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BROOKSVILLE - TAMPA BAY REGIONAL AIRPORT
& TECHNOLOGY CENTER



Michael Baker
INTERNATIONAL

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Chapter 1.0

Introduction



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1.0 INTRODUCTION

1.1 Overview

In November 2013, Hernando County contracted with Michael Baker Jr., Inc. to develop a Master Plan Update for the Brooksville-Tampa Bay Regional Airport (BKV). The need for this update was essentially twofold. The primary reason being the Federal Aviation Administration (FAA) requires airports receiving development grants to conduct periodic updates to their future development plan. Secondly, over the past several years many changes have occurred at the airport and in the aviation industry that prompted the need to reassess the airport's anticipated growth and 20-year airport capital improvement plans.

The purpose of the master plan document is to identify in detail the justifications, methodologies, and reasoning for the developments shown within the Airport Layout Plan (ALP) drawing set. In addition to grant funding, the airport's master plan serves a variety of functions including projecting future aviation activity, being a tool for financial planning, and guiding adjacent land uses. The primary planning objective of this Master Plan Update was to create a 20-year development program that would maintain a safe, efficient, economical, and environmentally acceptable airport facility for Hernando County. By achieving this objective, the document should provide guidance to satisfy aviation demand in a financially feasible and responsible manner, while at the same time addressing the aviation, environmental, and socioeconomic issues of the community.

The airport does not exist in a static environment, but rather within the context of a larger community. As such, any future developments identified by this study considered potential impacts to the community. Multiple opportunities were available for community and governmental representatives to participate in this study. This involvement was facilitated through the formulation of a Technical Advisory Committee (TAC) and was furthermore presented and discussed in an open forum at community workshop/public meetings and also at Hernando County Board of County Commissioners (BOCC) meetings. It is important to note that the study results and the future developments presented in this report represent a plan to guide the airport and the BOCC in meeting demands as they develop; therefore, no development should be undertaken until there is a clearly identified need for it.

Although the development of a master plan and associated ALP drawing set serves many objectives, one of the most significant purposes of this study is to allow the airport to meet federal assurances for grant funding eligibility. In 1982, the federal government adopted the Airport and Airway Improvement Act; this act allowed federal funds to be distributed through a grant program to airports throughout the country. These federal grants did not require repayment provided that certain rules were followed and adhered to (i.e., assurances). Over the years, the grant legislation has been revised, renamed, and expanded to presently include 39 separate assurances that must be met in order to be considered "compliant." The current grant program, referred to as the Airport Improvement Program (AIP), provides grant funding to cover a significant portion of the costs required to address airport safety, capacity, security, or environmental concerns. Grant Assurance Number 29 states that the airport sponsor will develop and maintain an ALP which denotes the airport's boundaries along with all existing and proposed development within. The ALP and any revision or modification thereof must be reviewed and approved via signature by an authorized representative of the Secretary.

1.2 Key Issues

The overall goal of an airport master plan is to provide guidelines for future airport development that will satisfy aviation demand in a cost-effective, feasible manner while addressing aviation, environmental, and socioeconomic issues of the community. The Master Plan Update will provide Hernando County with a comprehensive overview of the airport's needs over the next 20 years and will include the identification, location, timing, and costs of proposed developments as necessary to meet future demand projections or to increase safety. In an effort to develop a more financially sustainable plan, the planning effort will utilize the results of an Airport Business Plan which is being conducted in concert with the Master Plan Update. The Business Plan will be designed to provide relevant guidance to Hernando County for facilitating the business of the airport in serving its existing and future tenants, users, and the community.

Some of the specific issues to be evaluated as part of this master plan process are delineated below, and specific tasks were incorporated into the study in an effort to address these considerations. This is not intended to be an exhaustive listing of items that require consideration within the study, but rather identifies major concerns or issues that should be addressed in support of Hernando County's long-term airport goals. Some specific goals and objectives to be considered include:

- ➔ Assess the operational efficiency, effectiveness, and safety of the airport.
- ➔ Evaluate the airport facility layout for conformance with FAA guidance and regulations.
- ➔ Evaluate and incorporate the aviation needs of the both the community and users.
- ➔ Assess the needs of current tenants and requirements necessary to attract new tenants and/or to expand their facilities.
- ➔ Assist the airport in supporting aviation demand within the region.
- ➔ Identify existing and alternative funding sources for airport development.
- ➔ Identify areas of environmental concern and provide mitigation options for future development.
- ➔ Evaluate long-term development options for general aviation and airport support facilities.
- ➔ Review the airport's existing and ultimate runway length requirements to identify any improvements necessary to meet demand and/or to entice additional traffic to the airport in the future.
- ➔ Identify vertical obstructions and investigate the associated impacts and/or mitigation options.

Process

This Master Plan Update provides a systematic outline of the development actions required to maintain and further develop airfield and landside facilities. This process provides the officials responsible for the scheduling, budgeting, and ultimate funding of airport improvement projects with advanced notice of the future needs of the airport. By phasing the airport improvements, the development can be conducted in an orderly and timely fashion.

In order to accomplish Hernando County's long-term development goals for BKV, this Master Plan Update was prepared in accordance with the requirements of the FAA and the Florida Department of Transportation (FDOT). All portions of this document are based on the criteria set forth in the FAA AC 150/5070-6B, Airport Master Plans, AC 150/5300-13A, Airport Design, FDOT Guidebook for Airport Master Planning, and Chapter 14-60 FAC – Airport Licensing, Registration and Airspace Protection. The following study tasks were performed for this effort:

- ➔ Conducted an inventory of the existing documents related to the airport, the physical airport facilities, the demographics of the airport service area, and the airport environment.
- ➔ Evaluated and compared the airfield capacity to the expected aviation activity.
- ➔ Determined the airport facilities required to meet the forecast demand.
- ➔ Developed and evaluated alternative methods to meet the facility requirements of the airfield.
- ➔ Developed a concise ALP drawing set that reflects proposed 20-year improvements.
- ➔ Compiled a schedule of the proposed improvements to include the cost estimates, phasing, and financial feasibility of each.

Reviews of this Master Plan Update report were conducted at key points such as at the completion of the forecasts and during the development of the alternatives. This ensured that input was received from important stakeholders such as the TAC, BOCC, FAA, FDOT, and the general public. The individual report chapters provide detailed explanations of these key steps. It should be noted that each step in the master plan process is built upon information and decisions made during previous steps. Taken as a whole, they address the key issues identified above and show how the study objective was met.

2.0 INVENTORY OF EXISTING CONDITIONS

2.1 Background

The master planning process requires the gathering of information related to the existing conditions of the airport. This information serves as the basis for future steps in the planning process. As such, information related to the Brooksville-Tampa Bay Regional Airport (BKV) and its surrounding areas was collected in order to evaluate the future aviation needs of the community. Data collected in this phase provides an inventory of the following:

- ➔ Existing physical facilities: runway, taxiways, aircraft parking aprons, navigational aids, airport terminal, and facility areas for general aviation, corporate, and aviation support activities.
- ➔ The airport's overall role in west central Florida: development history, location, and access relationship to other transportation modes.
- ➔ Previous studies that contain information related to the development and eventual implementation of projects at BKV.

In order to obtain an accurate depiction of BKV and its surrounding community, it was necessary to conduct an inventory of data to address these and other issues from a variety of sources including:

- ➔ Interviews with airport personnel
- ➔ Interviews with BKV users and tenants
- ➔ Coordination with local, state, and federal agencies
- ➔ Research and review of previous airport planning analyses and studies
- ➔ Review of aerial photography, mapping, and facility layout plans
- ➔ Review of facility directories, approach plates, sectional charts, etc.
- ➔ Reference materials such as FAA publications, activity databases, and planning guidelines
- ➔ Review of airport and FAA statistical reports

2.2 Airport Role

Over the past 100 years of flight, general aviation airports have evolved from simple landing strips to complex aviation centers. However, the way the industry categorizes them has not kept pace. In May 2012, the FAA completed a study, General Aviation Airports: A National Asset, to examine the roles that general aviation airports play in our national aviation system to ensure that policy makers plan and invest wisely. Airports serving mostly general aviation operators have been divided into four categories:

- ➔ National
- ➔ Regional
- ➔ Local
- ➔ Basic

BKV is a public use general aviation facility that is categorized as a regional airport. Airports identified in this category support regional economies by connecting communities to statewide and interstate markets. On average, regional airports typically experience high levels of activity with some jets and multi-engine propeller aircraft. In addition to the FAA's analysis, the most recent

update of the Continuing Florida Aviation System Planning Process (CFASPP) has further identified that BKV is best suited for providing Recreational/Sport, Tourism, Flight Training, Corporate, Business/Recreational, and Air Cargo Services.

2.3 Airport History

Brooksville-Tampa Bay Regional Airport, like many general aviation airports, is a former WWII military airfield. The War Department constructed a complete operational training facility at the site at the start of WWII. The project consisted of runways, taxiways, aprons, roads, utility systems, and about 150 buildings and structures. The Brooksville Army Air Field was used as an auxiliary airfield of MacDill Field and Drew Field for training pilots and ground crews during the war. Operations at this field began in November 1942 with the arrival of the 1st Bomb Squadron. The 9th Bombardment Group used the airport for training on B-17 Flying Fortress and B-24 Liberators. The bomber crews from Brooksville regularly made practice runs to the Avon Park and Osprey Bombing Ranges.

The site remained active until late 1945, then began concluding its activities and closing down. The Army determined that the site was surplus to their needs and reported it excess to the War Assets Administration (WAA) between April 1946 and June 1947. The WAA sold or removed most of the improvements for off-site use and later conveyed the acreage and remaining improvements to the city of Brooksville in 1948. Shortly thereafter, the city of Brooksville transferred the property to Hernando County.

Today, the airport's two runway airfield is capable of accommodating general aviation/private, corporate, military, and other larger aircraft that are associated with commercial activity. BKV has onsite rail facilities for possible direct-by-rail access to the deep water Port of Tampa. Interstate 75, U.S. 41 and U.S. 19 are nearby, and the adjacent Suncoast Parkway has streamlined travel time to Tampa considerably. With over 125 businesses, the Technology Center is home to world class manufacturers and aerospace suppliers. Because Tampa International Airport (TPA) is a short drive away, BKV does not serve the general public through commercial airlines.

2.4 Location / Locale

The Hernando County Board of County Commissioners (BOCC) is the governing body that owns the Brooksville-Tampa Bay Regional Airport and controls the operations thereof. The BOCC has five commissioners that represent their respective districts within the county. BKV is located approximately six miles southwest of Brooksville, and is situated on 2,403 acres that is well-suited for commercial and/or industrial development. **Figure 2-1** illustrates the location of the airport in relation to the State of Florida and Brooksville. There are several commercial service airports located within 60 nautical miles of BKV including TPA (30 nautical miles south), St. Pete-Clearwater International (PIE) (36 nautical miles southwest), Orlando International Airport (MCO) (60 nautical miles east), and Sarasota-Bradenton International (SRQ) (65 nautical miles south). **Table 2-1** provides a brief comparison of the public airports in the area along with their respective facilities and associated distances from BKV.

**Table 2-1
Public Airports In The Region**

Airport	NM from BKV	Runways	Published Instrument Approach Procedures
Pilot County Airport (X05)	9 S	18-36 (3,700' x 75')	None
Inverness Airport (INF)	21 NE	1-19 (5,001' x 75')	RNAV (GPS)
Zephyrhills Municipal Airport (ZPH)	22 SE	4-22 (4,999' x 100') 18-36 (4,954' x 100')	GPS, NDB
Crystal River Airport (CGC)	25 NW	18-36 (2,666' x 100') 9-25 (4,557' x 75')	RNAV (GPS)
Tampa Executive Airport (VDF)	28 SE	18-36 (3,259' x 75') 5-23 (5,000' x 100')	ILS, LOC, RNAV (GPS)
Tampa International (TPA)	30 SW	19R-1L (11,002' x 150') 19L-1R (8,300' x 150') 10-28 (6,999' x 150')	ILS, LOC, RNAV (GPS)
Plant City Airport (PCM)	32	10-28 (3,948' x 75')	RNAV (GPS), VOR
Peter O. Knight Airport (TPF)	33 S	4-22 (3,580' x 100') 18-36 (2,687' x 75')	RNAV (GPS), NDB
Clearwater Airpark (CLW)	34 SW	16-34 (4,108' x 75')	None
St. Pete-Clearwater International (PIE)	36 SW	18R-36 L (4,000' x 75') 18L-36R (9,730' x 150') 9-27 (4,712' x 150') 4-22 (5,903' x 150')	ILS, LOC, RNAV (GPS), VOR/DME
Albert Whited Airport (SPG)	43 SW	7-25 (3,677' x 75') 18-36 (2,864' x 150')	RNAV (GPS), VOR

Source: FAA Terminal Procedures Publication (TPP) effective 2/6/2014 through 3/6/2014.

2.5 Previous Studies

During the course of this planning effort, previous studies were reviewed and utilized whenever possible in order to gather as much pertinent background information prior to developing forecasts and development recommendations. Over the past several years, there have been several studies completed by state and federal agencies regarding BKV. Examples of these studies include but are not limited to the airport's previous master plan update, Continuing Florida Aviation System Planning Process (CFASPP), feasibility studies, and prior activity forecasts. The following sections provide an overview of the 2006 Master Plan Update, and the Continuing Florida Aviation System Planning Process.

2006 Master Plan Update

The previous Master Plan Update for BKV was completed in 2006 and included the thought and reasoning behind proposed development recommendations. Therefore, the previous study provides insight that is useful for conducting this current planning effort. The 2006 Master Plan Update included recommendations to expand the existing Runway 27 to approximately 8,000 feet and to construct full-length parallel taxiways along the inner portions of the airfield. The study also recommended additional corporate and T-hangar developments. Since the completion of the 2006 Master Plan Update, a new Airport Traffic Control Tower (ATCT) was constructed and several of the recommendations from the study have either been completed or are under construction at BKV. The airport is also going through the process of rebranding itself as a premier aviation facility and science and technology center. Given these changes, and that more accurate activity data is now available from the ATCT, the need for a new Master Plan Update (MPU) was justified to reevaluate the airport's long-term needs.

Continuing Florida Aviation System Planning Process (CFASPP)

The CFASPP was established by the FAA and FDOT because of the need for a method to help maintain a viable statewide aviation environment. This process is a method used within Florida to continually monitor the aviation environment and determine the development requirements to best meet projected aviation demands. The most recent updates for BKV pertaining to airport roles, existing and future demand, and system requirements were reviewed and used as appropriate for the current update of the BKV Airport Master Plan.

2.6 Airport Access

The Brooksville-Tampa Bay Regional Airport and Technology Center is bounded on the west, north and east by major roadways. U.S. 41 runs parallel to the airport's eastern boundary. The four-lane arterial roadway has historically served as the primary access to, and entry into, the airport. Spring Hill Drive, a four-lane county arterial roadway, was constructed generally along the airport's northern boundary and provides major access to the Technology Center and Airport Administration offices. The Suncoast Parkway, which lies along the airport's western boundary, is a four-lane limited-access toll road with entry/exit points to the south (County Line Road) and north (Spring Hill Drive) of the airport.

There are several points of access into the airport property from the surrounding roadway network. From U.S. 41, there are two access drives into the FBO area and one into the fire station. Railpark Drive, a two lane county roadway constructed along the south boundary of the Southwest Florida Water Management District office parcel, extends to American Flyer Drive which leads to Runway Drive. American Flyer Drive serves the eastern portion of the Technology Center, which includes hangars along the east side of Runway 3-21. Runway Drive, an east-west, two-lane county road emanating from U.S. 41, has been the historic point of access to the interior of the airport, crossing at the south end of Runway 3-21, behind a key pad-activated gate. Sgt. Lea Mills Boulevard is a two-lane county road that extends west from U.S. 41 along the airport's southern boundary and ends at Corporate Boulevard.

There are four points of access from Spring Hill Drive, three of which enter into the Technology Center as two-lane public roads. The fourth access drive goes directly to a private aviation facility. On the west side of the airport, a two-lane county roadway (Aerial Way) extends south from Spring Hill Drive through the Technology Center near the west end of Runway 9-27. Aerial Way terminates at the airport's sole access road from the west (Corporate Boulevard), a two-lane county road which crosses the Suncoast Parkway as an overpass and connects to Anderson Snow Road, a County north-south collector roadway from Spring Hill Drive to County Line Road. Corporate Boulevard continues beyond Aerial Way along the airport's west side and ends at Sgt. Lea Mills Boulevard. Radial Road provides an external point of access to the southwest, which serves the Airport Subregional Wastewater Treatment Plant and a couple of parcels of land which were landlocked by the construction of the Suncoast Parkway.

2.7 Climate

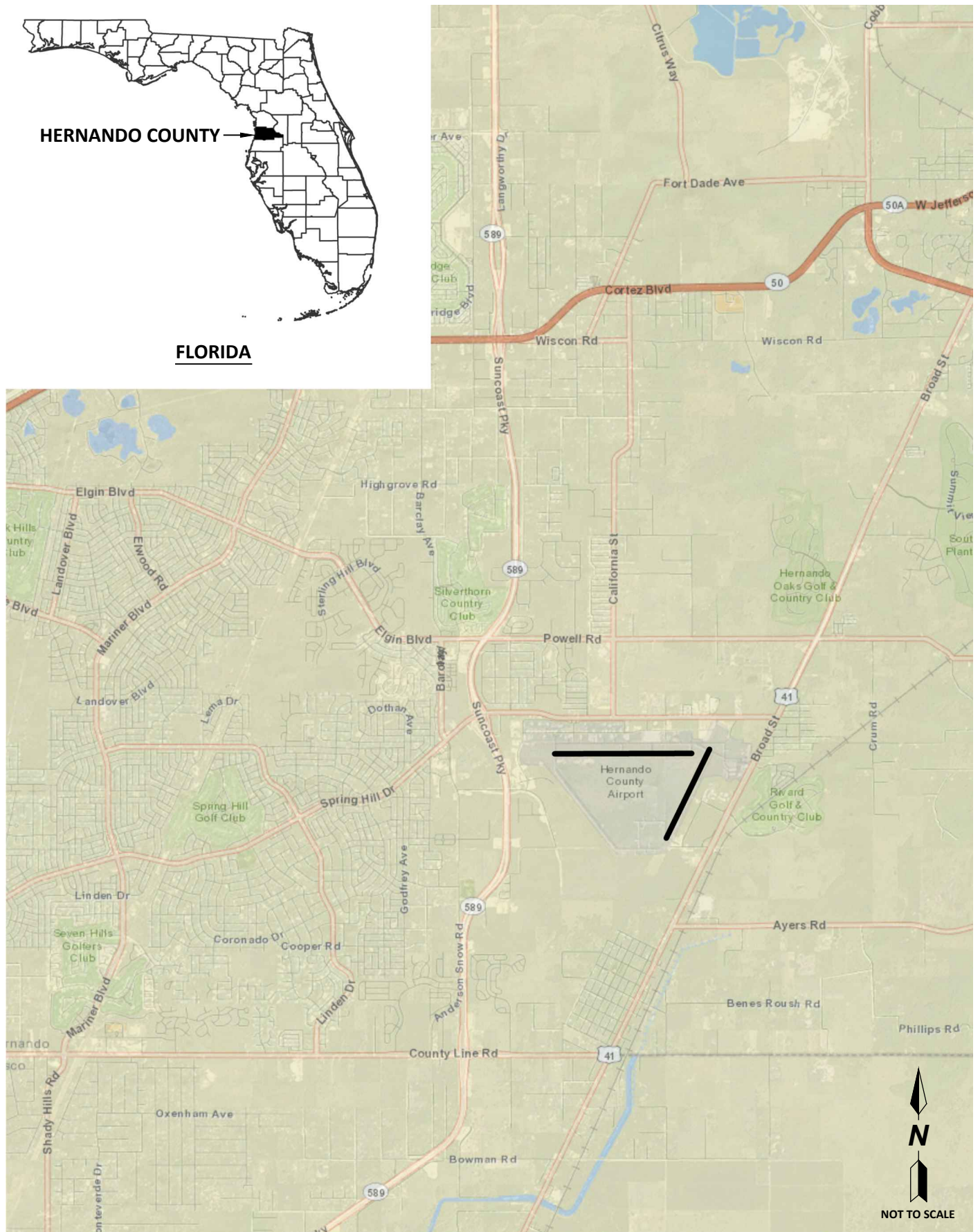
Because Brooksville is located in west central Florida near the warm waters of the Gulf of Mexico, the temperatures remain relatively mild throughout the year. The average low in the summer months

(June, July, and August) has historically been 72 degrees; whereas, the average high during the same months has historically been 91 degrees. The lowest recorded temperature in Brooksville was 13 degrees in 1985 and the highest recorded temperature was 110 degrees in 1985. June is the average warmest month and conversely January is the average coldest month. Historical average precipitation in the area varies from 2.09 inches (November) to 8.24 inches (July). Historical wind data obtained from the National Climatic Data Center (NCDC) from 2004 through 2013 revealed that the predominant wind direction at BKV is from the west.

Wind Data

Table 2-2 presents the results of an updated wind analysis for BKV which utilized observations obtained from the on-airport Automated Surface Observing System (ASOS) during the years 2004 through 2013. **Figure 2-2** illustrates All Weather, VFR, and IFR wind coverage by direction at BKV with no tailwind component (i.e., assuming that the runway can only be used in one direction). The highlighted sections of the figure represent the runway end that would be preferred for approaches/departures based on the wind direction.

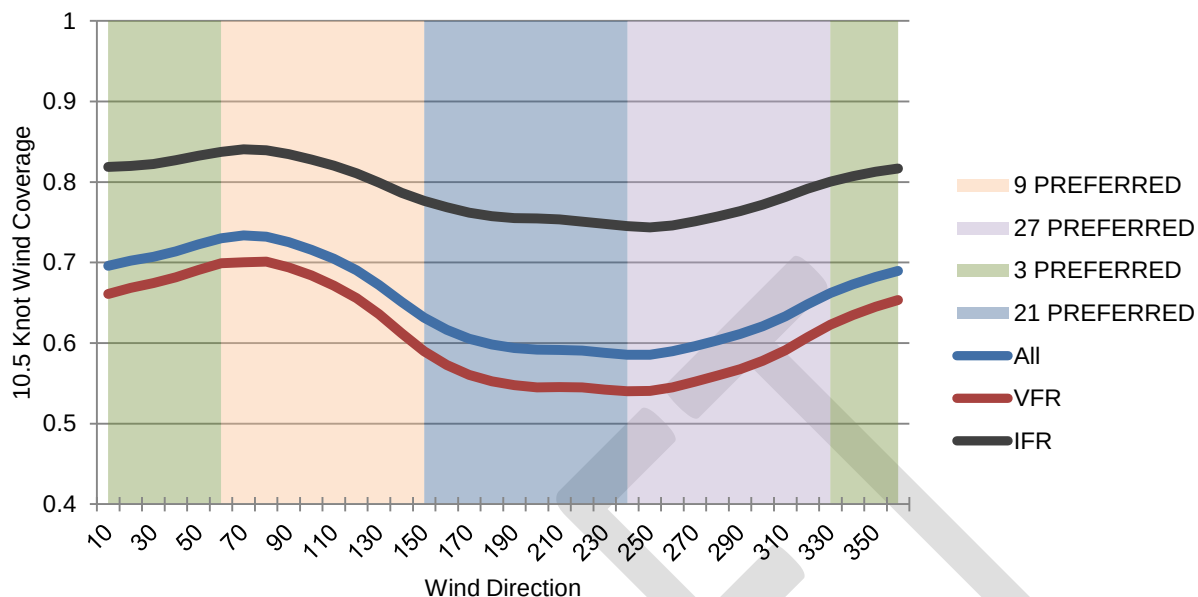
Table 2-2												
Runways 3-21 and 9-27 Coverage Analysis (2004-2013)												
	All Weather Coverage % (Knots)				Visual Flight Rule (VFR) Coverage % (Knots)				Instrument Flight Rule (IFR) Coverage % (Knots)			
Runway	10.5	13	16	20	10.5	13	16	20	10.5	13	16	20
3-21	95.01	97.32	99.33	99.86	94.46	97.09	99.34	99.88	96.95	98.13	99.26	99.78
9-27	97.57	98.89	99.78	99.95	97.45	98.89	99.82	99.98	98.00	98.93	99.65	99.89
Combined	99.35	99.86	99.97	100.00	99.36	99.89	99.99	100.00	99.33	99.77	99.92	99.98
	Ceiling = All Visibility = All 117,593 Observations (100.00%)				Ceiling ≥ 1,000' Visibility ≥ 3 Miles 92,231 Observations (78.19%)				Ceiling < 1,000' and ≥ 200' Visibility < 3 Miles and ≥ ½-Mile 25,599 Observations (21.7%)			
Source: Station 722014, Hernando County, Florida, 2004-2013.												



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Figure 2-1 Location / Vicinity Map
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Figure 2-2
Wind Coverage by Direction



Source: Station 722014, Hernando County, Florida, 2004-2013.

2.8 Landside Facilities

The inventory of airport landside facilities includes all facilities located within the airport boundaries that are not required for aircraft movement and air navigation. Some examples of these facilities include but are not limited to hangar structures, parking, fuel storage and fueling facilities, fencing, and terminal facilities. A graphic denoting the various landside facilities is shown in **Figure 2-3**.

Based on the geometric layout of the active runways and taxiways, the Brooksville-Tampa Bay Regional Airport and Technology Center has been divided into four distinct areas. Throughout the remainder of this Master Plan Update, these areas will be referred to as:

- ➔ **North Side** – The area located on the north side of Runway 9-27 includes the Technology Center and the Northeast Hangar Area. On the airside, this area is served primarily by Taxiway A, Runway 9-27, and their associated connector taxiways and taxilanes. Landside access to this area is served by Flight Path Drive and Aviation Loop Drive. Entrance to the airport on the north side is provided by Spring Hill Drive.
- ➔ **East Side** – The entire area located on the east side of Runway 3-21 and Runway end 27. Taxiway B provides airfield access into this area. Landside access is from U.S. 41.
- ➔ **West Side** – The area located to the west of the airfield, including the Technology Center and the closed runway. Access to the west side of the airport is provided from Aerial Way from the north, Corporate Boulevard from the west, and Sgt. Lea Mills Boulevard from the east.
- ➔ **Midfield** – The area bounded by Runway 9-27 on the north, Runway 3-21 on the east, Sgt. Lea Mills Boulevard to the south, and the closed runway to the west.

Currently the predominant area of general aviation development at BKV is concentrated on the east side of the airport near U.S. 41.

Technology Center

With over 125 businesses, the Brooksville-Tampa Bay Regional Airport and Technology Center is home to world class manufacturers and aerospace suppliers. The Technology Center encompasses approximately 430 acres and leases parcels of land for building and ready-to-build sites between two to 50 acres. A substantial portion of the Technology Center is situated along the north, south, and west sides of the airfield and is adjacent to the Suncoast Parkway. On the airport's southeast side, the Technology Center offers rail-side lots with access to track loading near U.S. 41.

Airport Administration and Maintenance

The airport administration and maintenance facilities are located on the north side of the airport near the intersection of Sam Pearson Way and Flight Path Drive. The 5,559 square foot administration facility is home to airport staff and the Hernando County Office of Business Development. The facility also includes a conference room that is used regularly by Hernando County staff and airport tenants.

The airport maintenance facility is located airside adjacent to an aircraft parking apron near the southeast corner on the administration building. The 1,500 square foot facility is used by airport staff to store and maintain equipment associated with operating the airport.

Hangars and Tie-Downs

Several aviation-related tenants are located within the Technology Center, north, northwest, and east of the airfield. These tenants maintain conventional/corporate hangars of different sizes and provide a variety of aviation-related services on the airport. Several of the largest hangars are used for maintenance and aircraft storage by the FBO. T-hangars and shade hangars are concentrated within the American Aviation FBO leasehold and along the east side of Taxiway B. The various airport hangars and their associated sizes are summarized in **Table 2-3**.

Fixed Base Operator

The airport is home to a full service Fixed Base Operator (FBO): American Aviation. The FBO is responsible for aircraft services such as passenger handling, aircraft fueling, parking, maintenance, charters, rentals, and flight training. An FBO also provides many ground handling services such as car rentals, hotel reservations, and pilot lounge facilities. A detailed view of the FBO and its respective terminal area facilities is graphically depicted in **Figures 2-4**.

American Aviation has been operating at BKV since 1979. The FBO's facilities are located adjacent to U.S. 41 on the northeast side of the airport near Runway 21. American Aviation maintains approximately 71,000 square feet of conventional hangar space, 40 T-hangars, 16 shade hangars, and apron facilities capable of accommodating up to 60 tie-down spaces.

Vehicular Parking

Businesses located at the Brooksville-Tampa Bay Regional Airport and Technology Center have designated parking areas for their employees and patrons. For the purpose of this study, vehicular parking associated with the FBO, hangars, and airport support facilities were identified as part of the inventory of existing facilities. The information depicted in **Table 2-3** is used later in this study to identify future parking needs.

Fencing / Security

The entire perimeter of the airport is securely enclosed by a six-foot high fence that is topped with three strands of barbed wire. Gates are provided at various locations throughout the property as needed for airside access. Airside access at motorized gate locations is accomplished by key code entry and/or remote control; whereas, remotely located gates are chained and locked with padlocks that can only be accessed by airport personnel.

Fuel Storage Facilities

The FBO maintains fuel storage facilities within its respective leasehold. Fuel storage facilities at American Aviation are located on the west side of the FBO's apron area. The fuel farm includes two 12,000 gallon tanks, one containing Jet A fuel and the other containing AvGas. Four fuel trucks also provide fueling services to aircraft. These include: two 3,000 gallon Jet A fuel trucks, and two AvGas – one a 2,000 gallon truck and the other a 1,200 gallon truck.

Fuel storage facilities are also located on the south side of the apron area associated with the westside maintenance complex. The fuel farm includes two Jet A fuel tanks – one 12,000 gallon and one 10,000 gallon tank, and one 4,000 gallon AvGas fuel tank. Also, 24/7 self-service AvGas fueling is offered at this facility. Four fuel trucks also provide fueling services to aircraft.

In addition to the FBO facilities, the Florida Army National Guard and Army Aviation Support Unit, Jet ICU, and Hernando County Sheriff's Department/Bay Flight own fuel storage facilities which are utilized for their own private fueling activities. Because private fueling activities are not considered in determining BKV's future needs, only the FBO facilities are evaluated later in the study from the standpoint of future airport requirements.

Fire Station

BKV features an on-site fire department to provide emergency and non-emergency services to the airport and Technology Center tenants. Personnel regularly train alongside with members of the local Florida Army National Guard and Army Aviation Support Facility stationed at the airport along with emergency operations staff, sheriff department personnel, and county leadership in HAZMAT exercises and disaster drills.

Hernando County Fire Station #14 is located on the far northeastern side of the American Aviation FBO apron and is manned 24 hours a day. The facility is currently equipped with an ALS (Advanced Life Support) engine, a brush truck and an ARFF (Aircraft Rescue and Firefighting) truck. Additional support is provided by the Hernando County Northwest Fire District, located five miles away from the airport, providing response times of less than 10 minutes.

**Table 2-3
Existing Airport Facilities**

Description	Size	Notes
Hangar Facilities		
Chapman Corporate Hangar	5,625 SF	
Neubert Corporate Hangar	10,000 SF	
NE Corporate Hangar	9,672 SF	
NE Corporate Hangar	10,000 SF	
NE Corporate Hangar	5,920 SF	
NE Corporate Hangar	6,400 SF	
NE Corporate Hangar	6,400 SF	
Dome Hangars (8)	8,600 SF	8 units (1,075 SF each)
Vacant Corporate Hangar	10,000 SF	
Old Sheriff's Hangar	3,600 SF	
American Aviation (FBO)	12,500 SF	
American Aviation (FBO)	15,000 SF	
American Aviation (FBO)	31,500 SF	
American Aviation (FBO)	12,000 SF	
T-Hangars	45,500 SF	40 units
Shade Hangars	17,000 SF	16 units
EAA Hangar	4,200 SF	
Jet ICU	17,500 SF	
Sheriff's Department/Bay Flight	3,500 SF	
SE Corporate Hangar	9,025 SF	
SE Corporate Hangar	6,000 SF	
SE Corporate Hangar	4,675 SF	
T-Hangars	33,525 SF	28 units
Westside Maintenance Facility	22,100 SF	
Subtotal	310,242 SF	
Apron Facilities		
Chapman Corporate Hangar	14,348 SF	Asphalt
Airport Administration	14,455 SF	Asphalt
Neubert Corporate Hangar	23,982 SF	Asphalt
NE Corporate Hangar	4,369 SF	Asphalt
NE Corporate Hangar	7,813 SF	Asphalt
NE Corporate Hangar	5,952 SF	Asphalt
NE Corporate Hangar	5,952 SF	Asphalt
NE Corporate Hangar	4,369 SF	Asphalt
FL Army National Guard	379,484 SF	Asphalt with Concrete Pads
Vacant Corporate Hangar	30,242 SF	Asphalt
American Aviation (FBO)	403,286 SF	Asphalt
Jet ICU	17,490 SF	Asphalt
Sheriff's Department/Bay Flight	7,821 SF	Asphalt
SE Corporate Hangars	47,923 SF	Asphalt
Westside Maintenance Facility	96,898 SF	Asphalt
Subtotal	1,064,384 SF	
Buildings / Other		
Airport Administration	5,559 SF	
Airport Maintenance	1,500 SF	
American Aviation FBO Terminal	3,750 SF	
Westside Maintenance Facility Administration	4,125 SF	
Fire Station #14	5,950 SF	
Subtotal	20,884 SF	
Auto Parking		

**Table 2-3
Existing Airport Facilities**

Description	Size	Notes
Airport Administration	24 spaces	
NE Corporate Hangars	11 spaces	
Dome Hangars	None	
Fire Station #14	6 spaces	
American Aviation	68 spaces	
Sheriff Department /Bay Flight	11 spaces	
SE T-Hangars	23 spaces	
SE Corporate Hangars	22 spaces	
Westside Maintenance Facility	27 spaces	
Subtotal	192 spaces	
Fuel Facilities		
American Aviation Fuel Storage (Jet-A)	20,000 Gal.	(2) 10,000 Gallon Tanks (Jet-A)
American Aviation Fuel Storage (Avgas)	20,000 Gal.	(2) 10,000 Gallon Tanks (AvGas)
Westside Maintenance Facility (AvGas)	4,000 Gal.	
Westside Maintenance Facility (Jet A)	22,000 Gal.	10,000 Gallon Tank (Jet A) 12,000 Gallon Tank (Jet A)
Subtotal	66,000 Gal.	
Source: Michael Baker Jr., Inc., 2014.		

Brooksville-Tampa Bay Regional Airport

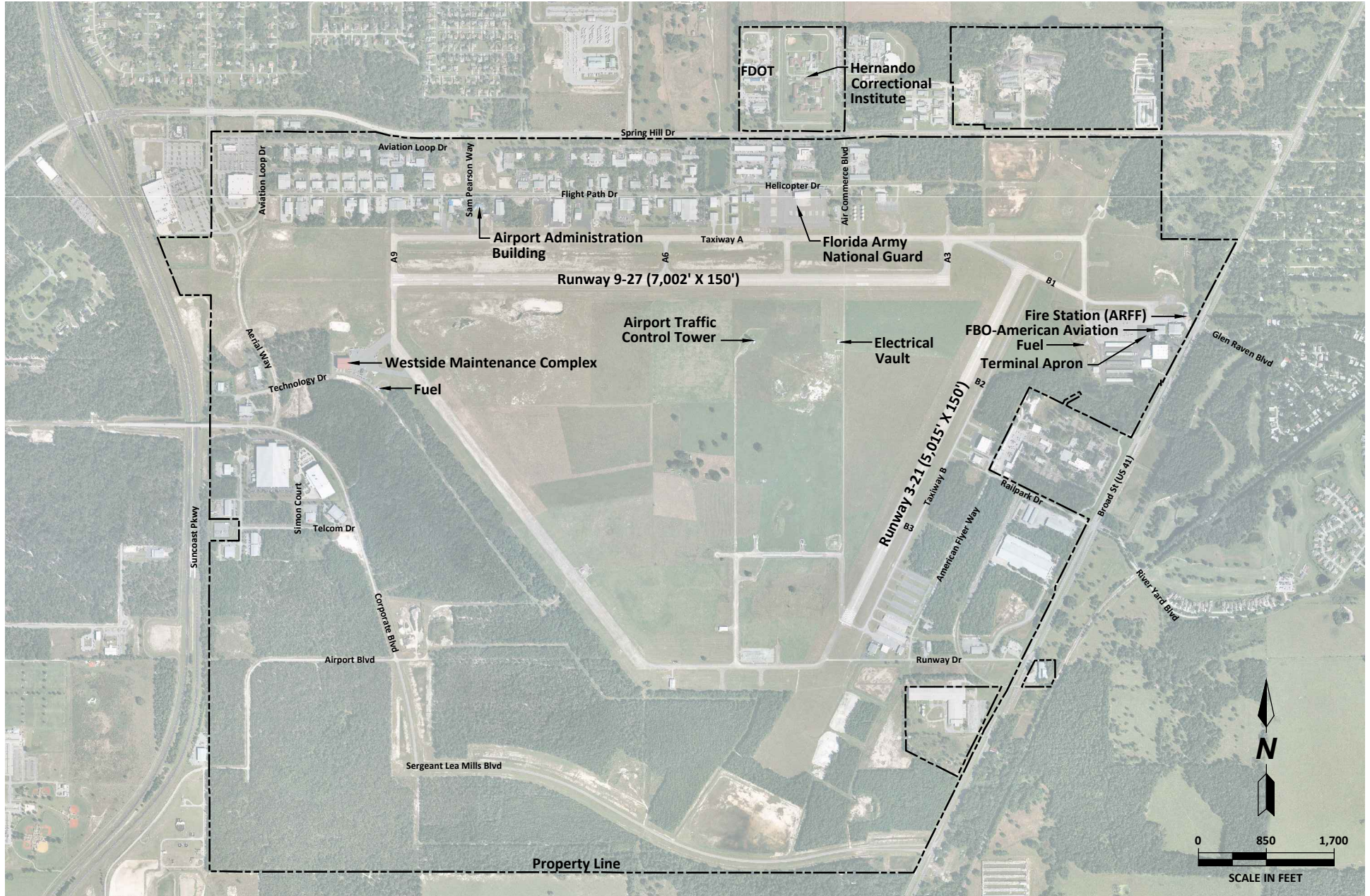


Figure 2-3 Existing Landside Facilities
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Brooksville-Tampa Bay Regional Airport

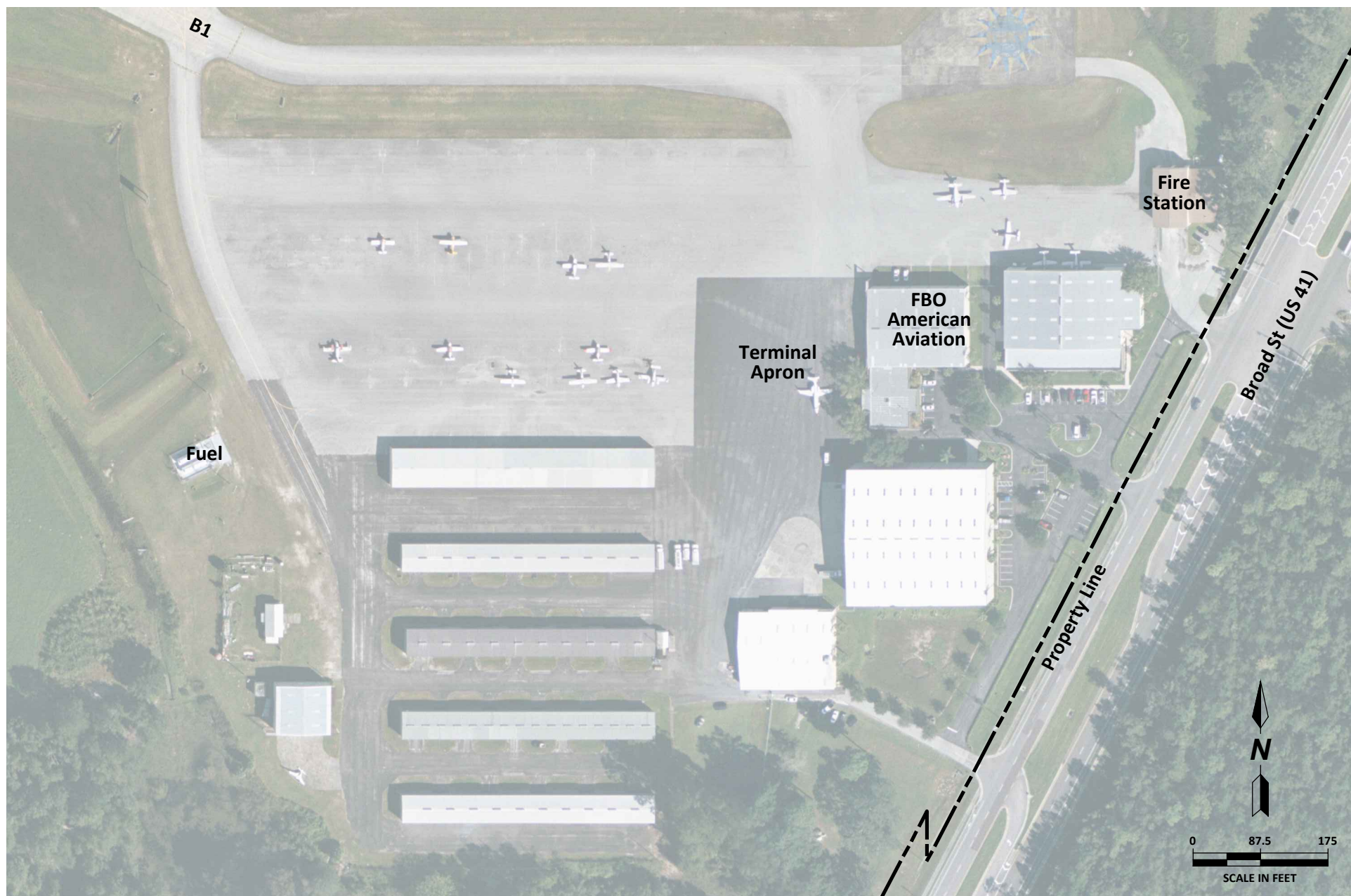


Figure 2-4 FBO & Terminal Area Facilities
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2.9 Airside Facilities

The inventory of airside facilities includes all facilities required to support the movement and operation of aircraft. These facilities include the airport's runway, taxiways, taxilanes, apron, airfield lighting, and pavement markings. The existing airfield facilities at BKV are discussed in the following sections and a graphic denoting the various airside facilities is illustrated in **Figure 2-5**.

Runways

There are two active runways at BKV. The primary runway, Runway 9-27, is 7,002 feet long and 150 feet wide. The secondary or crosswind runway, Runway 3-21, has an overall length of 5,015 feet and is 150 feet wide. Both runways are lighted for nighttime operations and are of concrete construction. A visual inspection of Runway 9-27 and Runway 3-21 was performed during the inventory visit conducted as part of this study. During the inventory, the pavement of both runways was found to be in good condition. Joint / crack sealing and spall repair was conducted on all runway pavements in March 2012. The 2014 FAA Digital Airport/Facility Directory documents the existing runway pavement strengths as shown in **Table 2-4**.

Table 2-4	
Runway Pavement Strength	
Runway 9-27	
Single Wheel	90,000 lbs.
Dual Wheel	130,000 lbs.
Single Tandem	165,000 lbs.
Dual Tandem	230,000 lbs.
Runway 3-21	
Single Wheel	50,000 lbs.
Dual Wheel	75,000 lbs.
Single Tandem	95,000 lbs.
Dual Tandem	135,000 lbs.
Source: 2014 FAA Digital Airport/Facility Directory	

Taxiways

There are currently two active taxiways serving the two runways at BKV, as well as multiple connector and exit taxiways that provide access to and from the runway and taxiway systems. All north airfield taxiway pavements are of concrete design, with the exception of Taxiway A-6 and a portion of Taxiway A-3. Joint/crack sealing and spall repair was conducted on all concrete taxiways in March 2012. Taxiway B and its four connector taxiways (B-1, B-2, B-3, and B-4) are of asphalt design. **Table 2-5** describes the location, width, and condition for each.

Taxiway A is the full-length parallel taxiway to Runway 9-27. Located on the north side of the runway, this taxiway also serves the departure end of Runway 21. The taxiway has been constructed to a width of 75 feet and maintains a taxiway centerline to runway centerline spacing of 525 feet. There are two additional connector taxiways associated with Taxiway A as well as two exit taxiways that serve each runway end.

Taxiway A-9 is 75 feet wide and provides access to Runway 9 from Taxiway A. Taxiway A-6 is located approximately 3,420 feet from the Runway 9 threshold and is constructed to a width of 50 feet. Taxiway A-5 is situated approximately 2,020 feet from the Runway 27 threshold and is 75 feet wide.

Taxiway A-3 serves the departure end for Runway 27, and the usable pavement surface varies from 92 feet at its widest point to 85 feet at its narrowest point. Upon visual inspection, the pavement surface for this taxiway showed signs of fatigue with visible cracking and therefore was categorized in fair condition. All four connector taxiways run in a north to south direction and connect Taxiway A to Runway 9-27 at a perpendicular angle. Taxiway A also has multiple entrance/exit taxilanes that provide

airfield access to the tenants of the North Hangar Area on the north side of the airfield. At its eastern end, Taxiway A extends approximately 1,700 feet beyond the threshold of Runway 27, passing through the runway safety area for Runway 21 and ending at a taxilane that services aircraft taxiing to and from the general aviation facilities.

There is also a connector Taxiway B-1 that runs in a northwest to southeast direction and ties into Taxiway A diagonally just beyond connector Taxiway A-3. Taxiway B-1 services Runway 21 and connects Taxiway A to the taxilane that leads into the FBO/general aviation portion of the airfield. There are no designated run-up areas for Taxiway A.

Taxiway B spans the entire length of Runway 3-21. It measures 35 feet in width, and the pavement is in fair condition. It provides access to the threshold end of Runway 21, commencing from connector Taxiway B-1 and running in a northeast to southwest direction. In addition to B-1, there are three other taxiways servicing Taxiway B and Runway 3-21. Taxiway B-2 is 50 feet wide and Taxiways B-4 and B-5 are 35 feet in width. Taxiway B-2 measures 149 feet from hold bar to runway centerline. There are no designated run-up areas for aircraft using Taxiway B.

**Table 2-5
Summary of Existing Airfield Pavements**

Surface	Length (feet)	Width (feet)	Pavement Type	Pavement Condition	Markings	Lighting
Runways						
9-27	7,002	150	Concrete	Good	Precision instrument (9) Non-precision instrument (27)	MIRL
3-21	5,015	150	Concrete	Good	Non-precision instrument	MIRL
Taxiways and Connectors						
A	8,704	75	Concrete	Fair	Centerline	MITL
B	5,020	35	Concrete	Fair	Centerline	MITL
A-9	530	75	Concrete	Fair	Centerline	MITL
A-6	530	50	Asphalt	Fair	Centerline	MITL
A-5	530	75	Concrete	Fair	Centerline	MITL
A-3	530	85 to 92	Concrete/Asphalt	Fair	Centerline	MITL
B-1	775	75	Asphalt	Fair	Centerline	MITL
B-2	240	50	Asphalt	Fair	Centerline	MITL
B-3	240	35	Asphalt	Fair	Centerline	MITL
B-4	240	35	Asphalt	Fair	Centerline	MITL
B-5	240	35	Concrete	Fair	Centerline	MITL
C-9	700	75	Concrete	Fair	Centerline	MITL
Closed Runway	5,050	150	Concrete	Poor	None	None

Source: Michael Baker Jr., Inc., 2014.

Brooksville-Tampa Bay Regional Airport

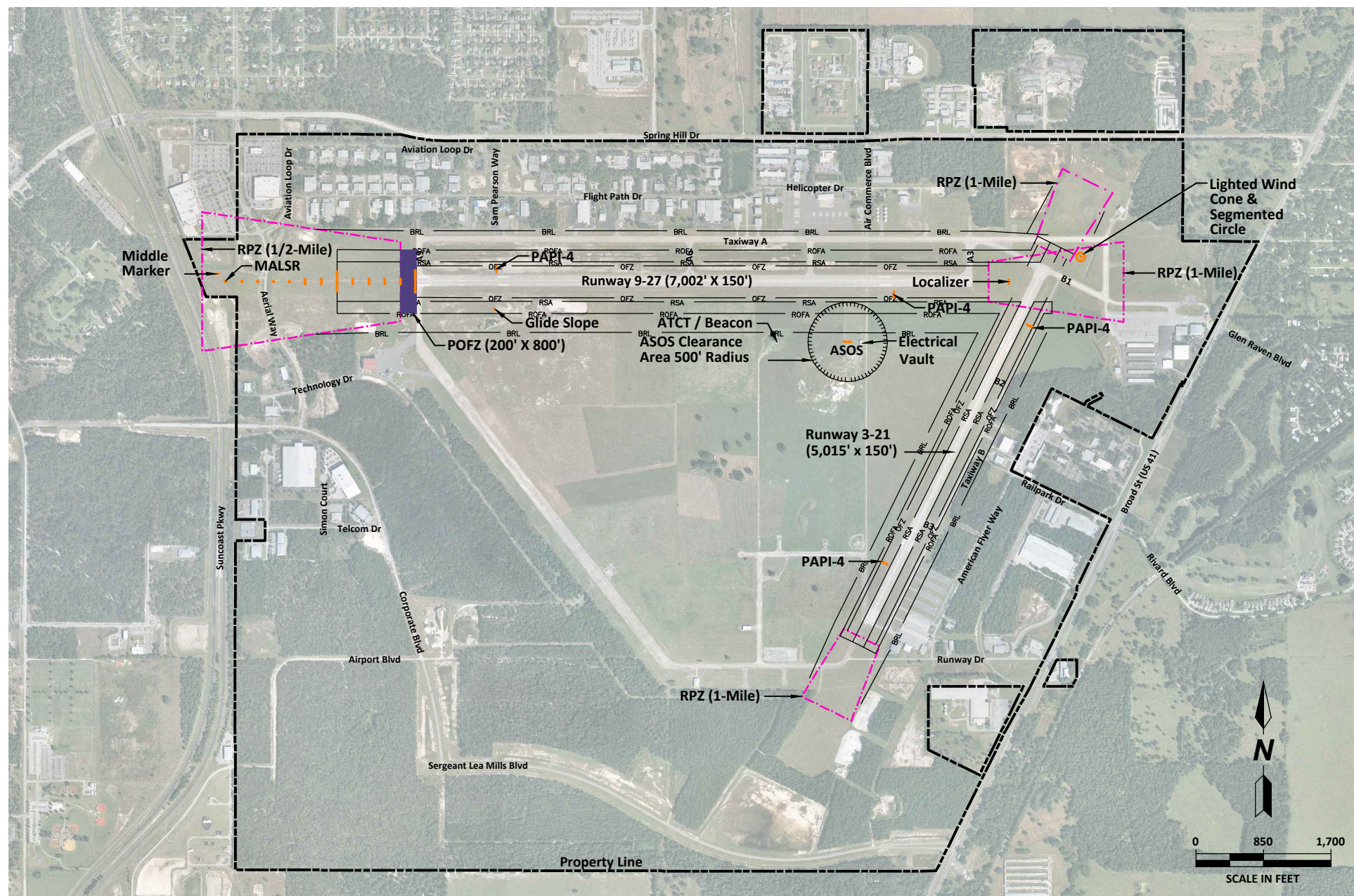


Figure 2-5 Existing Airside Facilities

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Pavement Markings

Pavement markings provide the standards for delineating operations on paved areas (runways, taxiways, and aprons) on the airfield. Runway 9 is marked for precision instrument approaches and Runways 27, 3 and 21 are marked to accommodate non-precision approaches. Markings include centerline striping, threshold bars, aiming point markers, side stripes, and runway shoulder markings. The approach ends of all runways are designated with markings that identify the runways by their magnetic azimuth. During the field visit, these markings were observed to be in good condition.

Taxiway markings are also in good condition throughout the airfield. All taxiways are equipped with taxiway centerline strips and hold short lines. At controlled airports, holding position markings identify the location on a taxiway or apron where aircraft are supposed to stop until it is safe to proceed onto the runway. Taxiways at the airport do not have edge markings to delineate the width of the taxiways. All runways and taxiways were cleaned and restriped in 2012.

Airfield Lighting

Airfield lighting is necessary at all airports that intend to accommodate operational activity during nighttime hours and/or during inclement weather conditions. It allows pilots to identify the airport from the air and also helps them maneuver safely on the ground during lowered visibility conditions. All airfield lighting electrical requirements at BKV are provided from the electrical vault located within a fenced area near the ATCT on the south side of Runway 9-27. The electrical vault houses the necessary transformers, controllers, and generators for airfield lighting, signage, and NAVAIDS. The following section discusses the type and condition of airfield lighting systems used at BKV.

Airport Rotating Beacon

The airport's rotating beacon universally indicates the location and presence of an airport at night or during Instrument Meteorological Conditions (IMC). The new beacon at BKV is located on top of the existing airport traffic control tower just west of the airport electrical vault. The beacon is equipped with an optical rotating lighting system that projects two beams of light, one green and one white, 180 degrees apart. The beacon is in excellent condition and is operational during nighttime hours and during poor visibility conditions. The former airport beacon remains in place adjacent to the electrical vault, and stands 35 feet from the security/service road. Although this beacon is operational, it has been decommissioned.

Runway Lighting

Both of the active runways at BKV are equipped with Medium Intensity Runway Lights (MIRLs) along their pavement edge, which are used primarily during night operations. During the evening when the ATCT is closed, pilots can operate the runway lighting by use of the pilot controlled lighting system. This lighting system is operated through the Common Traffic Advisory Frequency (CTAF) of 118.55 MHz. Having the pilot controlled lighting on the CTAF eliminates the need for pilots to change frequencies in order to turn the airfield lights on, thus allowing a continuous listen/watch form of communication on a single frequency. The pilot simply keys the aircraft's microphone to control the runway lighting system.

As part of the runway lighting system, the identification of the runway end, or threshold, is of major importance to a pilot during landing and takeoff. Therefore, runway ends and thresholds are equipped with special lighting to aid in the approach to or identification of the runway end during takeoff and

landing. At BKV, the ends of Runway 9-27 and Runway 3-21 are identified with four threshold lights located towards the sides of each runway. An additional 18 threshold lights are evenly spaced across the end of Runway 9 as part of the approach lighting system. Threshold lights have a two color (red/green) lens and are placed across the end of the runway pavement. The green half of the lens faces approaching aircraft thereby identifying the beginning of the usable runway. The red half of the lens faces the aircraft on takeoff, indicating the end of the usable runway.

A Precision Approach Path Indicator (PAPI) system provides the pilot of an aircraft with visual descent guidance information during the approach to a runway. These lights are typically visible from five miles during the day and up to 20 miles or more at night. PAPIs use a light bar unit that is installed in a single row perpendicular to the runway edge. The lights in the light bar project a beam of white light in the upper segment and red light in the lower segment. Depending on the aircraft's angle in relation to these lights, the pilot will receive a combination that indicates his position relative to the desired glide slope. BKV has a four light PAPI system located on the left side of each runway. The systems are over 20 years old and are currently in the process of being renewed or replaced. In addition to these systems, Runway 9 is equipped with a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) which is used in conjunction with various NAVAIDS to provide a full precision instrument approach capability during inclement weather conditions. The MALSR is also over 20 years old and it is difficult to obtain replacement parts. Both runway identification lighting and approach lighting systems are pilot controlled. These fixtures are illuminated with the runway lighting, but do not include changeable intensity control.

Taxiway and Apron Lighting

In addition, all taxiways including connectors are equipped with Medium Intensity Taxiway Lights (MITLs) along the edges that are pilot controlled. However, as with the approach lighting system, the taxiway edge lights are not outfitted with changeable intensity control. There is no apron edge lighting available. However, lighting near the ramp and hangar areas is provided via outdoor lighting affixed to the hangars and poles. At the Westside Maintenance Facility there is some exterior lighting available, but it does not adequately illuminate the area.

Instrument Approaches and Navigational Aids

As stated earlier, Runways 3, 21, and 27 are marked to accommodate non-precision instrument approaches, while Runway 9 is marked to accommodate precision instrument approaches. Runway 9 currently is equipped with a Category-I Instrument Landing System (ILS) approach including a MALSR that extends beyond the runway end, a Middle Marker, and an Outer Marker. The ILS broadcasts on 111.1 MHz with a three letter designate I-OSV and provides for a Decision Height of not less than 200 feet above field elevation when visibility is not less than one-half statute mile.

In addition, each runway end at BKV has non-precision instrument approach capability through the use of Global Positioning Satellites (GPS). By analyzing the time delays of signals received from some of these satellites, air based receivers are able to determine latitude, longitude, and altitude. All four of the GPS straight-in and circling non-precision approaches at each end offer better minimum descent altitudes and visibility requirements.

Wind Cone and Segmented Circle

The purpose of a segmented circle is to help pilots locate the wind cone while in-flight and to identify any special traffic patterns that may exist at the airport. The segmented circle encompasses

360 degrees similar to a compass, and where applicable, traffic pattern and landing strip indicators are provided outside the circle to denote the established traffic patterns. At BKV, there are no traffic pattern or landing strip indicators located outside the segmented circle and for this reason the traffic patterns for both runways are standard left-hand patterns. In this arrangement, pilots make a series of left-hand turns in order to access the approach end of each runway. The wind cone and segmented circle at BKV is centrally located northeast of the Runway 27 threshold between Taxiways A and B1 and is illuminated at night for visibility.

Automated Surface Observing System (ASOS)

BKV is equipped with an on-airport ASOS which is located adjacent to the electrical vault within the midfield portion of the airport. The ASOS was commissioned in 1992 and is used to measure and record weather conditions by using a suite of sensors. ASOS units are implemented cooperatively with the National Weather Service (NWS) and the FAA, which distributes the information to pilots. Specifically, the ASOS at BKV records temperature, visibility, precipitation types and amounts, wind direction and speed, cloud ceiling and barometric pressure, among others.

According to NWS representatives, the equipment is in good working order; however, it is recommended that an Uninterruptable Power Supply (UPS) be installed in the future to protect against power interruptions to the sensors.

Airfield Signage

BKV has a number of illuminated airfield signs which display instruction and guidance information to pilots. Holding designation signage (e.g., runway/taxiway intersection) is identified by white numbers on a red background. Directional and informational signage is identified by black inscriptions on a yellow background; whereas, signs that contain yellow text on a black background identify the runway or taxiway on which the aircraft is located. In addition to informational and directional signage, Runway 9-27 is equipped with runway distance remaining signs that are characterized by single, double-sided white numbers on black backgrounds. The distance to remain signage illustrates numeric digits which represent the quantity of runway available in thousands of feet. These signs are utilized by pilots as a reference during aircraft takeoffs and landings. Currently, additional airfield signage is needed in some locations on the airfield and existing signage is in need of replacement or upgrade as the equipment reaches the end of its useful service life.

Airport Utilities

The facility requirements and development alternatives created in this study are partially dependent upon the airport's ability to provide essential utility service to future development areas. Because existing electrical, drainage, sanitary sewer, and water service is currently provided to existing structures such as businesses throughout the Technology Center, the FBO, hangars and support facilities, it is safe to assume that developments located around the periphery of the airfield will have the ability to easily connect to utilities.

Airspace Environment

BKV is surrounded by Class D airspace within a four nautical mile radius, extending from the surface up to 1,500 feet above Mean Sea Level (MSL). The airspace directly over the airfield is classified as Class E airspace. This Class E category begins at 700 feet Above Ground Level (AGL) and extends upward; however, the airfield is located just inside Tampa Bay's Class B airspace, which

has various floor and ceiling levels. The overlapping Class B airspace begins at 6,000 AGL and extends upward until it meets the next overlapping airspace. It meets up with Class E airspace once again at 10,000 feet AGL and continues as Class E airspace until it meets up with the overlying controlled airspace (Class A) at 17,999 MSL. The airspace north of the airfield falls wholly within Class E airspace, and it extends from 700 feet AGL up to the 18,000-foot MSL floor of Class A airspace (the overlying controlled airspace). Airspace designated as Class B or Mode C designates a high traffic area where air traffic control personnel use transponders to identify, communicate and control aircraft operating within the designated airspace. At BKV, Mode C airspace consists of a 30 nautical mile radius which corresponds to the outer ring of Tampa's Class B airspace. Mode C airspace bisects the airfield in an east to west direction. Class B, D and E airspace are classified as controlled airspace, with specific requirements governing VFR and IFR operations.

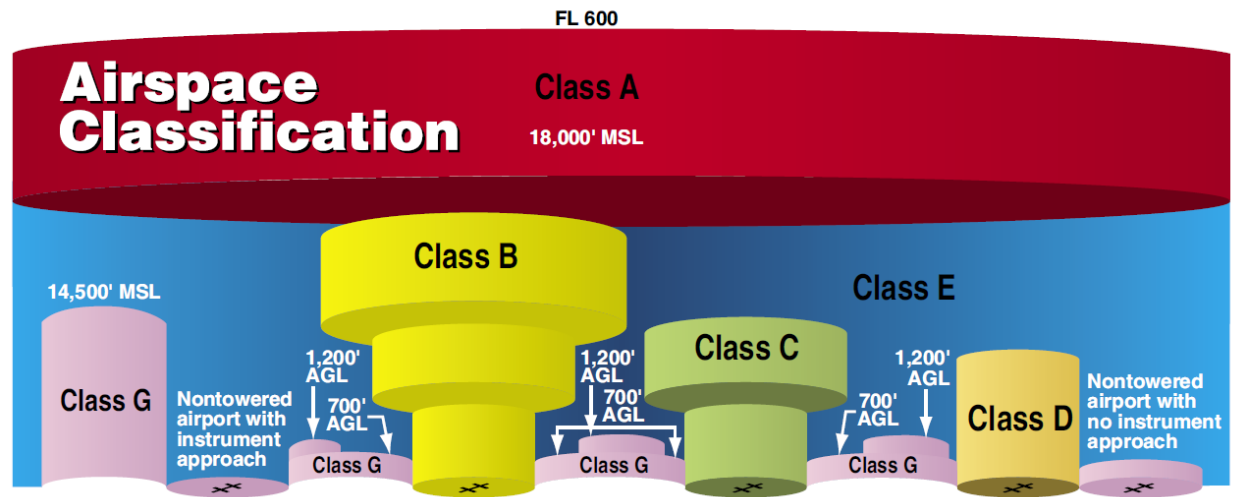
Victor Airways

The airspace environment of BKV is also influenced by two Victor airways. These airways are designated corridors of airspace used for en route navigation by linking VHF Omni-directional Range (VOR) facilities. Victor Airway V7-521 passes through a small portion of the Class E airspace on the northeast side. This northwest/southeast route runs between the VOR facilities at the Lakeland Linder Regional and Cross City Airports. The second Victor Airway, V441-579, passes through the westernmost edge of Class E airspace over the airport. This route runs from the VOR facility at the St. Pete-Clearwater International Airport almost directly north to the VOR facility at the Gainesville Regional Airport.

Airport Traffic Control (ATCT)

The ATCT at BKV is located within the midfield portion of the airport, just west of the electrical vault, and is staffed by Robinson Aviation, Inc. (RVA) between the hours 7:00 a.m. and 10:00 p.m. seven days a week. The ATCT not only oversees aircraft flying within the controlled airspace near BKV, but also the vehicles and aircraft operating on the ground within the defined movement area. Vehicle or aircraft operators must maintain contact with tower personnel in either of these areas, whether on the ground or in the air. ATCT personnel's purpose is to ensure that all movements are coordinated in a safe manner. Pilots that wish to enter or transition through the Class D airspace surrounding BKV must first get clearance from the ATCT. **Figure 2-6** graphically depicts a comparison of the airspace classes by type; whereas, the aeronautical chart for BKV and the surrounding area is shown in **Figure 2-7**.

Figure 2-6
Airspace Classes



Source: FAA 2008 Pilot's Handbook of Aeronautical Knowledge.

2.10 Environmental Factors

Some of the proposed improvement projects at the airport will require environmental permitting through a number of different agencies, each with its own criteria and focus. Future development of the airport and the integration of environmental permitting will be critical to the success of each project as well as to the success of the airport.

Coordination with the appropriate agencies for permitting requirements will be made on an individual basis as each project is funded. Additional details to the possible environmental impacts are included as part of the alternatives analysis in this Master Plan Update.

Brooksville-Tampa Bay Regional Airport



Figure 2-7 Sectional Aeronautical Chart

DRAFT

Chapter 2.0

Inventory of Existing Conditions



BROOKSVILLE - TAMPA BAY REGIONAL AIRPORT
& TECHNOLOGY CENTER



Michael Baker
INTERNATIONAL

3.0 AVIATION ACTIVITY FORECASTS

3.1 Introduction

This forecasting effort was conducted in 2014 as a component of the Master Plan Update (MPU) for the Brooksville-Tampa Bay Regional Airport (BKV). The forecasts were developed based on the most recent information available at the time and are utilized in later sections to determine long-term facility requirements, alternatives, and recommendations. The forecasts are presented over a 20-year planning period that extends from 2013 through 2033. It is noted that an Airport Traffic Control Tower (ATCT) opened on October 15, 2012 at BKV. The ATCT is open 365 days a year from 7:00 a.m. to 10:00 p.m. Therefore, the majority of aircraft operations are now counted by ATCT personnel and are utilized for this forecasting effort, as opposed to previous forecasting efforts that incorporated activity estimates from airport management and tenants. In the previous master plan, the initial or baseline year was 2004. Since that time, the number of based jets grew from 3 to 14 and Instrument Flight Rules (IFR) activity increased from 2,913 annual operations to 5,026, which represents an Average Annual Growth Rate of 6.25 percent for IFR activity between 2004 and 2013. The population of Hernando County increased 32.81 percent from 130,809 in 2000 to 173,731 in 2013. Much of the growth at BKV and within Hernando County may be attributed to population growth in the greater Tampa Bay area, constraining factors at other General Aviation (GA) airports in the region (e.g., runway length, approach capability, and developable space), and other projects such as the construction of the Suncoast Parkway which provided improved access to BKV and Hernando County. With the anticipation of continued population growth in the area, the airport should plan for the potential to accommodate greater numbers of annual operations and based aircraft. These types of historical and anticipated trends are reviewed in this chapter to evaluate the potential for operations and based aircraft growth at BKV. The forecasts herein are intended to present a growth scenario that will allow the Hernando County BOCC to plan for potential improvements to the airport in case they are necessary during the 20-year planning period. The following forecasting elements are presented in this chapter:

- ➔ Forecasting Limitations
- ➔ Historical and Baseline Activity
- ➔ Factors and Opportunities Affecting Activity Levels
- ➔ Annual Operations Forecast
- ➔ Itinerant and Local Operations Forecast
- ➔ Operations by Aircraft Type Forecast (Fleet Mix Forecast)
- ➔ Critical Aircraft Forecast
- ➔ Instrument Operations Forecast
- ➔ Peak Operations Forecast
- ➔ Based Aircraft Forecast
- ➔ Summary

3.2 Forecasting Limitations

Forecasting aviation activity is a complex process that considers a multitude of factors, both controllable and beyond an airport's control. Forecasts are not to be construed with predictions of the future but rather as an educated guess of future activity based on a variety of predictors, calculations, assumptions, and subjective judgment. The accuracy of the estimates decline as the

planning term is extended, potentially as a result of unforeseen local or geo-political events, natural disasters, and/or climatological events.

The Federal Aviation Administration's (FAA) forecast approval process typically constitutes an approval for planning purposes only, which allows for the illustration of projects that are consistent with long-term growth expectations on the Airport Layout Plan (ALP). In most cases, prior to issuing a grant, the FAA will require updated data which demonstrates that the proposed project is justified by activity at the time, or by activity that would directly result from the implementation of the proposed project. This ensures that available funding is directed towards critical airport projects throughout the U.S.

3.3 Historical and Baseline Activity

Many elements compose the broad definition of GA activity. In simplest terms, GA includes all segments of the aviation industry except those conducted by scheduled commercial air carriers and the U.S. military. GA activities may include pilot training, sightseeing, aerial photography, law enforcement, and medical flights, as well as business, corporate, and personal travel. GA operations are divided into the categories of local or itinerant. Local operations are those arrivals or departures performed by aircraft that remain within the airport traffic pattern, or those that occur within sight of the airport. Local operations are most often associated with training activity and flight instruction (e.g., touch-and-goes). Itinerant operations are arrivals or departures that do not remain within the airport traffic pattern and/or that originate from another airport. The FAA defines an operation as either a single aircraft landing or takeoff. Under this definition, touch-and-go training procedures are considered two operations (one takeoff plus one landing) and are deemed local operations. Itinerant operations are typically comprised of private, business/corporate, and air taxi flight activity, but may also include law enforcement and medical flights.

As mentioned, the ATCT at BKV opened on October 15, 2012 and therefore a full year of activity data was available for 2013. According to records from the FAA's Air Traffic Activity Data System (ATADS) database, the ATCT recorded a total of 46,275 operations in 2013, of which 47.52 percent were itinerant operations and 52.48 percent were local operations. Because the ATCT is only open 15 hours a day, that total does not account for operations that occurred when the ATCT was closed between 10:00 p.m. and 7:00 a.m. Therefore, IFR flight plan activity data, or operations that pilots file with the FAA when they intend to fly within IFR controlled airspace, was reviewed to determine the percentage of IFR operations that occurred when the ATCT was closed in 2013, which equated to 7.64 percent. That percentage was then utilized to determine that an additional 3,828 operations may have not been counted in 2013, thus resulting in an estimated total of 50,103 operations for BKV in the baseline year (refer to **Table 3-1**). Other historical activity data was obtained from the FAA's 2013 Terminal Area Forecast (TAF) for BKV as well as the FAA's Traffic Flow Management System Counts (TFMSC) database. The number of operations by aircraft type in 2013 was determined by first obtaining the number of jet operations from the FAA's TFMS database; thereafter, the number of single-engine piston, multi-engine piston, turboprop, and jet operations were distributed based on their percentage of the based aircraft fleet at BKV.

Table 3-1
2013 Baseline Activity for BKV

Operations								
Itinerant (IT) Operations				Local (LOC) Operations				Total Operations
Civilian	Military	Total	IT %	Civilian	Military	Total	LOC %	
22,073	1,735	23,808	47.52%	20,136	6,159	26,295	52.48%	50,103
Operations by Aircraft Type								
SEP		MEP		Turboprop		Jet		Helicopter
37,871		3,607		2,404		1,412		4,809
Based Aircraft by Aircraft Type								
SEP		MEP		Turboprop		Jet		Helicopter
176		126		12		8		14
Sources: FAA ATADS database, FAA TFMSC database, airport records, and Michael Baker Jr., Inc., 2014.								

Sources: FAA ATADS database, FAA TFMSC database, airport records, and Michael Baker Jr., Inc., 2014.

FAA 2013 Terminal Area Forecast (2013 TAF)

Each year, the FAA develops activity forecasts for U.S. airports as part of the TAF, which is used to determine long-term planning and budgeting needs for aviation infrastructure. The most recent 2013 edition of the TAF presents historical activity records back to 1990 and forecasts through the year 2040. The TAF values are presented in **Table 3-2** and were not adjusted to reflect actual baseline operations and based aircraft data in 2013. Because the ATCT did not open until October 2012, there is little reliability to the operations numbers prior to 2013. The most important aspect of the TAF is the projected annual growth rates during the planning period. For example, the TAF projects an AAGR of 2.27 percent for total operations between 2013 and 2033 and a slight decline in the ratio of local operations to total operations. Those types of characteristics were considered as part of the operations forecasting effort in this MPU. The 2013 TAF projects based aircraft to increase at an AAGR of 1.48 percent from 2013 to 2033, with the strongest growth anticipated for jets.

Table 3-2
2013 TAF for BKV (1990-2013)

Operations									
Year	Itinerant (IT) Operations				Local (LOC) Operations				Total Operations
	Civilian	Military	Total	IT %	Civilian	Military	Total	LOC %	
1990	21,430	150	21,580	46.11%	25,220	0	25,220	53.89%	46,800
2000	21,800	150	21,950	46.26%	25,500	0	25,500	53.74%	47,450
2010	33,500	4,500	38,000	48.25%	40,000	750	40,750	51.75%	78,750
2013	18,683	1,795	20,478	46.58%	18,271	5,218	23,489	53.42%	43,967
2033	31,984	1,958	33,942	49.32%	29,191	5,692	34,883	50.68%	68,825
AAGR	2.72%	0.44%	2.56%	0.29%	2.37%	0.44%	2.00%	-0.26%	2.27%
Based Aircraft									
Year	SEP	Jet	Multi	Helicopter	Other	Total			
1990	78	2	18	6	0	104			
2000	85	2	8	5	3	103			
2010	107	15	13	6	0	141			
2013	112	15	13	8	13	161			
2033	125	39	13	26	13	216			
AAGR	0.55%	4.89%	0.00%	6.07%	0.00%	1.48%			

Source: FAA 2013 TAF.

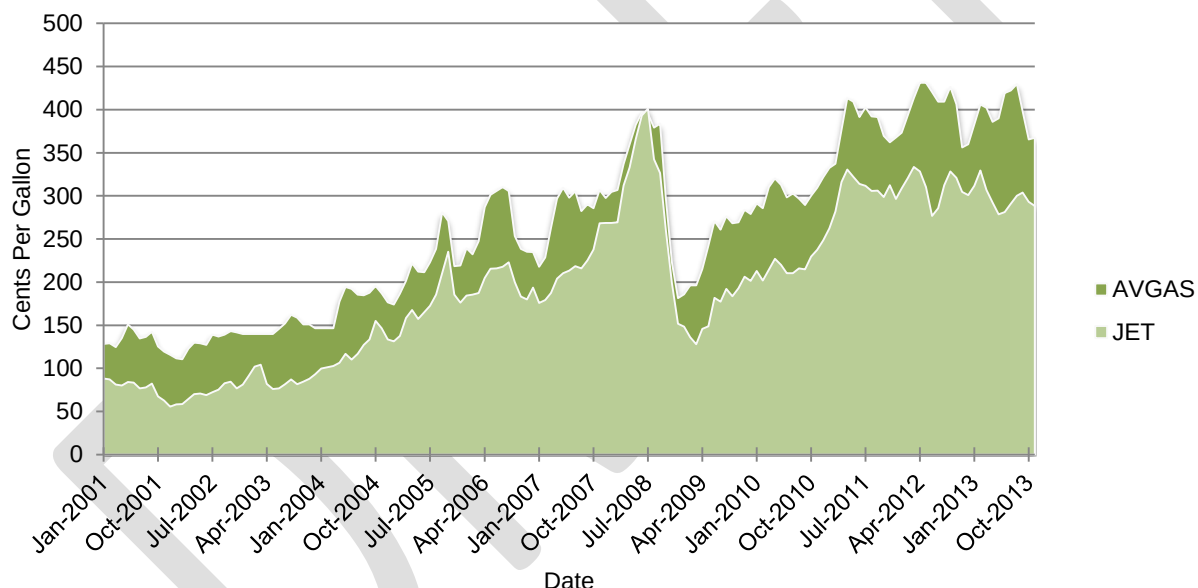
AAGR – Represents the average annual growth rate from 2013 to 2033.

3.4 Factors and Opportunities Affecting Activity Levels

This section describes past and present trends that may influence BKV's operations and based aircraft levels. As part of any forecasting effort, the FAA recommends the identification of historical factors that represented turning points for the U.S. aviation industry such as the terrorist attacks on September 11, 2001, sharp fuel price increases after Hurricane Katrina damaged Gulf Coast refineries in August 2005 (refer to **Figure 3-1**), and the economic recession of the late 2000s. Although some of those factors were impossible to predict, their resulting consequences had considerable impacts on aviation activity throughout the U.S. Local trends are also important because they provide airport-specific information that can be used to support the selection of preferred forecasts. The following trends were considered in this analysis:

- ➔ Economic Conditions
- ➔ Airport-Specific Factors
- ➔ FAA Next Generation Air Transportation System (NextGen)

Figure 3-1
Historical Wholesale Price of Aviation (2011-2013)



Source: U.S. Energy Information Administration.

Economic Conditions

As shown in **Figure 3-2**, BKV is located in Hernando County which is part of the Tampa-St. Petersburg-Clearwater Metropolitan Statistical Area (MSA) that also includes Hillsborough, Pasco, and Pinellas Counties. **Table 3-3** presents historical and forecast population data for Hernando County, the MSA, the entire state of Florida, and the U.S. Compared to the MSA, state, and U.S., Hernando County experienced a higher AAGR in population between 2000 and 2013 and the trend is projected to continue through 2018. Although this represents only one indicator of economic growth, the nearly 33 percent increase in the county's population from 2000 to 2013 is probably one of many factors that contributed to the growth in based aircraft and flight plan activity during the same timeframe. As the population is expected to continue to increase in the county, it should be

reasonable to expect that continued based aircraft and operational growth would occur at BKV. This may be particularly evident by the high number of large-scale housing developments that are being constructed in the county, many of which provide more affordable options than the higher population counties to the south. Furthermore, projects that provide improved access between Hernando County and Hillsborough, Pasco, and Pinellas Counties, such as the previous construction of the Suncoast Parkway and the current widening of the Veterans Expressway, may also result in continued population and economic growth in Hernando County. Additional economic considerations are presented in the Business Plan that was conducted in conjunction with this MPU.

Table 3-3
Historical and Forecast Population (2000-2018)

Year	County	MSA	State	U.S.
2000	130,809	2,385,998	15,963,334	281,302,576
2010	172,778	2,783,243	18,801,310	308,725,722
2013	173,344	2,879,531	19,380,009	315,024,374
2018	189,174	3,065,408	20,714,390	327,511,109
AAGR1	2.19%	1.46%	1.50%	0.87%
AAGR2	1.76%	1.26%	1.34%	0.78%

Source: Alteryx, Inc., 2014.

AAGR1 – Represents the average annual growth rate from 2000 to 2013.

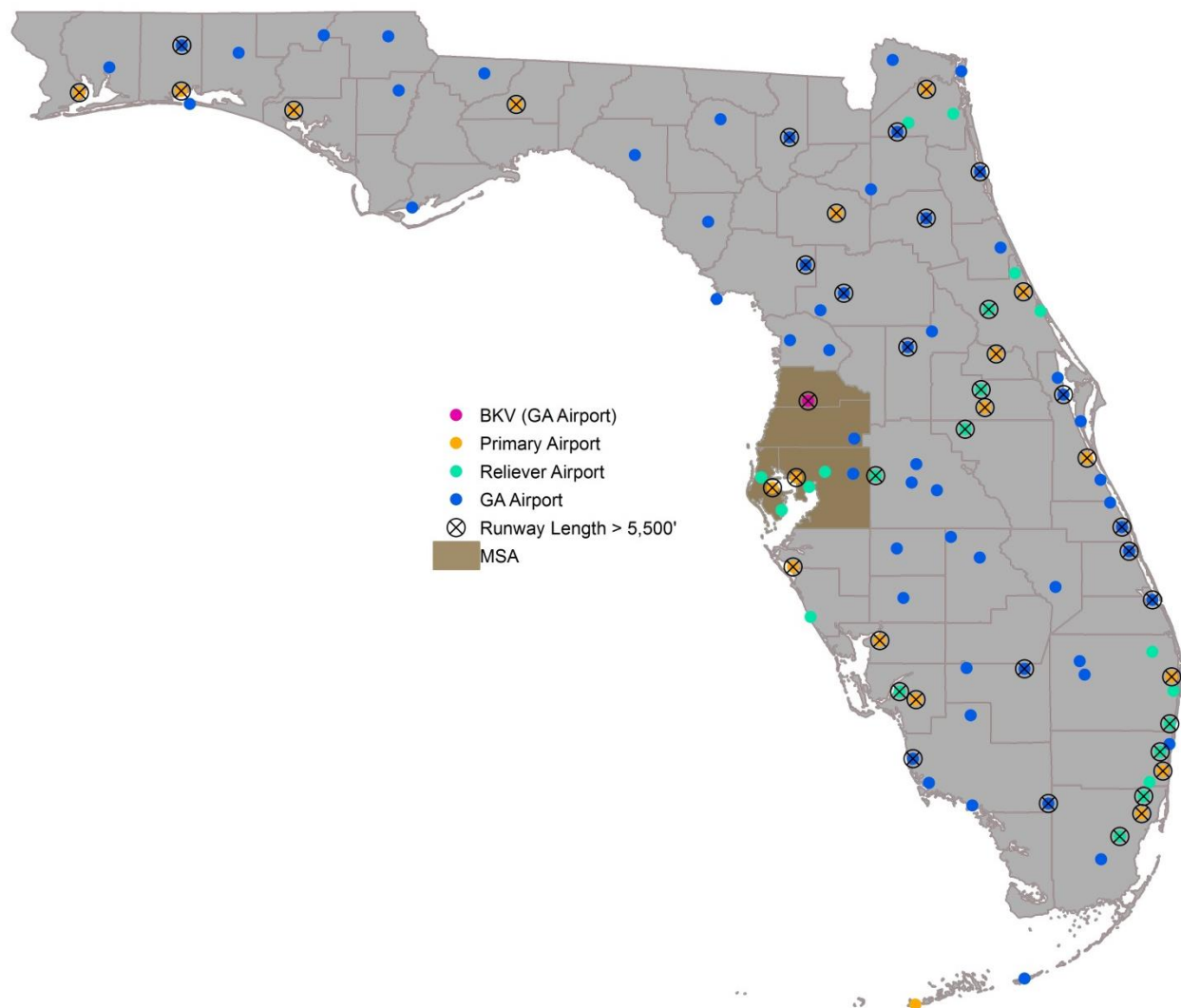
AAGR2 – Represents the average annual growth rate from 2013 to 2018.

Airport-Specific Factors

Much of the growth at BKV may also be attributed to airport-specific factors. Since the previous master plan was completed, a second Fixed Base Operator (FBO) facility and an ATCT was constructed, and several industrial/commercial properties were also constructed on the airport property. The airport is also considering additional pursuits that may generate additional activity at BKV including a Maintenance, Repair, and Overhaul (MRO) facility that could accommodate narrow-body commercial jets (e.g., Boeing 737s) and a potential U.S. Customs and Border Protection (CBP) facility to provide clearance services for international arrivals. The county also plans to improve access to developable portions of the airport property by constructing new roads and infrastructure. The airport is also well-maintained and has been recognized by FDOT as General Aviation Airport of the Year three separate times. Subsequently, the airport is viewed as a key economic asset within Hernando County and there has been and continues to be a strong investment in the facility to make it attractive for growth opportunities.

Figure 3-2 also illustrates the airports in Florida that are part of the FAA's National Plan of Integrated Airport Systems (NPIAS), which includes airports that are critical to the nation's aviation system and are therefore eligible to receive Airport Improvement Program (AIP) grants. As shown, the three counties that border Hernando County (Pasco to the south, Citrus to the north, and Sumter to the east) do not have runways with lengths greater than 5,500 feet, which is often viewed as a minimum requirement for regular jet activity. The three NPIAS airports in those surrounding counties also do not have ILS approaches or ATCTs. Consequently, BKV already has the facilities and services available to continue to attract corporate aviation activity within the area.

Figure 3-2
NPIAS Airports in Florida



Source: Michael Baker Jr., Inc., 2014.

FAA Next Generation Air Transportation System (NextGen)

According to the FAA's June 2013 NextGen Implementation Plan, NextGen includes a series of improvements to the national aviation system that are intended to make air travel more safe, convenient, and dependable. By investing in new technologies and replacing aging systems, NextGen initiatives are focused on improving schedule predictability, reducing environmental impacts, flying more direct routes, limiting ground holding, better circumventing poor weather, providing better approaches and access to airports, and improving safety for accident avoidance. The FAA's investment in NextGen initiatives should help to improve access and approach capability for airports around the U.S. At GA airports such as BKV, the benefits of NextGen technologies are becoming more and more apparent with the rollout of Localizer Performance with Vertical Guidance (LPV) approaches that provide horizontal and vertical course guidance to aircraft via Global Positioning System (GPS). Through the recommendations of this MPU and the FAA's ongoing

NextGen initiatives, it is anticipated that BKV will continue to become more accessible for corporate aircraft traffic and instrument activity.

3.5 Annual Operations Forecast

In order to illustrate a range of growth scenarios during the 20-year planning period of a master plan, the FAA recommends the consideration of several operations forecasting methods. The FAA report, *Forecasting Aviation Activity by Airport*, suggests forecasting methods that include regression analysis, review of historical trends and growth rates, Operations Per Based Aircraft (OPBA), and others. Often times, forecasting methods that utilize regression or other statistical analyses require several years of historical activity records in order to determine if a reliable correlation between past activity and other variables can be determined. Because only one full year of ATCT records were available at the time of this writing, it was not possible to analyze such statistical trends for BKV. For that reason, the operations forecasting effort included an evaluation of several growth rates for national, state, and local factors. Descriptions of the operations forecasting methods that were considered for BKV are provided below and the resulting forecasts are shown in **Table 3-4** and **Figure 3-3**.

- ➔ **FAA Terminal Area Forecast (TAF)** – The 2013 TAF indicates that total operations at BKV will increase at an AAGR of 2.27 percent between 2013 and 2033. The 2.27 percent AAGR was utilized to calculate the TAF forecast for BKV (i.e., beginning with the 2013 baseline value, each forecast year was increased by 2.27 percent over the previous year). Of the forecasting methods that were evaluated, the TAF has the second highest AAGR.
- ➔ **FAA Aerospace Forecast** – The FAA also produces annual forecasts of nationwide aviation activity which are presented in the FAA Aerospace Forecast document. The most recent edition covers a forecast period between 2013 and 2033. For total general aviation hours flown during the forecast period, the FAA forecasts an AAGR of 1.50 percent. The 1.50 percent AAGR was applied to determine the FAA Aerospace Forecast for BKV.
- ➔ **FAA TFMSC Forecast** – The FAA’s TFMSC database includes records of historical flight plan activity for BKV that date back to 2000. Between 2000 and 2013, flight plan activity increased at an AAGR of 3.23 percent. Although that AAGR is higher than any of the others mentioned in this section, it represents one of the few historical activity records where several years of data were available and was therefore used to forecast total activity for BKV. It is recognized that flight plan activity typically is associated with itinerant IFR operations, but the growth rate was utilized for all activity in order to evaluate a potential higher growth scenario.
- ➔ **FDOT GA Operations Forecast** – The FDOT Aviation and Spaceports Office also produces a forecast for public airports in Florida. In the most recent forecast, FDOT projects operations to increase at an AAGR of 1.35 percent between 2013 and 2032. The FDOT forecast utilized more accurate baseline numbers for 2013 than the Continuing Florida Aviation System Planning Process (CFASPP) forecast, which forecasted activity between 2009 and 2029 and was developed prior to the construction of the ATCT. As such, the FDOT’s 1.35 AAGR was employed to forecast activity herein.
- ➔ **Population Forecast** – Prior to events such as the terrorist attacks that occurred on September 11, 2001, Hurricane Katrina in 2005, and the economic recession between 2007 and 2009, correlations between population and operations were commonly utilized to conduct aviation forecasts. In the years since 2009, the airport experienced strong growth in flight plan activity while Hernando County also experienced some minimal population growth.

Assuming that future growth in total operations will be consistent with the anticipated population growth, the population forecast utilized the 1.75 percent AAGR that was forecast for Hernando County between 2013 and 2018.

- ➔ **Average of Forecasting Methods** – The five forecasting methods above utilized different sources and techniques to develop forecasts for BKV which considered local, regional, and nationwide trends. Because overlapping factors may affect BKV's activity levels, the last forecasting method consists of an average of the five methods. The resulting forecast increases BKV's operations at an AAGR of 2.09 percent from 50,103 in 2013 to 75,731 by 2033.

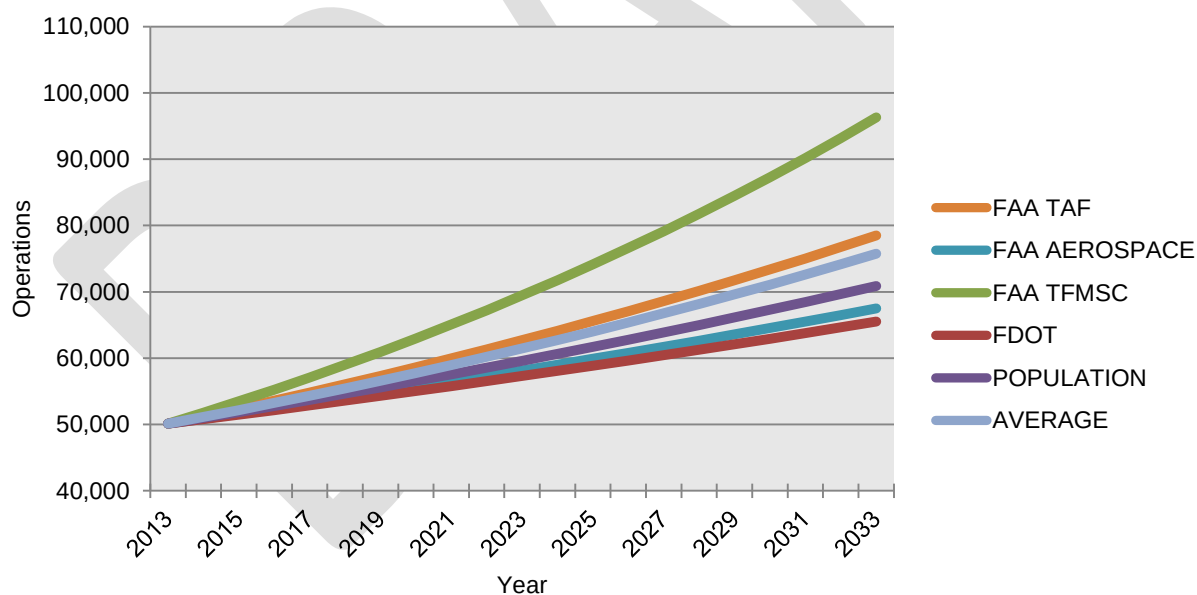
Table 3-4
BKV Operations Forecasting Methods

Year	FAA TAF	FAA Aerospace	FAA TFMSC	FDOT	Population	Average
2013	50,103	50,103	50,103	50,103	50,103	50,103
2018	56,054	53,975	58,991	53,577	54,643	55,448
2023	62,711	58,146	69,455	57,293	59,595	61,440
2028	70,159	62,640	81,776	61,266	64,995	68,167
2033	78,492	67,481	96,283	65,515	70,884	75,731
AAGR	2.27%	1.50%	3.32%	1.35%	1.75%	2.09%

Source: Michael Baker Jr., Inc., 2014.

AAGR – Represents the average annual growth rate from 2013 to 2033.

Figure 3-3
BKV Operations Forecasting Methods (2013-2033)



Source: Michael Baker Jr., Inc., 2014.

Recommended Forecast

Several forecasting methods were considered while determining the recommended forecast for BKV that utilized various growth rates from the FAA, FDOT, and other sources. Because there is no way of determining exactly what types of activity levels may occur at BKV in 2033, it was important to select a forecast that would allow the airport to plan for improvements if and when they are needed, but that represented a conservative scenario considering some of the declines in nationwide general aviation activity since the early 2000s. Therefore, the average of the five forecasting methods was selected which increases total operations by 2.09 percent from 50,103 operations in 2013 to 75,731 operations by 2033. Although the associated growth is slightly less than the TAF, it provides a balanced scenario that is still stronger than the population growth expectations for Hernando County, the FAA Aerospace Forecast for the entire U.S., and FDOT's forecast for BKV.

3.6 Itinerant and Local Operations

Table 3-5 presents the itinerant and local operations forecast for both civilian and military activity during the planning period. Military activity was held steady in the forecast years due to the sensitive nature associated with future military plans and also because of recent announcements by the federal government regarding defense spending cuts. A slight increase in the ratio of itinerant operations to total operations was forecast, increasing the share of itinerant operations from 47.52 percent in 2013 to 51.47 percent by 2033, which is consistent with the growth projected in the 2013 TAF for BKV and anticipated trends at towered airports (as determined from the FAA Aerospace Forecast Fiscal Years 2013-2033).

Table 3-5									
Itinerant and Local Operations Forecast (2013-2033)									
Operations									
Year	Itinerant (IT) Operations				Local (LOC) Operations				Total Operations
	Civilian	Military	Total	IT %	Civilian	Military	Total	LOC %	
2013	22,073	1,735	23,808	47.52%	20,136	6,159	26,295	52.48%	50,103
2018	25,144	1,735	26,879	48.48%	22,410	6,159	28,569	51.52%	55,448
2023	28,650	1,735	30,384	49.45%	24,897	6,159	31,056	50.55%	61,440
2028	32,656	1,735	34,391	50.45%	27,618	6,159	33,777	49.55%	68,167
2033	37,242	1,735	38,977	51.47%	30,596	6,159	36,754	48.53%	75,731
AAGR	2.65%	0.00%	2.50%	0.40%	2.11%	0.00%	1.69%	-0.39%	2.09%
Source: Michael Baker Jr., Inc., 2014.									
Note: Totals may not add correctly due to rounding.									
AAGR – Represents the average annual growth rate from 2013 to 2033.									

3.7 Operations by Aircraft Type Forecast (Fleet Mix Forecast)

Airfield design standards are determined based on the most demanding aircraft that regularly operates at the airport, which is referred to as the critical or design aircraft. The FAA defines regular activity as at least 500 annual operations. As shown in **Table 3-6**, with 1,412 jet operations in 2013, it is likely that jets are the most demanding type of aircraft that regularly operate at BKV; however, larger Lockheed C-130 turboprops that are flown by the military may also contribute to the design requirements for the airport. The forecast of operations by aircraft type was conducted as follows:

- ➔ **Single-Engine Pistons** – The forecast of single-engine piston operations consisted of the remainder of total operations after the forecasts below were calculated.

- ➔ **Multi-Engine Pistons** – The percentage of multi-engine piston operations to total operations (7.41 percent) was held stable throughout the planning period.
- ➔ **Turboprops** – Turboprop operations were forecast to increase at an AAGR of 2.10 percent during the planning period, which represents the FAA Aerospace Forecast Fiscal years 2013-2033 projected growth rate for GA turboprop hours flown between 2012 and 2033.
- ➔ **Jets (General Aviation)** – Jet operations were forecast to increase at an AAGR of 4.30 percent during the planning period, which represents the FAA Aerospace Forecast Fiscal years 2013-2033 projected growth rate for GA jet hours flown between 2012 and 2033. The stronger growth rate for jet operations was selected because of the FAA’s growth expectations for based jets at BKV as well as the strong growth in based jets that has occurred at BKV.
- ➔ **Jets (Commercial)** – As explained within the critical aircraft forecast (following section), the airport has recently entered into a confidential agreement with a cargo operator to investigate the feasibility of establishing an air cargo operation at BKV in the future. Therefore, in order to adequately plan for that potential, it was assumed that 500 commercial-sized jets (e.g., Boeing 757 or 767) would operate at the airport by 2018 and a small increase in operations would occur in each year of the forecast period.
- ➔ **Helicopters** – The percentage of helicopter operations to total operations (3.26 percent) was held stable throughout the planning period.

**Table 3-6
Operations by Aircraft Type Forecast (Fleet Mix Forecast) (2013-2033)**

Year	Total Operations	SEP	MEP	Turboprop	Jet (GA)	Jet (Commercial)	Helicopter
2013	50,103	37,871	3,607	2,404	1,412	0	4,809
2018	55,448	41,255	3,978	2,668	1,743	500	5,304
2023	61,440	45,556	4,392	2,960	2,151	526	5,856
2028	68,167	50,353	4,853	3,284	2,655	552	6,470
2033	75,731	55,707	5,367	3,644	3,277	580	7,156
AAGR	2.09%	1.95%	2.01%	2.10%	4.30%	N/A	2.01%

Source: Michael Baker Jr., Inc., 2014.

Note: Totals may not add correctly due to rounding.

AAGR – Represents the average annual growth rate from 2013 to 2033.

SEP – Single-Engine Piston MEP – Multi-Engine Piston

3.8 Critical Aircraft Forecast

According to FAA Order 5100.38C, Airport Improvement Program Handbook, “a critical design aircraft is that airplane using (or is highly likely to use) the airport on a regular basis. A regular basis is at least 500 annual itinerant operations.” At this time, the most demanding aircraft types that conduct at least 500 annual itinerant operations at BKV consist of medium-sized corporate jets (e.g., Citations, Learjets, and Hawkers). The airport also receives occasional operations by larger corporate jets (e.g., Gulfstreams and Challengers) and is considering providing U.S. Customs and Border Patrol (CBP) services in order to attract additional corporate aviation and international business opportunities. Furthermore, according to Airport Traffic Control Tower (ATCT) personnel, the airport also received approximately 200 operations by Lockheed C-130 Hercules turboprops in 2013. ATCT personnel indicated that the U.S. Coast Guard conducts C-130 training exercises as often as twice a month, the U.S. Air Force conducts C-130 parachute training operations at BKV approximately once a quarter, and the U.S. Army also conducts C-130 operations at BKV. Since the previous master plan, a new tenant that develops specialized C-130 technologies, Airdyne Aerospace,

Inc., also moved into a facility at BKV. Therefore, the airport has several current and potential opportunities for continued growth in C-130 operations during the planning period.

The previous two master plans and the CFASPP also identified the potential for future air cargo growth at BKV using larger commercial aircraft. The airport recently designed a customizable shell for an Aviation Services Facility (ASF) that can accommodate commercial aircraft such as the Boeing 737-800 and the Airbus A320. The ASF may be utilized as a facility for Maintenance, Repair, and Overhaul (MRO) activities, cargo processing, based aircraft storage, or any other aviation-related function. Consequently, after the ASF is constructed, it is anticipated that larger commercial aircraft may operate at BKV.

The previous master plan identified a Runway Design Code (RDC) of D-IV for Runway 9-27 and an RDC of B-II for Runway 3-21, which is determined based on the Aircraft Approach Category (AAC – approach speed) and Airplane Design Group (ADG – wingspan) of the critical aircraft (refer to **Table 3-7**). Of the 1,412 jet operations that occurred in 2013 at BKV, 953 were conducted by jets with approach speeds of 121 knots or more (i.e., C and greater approach speeds). Therefore, the existing RDC for Runway 9-27 was determined based on a combination of the following critical aircraft:

- ➔ **Bombardier Challenger 600 Corporate Jet** – This RDC C-II jet frequently operates at BKV and was used to determine the AAC for Runway 9-27 (i.e., C or D).
- ➔ **Lockheed C-130 Hercules** – This RDC C-IV military turboprop also frequently operates at BKV and was used to determine the ADG for Runway 9-27 (i.e., IV). Although only 200 C-130 operations occurred at BKV in 2013, this military aircraft has historically been identified as the critical aircraft for Runway 9-27 and there may be a potential for increased activity during the planning period.

It is assumed that the future RDC for Runway 9-27 will also be C-IV or D-IV as larger commercial jets are expected to utilize the proposed ASF at BKV. The airport has also recently entered into a confidential agreement with a cargo operator to investigate the feasibility of establishing an air cargo operation at BKV in the future. Discussions are in the initial stages and the interested party envisions establishing a distribution center in support of Boeing 757 and 767 operations. In the next two to three years the proposed development could result in approximately 500 commercial aircraft operations annually.

The critical aircraft forecasts are presented in **Table 3-8**. As shown, the existing and forecast critical aircraft for Runway 9-27 consisted of a combination of several aircraft to produce an RDC of C/D-IV. A minimal growth rate of one percent was applied to the C-130 operations and future commercial jet operations (following the construction of the ASF or opening of a cargo facility in the 2018 timeframe) to allow the airport to continue to plan for that type of activity during the planning period. The RDC for Runway 3-21 was determined based on the next less demanding class of aircraft that regularly operates at BKV, which consists of smaller business jets and corporate turboprops that have an ARC of B-II. The features of these critical aircraft and associated RDCs are evaluated later in this report to determine long-term facility requirements for BKV.

**Table 3-7
Runway Design Code (RDC)**

Aircraft Approach Category (AAC)		Airplane Design Group (ADG)	
Category	Approach Speed (Knots)	Group	Wingspan (Feet)
A	<91	I	<49
B (3-21)	91 to <121	II (3-21)	49 to <79
C (9-27)	121 to <141	III	79 to <118
D (9-27)	141 to <166	IV (9-27)	118 to <171
E	>166	V	171 to <214
		VI	214 to <262

Source: Michael Baker Jr., Inc., 2014.

**Table 3-8
Critical Aircraft Forecast**

Runway	Runway 9-27			Runway 3-21	
Aircraft Type	Business Jet	C-130	Commercial Jet	Business Jet	Turboprop
RDC	C-I to C-III	C-IV	C-III to C-IV	B-I to B-II	B-I to B-II
Sample Aircraft	Challenger 600	C-130	Boeing 757	Lear 35	King Air 350
Year	Critical Aircraft Operations			Critical Aircraft Operations	
2013	953	200	0	459	2,204
2018	1,176	221	500	567	2,447
2023	1,452	244	526	699	2,716
2028	1,792	269	552	863	3,015
2033	2,212	297	580	1,065	3,346
AAGR	4.30%	2.00%	N/A	4.30%	2.11%

Source: Michael Baker Jr., Inc., 2014.

AAGR – Represents the average annual growth rate from 2013 to 2033.

RDC – Runway Design Code

3.9 Instrument Operations Forecast

According to the FAA report, Forecasting Aviation Activity by Airport, instrument operations consist of “arrivals, departures, and overflights conducted by an FAA approach control facility for aircraft with an Instrument Flight Rule (IFR) flight plan or special Visual Flight Rule (VFR) procedures.” At BKV, IFR operations generally consist of approaches and departures by aircraft filing flight plans with the FAA, which included a total of 5,026 operations in 2013 or 10.03 percent of all operations, which was obtained from the FAA’s TFMSC database. For this forecasting effort, it was assumed that the percentage of IFR operations to total operations would increase at 0.70 percent per year in accordance with the FAA’s forecast of IFR GA aircraft at en route traffic control centers from the FAA Aerospace Forecast Fiscal Years 2013-2033. As shown in **Table 3-9**, this forecast results in instrument operations increasing from 5,026 operations in 2013 to 8,734 operations by 2033. It is anticipated that this forecast is consistent with the FAA’s ongoing NextGEN improvements that are being conducted to improve access to airports and efficiency within the nation’s airspace system.

Table 3-9
Instrument Operations Forecast (2013-2033)

Year	Total Operations	Instrument Operations	Instrument %
2013	50,103	5,026	10.03%
2018	55,448	5,760	10.39%
2023	61,440	6,609	10.76%
2028	68,167	7,592	11.14%
2033	75,731	8,734	11.53%
AAGR	2.09%	2.80%	0.70%

Source: Michael Baker Jr., Inc., 2014.

Note: Totals may not add correctly due to rounding.

AAGR – Represents the average annual growth rate from 2013 to 2033.

3.10 Peak Operations Forecast

Peak activity was calculated for the Average Peak Month (APM), Average Day Peak Month (ADPM), Average Day Peak Hour (ADPH), itinerant peak hour, and local peak hour. Peaking forecasts are conducted so that airports can plan for times when the highest concentration of activity occurs. **Table 3-10** presents the forecast of peaking activity for BKV and the methodology for each component of the peaking forecast is detailed below. These forecasts are typically used to determine apron area requirements and terminal sizing requirements. The demand for passenger services and potential peak hour passengers is presented in the following chapter.

- ➔ **Average Peak Month (APM)** – In 2013, FAA TFMSC data indicates that April was the peak month for instrument activity with 344 operations, which equated to 10.51 percent of annual instrument activity. That percentage was applied to calculate the APM throughout the planning period.
- ➔ **Average Day Peak Month (ADPM)** – An average month contains 30.42 days ($365 \div 12$). The ADPM was calculated by dividing the APM by 30.42.
- ➔ **Average Day Peak Hour (ADPH)** – When both itinerant and local operations occur simultaneously at BKV, the ADPH can represent a large portion of the ADPM. Although the exact ADPH value is difficult to quantify, it is estimated that peak hour activity may equate to 15 percent of ADPM activity at BKV.
- ➔ **Itinerant Peak Hour** – Itinerant peak hour operations were calculated according to the year-to-year share of itinerant activity from Table 3-5.
- ➔ **Local Peak Hour** – Local peak hour operations were calculated according to the year-to-year share of local activity from Table 3-5.

Table 3-10
Peak Operations Forecast (2013-2033)

Year	Total Operations	APM	ADPM	ADPH	Itinerant	Local
2013	50,103	5,266	173	26	12	14
2018	55,448	5,828	192	29	14	15
2023	61,440	6,457	212	32	16	16
2028	68,167	7,164	236	35	18	18
2033	75,731	7,959	262	39	20	19
AAGR	2.09%	2.09%	2.09%	2.09%	2.50%	1.69%

Source: Michael Baker Jr., Inc., 2014.

Note: Totals may not add correctly due to rounding.

AAGR – Represents the average annual growth rate from 2013 to 2033.

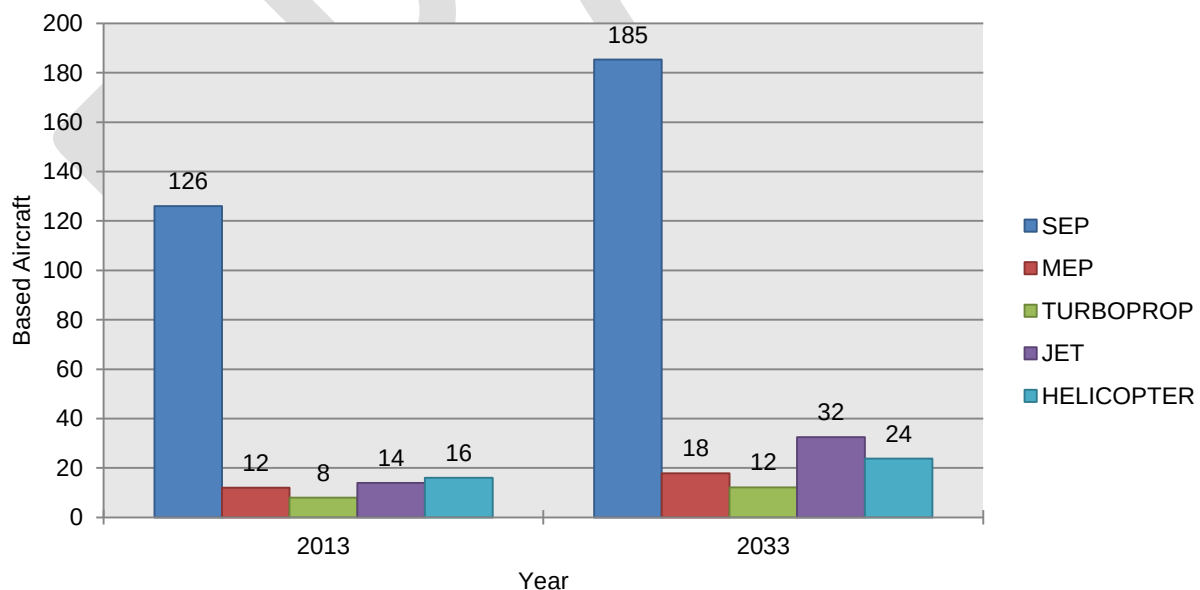
3.11 Based Aircraft Forecast

As shown in **Table 3-11** and **Figure 3-4**, the forecast of based aircraft by type employed the annual growth rates that were calculated for operations by aircraft type (refer to Table 3-6). This produced consistent growth scenarios for both operations and based aircraft, with the strongest growth anticipated for jets to be consistent with the FAA's projection in the 2013 TAF and the strong growth in based jets that has occurred in recent years at BKV. The forecast increases the number of based jets by 18 from 14 in 2013 to 32 by 2033. The number of total based aircraft is forecast to increase by 96 from 176 in 2013 to 272 by 2033. Single-engine pistons are expected to continue to comprise the majority of BKV's fleet mix throughout the planning period. It is noted that the airport currently has a waiting list for T-hangar storage, which is typically the preferred storage method for piston aircraft.

Year	Total Based Aircraft	SEP	MEP	Turboprop	Jet	Helicopter
2013	176	126	12	8	14	16
2018	196	139	13	9	17	18
2023	218	153	15	10	21	20
2028	243	168	16	11	26	22
2033	272	185	18	12	32	24
AAGR	2.19%	1.95%	2.01%	2.10%	4.30%	2.01%

Source: Michael Baker Jr., Inc., 2014.
 Note: Totals may not add correctly due to rounding.
 AAGR – Represents the average annual growth rate from 2013 to 2033.

**Figure 3-4
Based Aircraft Forecast (2013-2033)**



Source: Michael Baker Jr., Inc., 2014

3.12 Summary

Table 3-12 presents a summary of the forecasts for BKV. According to the FAA's June 2008 Review and Approval of Aviation Forecasts guidance, total operations and based aircraft forecasts are considered consistent with the TAF if they differ by less than 10 percent in the five-year forecast period and 15 percent in the 10-year forecast period. Both the total operations and based aircraft forecasts remain within those thresholds (as shown in red); although the operations forecast is lower than the 2013 TAF for BKV, the values calculated herein utilized actual baseline numbers and considered a wide variety of growth scenarios. Overall, the forecasts were developed in order to allow the airport to plan for facility improvements that are typical of an airport such as BKV, if and when they may be needed in the future.

Table 3-12 Airport Planning Forecasts Forecast Levels and Growth Rates											
Brooksville-Tampa Bay Regional Airport											
Base Year: 2013											
							Average Annual Compound Growth Rates				
	Base Yr. Level	Base Yr. + 1 Yr.	Base Yr. + 5 Yrs.	Base Yr. + 10 Yrs.	Base Yr. + 15 Yrs.	Base Yr. + 20 Yrs.	Base Yr. + 1 Yr.	Base Yr. + 5 Yrs.	Base Yr. + 10 Yrs.	Base Yr. + 15 Yrs.	Base Yr. + 20 Yrs.
	2013	2014	2018	2023	2028	2033	2014	2018	2023	2028	2033
Itinerant and Local Operations											
Itinerant (IT) Civilian	22,073	22,656	25,144	28,650	32,656	37,242	2.64%	2.64%	2.64%	2.65%	2.65%
IT Military	1,735	1,735	1,735	1,735	1,735	1,735	0.00%	0.00%	0.00%	0.00%	0.00%
IT Total	23,808	24,390	26,879	30,384	34,391	38,977	2.45%	2.46%	2.47%	2.48%	2.50%
IT %	47.52%	47.71%	48.48%	49.45%	50.45%	51.47%	0.40%	0.40%	0.40%	0.40%	0.40%
Local (LOC) Civilian	20,136	20,575	22,410	24,897	27,618	30,596	2.18%	2.16%	2.14%	2.13%	2.11%
LOC Military	6,159	6,159	6,159	6,159	6,159	6,159	0.00%	0.00%	0.00%	0.00%	0.00%
LOC Total	26,295	26,734	28,569	31,056	33,777	36,754	1.67%	1.67%	1.68%	1.68%	1.69%
LOC %	52.48%	52.29%	51.52%	50.55%	49.55%	48.53%	-0.36%	-0.37%	-0.38%	-0.38%	-0.39%
Total Operations	50,103	51,124	55,448	61,440	68,167	75,731	2.04%	2.05%	2.06%	2.07%	2.09%
TAF Comparison	0.00%	-0.23%	-1.08%	-2.03%	-2.84%	-3.52%					
Operations by Aircraft Type (Fleet Mix)											
SEP	37,871	38,615	41,255	45,556	50,353	55,707	1.96%	1.73%	1.86%	1.92%	1.95%
MEP	3,607	3,678	3,978	4,392	4,853	5,367	1.97%	1.98%	1.99%	2.00%	2.01%
Turboprop	2,404	2,455	2,668	2,960	3,284	3,644	2.10%	2.10%	2.10%	2.10%	2.10%
Jet (GA)	1,412	1,473	1,743	2,151	2,655	3,277	4.30%	4.30%	4.30%	4.30%	4.30%
Jet (Commercial)	0	0	500	526	552	580	N/A	N/A	N/A	N/A	N/A
Helicopter	4,809	4,904	5,304	5,856	6,470	7,156	1.97%	1.98%	1.99%	2.00%	2.01%
Instrument Operations											
Instrument Operations	5,026	5,164	5,760	6,609	7,592	8,734	2.75%	2.76%	2.78%	2.79%	2.80%
Peak Operations											
Average Peak Month (APM)	5,266	5,373	5,828	6,457	7,164	7,959	2.04%	2.05%	2.06%	2.07%	2.09%
Average Day Peak Month (ADPM)	173	177	192	212	236	262	2.04%	2.05%	2.06%	2.07%	2.09%
Average Day Peak Hour (ADPH)	26	26	29	32	35	39	2.04%	2.05%	2.06%	2.07%	2.09%
IT Peak Hour	12	13	14	16	18	20	2.45%	2.46%	2.47%	2.48%	2.50%
LOC Peak Hour	14	14	15	16	18	19	1.67%	1.67%	1.68%	1.68%	1.69%
Based Aircraft											
SEP	126	128	139	153	168	185	1.95%	1.95%	1.95%	1.95%	1.95%
MEP	12	12	13	15	16	18	2.01%	2.01%	2.01%	2.01%	2.01%
Turboprop	8	8	9	10	11	12	2.10%	2.10%	2.10%	2.10%	2.10%
Jet	14	15	17	21	26	32	4.30%	4.30%	4.30%	4.30%	4.30%
Helicopter	16	16	18	20	22	24	2.01%	2.01%	2.01%	2.01%	2.01%
Total Based Aircraft	176	180	196	218	243	272	2.15%	2.16%	2.17%	2.18%	2.19%
TAF Comparison	0.00%	0.66%	3.39%	7.01%	10.89%	15.04%					
Operational Factors											
Ops per Based Aircraft	285	284	283	282	280	279	-0.11%	-0.11%	-0.11%	-0.11%	-0.10%
Local Ops per Based Aircraft	149	149	146	142	139	135	-0.47%	-0.48%	-0.48%	-0.49%	-0.49%
Source: Michael Baker Jr., Inc., 2014. Note: Totals may not add correctly due to rounding. SEP – Single-Engine Piston MEP – Multi-Engine Piston											

Chapter 4.0

Facility

Requirements



BROOKSVILLE - TAMPA BAY REGIONAL AIRPORT
& TECHNOLOGY CENTER



Michael Baker
INTERNATIONAL

4.0 FACILITY REQUIREMENTS

4.1 Introduction

The facility requirements evaluation compares the current airfield and landside components of the Brooksville-Tampa Bay Regional Airport (BKV) to Federal Aviation Administration (FAA) planning guidelines and the FAA-approved forecasts of aviation demand. The goal is to identify improvements that will be needed over the course of the 20-year planning period. Later in this Master Plan Update (MPU), a recommended course of action is presented that attempts to satisfy the identified facility requirements in the most efficient manner possible. An analysis of the following airport components is presented herein:

- ➔ Airfield Capacity and Configuration
- ➔ Design Aircraft Identification
- ➔ Runway Length Analysis
- ➔ Runway Strength Analysis
- ➔ Instrument Approaches
- ➔ Airfield Design Standards
- ➔ Airfield Lighting, Markings and Signage, and Navigational Aids
- ➔ Transient Apron and Based Aircraft Storage
- ➔ Airport Support Facilities
- ➔ Land Use Considerations
- ➔ Airport Security Analysis

4.2 Airfield Capacity and Configuration

The FAA defines airport capacity as an estimate of aircraft that can be processed through the airfield system during a specific period with acceptable levels of delay. This section evaluates whether the existing airfield configuration of BKV is capable of accommodating forecast levels of demand during the planning period. This analysis only evaluates the airfield capacity for Runway 9-27 because the FAA does not participate in funding for Runway 3-21 at this time. Runway 3-21 is not currently needed for airfield capacity or wind coverage purposes, but it does serve an important role at BKV by allowing for a separation of traffic (i.e., training vs. itinerant activity) and also allows the airport to remain operational when Runway 9-27 is closed for maintenance; it is noted, however, that the FAA does participate in funding for parallel Taxiway B that runs along the eastern side of Runway 3-21 because the taxiway provides access to many of the airport's landside facilities in that area. Estimates of airfield capacity were developed in accordance with the methods presented in FAA AC 150/5060-5, *Airport Capacity and Delay (Capacity AC)*. This methodology does not account for every possible situation at an airport, but rather the most common situations observed at U.S. airports when the *Capacity AC* was adopted. The *Capacity AC* provides a methodology for determining the hourly capacity, Annual Service Volume (ASV), and average expected delays of the airfield system, which are defined below. Each of these factors was calculated for existing conditions and for key years during the 20-year planning period at BKV. The results are used for planning purposes to determine if airfield improvements are needed to combat unacceptable levels of delay.

- ➔ **Hourly Airfield Capacity** – An airport’s hourly airfield capacity represents the maximum number of aircraft that can be accommodated under conditions of continuous demand during a one-hour period. Using peak hour forecasts, the hourly airfield capacity is determined for both Visual Flight Rule (VFR) and Instrument Flight Rule (IFR) activity.
- ➔ **Annual Service Volume (ASV)** – The ASV estimates the annual number of operations that the airfield configuration should be capable of handling with minimal delays. The ASV accounts for peaking characteristics in its calculation of 12-month demand as well as periods of low-volume activity.
- ➔ **Delay** – The average anticipated delay is based on a ratio of forecast demand to the calculated ASV. According to the *Capacity AC*, “as demand approaches capacity, individual aircraft delay is increased. Successive hourly demands exceeding the hourly capacity result in unacceptable delays.”

FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS Order)*, states that Chapter 2 of the *Capacity AC* (Capacity and Delay Calculations for Long-Range Planning) should be used for most airports, particularly where capacity is not a constraining factor. Depending upon the aircraft fleet mix and activity levels, a typical single-runway can safely accommodate up to 250,000 annual operations without incurring substantial delay. Because of the single-runway configuration of BKV and the moderate levels of existing and forecast activity, the long-range method of determining airfield capacity and delay was employed while considering the following assumptions during the 20-year planning period:

- ➔ The number of arrivals and departures are generally equal.
- ➔ There is a full-length parallel taxiway available along Runway 9-27.
- ➔ Airfield capacity calculations are maximized when there are four exit taxiways provided for arrivals on both runway ends.
- ➔ BKV will remain a general aviation airport throughout the 20-year planning period, although some non-passenger commercial activity may occur at some point in the future (e.g., cargo or maintenance).

Several airport characteristics must be considered as part the airfield capacity analysis including runway and taxiway configuration, aircraft fleet mix, runway utilization and instrumentation, weather conditions, and potential airspace constraints, many of which were previously documented as part of the inventory. Based on a review of each of these characteristics, Runway 9-27 would only need one additional exit taxiway in order for the runway to be able to accommodate its theoretical ASV of approximately 230,000 operations, hourly VFR capacity of 98 operations, and hourly IFR capacity of 59 operations. The additional exit taxiway should be located between the western end of the runway (Runway 9 end) and exit Taxiway A6. According to Table 4-9 in FAA AC 150/5300-13, *Airport Design*, an exit taxiway in that vicinity would provide accommodate the exit demands for all small twin aircraft during wet runway conditions (when landing on Runway 27) and for the majority of turboprop and jet operations at BKV during dry runway conditions. Furthermore, the *NPIAS Order* states that holding aprons or bypass taxiways should be considered at the runway ends if the runway experiences 20,000 itinerant operations or 30 peak hour operations. Because the airport currently experiences more than 20,000 itinerant operations, the provision of holding aprons or bypass taxiways at the runway ends should be considered as a component of this planning effort. **Table 4-1** presents a comparison of the theoretical ACV and hourly airfield capacity values to the forecasts of aviation demand for BKV. The average delay per operation was found to be negligible for aircraft throughout the planning period (i.e., just a few seconds of delay per operation).

**Table 4-1
Forecast Airfield Capacity Levels for Runway 9-27**

Capacity	ASV = 230,000		IFR Peak Hour = 59		VFR Peak Hour = 98	
Year	Annual Operations	Capacity Level	IFR Peak Hour	Capacity Level	VFR Peak Hour	Capacity Level
2013	50,103	21.78%	12	20.34%	14	14.29%
2014 F	51,124	22.23%	13	22.03%	14	14.29%
2018 F	55,448	24.11%	14	23.73%	15	15.31%
2023 F	61,440	26.71%	16	27.12%	16	16.33%
2028 F	68,167	29.64%	18	30.51%	18	18.37%
2033 F	75,731	32.93%	20	33.90%	19	19.39%

Source: Michael Baker Jr., Inc., 2014.

4.3 Design Aircraft Identification

As described in the previous chapter, the critical or design aircraft is that airplane using (or highly likely to use) the airport on a regular basis, which is defined as at least 500 annual operations. The design aircraft is used to identify the requirements for various airfield facilities such as Runway Safety Area (RSA) width and length beyond a runway end, runway width, and separations to parallel taxiways and aircraft parking areas. Each runway at BKV has a different design aircraft: the design aircraft for Runway 9-27 is a combination of aircraft that produce a Runway Design Code (RDC) of C-IV and the design aircraft for Runway 3-21 is also a combination of small turboprops and small business jets that produce an RDC of B-II. The characteristics of those aircraft are used throughout the remainder of this chapter to evaluate the airfield facility requirements for BKV.

It is also important to identify the Taxiway Design Group (TDG) for the various taxiways and taxilanes at BKV. The selection of a TDG is based on the undercarriage dimensions of the largest aircraft that operates on each respective taxiway or taxilane. Most of the taxiways that run parallel to Runway 9-27 are designed to accommodate large aircraft such as Lockheed C-130 Hercules, corporate jets, and even commercial-sized jets. As mentioned in the forecast chapter, the airport is in discussions with an interested party that is considering establishing a distribution center at BKV and utilizing Boeing 757 and 767 aircraft. Those aircraft fall into the TDG 5 category that requires 75foot wide taxiways. Therefore, TDG 5 was used herein to evaluate the taxiways parallel to Runway 9-27 and is consistent with previous planning efforts and ongoing improvements at the airport. The taxiways and taxilanes that run parallel to Runway 3-21 are mostly designed to accommodate aircraft with smaller wingspans that fall into the TDG 2 category (e.g., Beechcraft King Air 350).

4.4 Runway Length Analysis

Runway length requirements are determined in accordance with FAA AC 150/5325-4, *Runway Length Requirements for Airport Design (Runway Length AC)*. The *Runway Length AC* presents methodologies for determining runway length requirements by aircraft type, from small piston aircraft to large commercial jets. The variables that affect takeoff calculations include field elevation, average maximum temperature during the hottest month, runway conditions (e.g., wet runway), takeoff weight, and differences in runway end elevation. Landing calculations are affected by field elevation and runway conditions. The following variables were pertinent to the runway length analysis for BKV:

- ➔ Field Elevation – 75.7 Feet Above Mean Sea Level (AMSL)
- ➔ Average Maximum Temperature (Hottest Month) – 91° Fahrenheit (June, July, and August)

The runway length analysis was conducted for both Runways 9-27 and 3-21 at BKV. The length requirements for each runway differ based on the specific types of aircraft that regularly operate on them. The forecast chapter indicated that the Runway Design Code (RDC) for Runway 9-27 was determined based on a range of aircraft that include the Bombardier Challenger 600 corporate jet and the Lockheed C-130 Hercules turboprop, but also indicated that there is a potential for a commercial cargo operator to relocate to BKV and to utilize Boeing 757 and 767 jets. Therefore, it is important to consider the runway length requirements for all existing aircraft types that currently operate at BKV and for those that may operate there in the future.

Table 4-2 provides the results of the runway length analysis for Runway 9-27. As shown, the length requirements for corporate jets with Maximum Takeoff Weights (MTOWs) of more than 12,500 pounds and up to 60,000 pounds are determined in accordance with charts in the *Runway Length AC*. Based on the conditions at BKV, the corporate jet runway length requirements at BKV range from as low as 4,700 feet to as high as 8,500 feet. It is noted that due to the nature of the on-demand air ambulance and aircraft repair businesses that are based at BKV, they are flying to destinations throughout the world and may operate in the higher payload range. Also, the Challenger 600 is an aircraft that is part of the “100% of Fleet” category in the *Runway Length AC*. Those aircraft often need additional runway length because of their higher MTOW and/or individual performance characteristics. The U.S. Coast Guard and Air National Guard typically use BKV to conduct C-130 training activities. Although the aircraft is generally capable of conducting takeoffs and landings on short runways, the C-130 requires 5,850 feet for takeoffs at MTOW and 3,000 feet for landings at Maximum Landing Weight (MLW) (refer to the information in Table 4-2). The Boeing 757 and 767 takeoff and landing length requirements differ based upon engine model. A sample range of takeoff and landing length requirements for the Boeing 757 and 767 are provided in Table 4-2 for MTOW and MLW conditions; however, airport staff should consult with any potential operator to determine their specific operating requirements. For the purposes of this planning effort and to be consistent with previous planning efforts for BKV, the County has selected a preferred length of 8,000 feet for Runway 9-27 to be further evaluated as part of the alternatives analysis process.

The runway length requirements for Runway 3-21 were determined primarily for non-jet aircraft with MTOWs of more than 12,500 pounds. This includes aircraft like the Beechcraft King Air 350i turboprop that has an MTOW of 15,000 pounds. However, it is noted that the FAA does not provide funding participation for Runway 3-21 at this time, and as such, the County should reevaluate the actual utilization of the runway and actual runway length needs when they are considering investing in a future rehabilitation project. According to the *Runway Length AC*, aircraft like the King Air 350i require approximately 4,700 feet of runway length for takeoffs and landings (refer to Table 4-2). That runway length was viewed as the benchmark requirement for this planning effort.

Table 4-2 BKV Runway Length Analysis				
Aircraft Type	Takeoff Length	Landing Length	Conditions	Source
Runway 9-27				
Corporate Jets (75% Fleet @ 60% Useful Load)	4,700 Feet	5,405 Feet	75.7 Feet AMSL, 91° F	AC 150/5325-4B (Figure 3-1)
Corporate Jets (75% Fleet @ 90% Useful Load)	6,800 Feet	7,000 Feet	75.7 Feet AMSL, 91° F	AC 150/5325-4B (Figure 3-1)
Corporate Jets (100% Fleet @ 60% Useful Load)	5,400 Feet	5,500 Feet	75.7 Feet AMSL, 91° F	AC 150/5325-4B (Figure 3-2)
Corporate Jets (100% Fleet @ 90% Useful Load)	8,500 Feet	7,000 Feet	75.7 Feet AMSL, 91° F	AC 150/5325-4B (Figure 3-2)
Lockheed C-130 Hercules	5,850 Feet	3,000 Feet	Sea Level, 59° F, MTOW or MLW	Aircraft Specifications Book
Boeing 757-200 (RB211-535C Engines)	7,800 Feet	5,400 Feet (Wet)	75.7 Feet AMSL, 84° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 757-200 (RB211-535E4 Engines)	7,500 Feet	5,700 Feet (Wet)	75.7 Feet AMSL, 84° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 757-200 (RB211-535E4B Engines)	6,500 Feet	5,700 Feet (Wet)	75.7 Feet AMSL, 84° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 757-200 (PW2037 Engines)	10,000 Feet	5,900 Feet (Wet)	75.7 Feet AMSL, 84° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 757-200 (PW2040 Engines)	7,800 Feet	5,900 Feet (Wet)	75.7 Feet AMSL, 84° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 757-300 (RB211-535E4 Engines)	9,500 Feet	6,500 Feet (Wet)	75.7 Feet AMSL, 84° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 757-300 (RB211-535E4B Engines)	8,200 Feet	6,500 Feet (Wet)	75.7 Feet AMSL, 84° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 757-300 (PW2040 Engines)	10,500 Feet	6,800 Feet (Wet)	75.7 Feet AMSL, 87° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 757-300 (PW2043 Engines)	8,400 Feet	6,800 Feet (Wet)	75.7 Feet AMSL, 87° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 767-200 (JT9D-7R4D/7R4E Engines)	6,300 Feet	5,400 Feet (Wet, Flaps 30)	75.7 Feet AMSL, 90° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 767-200 (CF6-80C2B2 Engines)	6,200 Feet	5,400 Feet (Wet, Flaps 30)	75.7 Feet AMSL, 90° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 737-300 (CF6-80A/80A2 Engines)	9,200 Feet	5,700 Feet (Wet, Flaps 30)	75.7 Feet AMSL, 90° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 737-300 (JT9D-7R4D/7R4E Engines)	10,700 Feet	5,700 Feet (Wet, Flaps 30)	75.7 Feet AMSL, 86° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 737-300 (CF6-80C2B2 or PW4052 Engines)	8,110 Feet	5,700 Feet (Wet, Flaps 30)	75.7 Feet AMSL, 90° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 767-300 Freighter CF6-80C2B7F Engines)	9,200 Feet	6,400 Feet (Wet, Flaps 30)	75.7 Feet AMSL, 86° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Boeing 767-300 Freighter (PW4062 Engines)	8,400 Feet	6,400 Feet (Wet, Flaps 30)	75.7 Feet AMSL, 86° F, MTOW or MLW	Boeing (F.A.R. Requirements)
Runway 3-21				
Turboprop (MTOW > 12,500 Pounds)	4,700 Feet	4,700 Feet	75.7 Feet AMSL, 91° F (No Adjustment for Turbojet Factors)	AC 150/5325-4B (Figure 3-1)
Source: Michael Baker Jr., Inc., 2014.				

4.5 Runway Strength Analysis

The current weight bearing capacity of Runway 9-27 is listed as 90,000 pounds for aircraft with a single-wheel gear configuration and 130,000 pounds for aircraft with a dual-wheel configuration, and 230,000 pounds for aircraft with a dual-tandem wheel configuration. Therefore, the pavement strength of Runway 9-27 is sufficient to support operations from the critical aircraft listed in Table 4-5 without sustaining any damage.

Non-jet aircraft within RDC classifications of B-II or below generally have gross maximum weights of less than 25,000 pounds. Jet aircraft within this classification, however, typically exceed 25,000 pounds, such as the Gulfstream II which has a gross weight of 36,000 pounds. Therefore, the crosswind runway should have a weight bearing capacity exceeding these criteria. Runway 3-21 currently has a weight bearing capacity of 50,000 pounds for single wheel, 75,000 pounds dual wheel and 135,000 pounds for dual tandem wheel gear aircraft. Based upon anticipated aircraft use, these pavement strengths are deemed sufficient to accommodate demand throughout the 20-year planning period.

4.6 Instrument Approaches

Currently, Runway 9 is equipped with a Category I precision instrument approach, which consists of an Instrument Landing System (ILS) augmented by a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR). The ILS has an Outer Marker (OM) and a Middle Marker (MM). The published visibility minimum for the ILS is ½ mile with a Decision Height (DH) of 276 feet.

During the summer of 2014, the airport completed a refurbishment of the existing Precision Approach Path Indicator (PAPI-4) lighting system to improve the approach capability for all four runway ends. For the near future, the following projects are being considered at BKV to improve the approach capability of Runway 9-27: 1) replacement of the existing ILS approach to Runway 9, and 2) replacement of the existing MALSR to address regular outages experienced with the system.

It is perceivable that the existing non-precision approaches to Runways 27 and 21 may change sometime in the future. As a result, it becomes necessary to protect the Runway Protection Zones (RPZ) and approach surfaces now in order to avoid any potential incompatible land uses or obstructions within those surfaces in the future. As alternatives are considered for the extension of Runway 9, it will be important to ensure that the future RPZs are clear of buildings and obstructions.

All four runway ends, Runways 9, 27, 3 and 21, have published non-precision approaches that utilize Global Positioning Satellite (GPS) equipment. Based upon anticipated demand, it is recommended that potential non-precision instrument approach upgrades to Runway 27 and potential helicopter only GPS approach capability to Runway 3-21 be considered in conjunction with the evaluation of airport alternatives. **Tables 4-3** and **4-4** summarize the existing and ultimate instrument approach features for Runways 9-27 and 3-21, which are utilized to establish airfield design standards and the associated long-term requirements for BKV.

Table 4-3
Existing and Ultimate Instrument Approaches – Runway 9-27

Runway End / Approach Feature	Runway 9		Runway 27	
	Existing	Ultimate	Existing	Ultimate
Part 77 Approach Category	Precision	Same	Non-precision	Same
Part 77 Approach Slope	50:1	Same	34:1	Same
Instrument Approaches	GPS, ILS, LOC	Same	GPS	Same
Horizontal Minimums	½ Mile	½ Mile	1 Mile	Same
Approach Lighting	MALSR	Same	Threshold	Same
Visual Glide Slope Indicator	PAPI-4	Same	PAPI-4	Same
Runway Markings	Precision	Same	Non-precision	Same

Source: Michael Baker Jr., Inc., 2014.

Table 4-4
Existing and Ultimate Instrument Approaches – Runway 3-21

Runway End / Approach Feature	Runway 3		Runway 21	
	Existing	Ultimate	Existing	Ultimate
Part 77 Approach Category	Non-precision	Same	Non-precision	Same
Part 77 Approach Slope	34:1	Same	34:1	Same
Instrument Approaches	GPS	Same	GPS	Same
Horizontal Minimums	1 Mile	Same	1 Mile	Same
Approach Lighting	Threshold	Same	Threshold	Same
Visual Glide Slope Indicator	PAPI-4	Same	PAPI-4	Same
Runway Markings	Non-precision	Same	Non-precision	Same

Source: Michael Baker Jr., Inc., 2014.

4.7 Airfield Design Standards

The FAA defines the requirements for airfield design standards in AC 150/5300-13A, *Airport Design*. These include numerous safety area and separation standards that must be followed to ensure that aircraft have adequate wingtip-to-wingtip clearances, overrun protection, and obstruction-free movement areas. **Tables 4-5 and 4-6** summarize the airfield design standards for existing conditions at BKV, with non-standard or non-preferential conditions identified in **red** and discussed below. Although many of the airfield design standards are self-explanatory, important features such as the Runway Safety Area (RSA) and Runway Object Free Area (ROFA) may require further definition. These important features are also discussed below and illustrated in **Figure 4-1**.

Non-Standard Airfield Design Features

The following airfield design features were found to be non-standard at BKV:

- ➔ **Runway Protection Zone (RPZ)** – The RPZ extends off the airport property beyond the end of Runway 9. “The RPZ’s 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 exercised through the acquisition of sufficient property interest in the RPZ.”¹ As shown in Figure 4-1, the portion of the RPZ that extends beyond airport property encompasses approximately 9.7 acres off the end of Runway 9. Also, Aerial Way traverses through the Runway 9 RPZ. In this case, it is typically preferable for airport

¹ FAA AC 150/5300-13A, *Airport Design*.

owners to either acquire the associated property or in this case consider the purchase of an easement to restrict structure heights and land uses within the RPZ.

- ➔ **Runway Blast Pad, Runway Shoulders, and Taxiway Shoulders** – Runway blast pads provide blast erosion protection beyond runway ends. Although stabilized turf blast pads and shoulders are typically acceptable for runways that serve Airplane Design Group (ADG) II and lower aircraft, the FAA recommends paved blast pads and shoulders for ADG III and higher facilities. As a result, the ultimate recommendations include the provision of paved blast pads, runway shoulders, and taxiway shoulders for the pavements at BKV that serve ADG III and higher aircraft operations.

Important Definitions

Definitions of the following airfield design features are presented to aid in the discussions throughout the remainder of this study:

- ➔ **Runway Safety Area (RSA)** – The RSA is a rectangular surface that is centered on the runway. The FAA dictates that RSAs shall be: “1) cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations; 2) drained by grading or storm sewers to prevent water accumulation; 3) capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and 4) free of objects, except for objects that need to be located in the RSA because of their function.”¹ Currently at BKV, the threshold of Runway 21 overlaps the Runway 27 RSA, which is considered a hazard to aircraft operations and reduces overall airport capacity. Alternatives to limit or remove the impacts associated with overlapping safety areas are considered in the alternatives chapter.
- ➔ **Runway Object Free Area (ROFA)** – The ROFA must be clear of ground objects protruding above the RSA edge elevation and is a rectangular surface that is centered on the runway. The ROFA is intended to “enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes.”¹ The existing localizer equipment is currently located within the ROFA surface associated with Runway 9-27 and is considered incompatible. It is recommended that the opportunity to relocate the localizer be evaluated as part of the alternatives analysis.

Table 4-5
Evaluation of Existing Airfield Design Standards (Runway 9-27)

Design Standard	Required Dimension	Runway 9 Evaluation	Runway 27 Evaluation
Runway Design Code (RDC)		D-IV	
RW Approach Visibility Minimums	½ Mile (Minimum)	½ Mile	1 Mile
Runway (RW) Width	150 Feet	150 Feet	
RW Safety Area (RSA) Width	500 Feet	Runway 21 overlaps Runway 27 RSA	
RSA Length Beyond RW End	1,000 Feet		
RW Object Free Area (ROFA) Width	800 Feet		
ROFA Length Beyond RW End	1,000 Feet		
RW Obstacle Free Zone (ROFZ) Width	400 Feet	Meets Standards	
ROFZ Length Beyond RW End	200 Feet	Meets Standards	
Precision Obstacle Free Zone (OFZ) Width	800 Feet	Meets Standard	Not Applicable
Precision Obstacle Free Zone (OFZ) Length	200 feet	Meets Standard	Not Applicable
RW Protection Zone (RPZ) Inner Width	Varies	1,000 Feet	500 Feet
RPZ Outer Width	Varies	1,750 Feet	1,010 Feet
RPZ Length	Varies	2,500 Feet	1,700 Feet
RPZ Notes	N/A	Meets Standards	Meets Standards
RW Blast Pad Width	200 Feet	Paved Blast Pad Recommended	
RW Blast Pad Length	200 Feet		
RW Shoulder Width	25 Feet	Paved Shoulders Recommended	
Taxiway (TW) Width (TDG-5)	75 Feet	Meets Standards	
TW Safety Area (TSA) Width	171 Feet	Meets Standards	
TW Object Free Area (TOFA) Width	259 Feet	Meets Standards	
Taxilane (TL) Object Free Area Width	225 Feet	Meets Standards	
TW Shoulder Width (TDG-5)	30 Feet	Paved Shoulders Recommended	
RW Centerline to Parallel TW Centerline	400 Feet	Meets Standards	
RW Centerline to Holdline	250 Feet	Meets Standards	
RW Centerline to Aircraft Parking Area	500 Feet	Meets Standards	
TW Centerline to Parallel TW/TL Centerline	215 Feet	Meets Standards	
TW Centerline to Fixed or Movable Object	129.5 Feet	Meets Standards	
TL Centerline to TL Centerline	198 Feet	Meets Standards	
TL Centerline to Fixed or Movable Object	112.5 Feet	Meets Standards	
RW Surface Gradient and Line of Sight	Maximum 1.5% Grade	Meets Standards	
Source: Michael Baker Jr., Inc., 2014.			

Table 4-6
Evaluation of Existing Airfield Design Standards (Runway 3-21)

Design Standard	Required Dimension	Runway 3 Evaluation	Runway 21 Evaluation
Runway Design Code (RDC)		B-II	
RW Approach Visibility Minimums	1-Mile (Minimum)	1-Mile	1-Mile
Runway (RW) Width	75 Feet	150 Feet	
RW Safety Area (RSA) Width	150 Feet	Runway 21 overlaps Runway 27 RSA	
RSA Length Beyond RW End	300 Feet		
RW Object Free Area (ROFA) Width	500 Feet		
ROFA Length Beyond RW End	300 Feet	Meets Standards	
RW Obstacle Free Zone (ROFZ) Width	400 Feet	Meets Standards	
ROFZ Length Beyond RW End	200 Feet		
RW Protection Zone (RPZ) Inner Width	Varies	500 Feet	500 Feet
RPZ Outer Width	Varies	700 Feet	700 Feet
RPZ Length	Varies	1,000 Feet	1,000 Feet
RPZ Notes	N/A	Meets Standards	Meets Standards
RW Blast Pad Width	95 Feet	Stabilized Turf is Acceptable	
RW Blast Pad Length	150 Feet		
RW Shoulder Width	10 Feet	Stabilized Turf is Acceptable	
Taxiway (TW) Width	35 Feet	Meets Standards	
TW Safety Area (TSA) Width	79 Feet	Meets Standards	
TW Object Free Area (TOFA) Width	131 Feet	186 Feet to FBO Apron – Meets Group III Standards.	
Taxilane (TL) Object Free Area Width	115 Feet	186 Feet to FBO Apron – Meets Group III Standards.	
TW Shoulder Width	15 Feet	Stabilized Turf is Acceptable	
RW Centerline to Parallel TW Centerline	240 Feet	Meets Standards	
RW Centerline to Holdline	200 Feet	Meets Standards	
RW Centerline to Aircraft Parking Area	250 Feet	Meets Standards	
TW Centerline to Parallel TW/TL Centerline	105 Feet	Meets Standards	
TW Centerline to Fixed or Movable Object	65.5 Feet	Meets Standards	
TL Centerline to TL Centerline	97 Feet	Meets Standards	
TL Centerline to Fixed or Movable Object	57.5 Feet	Meets Standards	
RW Surface Gradient and Line of Sight	Maximum 2.0% Grade	Meets Standards	

Source: Michael Baker Jr., Inc., 2014.

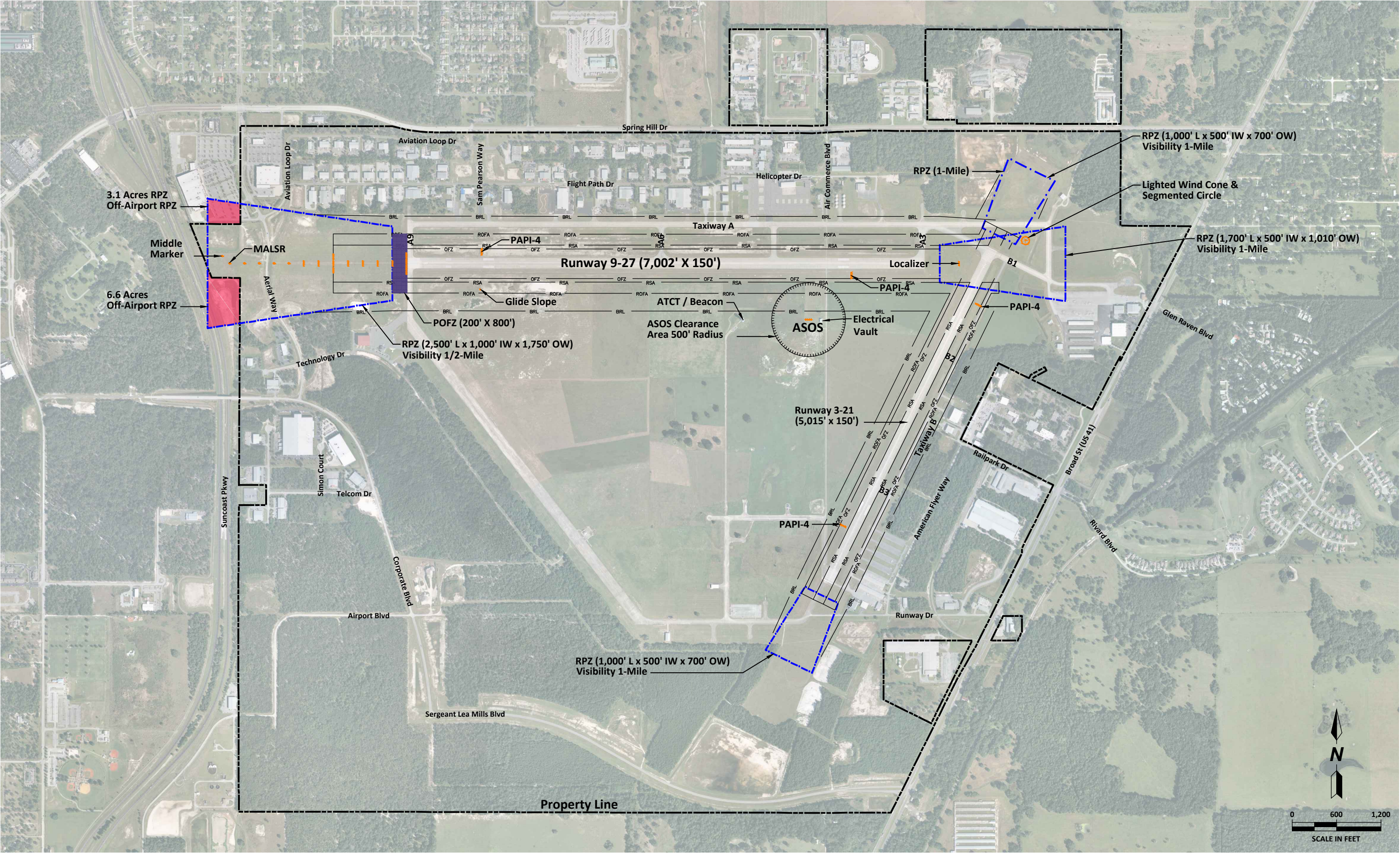


Figure 4-1 Existing Airfield Design Standards
DRAFT

4.8 Taxiways

The taxiway system allows aircraft to maneuver to and from various portions of the airport. An effective taxiway system provides for the orderly movement of aircraft and enhances operational efficiency and safety by reducing the potential for congestion, runway crossings, and pilot confusion. The existing taxiway system at BKV is depicted in Figure 4-1.

Any new taxiways, including bypass, exit, and run-up areas that are required to meet demand before the end of the planning period are also presented. It should be noted that additional taxiway improvements will likely be recommended during the alternatives analysis to provide appropriate access to new airport development.

Taxiway A

With the exception of Taxiway A6, all taxiways serving Runway 9-27 are 75 feet wide and meet or exceed RDC IV and TDG 5 design standards. As identified earlier in this chapter, one additional exit taxiway from Runway 27 is recommended. The additional exit taxiway should be located between the western end of the runway (Runway 9 end) and exit Taxiway A6. As part of a previous airfield drainage project along the north side of Runway 9-27, pipes were installed in anticipation of the future development of the exit taxiway. A new Taxiway, designated A2, is also recommended to provide access to the future Runway 27 threshold.

Taxiway B

All taxiways serving Runway 3-21 are 35 feet wide and meet or exceed RDC-II and TDG 2 design standards. In the event that Runway 3-21 is relocated in the future to accommodate the proposed extension of Runway 9-27, it is recommended that Taxiway B be extended to the southwest to maintain parallel access to the runway and adjacent facilities.

Taxiway C

Currently Taxiway C9 is the only C taxiway in the system. Taxiway C9 meets RDC IV and TDG 5 design standards. In the future, a new inboard parallel Taxiway C is needed to serve Runway 9-27 and provide access to the midfield portion of the airfield. Taxiway C should be designed to meet the RDC IV runway centerline to taxiway centerline separation standard of 400 feet and TDG 5 design standards. The western end of the proposed taxiway will need to accommodate the glideslope critical area. The placement of exit taxiways connecting to Taxiway C will be further evaluated as part of the airport alternatives analysis.

4.9 Airfield Lighting, Markings and Signage, and Navigational Aids

The following sections describe the existing and ultimate requirements for airfield lighting, markings and signage, and navigational aids at BKV.

Airfield Lighting

The airfield lighting at BKV consists of the runway edge lights, threshold lights, approach lights, and taxiway edge lights. Medium Intensity Runway Lights (MIRLs) are located along the edges of Runways 9-27 and 3-21 and emit white light in all places except in the caution zone (i.e., the last 2,000 feet of the runway). “In the caution zone, yellow lights are substituted for white lights; they

emit yellow light in the direction facing the instrument approach threshold and white light in the opposite direction. [...] The yellow lights indicate caution on rollout after landing.”² The runway threshold lights emit green on the side of approaching aircraft and red on the other side. The precision ILS approach to Runway 9 is supplemented by a MALSR approach lighting system. The only lights on the ends of Runways 3, 21, and 27 are threshold lights. All taxiways and connectors are equipped with blue Medium Intensity Taxiway Lights (MITLs). However, taxiway lighting along Taxiway C9 consists of solar powered LED MITLs. Currently, there are plans to wire and illuminate these lights and provide additional LED edge lighting for the nearby Westside Maintenance Complex apron. Provisions are also being made to provide circuitry to accommodate additional mast and taxiway lights in this area. These existing and planned airfield lighting systems at BKV are consistent with the existing and planned approaches to Runways 9-27 and 3-21. However, the lighting systems experience frequent outages and are reaching the end of their useful service life. Therefore, it is recommended that the runway, taxiway and MALSR lighting systems be refurbished/replaced in the near future. Furthermore, in order to provide enhanced visibility of the runway ends during nighttime or low visibility conditions, the provision of Runway End Identifier Lights (REILs) should be considered for Runways 3, 21, and 27.

Apron Lighting

Lighting near the FBO apron and hangar areas is provided via outdoor lighting affixed to the hangars and poles. However, additional apron lighting is needed in the Westside Maintenance Complex area. In response to this need, the airport is currently conducting a design project to provide additional apron edge lighting and provisions for future mast lighting in this area.

Airfield Markings and Signage

Many of the airfield markings at BKV were recently repainted in conjunction with the joint rejuvenation project completed and therefore no issues were identified for the current runway and taxiway markings. Furthermore, each end of Runway 9-27 and Runway 3-21 is marked consistently with the available approaches and respective visibility minimums. Runway 9 is marked precision and Runways 3, 21, and 27 are marked non-precision. Although the existing markings comply with FAA AC 150/5340-1L, *Standards for Airport Markings*, in the future if the airport obtains Part 139 Certification for commercial service, all entrance taxiways with a runway holding position marking will have to be provided with enhanced taxiway centerline markings and surface painted runway holding position markings. Those markings are intended to help prevent or minimize runway incursions (i.e., the incorrect presence of an aircraft, vehicle, or person on a surface designated for takeoffs and landings) by providing greater situational/visual awareness to pilots.

Existing airfield signage at BKV is nearing the end of its useful service life, and for that reason the airport intends to conduct a design project for upgraded signage and lighting in 2015. The signage upgrades will be designed in accordance with the guidelines contained in FAA AC 150/5340-18F, *Standards for Airport Sign Systems*. New signage should also include perch deterrents to discourage wildlife activity near the airfield.

Navigational Aids

As mentioned, the main navigational aid improvements for BKV consist of replacing or correcting the MALSR associated with the precision instrument approach to Runway 9 and also adding REILs

² FAA AC 150/5340-30, *Design and Installation Details for Airport Visual Aids*.

to Runways 3, 21, and 27 in order to provide enhanced visibility of the runway ends during nighttime and low visibility conditions. Furthermore, the presence of the localizer and localizer equipment building within the RSA/ROFA are considered incompatible within those surfaces, and as such, opportunities to relocate those items will be considered as part of this planning effort. No additional navigational aid improvements are recommended at this time.

4.10 Transient Apron and Based Aircraft Storage

Apron and hangar requirements are calculated in consideration of the airport's existing and forecast based aircraft mix, owner storage preferences, and transient aircraft parking demands. In previous years it was assumed that a certain percentage of based aircraft, mostly single and multi-engine pistons, would desire apron tiedown parking because it is the lowest cost storage option. Today, most owners want to be able to protect their aircraft from poor weather and vandalism and therefore opt for hangar storage. At BKV, most based fixed-wing aircraft are parked within hangars, although there are some aircraft that do park on the paved tiedown areas. The following sections describe the requirements for transient apron space and based aircraft storage during the planning period. The aircraft storage requirements for the Florida Army National Guard (ARNG) were not evaluated as part of this planning effort because it is assumed that the ARNG evaluates their own facility needs.

Transient Apron

The transient apron areas at BKV are located at the FBO and Westside Maintenance Area facilities and include a combined total of approximately 36,000 square yards. The apron at American Aviation covers an area of approximately 45,000 square yards, of which approximately 25,000 square yards is used for transient aircraft parking. The transient apron at the Westside Maintenance Complex covers an area of approximately 11,000 square yards. In order to determine transient apron space requirements, the FAA recommends calculating the space required to park a certain percentage of aircraft on the itinerant peak day. For BKV, it was assumed that 50 percent of itinerant peak day traffic would be applied in the calculation. Transient aircraft at BKV range in size from small pistons to large corporate jets, and as such, the space requirements should consider the general mix of aircraft that are parked on the transient apron. For smaller aircraft, 300 square yards is a typical apron space requirement, while larger jets may require 1,000 or more square yards. As shown in **Table 4-7**, the transient apron requirements for BKV were calculated by assuming that two-thirds of transient aircraft need 300 square yards of space and the remaining one-third needs 1,000 square feet. Overall, the transient apron areas at BKV appear to be reaching their capacity during peak times. For that reason, American Aviation is planning on expanding their aircraft parking area to the south by removing some of the existing T-hangar and shade hangar structures. Other potential expansion opportunities will be reviewed later in this study.

**Table 4-7
Transient Apron Storage Requirements**

Year	ADPM	50% ADPM	300 SY Per Aircraft		1,000 SY Per Aircraft		Total SY
			66.67%	SY	33.33%	SY	
2013	173	87	58	17,300	19	19,222	36,522
2014 F	177	89	59	17,700	20	19,667	37,367
2018 F	192	96	64	19,200	21	21,333	40,533
2023 F	212	106	71	21,200	24	23,556	44,756
2028 F	236	118	79	23,600	26	26,222	49,822
2033 F	262	131	87	26,200	29	29,111	55,311

Source: Michael Baker Jr., Inc., 2014.

Based Aircraft Storage

There are several different types of based aircraft storage available at BKV including apron tiedowns, T-hangars, corporate hangars, and bulk hangar storage. Since the early 2000s, the airport has experienced strong growth in the number of based jets and pistons as well as the development of new facilities to cater to those aircraft, and as such, much of the recent development has consisted of new T-hangar and corporate hangar construction. The forecasts for BKV project continued growth for all aircraft types including pistons, turboprops, jets, and helicopters. It is anticipated that the owners of those aircraft will desire a variety of different storage options. Today, most owners prefer to store their aircraft in a hangar in order to protect the plane from harsh weather conditions and to prevent vandalism from occurring. Although most of the hangars at BKV are currently occupied, there are some available for lease and others that turnover fairly quickly when a tenant departs (e.g., T-hangars). For the purposes of this analysis and to allow for future hangar development opportunities, it was assumed that all new based aircraft would require a newly-constructed hangar facility at BKV; however, it is noted that the FBO may have the capability to accommodate some new based aircraft at their facility, and this analysis does not account for plans to demolish the Hernando County-owned T-hangars and shade hangars within the American Aviation leasehold and to construct new T-hangars adjacent to the existing T-hangars in the southeast corner of the airport. It is noted that the previous master plan recommended consolidating all T-hangars in that location on the airport property.

The results of the based aircraft storage requirements are summarized in **Table 4-8**. As shown, it was assumed that a large percent of piston aircraft would prefer T-hangar storage and all turboprops and jets would prefer conventional or corporate hangar storage. The hangar sizing requirements were determined by selecting a square footage that could capture a range of models for each aircraft type. By 2033, it is anticipated that an additional 50 T-hangar bays will be required and an additional 137,925 square feet of conventional or corporate hangar space. That would essentially double the airport's current hangar footprint by 2033, particularly because of the strong growth that is anticipated for based jets. The remaining sections of this study include alternatives and recommendations for accommodating the anticipated hangar development demands at BKV during the planning period.

**Table 4-8
Based Aircraft Storage Requirements**

Year	Total Based Aircraft	SEP	MEP	Turboprop	Jet	Helicopter
2013	176	126	12	8	14	16
2014 F	179	128	12	8	15	16
2018 F	196	139	13	9	17	18
2023 F	219	153	15	10	21	20
2028 F	243	168	16	11	26	22
2033 F	271	185	18	12	32	24
Additional Aircraft (2013 vs. 2033)	95	59	6	4	18	8
2033 T-hangar Storage Requirement						
% Preferred by Aircraft Type		75.00%	60.00%	0.00%	0.00%	25.00%
Additional T-hangars Required by 2033	50	44	4	0	0	2
2033 Conventional / Corporate Hangar Storage Requirement						
% Preferred by Aircraft Type		25.00%	40.00%	100.00%	100.00%	75.00%
Aircraft Space Requirement		1,500 SF	2,000 SF	3,000 SF	5,000 SF	1,500 SF
Additional Space Required by 2033	137,925 SF	22,125 SF	4,800 SF	12,000 SF	90,000 SF	9,000 SF
Source: Michael Baker Jr., Inc., 2014.						
Note: Totals may not add correctly due to rounding.						

4.11 Airport Support Facilities

Support facilities are those airport features that are not necessarily specific to aircraft operations, movement, and storage, but which are vital to ensuring the efficiency, safety, and persistency of aircraft activity. For BKV, the existing support facilities consist of the FBO terminal area, Westside Maintenance Complex, airport fueling facilities, airport maintenance facility, automobile parking and access, airport traffic control tower, and U.S. Customs and Border Patrol facility. A review of BKV's existing support facilities is presented in the following sections.

Fixed Base Operator (FBO)

There is currently one FBO at BKV, American Aviation, that is located on the eastern end of Runway 9-27. The FBO provides a range of services such as fueling, maintenance, and hangar storage. As previously mentioned, American Aviation is planning on expanding their apron footprint by removing some of the Hernando County-owned T-hangars and shade hangars. That will allow them to rehabilitate existing apron pavement and provide more space for a maintenance hangar and transient aircraft parking facilities, particularly for larger corporate aircraft. The T-hangars and shade hangars that are removed will be replaced with new T-hangars that will be located in the southeast corner of the airport property. The FBO has indicated the need for additional hangar and apron facilities in the future; therefore, the alternatives analysis will identify potential opportunities for providing those types of facilities. It is important to note that the FBO determines their own facility needs based on their own individual business models and demands for services; however the following sections provide an evaluation of some of the services that the FBO provides in order to evaluate the overall long-term needs for the airport during the planning period.

Airport Fueling Facilities

American Aviation currently has two 12,000 gallon tanks, one containing Jet A and the other containing AvGas, as well as trucks to transport the fuel to aircraft. The Westside Maintenance Complex has two Jet A tanks (one 12,000 gallon and one 10,000 gallon) and one 4,000 gallon AvGas tank. Some of the corporate hangar tenants and governmental tenants also maintain their own fuel tanks that are used exclusively for their own operations. American Aviation's historical fuel sales records indicate that they typically had to refill their Jet A tank at least twice a month. As jet operations are forecast to increase at the highest rate amongst the various aircraft types during the planning period, it is anticipated that there will be a need for additional Jet A fuel tanks at BKV, particularly if larger commercial jets are introduced into the airport's fleet mix. The provision of additional Jet A fuel tanks will reduce the need for fuel deliveries and will allow the FBO to have the stock necessary to accommodate known and potentially unknown fueling demands that may arise during the planning period. The provision of Jet A tanks that maximize the amount of fuel that can be delivered is typically desirable because it reduces the overall costs for the fuel customer (e.g., 10,000 to 12,000 gallons). Therefore, evaluating the fuel needs for the FBO is more of a benefit/cost related exercise as it pertains to their individual business needs, but the potential to reserve for expansion of their respective fuel farms will be considered as a component of this planning effort. The 4,000 gallon tank at the Westside Maintenance Complex is being considered for replacement because it does not provide an adequate supply and does not allow for cost-effective refills from a larger capacity tanker truck.

Airport Maintenance Facility

The airport maintenance facility is located in the same vicinity of the airport administration building and consists of a 1,500 square foot building that is used to store and maintain equipment. The facility has exceeded its capacity and is not capable of handling the long-term maintenance needs of the airport. Airport maintenance staff is currently forced to store equipment outside exposed to the elements. In an effort to optimize the useful service life of the equipment, it will be necessary to provide a replacement or expanded airport maintenance facility during the planning period. It would also be desirable for the facility to have a fueling station capable of providing an on-site supply of both unleaded and diesel fuel for airport vehicles and equipment versus having to travel off site to the Hernando County fueling facility.

Automated Surface Observation System

Since 1992, the airport has been served by an automated surface observation system (ASOS) which is located adjacent to the electrical vault within the midfield portion of the airport. According to NWS representatives, the equipment is in good working order but is subject to frequent power outages. In the future, it is recommended that the ASOS be supported by an Uninterruptable Power Supply (UPS) to protect against power interruptions to the sensors.

Aircraft Rescue and Firefighting Building

BKV is equipped with an on-airport Aircraft Rescue and Firefighting facility (ARFF). Hernando County Fire Station #14 is located on the far eastern side of the transient apron adjacent to the American Aviation FBO with access to the airfield and US 41. Additional support is provided by the Hernando County Northwest Fire District, located 5 miles away from the airport, providing a response time of less than 10 minutes.

The level of service required is based upon the aircraft rescue and firefighting index. The index is determined by a combination of: 1) The length of air carrier aircraft expressed in groups; and 2) average daily departures of air carrier aircraft. There is no regularly scheduled air service, but the airport does occasionally receive charter aircraft service. Aircraft used by this service fall into the Index B group, which includes aircraft at least 90 feet but less than 125 feet in length. The ARFF is currently equipped with a self-contained nitrogen charged “Fire Boss” unit, having 500 pounds of dry chemical and 100 gallons of pre-mixed aqueous film forming foam (AFFF) agent. This equipment meets the Index A standard, which includes aircraft less than 90 feet in length, such as the Gulfstream IV. In the future, ARFF improvements will need to be assessed if demand for air carrier aircraft activity increases at BKV.

Automobile Access and Parking

The airport recently completed the design to realign Aerial Way and extend Technology Drive. These improvements are designed to improve the overall access to the west side of the airport and Technology Center. Access on the north side of the airport will also be evaluated as part of the airport alternatives analysis. Key stakeholders have indicated that the airport’s main entrance along the north side of the airport could be better defined. Although this entrance meets existing design standards, the current configuration that straddles the gunnery backstop near the airport entrance sign can be confusing to motorists entering and leaving the airport property. This configuration also contributes to poor ingress and egress conditions at the intersection of Sam Pearson Way and Aviation Loop Drive.

Ample parking is provided adjacent to existing facilities throughout the airport and Technology Center. In the future, all parking facilities associated with new development proposed in this airport master plan update must meet applicable Florida and local code requirements.

As part of the airport's rebranding initiative, the airport is currently in the process of conducting a signage planning study. Directional signage recommendations from the study will be incorporated into the capital improvement program of this master plan update.

U.S. Customs and Border Patrol (CBP)

Due to the nature of the on-demand air service providers at BKV that conduct operations throughout the world, Hernando County is investigating the potential for providing U.S. CBP services at the airport. The initial steps include conducting a feasibility study to evaluate potential sites that would be suitable for constructing a CBP facility and having an apron that would be able to accommodate larger corporate jets. The CBP facility would be a user fee based operation in which the operators of each aircraft that use the facility must pay a fee. The final results of the feasibility study will be included in the recommendations of this planning effort.

Aircraft Wash Rack Facility

BKV currently does not have an aircraft wash rack facility for the use by based aircraft. Therefore, outdoor washing and rinsing of aircraft is strictly prohibited. In the future, it is recommended that an aircraft wash rack be provided at BKV to facilitate aircraft cleaning and to properly dispose of any soap, detergents or residue resulting from aircraft washing. The location of this proposed facility will be addressed as part of the airport alternatives analysis.

Airport Traffic Control Tower (ATCT)

The airport currently has a federally-subsidized contract ATCT that was opened in 2012. The ATCT provides ground control services at BKV 365 days a year from 7:00 a.m. to 10:00 p.m. Interviews with ATCT personnel indicated that the current control tower is sufficient to meet their needs. It is recommended that any proposed airport development should consider the visibility and sight requirements of the current ATCT.

Cargo Facility

As part of the previous airport master plan update, the possibility of accommodating a cargo operation was considered as part of the long-term planning for the airport. It was determined that the northwest portion of the midfield area would provide an ideal location for such a facility.

Since that time, the airport completed the design of a cargo apron in support of the project. This area provides direct airfield access to the primary runway via the proposed parallel Taxiway C, and roadway access to this area can be provided via the Suncoast Parkway located nearby. Also, it was determined that additional roadway access may be provided between the airport and the existing highway without impacting existing or planned airfield facilities. The cargo design project also identified locations of stormwater facilities in order to optimize this location and protect the stormwater facilities from future development. The project design locks in the stormwater/drainage requirements in accordance with August 2009 Southwest Florida Water Management District (SWFWMD) requirements. This enables the proposed cargo development to be constructed within

the 20-year horizon without changing stormwater treatment (water quality) requirements. The final design of the cargo facility will be incorporated into the master plan update.

4.12 Land Acquisition Requirements

The purpose of the land area requirements is to review the airport's facilities in comparison to FAA standards in order to identify additional property that may be required for inclusion into the land property envelope. The additional properties may be necessary for land use compatibility purposes, future development needs, or to obtain control over an RPZ. For BKV, the recommended developments should not require additional property acquisition during the planning period. However, Hernando County should consider obtaining easements for the sections of the Runway 9 RPZ that extend outside the airport property over the Suncoast Parkway and the adjacent shopping plaza. It is noted that the Hernando County Code of Ordinances contains a zoning ordinance for the airport (Appendix A, Article X). The zoning ordinance identifies clear zones that extend outward and upward from the beginning of the approach surface to the point where the surface reaches 50 feet above the ground. Within the clear zones, various uses are prohibited such as daycares, nursing homes, hotels, hospitals, religious establishments, and educational facilities. The zoning ordinance also states that certain activities which may interfere with aircraft operations are prohibited (e.g., certain illumination, smoke or glare, and electronic interference). Although the zoning ordinance provides for some degree of control within the clear zones, the clear zones do not necessarily match the same size and shape of the RPZs beyond each runway end at BKV and the zoning ordinance does not preclude certain development types like an easement could.

4.13 Airport Security Analysis

In May 2004, the Transportation Security Administration (TSA) released *Security Guidelines for General Aviation Airports*. According to the TSA website, this document “constitutes a set of federally-endorsed guidelines for enhancing airport security at general aviation facilities throughout the nation. It is intended to provide general aviation airport owners, operators, and users with guidelines and recommendations that address aviation security concepts, technology, and enhancements.”³

The document includes a measurement tool that is used to assess the recommended security characteristics for general aviation airports. First, each airport is assigned a certain point value that is calculated considering the airport's location, number and types of based aircraft, runway length and surface characteristics, and number and types of aircraft operations. Then, the airport's point value is compared to the TSA's recommended security features in **Table 4-9** to evaluate whether additional security features may be appropriate. A point value of 42 was calculated for BKV at this time, which means that all security features shown within the “25-44 Point Range” are recommended. BKV currently has many of the security features recommended by the TSA and recently received grant funding from the FDOT to update perimeter access and control points, installation of additional CCTV equipment and upgrade of perimeter lighting. This effort is currently under design and is anticipated to be advertised during the spring of 2015 for construction.

³ http://www.tsa.gov/what_we_do/tsnm/general_aviation/security.shtm, accessed July 19, 2012.

Table 4-9
Analysis of BKV Security Features

TSA Recommended Security Feature	Point Range / Applicable Security Feature				BKV Status
	>45	25-44	15-24	0-14	
Fencing					✓
Hangars					✓
Closed Circuit Television (CCTV)					In Progress
Intrusion Detection System					
Access Controls		RECOMMENDED			✓
Lighting System		RECOMMENDED			✓
Personnel ID System		RECOMMENDED			Recommended
Vehicle ID System		RECOMMENDED			Recommended
Challenge Procedures		RECOMMENDED			✓
Law Enforcement Support		RECOMMENDED			✓
Security Committee		RECOMMENDED			Recommended
Pilot Sign-In/Out Procedures		RECOMMENDED			✓
Signs		RECOMMENDED			✓
Documented Security Procedures		RECOMMENDED			Recommended
Positive Passenger/Cargo ID		RECOMMENDED			Recommended
All Aircraft Secured		RECOMMENDED			✓
Community Watch Program		RECOMMENDED			Recommended
Contact List		RECOMMENDED			✓

Sources: TSA Security Guidelines for General Aviation Airports and Michael Baker Jr., Inc., 2014.

4.14 Summary of Facility Requirements

Table 4-10 presents a summary of the identified facility requirements. The order in which these improvements are listed is not meant to imply a priority or phasing of these projects. Essentially, this table includes the minimum facility requirements over the 20-year planning period based on the projected demand. The remaining sections of this report present recommendations to satisfy these facility requirements at BKV, including a phased development program over the next 20 years.

**Table 4-10
Summary of Facility Requirements**

Category	Requirement
Runways	- Extend Runway 9-27 to 8,000 feet by 150 feet wide (999 foot extension). - Provide 25-foot wide paved shoulders on Runway 9-27. - Construct blast pads (200 feet x 200 feet) at both ends of Runway 9-27.
Taxiways	- Provide 30-foot wide paved shoulders for taxiways serving Runway 9-27. - Extend Taxiway A to accommodate Runway 9-27 extension. - Relocate Taxiway A1 to accommodate Runway 9-27 extension. - Provide additional exit taxiway between Taxiways A6 and A9. - Provide parallel Taxiway C access with exit taxiways to accommodate Design Group IV aircraft movement to future midfield development.
NAVAIDs	- Refurbish/replace ILS and MALSR lighting systems. - Install REILS (Runways 3, 21 and 27). - Relocate existing windcone along Runway 21.
Signage	- Upgrade airfield signage (include perch deterrents). - Improve landside directional signage in accordance with recommendations contained in the airport signage plan.
Runway and Taxiway Lighting	Refurbish/replace Runway 9-27 runway lighting system and associated taxiway lighting systems.
Runway Safety Area	Correct Runway 21 overlap of Runway 27 RSA
Apron Area	- Construct at least 19,311 square yards of additional apron area to accommodate transient aircraft and based aircraft tie-down parking needs. - Relocate existing tie-down parking positions when Runway 9-27 is extended.
T-hangars	- Demolish dome hangars, T-hangars and shade hangars and relocate to southeast T-hangar area. - Construct an additional 50 T-hangars.
Corporate/Conventional Hangars	Construct an additional 137,925 square feet of conventional or corporate hangar space.
Airport Support Facilities	- Construct an airport maintenance facility capable of storing and protecting airport vehicles and equipment. - Construct fueling station facility adjacent to the airport maintenance facility. - Provide an Uninterruptable Power Supply (UPS) to protect against power interruptions to the ASOS sensors. - Construct a UFA Customs Facility with apron and connecting taxiway. - Construct an aircraft wash rack facility. - Construct cargo apron and support processing facilities.
Access Improvements	- Realign Aerial Way and extend Technology Drive in order to improve the overall access to the west side of the airport and Technology Center. - Provide improved northside access from Spring Hill Drive to better define the main entrance to the airport and eliminate confusing roadway configuration. - Other access improvements to be determined based upon the selected development alternatives. - All parking facilities associated with new development proposed in this airport master plan update must meet applicable Florida and local code requirements.
Utility Infrastructure	To be determined based upon the selected development alternatives.
Land Acquisition	To be determined based upon the selected development alternatives.
Airport Security	- Establish personnel and vehicle ID systems. - Establish a security committee. - Establish documented security procedures. - Establish positive passenger/cargo ID system. - Establish a community watch program.

Source: Michael Baker Jr., Inc., 2014.

Chapter 5.0 Preliminary Alternatives



**BROOKSVILLE - TAMPA BAY REGIONAL AIRPORT
& TECHNOLOGY CENTER**



Michael Baker
INTERNATIONAL

5.0 PRELIMINARY ALTERNATIVES

5.1 Introduction

This chapter introduces the preliminary alternatives for the Brooksville-Tampa Bay Regional Airport (BKV), which are intended for discussion purposes between the various stakeholders including the Technical Advisory Committee (TAC) for this Master Plan Update, airport tenants, and the public. The individual components of each preliminary alternative were evaluated to aid in the selection of a preferred alternative that represents the desired development plan for the 20-year planning period. For that reason, the preliminary alternatives should be viewed as flexible development plans that may be refined or combined to best satisfy the needs of the airport's stakeholders. The main intent of the preliminary alternatives is to evaluate realistic airfield development options that would satisfy the facility requirements identified in the previous chapter and to analyze the development and redevelopment possibilities for vacant parcels on the airport property. The preferred alternative, as presented in **Chapter 6**, illustrates the recommended layout of all landside developments, such as corporate hangars, aprons, and support facilities. The preliminary alternatives should subsequently be viewed as a broad examination of relationships between required and desired airfield and landside developments in order to provide a clear understanding of the airport's possibilities and limitations.

The following elements are covered within this chapter:

- ➔ Development Constraints
- ➔ Previously Designed Development Concepts
- ➔ Airfield Alternatives
- ➔ Instrument Approach Alternatives
- ➔ Land Use Analysis
- ➔ Landside Development Alternatives
- ➔ Support Facilities

5.2 Development Constraints

Land uses on the airport property consist of transportation-related infrastructure, commercial and industrial developments, institutional features, and open space. There are few land uses surrounding BKV that would be incompatible with the continued expansion of the airport's airfield and landside facilities (e.g., residential development). However, the ultimate expansion potential of Runway 9-27 is constrained by the presence of roads such as the Suncoast Parkway, Aerial Way, and Broad Street (U.S. Route 41). There are also vehicular and utility access limitations to some portions of the airport property that would need to be addressed in order to maximize the development potential of the property. Many of those factors were analyzed in conjunction with the Business Plan effort that was conducted for this Master Plan Update and are illustrated on the preferred alternative. As shown in **Figure 5-1**, there are several wetlands on the airport property that mostly consist of drainage features. If possible, new development should be avoided within the wetland areas and expansion of some of the drainage features would likely be necessary in order to maintain sufficient stormwater capacity. All airport development actions must also avoid floodplain impacts whenever there is a practicable alternative. In addition, the design must also minimize the adverse impacts to the floodplain's natural and beneficial values and minimize the likelihood of flood-related risk to human life, health, and welfare. Based on a review of the current FEMA Federal Insurance Rate Maps (refer to Figure 5-1), portions of the airport property are located within a 100-year floodplain with Base

Flood Elevations (BFEs) of 64.3 feet (i.e., Floodplain AE) and much of the southern and eastern portions of the property are located within a 500-year floodplain (i.e., Floodplain X). Efforts to minimize impacts to those floodplain areas must be considered with any proposed development action. A more in depth analysis of potential environmental impacts is provided in conjunction with the preferred alternative.

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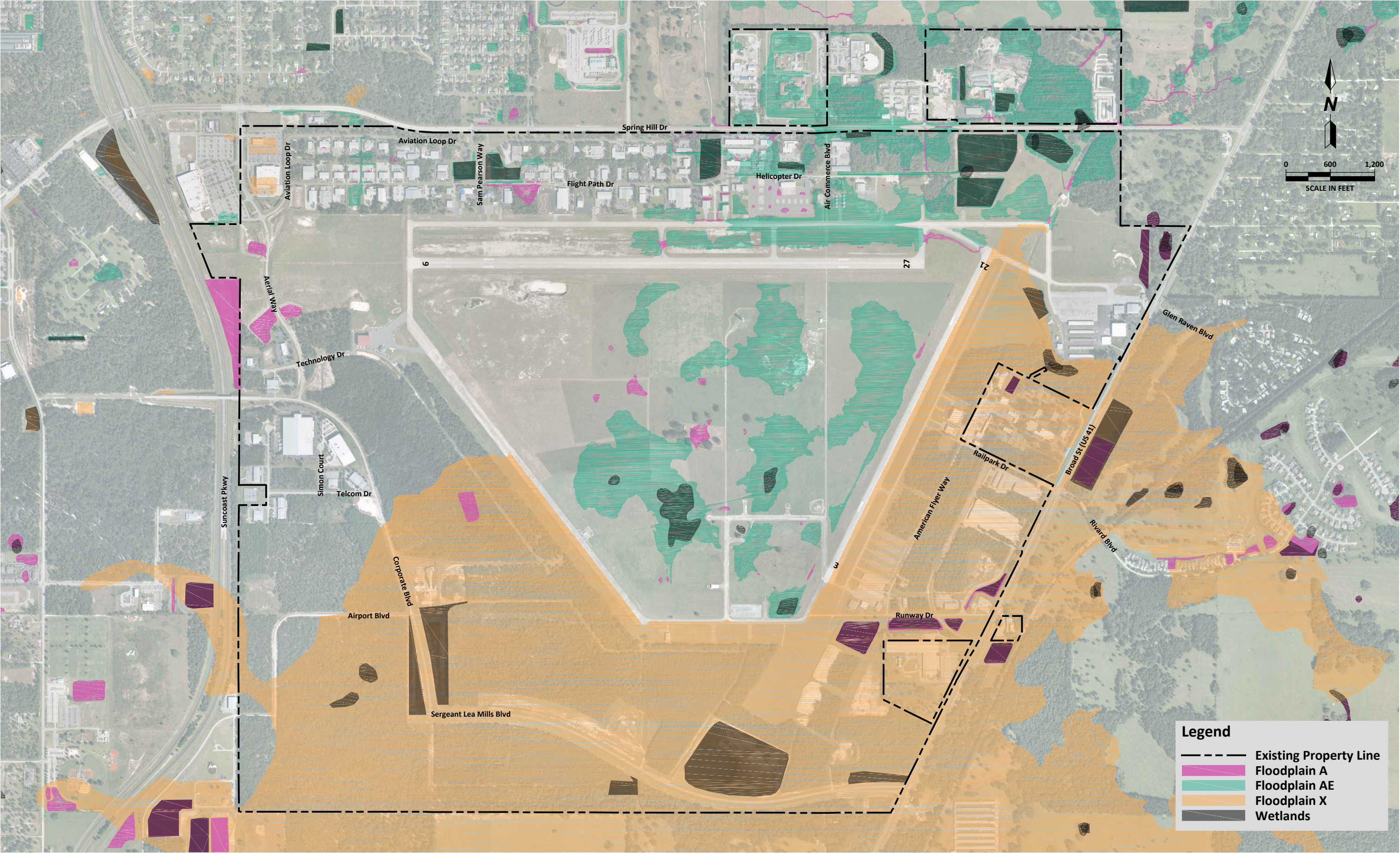


Figure 5-1 Development Constraints
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5.3 Previously Designed Development Concepts

The figures throughout this chapter illustrate development concepts that have been previously designed for BKV. These are facilities that have been designed or proposed for development in order to encourage specific users to the airport such as a large cargo apron, a Maintenance Repair and Overhaul (MRO) facility for commercial aircraft, a corporate hangar development area, additional T-hangars, and a U.S. Customs and Border Protection (CBP) facility for processing international passengers and their cargo. **Table 5-1** includes a description and cost estimate for these various facilities, all of which are illustrated on preferred alternative and the Airport Layout Plan (ALP).

Table 5-1 Previously Designed Development Concepts	
Project Description (See Figures for Project ID)	Estimated Cost
Ⓐ Air Cargo Apron – The proposed air cargo apron covers 137,600 square yards and is located on the south side of Runway 9-27 near the west end of the runway (Runway 9 end). The apron was designed with asphalt pavement and concrete hardstands for aircraft parking. A partial parallel taxiway would need to be constructed on the south side of Runway 9-27 in order to access the facility.	\$16,782,984
Ⓑ MRO Facility – The proposed MRO facility is located along Helicopter Drive near the end of Runway 27. The plans call for a 25,600 square foot hangar with a 6,400 square foot attached office with the ability to expand the entire facility to the east (apron and new hangar) to provide additional maintenance capacity. The facility could accommodate most medium-sized commercial aircraft.	\$5,000,000
Ⓒ Corporate Hangar Development Area – This proposed development is located in the northeast corner of the airport property and includes the construction of an apron for corporate hangars to be constructed around. The facility would be accessible by a new connection to Spring Hill Drive and could accommodate approximately 10 new hangars with varying capacities (ranging in size from 6,000 square feet to 15,000 square feet). It is anticipated that this area would be utilized primarily to store aircraft with wingspans less than 79 feet (i.e., Airplane Design Group (ADG) II aircraft and smaller).	\$6,862,000
Ⓓ T-Hangars – The construction of four additional T-hangar buildings is planned adjacent to the existing T-hangars in the southeastern portion of the airport property. The four buildings would increase the airport's T-hangar capacity by 40 bays and could accommodate a mix of ADG I and smaller ADG II aircraft. In order to satisfy the identified requirement of 50 T-hangar bays during the 20-year planning period, additional buildings are planned in the same southeastern portion of the airport property.	(2) 13 Bay - \$793,800 (2) 7 Bay - \$793,800 (4) Total - \$2,942,100
Ⓔ U.S. CBP Facility – The proposed CBP facility is located where the dome hangars are currently located directly to the east of the Florida Army National Guard's facilities. This would be a "User Fee Airport" CBP facility that would be used to process general aviation passengers and their cargo. The apron would be constructed to accommodate ADG III and smaller corporate jets such as the Gulfstream G550.	\$1,295,350
Source: Michael Baker Jr., Inc., 2014.	

5.4 Airfield Alternatives

The intent of the airfield alternatives analysis was to satisfy the identified length requirements for Runway 9-27, to improve the efficiency and safety of aircraft movements throughout the airfield, and to maximize aviation development opportunities on the airport property. As mentioned in the previous chapter, a recommended length of 8,000 feet was identified for Runway 9-27 in addition to paved shoulders and blast pads. Therefore, two extension options were explored for Runway 9-27 in order to provide an additional 998 feet for the larger jet activity that is anticipated to regularly operate at BKV during the planning period. No overall improvements were recommended for Runway 3-21, with the exception of maintaining the current length of 5,015 feet and preventing any conflicts with aircraft activity on Runway 9-27.

Airfield Alternative 1 (Runway 9 Extension)

Airfield Alternative 1 is illustrated in **Figure 5-2** and summarized in **Table 5-2**. This alternative includes a 998-foot extension of Runway 9-27 to the west (Runway 9 extension) and relocation of all navigational aids and approach lighting, as well as relocation of Aerial Way because of Runway Safety Area (RSA) conflicts. Due to the provision of the precision Instrument Landing System (ILS) approach to Runway 9, the MALSR would have to be relocated outside the current airport property boundary and would extend across the Suncoast Parkway. Furthermore, the Runway Protection Zone (RPZ) beyond the Runway 9 end would also extend further outside the airport property and over the Suncoast Parkway, which may require relocation of the highway within the RPZ in order to prevent the introduction of any new incompatible land uses. Table 5-1 includes a detailed assessment of all features associated with Airfield Alternative 1 including cost estimates.

Airfield Alternative 2 (Runway 27 Extension)

Airfield Alternative 2 is illustrated in **Figure 5-3** and summarized in **Table 5-3**. This alternative includes a 998-foot extension of Runway 9-27 to the east (Runway 27 extension) as well as relocation of all navigational aids. Because this alternative would create an overlapping “V” intersection at the ends of Runways 27 and 21, the FAA would require a decoupling of the two runway ends at the time when Runway 27 is extended. Therefore, Alternative 2 includes an 815 foot shift of Runway 3-21 to the south and a reconfiguration of the taxiway geometry near the new ends of Runways 27 and 21.

Preferred Runway 9-27 Extension Alternative

Due to the property impacts associated with the MALSR relocation and RPZ shift that would occur under Airfield Alternative 1, Airfield Alternative 2 is considered the preferred extension option for Runway 9-27. Airfield Alternative 2 would not require any property acquisition and would not result in any major impacts to existing airport facilities; however, it would still be necessary to shift Runway 3-21 to the south in order to prevent creating an overlapping “V” intersection at the ends of Runway 27 and 21. The 998-foot extension of the Runway 27 end was carried forward as part of the preferred alternative for this Master Plan Update and is illustrated on the ALP.

Table 5-2 Airfield Alternative 1				
Action	Runway 9 Extension	Parallel Taxiway (South of Runway 9-27)	Parallel Taxiway (West of Runway 3-21)	Miscellaneous Projects
Identified Requirement	Extend to 8,000 Feet	Construct as Needed to Support Development	Construct as Needed to Support Development	Construct Paved Shoulders and Blast Pads
Alternative Description	Includes a 998-foot extension of Runway 9-27 to the west (i.e., Runway 9 end). The project would also include an extension of parallel Taxiway A to the new runway end and relocation of the PAPI, glide slope antenna, MALSR, and RPZ. Both the MALSR and the RPZ would extend off the airport property and would require property acquisition and a potential relocation of the Suncoast Parkway. Aerial Way would also have to be relocated because of the extended RSA.	Includes the construction of a parallel taxiway on the south side of Runway 9-27. This taxiway would be constructed to support development between the two runways. Such a project may be needed during the planning period because there is limited space remaining for development on the other sides of the runways. Near the Runway 9 end, a small shift in the taxiway is shown in order to prevent the need to relocate the glide slope antenna.	Includes the construction of a parallel taxiway on the west side of Runway 3-21. This taxiway would be constructed to support development between the two runways. Such a project may be needed during the planning period because there is limited space remaining for development on the other sides of the runways.	Paved runway shoulders, taxiway shoulders, and blast pads are recommended for airfield facilities that serve ADG III aircraft and are required for facilities that serve ADG IV and higher aircraft. Therefore, this alternative includes the construction of blast pads at each end of Runway 9-27, shoulders along Runway 9-27, and shoulders along Taxiway A.
Cost Estimate	To be determined in conjunction with the preferred alternative.	To be determined in conjunction with the preferred alternative.	To be determined in conjunction with the preferred alternative.	To be determined in conjunction with the preferred alternative.
Operational Performance	The extension would satisfy the identified runway length requirement during the planning period.	The project would be constructed as necessary to support development between the two runways. It would provide aircraft access to the areas.	The project would be constructed as necessary to support development between the two runways. It would provide aircraft access to the areas.	The construction of these projects would provide resistance to blast erosion, prevent the ingestion of foreign objects into aircraft engines, and could accommodate emergency vehicles.
Environmental	The MALSR and RPZ extension outside of the current airport property would require property acquisition and potentially a large scale road relocation project for the Suncoast Parkway. Such a roadway relocation project would impact several nearby properties and may produce some environmental impacts.	Minimal environmental impacts would be anticipated from the proposed parallel taxiway, with the exception of some floodplain impacts.	Minimal environmental impacts would be anticipated from the proposed parallel taxiway, which the exception of some impacts to floodplains.	Minimal environmental impacts would be anticipated.
Feasibility	Due to the off airport impacts and high costs associated with this alternative, other extension options should be explored. Any extension of Runway 9-27 to the west has the potential to shift the RPZ and MALSR outside the airport property and would therefore create undesired impacts and costs.	Such a project would be feasible as needed, but the small shift near Runway 9 may be preventable if the glide slope antenna can be relocated. Also, as explored later in this chapter, there would be development restrictions along the parallel taxiway due to line of sight issues from the ATCT.	Such a project would be feasible as needed, but there would be development restrictions along the parallel taxiway due to line of sight issues from the ATCT.	Airport activity and development priorities should be monitored to determine when the construction of such features would be warranted.
Source: Michael Baker Jr., Inc., 2014.				



Figure 5-2 Airfield Alternative 1
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Table 5-3 Airfield Alternative 2					
Action	Runway 27 Extension	Runway 3-21 Shift	Parallel Taxiway (South of Runway 9-27)	Parallel Taxiway (West of Runway 3-21)	Miscellaneous Projects
Identified Requirement	Extend to 8,000 Feet	Prevent Intersecting Runway Ends	Construct as Needed to Support Development	Construct as Needed to Support Development	Construct Paved Shoulders and Blast Pads
Alternative Description	Includes a 998-foot extension of the Runway 9-27 to the east (i.e., Runway 27 end). The project would also include relocation of the localizer outside the RSA. In order to prevent the creation of an overlapping “V” intersection of two runway ends, this alternative includes a shift of Runway 3-21 to the south.	This alternative includes a shift of Runway 3-21 by 815 feet to the south in conjunction with the extension of Runway 9-27. The project would be necessary in order to prevent the creation of a “V” intersection with the extended Runway 27 end and the existing Runway 21 end. The FAA discourages such an intersection because it can result in confusion for pilots navigating the airfield.	Includes the construction of a parallel taxiway on the south side of Runway 9-27. This taxiway would be constructed to support development between the two runways. Such a project may be needed during the planning period because there is limited space remaining for development on the other sides of the runways. Near the Runway 9 end, a small shift in the taxiway is shown in order to prevent the need to relocate the glide slope antenna.	Includes the construction of a parallel taxiway on the west side of Runway 3-21. This taxiway would be constructed to support development between the two runways. Such a project may be needed during the planning period because there is limited space remaining for development on the other sides of the runways.	Paved runway shoulders, taxiway shoulders, and blast pads are recommended for airfield facilities that serve ADG III aircraft and are required for facilities that serve ADG IV and higher aircraft. Therefore, this alternative includes the construction of blast pads at each end of Runway 9-27, shoulders along Runway 9-27, and shoulders along Taxiway A.
Cost Estimate	To be determined in conjunction with the preferred alternative.	To be determined in conjunction with the preferred alternative.	To be determined in conjunction with the preferred alternative.	To be determined in conjunction with the preferred alternative.	To be determined in conjunction with the preferred alternative.
Operational Performance	The extension would satisfy the identified runway length requirement during the planning period.	This project would be needed in order to increase situational awareness for pilots navigating the airfield.	The project would be constructed as necessary to support development between the two runways. It would provide aircraft access to the areas.	The project would be constructed as necessary to support development between the two runways. It would provide aircraft access to the areas.	The construction of these projects would provide resistance to blast erosion, prevent the ingestion of foreign objects into aircraft engines, and could accommodate emergency vehicles.
Environmental	The extension and associated navigational aids and RPZ would remain on the airport property; therefore, limited environmental impacts would be anticipated with the exception of minor floodplain impacts.	Minimal environmental impacts would be anticipated from this project, although closure of a portion of Runway Drive would be needed to construct the new portion of the runway pavement on the south end (i.e., Runway 3 end).	Minimal environmental impacts would be anticipated from the proposed parallel taxiway, with the exception of some floodplain impacts.	Minimal environmental impacts would be anticipated from the proposed parallel taxiway, which the exception of some impacts to floodplains.	Minimal environmental impacts would be anticipated.
Feasibility	It is anticipated that this is the most feasible option for extending Runway 9-27 to 8,000 feet. Such a project could occur as justified by aircraft activity.	If the extension of Runway 27 is constructed, the FAA would require a decoupling of the new end of Runway 27 and the existing Runway 21 end.	Such a project would be feasible as needed, but the small shift near Runway 9 may be preventable if the glide slope antenna can be relocated. Also, as explored later in this chapter, there would be development restrictions along the parallel taxiway due to line of sight issues from the ATCT.	Such a project would be feasible as needed, but there would be development restrictions along the parallel taxiway due to line of sight issues from the ATCT.	Airport activity and development priorities should be monitored to determine when the construction of such features would be warranted.
Source: Michael Baker Jr., Inc., 2014.					



Figure 5-3 Airfield Alternative 2
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5.5 Instrument Approach Alternatives

As part of the airfield alternatives analysis, the associated instrument approach procedures were evaluated for the existing ends of all runways as well as the extended ends of Runway 9-27 and the shifted ends of Runway 3-21. The analysis focused on identifying any existing or potential Threshold Siting Surface (TSS) obstructions. Unlike the Federal Aviation Regulations (FAR) Part 77 surfaces that are primarily used to adopt building height and land use restrictions around airports, the TSS is the surface that is evaluated to determine if one or more of the following actions are necessary:

- ➔ Obstacle clearing, marking, or lighting is necessary within the TSS.
- ➔ Displacement of the runway threshold is necessary because obstacles cannot be cleared from the TSS, which results in a shorter landing distance.
- ➔ Modification of the approach glide path and/or threshold crossing height is necessary.
- ➔ Prohibition of nighttime operations may be necessary unless an approved Visual Glide Slope Indicator (VGSI) is in use.

At BKV, the only runway end that currently contains TSS penetrations is the Runway 3 end. A portion of Runway Drive traverses the Runway 3 TSS and vehicles traveling on the road may penetrate the road by up to four feet. However, Runway Drive is a private road in that location and drivers are instructed to contact the Airport Traffic Control Tower (ATCT) prior to proceeding on the section directly beyond the Runway 3 end. Under Airfield Alternative 1, Runway 9-27 is extended by 998 feet to the west (Runway 9 end) and the associated TSS would have penetrations that include Aerial Way and one or more light posts in the Target parking lot. Consequently, Aerial Way not only poses RSA conflicts under Airfield Alternative 1, but also obstruction concerns for the potential TSS. Under Airfield Alternative 2, Runway ends 27, 3, and 21 are relocated, none of which would have TSS penetrations.

5.6 Land Use Analysis

Considering the airfield developments shown under Airfield Alternative 2, the remaining vacant sections of the airport property were analyzed in terms of their potential use, aircraft and automobile access, and feasibility of development. The intent was to evaluate the highest and best use for the vacant parcels, as well as to determine if additional property should be acquired to accommodate the airport's growth initiatives. Furthermore, this land use analysis should provide the airport with a plan to maximize development opportunities on the property and to generate additional revenues. The information included in this analysis places priority on reserving as much space as possible for aviation development and expansion. The results of the Business Plan should be viewed in conjunction with this analysis in order to determine practicable methods of encouraging both aviation and non-aviation development on the airport property. The parcels are illustrated in **Figure 5-4** and evaluated in **Table 5-4**.

There are dashed red lines shown in Figure 5-4 that project from the ATCT and show the line of sight to the airfield. Buildings that are constructed along the dashed line to the north and to the east of the dashed line could physically block the view of the airfield from the ATCT and/or could create shadows that block the view of the airfield. **Figure 5-5** illustrates a hypothetical shadow analysis for the airfield. The figure shows the shadows that would be produced if 30-foot tall structures were constructed along the 30-foot Building Restriction Line (BRL) for each runway and arbitrarily

spaced at each exit taxiway. It might be possible for some structures to block the view of the proposed taxiway near the Runway 9 end due to the curve in the taxiway and it is likely that most structures that are developed along the west side of Runway 3-21 would produce shadows over the runway. Therefore, it would be necessary to conduct a thorough evaluation of any proposed developments in order to prevent blocking the view of the airfield from the ATCT. The following equation was used to determine the dimensions of the shadows that were created:

$$\text{Shadow Length} = \frac{(\text{Proposed Structure El.} \times \text{Distance from ATCT})}{(\text{ATCT Cab El.} - \text{Proposed Structure El.})}$$

Table 5-4 Land Use Analysis				
Landside Zone	Approximate Acreage	Potential Use	Access	Feasibility of Development
1	12.7 Acres	Non-Aviation	Vehicle access could be provided from Spring Hill Drive or Helicopter Drive. Aviation access is cut off by Helicopter Drive.	This is one of the few remaining sites on the airport property with direct access to Spring Hill Drive. Located approximately 1,200 feet from the centerline of Runway 9-27, this area could accommodate a multi-story structure.
2	4.7 Acres	Aviation Development	Vehicle access would be provided from Helicopter Drive. Airfield access would be provided along Taxiway A.	This is one of the few sites along Taxiway A that has not been slated for development. It is anticipated that some sort of corporate hangar or commercial facility (e.g., maintenance) would be appropriate for this site.
3	4.0 Acres	Open Space	This site is accessible from Broad Street (U.S. 41).	Due to the location within the Runway 27 approach, there are limited development opportunities for this site.
4	9.5 Acres	FBO Expansion Area	Existing FBO facilities for vehicles and aircraft.	It is anticipated that this would be the next logical site for expanding the FBO facilities. However, it may be difficult to connect to the FBO facilities to the east due to the location of a retention pond and fuel tanks.
5	6.3 Acres	FBO Expansion Area	Existing FBO facilities for vehicles and aircraft.	Some modification of the existing FBO facilities may be needed in order to construct and access this site.
6	15.6 Acres	Rail Accessible Industrial	Vehicle access would be provided from American Flyer Way.	This is the only site on the airport property that has direct rail access and would therefore be appropriate for industrial development.
7	368.4 Acres	Aviation / Industrial	Vehicle access could be provided by extending Technology Drive and Telecom Drive and by providing a new connection to Sergeant Lea Mills Boulevard. Aviation access would be provided by constructing new parallel taxiways along the runways.	There are development restrictions on this site that are associated with line of site issues from the ATCT. Buildings that are constructed along and to the east of the dashed red lines shown on Figure 5-4 may physically block the view of the airfield from the ATCT and/or could produce shadows that block the view.
8	21.0 Acres	Non-Aviation	Vehicle access could be provided from Broad Street (U.S. 41) and Sergeant Lea Mills Boulevard.	This is the largest site with direct access to Broad Street (U.S. 41). This site could accommodate a multi-story structure.
9	5.8 Acres	Open Space	This site is accessible from Sergeant Lea Mills Boulevard.	This site contains a retention pond and should be left as open space.
10	14.6 Acres	Non-Aviation	Vehicle access could be provided by a new connection to Sergeant Lea Mills Boulevard.	Due to the proximity to the future Runway 3 end, there may be some development restrictions in this area (e.g., height and/or land use restrictions).
11	67.6 Acres	Corporate / Industrial Park	Vehicle access could be provided by from Sergeant Lea Mills Boulevard	To be developed as warranted by demand.
12	69.6 Acres	Corporate / Industrial Park	Vehicle access could be provided by extending Sergeant Lea Mills Boulevard to Downwind Way.	To be developed as warranted by demand.
13	11.6 Acres	Corporate / Industrial Park	Vehicle access could be provided by extending Sergeant Lea Mills Boulevard to Downwind Way and from Airport Boulevard.	To be developed as warranted by demand.
14	55.7 Acres	Corporate / Industrial Park	Vehicle access could be provided by extending Sergeant Lea Mills Boulevard to Downwind Way and from existing roads (Airport Boulevard and Corporate Boulevard).	To be developed as warranted by demand.
15	221.4 Acres	Corporate / Industrial Park	Vehicle access could be provided by Airport Boulevard and new road construction.	To be developed as warranted by demand.
16	8.8 Acres	Corporate / Industrial Park	Vehicle access could be provided by extending Technology Drive and from Aerial Way.	To be developed as warranted by demand. Some portion of this site is currently being developed by Micro Matic.
17	57.4 Acres	Corporate / Industrial Park	Vehicle access could be provided from Telecom Drive, Corporate Boulevard, and Airport Boulevard.	To be developed as warranted by demand. Some portion of this site is currently being developed by Micro Matic.
18	27.9 Acres	Aviation Development	Vehicle access could be provided by extending Technology Drive. Aviation access is provided along the closed runway.	If needed, this site could be used for aviation development. However, roadway access to the proposed aircraft facility could have the potential to cut off aviation access to this site..
19	36.4 Acres	Corporate / Industrial Park	Vehicle access could be provided from Aerial Way and an extended Technology Drive.	To be developed as warranted by demand.
20	12.2 Acres	Aviation Expansion Area	Vehicle access is currently provided along Aerial Way and Technology Drive.	Due to the proximity to the existing Runway 9 end, there may be some development restrictions in this area (e.g., height and/or land use restrictions). However, it would be suitable for expanding the existing facilities in that area.
21	13.8 Acres	General Aviation Expansion Area	Vehicle access is provided along American Flyer Way. Aircraft access is provided along Taxiway B.	It is anticipated that continued T-hangar and/or facilities for general aviation aircraft would continue to be constructed in this portion of the airport property.
22	9.3 Acres	General Aviation / Corporate Expansion Area	Vehicle access is provided along American Flyer Way. Aircraft access is provided along Taxiway B.	It is anticipated that facilities for general aviation and corporate aircraft would be constructed in this portion of the airport property.
23	18.6 Acres	Non-Aviation	Vehicle access could be provided from Spring Hill Drive.	This is one of the few remaining areas on the airport property that is located on a stand-alone site along Spring Hill Drive.
Source: Michael Baker Jr., Inc., 2014.				



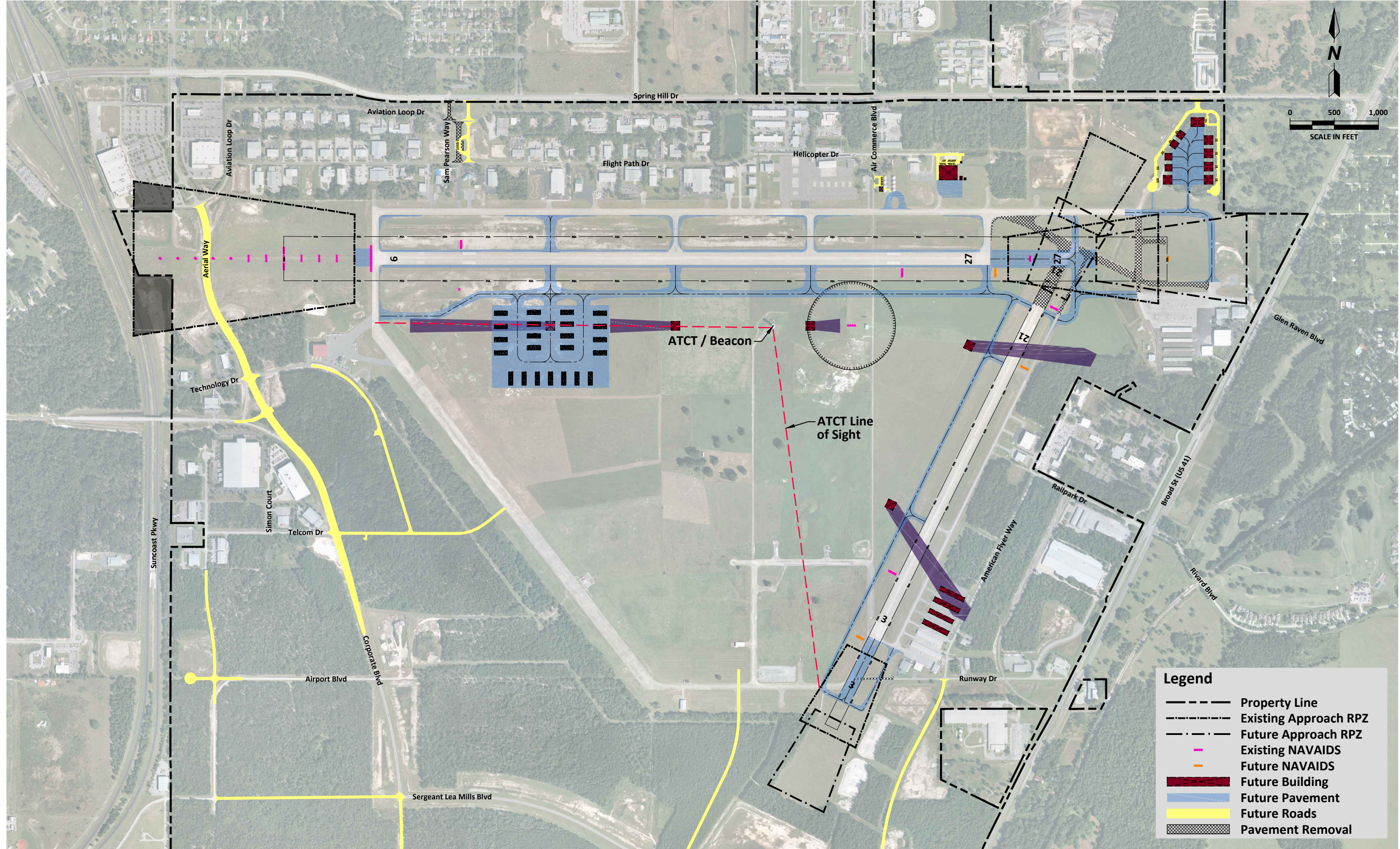


Figure 5-5 Sample Shadow Analysis
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5.7 Landside Development Alternatives

Figure 5-6 illustrates a potential landside development alternative for the vacant sites along Runway 3-21. As shown, the construction of several additional T-hangars could occur adjacent to the existing and planned T-hangar buildings. Six additional T-hangar buildings are shown which would double the existing and planned T-hangar storage capacity in the southeast corner of the airport. A small tiedown apron could also be constructed around that location to accommodate approximately 28 aircraft and an aircraft wash rack. The construction of these types of storage facilities for smaller based aircraft would help the FBO undertake some of the redevelopment plans at their current site to that cater to corporate aircraft. Near the proposed Runway 21 end, the construction of several corporate hangars could occur. The corporate hangars shown are 100 foot wide and 100 feet deep and could store a wide range of corporate jet sizes. The areas around the FBO are shown as reserved for expansion of their facilities and the area behind the potential T-hangar development is shown as reserved for industrial expansion due to the presence of the rail line. That is the only remaining parcel on the airport property that has direct access to a rail line and would be beneficial for an industrial development that would utilize the rail line. Other proposed landside development options are discussed and illustrated in conjunction with the preferred alternative.

As shown in **Figure 5-7**, several large hangar developments could be constructed on the west side of the airport property near the Runway 9 end. Besides the large cargo apron and processing facility that was previously proposed for BKV, additional corporate hangars and/or aircraft maintenance facilities could be constructed along the closed runway. Corporate hangars could be constructed along a shared taxilane to make use of the depth of the property behind the closed runway. Along the new parallel taxiway that is shown to the south of Runway 9-27, additional facilities could be constructed that would likely cater to larger commercial sized aircraft.

5.8 Support Facilities

The facility requirements analysis identified the need for several support facility and automobile access improvements at BKV including the following:

- ➔ A new airport maintenance facility capable of storing and fueling vehicles and equipment.
- ➔ A UFA CBP facility and apron.
- ➔ Construction of an aircraft wash rack.
- ➔ Construction of a cargo apron and support processing facilities.
- ➔ Realignment of Aerial Way and extension of Technology Drive in order to improve access to the west side of the airport and the Technology Center.
- ➔ Improve access from Spring Hill Drive to better define the main entrance to the airport.

Although previous graphics show the preferred location for the many support facilities, some proposed improvements have yet to be addressed. Based on discussions with airport personnel, the new maintenance facility should be sited in a location that would not interfere with future aviation and non-aviation development opportunities. Figures 5-6 and 5-7 illustrate a potential site in the southern portion of the airport near the Runway 3 end, which is far from where any near-term development is expected and would not interfere with the line of site between the ATCT and the airfield. The facility would ideally include automobile fuel tanks and pumps so that airport equipment could be refueled on-site instead of having to drive off-site to the Hernando County fueling facility.

Regarding access, a conceptual plan was developed for realigning the main entrance to the airport. The plan includes removing the portion of Sam Pearson Way and having a single entrance along Airpark Boulevard. That would reduce the number of turns that is currently necessary when using the main entrance and would provide direct access to the Airport Administration Building. Other projects could be conducted to provide improved access to the western and southern portions of the airport property and include a partial relocation of Aerial Way and extensions of Technology Drive, Telecom Drive, and Sergeant Lea Mills Boulevard. The construction of new roads would be necessary in some locations in order to provide access when there is a demand for development.

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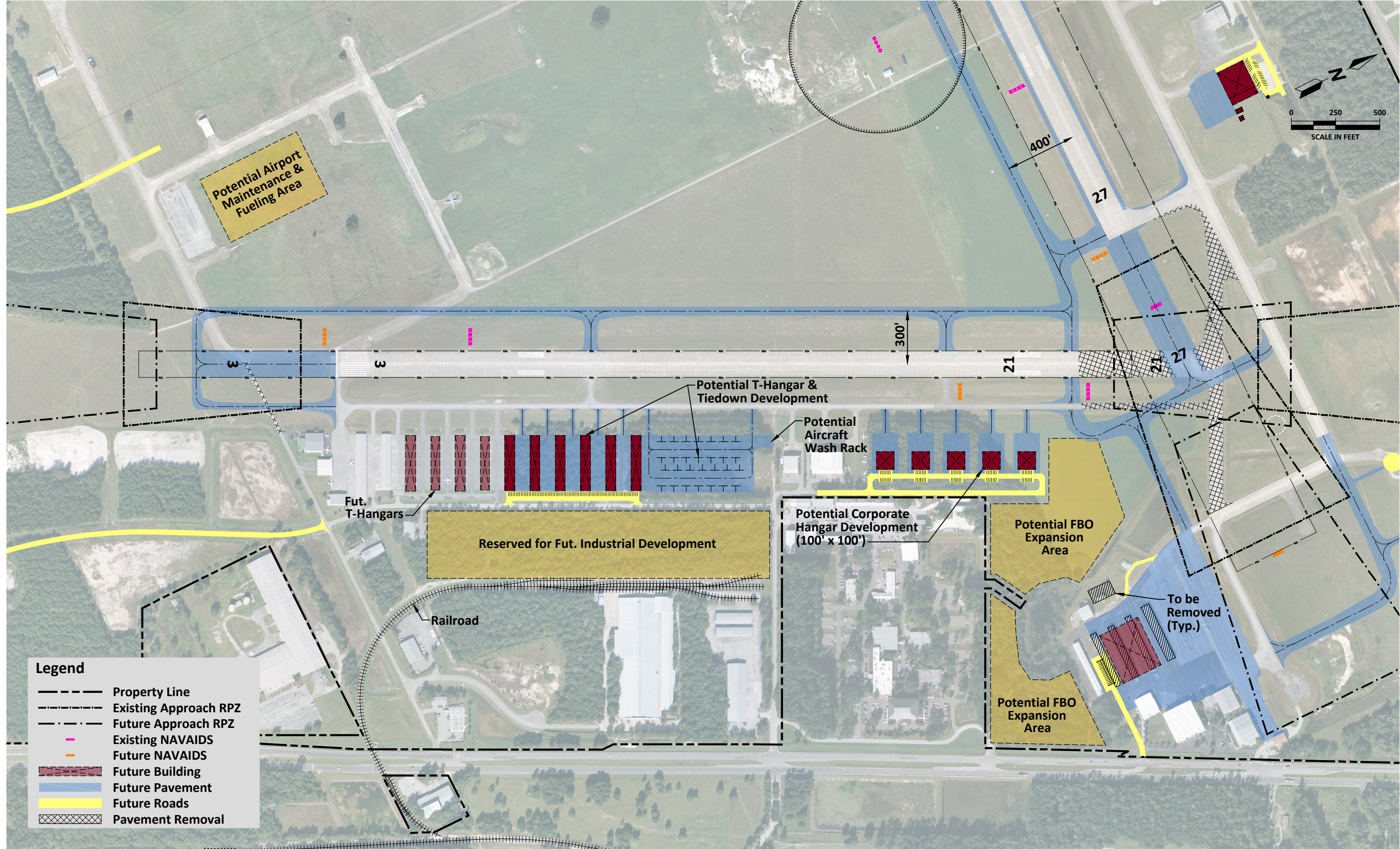


Figure 5-6 Eastside Development Alternative
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Figure 5-7 Westside Development Alternative
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Chapter 6.0

Preferred Alternative



BROOKSVILLE - TAMPA BAY REGIONAL AIRPORT
& TECHNOLOGY CENTER



Michael Baker
INTERNATIONAL

6.0 PREFERRED ALTERNATIVE

6.1 Introduction

The previous chapter presented the preliminary alternatives for BKV including options for extending Runway 9-27 to 8,000 feet and the continued expansion of the airport's landside facilities (e.g., the development of hangars and support facilities). The intent of the preliminary alternatives was to evaluate various scenarios for satisfying the identified facility requirements. A preferred alternative was ultimately selected that represented the recommended development concept for the 20-year planning period of this Master Plan Update. This chapter describes each component of the preferred alternative and also presents an environmental action plan that describes the potential environmental impacts and level of documentation that would be necessary to undertake the proposed developments. The cost estimates for the preferred alternative are presented in the next chapter in conjunction with a Capital Improvement Plan (CIP) that shows anticipated project phasing and funding sources over the course of the 20-year planning period.

6.2 Preferred Alternative

As shown in **Figure 6-1**, the preferred alternative includes a combination of the airfield and landside development alternatives that were presented in the previous chapter. The primary airfield recommendation is an extension of Runway 9-27 to the east (Runway 27 end) by 998 feet to provide a total runway length of 8,000 feet. In conjunction with the Runway 9-27, it would be necessary to shift Runway 3-21 to the south in order to prevent the creation of an overlapping "V" intersection at the ends of Runways 21 and 27. Some modification of the taxiways would also be necessary in that area to provide adequate aircraft traffic flows between the relocated runway ends. Other airfield improvements include the provision of paved blast pads and shoulders for Runway 9-27 and the associated taxiway system and navigational aid, signage, and lighting improvements. A detailed listing of all airfield projects that are anticipated during the planning period is presented with the CIP. In the long-term, additional parallel taxiways may be considered for both runways to allow for continued expansion of the airport's landside infrastructure.

The proposed landside improvements were tailored to separate the traffic on the airport by aircraft classification. The development on the east side of the airport along Taxiway 'B' is focused on providing facilities for small and medium-sized general aviation aircraft. The proposed development includes the provision of 10 additional T-hangar buildings with a total of 100 bays, a new aircraft tiedown apron with an aircraft wash rack, and five corporate hangars that are each 10,000 square feet. It is noted that some of the T-hangars are needed to serve as replacements for the existing T-hangars that are being removed in the Fixed Base Operator (FBO) area. On the west side of the airport, the development is focused on providing facilities for larger corporate and commercial aircraft. Along the closed runway, 10 corporate hangars are shown that are each 14,400 square feet and there are additional maintenance facilities shown that is a previously-considered concept for the area. The 10 corporate hangars are shown along shared taxilanes in order to maximize the development in that area and to reduce overall infrastructure costs, but other layouts may be considered in that area. Along the proposed parallel taxiway that is shown to the south of Runway 9-27, a large cargo apron and processing facility is shown and two larger areas are preserved for activities associated with larger commercial-sized aircraft. The cargo apron was a previously-designed project that provided a ready-to-go plan if the airport was approached by a cargo operator.

Other landside improvements are shown in pockets of the property just north of Runway 9-27 including a potential U.S. Customs and Border Protection (CBP) facility, an aircraft Maintenance, Repair, and Overhaul (MRO) facility, and another corporate hangar development in the northeast corner of the airport property that contains 10 hangars of various sizes.

6.3 Non-Aviation Land Use Analysis

After the preferred development was selected for airfield and landside infrastructure at BKV, it was possible to identify other portions of the airport property that could be considered for non-aviation development. These represent areas that do not have direct access to the airfield and that may not be needed to support the anticipated aviation demands at BKV. **Figure 6-2** illustrates 13 parcels of land where non-aviation development may be considered. The available areas range in size from as small as 8.8 acres to as large as 345 acres, but in no way represents an actual parcelization of the airport's land. In the southwest corner of the airport property, there are several large tracts of land available for lease within the industrial park. It is anticipated that those areas would continue to attract industrial and corporate businesses that desire to be located in Hernando County. Area 3 is located along the rail line and should therefore be reserved for a company that needs rail access. Areas 1, 2, and 4 have direct access from heavily traveled roads in the area (Spring Hill Drive and Broad Street / U.S. Route 41) and could accommodate multi-story structures. The information presented in this land use analysis may be used to better understand the non-aviation development opportunities that exist at BKV.

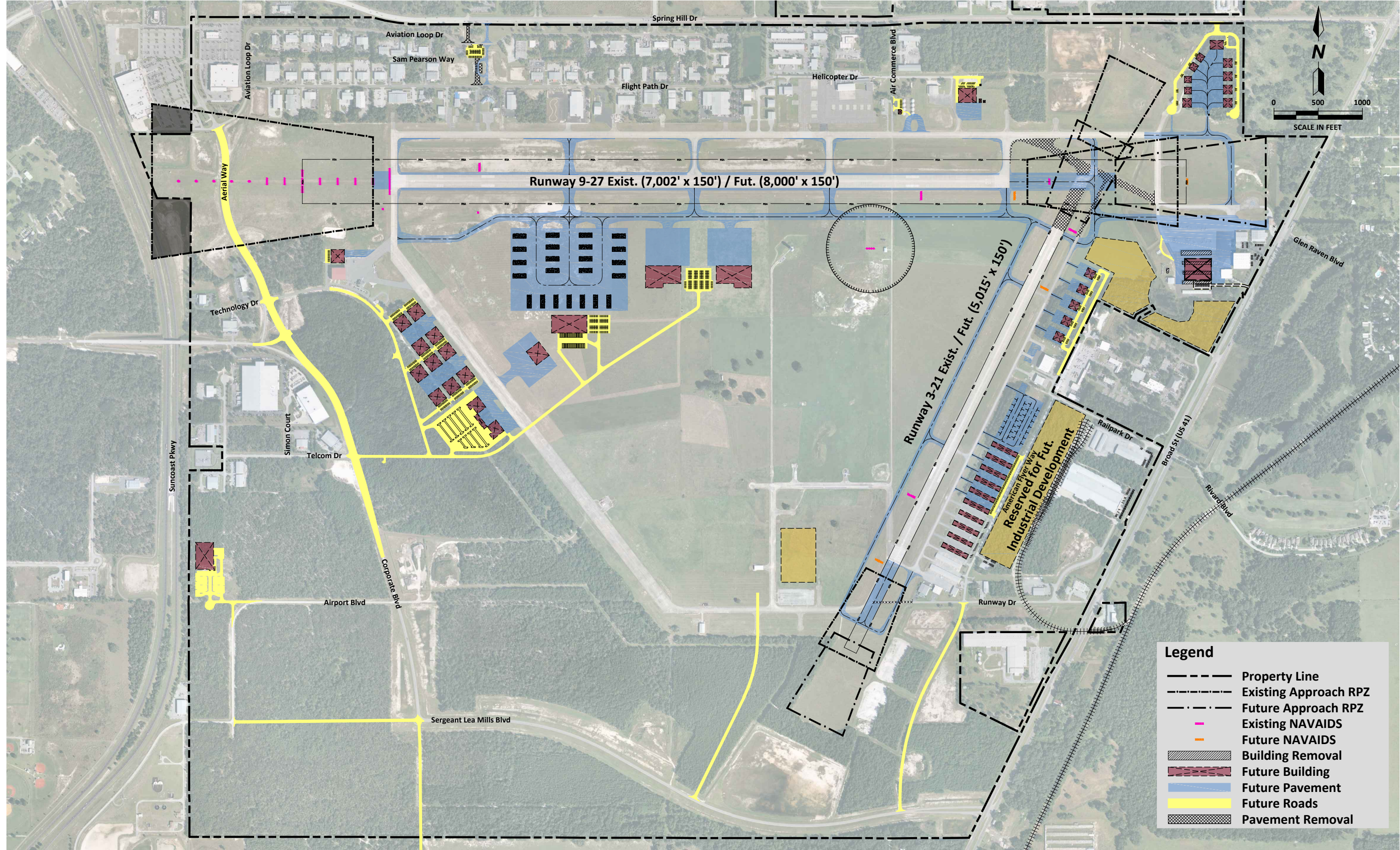


Figure 6-1 Preferred Alternative
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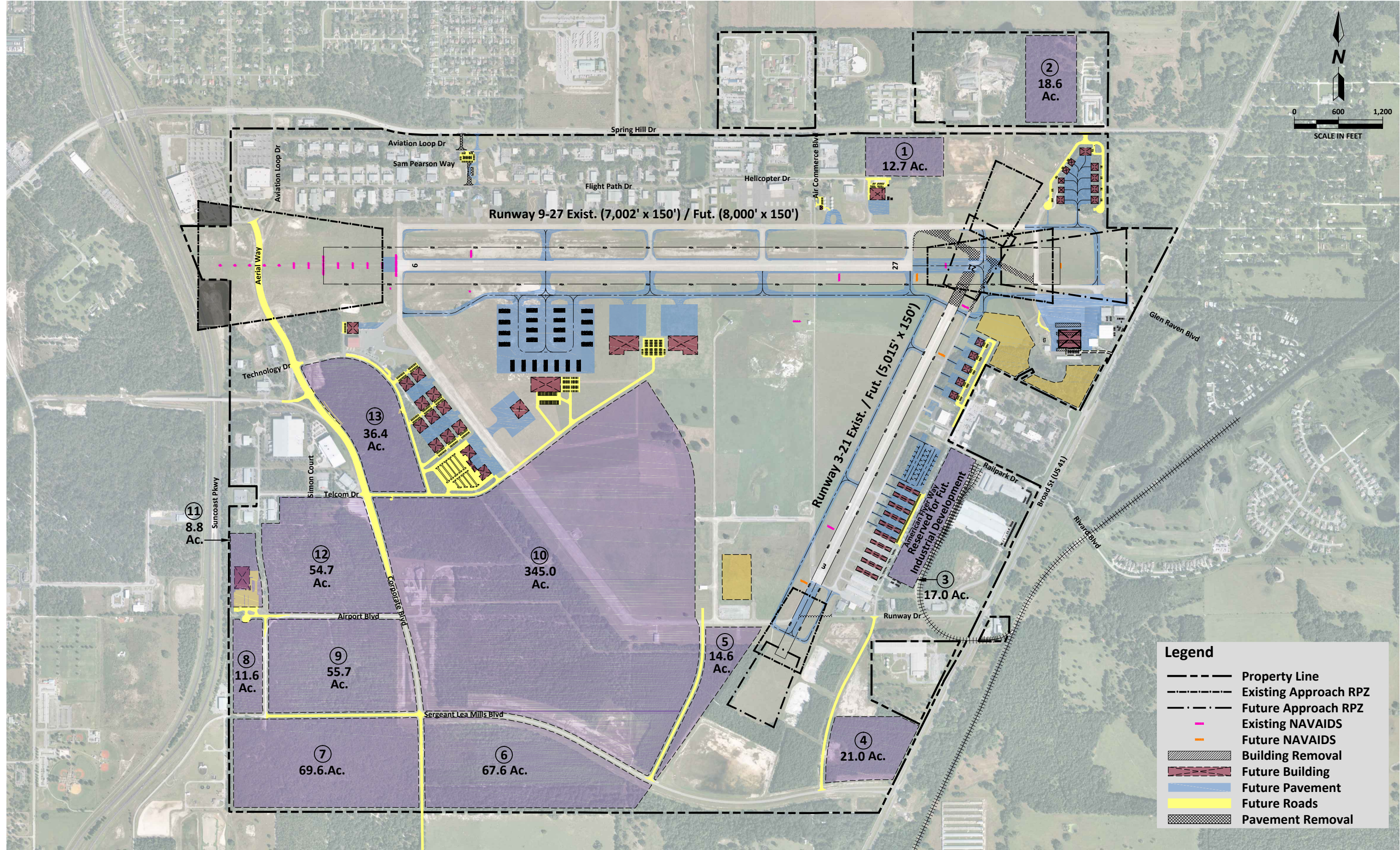


Figure 6-2 Non-Aviation Land Use Analysis
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6.4 Noise Contours and Land Use Compatibility

The FAA's Integrated Noise Model (INM) computer program is used to generate airport noise contours and to evaluate incompatible noise exposure to sensitive land uses such as residential properties, schools, places of worship, and hospitals. The noise contours illustrate the Day-Night Average Sound Level (DNL) that occurs during an average day and are generated by inputting various airport-specific factors into INM (aircraft activity and fleet mix, flight tracks, runway utilization, day and night activity, etc.). According to the FAA's Environmental Desk Reference for Airport Actions, "DNL is the 24-hour average sound level in decibels (dB). This average is derived from all aircraft operations during a 24-hour period that represents an airport's average annual operational day. [...] DNL adds a 10 dB noise penalty to each aircraft operation occurring during nighttime hours (10 p.m. to 7 a.m.). DNL includes that penalty to compensate for people's heightened sensitivity to noise during this period." The FAA identifies DNL levels of 65 dB and higher as incompatible with noise sensitive land uses.

Using the latest version of INM (Version 7.0d), DNL noise contours were generated for the following two scenarios at BKV: 1) existing 2013 activity levels, fleet mix, and runway configuration, and 2) forecast 2033 activity levels, fleet mix, and runway configuration (including an extension of the Runway 9-27 to the east and a shift of Runway 3-21 to the south). The INM inputs in **Table 6-1** were derived from the fleet mix forecasts in Table 3-6 and 3-8 and by reviewing historical flight records to identify aircraft models that commonly operate at BKV. As shown in **Figure 6-3**, the DNL 65 dB contour remains within the airport's boundary under the existing and forecast scenarios. With the extension of Runway 9-27 and the shift of Runway 3-21, the 2033 DNL 65 dB contour would not encompass any sensitive land uses, and therefore, the preferred airfield development should not result in any significant noise impacts.

Aside from noise, the projects illustrated within the preferred alternative should not produce any new incompatible land uses. The relocated Runway Protection Zones (RPZs) would remain on the airport property beyond the ends of Runway 3, 21, and 27. Although portions of the RPZ beyond the end of Runway 9 currently extends over the Suncoast Parkway and the parking lot in front of Target, no additional incompatible land uses would be introduced into that RPZ as part of the preferred alternative. Furthermore, easements are recommended for those portions of the RPZ that extend off the airport property in order to be able to clear trees and to prevent the construction of incompatible land uses. The airspace is currently protected in that area in accordance with the Hernando County Code of Ordinances, which describes a specific zoning ordinance pertaining to the airport (Article X – Brooksville-Tampa Bay Regional Airport Zoning Ordinance).

Table 6-1
Integrated Noise Model (INM) Inputs

Aircraft Type	Model	INM Code	2013 Operations	2033 Operations
Single-Engine Piston	Cessna 182	CNA182	37,871	55,707
Multi-Engine Piston	Beechcraft Baron 58	BEC58P	3,607	5,367
Turboprop	Cessna Conquest	CNA441	2,404	3,346
Jet (Small)	Lear 35	LEAR35	459	1,065
Jet (Medium)	Bombardier Challenger	CL600	953	2,212
Jet (Commercial)	Boeing 757-300	757300	0	580
Military Turboprop	Lockheed C130	C130AD	200	297
Military Helicopter	Sikorsky S-70	S70	4,809	7,156

Source: Michael Baker Jr., Inc., 2015.

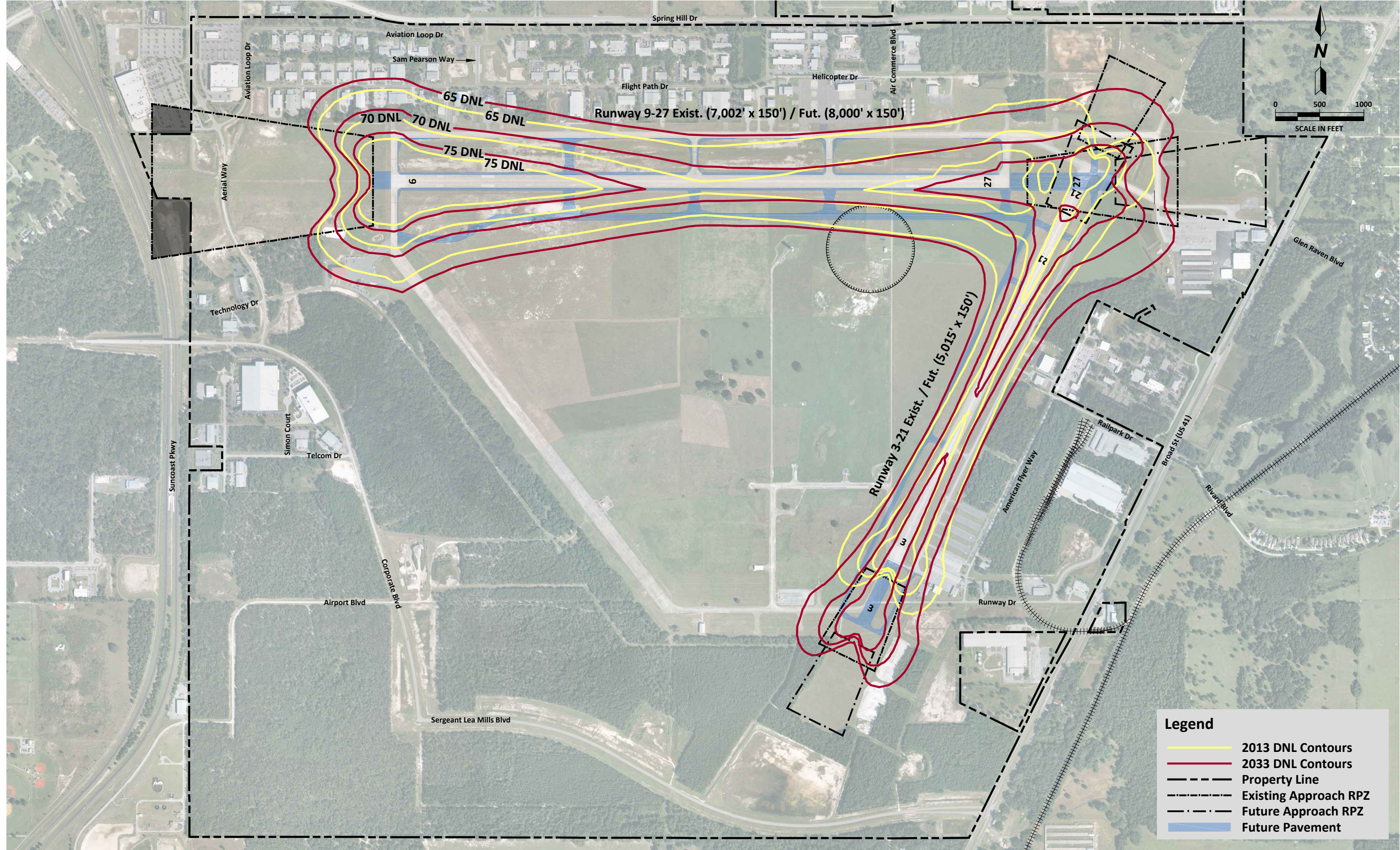


Figure 6-3 Noise Contours
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6.5 Potential NEPA Documentation and Environmental Permits

The following sections describe the necessary level of documentation and permitting that would be associated with undertaking the projects proposed within the preferred alternative, as well as identify any potential environmental impacts could be expected.

Potential NEPA Documentation

Change 1 of FAA Order 1050.1E, Environmental Impacts: Policies and Procedures, provides the FAA policy and procedures to ensure compliance with the requirements of National Environmental Policy Act (NEPA) for FAA funded projects and lists the type of NEPA documentation required for each project type. Chapter 3 of FAA Order 1050.1E contains advisory and emergency actions and categorically excluded projects and actions. Categorically excluded projects and actions are those that meet the criteria contained in 40CFR 1508.4 and represent actions that do not normally require and EA or EIS and do not individually or cumulatively have a significant effect on the environment. Chapter 4 of FAA Order 1050.1E provides a summary of requirements for environmental assessments and findings of no significant impact (FONSI) and lists examples of actions or projects that normally require an EA which includes but is not limited to the following:

- ➔ Actions that are not categorically excluded
- ➔ Actions that are categorically excluded but involves at least one extraordinary circumstance that may significantly impact the environment
- ➔ Actions that require a Section 404 Individual permit
- ➔ Establishment of fuel storage and distribution systems
- ➔ Federal financial participation in or unconditional airport layout plan approval of a major runway extension

Potential Regulatory Permits

Permitting requirements for each project type are based upon current federal, state, and local environmental regulations. The following criteria were used to determine the potential environmental permit that would be required for each project:

1. State Environmental Resource Permit (ERP)

An ERP is required if the project meets one of the following criteria:

- a. The project proposes work in, on or over wetlands and surface waters.
- b. The project proposes to construct more than 4,000 square feet of impervious or semi-pervious surface.
- c. The project proposed has an area that is greater than 1 acre.
- d. The project proposes impounding greater than 40-acre feet.
- e. The project has a dam that is greater than 10 feet in height.
- f. The project is part of a larger development plan.
- g. The project is a modification of an existing permit.

2. National Pollutant Discharge Elimination System (NPDES) Permit for Construction Activity

An NPDES for Construction permit is required if the project area is greater than 1 acre.

3. Gopher Tortoise Relocation Permit

The project is in an undeveloped upland that has the potential to contain gopher tortoise habitat and gopher tortoise.

4. FDEP Industrial Wastewater Permit

The project has the potential to contaminate groundwater.

5. Section 404 Permit or Corps of Engineers (COE) Dredge and Fill Permit

A Section 404 Permit is required if the project proposes to fill or dredge wetlands.

Preferred Alternative Projects

The projects proposed for the preferred alternative was overlaid on a Florida Land Use, Cover and Classification System (FLUCFCS) map and the most recent aerial photograph to determine if the proposed project has would potentially impact developed areas, wetlands, non-forested uplands, and forested uplands. The projects proposed for the preferred alternative, their potential impact to wetlands, forested uplands, and protected species, the anticipated level of documentation (Categorical Exclusion or Environmental Assessment) that will be required by the FAA to satisfy NEPA requirements and the section of FAA Order 1050.1E that the project falls under, and the regulatory permits that would be required to construct the project are listed in **Table 6-2**.

The projects have been divided into the following:

1. Projects with no potential environmental impact
2. Projects with potential protected species impact
3. Projects with potential wetland impact
4. Projects with potential wetland and protected species impact

Projects with No Potential Environmental Impacts

Projects with no potential environmental impacts are located on developed areas within airport property. These include mowed upland or paved areas that do not require land acquisition and have a project area that is greater than one acre. These projects are typically categorically excluded and require an ERP and NPDES permit except when specifically identified in FAA Order 1050.1E as requiring additional documentation such as the construction of a fueling facility or a major runway extension.

Projects with Potential Protected Species Impacts

Projects with potential protected species impacts are projects that are located on undeveloped forested and non-forested areas of the airport that has the potential to contain gopher tortoise and their habitat. The gopher tortoise is a listed species in the State of Florida and impacts to this listed species and their habitat require a Florida Fish and Wildlife Conservation Commission Gopher Tortoise Relocation Permit. The projects under this category are categorically excluded except for

the fuel farm and Runway 9-27 extension which requires an Environmental Assessment (EA) per FAA Order 1050.1E.

Projects with Potential Wetland Impacts

Projects that are located in areas that contain wetlands or are near wetlands are required to have an ERP permit. In the State of Florida there is a memorandum of agreement between the state and the COE for Joint Application such that the ERP also serves as the application for a Section 404 or COE Dredge and Fill Permit. Projects with wetland impacts that require a Section 404 Individual permit are also required to have EA NEPA documentation. Projects with wetland impacts that can be permitted with a Section 404 Nationwide or General Permit would most likely be categorically excluded. The realigned airport entrance road has the potential to impact State Surface Waters which is not a Waters of U.S. and therefore would not require a Section 404 permit. The Corporate Boulevard extension and other roadway projects have the potential to impact wetlands and may require a Section 404 permit depending on the total area of wetlands that would be impacted and therefore may require an EA to meet NEPA requirements.

Table 6-2 Preliminary Environmental Review of Preferred Alternative												
Project	Acreage	Noise	Air Quality	Wetland	Upland Forested	Protected Species	NEPA Documentation	1050.1E Reference	State Permit	Federal Permit	Comments	FLUCFCS Code Impacted
Projects with No Environmental Impacts												
T-Hangars (4 Buildings - Construction)	6.6	N	N	N	N	N	CatEx	310 f	ERP, NPDES	None	Project area has been cleared & paved	8100
Airfield Electrical Improvements (Design & Construction)	8.8	N	N	N	N	N	CatEx	310 g	ERP, NPDES	None		8100
FBO Apron Rehabilitation (Construction) - remill - resurface	11	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None	Project area is paved	8100
Realigned Airport Entrance Road (Design & Construction) -	5.4	N	N	Y	N	N	CatExD	310 a or k	ERP, NPDES	None*	State surface water impact. *Provided the surface water is not Waters of the U.S. or the project is permitted as COE Nationwide or General Permit	6530
Airport Signage (Landside)		N	N	N	N	N	CatEx or CatExD	310 f	ERP, NPDES	None		4400/4120
T-Hangar Demolition	3.9	N	N	N	N	N	CatEx	310 f	ERP, NPDES	None		8100
Airport Security Improvements (Construction)		N	N	N	N	N	CatEx	309 h	ERP, NPDES	None	Project area assumed to be developed.	8100
FBO Hangar, Parking, & Access Improvements (American Aviation)	4.7	N	N	N	N	N	CatEx or CatExD	310 f	ERP, NPDES	None		8100
Wildlife Hazard Remediation (Grading Improvements)	5	N	N	N	N	N	CatEx	310 e	ERP-Exemption	None	RSA & TSA - mowed areas	8100
Runway 9 ILS Replacement (MALSR)	21.4	N	N	N	N	N	CatEx	309 b	ERP, NPDES	None		8100
Runway 9 ILS Replacement (Glide Slope & Localizer)	3.2	N	N	N	N	N	CatEx	309 b	ERP, NPDES	None		8100
Pavement Maintenance (2,400 LF of Closed Runway) - resurface only	11.1	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None		8100
Closure of Runway Drive (Pavement Removal)	0.6	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None		8100
Runway End Decoupling (Runway Ends 21 and 27)	5.7	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None		8100
Pavement Maintenance (Taxiway B)	4.6	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None		8100
Customs Facility	4.1	N	N	N	N	N	CatEx	310 f	ERP, NPDES	None		8100
Taxiway A8 Connector (Asphalt)	1.5	N	N	N	N	N	CatEx	309 e	ERP, NPDES	None		8100
Pavement Maintenance (Runway 3-21 - Asphalt)	17.2	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None		8100
Runway 3-21 Shift (Asphalt - Runway 3 End Only)	9.4	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None		8100
Air Cargo Apron (Phase I) & Taxiway C Improvements	22.5	N	N	N	N	N	CatEx	310 e & 310	ERP, NPDES	None		8100
Air Cargo Building	9	N	N	N	N	N	CatEx	310 f	ERP, NPDES	None		8100
Pavement Maintenance (Runway 9-27 - Asphalt)	24.1	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None		8100
Blast Pads & Shoulders (Runway 9-27) - new	9	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None		8100
Pavement Maintenance (Taxiway A - Asphalt)	23.9	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None		8100
Taxiway A Fillet & Shoulder Improvements (widening)	2	N	N	N	N	N	CatEx	310 e	ERP, NPDES	None		8100
Projects with Potential Protected Species Impacts												
MRO Facility (Construction)	4.6	N	Y	N	Y	Y	CatEx	310 f	ERP, NPDES	None	Contains gopher tortoise	4340
Extension of Telecom Drive & Technology Drive with Infrastructure Improvements	9.9	N	N	N	Y	Y	CatEx or CatExD	310 a	ERP, NPDES	None	May contain gopher tortoise	4400/4120
Corporate Boulevard & Aerial Way Realignment	22	N	N	N	Y	Y	CatEx or CatExD	310 a	ERP, NPDES, GTRP	None	May contain gopher tortoise	2600/7400/4400/8100
Westside Infrastructure Improvements (utilities)	50	N	N	N	Y	Y	CatEx or CatExD	310 f	ERP, NPDES, GTRP	None	May contain gopher tortoise	4400; 8100
Eastside Apron & Aircraft Wash Rack	9	N	N	N	Y	Y	CatEx or CatExD	310 f	ERP, NPDES, GTRP, FDEP IWP	None		4340;1900;8100
Airfield Signage Improvements	0.5	N	N	N	N	Y	CatEx	310 f	GTRP	None	May contain gopher tortoise	8100
Westside Aircraft Maintenance Facilities	7.2	N	N	N	Y	Y	CatEx or CatExD	310 f	ERP, NPDES, GTRP	None	May contain gopher tortoise	4400;4120;8100
Airport Maintenance & Fueling Facility - new area	5.5	N	N	N	N	Y	Focused EA	401 f	ERP, NPDES	None	May contain gopher tortoise	8100
Taxilane Improvements (T-hangar Taxilanes)	5.5	N	N	N	Y	Y	CatEx or CatExD	310 e	ERP, NPDES, GTRP	None	May contain gopher tortoise	4340;8100
Eastside Tree Removal (GA & Industrial Parcels - 30+ Acres) - east of Runway 3-21 & Taxiway B	30	N	N	N	Y	Y	CatEx or CatExD	310 f	ERP, NPDES, GTRP	None	May contain gopher tortoise	4340;1900;8100
T-Hangars (3 Buildings)	4.6	N	N	N	Y	Y	CatEx or CatExD	310 f	ERP, NPDES, GTRP	None	May contain gopher tortoise	4340;8100
Westside Corporate Hangar Development (Phase 1)	7.2	N	N	N	Y	Y	CatEx or CatExD	310 f	ERP, NPDES, GTRP	None	May contain gopher tortoise	4400;4120;8100
Eastside Corporate Hangar Development (Phase 1)	5.1	N	N	N	Y	Y	CatEx or CatExD	310 f	ERP, NPDES, GTRP	None	May contain gopher tortoise	4340;8100
Westside Maintenance Hangar & Apron Expansion	1.7	N	N	N	Y	Y	CatEx or CatExD	310 e	ERP, NPDES, GTRP	None	May contain gopher tortoise	4400;4120;8100
Taxilane Improvements (T-Hangar Taxilanes)	5.5	N	N	N	Y	Y	CatEx or CatExD	310 e	ERP, NPDES, GTRP	None	May contain gopher tortoise	4400;4120;8100
T-Hangars (3 Buildings)	5.5	N	N	N	Y	Y	CatEx or CatExD	310 f	ERP, NPDES, GTRP	None	May contain gopher tortoise	4400;4120;8100
Runway 9-27 Extension (Asphalt)	30.7	Y	Y	N	N	Y	EA	401k (3)	ERP, NPDES. GTRP	None	May contain gopher tortoise; Requires updated noise contours or Part 150 Study	8100
South Connector Road - Sergeant Lea Mills Boulevard to Midfield (Design and Construction)	6.9	N	N	N	Y	Y	CatEx or CatExD	310 a	ERP, NPDES, GTRP	None	May contain gopher tortoise	4400;4120;8100
Westside Corporate Hangar Development (Phase 2)	9.3	N	N	N	Y	Y	CatEx or CatExD	310 f	ERP, NPDES, GTRP	None	May contain gopher tortoise	4400;4120;8100
Eastside Corporate Hangar Development (Phase 2)	7.1	N	N	N	Y	Y	CatEx, CatExD	310 f	ERP, NPDES, GTRP	None	May contain gopher tortoise	4340;8100

Table 6-2 Preliminary Environmental Review of Preferred Alternative												
Project	Acreage	Noise	Air Quality	Wetland	Upland Forested	Protected Species	NEPA Documentation	1050.1E Reference	State Permit	Federal Permit	Comments	FLUCFCS Code Impacted
Northeast Apron & Hangar Development	19.3	N	N	N	Y	Y	CatEx or CatExD	310 f	ERP, NPDES, GTRP	None	May contain gopher tortoise	4100;8100
Parallel Taxiway C (Runway 9-27 - Asphalt)	49.2	N	N	N	N	Y	CatEx or CatExD	310 e	ERP, NPDES, GTRP	None	May contain gopher tortoise	8100
Westside Commercial Aviation Development (2 areas)	42.6	N	N	N	Y	Y	CatEx or CatExD	310 e	ERP, NPDES, GTRP	None	May contain gopher tortoise	4400;4120;8100
Parallel Taxiway D (Runway 3-21 - Asphalt)	32.2	N	N	N	N	Y	CatEx or CatExD	310 e	ERP, NPDES, GTRP	None	May contain gopher tortoise	8100
Projects with Potential Wetland Impacts												
Corporate Boulevard Extension (Design and Construction)	12.9	N	N	Y	Y	Y	CatEx D/Focused EA	310 a	ERP, NODES, GTRP	404		4120; 4400; 2100;6530
Other Roadway Projects (West of Lee Mills and North of Lee Mills)	9.8	N	N	Y	Y	Y	CatExD/Focused EA	310 a	ERP, NPDES, GTRP	404	May contain gopher tortoise	4120; 6530;7400; 4400
ERP = Environmental Resource Permit NPDES = National Pollutant Discharge Elimination System Permit for Construction Activity Section 404 = Corps of Engineers Dredge and Fill Permit GTRP = Gopher Tortoise Relocation Permit FDEP IWP = FDEP Industrial Wastewater Permit												

Chapter 7.0

Implementation Plan



BROOKSVILLE - TAMPA BAY REGIONAL AIRPORT
& TECHNOLOGY CENTER



Michael Baker
INTERNATIONAL

7.0 IMPLEMENTATION PLAN

7.1 Introduction

The primary objective of this chapter is to analyze the financial feasibility of developing the projects included in the Capital Improvement Program (CIP) for BKV. The proposed financial plan was developed after evaluating the financial structure of BKV and identifying potential sources of revenue that may be available to fund capital improvement projects. The funding sources were then matched with projects over an estimated phasing schedule to determine the financial implications of undertaking the recommended capital improvements. The implementation plan presented herein describes the staging of proposed improvements and identifies various means of funding the improvements. It is the intent of this implementation plan to provide general financial guidance to airport staff for making policy decisions regarding the recommended development of the airport over the 20-year planning period.

7.2 Airport Financial Structure

Most airports are responsible for maintaining their own operating and expense budget in what is referred to as an “Enterprise Fund.” Enterprise funds are simply described as a fund used to account for revenues received for goods or services provided to the general public on a continuing basis that are primarily financed through user charges. Federal grant assurances mandate that airports maintain accounting records in accordance with federally accepted standards in order to illustrate that airport revenues are not being comingled with local government sources. Within the Hernando County budget, the enterprise fund for BKV is referred to as the Airport/Industrial Park fund. All local match funding for capital improvement projects come from airport revenues and the airport’s reserve account; however, it is conceivable that during special circumstances the airport may implement alternative methods (commercial loan, etc.) to finance revenue-generating projects that could potentially benefit the community and/or generate additional revenues. The principal sources of revenue identified at BKV are as follows:

- ➔ Hangar Rental Revenues
- ➔ Aviation Land Lease Revenues
- ➔ Florida Army National Guard Lease Revenues
- ➔ Fuel Flowage Fees on Aviation Fuel Sales
- ➔ Other User Fees
- ➔ Non-Aviation Building Leases
- ➔ Non-Aviation Land Lease Revenues

As shown in **Table 7-1**, the largest portion of the airport’s revenue comes from non-aviation sources. From 2009 to 2014, an average of approximately 37 percent of the revenues at BKV came from aviation-related sources and the remaining 63 percent came from non-aviation and other sources. This highlights the importance of the growth in both the aviation and non-aviation related development at BKV in order for the airport to maximize on the potential to have a financially self-sustainable Airport/Industrial Park fund for Hernando County.

**Table 7-1
Historical Operational Revenues
Brooksville-Tampa Bay Regional Airport**

Item	Fiscal Year (Oct-Sep)						Avg % of Ops Budget
	2009	2010	2011	2012	2013	2014	
Property Revenue (Leases & Rentals)							
<u>Aeronautical Use</u>							
Hangar Leases	385,661	429,649	436,198	369,674	382,677	438,396	
FBO Lease	48,738	61,535	67,933	64,734	48,353	126,345	
Land (Aeronautical)	32,160	26,610	27,300	30,884	34,812	32,702	
FL National Guard	70,814	70,814	43,256	31,554	-	31,554	
Subtotal Aeronautical Revenue	537,373	588,607	574,687	496,846	460,842	628,997	37.0%
<u>Non-Aeronautical</u>							
Building Leases	546,946	572,580	529,844	502,258	503,211	506,563	
Building Rentals	19,688	34,750	33,675	34,060	3,125	12,000	
APNE	99,345	100,453	99,345	95,417	91,489	91,969	
County Maintenance Department	43,483	42,032	41,728	41,973	41,803	41,945	
Corporate Airpark	147,912	148,467	147,928	146,803	146,803	150,611	
Land (Non-Aeronautical)	318,669	203,218	158,307	168,884	181,177	199,592	
Land (Agricultural)	3,461	5,070	10	1,970	3,520	1,050	
User Fees (Land)	1,700	1,700	1,700	1,700	1,700	1,700	
County Utility Department (HCUD)	3,851	3,851	-	3,851	3,850	-	
Subtotal Non-Aeronautical Revenue	1,185,055	1,112,122	1,012,537	996,916	976,678	1,005,430	59.1%
Subtotal Property Revenue	1,722,428	1,700,729	1,587,224	1,493,762	1,437,520	1,634,427	96.0%
Subtotal Other Revenues	72,128	67,075	75,155	82,432	83,442	67,249	4.0%
Total Operating Revenue	1,794,557	1,767,804	1,662,379	1,576,194	1,520,962	1,701,676	100.0%

Just as the airport has regular streams of revenue, it conversely has a number of annual expenditures which are necessary in order to operate and maintain the airport. The principal sources of airport expenses at BKV are generally described as follows:

- ➔ Employee Salaries and Benefits
- ➔ Maintenance Expenses
- ➔ Capital Improvement Projects
- ➔ Insurance
- ➔ Services
- ➔ Utility Fees
- ➔ Miscellaneous Expenses
- ➔ Supplies and Equipment

As shown in **Table 7-2**, salaries and wages account for a large portion of the airport's expenses, as do contracted professional services and facility maintenance. As the airport continues to expand its envelope for aviation and non-aviation development, it is anticipated that the required costs for those categories of expenses will continue to grow, particularly as added staff, infrastructure, and facilities may be needed to manage, maintain, and market the airport property. A detailed assessment of the airport's financial structure is presented in conjunction with the Business Plan.

A summary of the airport's historical profit/loss statement is presented in **Table 7-3**. Although years 2013 and 2014 show a deficit in the airport's finances, this was primarily due to several factors including litigation expenses, hurricane repairs, and unreimbursed expenses for contracted professional services. It is the intent of this implementation plan and the associated Business Plan to show methods for the airport to show a more break even or positive financial scenario moving forward during the planning period with a primary focus on the next five years (2015 to 2019).

Table 7-2 Historical Expenses Brooksville-Tampa Bay Regional Airport							
Item	Fiscal Year (Oct-Sep)						Avg % of Ops Budget
	2009	2010	2011	2012	2013	2014	
Salaries & Wages							
Salaries & Wages	265,413	251,063	288,186	308,175	325,026	308,730	
Overtime & Special Pay	381	704	148	1,430	2,978	3,738	
Subtotal - Salaries & Wages	265,794	251,767	288,334	309,605	328,004	312,468	
Fringe Benefits							
FICA (Matching)	20,051	18,689	21,065	22,608	23,329	22,147	
Retirement	28,021	28,305	29,015	17,016	22,475	27,182	
Life & Health Insurance	42,028	51,669	46,715	48,533	48,797	54,327	
Worker's Compensation	12,109	11,605	11,196	10,980	10,361	7,422	
Other Benefits	0	2,046	6,359	6,275	0	4,337	
Subtotal - Fringe Benefits	102,209	112,314	114,350	105,412	104,962	115,415	
Subtotal - Personnel	368,003	364,081	402,684	415,017	432,966	427,882	28.7%
Contracted Services							
Professional	19,385	25,365	21,173	26,038	88,588	220,123	
Engineering [1]	10,452	117,082	32,104	76,116	78,108	552,090	
Insurance	62,016	61,176	48,093	52,180	75,961	74,225	
Other Contracted Services	31,007	35,459	7,786	18,685	30,703	45,324	
Subtotal - Contracted Services	122,859	239,081	109,155	173,019	273,359	891,763	23.7%
Operating Services & Supplies							
Office Supplies	5,991	1,430	1,368	2,085	3,434	2,050	
Printing & Binding	258	575	1,153	1,734	1,027	1,811	
Operating Supplies	6,835	5,238	3,493	5,671	6,068	7,974	
Fuel & Lubricants	9,167	9,713	12,994	17,246	17,999	14,831	
Equipment (Expensed)	34,714	2,360	1,909	4,356	2,636	3,516	
Equipment (Rental)	3,344	3,458	5,932	3,872	2,802	3,223	
Books/Publications/Subscriptions	291	298	379	491	622	640	
Dues & Memberships	1,465	1,565	1,300	2,840	4,190	2,455	
Travel & Per Diem	1,448	2,476	4,176	5,773	7,362	10,111	
Education/Training/Tuition	480	1,456	810	1,394	679	1,859	
Subtotal Operating Services & Supplies	63,994	28,568	33,515	45,462	46,819	48,469	2.8%
Utilities							
Communications	3,304	952	744	819	1,450	1,226	
Communications (ATCT)	0	0	0	0	40,989	23,365	
Postage & Freight	983	1,689	2,276	2,006	1,857	2,952	
Water/Sewer	29,306	21,655	44,246	36,015	32,446	34,523	
Electricity	16,368	17,626	15,756	15,531	14,743	13,264	
Subtotal Utilities	49,960	41,922	63,022	54,371	91,484	75,331	4.6%
Maintenance & Repairs							
Buildings & Grounds (Aeronautical)	9,669	19,367	12,073	472,028	647,762	64,630	
Buildings & Grounds (Non-Aeronautical)	18,137	2,524	106,246	12,398	3,168	132,037	
Vehicles	7,159	2,011	2,870	4,082	1,254	10,354	
Equipment	38,993	30,472	36,100	31,527	24,341	58,765	
Subtotal Maintenance & Repairs	73,959	54,373	157,289	520,034	676,525	265,786	23.5%
Administrative Charges & Fees							
Promotional Activities	5,696	20,250	18,812	41,631	34,756	49,097	
Advertising (Legal)	232	193	173	1,079	517	204	
Bank Charges	1,079	1,840	1,349	1,158	1,163	1,097	
Filing Fees	730	614	80	502	828	670	
Permit Applications	6,447	3,015	9,788	1,135	3,384	2,989	
Interdepartment Charges							
Airport Security	0	0	24,449	23,989	24,495	25,290	
County Cost Allocation	194,956	139,313	108,026	90,589	119,812	249,364	
Special Assessments	1,659	3,791	-1,684	26,361	6,402	9,334	
Capital Recovery (Fleet)	8,309	12,780	9,854	8,371	8,371	8,299	
Capital Recovery (Fleet Facility)	964	1,009	1,042	669	561	0	
Capital Recovery (T.S.)	0	0	0	0	1,153	1,153	
Other Charges & Fees	3,182	0	0	0	275	0	
Bad Debt (Accounts Receivable)	0	0	50,000	20,000	0	20,000	
Subtotal - Administrative Charges & Fees	223,253	182,806	221,888	215,486	201,718	367,497	16.7%
Total Operating Expenses (w/o Depreciation)	902,027	910,832	987,554	1,423,389	1,722,871	2,076,729	100.0%

**Table 7-3
Historical Profit/Loss Statement
Brooksville-Tampa Bay Regional Airport**

Item	Fiscal Year (Oct-Sep)					
	2009	2010	2011	2012	2013	2014
Operating Revenues						
Property Income (Aero)	537,373	588,607	574,687	496,846	460,842	628,997
Property Income (Non-Aero)	1,185,055	1,112,122	1,012,537	996,916	976,678	1,005,430
Other Income	72,128	67,075	75,155	82,432	83,442	67,249
Total Operating Revenues	1,794,557	1,767,804	1,662,379	1,576,194	1,520,962	1,701,676
Operating Expenses [1]						
Personnel	368,003	364,081	402,684	415,017	432,966	427,882
Contracted Services	122,859	239,081	109,155	173,019	273,359	891,763
Operating Services & Supplies	63,994	28,568	33,515	45,462	46,819	48,469
Utilities	49,960	41,922	63,022	54,371	91,484	75,331
Maintenance & Repairs	73,959	54,373	157,289	520,034	676,525	265,786
Administrative Charges & Fees	223,253	182,806	221,888	215,486	201,718	367,497
Operating Expenses	902,027	910,832	987,554	1,423,389	1,722,871	2,076,729
Net Surplus (Deficit)	892,529	856,973	674,825	152,805	(201,909)	(375,052)
Notes:						
[1] does not include depreciation expense.						

7.3 Project Eligibility

The Capital Improvement Plan (CIP) identifies recommended projects and associated cost estimates for the 20-year planning period at BKV. FAA Order 5100.38C, Airport Improvement Program (AIP) Handbook, sets forth the official policy and procedures to be used in the administration of AIP grants. **Table 7-4** lists typical examples of eligible and ineligible AIP projects. Projects eligible for AIP funding at BKV are eligible for 90 percent of the project cost to be covered by the FAA with the Florida Department of Transportation (FDOT) and the airport responsible for five percent each. Each year, the airport receives \$150,000 in entitlement funds from the FAA. Those funds are mostly used for safety, pavement, lighting, and planning/design/environmental projects. If the airport is conducting a larger project that is more expensive, the FAA may provide additional discretionary funding. The FDOT also has special funding programs that typically cover up to either 80 percent of the project cost for non-revenue generating projects or 50 percent of the project cost for revenue-generating projects. It is noted that these are typical funding shares, but the shares at BKV tend to vary widely based on the individual project, local commitment to conduct projects, and funding availability. Therefore, the shares in the airport's CIP do not necessarily follow a standard funding scenario.

Table 7-4
Examples of Eligible vs. Ineligible AIP Projects

Eligible Projects	Ineligible Projects
Runway construction/rehabilitation	Maintenance equipment and vehicles
Taxiway construction/rehabilitation	Office and office equipment
Apron construction/rehabilitation	Fuel farms*
Airfield lighting	Landscaping
Airfield signage	Artworks
Airfield drainage	Aircraft hangars*
Land acquisition	Industrial park development
Weather observation stations (AWOS)	Marketing plans
NAVAIDs such as REILs and PAPIs	Training
Planning studies	Improvements for commercial enterprises
Environmental studies	Maintenance or repairs of buildings
Safety area improvements	
Airport layout plans (ALPs)	
Access roads only located on airport property	
Removing, lowering, moving, marking, and lighting hazards	
Glycol Recovery Trucks/Glycol Vacuum Trucks**	

Source: FAA AIP Overview, <http://www.faa.gov/airports/aip/overview/>, accessed December 9, 2014.

*May be eligible. Contact your local Airport District or Regional Office for more information.

**To be eligible, the vehicles must be owned and operated by the Airport and meet the Buy American Preference specified in the AIP grant. Contact your local Airport District or Regional Office for more information.

In addition, the following must also apply for FAA to consider a project for AIP funding:

The project sponsorship requirements have been met.

The project is reasonably consistent with the plans of planning agencies for the development of the area in which the airport is located.

Sufficient funds are available for the portion of the project not paid for by the Federal Government.

The project will be completed without undue delay.

The airport location is included in the current version of the NPIAS.

The project involves more than \$25,000 in AIP funds.

The project is depicted on a current airport layout plan approved by FAA.

7.4 Estimate of Project Costs

The estimated project costs presented for each identified airport improvement reflects a preliminary opinion of the probable implementation costs for the projects listed herein. In addition to the estimated construction costs, anticipated fees for design, inspection, permitting, surveying, testing and administration were also included in the overall estimate where applicable. Each project cost is presented in the base year dollar value and therefore does not reflect unanticipated increases in labor and material costs or changes in environmental legislation. In addition, a contingency was added to the overall costs of some projects to account for unforeseen variables. The contingency may range from zero percent to 30 percent based on the number of uncertainties associated with each project. A detailed environmental analysis may be required to recognize the full scope of environmental and budgetary impacts associated with the proposed development. Some projects may also require mitigation measures to offset impacts to environmentally sensitive areas whereas others may require some level of environmental remediation based on conditions that may or may not have been identified during this planning study. For those reasons, it is important to note that the estimates shown are accurate based on the costs of labor, materials, and anticipated impacts calculated at the time of this writing. As such, it is important to revisit and update costs regularly to ensure an accurate CIP.

7.5 Estimate of Project Costs

Based on the facility requirements and preferred alternative identified in previous chapters of this report, a CIP and phasing plan were identified for the 20-year planning period. The CIP planning period in this chapter is defined as 2015 through 2034. Each project within the CIP was assigned to a particular planning period or development stage (i.e., Stage 1, Stage 2, or Stage 3). The Stage 1 time period extends from 2015 to 2019, the Stage 2 period extends from 2020 to 2024, and the Stage 3 period spans the final 10 year timeframe from 2025 through 2034. A detailed breakdown of costs and phasing was produced for Stage 1 projects; however, the Stage 2 and 3 projects are listed in a more generalized order that should remain flexible.

Although this study charts a course for planned development, it must be emphasized that the planning and development of an airport is a continuous process. The rehabilitation of existing facilities and development of new facilities must be predicated on sustained demand, which justifies the costs of improvements. Therefore, periodic reevaluation of activity will be necessary to accommodate variations from the aviation forecasts and/or to adjust for other unforeseen factors. This will ensure that any change in aviation demand or within the local area will be fully considered as the development of BKV continues. It is also possible that other improvements not identified within this study may also be required to facilitate safe and efficient airport operations. All future improvement projects identified in this report or otherwise shall be compatible with the development strategies proposed in the Airport Layout Plan (ALP) for BKV.

Probable costs shown within the CIP were derived from various sources and are considered appropriate for planning purposes. Prior to constructing a specific project, the financial feasibility of the project should be re-examined and then detailed costs should be developed as part of a design and engineering study. The total probable cost of the 20-year CIP is estimated at nearly \$65.8 million in FAA investment, \$25.8 million in state investment, \$19 million in local investment, and \$84 million in private investment. Those figures includes all studies, infrastructure improvements, and proposed construction costs necessary to achieve the developments shown in the CIP tables. The CIP for each

period presents the improvements slated for implementation during the period, but it does not assume how financially feasible it will be for BKV to undertake the projects or whether or not funding will be available. Therefore, this list of projects should be used for planning purposes only.

7.6 Project Phasing

Since the airport's actual versus forecast activity levels may vary, it is important for the staging of proposed improvement projects remain sensitive to such variations. Some projects may take precedence over others, depending on their level of priority or due to the availability of funding. Thus, a list of prioritized improvements was established based upon the urgency of need, ease of implementation, logic of project sequencing, and input from airport staff. The objective was to establish an efficient order for project development and implementation that meets or exceeds the forecasted aviation demands at BKV while meeting the needs expressed by airport staff, the Technical Advisory Committee (TAC), Hernando County Board of County Commissioners, and the citizens of Hernando County. As mentioned earlier and shown in **Table 7-5**, the development schedule is divided into three general stages: Stage 1 (2015-2019), Stage 2 (2020-2024), and Stage 3 (2025-2034). The costs are provided in year 2015 dollars.

The projects in the first five years of the CIP include the construction of T-hangars, airfield electrical improvements, apron rehabilitation and new apron construction, the construction of a new Fixed Base Operator (FBO) maintenance hangar, navigational aid and lighting improvements, and other roadway and signage projects. The funding for many of these projects has been pre-determined between the airport, FAA, FDOT, private parties, and the county, but can be subject to change on a case-by-case and annual basis. The Stage 2 projects include items that will be necessary based on the forecast demand and to provide anticipated maintenance activities. Many of the Stage 3 projects include the large price runway, taxiway, hangar, and roadway projects that would likely only be implemented as required by demand at the time.

Table 7-5 BKV Capital Improvement Plan (2015-2034)						
Description	Total Cost	FAA	FDOT	Local	Private	Year/Phase
Stage 1 (2015-2019)						
T-Hangars (4 Buildings - Design)	\$53,728	\$0	\$0	\$53,728	\$0	2015
T-Hangars (4 Buildings - Construction)	\$2,942,100	\$0	\$0	\$2,942,100	\$0	2015
Airfield Electrical Improvements (Design & Construction)	\$1,470,800	\$1,323,720	\$117,664	\$29,416	\$0	2015
Exhibit A Property Map Update	\$75,000	\$67,500	\$3,750	\$3,750	\$0	2015
MRO Facility (Design)	\$224,000	\$0	\$0	\$224,000	\$0	2015
FBO Apron Rehabilitation (Design)	\$72,716	\$0	\$58,173	\$14,543	\$0	2015
FBO Apron Rehabilitation (Construction)	\$873,204	\$0	\$698,563	\$174,641	\$0	2015
Realigned Airport Entrance Road (Design & Construction)	\$630,000	\$0	\$504,000	\$126,000	\$0	2016
Airport Signage (Landside)	\$209,000	\$0	\$0	\$209,000	\$0	2016
T-Hangar Demolition	\$200,000	\$0	\$0	\$200,000	\$0	2016
Airport Security Improvements (Construction)	\$379,000	\$0	\$303,200	\$75,800	\$0	2016
MRO Facility (Construction)	\$5,700,000	\$0	\$3,000,000	\$2,700,000	\$0	2016
Runway 9 ILS Replacement (Glide Slope & Localizer)	\$1,000,000	\$0	\$800,000	\$200,000	\$0	2017
Extension of Telecom Drive & Technology Drive with Infrastructure Improvements	\$402,258	\$0	\$321,806	\$80,452	\$0	2017
FBO Hangar, Parking, & Access Improvements (American Aviation)	\$3,000,000	\$0	\$0	\$0	\$3,000,000	2017
Corporate Boulevard & Aerial Way Realignment	\$836,901	\$0	\$669,521	\$167,380	\$0	2018
Westside Infrastructure Improvements	\$500,000	\$0	\$250,000	\$250,000	\$0	2018
Eastside Apron & Aircraft Wash Rack	\$3,296,000	\$2,966,400	\$164,800	\$164,800	\$0	2018
Airfield Signage Improvements	\$800,000	\$0	\$640,000	\$160,000	\$0	2019
Westside Aircraft Maintenance Facilities	\$8,000,000	\$0	\$0	\$0	\$8,000,000	2019
Wildlife Hazard Remediation (Grading Improvements)	\$150,000	\$135,000	\$7,500	\$7,500	\$0	2019
Runway 9 ILS Replacement (MALSR)	\$175,000	\$225,000	\$8,750	\$8,750	\$0	2019
Stage 2 (2020-2024)						
Airport Maintenance & Fueling Facility	\$1,500,000	\$0	\$750,000	\$750,000	\$0	PH2
Taxilane Improvements	\$1,600,000	\$0	\$800,000	\$800,000	\$0	PH2
Eastside Tree Removal (GA & Industrial Parcels - 30+ Acres)	\$500,000	\$0	\$400,000	\$100,000	\$0	PH2
T-Hangars (3 Buildings)	\$2,400,000	\$0	\$1,200,000	\$1,200,000	\$0	PH2
Pavement Maintenance (2,400 LF of Closed Runway)	\$2,400,000	\$2,160,000	\$120,000	\$120,000	\$0	PH2
Westside Corporate Hangar Development (Phase 1)	\$8,000,000	\$0	\$0	\$0	\$8,000,000	PH2
Closure of Runway Drive (Pavement Removal)	\$35,000	\$0	\$0	\$35,000	\$0	PH2
Runway End Decoupling (Runway Ends 21 and 27)	\$4,500,000	\$4,050,000	\$225,000	\$225,000	\$0	PH2
Airport Support Equipment (Front End Loader)	\$35,000	\$31,500	\$1,750	\$1,750	\$0	PH2
Eastside Corporate Hangar Development (Phase 1)	\$3,000,000	\$0	\$0	\$0	\$3,000,000	PH2
Pavement Maintenance (Taxiway B)	\$800,000	\$720,000	\$40,000	\$40,000	\$0	PH2
ARFF Truck Replacement	\$1,000,000	\$0	\$800,000	\$200,000	\$0	PH2
Customs Facility	\$1,295,350	\$0	\$647,675	\$647,675	\$0	PH2
Taxiway A8 Connector (Asphalt)	\$700,000	\$630,000	\$35,000	\$35,000	\$0	PH2
Westside Maintenance Hangar & Apron Expansion	\$1,000,000	\$0	\$0	\$0	\$1,000,000	PH2
Stage 3 (2025-2034)						
Master Plan Update	\$350,000	\$315,000	\$17,500	\$17,500	\$0	PH3
Taxilane Improvements (T-Hangar Taxilanes)	\$1,600,000	\$0	\$800,000	\$800,000	\$0	PH3
T-Hangars (3 Buildings)	\$2,400,000	\$0	\$1,200,000	\$1,200,000	\$0	PH3
Runway 9-27 Extension (Asphalt)	\$7,000,000	\$6,300,000	\$350,000	\$350,000	\$0	PH3
Runway 3-21 Shift (Asphalt - Runway 3 End Only)	\$3,300,000	\$0	\$2,640,000	\$660,000	\$0	PH3
Air Cargo Apron (Phase I) & Taxiway C Improvements	\$16,632,984	\$0	\$0	\$0	\$16,632,984	PH3
Air Cargo Building	\$5,000,000	\$0	\$0	\$0	\$5,000,000	PH3
Pavement Maintenance (Runway 9-27 - Asphalt)	\$14,000,000	\$12,600,000	\$700,000	\$700,000	\$0	PH3
Blast Pads & Shoulders (Runway 9-27)	\$9,300,000	\$8,370,000	\$465,000	\$465,000	\$0	PH3
Pavement Maintenance (Taxiway A - Asphalt)	\$8,300,000	\$7,470,000	\$415,000	\$415,000	\$0	PH3
Taxiway A Fillet & Shoulder Improvements	\$9,000,000	\$8,100,000	\$450,000	\$450,000	\$0	PH3
Corporate Boulevard Extension (Design and Construction)	\$0	\$0	\$0	\$0	\$0	PH3
South Connector Road - Sergeant Lea Mills Boulevard to Midfield (Design and Construction)	\$0	\$0	\$0	\$0	\$0	PH3
Westside Corporate Hangar Development (Phase 2)	\$12,000,000	\$0	\$0	\$0	\$12,000,000	PH3
Eastside Corporate Hangar Development (Phase 2)	\$4,500,000	\$0	\$0	\$0	\$4,500,000	PH3
Pavement Maintenance (Runway 3-21 - Asphalt)	\$3,500,000	\$0	\$2,800,000	\$700,000	\$0	PH3
Northeast Apron & Hangar Development	\$6,862,000	\$0	\$0	\$0	\$6,862,000	PH3
Other Roadway Projects	\$0	\$0	\$0	\$0	\$0	PH3
Parallel Taxiway C (Runway 9-27 - Asphalt)	\$8,000,000	\$7,200,000	\$400,000	\$400,000	\$0	PH3
Westside Commercial Aviation Development	\$16,000,000	\$0	\$0	\$0	\$16,000,000	PH3
Parallel Taxiway D (Runway 3-21 - Asphalt)	\$3,500,000	\$3,150,000	\$175,000	\$175,000	\$0	PH3
Totals (All Years)		\$65,746,620	\$25,819,652	\$18,988,785	\$83,994,984	
Average Per Year		\$3,257,331	\$1,290,983	\$949,439	\$4,199,749	
Stage 1 Totals		\$4,650,120	\$7,547,727	\$7,791,860	\$11,000,000	
Stage 2 Totals		\$7,591,500	\$5,019,425	\$4,154,425	\$12,000,000	
Stage 3 Totals		\$53,505,000	\$13,252,500	\$7,042,500	\$60,994,984	

7.7 Consumer Price Index (CPI) Adjustment

The improvements shown in previous tables illustrate the facilities needed at BKV to meet the forecast demands through the end of the 20-year planning period and likely beyond as well. The cost estimates were determined in year 2015 dollars, so as time goes by the values should be reviewed to determine if any project cost adjustments have occurred. Although the costs for construction projects is highly variable due to the fluctuating cost of materials (e.g., asphalt, steel, and energy production), a reasonable estimate of future costs can be calculated by adjusting the 2015 costs by the appropriate Consumer Price Index (CPI) inflation factor. The Bureau of Labor Statistics (BLS) provides an online CPI inflation calculator that may be used to compare historical costs to present day cost and is available on this website (http://www.bls.gov/data/inflation_calculator.htm).

7.8 Funding Analysis

As mentioned earlier, the funds for the projects listed in the first five years of the CIP have largely been programmed for the airport through a combination of FAA, FDOT, private, and local funds. **Table 7-6** further illustrates the funding allocation for the Stage 1 planning period, which has been determined through negotiation between the airport and the entities listed. The next section of this chapter concentrates on producing a five-year financial plan for the airport that would result in a financially self-sustainable Airport/Industrial Park enterprise fund for Hernando County.

Table 7-7 illustrates one proposed method for the airport to pay for the local share of project costs. For the larger cost items that would be paid for by the airport between 2015 and 2019, such as the T-hangars and the Maintenance, Repair, and Overhaul (MRO) facility, it is anticipated that the airport would seek a commercial loan to cover the construction costs. Some project funds have already been committed and accounted for by the airport including the design of the T-hangars, the MRO facility, and the FBO apron improvements, as has the construction of the FBO apron improvements. Those projects would not have to be reviewed as part of the cash flow analysis in this chapter because the associated funds have already been allocated in the airport's budget. The other projects would be covered by the airport's annual operating revenues and by funds in the airport's reserve account.

Table 7-6							
Stage 1 CIP Funding Analysis (2015-2019)							
Description	Total Cost	Funding Breakdown	FAA	State	Local	Private	Year
2015-1 T-Hangars (4 Buildings - Design)	\$53,728	LOCAL-100	\$0	\$0	\$53,728	\$0	2015
2015-2 T-Hangars (4 Buildings - Construction)	\$2,942,100	LOCAL-100	\$0	\$0	\$2,942,100	\$0	2015
2015-3 Airfield Electrical Improvements (Design & Construction)	\$1,470,800	FAA-90/STATE-8/LOCAL-2	\$1,323,720	\$117,664	\$29,416	\$0	2015
2015-4 Exhibit A Property Map Update	\$75,000	FAA-90/STATE-5/LOCAL-5	\$67,500	\$3,750	\$3,750	\$0	2015
2015-5 MRO Facility (Design)	\$224,000	LOCAL-100	\$0	\$0	\$224,000	\$0	2015
2015-6 FBO Apron Rehabilitation (Design)	\$72,716	STATE-80/LOCAL-20	\$0	\$58,173	\$14,543	\$0	2015
2015-7 FBO Apron Rehabilitation (Construction)	\$873,204	STATE-80/LOCAL-20	\$0	\$698,563	\$174,641	\$0	2015
2016-1 Realigned Airport Entrance Road (Design & Construction)	\$630,000	STATE-80/LOCAL-20	\$0	\$504,000	\$126,000	\$0	2016
2016-2 Airport Signage (Landside)	\$209,000	LOCAL-100	\$0	\$0	\$209,000	\$0	2016
2016-3 T-Hangar Demolition	\$200,000	LOCAL-100	\$0	\$0	\$200,000	\$0	2016
2016-4 Airport Security Improvements (Construction)	\$379,000	STATE-80/LOCAL-20	\$0	\$303,200	\$75,800	\$0	2016
2016-5 MRO Facility (Construction)	\$5,700,000	STATE-52.63/LOCAL-47.37	\$0	\$3,000,000	\$2,700,000	\$0	2016
2017-1 Runway 9 ILS Replacement (Glide Slope & Localizer)	\$1,000,000	STATE-80/LOCAL-20	\$0	\$800,000	\$200,000	\$0	2017
2017-2 Extension of Telecom Drive & Technology Drive with Infrastructure Improvements	\$402,258	STATE-80/LOCAL-20	\$0	\$321,806	\$80,452	\$0	2017
2017-3 FBO Hangar, Parking, & Access Improvements (American Aviation)	\$3,000,000	PRIVATE-100	\$0	\$0	\$0	\$3,000,000	2017
2018-1 Corporate Boulevard & Aerial Way Realignment	\$836,901	STATE-80/LOCAL-20	\$0	\$669,521	\$167,380	\$0	2018
2018-2 Westside Infrastructure Improvements	\$500,000	STATE-50/LOCAL-50	\$0	\$250,000	\$250,000	\$0	2018
2018-1 Eastside Apron & Aircraft Wash Rack	\$3,296,000	FAA-90/STATE-5/LOCAL-5	\$2,966,400	\$164,800	\$164,800	\$0	2018
2018-2 Airfield Signage Improvements	\$800,000	STATE-80/LOCAL-20	\$0	\$640,000	\$160,000	\$0	2019
2019-1 Westside Aircraft Maintenance Facilities	\$8,000,000	PRIVATE-100	\$0	\$0	\$0	\$8,000,000	2019
2019-2 Wildlife Hazard Remediation (Grading Improvements)	\$150,000	FAA-90/STATE-5/LOCAL-5	\$135,000	\$7,500	\$7,500	\$0	2019
2019-3 Runway 9 ILS Replacement (MALSR)	\$175,000	FAA-90/STATE-5/LOCAL-5	\$157,500	\$8,750	\$8,750	\$0	2019
Short-Term Totals	\$31,239,707		\$4,650,120	\$7,547,727	\$7,791,860	\$11,000,000	

Table 7-7			
Method of Financing Local Share of Airport Projects			
Description	Local Share	Method of Financing Local Share	Year
2015-1 T-Hangars (4 Buildings - Design)	\$53,728	Funds Already Accounted for (not included in cash flow analysis)	2015
2015-2 T-Hangars (4 Buildings - Construction)	\$2,942,100	\$500,000 from Airport Fund / \$2,442,100 20-Year Loan @ 4% Interest (half year in 2015 @ \$88,792, full year in later years @ \$177,583)	2015
2015-3 Airfield Electrical Improvements (Design & Construction)	\$29,416	Airport Funds	2015
2015-4 Exhibit A Property Map Update	\$3,750	Airport Funds	2015
2015-5 MRO Facility (Design)	\$224,000	Funds Already Accounted for (not included in cash flow analysis)	2015
2015-6 FBO Apron Rehabilitation (Design)	\$14,543	Funds Already Accounted for (not included in cash flow analysis)	2015
2015-7 FBO Apron Rehabilitation (Construction)	\$174,641	Funds Already Accounted for (not included in cash flow analysis)	2015
2016-1 Realigned Airport Entrance Road (Design & Construction)	\$126,000	County Line of Credit @ 1% Interest for 10 Years (annual payment of \$13,245)	2016
2016-2 Airport Signage (Landside)	\$209,000	Airport Funds	2016
2016-3 T-Hangar Demolition	\$200,000	Assumed that Sale of Scrap Metal would Equal Demolition Costs (not included in cash flow analysis)	2016
2016-4 Airport Security Improvements (Construction)	\$75,800	Airport Funds	2016
2016-5 MRO Facility (Construction)	\$2,700,000	20-Year Loan @ 4% Interest (annual payment of \$196,338)	2016
2017-1 Runway 9 ILS Replacement (Glide Slope & Localizer)	\$200,000	Airport Funds	2017
2017-2 Extension of Telecom Drive & Technology Drive with Infrastructure Improvements	\$80,452	County Line of Credit @ 1% Interest for 10 Years (annual payment of \$8,454)	2017
2017-3 FBO Hangar, Parking, & Access Improvements (American Aviation)	\$0	No Local Match	2017
2018-1 Corporate Boulevard & Aerial Way Realignment	\$167,380	County Line of Credit @ 1% Interest for 10 Years (annual payment of \$17,596)	2018
2018-2 Westside Infrastructure Improvements	\$250,000	County Line of Credit @ 1% Interest for 10 Years (annual payment of \$26,281)	2018
2018-1 Eastside Apron & Aircraft Wash Rack	\$164,800	Airport Funds	2018
2018-2 Airfield Signage Improvements	\$160,000	Airport Funds	2019
2019-1 Westside Aircraft Maintenance Facilities	\$0	No Local Match	2019
2019-2 Wildlife Hazard Remediation (Grading Improvements)	\$7,500	Airport Funds	2019
2019-3 Runway 9 ILS Replacement (MALSR)	\$8,750	Airport Funds	2019
Short-Term Totals	\$7,791,860		

7.9 Five Year Financial Plan

As mentioned earlier, the Business Plan included an in-depth analysis of the airport's historical revenues and expenses, as well as operating procedures, in order to determine if recommendations could be made to improve the finances of the airport in the future. The Business Plan focused on providing management and finance strategies for the short-term planning period between 2015 and 2019, but also presented overall practices that should be considered by the airport moving forward. It is the goal of Hernando County for the Airport/Industrial Park enterprise fund to be financially self-sustainable on an annual basis so that transfers from the General Fund do not have to occur to cover any annual losses at BKV. It is also desired for the airport to remain a continuously profitable entity for the county and to continue to grow and expand the aviation and non-aviation envelopes of the airport property. The airport is a key asset for Hernando County in that it has a large amount of land available for aviation and non-aviation development that can continue to help attract new businesses and jobs to the county. It was those themes that the business plan was largely developed around. Some recommendations of the business plan included the following:

- ➔ **Preserve and Enhance the Airfield** – It will be necessary to maintain and improve the airport's infrastructure in order to continue to provide a viable aviation facility.
- ➔ **Enhance Financial Performance** – Objectives include to develop and implement a formal rates and charges policy that ensures that leaseholds are generating an appropriate market rate, develop and implement a lease management program to better track commercial leases, to provide additional staffing, and to conduct a strategic plan every five years.
- ➔ **Promote and Facilitate Additional General Aviation Services and Facilities** – To develop additional T-hangars and conventional hangars and to support private development initiatives for corporate and commercial hangars, as well as to conduct continuous marketing programs to highlight the potential for growth at BKV. Also, to ensure that adequate general aviation services continue to be provided at the airport.
- ➔ **Prepare and Promote Aeronautical/Non-Aeronautical Property for Attracting New Businesses** – To continue to encourage aviation and non-aviation development on the airport property and to plan and conduct infrastructure improvements to facilitate in the quick development of parcels.
- ➔ **Pursue Aeronautical/Non-Aeronautical Business Opportunities to Enhance Revenue** – Develop a consistent marketing program to highlight BKV's development potential, identify a comprehensive incentive program to attract tenants, develop relationships with real estate experts, and hire a marketing specialist.
- ➔ **Pursue Creation of Additional Employment Opportunities for the Community** – Continue to expand business and job growth on the airport property through marketing, incentive, and academic opportunities, as well as to develop strategic relationships with employment-related organizations to constantly be aware of growth opportunities.

These general strategies went into the development of the five-year financial plan for BKV. Furthermore, the anticipated funding methods for the airport's local share were also incorporated into the financial plan. As of April 1, 2015, the airport's reserve fund had \$1,262,855 that is available to cover capital improvements, repairs and maintenance, and other unexpected expenses. Due to the high number of capital improvement projects that are being conducted in the short-term planning period, it is anticipated that the airport will have to utilize some of the reserve funds to cover project costs (e.g., for the T-hangar replacement). Description of the anticipated revenues, expenses, and profit-loss statements are provided below.

Anticipated Revenues

The anticipated revenues for the airport are presented in **Table 7-8**. Each year, it is anticipated that all aeronautical and non-aeronautical revenues will increase with the rate of inflation, which equates to approximately 1.80 percent per year. For hangar leases, it is anticipated that the 40 new T-hangars will be available to replace the existing T-hangars in the FBO area in 2016. For the purpose of this analysis, the target price for the 40 new units is an average of \$325 per month vs. an average of \$260 per month for the existing units. After the existing T-hangars are vacated, it is anticipated that they will be prepped for demolition and will remain vacant until that time. The financial analysis shows the MRO facility generating revenues beginning in 2017 at a monthly rate that is equivalent to 125 percent of the monthly loan payment. In 2018, it is assumed that one additional acre of aeronautical land will be leased at a rate of \$0.06 per square feet. Within the corporate airpark, it is assumed that an additional five acres of land will be leased at \$0.06 per square feet in 2017, 2018, and 2019, and 10 acres of additional non-aeronautical lands will be leased at the same rate in both year 2017 and 2019. Fuel flowage fees were increased at a rate of three percent per year. These assumptions result in the airport's revenues growing from \$1,701,685 in 2015 to \$2,263,495 by 2019, which equates to an overall growth of 33 percent during the five-year period.

Anticipated Expenses

The anticipated expenses for the airport are presented in **Table 7-9**. In order to handle the additional workload associated with maintaining and operating the airport on a day-to-day basis and the development that is planned for BKV, it is assumed that one additional new hire will be needed in year 2016 and 2018. For this analysis, an average salary of \$40,000 per year was used for the new hires and employee wages were increased at a rate of five percent per year. Benefits were increased at a rate of three percent per year and contracted services were increased at a rate of 1.50 percent per year; however, the rates for engineering services were slightly adjusted because the capital projects already include the design fees. Therefore, it is anticipated that the engineering fees shown will be used for miscellaneous services during the timeframe shown. The year-to-year increases for operating services and supplies was estimated at one percent, for utilities at one percent, for maintenance and repairs at three percent, and for administrative charges and fees at 1.50 percent. These assumptions result in the airport's expenses growing from \$1,220,099 in 2015 to \$1,544,242 by 2019, which equates to an overall growth of 27 percent during the five-year period. It should be noted this does not account for the additional payments that must be made for debt service and to fully cover the local share of project costs.

Anticipated Profit/Loss Statement

The anticipated profit/loss statement for the airport is presented in **Table 7-10**. As shown, before reflecting debt service and the local share costs for capital projects, the day-to-day operation and maintenance of the airport (i.e., the operating revenues minus the operating expenses) is expected to increase each year. However, as existing loan payments are complete and new loan payments must be made, and as the local share for capital projects must be covered, the airport would have to utilize reserve funds in some years to make up the difference.

Conclusions

Based on the assumptions presented herein, it is anticipated that the airport can continue to pay for the day-to-day operations and maintenance of the airport and also cover the local share of the project using a combination of budgeted and reserve funds. Although the information presented in the financial plan is subject to change based on project needs, changes in funding commitments from the FAA and FDOT, or for some other reason, the airport should have the financial flexibility to conduct the projects in the manner shown. The Business Plan describes additional project financing strategies that should be considered to more effectively manage conduct capital improvement projects and to further market the airport for private investment and development.

For the Stage 2 and 3 planning periods, similar financial analyses should be conducted as project time tables can be more clearly established based on need at the time. Similar to this analysis, it would be important to review historical revenues and expenses, prioritize projects, determine anticipated funding, and determine appropriate methods for covering the local share of projects.

**Table 7-8
Projected Operational Revenues
Brooksville-Tampa Bay Regional Airport**

Item	Fiscal Year (Oct-Sep)				
	2015	2016	2017	2018	2019
Property Revenue (Leases & Rentals)					
Aeronautical Use					
Hangar Leases/MRO	409,279	447,846	701,329	713,953	726,804
FBO Lease	70,859	72,135	73,433	74,755	76,100
Land (Aeronautical)	31,298	31,861	32,435	35,632	36,274
Sheriff's Department (Hangar)	4,242	4,318	4,396	4,475	4,555
<u>FL National Guard</u>	<u>42,076</u>	<u>42,833</u>	<u>43,604</u>	<u>44,389</u>	<u>45,188</u>
Subtotal Aeronautical Revenue	557,754	598,993	855,197	873,204	888,922
Non-Aeronautical					
Building Leases	536,385	546,040	555,868	565,874	576,060
Building Rentals	23,295	23,714	24,141	24,576	25,018
APNE	98,071	99,836	101,633	103,462	105,325
County Maintenance Department	42,920	43,692	44,479	45,279	46,094
Corporate Airpark	150,753	153,467	169,297	185,412	201,818
Land (Non-Aeronautical)	208,664	212,420	242,380	246,742	277,320
Land (Agricultural)	2,500	2,500	2,500	2,500	2,500
User Fees (Land)	2,000	2,000	2,000	2,000	2,000
<u>County Utility Department (HCUD)</u>	<u>2,613</u>	<u>2,660</u>	<u>2,708</u>	<u>2,757</u>	<u>2,806</u>
Subtotal Non-Aeronautical Revenue	1,067,200	1,086,329	1,145,006	1,178,603	1,238,940
Subtotal Property Revenue	1,624,954	1,685,322	2,000,203	2,051,807	2,127,863
Subtotal Other Revenues	76,731	77,803	78,907	80,044	81,216
Total Operating Revenue	1,701,685	1,763,125	2,079,110	2,131,851	2,209,078

Table 7-9 Projected Expenses Brooksville-Tampa Bay Regional Airport					
Item	Fiscal Year (Oct-Sep)				
	2015	2016	2017	2018	2019
Salaries & Wages					
Salaries & Wages	305,654	360,937	378,983	437,932	459,829
Overtime & Special Pay	<u>1,500</u>	<u>1,500</u>	<u>1,500</u>	<u>1,500</u>	<u>1,500</u>
Subtotal - Salaries & Wages	307,154	362,437	380,483	439,432	461,329
Fringe Benefits					
FICA (Matching)	23,383	27,612	28,992	33,502	35,177
Retirement	27,400	32,356	32,985	38,115	40,021
Life & Health Insurance	52,645	62,167	63,374	73,232	76,893
Worker's Compensation	11,477	13,553	13,816	15,965	16,763
Other Benefits	<u>1,500</u>	<u>1,500</u>	<u>1,500</u>	<u>1,500</u>	<u>1,500</u>
Subtotal - Fringe Benefits	116,405	137,188	140,667	162,314	170,355
Subtotal - Personnel	423,559	499,624	521,150	601,746	631,684
Contracted Services					
Professional	67,780	68,797	69,829	70,876	71,939
Engineering [1]	25,000	25,000	25,000	25,000	25,000
Insurance	63,209	64,157	65,120	66,097	67,088
Other Contracted Services	<u>28,583</u>	<u>29,012</u>	<u>29,447</u>	<u>29,889</u>	<u>30,337</u>
Subtotal - Contracted Services	184,572	186,966	189,770	192,617	195,506
Operating Services & Supplies					
Office Supplies	2,754	2,781	2,809	2,837	2,865
Printing & Binding	1,104	1,115	1,126	1,137	1,149
Operating Supplies	5,938	5,998	6,058	6,118	6,179
Fuel & Lubricants	13,795	13,933	14,072	14,213	14,355
Equipment (Expensed)	8,331	8,414	8,498	8,583	8,669
Equipment (Rental)	3,810	3,848	3,886	3,925	3,964
Books/Publications/Subscriptions	458	463	467	472	477
Dues & Memberships	2,326	2,349	2,372	2,396	2,420
Travel & Per Diem	5,277	5,330	5,383	5,437	5,491
Education/Training/Tuition	<u>1,124</u>	<u>1,135</u>	<u>1,147</u>	<u>1,158</u>	<u>1,170</u>
Subtotal Operating Services & Supplies	44,916	45,365	45,819	46,277	46,740
Utilities					
Communications	1,437	1,459	1,481	1,503	1,525
Communications (ATCT)	10,887	11,050	11,216	11,384	11,555
Postage & Freight	1,990	2,020	2,050	2,081	2,112
Water/Sewer	33,527	34,030	34,541	35,059	35,585
Electricity	<u>15,781</u>	<u>16,018</u>	<u>16,258</u>	<u>16,502</u>	<u>16,750</u>
Subtotal Utilities	63,622	64,576	65,545	66,528	67,526
Maintenance & Repairs					
Buildings & Grounds (Aeronautical)	210,382	216,694	223,195	229,891	236,787
Buildings & Grounds (Non-Aeronautical)	47,124	48,538	49,994	51,494	53,039
Vehicles	4,760	4,903	5,050	5,202	5,358
Equipment	<u>37,801</u>	<u>38,935</u>	<u>40,103</u>	<u>41,306</u>	<u>42,545</u>
Subtotal Maintenance & Repairs	300,068	309,070	318,342	327,892	337,729
Administrative Charges & Fees					
Promotional Activities	28,799	29,231	29,670	30,115	30,566
Advertising (Legal)	406	412	418	424	431
Bank Charges	1,300	1,320	1,340	1,360	1,380
Filing Fees	579	588	596	605	615
Permit Applications	4,527	4,595	4,663	4,733	4,804
Interdepartment Charges					
Airport Security	16,616	16,865	17,118	17,375	17,636
County Cost Allocation	152,598	154,887	157,211	159,569	161,962
Special Assessments	7,758	7,875	7,993	8,113	8,234
Capital Recovery (Fleet)	9,471	9,613	9,757	9,903	10,052
Capital Recovery (Fleet Facility)	718	729	740	751	762
Capital Recovery (T.S.)	390	396	402	408	414
Other Charges & Fees	585	593	602	611	621
Bad Debt (Accounts Receivable)	<u>15,225</u>	<u>15,453</u>	<u>15,685</u>	<u>15,920</u>	<u>16,159</u>
Subtotal - Administrative Charges & Fees	203,362	206,412	209,508	212,651	215,841
Total Operating Expenses (w/o Depreciation)	1,220,099	1,312,013	1,350,135	1,447,711	1,495,025

**Table 7-10
Projected Profit/Loss Statement
Brooksville-Tampa Bay Regional Airport**

Item	Fiscal Year (Oct-Sep)				
	2015	2016	2017	2018	2019
Operating Revenues					
Property Income (Aero)	557,754	598,993	855,197	873,204	888,922
Property Income (Non-Aero)	1,067,200	1,086,329	1,145,006	1,178,603	1,238,940
Other Income	<u>76,731</u>	<u>77,803</u>	<u>78,907</u>	<u>80,044</u>	<u>81,216</u>
Total Operating Revenues	1,701,685	1,763,125	2,079,110	2,131,851	2,209,078
Operating Expenses [1]					
Personnel	423,559	499,624	521,150	601,746	631,684
Contracted Services	184,572	186,966	189,770	192,617	195,506
Operating Services & Supplies	44,916	45,365	45,819	46,277	46,740
Utilities	63,622	64,576	65,545	66,528	67,526
Maintenance & Repairs	300,068	309,070	318,342	327,892	337,729
Administrative Charges & Fees	203,362	206,412	209,508	212,651	215,841
Operating Expenses	1,220,099	1,312,013	1,350,135	1,447,711	1,495,025
Operating Surplus (Deficit)	481,586	451,111	728,975	684,140	714,053
Less Debt Service	210,901	509,275	395,620	439,497	439,497
Less Local Share for Capital Projects	533,166	284,800	200,000	324,800	16,250
Net Operating Surplus (Deficit)	(262,481)	(342,964)	133,355	(80,157)	258,306
Reserve Fund Balance/Rollover (balance of \$1,262,855 on 4/1/2015)	1,000,374	657,411	790,765.93	710,609	968,915.03

Chapter 8.0

Airport Layout Plan



BROOKSVILLE - TAMPA BAY REGIONAL AIRPORT
& TECHNOLOGY CENTER



Michael Baker
INTERNATIONAL

8.0 AIRPORT LAYOUT PLAN

8.1 Introduction

The purpose of an approved Airport Layout Plan (ALP) is to serve as the blueprint for future airport development. One condition of accepting and utilizing grant funding for airport improvement projects is to maintain an updated ALP. For the Brooksville-Tampa Bay Regional Airport (BKV), the updated development recommendations presented in this study are pictorially summarized in the ALP drawing set and include the preferred concepts for airfield development, landside facility development, and other reserved areas for non-aviation use. The ALP drawing set represents a scaled, graphic presentation of the airport's 20-year development program, thereby providing the airport with a feasible improvement plan that would increase the capability and safety of aircraft operations, promote compatibility with existing and proposed developments, and further upgrade the airport to effectively serve the anticipated demands of general aviation, corporate, and potentially commercial aircraft traffic. The drawings depict the recommendations of this study with regard to aviation development for the short, intermediate, and long-term planning periods.

The dimensional information provided in the drawings demonstrates compliance with minimum airport design standards established by federal, state, and local authorities. The ALP Drawing Set was developed in accordance with the guidance outlined in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6, Airport Master Plans, AC 150/5300-13A, Airport Design, FAA ARP Standard Operating Procedure (SOP) 2.0, Standard Operating Procedure for FAA Review and Approval of Airport Layout Plans and other supporting circulars and orders.

The ALP drawing set includes the following individual drawing sheets:

- ➔ Title Sheet (Sheet 1)
- ➔ Airport Data Sheet (Sheet 2)
- ➔ Airport Layout Plan Drawing (Sheet 3)
- ➔ Airport Airspace Drawings (Sheets 4 through 6)
- ➔ Inner Portion of the Approach Surface Drawings (Sheets 7 through 10)
- ➔ Runway Departure Surface Drawings (Sheets 11 and 12)
- ➔ Terminal Area Drawing (Sheet 13)
- ➔ Land Use Drawing (Sheet 14)
- ➔ Airport Property Map/Exhibit A (Sheet 15)

8.2 Title Sheet (Sheet 1)

The Title Sheet serves as the introduction to the ALP drawing set. It includes the airport name, a location map, vicinity map, and an index of drawings included in the ALP drawing set. Also highlighted on the Title Sheet are the project name, sponsor's name, and the FAA grant number.

8.3 Airport Data Sheet (Sheet 2)

The Airport Data Sheet summarizes key elements that are depicted on the Airport Layout Plan Drawing such as airport coordinates, runway end elevations, runway high and low points, and true azimuths for each runway. Supplemental tables, as required by the FAA ALP Review Checklist, are depicted on the Airport Data Sheet including the airport data table and runway data table.

8.4 Airport Layout Plan Drawing (Sheet 3)

The Airport Layout Plan Drawing, also referred to as the ALP, depicts all existing facilities and proposed developments planned over the 20-year planning period at BKV. These plans are reviewed by and must be approved by the FAA prior to authorizing federal funding for future improvement projects. The ALP provides clearance and dimensional information required to show conformance with applicable FAA design standards as outlined in FAA AC 150/5300-13A, Airport Design. The ALP also reflects planned changes to physical features on the airport property and critical land use changes near the airport property that may impact navigable airspace or the ability of the airport to operate. The features of the ALP include, but are not limited to: the runway, taxiways, lighting, navigational aids, terminal facilities, hangars, other airport buildings, aircraft parking areas, automobile parking, and airport access elements.

Key dimensional criteria for Runway 9-27 was based on Runway Design Code (RDC) D-IV and Runway 3-21 was based on RDC B-II. The RDC and other runway approach factors are used to determine the physical characteristics of the runways (e.g., length, width, and strength), taxiway widths, and dimensions for the Runway Safety Area (RSA), Runway Object Free Area (ROFA), Building Restriction Line (BRL), clearance areas around navigational aids, etc.

8.5 Airport Airspace Drawings (Sheets 4 through 6)

Federal Aviation Regulations (FAR) Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace, prescribes airspace standards, which establish criteria for evaluating navigable airspace. Airport imaginary surfaces are established relative to the airport runways and types of approaches they provide. The size of each imaginary surface is based on the runway category with respect to the existing and proposed visual, non-precision, or precision approaches for that runway. The slope and dimensions of the respective approach surfaces are determined by the most demanding, existing or proposed, approach for each runway. For Runway 9-27 at BKV, the dimensions of the imaginary surfaces are applicable to the precision Instrument Landing System (ILS) approach to the Runway 9 end with one-half mile horizontal visibility minimums and the non-precision GPS approach to the Runway 27 end with one mile horizontal visibility minimums. For Runway 3-21, the dimensions of the imaginary surfaces are applicable to the non-precision GPS approaches to each runway end with one mile horizontal visibility minimums.

- ➔ Primary Surface – A rectangular area symmetrically located about the runway centerline and extending a distance of 200 feet beyond each runway end. Its elevation is the same as the nearest point along the runway edge. The primary surface for Runway 9-27 is 1,000 feet wide and the primary surface for Runway 3-21 is 500 feet wide.
- ➔ Horizontal Surface – An oval shaped, flat area situated 150 feet above the published airport elevation of 75.7 feet Above Mean Sea Level (AMSL) at BKV. Its dimensions are determined by connecting 10,000-foot arcs starting 200 feet beyond the future runway ends. The horizontal surface elevation for BKV is 225.7 feet AMSL.
- ➔ Conical Surface – A sloping area whose inner perimeter conforms to the shape of the horizontal surface. It extends outward for a distance of 4,000 feet measured horizontally, and slopes upward at a 20:1 ratio. At BKV, the conical surface extends upward to an elevation of 425.7 feet AMSL.

- ➔ Transitional Surface – A sloping area beginning at the edges of the primary and approach surfaces and sloping upward and outward at a ratio of 7:1.
- ➔ Approach Surface – This surface begins at the ends of the primary surface and slopes upward at a predetermined ratio while at the same time flaring out horizontally. The width and elevation of the inner ends conform to that of the primary surface, while the slope, length, and outer width are determined by the runway service category and existing or proposed instrument approach procedures.

8.6 Inner Portion of the Approach Surface Drawings (Sheets 7 through 10)

The Inner Portion of the Approach Surface Drawings show both plan and profile views of the approach surfaces beyond each runway end. The purpose of these drawings is to locate and document existing objects which represent obstructions to navigable airspace within the existing and proposed approach slopes for each runway. Additionally, the drawings show the ground profile and terrain features along the extended centerline of each runway end.

Any controlling structures, such as roadways, natural ground elevations, and trees, are also shown on the Inner Portion of the Approach Surface Drawings, if applicable. Additionally, fixed objects located along the extended runway centerlines are also illustrated on the sheets to provide an indication of the relative distance to the approach surfaces. As applicable, obstructions to navigable airspace are listed in an obstruction data table along with a recommended action for each obstruction.

8.7 Runway Departure Surface Drawings (Sheets 11 and 12)

The Runway Departure Surfaces Drawing consists of large scale plan views of departure surfaces for all runway ends at BKV. The Departure Surfaces Drawing depicts the ground contour along the extended runway centerline plus any significant natural or non-natural objects located along the extended runway centerline and also provides a top elevation for those objects. Commonly shown objects include buildings, roads, ditches, and trees. Surface penetration and disposition information is included in the associated obstruction data tables.

8.8 Terminal Area Drawing (Sheet 13)

The Terminal Area Drawing presents an enlarged view of the Fixed Base Operator (FBO) area at BKV and therefore provides additional dimensional details such as apron areas (existing and proposed) that are not easily visible on the ALP. This drawing denotes the short and long-term developments and improvements within the vicinity of the FBO complex at BKV and also illustrates many of the surrounding landside development recommendations. Existing and proposed automobile access and parking improvements are also included.

8.9 Land Use Drawing (Sheet 14)

The Land Use Drawing designates various sectors of the property for specific uses and also shows an aerial view of the land surrounding BKV. Additionally, the 2013 and 2033 noise contours developed as a component of this study have been superimposed on the drawing to ensure that appropriate

aviation-compatible zoning is maintained. The FAA has established national guidelines for land use compatibility related to airport-generated noise impacts. In most cases, noise sensitive land uses are considered incompatible if they are exposed to Day-Night Average Sound Levels (DNL) of 65 decibels or higher, unless noise mitigation measures are undertaken.

8.10 Airport Property Map (Sheet 15)

The Airport Property Map defines the existing and proposed airport boundaries in a graphical form. The purpose of the drawing and associated tables is to identify how property and easements have been acquired in the past as well as to illustrate properties and easements that should be obtained in the future as necessary to accommodate the proposed development plan. In order to promote compatible development, the purchase of easements is shown in the portions of the RPZ that extend beyond the Runway 9 end.

8.11 Summary

The ALP Drawing Set is intended to depict BKV's capital development program in graphical form. Prior to incorporating the developments herein, preliminary plans were presented to the Hernando County Board of County Commissioners (BOCC), Master Plan Technical Advisory Committee, and to the public for their review and approval. Thus, this plan set accurately reflects the goals and intentions of airport management and the adjacent community throughout the 20-year planning period.