements. Typically, 80 percent of transient aircraft are stored on the apron while the remaining 20 percent are stored in conventional hangars. These percentages were used to calculate the transient aircraft storage areas required to meet the forecast demand. Table 4.5.5-1 lists the transient aircraft storage requirements based on the forecast transient aircraft activity at the Concord-Padgett Regional Airport.

**Table 4.5.5-1**
**Transient Aircraft Storage Requirements**
**Concord-Padgett Regional Airport**

| Year | Apron Area (Square Yards) | Conventional Hangars (Square Feet) |
|---|---|---|
| 2017 | 217,700 | 101,800 |
| 2023 | 224,800 | 105,100 |
| 2028 | 231,900 | 108,400 |
| 2038 | 246,000 | 115,000 |

Source: Talbert, Bright & Ellington, Inc., February 2018.

## 4.5.6 Aircraft Storage Requirements Summary

Table 4.5.6-1 lists the aircraft storage requirements for the 20-year planning period. These numbers include storage for both based and transient aircraft.

**Table 4.5.6-1**
**Total Aircraft Storage Requirements**
**Concord-Padgett Regional Airport**

| Facility | Current Capacity | Existing Need | Phase 1 (2018-2023) | Phase 2 (2024-2028) | Phase 3 (2029-2038) |
|---|---|---|---|---|---|
| T-Hangar Units | 67 | 62 | 63 | 63 | 63 |
| Conventional Hangar (sf) | 399,637 sf | 365,800 sf | 403,100 sf | 430,400 sf | 509,000 sf |
| Excess | | +33,837 | | | |
| Total Apron Area (sy) | 178,953 sy | 263,700 sy | 270,800 sy | 281,900 sy | 302,000 sy |
| Deficiency | | -84,747 | | | |

Source: Talbert, Bright & Ellington, Inc., February 2018.

## 4.5.7 Fueling Facilities

The Concord-Padgett Regional Airport fueling facilities currently consist of nine separate aboveground storage tanks. Fuel delivery schedules can be adjusted as the demand warrants, which temporarily eliminates the need for additional fuel storage tanks. However, one additional Jet A tank may be necessary over the 20-year planning period, as commercial air service increased. This proposed tank can be accommodated at the existing fuel farm. The existing and proposed fuel storage tanks are shown in Table 4.5.7-1.

**Table 4.5.7-1**
**Fuel Storage Requirements**
**Concord-Padgett Regional Airport**

| No. of Tanks | Fuel | Size (gallons) | Status |
|---|---|---|---|
| 1 | Avgas | 15,000 | Existing |
| 4 | Jet A | 15,000 | Existing |
| 1 | Jet A | 20,000 | Existing (recently constructed) |
| 1 | Unleaded Automobile Gas | 1,000 | Existing |
| 1 | Diesel | 500 | Existing |
| 1 | Empty | 1,000 | Existing |
| 1 | Jet A | 20,000 | Proposed |
| 1 | Avgas | 15,000 | Proposed |

Source: Talbert, Bright & Ellington, Inc., February 2018.

The segregation of Avgas fueling facilities from Jet A facilities is recommended to enhance the flow of aircraft around the apron area. The smaller general aviation (GA) aircraft, which require Avgas are predominately located on the north side of the Airport. A relocated Avgas tank with self-fueling capabilities will increase the operations efficiency of the Airport. A one-way taxilane could be designated adjacent to this Avgas tank which would also increase movement efficiency and help to eliminate bottlenecks during fueling operations. This facility could be located adjacent to the northern apron areas. No relocation of the Jet A tanks is anticipated.

The fuel farm meets U.S. Environmental Protection Agency (USEPA) requirements and is in good condition. As the number of based aircraft increases, the demand on Avgas and Jet A fuel will also increase.

As the production of 100LL Avgas decreases in the U.S. due to USEPA leaded fuel restrictions, an alternative fuel will likely be introduced to the piston-powered aircraft fleet in coming years. This new fuel may potentially be blended with existing Avgas so that airports throughout the system would not be required to install additional fuel storage tanks when the new fuel is adopted. This new fuel will also eliminate the potential from lead contamination in the event of a fuel spill.

## 4.5.8 Airfield Maintenance Equipment and Storage Facilities

The Airport currently operates a number of vehicles used for airfield maintenance including four tractors for grass cutting. The Airport currently has a 7,200-square-foot storage building located in the south apron area, adjacent to the fuel farm. It is anticipated that this facility will sufficiently accommodate the airfield storage needs over the 20-year planning period. However, an expansion of this storage space may be needed if additional maintenance equipment is acquired.

The Airport owns several pieces of aircraft service equipment including tugs, ground power units, fueling trucks, and courtesy vehicles. A list of these vehicles is included in Table 2.2.6-1 (pages 26 through 28). Additional Jet A and Avgas fueling trucks should be acquired over the 20-year planning period to meet the forecast fueling demand. Also, additional ground support equipment will be necessary to service more and larger aircraft in the future. The covered storage area for this equipment should be expanded adjacent to the existing terminal building.

## 4.5.9 Perimeter Fencing

Perimeter fencing is crucial to the prevention of animal and human incursion on aircraft operating areas. A portion of the Airport is bounded by woods and undeveloped areas and subject to animal incursions. The terminal area of the general aviation airport is the most likely place for human incursions to occur. The Concord-Padgett Regional Airport has recently installed new perimeter fencing along the portions of the airport property line. This fencing meets FAA 14 CFR Part 139 standards and is in good condition but sections not replaced during the recent project may need to be replaced during the 20-year planning period.

## 4.5.10 Air Traffic Control Tower

The existing ATCT at JQF is located on the airport terminal building. The top of the ATCT cab sits at approximately 701 feet AMSL, with an estimated eye-level height of 693 feet AMSL, which is approximately 11 feet lower than the end of Runway 20. In addition, the existing control tower cab size is not sufficient to accommodate new technological equipment, additional workstations, and counter space. Based on these deficiencies, an ATCT Site Selection Study was completed in December 2012 (Appendix E), which recommended the development of a new tower approximately 66 feet south of the existing ATCT.

Since the completion of the ATCT Site Selection Study in 2012, JQF has experienced significant changes including commercial services operations. Because of these changes, the location of the ATCT has been changed to Proposed Tower Site No. 4, which is located approximately 3,227.0 feet northeast of the existing general aviation terminal in an undeveloped area between Runway 02-20 and I-85. The site is located at Latitude 35° 23' 31.06" and Longitude 80° 42' 17.05" (Northing 601,921.54 and Easting 1,491,952.29) and has a ground elevation of 714.0 feet MSL. The proposed tower provides completely unobstructed views of controlled airport surface areas and maximum visibility of airborne

traffic. It is recommended that this new tower be designed and located within the first five years of the 20-year planning period.

## 4.6 Airspace and NAVAID Requirements

It is important to research the airspace surrounding the Concord-Padgett Regional Airport and determine how it would impact aircraft approaching or departing from the Airport. It is also important to identify existing and potential obstructions to the airspace surfaces in the immediate vicinity of the airport.

### 4.6.1 Airspace Capacity

The Concord-Padgett Regional Airport lies within the CLT Class B airspace. The Airport lies within a relatively congested area of airspace with CLT located 15 miles southwest. The assistance of Charlotte Approach and Departure Control has and will continue to aid in the navigation of instrument flights to and from JQF. The ILS approach at JQF is located on Runway 20 due to the proximity of CLT operations. It is recommended that future operations at JQF be conducted to and from the northeast of the Airport to continue to minimize conflicts with CLT operations. Approach operations to Runway 23 at CLT would conflict with the final approach course of an ILS approach to Runway 02 at JQF. To the extent possible, approach to JQF should be vectored in from the northeast, utilizing the Runway 20 approach capabilities. As additional aircraft take to the skies over the next 20 years, airspace efficiency will become a major concern. Every effort should be made to separate the GA operations at JQF from the faster-moving commercial operations at CLT.

As shown on the Charlotte Sectional and the approach plates, there are a few towers in the vicinity of the Concord-Padgett Regional Airport ranging in height from 919 feet AMSL to 2,049 feet AMSL. The construction of additional towers near the Airport needs to be assessed as to the impact of the safety of the customers at JQF and the impact upon the surrounding airspace.

The FAA is currently updating the air traffic control facilities and capabilities throughout the National Airspace System. This upgrade, known as NextGen, allows for more accurate navigation using GPS technology. Radar coverage at JQF is provided by the air traffic control facilities at the Charlotte-Douglas International Airport. Any NextGen facility improvements at JQF will be determined by the FAA.

### 4.6.2 Instrument Landing System

The Concord-Padgett Regional Airport is equipped with a Category I ILS approach to Runway 20. This ILS approach currently meets CAT II capabilities via the installation of runway centerline and touchdown zone lights but requires FAA equipmet upgrades to provide a CAT II approach.. This

approach capability at JQF meets the current needs of the Airport and will accommodate the forecast requirements through the 20-year planning period.

The Airport is also equipped with area navigation (RNAV) GPS approaches to Runway 02 and 20. The GPS approach to Runway 02 is a non-precision approach while the localizer performance with vertical guidance (LPV) GPS approach to Runway 20 has the same minimums as the ILS approach. These approach capabilities will accommodate the existing and future approaches at the Airport.

### 4.6.3 Visual Guidance Lighting System

The precision approach path indicator (PAPI) system is an instrument that provides electronic visual guidance to the pilot to allow vertical guidance to the runway end. The PAPI provides accurate guidance with one set of lights which indicate different slopes: above, on course, or below the glide slope.

It is generally recommended that PAPIs be installed on each end of an instrument runway or where maintaining vertical guidance is necessary (such as over populated areas). Four-box PAPIs are currently installed on the left side of each end of Runway 02-20 at the Concord-Padgett Regional Airport. Obstruction clearance planes are required for PAPIs. These surfaces extend four nautical miles from the touchdown point at a slope of 3 degrees. No improvements are needed for the existing PAPIs at the Airport.

### 4.6.4 Automated Weather Observing System

The Concord-Padgett Regional Airport is currently equipped with an automated weather observing system (AWOS-3) system. It is recommended to upgrade this system to an AWOS-3-PT. This system has the standard features of an AWOS-3 plus the capability of present weather reporting and lightning detection information.

## 4.7 Landside Facility Requirements

This section identifies landside facilities needed to satisfy the 20-year forecast of aviation demand at the Concord-Padgett Regional Airport. The identification of needed facilities does not constitute a requirement in terms of absolute design standards or goals but rather an option for facility improvements to resolve various types of facility or operational inadequacies, or to make improvements as demand warrants. The facilities recommended as part of this Master Plan Update have been identified from inventory and forecast findings and planned in accordance with FAA airport design standards.

## 4.7.1 Terminal Buildings

### 4.7.1.1 Commercial Service Terminal

The commercial service terminal building was built in 2016 and is approximately 25,000 square feet with 15 percent of the facility designated for private use by airlines and TSA and 85 percent to be available for public space. The building is located in an area that is a permanent SIDA status area 24-hours a day, seven days a week. Figures 2.2.6.3-1a and b (pages 34 and 35) illustrate the floor plan of the terminal building.

On December 20, 2013, Allegiant Air (an American low-cost airline owned by Allegiant Travel Company, which operates scheduled and charter flights) initiated service between JQF and SFB. Since that initial launch date, Allegiant Air has added additional routes and provides service to and from JQF to:

- SFB (four days a week)
- PIE (three days a week)
- FLL (four days a week)
- PDG (two days a week)
- MSY (two days a week)

Estimated requirements for key functional areas of the passenger terminal building were determined based on facilities provided at comparable airports and guidelines published in Airport Cooperative Research Program (ACRP) Report 25 *Airport Passenger Terminal Planning and Design*.[17] Required facilities are sized to accommodate average day peak month passenger demands and estimated based on forecasts presented in Table 4.7.1.1-1 (page 94). Table 4.7.1.1-2 (page 94) provides a generalized square footage terminal expansion guideline.

The guidelines in Table 4.7.1.1-2 (page 95) assume regular scheduled air carrier service and an hourly enplaned passenger growth percentage, resulting in the need to expand the commercial service terminal to 43,327 square feet. The final terminal expansion guideline should be developed in concert with an architectural expansion study where alternatives can be developed and physical constraints thoroughly reviewed to accommodate the needs of the airlines.

[17]Transportation Research Board, Airport Cooperative Research Program (2010), "ACRP Report 25 Airport Passenger Terminal Planning and Design," <http://www.trb.org/Publications/Blurbs/163252.aspx >, accessed March 8, 2018.

**Table 4.7.1.1-1**
**Peak Hour Enplanements Forecast**
**Concord-Padgett Regional Airport**

| Year | Annual Enplanements | Peak Hour Enplanements |
|---|---|---|
| 2017 | 115,074 | 326 |
| 2018 | 117,491 | 333 |
| 2019 | 119,958 | 340 |
| 2020 | 122,477 | 347 |
| 2021 | 125,049 | 354 |
| 2022 | 127,675 | 362 |
| 2023 | 130,356 | 369 |
| 2024 | 133,094 | 377 |
| 2025 | 135,889 | 385 |
| 2026 | 138,742 | 393 |
| 2027 | 141,656 | 401 |
| 2028 | 144,631 | 410 |
| 2029 | 147,668 | 418 |
| 2030 | 150,769 | 427 |
| 2031 | 153,935 | 436 |
| 2032 | 157,168 | 445 |
| 2033 | 160,468 | 455 |
| 2034 | 163,838 | 464 |
| 2035 | 167,279 | 474 |
| 2036 | 170,792 | 484 |
| 2037 | 174,378 | 494 |
| 2038 | 178,040 | 504 |

Note: Two peak hour departures (July 2017) at 91percent load factor increasing to three peak hour departures by 2038 with 91% load factor.
Source: Concord-Padgett Regional Airport, January 2018.
Talbert, Bright & Ellington, Inc., February 2018.

Should, within the 20-year planning period, commercial air service be discontinued at JQF, plans are in place to use the commercial service terminal building for the staging of NASCAR charters during race weeks instead of using the existing general aviation terminal to process NASCAR race teams.

### 4.7.1.2 General Aviation Terminal

The general aviation terminal building for Concord-Padgett Regional Airport was built in 1994. It is a two-story building located between the apron and parking lot. The terminal building includes space for the lobby, airport administration offices, FBO services, line services, additional staff offices, operations, restrooms, conference rooms, pilot's lounge,

## Table 4.7.1.1-2
## Existing/Proposed Commercial Service Terminal Building Space Utilization
## Concord-Padgett Regional Airport

| Space Allocation | Existing Square Footage | Year | | | |
|---|---|---|---|---|---|
| | | 2018 | 2023 | 2028 | 2038 |
| Design Hour Departing Passengers | | 333 | 369 | 410 | 504 |
| Growth Percentage | | | 110.8% | 111.1% | 122.9% |
| **PUBLIC SPACE** | | | | | |
| Drop-off | 861 | 861 | 954 | 957 | 1,058 |
| Entrance/Exit Vestibule | 410 | 410 | 454 | 456 | 504 |
| Lobby | 1,391 | 1,665 | 1,845 | 2,050 | 2,520 |
| Check-In Queue | 1,346 | 2,498 | 2,768 | 3,075 | 3,780 |
| Active Check-In Area | 288 | 333 | 369 | 410 | 504 |
| Checkpoint Queue | 1,137 | 1,199 | 1,328 | 1,476 | 1,814 |
| Secure Restrooms | 986 | 8,325 | 9,225 | 10,250 | 12,600 |
| Holdroom | 6,833 | 752 | 833 | 836 | 924 |
| Arrival Entry | 752 | 2,654 | 2,941 | 2,949 | 3,262 |
| Bag Claim | 2,654 | 1,199 | 1,328 | 1,476 | 1,814 |
| Non-Secure Restrooms | 724 | 129 | 143 | 143 | 159 |
| TSA Counter Area | 129 | 211 | 234 | 234 | 259 |
| ATO/TSA Hall | 211 | 125 | 139 | 139 | 154 |
| Telecommunications Entrance Area | 125 | 173 | 192 | 192 | 213 |
| Electrical Room | 173 | 1,740 | 1,740 | 1,740 | 2,540 |
| Checked Baggage Inspection Area | 842 | 120 | 133 | 133 | 148 |
| Breakroom Hall | 120 | 175 | 194 | 194 | 215 |
| Police | 175 | 1,600 | 2,400 | 2,400 | 2,400 |
| Checkpoint Queue | 2,446 | 2,446 | 3,669 | 3,669 | 3,669 |
| Private Screening | 102 | 102 | 113 | 113 | 125 |
| Mezzanine Access | 136 | 136 | 151 | 151 | 167 |
| Lost Baggage Storage | 254 | 254 | 281 | 282 | 312 |
| Airport Reception | 97 | 97 | 107 | 108 | 119 |
| Airport Storage | 123 | 123 | 136 | 137 | 151 |
| Bypass Corridor | 154 | 154 | 171 | 171 | 189 |
| Fire Sprinkler Room | 45 | 45 | 50 | 50 | 55 |
| **Subtotal** | **22,514** | **27,525** | **31,898** | **33,792** | **39,658** |
| **PRIVATE SPACE** | | | | | |
| ATO Counter Area | 330 | 330 | 333 | 369 | 410 |
| ATO 1 Office | 234 | 234 | 315 | 315 | 315 |
| ATO 2 Office | 239 | 239 | 315 | 315 | 315 |
| TSA Office | 340 | 340 | 340 | 377 | 378 |
| TSA/ATO/RCA Breakroom | 737 | 737 | 737 | 817 | 819 |

**Table 4.7.1.1-2**
**Existing/Proposed Commercial Service Terminal**
**Building Space Utilization**
**Concord-Padgett Regional Airport**

| Space Allocation | Existing Square Footage | Year | | | |
|---|---|---|---|---|---|
| | | 2018 | 2023 | 2028 | 2038 |
| TSA Telecommunications | 102 | 102 | 102 | 113 | 113 |
| TSA Supervisor's Office | 217 | 217 | 217 | 240 | 241 |
| RCA 1 Office and Counter | 337 | 337 | 337 | 373 | 374 |
| RCA 2 Office and Counter | 329 | 329 | 329 | 365 | 366 |
| **Subtotal** | **2,865** | **2,865** | **3,025** | **3,284** | **3,331** |
| **TOTAL** | **25,379** | **30,550** | **35,182** | **37,123** | **43,327** |
| Percent Public Area | 88.7% | 90.6% | 91.4% | 91.2% | 92.3% |
| Percent Private Area | 11.3% | 9.4% | 8.6% | 8.8% | 7.7% |

**NOTES:**
- Enplanements over the 20-year planning period determine the growth demand.
- Aviation industry is moving towards larger aircraft, which puts peak hour demand stress on facilities.
- Passenger peak hour (pph) illustrates demand for up to 11 ticket counter positions at 20-year enplanement period.
- Kiosks currently are not being used but demand shows there should be 7 in 2018.
- Currently there is 1 EDS machine. Demand supports 2 currently and 3 at 20-year enplanement period.
- Currently there is no outbound bag makeup.
- Restroom SF deficit could be remedied with additional sets of secure side and non-secure side restrooms
- There are no retail or concessions.

Source: The Wilson Group, March 2018.

rental cars, storage, and mechanical rooms. Table 2.2.6.4-1 (page 36) and Figure 2.2.6.4-1 (page 37) illustrate the floor plan of the terminal building.

Table 4.7.1.2-1 (page 97) lists the current and proposed minimum square footage requirements for the general aviation terminal facility. The terminal usage requirements were determined using the previous JQF Airport Master Plan calculations with revised peak hour and enplaned passenger numbers. This formula was used as it more accurately reflects the terminal usage at the Airport when compared to the FAA guidelines. A minimum of a 9,600-square-foot terminal expansion is recommended to accommodate the airport needs over the next 20 years.

## 4.7.2 Automobile Parking

Concord-Padgett Regional Airport has the following automobile parking available (Figure 2.2.6.6-1 (page 40):

**Table 4.7.1.2-1**
**Existing/Proposed General Aviation Terminal**
**Building Space Utilization**
**Concord-Padgett Regional Airport**

| Terminal Area | FAA Guidelines | Concord Guidelines[3] | Year | | |
|---|---|---|---|---|---|
| | | | 2023 | 2028 | 2038 |
| Peak Hour Passenger | | | 296 | 319 | 357 |
| Enplaned Passenger | | | 148 | 160 | 179 |
| General Lobby | 100 sf peak/hour/passenger[1] | N.A. | N.A. | N.A. | N.A. |
| Departure Lobby | 500 to 1,200 sf[1] | 40 sf per seat | 74 seats | 80 seats | 90 seats |
| | 20 sf per seat | | 2,960 sf | 3,200 sf | 3,600 sf |
| Rental Car | 8' by 6' min. = 48 sf per agency[1] | 100 sf per agency | 300 sf | 300 sf | 300 sf |
| Coffee Shop (includes kitchen) | 80 seats (million pass) | 40 sf per seat | 40 seats | 50 seats | 60 seats |
| | 35 sf to 40 sf per seat[2] | | 1,600 sf | 2,000 sf | 2,400 sf |
| | 1,000 sf to 3,000 sf[1] | | | | |
| Vending Machines | 50 sf min.[2] | 50 sf | 50 sf | 50 sf | 50sf |
| | 80 sf min.[1] | | | | |
| Snack Bar | 400 sf to 600 sf[1] 15% to 25%[2] of coffee shop | 400 sf | 400 sf | 400 sf | 400 sf |
| Bar/Lounge | 200 sf min.[1] | 400 sf | 400 sf | 400 sf | 400 sf |
| | 25% to 35%[2] of coffee shop | | | | |
| Newsstand | 150 sf min.[2] | 300 sf with gift shop | 300 sf | 300 sf | 300 sf |
| | 600 sf to 700 sf per million passengers | | | | |
| Gift Shop | 600 sf to 700 sf per million passengers[2] combine with newsstand at small airport | N.A. | N.A. | N.A. | N.A. |
| Maintenance/Storage | 12% to 18% of airport[2] | 15% of airport | 796 sf | 925 sf | 1,092 sf |
| Circulation | 20% to 30% of airport[1] | 20% of airport | 1,062 sf | 1,234 sf | 1,455 sf |
| Restrooms | 1,500 sf to 1,800 sf per 500 peak/hour/passengers[2] | 300 sf | 300 sf | 300 sf | 300 sf |
| Security | | 150 sf | 150 sf | 150 sf | 150 sf |
| **Total** | | | **7,468 sf** | **8,409 sf** | **9,597 sf** |

[1]FAA, "*Advisory Circular 150/5360-9 – Planning and Design of Airport Terminal Facilities at Non-Hub Locations*," April 4, 1980.
[2]FAA, "*Advisory Circular 150/5360-13 – Planning and Design Guidelines for Airport Terminal Facilities*," April 22, 1988.
Source: Talbert, Bright & Ellington, Inc., February 2018.

- Daily Parking (in front of the general aviation terminal) – 32
- Car rental (south of daily parking) – 24

- South parking Lot – 174North lot (next to Hangar A) – 90
- South long-term (gravel lot on south side of Aviation Boulevard) - 359
- North long-term (gravel lot on north side of Aviation Boulevard) – 134
- Parking Deck (in front of commercial service terminal) - 700
- Total spaces – 1,513

An adequate number of automobile parking spaces should be provided for airport employees, tenants, and the general public that use the commercial service and general aviation terminals.

#### 4.7.2.1 Commercial Service Terminal Parking

There are currently 700 total automobile parking spaces in the parking deck in front of the commercial service terminal. Using a ratio 1.5 parking spaces times the number of peak hour passengers plus 15 percent, the parking deck would need to expanded another 200 spaces to accommodate peak hour passenger the 20-year planning period. The two long-term gravel parking lots should be paved over the 20-year planning period.

#### 4.7.2.2 General Aviation Terminal Parking

The general aviation terminal currently has 32 automobile parking spaces in front of the terminal. The north and south short- and long-terms are expected to provide sufficient parking for the 20-year planning period. However, if JQF determines to redevelop the south parking lot (174 spaces) as conventional hangar space, the area in front of the general aviation should be redeveloped as parking deck outside the 20-year planning period.

### 4.7.3 Cell Phone Lot

Many airports have instituted cell phone lot waiting areas to allow meeter/greeters to park near the airport terminal and wait for their arriving party to call when they are ready for pickup. However, the requirements for meeter/greeters using the cell phone lot can vary from airport to airport. For instance, some airports require drivers to remain in their vehicles while waiting while other airports may apply parking time limits implying drivers may leave their vehicles for a short period while using the cell phone lot.

JQF proposes to construct a 24-space cell phone lot on Zephyr Place west of the parking garage for the commercial service terminal. The location of the cell phone lot will allow meeter/greeters to wait in their vehicles for arriving passengers without queueing in front of the terminal building. Once the arriving passenger is on the curb waiting to be picked up the meeter/greeter can arrive in a matter of minutes. This reduces congestion and security problems in front of terminal.

### 4.7.4 Landside Access

Aviation Boulevard provides direct access to the Airport from Derita Road. Airport facilities are accessed via Aviation Boulevard with the exception of the northernmost hangars located off of Myint Lane from Derita Road and the commercial service terminal and south hangar area accessed from Zephyr Place. A relocated commercial service terminal roadway is recommended to access the existing commercial service terminal area, as current access from Aviation Boulevard causes confusion for commercial service passengers. This will give airport automobile traffic a central airport entrance from Derita Road and more efficient access to all airport facilities. This commercial service terminal roadway roadway is recommended for the first phase of the development plan.

Derita Road, which is currently two lanes, is being widened to a total of five lanes to accommodate the increased development between Poplar Tent and Concord Mills Boulevard. This improvement will include turning lanes to allow for entering and exiting vehicles to not impede non-airport related traffic.

Additional future access to I-85 may be achieved through the development of a dedicated airport interchange between the Poplar Tent Road exit and Concord Mills Boulevard exit. This interchange is primarily dependent upon the development of the eastern side of the airport property. However, the automobile traffic along the existing access roads may warrant the development of this interchange to reduce future congestion and increase airport ingress and egress. A widening of Interstate 85 may limit airport development on the southeastern side of Runway 02-20.

## 4.8 Facility Requirements Summary

Table 4.8-1 (page 100) summarizes the facility requirements for the Concord-Padgett Regional Airport and lists the phases in which various facilities will be needed, as driven by demand.

Additional airport facilities not included in the previous sections include additional ARFF equipment and command center as the operations/based aircraft increase at the Airport. There is no anticipated change in the ARFF index of the Airport due to future operations. Snow removal equipment is also recommended due to the number of airport users impacted by a shutdown of the Airport during a snowstorm.

One of the key components of the future facility additions will be the short- and long-term sustainability of the Airport. It is important for the Airport to provide the most benefit while utilizing the fewest resources possible. These resources may include fuel, electricity, consumables (such as paper), and water. The Concord-Padgett Regional Airport has taken steps to reduce electric consumption with the addition of LED taxiway lights, which use a fraction of the electricity that halogen bulbs use.

**Table 4.8-1**
**Facility Requirements Summary**
**Concord-Padgett Regional Airport**

| Facility | Current Capacity | Existing | Phase 1 (2018-2023) | Phase 2 (2024-2028) | Phase 3 (2029-2038) |
|---|---|---|---|---|---|
| Runway | | 7,400' x 100' | 7,400' x 150' | 7,400' x 150' | 7,400' x 150' |
| Taxiway | | Full-Parallel | Full-Parallel | Full-Parallel | Full-Parallel |
| T-Hangar Units | 67 | 62 | 63 | 63 | 63 |
| Conventional Hangar (sf) | 399,637 sf | 365,800 sf | 403,100 sf | 430,400 sf | 509,000 sf |
| Excess | | +33,837 | | | |
| Total Apron Area (sy) | 178,953 sy | 263,700 sy | 270,800 sy | 281,900 sy | 302,000 sy |
| Deficiency | | -84,747 | | | |
| Automobile Parking Spaces | | 1,513 | 1,513 | 1,713 | 2,213 |
| Commercial Service Terminal (sf) | | 25,000 sf | 35,182 sf | 37,123 sf | 43,327 sf |
| General Aviation Terminal (sf) | | 12,618 sf | 20,086 sf | 21,027 sf | 22,215 sf |

Source: Talbert, Bright & Ellington, Inc., March 2018.

The Airport has also reduced water usage by changing the fire suppression systems in many of the hangars to one that uses less water than a conventional sprinkler system. Other options for increasing sustainability at the Airport include:

- Increased use of skylights/windows on northern facing building walls to reduce the amount of artificial light required
- Increased use of solar panels as the cost of this technology decreases Increased use of LED lighting technology for both direct and indirect airfield lighting
- Coordinated recycling program with the City of Concord for used batteries, oil, and aircraft lubricants in addition to typical household recyclable items
- Energy conscious architecture of future facilities to reduce utility requirements
- Carbon exchange programs with local public/private industry to offset carbon footprint of JQF

A carbon exchange program can be developed and incorporated into the Airport Best Management Practices. This program would work with other city departments to purchase or trade carbon credits. This would offset the carbon emissions from operations at JQF while increasing the environmental sustainability of the facility.

These changes represent some of the potential solutions for achieving airport sustainability, which should be incorporated into the ongoing airport planning process and evolve with the development of future technologies.