Wilbur Smith Associates

Beaufort County Airport Master Plan Update

DRAFT

Submitted to:

The Beaufort County, South Carolina

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Executive Summary

Beaufort County Airport (ARW), also known as Ladys Island Airport, is a small general aviation airport located near Beaufort, South Carolina. The Airport serves a small, but growing community made up of retiree's, military personnel, residents, and businesses. The center of the Beaufort community is an urban complex consisting of the city of Beaufort, the town and harbor of Port Royal, the Naval Hospital Beaufort and two U.S. Marine Corps installations: Marine Corps Air Station (MCAS) and Marine Corps Recruit Depot, Parris Island. Adjacent to this area are the islands of Hilton Head, Fripp Island, and Hunting Island with beach and resort developments.

National and Regional Map

Purpose of the Master Plan

Last updated in 1978, Beaufort County has chosen to update the ARW Airport Master Plan. The primary objective of this Master Plan is to produce a comprehensive planning guide for the continued development of a safe, efficient, and environmentally compatible aviation facility that meets the goals of the Beaufort County Airport, users and tenants, and the surrounding service area. The plan must also satisfy FAA guidelines for the development of Airport Master Plans and facilities, while incorporating characteristics that are unique to the service area. The study focuses on aeronautical forecasts, need and justification for development, and a staged plan for recommended development.

Based on this analysis, future recommended improvements for the Airport will be depicted on an Airport Layout Plan (ALP). The plan will be adopted by Beaufort County and the City of Beaufort as well as accepted by the South Carolina Aeronautics Commission (SCAC) and Federal Aviation Administration (FAA), thus allowing the Airport eligibility for state and federal grants for assistance in funding the improvements.

Existing Conditions

The Airport occupies approximately 110 acres, owned by the county. U.S. Route 21 is the major roadway providing access to ARW, but there are several roadway and highway systems which connect the region to major cities.

Beaufort County Airport is owned and operated by Beaufort County, which also oversees the operations at Hilton Head Island Airport (HXD). The Airport also gets direction from the Beaufort County Airports Board (BCAB). This body is composed of 11 members plus two County/Town of Hilton Head councilmen who serve as liaison. Beaufort County owns and operates the FBO, providing flight and fuel services to based and transient aircraft, as well as maintaining and renting space in three T-hangar complexes capable of storing 34 aircraft.

The primary component of the airfield at ARW is Runway 7/25, measuring 3,434 feet long by 75 feet wide and having a load-bearing capacity of 50,000 pounds for dual-wheel gear aircraft. The runway is accessed by a partial parallel taxiway as well as a 21,750 square yard apron with entrance/exit taxiways leading from it. Additional facilities such as the terminal building, vehicle parking, navigation and communications equipment, and fuel storage all contribute to the Airport's day-to-day operation. The Master Plan evaluates these facilities individually to determine their safety, efficiency and effectiveness. The recommended plan will address the deficiencies of existing facilities as well as facilities needed to accommodate growth.

Forecast Summary

It is anticipated that Beaufort County Airport will see increasingly strong growth during the 20-year planning period, depending on the removal of possible constraints. Market area demographic trends indicate that the Airport is likely to outpace national growth in general aviation. Based aircraft are expected to increase from 56 aircraft in 2008 to 92 aircraft by 2028. The Airport will also see an increase in the number of operations. By the end of the planning period, more than 74,000 operations are projected to occur. The following table summarizes the projections for the Beaufort County Airport throughout the 20-year Master Plan Update planning period.

	Based Aircraft Total	Total Operations
Actual		
2008	56	41,000
Projected		
2013	63	47,500
2018	72	55,100
2023	81	63,800
2028	92	74,100

Source: Wilbur Smith Associates and airport records

Facility Requirements

Based on the Airport's future role and using industry and FAA planning standards, the facility requirements analysis identifies the following needs for Beaufort County Airport:

- Extension of Runway 7-25 from 3,434 feet to 5,000 feet
- Extension of the parallel taxiway to Runway 25 end
- Improvements necessary to comply with FAA standards for runway safety areas and runway object free areas

- Development of at least 25 additional T-hangars spaces
- Development of 31,500 SF of conventional/corporate hangars
- Expansion of terminal building by at least 1,750 square feet
- Relocation and expansion of vehicular parking
- Development of maintenance storage facility of 800 square feet

Alternatives Analysis

The process of selecting development recommendations consists of identifying and evaluating alternatives that meet the Airport's 20-year requirements. The most critical of the requirements identified are the need to increase compliance with FAA standards, provide for aviation expansion, and preserve flexibility while increasing revenue generation potential. The airfield alternatives are evaluated on their impacts to the surrounding environment and community while providing a 5,000-foot runway to accommodate future demand. The following table summarizes the impacts related to each development alternative.

Impact Evaluation Factors	Meeting Standards	Alternative 1	Alternative 2	Alternative 3
Marsh/OCRM (AC)	5	11	1	19
Land Acquisition (AC)	0	41	153	0
Number of Parcels	0	24	63	0
Number of Homes	0	8	16	0
Number of Businesses	0	0	7	0
Beaufort MCAS Impacts	No	No	Yes	No
Cemetery Impacts	No	1	No	No
Hwy 21 Tunnel/Realignment	No	Yes	No	No
Power Substation & Pole Impacts	13	20	Unknown	13
Noise	On-Airport	On-Airport*	On-Airport*	On-Airport
Approach Impacts	No	No	Yes	Yes

*On-airport noise only through land acquisition tied to the runway extension/realignment

Alternative 3, shown on the last page of this executive summary, is the recommended development option for ARW. The analysis results in an airfield recommendation to extend the runway into the salt marsh, a total of 1,566 feet from the end of Runway 25 (not including runway safety area). While this alternative avoids impacts to nearby residents, businesses, and Highway 21, it has impacts to the salt marsh.

Airport Development Program

Concerns over airport expansion have been raised and bring into question the willingness to undertake a runway extension at ARW. In light of these concerns, a phased approach to development provides an ultimate runway length of 5,000 feet, beyond the planning horizon with incremental development within the 20-year period. The recommended airfield alternative is broken down into the following phases:

Phase 1 (0-5 years) – Runway safety area improvements to meet FAA design standards and taxiway extension to provide a full length parallel.

Phase 2 (6-10 years) – 966-foot runway and taxiway extension to 4,400 feet to support existing based aircraft.

Phase 3 (11-20 years) – No airfield expansion.

Ultimate – 600-foot runway and taxiway extension to achieve 5,000 feet. This will not be carried out within the 20-year planning period and may be studied further in subsequent master planning efforts.

Key landside development recommendations have been provided that fit with the chosen airfield development and allow for the expansion of existing facilities. Hangar expansion will keep pace with demand and allow for revenue generation growth. Terminal building improvements will update the existing facility in its current location, while providing for additional space to accommodate increased activity and maintenance storage functions. The vehicle parking lot will be relocated and expanded to increase capacity.

Below are estimated costs of the recommended, phased development through the 20-year planning period, expressed in 2011 dollars.

Phase I (0 – 5 Years)

Project	FAA Eligible	State Share	Sponsor Share	Private Sources	Total
A. RSA Improvements (both ends)	$3,771,500	$99,250	$99,250		$3,970,000
B. Taxiway Extension (2,225' x 35)	$779,000	$20,500	$20,500		$820,000
C. Helipad	$71,250	$1,875	$1,875		$75,000
D. Hangar Development				$4,800,000	$4,800,000
E. Apron Expansion	$475,000	$12,500	$12,500		$500,000
F. Terminal Expansion	$237,500	$6,250	$6,250		$250,000
G. Road/Parking Improvements	$712,500	$18,750	$18,750		$750,000
TOTAL PHASE I	**$6,046,750**	**$159,125**	**$159,125**	**$4,800,000**	**$11,165,000**

Phase II (6 – 10 Years)

Project	FAA Eligible	State Share	Sponsor Share	Private Sources	Total
H. Runway Extension (966' x 75')	$ 5,343,750	$140,625	$140,625		$5,625,000
I. Taxiway Extension (1,206' x 35')	$3,111,250	$81,875	$81,875		$3,275,000
J. Hangar Development				$1,950,000	$1,950,000
TOTAL PHASE II	**$8,455,000**	**$222,500**	**$222,500**	**$1,950,000**	**$10,850,000**

Phase III (11 – 20 Years)

Project	FAA Eligible	State Share	Sponsor Share	Private Sources	Total
K. Hangar Development				$1,930,000	$1,930,000
L. Fuel Farm Relocation	$285,000	$7,500	$7,500		$300,000
TOTAL PHASE III	**$285,000**	**$7,500**	**$7,500**	**$1,930,000**	**$2,230,000**

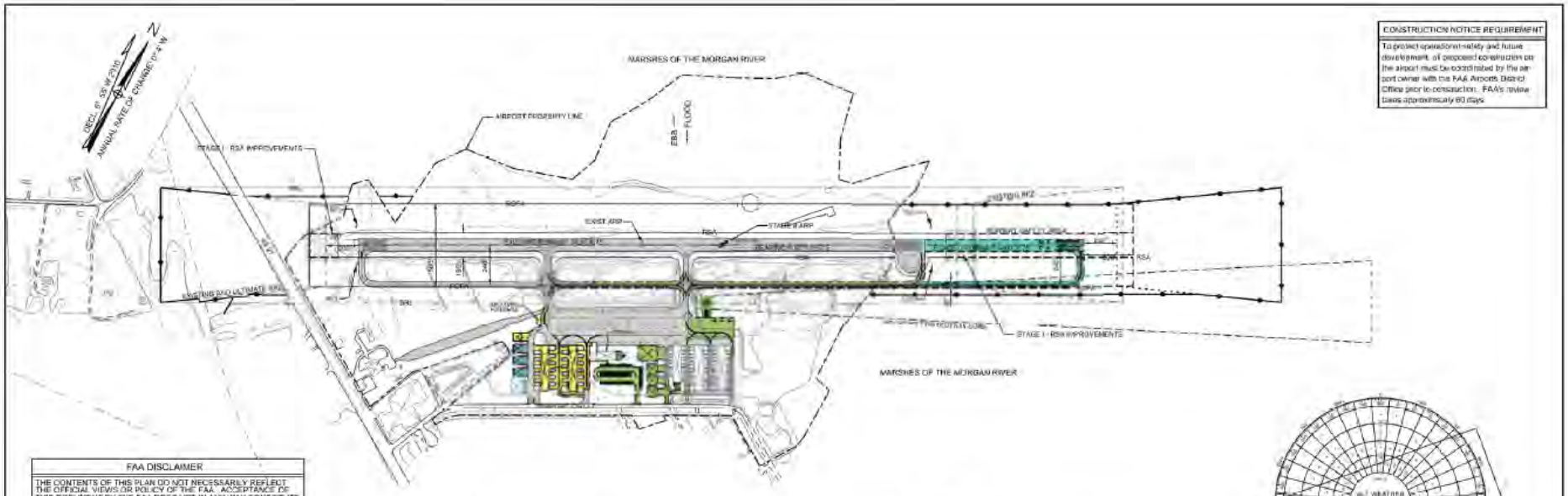
Source: Wilbur Smith Associates

Airport Finances

Demonstrated in the tables above, the estimated rough order of magnitude project costs for future development will be shared between federal, state, Airport (sponsor) and private developer resources. The estimates contained in these tables are derived from analyzing similar projects and should be re-evaluated at the time of project initiation. The portion of project cost sharing will be based on funding eligibility and the nature of projects undertaken.

This Master Plan examines the financial operating outcome of the Airport for fiscal years 2008 through 2011(budgeted) to identify the potential for funding development through the use of Airport funds. The Airport's net revenue has remained positive for the past four years and is trending upward. The Airport has maintained a relatively consistent ratio between the revenue generated from fuel and oil sales, the primary source of revenue for the Airport, and the expense of sales and services. As fuel and oil sales increase and the ratio of related costs of sales and services remains consistent, the Airport will likely continue to experience positive financial performance.

Based on incremental growth in revenues and expenses and planned facility development, it is likely that the Airport will maintain self-sufficiency in the near term and become more profitable in later years. Analysis of the summary financial information indicates that positive income from Airport operations should go into an airport capital improvement fund to be used to pay the sponsor share of capital project costs.



CONSTRUCTION NOTICE REQUIREMENT
To protect operational safety and future development, all proposed construction on the airport must be coordinated by the airport owner with the FAA Airports District Office prior to construction. FAA's review takes approximately 60 days.

FAA DISCLAIMER
THE CONTENTS OF THIS PLAN DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES OR THE STATE OF SOUTH CAROLINA TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

TAXIWAY DISTANCES	
	DISTANCE
TO RUNWAY CENTERLINE	240'
TO AIRCRAFT PARKING	135'
TO PARALLEL TAXIWAYS	N/A

DEVELOPMENT STAGES

EXISTING PAVEMENT	STAGE ONE 0-5 YEARS	STAGE TWO 6-10 YEARS	STAGE THREE 11-20 YEARS

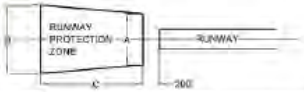
NOTES:

PROPERTY BOUNDARIES OBTAINED FROM R.D. TROGDON SURVEY OF BEAUFORT COUNTY AIRPORT FOR THE BEAUFORT COUNTY COUNCIL. SEE EXHIBIT A.

ALL LEASES OF LAND FOR NON-AERONAUTICAL USES MUST BE COORDINATED WITH THE FEDERAL AVIATION ADMINISTRATION.

RUNWAY ELEVATIONS (MSL)				
	EXISTING ELEVATION DATA		ULTIMATE ELEVATION DATA	
RUNWAY END	R/W 07	R/W 25	R/W 07	R/W 25
DISPLACED THRESHOLD	N/A	N/A	N/A	N/A
RWY INTERSECTION	N/A	N/A	N/A	N/A
RWY HIGH AND LOW POINTS	10.1'/9.0'	9.3'/9.0'	10.1'/9.0'	9.3'/9.0'
TOUCHDOWN ZONE ELEV.	10.1'	9.3	10.1'	9.3'

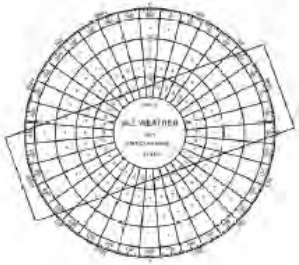
RUNWAY DATA				
	RUNWAY 07-25			
	EXISTING		ULTIMATE	
% EFFECTIVE GRADIENT	0.10%		0.10%	
% WIND COVERAGE - 13 KNOTS (ALL WEATHER)	97.81%		97.81%	
MAXIMUM ELEVATION ABOVE MSL	10'		10'	
RUNWAY LENGTH	3,434'		4,400'	
RUNWAY WIDTH	75'		75'	
RUNWAY SURFACE TYPE	ASPHALT		ASPHALT	
RUNWAY STRENGTH	50,000 LBS DWG		50,000 LBS DWG	
RUNWAY	07	25	07	25
PART 77 APPROACH CATEGORY	NON-PRECISION	NON-PRECISION	NON-PRECISION	NON-PRECISION
APPROACH VISIBILITY MINIMUMS	1 MILE	1 MILE	1 MILE	1 MILE
TYPE INSTRUMENT APPROACH	RNAV/LNAV	RNAV/LNAV/LPV	RNAV/LNAV	RNAV/LNAV/LPV
APPROACH SLOPE	34:1	34:1	34:1	34:1
RUNWAY LIGHTING	MIRL	MIRL	MIRL	MIRL
RUNWAY MARKING	NON-PRECISION	NON-PRECISION	NON-PRECISION	NON-PRECISION
NAVAIDS & VISUAL AIDS	REIL/PAPI	REIL/PAPI	REIL/PAPI	REIL/PAPI
RUNWAY SAFETY AREA	1,068'X 1,160'	1,068'X 1,160'	5,000'X 1,000'	5,000'X 1,000'
RUNWAY OBJECT FREE AREA	4,084'X 800'	4,084'X 800'	5,000'X 800'	5,000'X 800'
DECLARED DISTANCES	N/A	N/A	N/A	N/A



RUNWAY PROTECTION ZONE DATA									
RUNWAY END	APPROACH SLOPE		EXISTING RPZ DIMENSIONS			ULTIMATE RPZ DIMENSIONS		
	EXISTING	ULTIMATE	A	B	C	A	B	C
RUNWAY 7	34:1	34:1	500'	700'	1,000'	SAME	SAME	SAME
RUNWAY 25	34:1	34:1	500'	700'	1,000'	SAME	SAME	SAME

RUNWAY END DATA						
RUNWAY END	EXISTING END DATA			ULTIMATE END DATA		
	ELEVATION	LATITUDE	LONGITUDE	ELEVATION	LATITUDE	LONGITUDE
RUNWAY 7	10.1'	32°24'35" N	80°38'21" W	SAME	SAME	SAME
RUNWAY 25	9.3'	32°24'52" N	80°37'48" W	7.7'	32°24'57" N	80°37'37"W

AIRPORT DATA		
SPONSOR	BEAUFORT COUNTY	
CITY	CITY OF BEAUFORT	
COUNTY	BEAUFORT	
STATE	SOUTH CAROLINA	
AIRPORT IDENTIFIER	KARW	
GPS AT AIRPORT	RWY 25 / RWY 7	
MEAN MAXIMUM TEMPERATURE	90° F	
	EXISTING	ULTIMATE
AIRPORT REFERENCE POINT (ARP) DATA (NAD 83) LAT.	32°24'43.74" N	32°24'46.12" N
LONG.	80°38'00.75" W	80°37'58.88" W
AIRPORT & TERMINAL NAVAIDS	LPV, BEACON, ANOS III P/T	LPV, BEACON, ANOS III P/T
AIRPORT REFERENCE CODE(ARC)	D-II	D-II
DESIGN AIRCRAFT	BEECH KING AIR	BEECH KING AIR



WIND DATA SOURCE:
BEAUFORT MCAS, SC PERIOD: 1998 - 2009
WEATHER BASED ON 72,887 OBSERVATIONS

WIND COVERAGE (13 KNOTS)			
	RUNWAY 07	RUNWAY 25	TOTAL
ALL WEATHER	88.63%	08.31%	97.81%
IFR	76.09%	25.20%	96.70%

LEGEND		
DESCRIPTION	EXISTING	ULTIMATE
GROUND CONTOURS		N/A
AIRPORT PROPERTY LINES		
BUILDINGS (NON-AIRPORT)		SAME
BUILDINGS (AIRPORT)		
RUNWAY PROTECTION ZONE (RPZ)		
RUNWAY END IDENTIFICATION LIGHT (REIL)		
ROTATING BEACON		
TREE LINE		N/A
FENCE LINE		N/A
PAVED ROAD		
AIRPORT REFERENCE POINT (ARP)		
RUNWAY SAFETY AREA AND OBJECT FREE AREA		

REVISIONS:		
REV. NO.	DATE	DESCRIPTION OF REVISION

0 200 400 600 800

DESIGNED BY: AG DATE: 03/31/2011
DRAWN BY: AG DATE: 03/31/2011
CHECKED BY: GD DATE: 03/31/2011

APPROVALS:

TITLE DATE
TITLE DATE
TITLE DATE

PLANS PREPARED BY: WilburSmith Associates

PLANS PREPARED FOR: BEAUFORT COUNTY AIRPORT
BEAUFORT COUNTY
LADY'S ISLAND, SC

PROJECT NO. (FAA): 102550

AIRPORT LAYOUT PLAN

02

Chapter

1

Inventory

This Airport Master Plan defines a concept for development at Beaufort County Airport (ARW) over the course of a 20-year planning period and is prepared in collaboration with airport management, federal and state agencies, local officials, and interested airport users. A goal of this study is to identify facility needs and evaluate development alternatives in order to provide guidance for the future development of the Airport. The plan recommends improvements in accordance with specific Federal Aviation Administration (FAA) criteria, taking into consideration anticipated changes in aviation activity trends at the local, regional, and national levels.

The primary objective of this Airport Master Plan is to produce a comprehensive planning guide for the continued development of a safe, efficient, and environmentally compatible aviation facility that meets the goals of the Beaufort County Airport, airport users and tenants, and the surrounding airport service area. The plan must also satisfy FAA guidelines for the development of Airport Master Plans and facilities, while incorporating characteristics that are unique to the service area. The study focuses on aeronautical forecasts, need and justification for development, and a staged plan for recommended development. Proposed airport development must adhere to standards that provide for safe aviation facilities while accommodating future demand. The staged plan looks at planning horizons of 0-5 years, 6-10 years, and 11-20 years. The first phase addresses existing facility deficiencies or non-compliance to airport design standards. The subsequent phases address the facilities and resources needed to accommodate predicted growth based on reasonable assumptions.

The first step in the airport master planning process as outlined in FAA Advisory Circular 150/5070-6B, “Airport Master Plans,” involves gathering information about the airport and its environs. An inventory of current conditions is essential to the success of a master plan, since the information also provides a foundation, or starting point, for subsequent evaluations. The inventory of existing conditions for the ARW Master Plan Update includes the following information:

- Information pertaining to airport ownership and management, the general airport setting, transportation access, the airport’s relationship to the National Airport System, and airport history,

- Population, employment, and socioeconomic information for the geographic area,
- A review of historic and current airport activity, including the general types of aircraft using the Airport,
- An overview of the area's airspace, air traffic control (ATC) management, and meteorological conditions,
- Descriptions of facilities and services now provided at the airport, including a general description of airside, terminal, landside, and support facilities such as utilities and other infrastructure-related amenities, and
- An overview of environmental considerations in and around airport property.

The data collected for this portion of the study was gathered through field interviews, research, meetings and telephone conversations from a variety of sources including airport management, airport tenants and users, local organizations, and airport service providers.

1.1 Airport Background and History

Airport Ownership and Management

Beaufort County Airport is owned and operated by Beaufort County, which also oversees the operations at Hilton Head Island Airport (HXD). The airport also gets direction from the Beaufort County Airports Board (BCAB). This body is composed of 11 members plus two County/Town of Hilton Head councilmen who serve as liaison. The members of the BCAB are appointed by the Beaufort County Council. The BCAB provides guidance on policy decisions, operations, and finances at ARW. The County is responsible for operating and maintaining the airport in a safe condition as well as leasing properties within the airport boundary. Airport management and operations staff are available on-site to ensure the safe and effective use of the facility.

Airport Role

ARW is defined by the 2008 South Carolina Airports System Plan as a Business/Recreation (SCIII) Airport. The criterion for this classification is based on runway length, the Airport Reference Code (ARC), and economic impact of the airport. ARW currently has a runway length of 3,434 feet, an ARC of B-II, and

a moderate economic impact. To be considered for the next higher classification, Corporate/Business (SCII), the airport would need a runway length of 5,000 feet; ARC B-II/C-II; have high economic impact, provide full service aircraft ground support; and involve 30%-50% corporate aircraft activity.

Airport Location and Access

Beaufort County is located on the seaward edge of the Atlantic Coastal Plain. Characterized by relatively flat terrain, the principal relief features are broad flat valleys with bordering bluffs that range in height from 20 to 40 feet. The workings of the shoreline currents, waves, and tidal streams results in constant change to the seaward margin of the County.

The center of the Beaufort community is an urban complex consisting of the city of Beaufort, the town and harbor of Port Royal, the Naval Hospital Beaufort and two U.S. Marine Corps installations: Marine Corps Air Station (MCAS) and Marine Corps Recruit Depot, Parris Island. Adjacent to this area are the islands of Hilton Head, Fripp Island, and Hunting Island with beach and resort developments.

The Beaufort County Airport is located at latitude 32°24.43' north and longitude 80°38.03' west. It sits 10 feet above sea level, and is sited about 2.5 miles southeast of the City of Beaufort on the north side of U.S. Route 21. Access to the airport is located off of Airport Circle.

The airport occupies approximately 110 acres, owned by the county. U.S. Route 21 is the major roadway providing access to ARW, but there are several roadway and highway systems which connect the region to major cities. Major highways providing access to ARW are shown on Figure 1-1. Some of the closest major cities to ARW are given below with approximate driving distances to each.

- Savannah, Georgia – 50 miles to the southwest
- Charleston, South Carolina – 70 miles to the northeast
- Columbia, South Carolina – 140 miles to the north
- Jacksonville, Florida – 180 miles to the south
- Macon, Georgia – 210 miles to the west
- Atlanta, Georgia – 292 miles to the west

Figure 1-1: National and Regional Map

Airport History

Beaufort County Airport was originally built in the 1950s. Prior to that date, the airport had been located at what is today the Marine Corps Air Station Beaufort. It was originally constructed with a more east/west runway orientation but was later rotated to the current alignment. Several years ago the runway numbers where changed from 06/24 to 07/25 due to a magnetic declination change.

On July 1, 1998, Beaufort County took over operations of the Fixed Base Operator (FBO) at the airport. Prior to that date, it was privately run by Master Aviation. Since taking over, the County has made several significant improvements to the apron pavements, a partial parallel taxiway, and several hangar facilities. In addition, weather reporting capability was provided by the installation of a state-owned and maintained system in 2007, which resulted in the airport's FAA identifier changing from 73J to ARW.

Population and Socioeconomic Data

For an airport master plan, socioeconomic characteristics are collected and examined to derive an understanding of the dynamics of growth within the geographic area served by the airport. This information is then used in forecasting aviation demand over the next twenty years. The types of socioeconomic data that are presented here include population and employment.

The area served by an airport, from within which most of its users come, is generally referred to as the airport's "Service Area." The service area for ARW is based on where aircraft owners live in the area and the drive times to nearby airports. For the purposes of this report, the primary airport service area for ARW is limited to Beaufort County.

Population growth statistics for Beaufort County are presented in Table 1-1 and are compared to state and national levels. The population in the County increased 194% from 51,530 in 1970 to 151,870 in 2008, an average increase of 2.9% per year. This significant rate of growth is a result of the quality of life in Beaufort County, as well as a strong military and tourism economic base.

As a matter of comparison, the State of South Carolina experienced positive growth rates during the same period. From 1970 to 2008, the population in South Carolina has increased from 2.6 million to over 4.4 million, a gain of almost 79 percent. During the same period from 1970 to 2008, the national population grew just over 50 percent, an average of 1.1 percent per year

Table 1-1: Population Growth Statistics

Area	1970	1980	1990	2000	2008	Annual Growth 1970-2008
Beaufort County	51,530	66,060	87,220	122,020	151,870	2.9%
South Carolina	2,604,330	3,132,380	3,501,160	4,023,570	4,435,950	1.4%
United States	203,982,310	227,225,620	249,622,810	282,216,950	306,044,990	1.1%

Source: Woods & Poole Economics, Inc.

Employment growth indicators for the period 1990 to 2008 in Beaufort County are presented in Table 1-2. Services and Trade are the leading industry sectors in the County, and have gained averages of 4.1 and 4.2 percent per year of total employees over the 1990 to 2008 period. The greatest gain, however, is led by the Construction category with an average 4.8 percent increase each year. Beaufort County has gained over 45,490 jobs during this same period, with an average annual growth rate of 3.3 percent. In comparison, the total employment for the State of South Carolina and for the entire United States grew at rates of 1.45 percent and 1.52 percent, respectively.

Table 1-2: Beaufort County Employment Growth Statistics

Employment	1990	2008	Annual Growth (%)
Farm and Agriculture	1,520	2,780	3.4
Mining	50	70	1.9
Construction	3,990	9,250	4.8
Manufacturing	1,390	1,140	-1.1
Transportation, Communication, and Utilities	1,200	2,570	4.3
Trade	11,550	24,310	4.2
Finance, Insurance, and Real Estate	4,980	10,670	4.3
Services	14,720	30,190	4.1
Government	6,080	10,080	2.9
Government (Military)	11,360	11,260	-.1
Total Employment	56,840	102,330	3.3

Source: Woods & Poole Economics, Inc.

Table 1-3 lists the top employers in the Beaufort County area. The presence of multiple real estate and development companies comes as a direct result of the tourism base of the area. Beaufort and Hilton Head Island are popular vacation destinations for people from all parts of the country. In addition to its tourism and real estate economic base, the region is home to three military installations; Parris Island Marine Corps Recruit Depot, the Marine Corps Air Station Beaufort, and the Beaufort Naval Hospital.

Table1-3: Beaufort County's Top Private Employers

Employer	Industry
Beaufort County School District	Education
Civilian Department of Defense	Government Contracting
Wal-Mart Associates	Retail
County of Beaufort	Local Government
Beaufort Memorial Hospital	Health Care
Tenet Health Systems, Hilton Head	Health Care
Southwind Sales and Marketing	Real Estate
Publix Supermarkets, Inc.	Retail
Morale Welfare and Recreation	Tourism
Westin Hilton Head, Limited	Tourism
Tempo Personnel Services	Service

Marriott Resorts	Tourism
Longhorn Steaks, Inc	Food Service
Cypress Club, LLC	Tourism
Sea Pines Plantation	Tourism/Real Estate
Malphrus Construction Company	Construction
Greenwood Development Corporation	Real Estate
Marriott Hotel Services	Tourism
Fripp Island, LLC	Real Estate
The Dafuskie Club	Tourism/Real Estate
Town of Hilton Head Island	Local Government
Bi-Lo, LLC	Retail
American Golf Corporation	Recreation Services
Marine Inn Owners Association	Real Estate Development
Resort Services, Inc	Tourism

Source: City of Beaufort Website

1.2 Historic and Current Based Aircraft

Based on the 2008 Form 5010 airport data maintained by the FAA, ARW has 56 based aircraft, including 38 single engine and 14 multi-engine aircraft. The majority of single-engine aircraft are owned by private citizens who store their aircraft in T-hangars at the airport. Table 1-4 shows the number of based aircraft has been increasing for the previous three years.

Table 1-4: Historic Based Aircraft

Year	Single-engine Piston	Multi-engine Piston	Jet	Helicopter	Other	Total Based Aircraft
1998	25	5	0	0	0	30
1999	25	5	0	0	0	30
2000	25	5	0	0	0	30
2001	43	7	0	0	0	50
2002	43	7	0	0	0	50
2003	23	6	0	0	0	29
2004	23	6	0	0	0	29
2005	33	2	0	0	0	35
2006	45	6	0	0	0	51
2007	45	6	0	0	0	51
2008	38	14	0	3	1	56

Source: FAA 5010 Form

1.3 Airspace, Air Traffic Control and Weather

On an average day in the U.S., approximately 50,000 general aviation and commercial aircraft depart an airport en route to another destination. As the volume of air traffic has grown so significantly over the history of aviation, there

has been an increasing need to regulate the efficient use of airspace. The Federal Aviation Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the U.S.

On a broad scale, the FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS covers the common network of U.S. airspace, including air navigation facilities, airports and landing areas, aeronautical charts, associated rules, regulations, and procedures, technical information, and personnel and material. The system also includes components shared jointly with the military.

Administratively, control of air traffic at ARW is covered by the air traffic controllers at Marine Corps Air Station Beaufort, located approximately six nautical miles northwest of the airport.

Regional Airspace

Airspace in the U.S. is classified generally as controlled, uncontrolled, or special use. Controlled airspace encompasses those areas where there are specific certification, communication, and navigation equipment requirements that pilots and aircraft must meet in order to operate in that airspace.

The U.S. airspace is further divided into seven classes, each of which has different rules and regulations. These classes are:

- Class A: This is designated for positive control of the aircraft. This area of airspace ranges from 18,000 feet above MSL to 60,000 feet above MSL. Within Class A airspace, only Instrument Flight Rules (IFR)[1] operations are authorized. The aircraft must have specific equipment and an air traffic control (ATC) clearance before entering the airspace.
- Class B: This is multi-layered airspace from the surface of the earth up to a defined height (MSL) specifically determined for the airport which it serves. It is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high performance aircraft at major airports. The aircraft must have specific equipment and an ATC clearance before entering the airspace.
- Class C: This airspace is defined around airports with ATCTs and radar approach control facilities. The top of Class C airspace is normally 4,000 feet above ground level (AGL). The aircraft must have specific equipment and

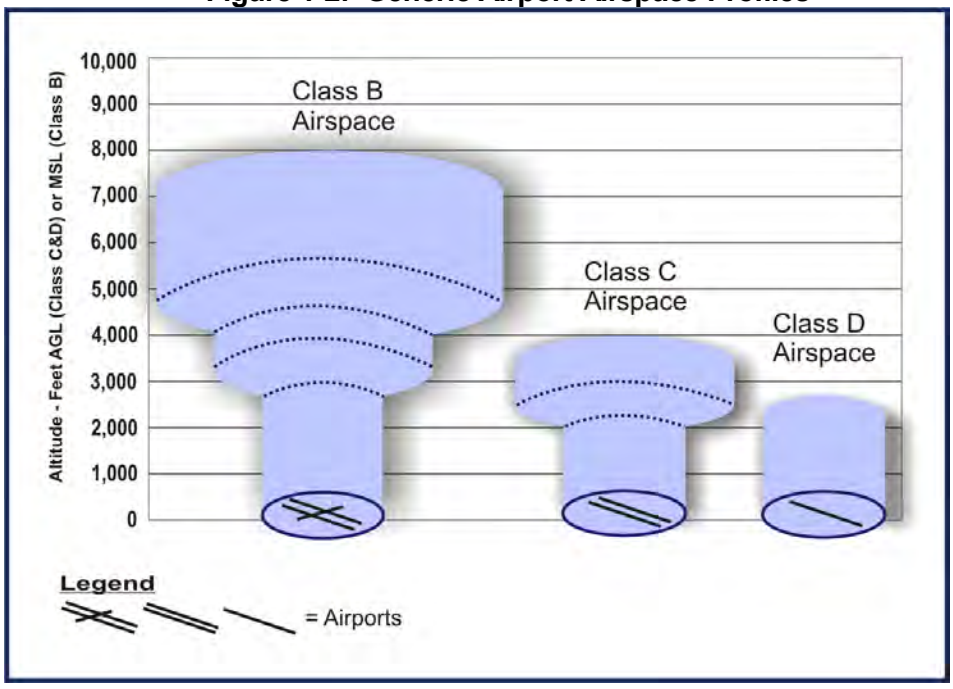
[1] IFR refers to procedures used by pilots when operating in accordance with Federal Aviation Regulations (FAR) that require an instrument flight plan.

must have established communications with the ATC facility having jurisdiction over the airspace before entering the airspace.

- Class D: This airspace is normally a circular area with a radius of four to five nautical miles around the primary airport and may include extensions necessary to include instrument approach and departure paths. Its height may vary based on characteristics found at the airport and in the surrounding areas. Class D airspace does not have radar approach control facilities.
- Class E: This is a general category that contains controlled airspace previously designated as control zones for non-towered airports, airspace transition areas, and Federal airways.
- Special Use Airspace (SUA): An area wherein activities must be confined because of their nature or wherein limitations are imposed on aircraft operations not part of those activities. SUA is generally classified as a Restricted, Prohibited, or Military Operations Area (MOA).
- Class G: Airspace not designated as Class A, B, C, D, E, or SUA is considered uncontrolled.

Figure 1-2 illustrates a profile perspective of the Class B, C, and D airspaces that surround towered airports throughout the country. This graphic shows the general shape of the airspace over each type of airport. The exact dimensions of these may vary depending on the unique characteristics surrounding a specific airport.

Figure 1-2: Generic Airport Airspace Profiles



The Class E airspace reserved for ARW is centered on the Airport. The ARW airspace lies entirely within the military airspace reserved for Beaufort MCAS (See Figure 1-3)

Several other public use airports are located the vicinity of ARW, some of which compete with the airport for customers. These nearby airports and their characteristics are summarized in Table 1-5. Figure 1-3 shows a map of the Beaufort area and the area airports from the Charlotte regional sectional aeronautical chart (updated July 2008).

Figure 1-3: Surrounding Airspace

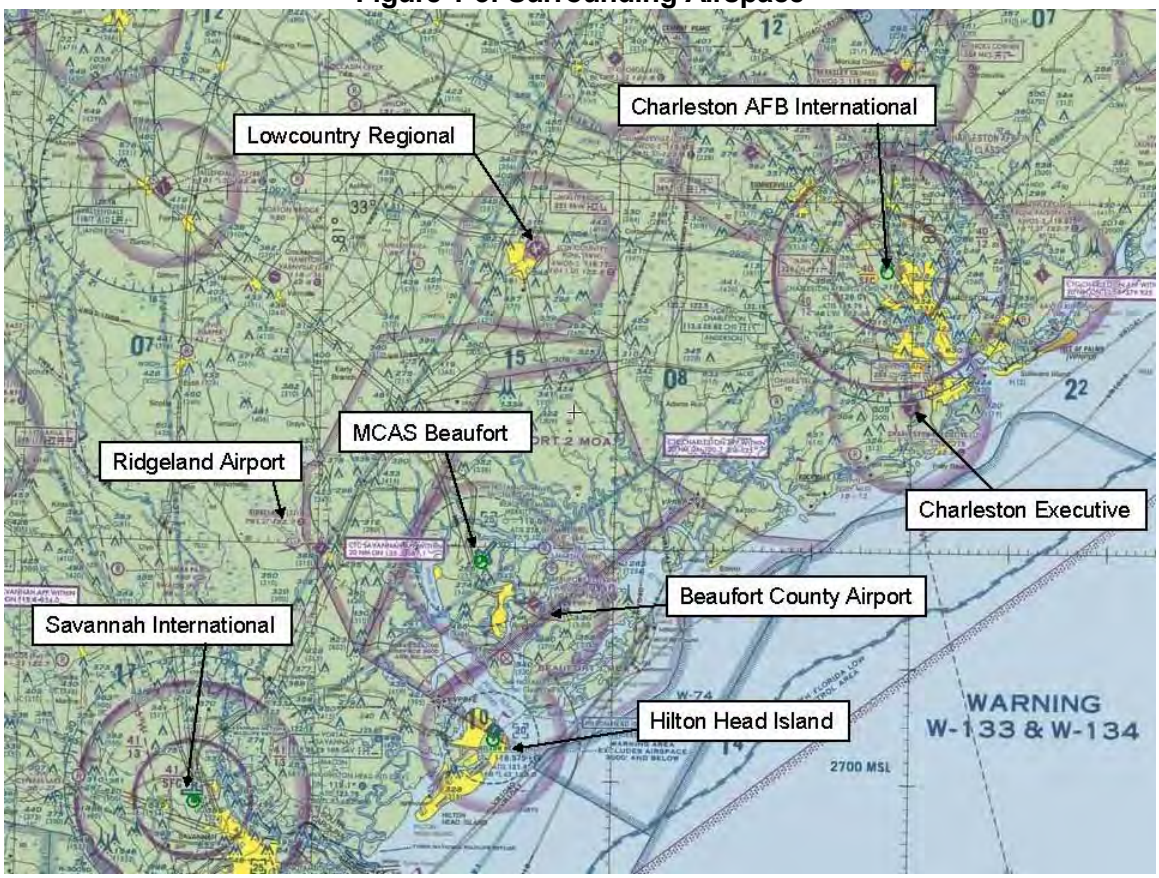


Table 1-5: Surrounding Airports

Airport	Airport Identifier	Flight Distance to ARW	Driving Distance to ARW	Drive Time to ARW	Runway Length (Max.)	Approach Type	Civilian Based Aircraft
Beaufort County	ARW	N/A	N/A	N/A	3,434	Non-Precision (GPS)	56
MCAS Beaufort	NBC	6 nm	14 miles	0.5 hours	12,202	HI-TACAN	0
Hilton Head Island Airport	HXD	12 nm	42 miles	1 hour	4,300	Non-Precision (GPS)	86
Ridgeland Airport	3J1	18 nm	40 miles	1 hour	2,692	Visual	57
Lowcountry Regional Airport	RBW	31 nm	57 miles	1.5 hours	6,002	Non-Precision (GPS)	20
Savannah/Hilton Head International Airport	SAV	33 nm	49 miles	1.25 hours	9,351	Precision (ILS)	123
Charleston Executive	JZI	36 nm	73 miles	2 hours	5,000	Precision (ILS/DME)	79
Charleston AFB/ International	CHS	42 nm	76 miles	2 hours	9,001	Precision (ILS)	37

Source: Google Maps, FAA, WSA analysis

Meteorological Conditions

Weather conditions play an important role in the operational capabilities of an airport. Temperature and air density are significant factors in determining the length of runway required for aircraft takeoffs and landings. High temperatures in the summer months result in longer runway length requirements and even longer lengths for airports well above sea level. In addition, wind speed and direction determine runway orientation and therefore dictate when a particular runway may be in use. Periods of low visibility due to weather conditions are one major factor in determining the need for navigational aids.

In order to determine the historical weather conditions at ARW, 10 years of hourly weather data (72,676 observations) collected by the weather station at nearby Marine Corps Air Station Beaufort and 30 years of data from the National Climatic Data Center were analyzed. The data focused on temperature, wind

strength and direction, ceiling height, and visibility distance. The average annual temperature for the region is 65 degrees Fahrenheit. During the month of July, the region's hottest month, the average high temperature is 91 degrees Fahrenheit. This is the temperature used to determine length requirements.

The FAA groups aircraft into Aircraft Categories based on their approach speed. A larger aircraft with faster approach speeds will be able to withstand a higher crosswind velocity during landings. These criteria are presented in Table 1-6.

Table 1-6: Aircraft Categories

Aircraft Category	Approach Speed	Example
A	<91 knots	Cessna 172
B	91 to <121 knots	King Air 200
C	121 to <141 knots	Citation X

Source: FAA Advisory Circular 150/5300-13

The direction and speed of the wind affects the direction in which traffic at an airport operates. The FAA recommends that an airport's runway configuration provide wind coverage at least 95 percent of the time. The 95 percent wind coverage requirement is computed on the basis of the crosswind not exceeding the thresholds defined in Advisory Circular 150/5300-13, change 6, page 10. Associated wind coverage for each runway and aircraft group at ARW is presented in Table 1-7. Combined, the runways provide the required coverage for all aircraft types.

Table 1-7: All Weather Wind Coverage

Runway	Crosswind Velocity	Wind Coverage	Aircraft Category
07/25	10.5 knots	95.37%	A
07/25	13 knots	97.81%	B
07/25	15 knots	99.20%	C

Source: NOAA 1998-2008, FAA wind rose analysis program

Independent of the wind direction, the ceiling and visibility conditions at an airport determine the ATC procedures in effect. Ceiling is the height above the earth's surface of the lowest layer of clouds not classified as "thin" or "partial." Visibility is the ability to see and identify prominent unlighted objects by day and prominent lighted objects by night. Ceiling and visibility vary with cloud conditions, fog, precipitation, and haze. The ceiling and visibility minimums at ARW are grouped into two categories: Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). VFR is in effect when the cloud ceiling is greater than or equal to 1,000 feet and visibility is greater than or equal to three miles. IFR conditions prevail when the visibility or cloud ceiling falls below those minimums prescribed under VFR.

As of May 2011, Runway 7 has a ceiling height of 380 feet with a visibility minimum of 1 mile. Runway 25 has a ceiling height of 208 feet with a visibility minimum of 1 mile. When conditions are less than these minimums, the airport is not available for aircraft landings and the pilots divert to their alternate airport. Typically, this occurs during the springtime in the early morning, when fog rolls in from the ocean. This period typically lasts for 2-4 hours at a time. According to historical weather data, the airport is only closed 1 percent of the time, an average of 1.7 hours per week.

1.4 Airport Facilities

Beaufort County Airport can be divided into several distinct areas. The airfield area consists of the parts of the Airport that accommodate the movement of aircraft. This includes runways, taxiways, aprons and hangars as well as the navigational and communication equipment designed to facilitate aircraft operations. Terminal/landside facilities include the terminal building and other structural development, as well as auto parking and access roadways. In addition, there are support-related facilities at the airport such as airport management and operations facilities.

Airfield Facilities

The largest land use type at ARW is the airfield. The runway, taxiways, and apron consist of approximately 10 percent of the total airport acreage. The existing airfield is depicted in Figure 1-4.

Runways

Runways are defined rectangular surfaces on an airport prepared or suitable for the landing or takeoff of airplanes. Each runway end is identified by a number designation corresponding to its general position on the compass. Therefore, a runway number of 7 corresponds to a compass position of about 70 degrees off of magnetic north and a runway number of 25 indicates about a 250 degree compass position. Each runway at an airport provides two compass positions, 180 degrees apart.

ARW's Runway 7/25 is 3,434 feet long by 75 feet wide. Based on a pavement study commissioned by the South Carolina Department of Commerce, Division of Aeronautics, the runway was in good condition with a Pavement Condition Index (PCI) of 89 as of 2001. Since then, the asphalt runway has been resurfaced and has a load-bearing capacity of 50,000 pounds dual-wheel gear aircraft.

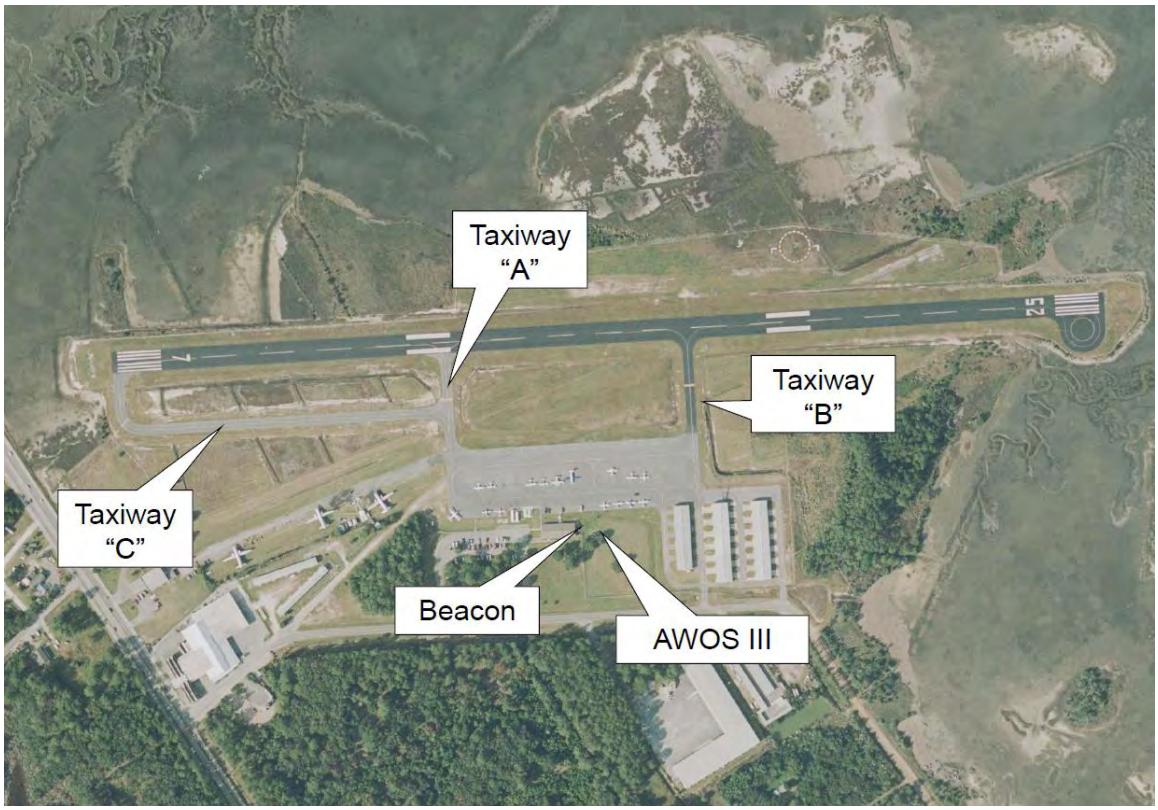
The runway is proving to be restrictive to some operations at ARW. Several Citation Jets which used to operate at ARW on a regular basis moved their business elsewhere, to airports with a longer runway and higher load-bearing capacity before the ARW runway was resurfaced. This was cited primarily as an insurance concern for the operators of the Citation aircraft, although the desire is to fly into ARW, which is the most convenient airfield for these customers.

A common aircraft utilizing ARW is the Beech King Air. It has been noted that departures of this aircraft type must limit take-off weight due to runway length requirements and the relatively short runway at ARW.

Taxiways

There are three sections of taxiway at ARW. Two sections running perpendicular to the runway connect the apron/aircraft parking area to the runway itself. The third section, Taxiway C, is a recently completed partial parallel taxiway which runs from the beginning of Runway 7 to Taxiway A. The different taxiways can be seen on the aerial photo in Figure 1-4

Figure 1-4: Existing Airfield



During the 2001 pavement study, Taxiway B received a PCI rating of 30. It has since been reconstructed and is in good condition. Taxiway A was determined to be in excellent condition during the study, receiving a PCI of 95.

Apron

ARW has an aircraft apron area used for aircraft movement and positioning, airfield vehicle parking, fuel storage and aircraft tiedown. The apron is approximately 21,750 square yards, and lies between the terminal building and the runway. The tiedown area is capable of storing 53 based and transient aircraft. Tiedown positions are available on a first-come first-served basis. Currently, space is sufficient for daily demand, except when jets are present.

Although labeled as “no parking”, the pavement adjacent to the aircraft tiedown area and the terminal building is used by pilots as a parking area. This undesired practice will be addressed as part of the master plan.

The apron pavement is also in good condition. It was originally constructed in two separate phases, and had PCIs of 68 and 88 in 2001. It was overlaid in 2005. Some minor cracks and weathering are present, and should get a crack sealing treatment in the near future.

Airfield Lighting

A variety of lighting aids for pilots are available for use at night or during adverse weather conditions at Beaufort County Airport. All of the lighting at ARW is in good condition.

Identification Lighting
A rotating beacon containing the universally accepted optical system is used to identify the location of the airport. The ARW Airport beacon is located directly adjacent to the terminal building.

Runway Lighting
Lighting aids are necessary to provide pilots with critical takeoff and landing information concerning runway alignment, lateral displacement, rollout operations, and distance.

Runway edge lights are used to outline the edge of runways during periods of darkness or restricted visibility conditions. The runway is outfitted with white Medium Intensity Runway Lights (MIRL) and amber lights at the roll-out end of each runway. They are operational and in good condition.

Taxiway Lighting

The taxiway has blue, medium intensity edge lighting. All of the lights are operational and in good condition.

Navigational Aids

A navigational aid (NAVAID) is a device that provides pilots with relative position information, in relation to a destination or another fixed point. They provide a pilot point-to-point guidance information or position data while in flight. Navaids typically used in aviation are GPS, radar, radio communications, or light sources. A summary of the different types of landing aids at ARW are shown in Table 1-8.

Table 1-8: ARW Landing Aids

Runway	Landing Aids
07	RNAV/GPS, PAPI, REIL
25	RNAV/GPS, Radar 1, PAPI, REIL

Source: FAA 5010 data

At ARW, Runway End Identifier Lights (REILs) provide rapid (white strobe light) and positive identification of the approach end of the runway and are installed on Runway 25 and 7. Precision Approach Path Indicators (PAPI) are installed on both runway ends. PAPI lights are arranged in rows, and change color from red to white, indicating the proper glideslope for an approaching aircraft. The PAPIs on Runway 7 are currently turned off due to tree obstructions.

ARW has published Global Positioning System (GPS) approaches for each runway end. GPS is a U.S. satellite based radio navigational, positioning, and time transfer system operated by the Department of Defense. An Area Navigation (RNAV) approach is a type of GPS approach that uses location points to guide an aircraft to an airfield. It is a more flexible system than standard IFR approaches, and allows the pilot more freedom to plan an approach. RNAV systems will play an increasing role as the FAA's NextGen Airspace program continues to evolve over the next few decades.

A radar approach procedure is also available on Runway 25. The radar operator at MCAS Beaufort advises incoming pilots of the distance to runway and current altitude at various intervals. A Localizer Performance with Vertical Guidance (LPV) approach has recently been established for Runway 25 as part of the RNAV/GPS approach. A LPV approach provides more accurate vertical and lateral guidance to aircraft than RNAV approaches. As mentioned previously, Runway 7 has a ceiling height of 380 feet with a visibility minimum of 1 mile. Runway 25 has a ceiling height of 208 feet with a visibility minimum of 1 mile.

Communications Facilities

Air Traffic Controllers communicate with pilots in the air and on the ground via a Transmitter/Receiver located at MCAS Beaufort. Controllers also communicate with other area airports and controllers via telephone.

In addition, ARW has a new Automated Weather Observing System (AWOS III) which was installed in early 2008 and is located in a grassy area between the terminal building and T-hangars. An AWOS III system provides weather observations which include: wind data, temperature, dew point, altimeter settings, density altitude, visibility, precipitation, and day/night information. Automated observing systems are designed to provide the pilot, and other users, up-to-the-minute airport weather observations. The observing systems work nonstop, updating observations every minute, 24 hours a day, every day of the year. By providing information on the atmosphere, these systems are designed to improve the safety and efficiency of aviation operations as well as being the key to improving forecasts and warnings.

The automated observing system routinely and automatically provides computer-generated voice directly to aircraft in the vicinity of airports, using FAA VHF ground-to-air radio or appended to the Automatic Terminal Information Service (ATIS) broadcast. In addition, the same information is available through a dial-in telephone and most of the data are also provided on the national weather data network.

Obstructions

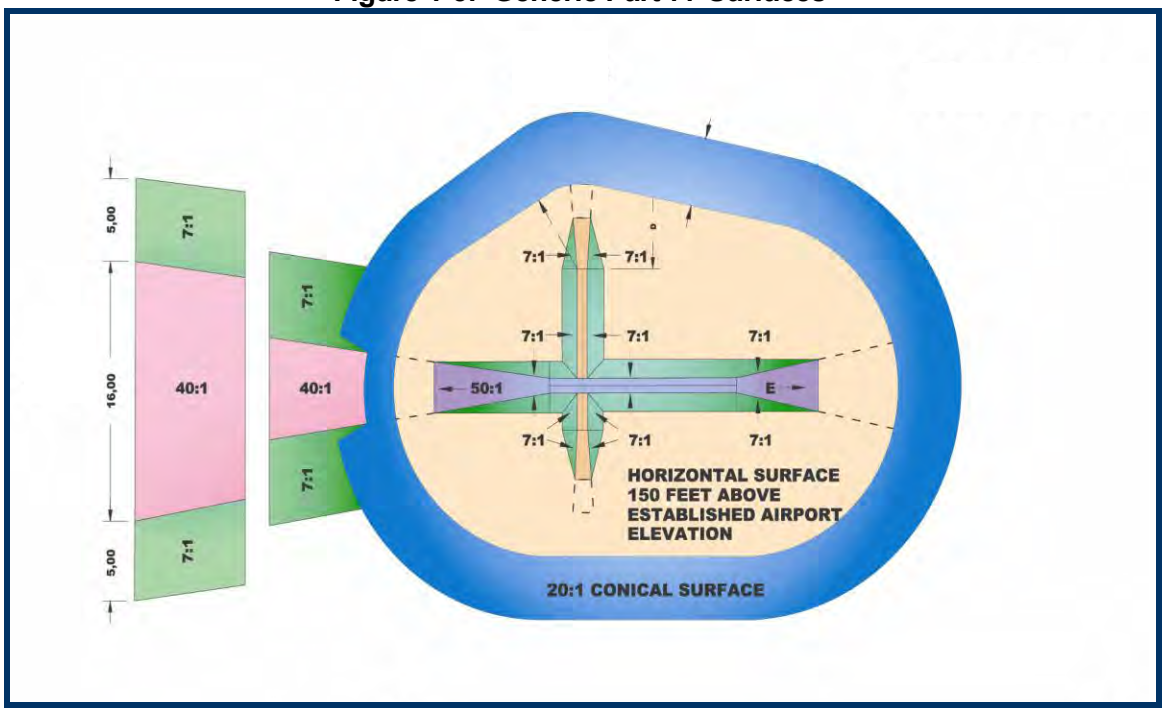
An object of some height located near an airport may be an obstruction to air navigation. FAA requires airports to be free of obstructions for the safety of pilots and aircraft. Obstructions are analyzed based on criteria defined in FAR Part 77, Objects Affecting Navigable Airspace. A primary focus of Part 77 is the establishment of standards for determining obstructions to ensure safe flight on and in the vicinity of an airport, as well as setting forth requirements for notifying the FAA of certain proposed construction or alteration activities and providing for aeronautical studies of obstructions to air navigation. While it is the responsibility of the FAA to determine the effect of these obstructions on the safe and efficient use of airspace, it is the airport owner who has the responsibility to ensure that the aerial approaches to the airport remain adequately cleared and protected.

To determine whether an object is an obstruction to air navigation, Part 77 establishes several imaginary surfaces in relation to an airport and to each runway end. The size of the imaginary surfaces depends upon the type of approach to the runway in question. The principal imaginary surfaces include:

- Primary Surface: Longitudinally centered on the runway at the same elevation as the nearest point on the runway centerline,
- Horizontal Surface: Located 150 feet above the established airport elevation, the perimeter of which is established by swinging arcs of specified radii from the center of each primary surface end, connected via tangent lines,
- Conical Surface: Extends outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet,
- Approach Surface: Longitudinally centered on the extended centerline, and extending outward and upward from each runway end at a designated slope based on the runway approach, 20:1 for visual approaches, 34:1 for non-precision, and 50:1 for precision approaches, and
- Transitional Surface: Extends outward and upward at a right angle to the runway centerline at a slope of 7:1 up to the horizontal surface.

Figure 1-5 shows a graphic representation of the generic Part 77 imaginary surfaces that exist around all airports.

Figure 1-5: Generic Part 77 Surfaces

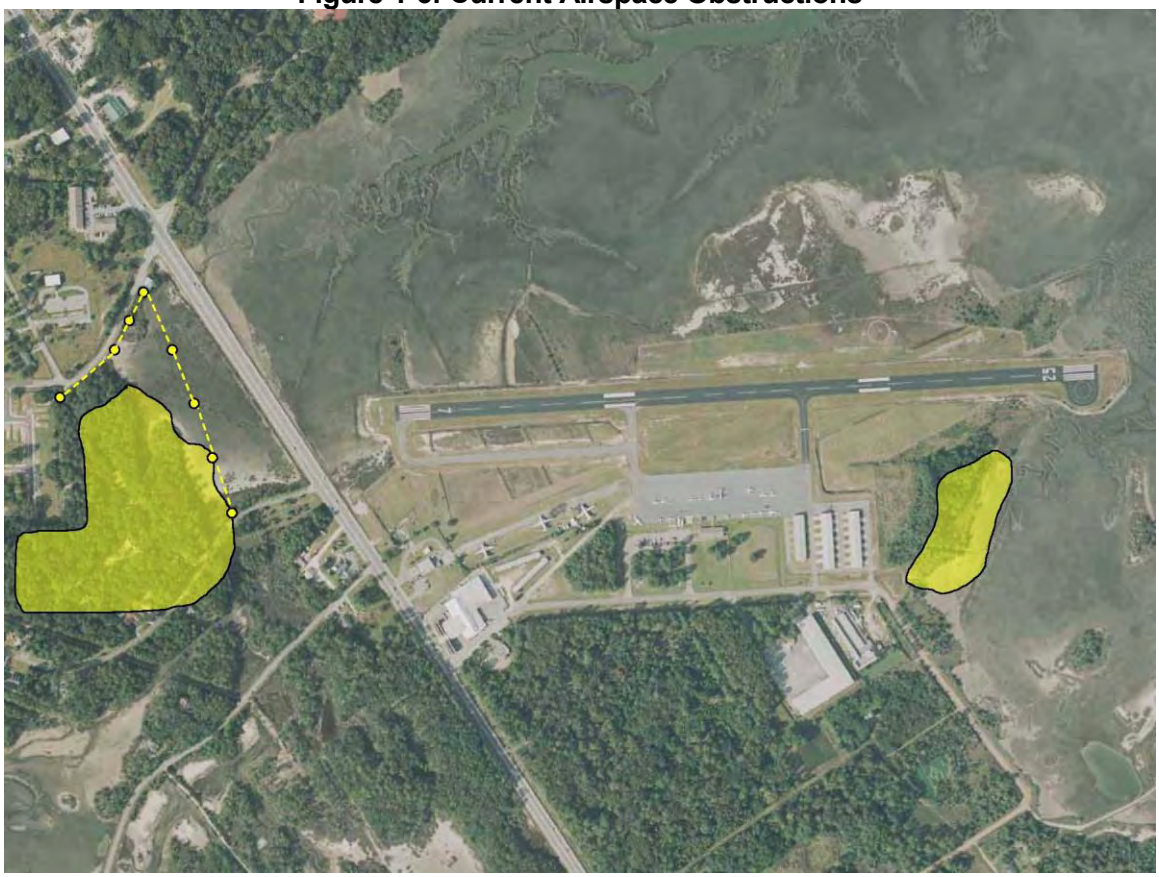


The purpose of Part 77 is to identify obstacles. If an object penetrates one of these surfaces, then it is considered an obstruction and must be removed or lit with a red obstruction light. If it remains, FAA evaluates the obstacle to determine if it is a hazard to pilots, based on Terminal Area Procedures (TERPS). If the

object penetrates TERPS surfaces, the IFR approach and departure procedure minimums will be increased to prevent the object from being a hazard. The consequence of this action can reduce runway capacity and how often pilots can use the runway.

Currently, there are tree obstructions at both runway ends, shown on Figure 1-6. These vertical obstructions are impacting the approach minimums for the Airport. A project is currently underway to remove them. However, existing power lines in the approach to Runway 7 may become obstacles once the trees are removed. This will be verified as part of the master plan.

Figure 1-6: Current Airspace Obstructions



Terminal/Landside Facilities

In addition to airfield related facilities, there are a significant number of buildings and other aviation-related facilities located along the Airport periphery. These buildings are owned by Beaufort County and house either county-related functions or are leased to tenants.

The Beaufort County Mosquito Control Division has 2 aircraft based at ARW which are used for spraying operations during the mosquito season. These are located on the southwest side of the airport and include a MD-500D helicopter and the OV-10 Bronco fixed-wing twin turboprop aircraft. Both of these aircraft are new additions to the mosquito control division and can operate from the airport at their maximum takeoff weight. The Beaufort County Mosquito Control Division recently sold their fleet of Convair C-131F aircraft. Mosquito Control does not pay the airport a leasing fee for their operations at ARW, but they do purchase fuel from the airport on a regular basis.

Terminal Building

The Administration/Terminal Building at ARW was built in the late 1980s. It is approximately 3,500 square feet, with about 2,000 square feet available for public use. Approximately 700 square feet of the building is currently being leased out to various tenants, including a rental car agency and the Beaufort County Sheriff's Office. The terminal includes a waiting area with television and wireless internet, a pilot lounge and planning area, a conference room, restroom facilities, and a small shop selling aviation related merchandise.

Airport management indicates the need for a larger conference room to provide public meeting space for the surrounding community, and two wings to house management operations at the airport and provide room for future expansion.

Hangars

There are three T-hangars located at ARW, capable of holding 34 aircraft. The older building rents for $200 per month and two hangars which were built more recently, rent at $240 per month. All spaces within the hangars are currently occupied, and there are approximately 55 to 60 aircraft on the hangar waiting list at ARW, which only includes legitimate pilots willing to pay fair market rent for hangar space.

The first conventional hangar recently built at ARW is located west of the auto parking lot. The 4,800 square foot hangar provides covered space for a mosquito control helicopter.

Plans for a potential corporate hangar located west of the T-hangars are also being considered for private development.

Automobile Parking

Currently, there are 62 vehicle parking spaces in the asphalt lot located immediately adjacent to the terminal building. The parking lot surface is in poor condition. Overnight pilot parking is also accommodated in this lot, taking up

approximately 90 percent of the available spaces. As a result, the parking lot is often full. Airport management has indicated the need for increased parking space, as well as developing a separate parking lot for rental cars and associated facilities. Enterprise Rental Cars has expressed a desire to operate at ARW. In addition, airport staff is considering overnight parking inside the fence for based aircraft owners.

Airport Security

The FAA Advisory Circular 150/5070-6B, "Airport Master Plans", stresses the need for proper security considerations in both commercial and general aviation airport facilities. Airport terminal and ground access facilities are becoming increasingly important areas to secure, as well as airfield access and aircraft storage areas.

ARW has multiple security features in place. There are various types of fencing surrounding airport property, including an electrified wildlife fence which surrounds most of the property facing the marsh. Standard six-foot chain link security fencing is used around the terminal building and aircraft parking area. Locked gates are also in place to prevent unauthorized access into the T-hangars. Perimeter fencing is incomplete in poor condition near the gate area at the fire station on the west side of the airport.

In addition to fencing, ARW has two security cameras in place, and regular police surveillance. The Beaufort County Sherriff's Office substation has an office inside the terminal facility, and is usually staffed during operating hours.

Airport Support Facilities

Airports require utilities to operate the facilities and communications systems, fuel farms to sell fuel to aircraft and buildings to store and maintain airport equipment to keep the grass cut and make repairs. These facilities make up the support features of an airport.

Utilities

As with any airport, a variety of utilities are needed to support the infrastructure and its tenants. The following is a list of utilities provided at the Airport.

- Electric service - South Carolina Electric and Gas (SCE&G)
- Municipal Water - Beaufort Jasper Water Sewer Authority (BJWSA)
- Cable - Direct TV Satellite
- Internet - Internet Services of the Lowcountry (ISLC)

- Phone - Embarq
- Septic - (There is currently no sewer hookup available)

Fuel Farm

The Fuel Farm is run by the County and provides full and self service options. It currently provides 100 Low Lead (Avgas) and Jet A fuel for based and itinerant aircraft at ARW. It has two tanks, each with a capacity of 12,000 gallons.

Both of the fuel tanks are located above ground, and have spill prevention barriers surrounding them. Two aircraft fueling trucks are also parked on the fuel spill prevention area. The fuel farm is in good condition, and has adequate fuel capacity for ARW. Airport management has expressed interest in relocating the fuel farm in conjunction with any terminal building expansion.

Airport Maintenance

Airport maintenance equipment at ARW includes a tractor and several other vegetation management tools. This equipment is used to maintain the airport facilities and keep the airfield safe for continuing operations. There are no existing equipment storage facilities at ARW. As a result, the equipment is currently exposed to the elements which reduce their service life.

Off-Airport Land Use

There is a tomato packing plant just off of Airport property and abutting U.S. Route 21. It is used on a seasonal basis, the most intense of which occurs in the early summer. This light industrial use contrasts with the surrounding marsh and the suburban use of the property around the airport. This operation does not interfere with airport operations.

The County also has a small fire department facility on the edge of the Airport property. This facility is fenced off from the airfield area, although the fence is currently in poor condition.

Figure 1-7 shows existing land use in and around airport property.

Figure 1-7: Surrounding Land Use

Environmental Overview

ARW is located in a low-lying coastal region within the county. It is bordered by marsh and wetland areas on several sides. Future development at ARW should be carefully considered to minimize impacts to the surrounding areas, and to mitigate environmental impacts whenever possible.

Marsh and wetland areas are often home to many species of wildlife. Some threatened or endangered species are known to be in the vicinity of ARW including:

Flora

- Pondberry (endangered)
- Piedmont Flatsedge (species of concern)
- Pond Spice (species of concern)

- Bandana of the Everglades (species of concern)
- Ogeechee Tupelo (species of concern)

Fauna

- Bald Eagle (not threatened, but protected by the Bald and Golden Eagle Protection Act)
- Eastern Coral Snake (species of concern)
- Eastern Woodrat (species of concern)
- Little Brown Myotis (species of concern)

ARW property is also located in a Coastal Protection Zone and will have limitations on certain types of development or restrictions on environmental mitigation techniques.

1.5 Summary

This inventory chapter represents a consolidated source of airport data that will be referenced during the course of the ARW Airport Master Plan process. When necessary, data presented in this chapter will be expanded upon following the completion of specific master planning tasks. In addition, as the master plan progresses, new and/or updated data related to facilities and infrastructure examined in this chapter may become available. When appropriate, new data will be incorporated into this chapter and the entire ARW Airport Master Plan Report.

The facility deficiencies and issues identified as part of the inventory process are summarized below:

- Limited runway length impacting current users
- Existing T-hangar shortage
- Existing automobile parking shortage
- Existing terminal building space shortage
- Perimeter fencing incomplete
- Airport maintenance equipment storage facility
- Automobile parking on aircraft ramp

The inventory data presented in this chapter provides a framework from which analysis in the ARW Airport Master Plan will proceed. Some inventory data, such as the Airport's history, provides general background knowledge. Other types of inventory data, such as ARW's role as a Business/Recreation (SCIII) airport, its historic aircraft activity, area socioeconomic trends, and existing airport facilities are used to develop forecasts of future activity levels at the airport and to determine future facility requirements. Much of the data presented in this chapter is used to conduct facility analyses as the master planning process works towards identifying a recommended development plan for ARW Airport.

Chapter
2

Projections of Aviation Demand

Projecting future aviation demand is a critical element in the overall master planning process. The activity forecasts developed in this chapter will be used in subsequent tasks to analyze the airport's ability to accommodate future activity and to determine the type, size, and timing of future airside and landside facility developments.

This chapter discusses the findings and methodologies used to project aviation demand at Beaufort County Airport (ARW). It must be recognized that there are always short-term fluctuations in an airport's activity due to a variety of factors that cannot be anticipated. The forecasts developed in the Master Plan Update provide a meaningful framework to guide the analysis of future, long range airport development needs and alternatives.

The projections of aviation demand developed for ARW are documented in the following sections:

- National Aviation Trends
- Regional Demographics
- FAA Aerospace Forecasts
- ARW Historic Aviation Activity
- Projections of Aviation Demand
- Beaufort County Airport Projections
  - Based Aircraft
  - Aircraft Operations
- Critical Aircraft

This forecast analysis includes methodologies that consider historical aviation trends at ARW and throughout the nation. Local historical data were collected from FAA Terminal Area Forecast (TAF) records and historical airport records. In addition, demographic data for Beaufort County were used to track local trends and conditions that can impact general aviation demand levels. Projections of aviation activity for the airport were prepared for the near-term (2013), mid-term (2018), and long-term (2023 and 2028) timeframes. These projections are generally unconstrained and assume the airport will be able to develop the various facilities necessary to accommodate based aircraft and future operations.

2.1 National Aviation Trends

The aviation industry and general aviation activity have experienced significant changes over the last 20 years. At the national level, fluctuating trends in general aviation usage and economic upturns/downturns resulting from the nation's business cycle have all impacted general aviation demand. At the local level, the positive demographic and economic performance experienced in Beaufort County has impacted general aviation demand in the region. This section examines general aviation trends and the numerous factors that have influenced those trends in the U.S.

Recent trends, both national and local, are important considerations in the development of projections of aviation demand for ARW. National trends can provide insight into the potential future of aviation activity and anticipated facility needs. Data sources that were examined and used to support this analysis of national general aviation trends included the following:

- Federal Aviation Administration, FAA Aerospace Forecasts, Fiscal Years 2008-2025
- National Business Aircraft Association (NBAA), NBAA Business Aviation Fact Book, 2004
- General Aviation Manufacturers Association (GAMA), General Aviation Statistical Databook
- Honeywell Corporation, 2007 Business Aviation Outlook

Data from these sources regarding historic and anticipated trends in general aviation will be summarized in the following sections of this report:

- General Aviation Overview
- General Aviation Industry
- Business Use of General Aviation
- Summary of National General Aviation Trends

Historic and anticipated trends related to general aviation will be important considerations in developing regional forecasts of general aviation demand for ARW.

General Aviation Overview

General aviation aircraft are defined as all aircraft not flown by commercial airlines or the military. There are over 18,300 public and private airports located throughout the United States of which more than 3,300 are included in the National Airport System, indicating their eligibility for federal funding assistance. Commercial service airports (those that accommodate scheduled airline service) represent a relatively small portion (538, or roughly 16%) of the airports in the National Airport System. General aviation airports, including reliever airports, comprise more than 2,800 facilities within the National Airport System. More than 15,000 additional airports, both private and public use, supplement those airports that are included in the National Airport System.

General Aviation Industry

A pronounced decline in the general aviation industry began in 1978, and lasted into the mid-1990s. This decline resulted in the loss of over 100,000 manufacturing jobs and a drop in aircraft production from about 18,000 aircraft annually to only 928 aircraft in 1994. Contributing to the decline in general aviation during this period was the increasing number of liability claims against aircraft manufacturers, the loss of Veterans Benefits that covered many costs associated with student pilot training, and the recessionary economy. Product liability lawsuits arising from aircraft accidents resulted in dramatic increases in aircraft manufacturing costs.

Enactment of the General Aviation Revitalization Act (GARA) of 1994 provided significant relief to the aviation industry. This Act established an 18-year Statute of Repose on liability related to the manufacture of all general aviation aircraft and their components where no time limit was previously established. GARA spurred manufacturers including Cessna and Piper Aircraft to resume production of single-engine piston aircraft. Some positive impacts the Act has had on the general aviation industry are reflected in recent national statistics. Since 1994, statistics indicate an increase in general aviation activity, an increase in the active general aviation aircraft fleet, and an increase in shipments of fixed-wing general aviation aircraft.

Most recently, however, the terrorist attacks of September 11th, 2001 and the recessionary national economy have had a dampening impact on these positive general aviation industry trends. Significant restrictions were placed on general aviation flying following September 11, 2001 which resulted in severe limitations being placed on general aviation activity in many areas of the country. With the exception of the Washington, D.C. area, most of these restrictions have now been lifted. Business and corporate general aviation have experienced some positive gains resulting from additional use of general aviation aircraft for travel tied in part to new security measures implemented at commercial service airports and the increased personal travel times that have resulted.

Business Use of General Aviation

Business aviation is one of the fastest growing facets of general aviation. Companies and individuals use aircraft as a tool to improve their businesses' efficiency and productivity. The terms "business" and "corporate" aircraft are often used interchangeably, as they both refer to aircraft used to support a business enterprise. FAA defines business use as "any use of an aircraft (not for compensation or hire) by an individual for transportation required by the business in which the individual is engaged." The FAA estimates that business aircraft use accounts for slightly more than 11 percent of all aviation activity. The FAA defines corporate transportation as "any use of an aircraft by a corporation, company or other organization (not for compensation or hire) for the purposes of transporting its employees and/or property, and employing professional pilots for the operation of the aircraft." An additional 12 percent of the nation's GA activity is considered corporate. Regardless of the terminology used, the business component of general aviation use is one that has experienced significant recent growth.

Increased personnel productivity is one of the most important benefits of using business aircraft. Companies flying general aviation aircraft for business have control of their travel. Itineraries can be changed as needed, and the aircraft can fly into destinations not served by scheduled airlines. Business aircraft usage provides:

- Employee time savings
- Increased en route productivity
- Minimized time away from home
- Enhanced industrial security
- Management control over scheduling

Many of the nation's employers who use general aviation are members of the National Business Aircraft Association (NBAA). The NBAA's Business Aviation Fact Book 2004 indicates that approximately 75 percent of all Fortune 500 businesses operate general aviation aircraft and 92 of the Fortune 100 companies operate general aviation aircraft. Business use of general aviation aircraft ranges from small, single-engine aircraft rentals to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. General aviation aircraft use allows employers to transport personnel and air cargo efficiently. Businesses often use general aviation aircraft to link multiple office locations and reach existing and potential customers. Business aircraft use by smaller companies has escalated as various chartering, leasing, time-sharing, interchange agreements, partnerships, and management contracts have emerged.

Other new, growing segments of the business aircraft fleet mix include business liners and ultralight jets. Business liners are large business jets, such as the

Boeing Business Jet and Airbus ACJ, which are reconfigured versions of passenger aircraft flown by large commercial airlines. Very light jets (VLJs) are a relatively new category of aircraft that includes the Adam A-700, Eclipse 500, and Cessna Mustang (among others). These are small jets, seating less than ten passengers, and that cost substantially less than typical business jet aircraft. They have been labeled as "personal jets". VLJ aircraft represent a significant departure from the cost of previously available jet aircraft. Certified by the FAA in June 2006, the Eclipse 500 has a purchase price of approximately $1.6 million and has experienced significant interest with orders for more than 2,500 aircraft to date. Eclipse, however, went through bankruptcy in 2009 and has since been sold and reformed as Eclipse Aerospace. Although significant interest in VLJ aircraft remains, it is a segment of the general aviation industry that is going through fluctuations and has yet to be a proven industry.

Business aviation is projected to experience additional growth in the future. The Honeywell Business Aviation Outlook projects that more than 14,000 new business aircraft valued at over $233 billion will be delivered between 2007 and 2017, excluding business liners and very light jets.

The anticipated changes in the nation's active general aviation fleet, including growth in the number of active jet aircraft, is likely to impact aviation activity at ARW over the study period of the master plan update. Recent general aviation trends and projected changes to the nation's active general aviation fleet will be reflected in the projections of aviation demand developed for the airport.

2.2 Regional Demographics

Regional demographic data were examined in detail in the preceding inventory chapter. Where applicable, this demographic data is used in the master planning process to relate area demographic trends to future aviation activity levels at the airport. This analysis examined the historical trends and future projections of the region's population, employment and earnings based on several reliable data sources. Historic and projected future population data were obtained from the U.S. Census as well as Woods and Poole Economics, Inc. Employment and income data were also compiled from Woods & Poole Economics.

Table 2-1 summarizes population growth trends experienced between 1970 and 2008 for Beaufort County. These trends are compared to population trends in South Carolina and the United States

Table 2-1: Population Growth Statistics

Area	1970	1980	1990	2000	2008	Annual Growth 1970-2008
Beaufort County	51,530	66,060	87,220	122,020	151,870	2.9%
South Carolina	2,604,330	3,132,380	3,501,160	4,023,570	4,435,950	1.4%
United States	203,982,310	227,225,620	249,622,810	282,216,950	306,044,990	1.1%

Source: Woods & Poole Economics, Inc.

Beaufort County, South Carolina, and the United States as a whole, have all seen steady increases in population growth. Beaufort County has nearly tripled its population during the 38 year period presented here, and the compounded annual growth rate (CAGR) of 2.9% is more than twice as high as the national average.

There are a number of demographics factors that impact, to varying degrees, the demand for general aviation in any particular region. In addition to population trends, regional economic trends also can significantly impact aviation demand. Regional economic trends are summarized in this analysis through an examination of employment and earnings data. Table 2-2 presents historic employment and earnings data for Beaufort County along with the CAGR for South Carolina and the United States.

Table 2-2: Demographic Data

Area	Employment	Earnings
Beaufort County CAGR 1990-2008	3.3%	5.1%
South Carolina CAGR 1990-2008	1.5%	2.7%
U.S. CAGR 1990-2008	1.5%	2.9%

Source: Woods & Poole Economics, Inc.

Data presented in Table 2-2 indicates that, in Beaufort County, compound growth in employment averaged 3.3 percent annually from 1990 to 2008. This rate is again more than twice the growth of the state and national averages of 1.5 percent.

Statistical analysis typically indicates that regional earnings is one of the most important demographic factors impacting aviation demand, illustrating an underlying assumption that as earnings (and consequently discretionary income) grow, regional residents have more to spend on all goods and services, including aviation-related goods and services. Gross earnings in Beaufort County are estimated to have grown at an average annual compound growth rate of 5.1 percent between 1990 and 2008. Once again, this is almost twice the state average of 2.7 percent and the national average of 2.9 percent.

Projections of population, employment, and earnings developed for Beaufort County indicate that the region is expected to experience continued high levels of growth, as shown in Table 2-3. County population is expected to increase steadily through the end of the forecast period, as the area continues to attract residents with its high quality of life offerings.

Regional employment is projected to continue to grow steadily, but at a slightly slower rate than experienced over the past few decades. The growth in regional earnings is expected to slow somewhat from past trends, but is still very strong at 3.5 percent annual growth through the forecast period.

The projected growth rates of these demographics reflect strong, steady growth over the projection period. These factors will have an important influence on the projection of aviation activity at ARW.

Table 2-3: Beaufort County Demographic Projections

	Year	Population	Employment	Earnings (in millions of $)
Actual	2007	147,140	98,970	3,884
Projected	2010	161,270	109,060	4,355
	2015	185,130	125,910	5,214
	2020	209,270	142,790	6,182
	2025	233,870	159,720	7,278
	2030	259,360	176,670	8,524
CAGR		2.5%	2.6%	3.5%

Source: Woods & Poole Economics, Inc.

2.3 FAA Activity Forecasts

On an annual basis, the FAA publishes forecasts that summarize anticipated trends in most components of civil aviation activity. Each published forecast revisits previous activity forecasts and updates them after examining the previous year's trends in aviation and economic activity. Many factors are considered in the FAA's development of forecasts, some of the most important of which are U.S. and international economic growth and anticipated trends in fuel costs. FAA

forecasts generally provide one of the most detailed analyses of historic and forecasted aviation trends and provide the general framework for examining future levels of aviation activity for the nation as well as in specific states and regions.

Examples of measures of national general aviation activity that are monitored and forecasted by the FAA on an annual basis in the FAA Aerospace Forecasts include active pilots, active aircraft fleet, and active hours flown.

Historic and projected activity in each of these categories will be examined in the following sections. Data presented are based on available data contained in the FAA Aerospace Forecast, Fiscal Years 2008-2025.

Active Pilots

Active pilots are defined by the FAA as those persons with a pilot certificate and a valid medical certificate. Table 2-4 summarizes historic and projected U.S. active pilots by certificate type.

Table 2-4: Historic and Projected U.S. Active Pilots by Type of Certificate

Certificate Type	2002	2007	2025	CAGR 2002-2007	CAGR 2007-2025
Students	85,991	84,339	100,200	-0.4%	1.0%
Recreational	317	239	240	-5.5%	0.02%
Sport Pilot	NA	2,031	20,600	NA	13.8%
Private	245,230	211,096	220,550	-3.0%	0.2%
Commercial	125,920	115,127	126,150	-1.8%	0.5%
Airline Transport	144,708	143,953	155,200	-0.1%	0.4%
Rotorcraft only	7,770	12,290	17,830	9.6%	2.1%
Glider only[1]	21,826	21,274	22,360	-0.5%	0.3%
Total	**609,936**	**590,349**	**663,130**	**-0.7%**	**0.7%**
Instrument Rated[2]	317,389	309,865	346,200	-0.5%	0.6%

Source: FAA Aerospace Forecasts, Fiscal Years 2008-2025.
[1]In March 2001, the FAA Registry changed the definition of this pilot category. This change added approximately 13,000 to this category.
[2]Instrument rated pilots should not be added to other categories in deriving total.

FAA projects small but steady growth in the active pilot population through 2025. Total active pilots are projected to increase from approximately 590,349 in 2007 to 663,130 in 2025, representing a CAGR of approximately 0.7%.

Active Aircraft Fleet

The FAA annually tracks the number of active general aviation aircraft in the U.S. fleet. Active aircraft are those aircraft currently registered and flying at least one hour during the year. Table 2-5 summarizes recent active aircraft trends as well as FAA projections of future active aircraft type.

Table 2-5: Historic and Projected U.S. Active General Aviation Fleet Mix

Aircraft Type	2002	2007	2025	CAGR 2002-2007	CAGR 2007-2025
Single-engine Piston	143,503	144,580	157,400	0.2%	0.5%
Multi-engine Piston	17,483	18,555	15,650	1.2%	-0.9%
Turboprop	6,841	8,190	10,820	3.7%	1.6%
Jet	8,355	10,997	29,515	5.7%	5.6%
Rotorcraft	6,648	9,685	16,855	7.8%	3.1%
Experimental	21,936	23,920	35,200	1.8%	2.2%
Sport Aircraft	NA	2,700	14,700	NA	9.9%
Other	6,478	6,380	6,360	-0.3%	-0.02%
Total	**211,244**	**225,007**	**286,500**	**1.3%**	**1.4%**
Total w/o Sport Aircraft	**211,244**	**222,307**	**271,800**	**1.0%**	**1.1%**

Source: FAA Aerospace Forecasts, Fiscal Years 2008-2025.

General aviation trended upward between 2002 and 2007. Total active aircraft increased 1.3 percent annually over the last five years, with rotorcraft and jet aircraft leading the increase.

The growth of jets is an important trend. This trend illustrates a movement in the general aviation community toward higher-performing, more demanding aircraft. Growth in jet aircraft is expected to significantly outpace growth in all other segments of the general aviation aircraft fleet through the planning period.

The other aircraft category expected to experience large growth is Sport Aircraft. This category of aircraft, created by the FAA in September 2004 through its rulemaking process, targets the recreational segment of aviation, including a sizeable portion of the ultralight aircraft community. A major part of the growth of this aircraft category is expected to come from already-existing – but not registered – recreational aircraft that register under the new rule. Trends at ARW indicate that recreational activity is diminishing while business activity remains constant, which implies that ARW is not likely to see much growth from sport aircraft. It is also unlikely that there are a significant number of unregistered aircraft on the airport. For these reasons, it is useful to examine the growth of the U.S. general aviation fleet, excluding sport aircraft. Without sport aircraft, the CAGR of the general aviation fleet drops from 1.4 percent to 1.1 percent.

Active Hours Flown

Hours flown is another statistic used by the FAA to measure and project general aviation activity. Hours flown is a valuable measure because it captures a number of activity-related data including aircraft utilization, frequency of use, and duration of use. Hours flown in general aviation aircraft have increased slightly from 2002 to 2007 by an annual average of 0.6 percent, as shown in Table 2-6. Part of this small increase is a result of the affects on general aviation following September 11th and the follow-on restrictions imposed by the federal government.

Table 2-6: Active General Aviation and Air Taxi Hours Flown (in thousands)

Aircraft Type	2002	2007	2025	CAGR 2002-2007	CAGR 2007-2025
Single-engine Piston	16,325	13,501	16,233	-3.7%	1.0%
Multi-engine Piston	2,566	2,527	2,035	-0.3%	-1.2%
Turboprop	1,850	2,187	2,698	3.4%	1.2%
Jet	2,745	4,405	16,743	9.9%	7.7%
Rotorcraft	1,875	3,629	6,295	14.1%	3.1%
Experimental	1,345	1,258	1,965	-1.3%	2.5%
Sport Aircraft	NA	143	1,108	NA	12.1%
Other	333	215	235	-8.4%	0.5%
Total	**27,039**	**27,865**	**47,312**	**0.6%**	**3.0%**
Total w/o Sport Aircraft	**27,039**	**27,722**	**46,204**	**0.5%**	**2.9%**

Source: FAA Aerospace Forecasts, Fiscal Years 2008-2025.

As with the active general aviation forecast, the influence of sport aircraft hours flown was factored out since sport aircraft do not and are not expected to contribute significantly to ARW's activity levels.

As presented by the FAA, the compound annual growth rate of hours flown over the projections period (not counting sport aircraft activity) is approximately 3 percent. Compared to the projected average annual growth rate of the general aviation active fleet, approximately 1.1 percent, the projected increase in hours flown represents anticipated increases in aircraft utilization. Hours flown by general aviation aircraft are estimated to reach approximately 47 million by 2025, compared to almost 28 million in 2007. Part of this activity increase is expected from the introduction of very light jets, the first of which was certified by the FAA in 2006. These jets will see service as air taxis with fractional ownership companies, where high utilization is a key to success.

Summary of National General Aviation Trends

The cyclical nature of general aviation activity is illustrated in the historic data presented in this analysis. While general aviation activity experienced rebounded growth during the mid and late 1990s, the terrorist attacks of 2001 and the recent economic downturn caused by record-high fuel prices has dampened activity over the last several years. FAA projections of general aviation activity, including active pilots, active aircraft, and hours flown, all show varied growth through the forecast horizon of 2025. Following stalled growth and some declines during 2001 and 2002, most components of general aviation activity are projected to rebound and soon surpass previous activity levels. An important national trend that has the potential to impact general aviation activity at ARW is the growing proportion of jet aircraft in the active general aviation fleet. The ability of ARW to accommodate increasing activity by general aviation jet aircraft will be an important consideration in the master plan update.

2.4 Historic Aviation Activity

Historic based aircraft and operations data for ARW provide the baseline from which future activity at the airport can be projected. While historic trends are not always reflective of future periods, historic data do provide insight into how local, regional, and national demographic and aviation-related trends may be tied to the airport.

Historic activity data for ARW have been compiled from several sources including airport and county records. When data were not available, interpolation or estimates were used, as indicated.

For the purpose of the following analysis, based aircraft are defined as aircraft permanently stored at an airport. An aircraft operation represents either a landing or departure conducted by an aircraft. A takeoff and a landing, for example, would count as two operations.

Overall, based aircraft at ARW have increased from 1998 to 2008, as shown in Table 2-7. The data provided for the 2008 FAA Form 5010 indicate that the number of based aircraft in 2008 has risen to 56 total aircraft.

The numbers of single-engine piston aircraft have increased over the past five years until 2008, when they experienced a slight drop. Multi-engine piston aircraft have increased as well, particularly in 2008, with 14 based at ARW. The recent addition of an amphibious aircraft provides the only based aircraft designated as “Other”.

Table 2-7: Historic Based Aircraft

Year	Single-engine Piston	Multi-engine Piston	Jet	Helicopter	Other	Total Based Aircraft
1998	25	5	0	0	0	30
1999	25	5	0	0	0	30
2000	25	5	0	0	0	30
2001	43	7	0	0	0	50
2002	43	7	0	0	0	50
2003	23	6	0	0	0	29
2004	23	6	0	0	0	29
2005	33	2	0	0	0	35
2006	45	6	0	0	0	51
2007	45	6	0	0	0	51
2008	38	14	0	3	1	56
CAGR (1998-2008)	**4.28%**	**10.84%**	**0%**	**300.0%**	**100%**	**6.44%**

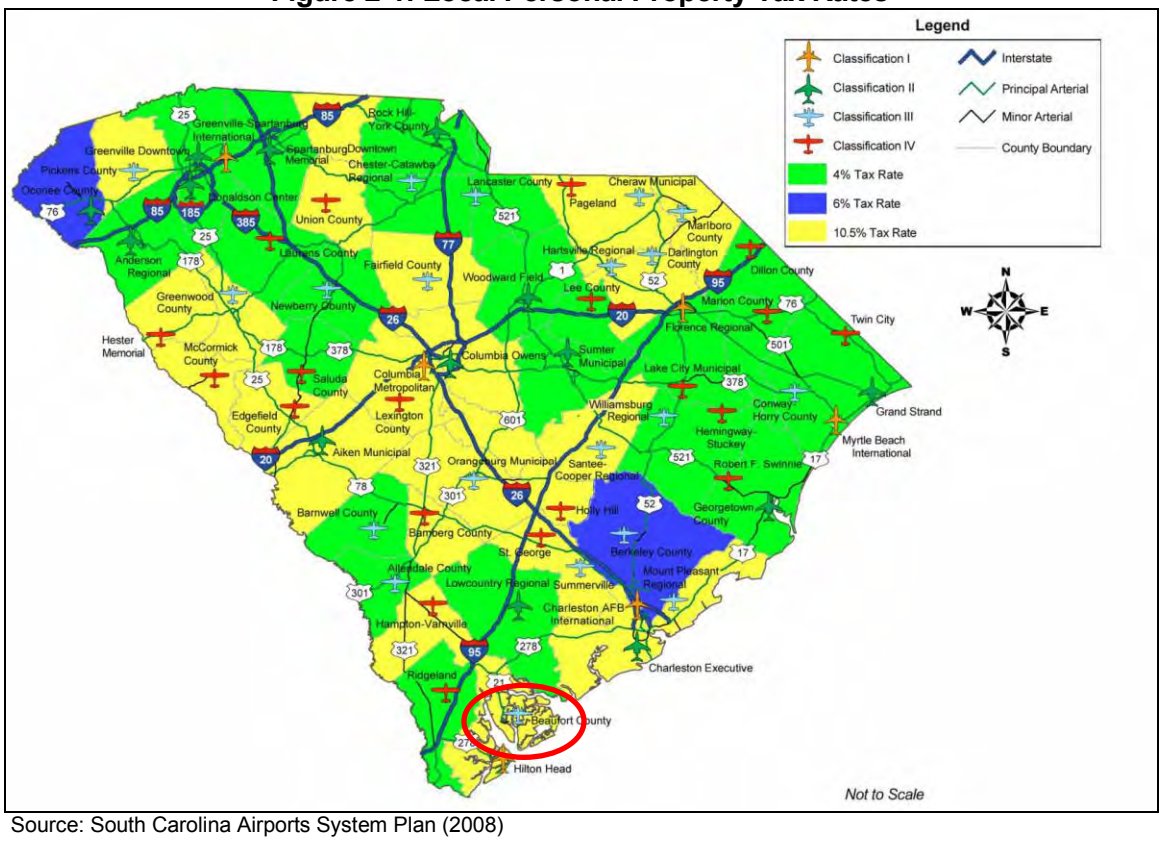
Source: FAA Terminal Area Forecast and Form 5010

The helicopter category has recently increased due to the introduction of two privately owned helicopters, as well as one helicopter owned by Beaufort County, which will be used in mosquito spraying operations.

One factor affecting the number of based aircraft in Beaufort County is the personal property tax rate. Beaufort County assesses a rate of 10.5 percent versus 4 percent in adjacent Jasper and Colleton counties (See Figure 2-1). This high tax rate can discourage aircraft owners from basing their aircraft in the county, particularly expensive jets. This effect has been confirmed by the initial results of the pilot surveys conducted as part of the master plan update. Several jet owner/operators are based on Walterboro's Lowcountry Regional Airport (RBW) who have homes or business interests in Beaufort County. They indicated if the runway was longer and the tax rate was less, then they would base or operate their aircraft out of ARW.

Historic operations data for ARW include operations conducted by both based aircraft as well as those conducted by itinerant aircraft arriving at ARW for a variety of reasons including business and recreation. Historic aircraft operations for ARW are summarized in Table 2-8.

Figure 2-1: Local Personal Property Tax Rates



Source: South Carolina Airports System Plan (2008)

Table 2-8: Historic Operations

Year	Itinerant Operations		Local Operations	Total Operations
	Air Taxi	General Aviation	General Aviation	
1998	1,500	11,400	15,500	28,400
1999	2,000	15,500	16,500	31,000
2000	2,000	15,500	16,500	31,000
2001	3,500	18,500	23,000	45,000
2002	4,000	20,000	26,000	50,000
2003	3,500	18,500	23,000	45,000
2004	3,500	18,500	23,000	45,000
2005	1,000	10,000	17,000	28,000
2006	1,500	14,500	25,000	41,000
2007	1,500	14,500	25,000	41,000
2008	1,500	14,500	25,000	41,000

Source: FAA Terminal Area Forecast and Form 5010

General aviation (GA) operations, both itinerant and local (touch and go), have experienced the greater increases than Air Taxi. With the exception of 2005, when the total number of operations dropped, Local GA operations have been increasing steadily over the past decade.

The drop in Air Taxi operations is attributed to increased insurance requirements where minimum runway lengths have been set in order to obtain lower premiums. With aviation fuel costs at historic highs, businesses cannot afford to pay higher premiums. Therefore, with respect to ARW, corporate jets now fly into surrounding airports over an hour away from their intended destination and their occupants then complete the trip by driving over land.

Total operations have remained constant over the past three years. Tube counters installed on Taxiway B have recorded on average 1,650 operations per month. Assuming the same number of operations occur on Taxiway A, this equates to 3,300 operations per month. This translates into 39,600 operations per year, confirming the FAA's Terminal Area Forecast (TAF).

2.5 Projections of Aviation Demand – Beaufort County Airport

Projections of aviation demand at ARW for the 20-year planning period are presented in the following sections:

- Based Aircraft Projections
- Aircraft Operations Projections

Various methodologies were examined and used to develop these projections. The results of these forecasting methodologies are compared and a preferred projection is selected.

Based Aircraft Projections

Based aircraft are those aircraft that are permanently stored at an airport. Estimating the number and types of aircraft expected to be based at ARW over the 20-year study period will impact the planning for future airport facility and infrastructure requirements. As the number of aircraft based at an airport increases, so does the amount of aircraft storage required at the facility. The based aircraft at ARW was projected using several different methodologies. Each methodology is summarized in the following sections and the results presented. These results are then compared and a preferred based aircraft projection for the airport selected. The preferred based aircraft projection for ARW will be carried forward in the master planning process and will be used to examine future airport facility needs.

Population Growth Methodology

Changes in area population are often a key factor that can affect aviation demand in a study area. In many instances there tends to be a direct correlation between an area's population and the number of based aircraft in that area. A based aircraft projection was developed for ARW that reflects the anticipated steady increase in population for the airport's general market area. The results of the population methodology are summarized in Table 2-9.

Table 2-9: Based Aircraft Projection Based on Population Growth

	Year	Total Based Aircraft
Historic	2008	56
Population Annual Growth Rate 2007-2030		2.5%
Projected	2013	63
	2018	72
	2023	81
	2028	92

Source: Wilbur Smith Associates, Woods & Pools

The results of this methodology indicate that as population in Beaufort County increases during the forecast period, total based aircraft at ARW are projected to increase to 92, representing a CAGR of 2.5 percent.

Growth in FAA Active Aircraft Methodology

This based aircraft projection methodology is used to develop projections of future based aircraft at ARW by assuming that the growth of based aircraft will correspond to the rate forecast by the FAA for active general aircraft (not including sport aircraft). The results of the FAA active aircraft methodology are summarized in Table 2-10.

Table 2-10: Based Aircraft Projection Based on FAA Growth of Active General Aviation Aircraft

	Year	Total Based Aircraft
Historic	2008	56
Active GA Aircraft Annual Growth Rate 2007-2017		0.9 %
Projected	2013	59
	2018	62
	2023	65
	2028	67

Source: Wilbur Smith Associates and FAA Terminal Area Forecast

This methodology projects the growth of total based aircraft from 56 to 67 by the end of the planning period.

Earnings Growth Methodology

A based aircraft projection was developed that mirrors the earnings projections for Beaufort County. Regional earnings, which are a good indicator of aviation activity, are projected to grow at 3.5 percent per year over the planning period in Beaufort County. Applying this ratio to ARW, based aircraft indicate an increase from 56 in 2008 to 111 in 2028, as shown in Table 2-11.

Table 2-11: Based Aircraft Projection Based on Earnings Growth

	Year	Total Based Aircraft
Historic	2008	56
Regional Earnings Annual Growth Rate 2007-2030		3.5 %
Projected	2013	67
	2018	79
	2023	94
	2028	111

Source: Wilbur Smith Associates, Woods & Poole Economics, Inc.

Comparison of Based Aircraft Projections

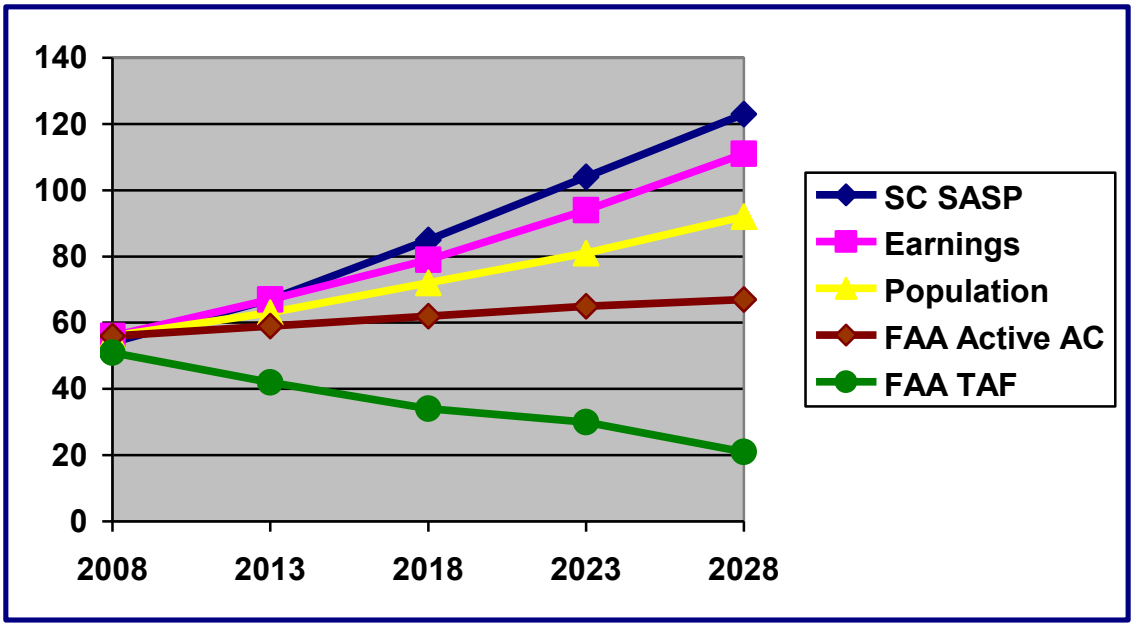
Table 2-12 shows the three based aircraft projections and compares them to the State's Airport System Plan forecast and FAA's based aircraft Terminal Area Forecast (TAF) for ARW. Growth rates range from 0.9 to 4.2 percent. With Beaufort County expected to have continued population growth and with its employment and earnings growth increasing faster than national averages, it is unlikely that the airport will experience the -4.3 percent growth forecast by the "top-down" FAA's terminal area forecast projection.

Table 2-12: Comparison of Based Aircraft Projections

	Year	Beaufort County Earnings Growth	Beaufort County Population Growth	FAA Active Aircraft Growth	SC State Airport System Plan**	FAA Terminal Area Forecast
Actual/Est.	2008	56	56	56	54	51
Projected	2013	67	63	59	67	42
	2018	79	72	62	85	34
	2023	94	81	65	104	30
	2028	111	92	67	123	21*
	CAGR	3.5%	2.5%	0.9%	4.2%	-4.3%

Source: Wilbur Smith Associates, FAA Aerospace Forecast, 2008-2025, and FAA Terminal Area Forecast
*Estimate **Interpolation

Figure 2-2: Comparison of Based Aircraft Projections



Source: Wilbur Smith Associates

However, it is likely that growth in based aircraft at the airport will be between 0.9 and 4.2 percent over the planning period, particularly if constraints and disincentives at ARW are alleviated.

Many aircraft owners desire to locate their aircraft at ARW if hangar space was made available. Currently, all 34 T-hangars are full and over 50 aircraft are on the verified hangar waiting list, which represents owners willing to pay the market rates if space were available. The full waiting list exceeds 100 perspective hangar renters, but it is considered more of a "wish list".

As mentioned previously, Beaufort County's tax rate on aircraft owners is higher than the nearest competing airports. It is reasonable to assume that more aircraft would base at ARW (assuming hangars were available) if the personal property tax rate for the county was lowered to a rate similar to surrounding counties.

Finally, jet aircraft operate and base at competing airports with runway lengths over 5,000 feet which meets some of the minimum insurance requirements for lower premium costs. If ARW had a runway long enough to address this insurance stipulation, then based on the survey results, more jet aircraft would operate to and from the airport and some would base at the Beaufort County Airport.

Based on this analysis, the recommended based aircraft forecast for ARW is the population-based projection which assumes some of the constraints described above will be resolved over the next 20 years. This forecast will be submitted to FAA for

their approval and used to determine future facility requirements. The recommended based aircraft projection is summarized in Table 2-13.

Table 2-13: Recommended Based Aircraft Projection

	Year	Total Based Aircraft
Actual	2008	56
Population Annual Growth Rate 2007-2030		2.5%
Projected	2013	63
	2018	72
	2023	81
	2028	92

Source: Wilbur Smith Associate's analysis

Forecast Scenarios

In addition to the recommended forecast, a "high" and "low" forecast projection was selected to conduct sensitivity tests throughout the master planning process. The South Carolina Airport System Plan projection for ARW will serve as the high forecast and will be used to test whether space is available to store 123 aircraft in 2028. This scenario will represent the upper potential for ARW if all the constraints listed above were resolved. The FAA Active Aircraft projection will be used as the low forecast and will test the financial feasibility of the recommended capital improvement program if none of the constraints are resolved. Based aircraft would grow at a much slower rate and the implications of funding new facilities at ARW would be analyzed.

Based Aircraft Fleet Mix Projections

Total based aircraft projected for ARW over the planning period using the preferred based aircraft projection were allocated to five aircraft categories – single-engine piston, multi-engine piston, jet, helicopter, and other – to develop a projection of the airport's based aircraft fleet mix through the planning period. The fleet mix projections were developed based on the fleet mix percentages exhibited at the airport in 2008 then rates of growth by aircraft types were used from the FAA Aerospace Forecasts. The existing based aircraft fleet mix at ARW is summarized as follows:

- Single-engine piston aircraft – 68 percent of total based aircraft
- Multi-engine piston aircraft – 25 percent of total based aircraft
- Jet aircraft – 0 percent of total based aircraft
- Helicopters – 5 percent of total based aircraft
- Other – 2 percent of total based aircraft

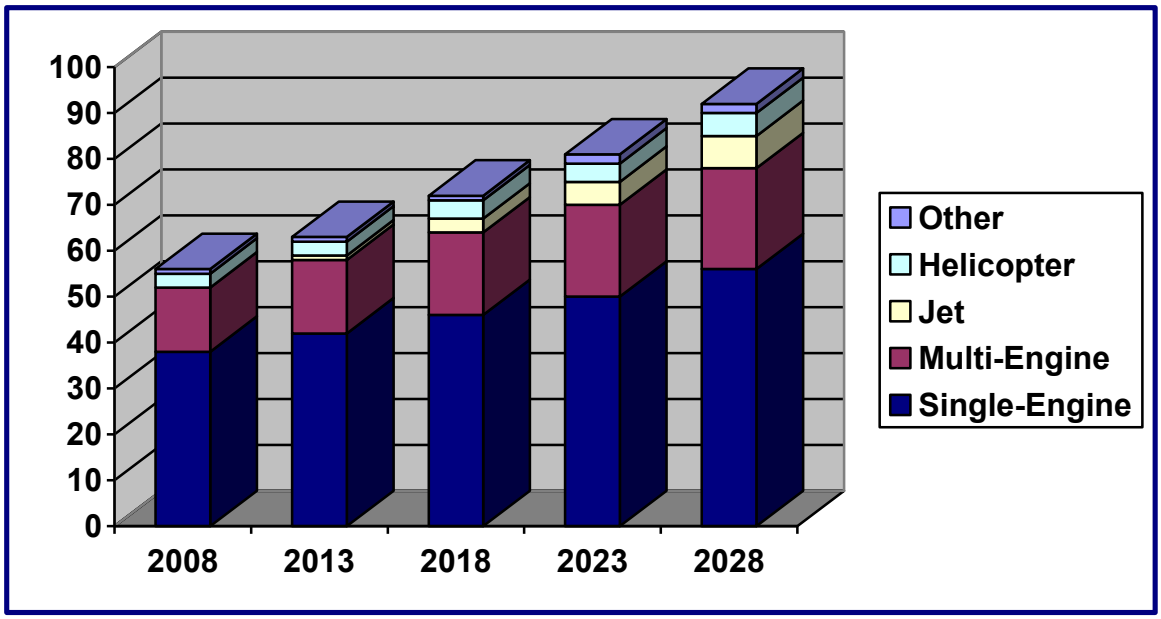
Based on projected U.S. general aviation trends found in the FAA's Aerospace Forecasts for years 2008 to 2025, jet aircraft will continue to represent a growing percentage of the active aircraft fleet in the nation. Single and multi-engine aircraft, however, are predicted to keep the current market share, or lose market share during the planning period. Helicopters are expected to slightly increase their current market share along with the "Other" aircraft category. The projected trends in the U.S. general aviation fleet were used to develop projections of ARW's future based aircraft fleet mix based on the master plan update's preferred projection of based aircraft. The preferred based aircraft fleet mix projections are presented in Table 2-14 and Figure 2-3.

Table 2-14: Preferred Based Aircraft Fleet Mix Projection

	Year	Total Based Aircraft	Single-engine Piston	Multi-engine Piston	Jet	Helicopter	Other
Historic	2008	56	38	14	0	3	1
Projected	2013	63	42	16	1	3	1
	2018	72	46	18	3	4	1
	2023	81	50	20	5	4	2
	2028	92	56	22	7	5	2

Source: Wilbur Smith Associate's analysis

Figure 2-3: Preferred Based Aircraft Fleet Mix Projection



Source: Wilbur Smith Associates

Aircraft Operations Projections

Many different factors impact the number of aircraft operations at the airport, including, but not limited to, total based aircraft, area demographics, activity and policies at neighboring airports, and national aviation trends. These factors are examined in the following sections and two methodologies are used to develop projections of future aircraft operations at ARW through the forecast period.

Projections of future operations at ARW are discussed in the following sections:

- Operations Per Based Aircraft Methodology
- Market Share Methodology
- Comparison of Aircraft Operations Projections
- Preferred Aircraft Operations Projections
- Projected Local/Itinerant Split
- Projected Fleet Mix

The result of each projection methodology is compared and a preferred projection scenario is selected. Following the selection of the preferred operations projection for the airport, the local/itinerant split at the airport is also identified. The preferred aircraft operations projection for ARW will be used to conduct a demand/capacity analysis in which the adequacy of existing airfield facilities will be evaluated to determine if capacity enhancing projects may be required to support future levels of aircraft operations at the airport.

Operations per Based Aircraft Methodology

The operations per based aircraft (OPBA) methodology is recognized by the FAA as an accepted means for relating the total number of aircraft operations to a known variable; in this case, based aircraft. OPBA is calculated by dividing the number of total general aviation operations that occur at an airport by the number of aircraft based at the airport. Total operations at ARW are projected by applying the airport's OPBA ratio to the preferred projection of based aircraft. The results of this projection scenario are summarized in Table 2-15.

Table 2-15: Preferred Aircraft Operations Based on Operations per Based Aircraft

	Year	Total Based Aircraft	OPBA	Total Operations
Historic	2008	56	732	41,000
Projected	2013	63	732	46,100
	2018	72	732	52,700
	2023	81	732	59,300
	2028	92	732	67,300

Source: Wilbur Smith Associate's analysis

The 2008 OPBA of 732 was held constant throughout the 20-year forecast period and multiplied by the preferred based aircraft projection to obtain the projection of aircraft operations.

FAA Hours Flown Methodology

The second aircraft operations projection methodology was based on the FAA's forecast of active general aviation and air taxi hours flown. It assumes that ARW would experience growth in operations consistent with growth in the number of hours flown nationally by general aviation and air taxi aircraft, according to FAA forecasts. Growth in hours flown is expected to total approximately 3 percent annually through the planning period. Applying that growth rate to ARW operations through the forecast period resulted in growth from 41,000 in 2008 to 74,100 operations by 2028, as shown in Table 2-16.

Table 2-16: Preferred Aircraft Operations Based on FAA Hours Flown Forecast

	Year	FAA Active General Aviation and Air Taxi Hours Flown	ARW Operations Projection
Historic	2008	28,241,000	41,000
Projected	2013	32,954,000	47,500
	2018	38,134,000	55,100
	2023	43,741,000	63,800
	2028	50,159,000	74,100
Average Annual Growth Rate		3.0%	3.0%

Source: Wilbur Smith Associates, FAA Terminal Area Forecast, FAA Aerospace Forecasts 2008-2025

Comparison of Aircraft Operations Projections

The results of the two aircraft operations projection scenarios examined in this analysis are summarized and compared with the State System Plan and FAA Terminal Area Forecast for ARW in Table 2-17.

Table 2-17: Comparison of Aircraft Operations Projections

	Year	OPBA	FAA Hours Flown Forecast	SC State Airport System Plan**	FAA Terminal Area Forecast
Actual	2008	41,000	41,000	38,500	41,000
Projected	2013	46,100	47,500	49,800	41,000
	2018	52,700	55,100	65,400	41,000
	2023	59,300	63,800	78,300	41,000
	2028	67,300	74,100	91,100	41,000*
CAGR		2.5%	3.0%	4.4%	0.0%

Source: Wilbur Smith Associates, FAA Terminal Area Forecast *Estimate **Interpolation

Forecasted annual operations at ARW in 2028 ranged from 67,300 to 91,100 operations. The FAA's terminal area forecast does not extend out to 2028, and they have "flat-lined" projected operations at small GA airports including ARW.

The FAA hours flown growth rate forecast results in a CAGR of 3.0 percent, slightly above the OPBA forecast of 2.5 percent. This level of growth in operations at ARW can be reasonably expected considering the above-average demographic growth that is projected to continue in the region during the planning period. Therefore, the FAA hours flown methodology is the preferred forecast.

It should be noted that the preferred aircraft operations projection for ARW represents an unconstrained projection and presumes that airport development needed to accommodate growth will be undertaken in a timely manner. Without continued infrastructure support and development for aviation activity at the airport, growth of operations could be anticipated to stabilize and/or decline in the later years, which, in turn, could result in fewer total operations accordingly.

2.6 Critical Aircraft

The development of airport facilities is driven by both the demand for those facilities, typically represented by total based aircraft and operations at an airport, as well as the type of aircraft that will make use of those facilities. Airport infrastructure components are designed to accommodate the most demanding aircraft, referred to as the critical aircraft, which will utilize the infrastructure on a regular basis. FAA defines an airport's critical aircraft as the most demanding class of aircraft that is anticipated to perform at least 500 annual operations at the airport.

After identifying an airport's critical aircraft, then the Airport Reference Code (ARC) can be determined. The ARC is a coding system that relates airport design criteria to the operational and physical characteristics of the airplanes that are intended to operate on the airfield. An ARC is a composite designation based on the Aircraft Approach Category (stall speed) and Airplane Design Group (wingspan) of the airport's critical aircraft. For ARW, the current critical aircraft is the Beech King Air, which has an ARC of B-II, which the current airfield is designed to accommodate. Very Light Jets (VLJ) are in the process of being certified by FAA and starting to fly, particularly by air taxi/charter firms like DayJet. Most VLJs fall in the ARC B-I or B-II category. However, based on letters from corporations and pilot survey results, the need for faster, corporate jet access to Beaufort County Airport is growing.

Corporations decide where to fly their aircraft based upon their business needs and then what airport has the necessary runway length and pavement strength to accommodate their aircraft. ARW currently has a runway length of 3,434 feet which doesn't provide adequate length for many corporate jet aircraft. As the pilot surveys have confirmed, pilots are using other airports with longer runways for their aircraft although they incur a drive time in excess of one hour to their final destination. In fact, Citation Jets Charter used to frequently operate at ARW, but now they are operating at competing airports due to runway length insurance requirements. They are still interested in operating at ARW, if the runway were lengthened in the future.

The Cessna Citation Jet CJ3 is an aircraft that may frequent ARW if the runway were lengthened. The Airport Reference Code for the CJ3 is B-II, which would not change the current ARC for the airport. It is unclear if this aircraft would have enough operations to become the airport's critical design aircraft and since it falls within the same ARC as the Beech King Air, it is recommended that the Beech King Air remain the airport's critical aircraft.

2.7 Summary

It is anticipated that Beaufort County Airport will see increasingly strong growth during the 20-year planning period, depending on the removal of the identified constraints. Market area demographic trends indicate that the airport is likely to outpace national growth in general aviation. Based aircraft are expected to increase from 56 aircraft in 2008 to 92 aircraft by 2028. The airport will also see an increase in the number of operations. By the end of the planning period, more than 74,000 operations are projected to occur. Table 2-19 summarizes the projections contained in this chapter.

Table 2-19: Summary of ARW Projections

	Based Aircraft Total	Total Operations
Actual		
2008	56	41,000
Projected		
2013	63	47,500
2018	72	55,100
2023	81	63,800
2028	92	74,100

Source: Wilbur Smith Associates and airport records

The next chapters will focus on assessing existing capacity and future facility requirements for the airport, as well as facilities that will be required to meet the demands of the future.

Chapter

3

Capacity Analysis/Facility Requirements

This chapter identifies improvements needed to satisfy the activity demand at Beaufort County Airport (ARW) based on forecasts presented in Chapter 2, in compliance with Federal Aviation Administration (FAA) design standards and goals identified by the Technical Advisory Committee. This task involves multiple analyses linking the projected aviation demand to existing and future facility needs. Additional data were collected from site visits to the Marine Corps Air Station Beaufort air traffic control tower as well as from input requested from airport management, pilots and tenants. The sections considered in this chapter of the Master Plan Update include the following:

3.1 Airfield Requirements

3.2 Landside Requirements

3.3 Summary

The adequacy of the existing runway length is a primary focus in determining the airfield requirements. Additionally, a review of how well the existing airfield conforms to applicable FAA design standards is also presented. Aircraft storage, fuel facilities and airport maintenance needs are identified under airfield requirements. Landside facilities are focused on determining requirements for terminal usage, automobile parking and roadway access.

As noted, some facility requirements are demand driven, i.e. they are tied directly to the aviation forecasts presented in the previous chapter. For example, the number of aircraft hangars needed in the future is tied directly to the based aircraft forecast. These demand-driven needs will be identified for the key study years to reflect an estimated timeframe of when the facility is needed; however, these facilities should not be undertaken until actual demand warrants their development.

The analysis described in this section identifies the minimum facilities needed. The airport owner, tenants and users may choose to provide facilities to a level above these minimums, based on other priorities, such as economic development. The facility requirements lay the foundation for the alternatives analysis, which begins with the identification of development concepts to meet the identified needs. The selected concepts will be shown on the Airport Layout Plan (ALP) and will be added into the Capital Improvement Program (CIP) for ARW described in subsequent chapters.

3.1 Airfield Requirements

Airfield Capacity

The airport capacity model is provided in FAA AC 150/5060-5 "Airport Capacity and Delay". The following key terms are relative to the discussion of capacity:

- *Demand* – the magnitude of aircraft operations to be accommodated in a specified period of time, provided by the forecasts.
- *Capacity* – a measure of the maximum number of aircraft operations that can be accommodated on an airport.
- *Annual Service Volume* – or ASV, a reasonable estimate of airport annual capacity.

There are several factors known to influence airport capacity. VFR and IFR hourly capacities estimated for ARW are based on the following assumptions:

1. *Runway-use Configuration:* The appropriate runway use configuration (No. 1) was taken from Figure 2-1 in the Advisory Circular.

2. *Percent Arrivals:* Arrivals equal departures.

3. *Percent of Touch and Go's:* Approximately 60 percent of the total operations are considered to be touch and go's.

4. *Taxiways:* The airport does not have a dedicated full-length parallel taxiway serving the primary runway, but it does have a turnaround at one end and a partial taxiway from the ramp at the other end.

5. *Airspace limitations:* ARW airspace is entirely enclosed within the nearby MCAS Beaufort airspace, but has no other airspace limitations.

6. *Runway Instrumentation:* The airport has non-precision approaches which helps to lower visibility minimums and allows access during most inclement weather conditions.

7. *Mix Index.* A mathematical expression used to categorize the percent of large aircraft (>12,500 pounds) using the airport. It is estimated to fall between 0 and 20 percent based on existing fleet usage and will continue to be in this range in future years. This index range is used for determining ASV.

To develop a portrait of peak operational demands, a peaking factor was applied to the preferred operational forecasts presented in Chapter 2. Based on similarly sized general aviation airports, peak month operations have been found to represent approximately 13 percent of annual operations. It is assumed that this monthly peaking factor would remain constant throughout the planning period. Average daily operations were estimated by dividing the peak month figure by 30 – the average number of days in any month throughout the year. To estimate peak hour operations, another peaking factor, the estimated percentage of daily activity occurring in the peak hour, (12 percent) was applied to the number of average daily operations. The results of applying these peaking figures to the preferred operational forecast are shown in Table 3-1.

Table 3-1: Peak Hour Demand

Demand	2008	2013	2018	2023	2028
Annual	41,000	47,500	55,100	63,800	74,100
Peak Month	5,330	6,175	7,163	8,294	9,633
Average Day	178	206	239	276	321
Peak Hour	21	25	29	33	39

Source: Wilbur Smith Associates

Under optimum conditions, Beaufort County Airport would have a VFR hourly capacity of about 90 operations, and an IFR capacity of about 50 operations. Based on annual forecast figures presented in the previous chapter, the airport will likely experience a peak hour of 21 to 39 operations throughout the forecast period. This operational characteristic is important to understand because some facilities should be sized to accommodate the peaks in activity, for example, the aircraft apron or terminal areas. Standard airport planning practices use the peak hour of the average day of the peak month (ADPM) as the peak level to plan for instead of the absolute peak level that occurs throughout the entire year.

By applying methodologies found in the Advisory Circular on capacity and demand, Beaufort County Airport has an annual service volume of approximately 200,000 operations. Overall capacity could be increased if a dedicated full-length parallel taxiway is constructed and a precision approach is developed in the future.

The forecast for annual operations is expected to increase from 41,000 to 74,100 operations by the end of the forecast period. This projected demand is well below the airport's annual capacity as shown in Table 3-2.

Table 3-2: Aviation Demand Capacity Analysis

	2013	2018	2023	2028
ASV (C)	200,000	200,000	200,000	200,000
Forecasted Operations (D)	47,500	55,100	63,800	74,100
Percent of Capacity	21%	24%	28%	32%

Source: Wilbur Smith Associates
Note: C = Capacity; D = Demand

Runway Classification

The most demanding types of aircraft that regularly use Beaufort County Airport today (i.e., more than 500 annual operations) are multi-engine turboprop aircraft, such as the Beech King Air C90, which are based at ARW. These aircraft are in Airport Reference Code (ARC) B-II and they weigh no more than 12,500 pounds, have wingspans of less than 49 feet and approach speeds of less than 91 knots.

Although Beaufort County Airport occasionally sees use by larger aircraft (e.g., small corporate jets and small-package cargo airplanes), they amount to less than 500 annual operations. Activity from a group small corporate jet aircraft may account for more than 500 annual operations within the 20-year planning period. These small corporate jets also fall within the B-II ARC category and the following summarizes the types of small corporate jets that have operated at ARW occasionally for the past 5 years:

Small Jet Users of ARW

- BeechJet 400A
- Cessna 500, 501, 525, 550, 551, 560
- Falcon 50, 900ex

Thus, it is recommended that ARW be designed to accommodate ARC B-II for the 20-year planning period of the master plan.

However, as small corporate jets become faster in the future and demand for their use at ARW increases, it is recommended that the airport monitor their activity at the airport. In the future, if more than 500 annual operations by C-II aircraft occurs or a corporate jet user bases an aircraft at ARW, then the airport should seek FAA approval to upgrade the airport to accommodate C-II design standards.

For reference purposes, the major areas that would be affected by a change in ARC criteria in the future are summarized below:

ARC B-II upgrade to C-II Implications:

- Increase runway width to 100 feet (+25 feet)
- Increase runway to taxiway centerline separation to 300 feet (+60 feet)
- Increase Runway Safety Area dimensions (+1400' length + 350' width)
- Increase Runway Protection Zone dimension (+15.7 acres)

Runway Length

The runway length required to accommodate ARC B-II aircraft was evaluated using FAA's runway length analysis provided in Advisory Circular (AC) 150/5325-4B *Runway Length Requirements for Airport Design*.

The current design aircraft for ARW is the King Air C90 and the FAA runway length curves for these type of aircraft with a maximum certificated takeoff weight (MTOW) of less than 12,500 pounds recommends 4,400 feet of runway to safely operate during 90 degree days (mean day maximum hot month).

The future design aircraft for ARW within the ARC B-II category includes small corporate jets, such as those currently operating at the airport on a limited basis, as described previously. These aircraft types are also included in FAA's runway length requirement category with MTOW of more than 12,500 pounds and less than 60,000 pounds. The runway length curves associated with these small to medium jet types (provided in the appendix) recommend the following runway lengths to safely operate during 90 degree days at ARW:

75% of these aircraft at 60% useful load	4,650 feet
100% of these aircraft at 60% useful load	5,390 feet

A few of the aircraft FAA includes in "100 percent category" for runway length calculations have been identified as potential users of ARW. Therefore, it is recommended that the midpoint of the runway length calculations above represent the future runway length requirements for ARW.

The runway at Beaufort County Airport is currently 3,434 feet in length and limits the usefulness of the airfield for some based aircraft and many itinerant aircraft, according to the surveys conducted as part of the master plan and discussions with corporate pilots and air taxi/charter businesses.

General aviation airports have witnessed an increased use of their runways by privately owned business jets. Over the years, business jets have proved themselves to be a tremendous asset to corporations by satisfying executive needs for flexibility in scheduling, speed, and privacy. In the past, several types of small corporate jets have operated at ARW, although on a restricted basis, due to the short runway.

Citation Jets Charter, Citation Shares and Alpha Flying are air taxi/charter operations that had operated at ARW in the past; however, as of 2007, they no longer operate at ARW due to the limited runway length and increases in insurance premiums related to short runway operations. According to these operators, including discussions and survey results, they are still interested in operating at ARW, if the runway were lengthened to 5,000 feet.

The survey included 200 aircraft owners that flew into lowcountry airports between 2007 and 2008 and 32 responses were received (16 percent). The results confirmed that some pilots are using other lowcountry airports (with longer runways than ARW) and then arranging for transportation, which takes one to two hours to drive to their final destination on the coast. According to the survey results, these aircraft would prefer to fly directly to Beaufort County Airport.

The survey also confirmed that the majority of the corporate jet traffic in the lowcountry area involves small to medium jets, such as Cessna Citation jets and Raytheon BeechJets. The survey respondents also indicated that if ARW had a runway at least 5,000 feet in length, the jet users would use ARW on 143 new annual trips to Beaufort County Airport. This equates to 286 annual operations or more than half what is considered by FAA as "regular basis" for determining the critical aircraft. Even though a 16 percent response rate is considered good, it is fair to say many survey forms are never filled out and so other potential jet users of ARW are unaccounted for.

According to the website ***Airport IQ Data Center,*** that samples aircraft operations at GA airports, the following jet operations were identified at ARW:

YEAR	ARW JET OPS
2004	105
2005	114
2006	85
2007	38
2008 (Jan-Jun)	45

As can be seen, the decrease of jet use at ARW is evident and the issue of the short runway impacting usefulness of the airport to its previous customers is confirmed.

Flight strips from the air traffic control tower at Marine Corps Station Beaufort for the months of August, September and October 2008 were reviewed to identify the number of jets flying into ARW. During the hot months of August and September, almost no jets flew into ARW. This confirms survey results that during hot weather ARW's 3,434 foot runway is useless for even small jet traffic.

Finally, ARW airport management has a letter from NetJets Inc. (included in the appendix) which is a national air taxi/charter service. They stated that if Beaufort County Airport provided 5,000 feet of runway it would allow NetJets to serve this desirable geographic area.

As a final note, the 2008 South Carolina Airports System Plan identifies the southeastern portion of South Carolina as lacking runways 5,000 feet or greater, due partially to existing constraints and/or public opposition to runway extensions. ARW is one of these airports with demand for smaller corporate jets but without the public opposition like some of its neighboring airports. A 5,000-foot runway at ARW would provide access to the Beaufort County's desirable coastal areas for corporate and leisure travelers, enhancing its economic viability and self-sustainability.

Therefore, based on FAA's runway calculations and supporting evidence above, it is recommended that the future runway length for ARW be 5,000 feet to accommodate small corporate jets in ARC B-II. Based on airport management goals, governmental/public support and project financing, achieving the recommended 5,000-foot runway length may fall outside of the 20-year planning period. Incremental growth, such as a runway extension to 4,400 feet to support based King Air aircraft, may be the most viable runway extension project within the planning period.

Runway Width

The width of a runway is determined by the critical aircraft category and the type of runway approach. The ARC B-II category requires a 75 foot wide runway. In the future if ARW obtains a precision instrument approach, it would require a runway width of 100 feet. However, to achieve minimums lower than ¾ mile visibility and be a "precision" runway, an approach lighting system is required. The runway at Beaufort County Airport is currently 75 feet wide and is consistent with design standards for ARC B-II aircraft and non-precision approaches.

It is recommended that Runway 07-25 be designated as a C-II runway in the future, beyond the 20-year timeframe and this master plan, so FAA will protect the possibility of medium corporate jets use in the future. It is also recommended that if the runway requires a full reconstruction in the future, that consideration be given to replacing it at a width of 100 feet.

Runway Strength

There are several factors which influence the strength of pavement required to support aircraft operations. These factors include, but are not limited to aircraft loads, frequency and concentration of operations, and the condition of subgrade soils.

Runway pavement strength is typically expressed based on common landing gear configurations. An example aircraft for each type of gear configuration are as follows:

- *Single-wheel* – each landing gear unit has a single tire. Example aircraft include light general aviation aircraft and small business jet aircraft.
- *Dual-wheel* – each landing gear unit has two tires. Example aircraft include the King Air, currently based at ARW.

The aircraft gear type and configuration dictates how aircraft weight is distributed to the pavement and determines pavement response to loading. The published runway pavement strengths at Beaufort County Airport are for single-wheel aircraft weighing 12,500 pounds or less. However, recent pavement projects and studies at ARW show that the pavement strength can accommodate aircraft at 50,000 pounds with dual-wheel landing gear configurations.

Taxiways

A taxiway is a defined path established for taxiing aircraft from the runway to a parking position, or from one part of the airport to another. It is recommended that an airport's primary runway be served by a full-length parallel taxiway allowing aircraft to enter or exit the runway as expeditiously as possible, to maximize safety, particularly when an airport does not have a 24 hour air traffic control tower and the mix of aircraft that use ARW.

At present, Runway 07/25 has a partial length parallel taxiway, Taxiway C. It extends from the departure end of Runway 07 to Taxiway A and the aircraft parking area. Aircraft departing Runway 25 must taxi on the runway and use the turnabout at the end of the runway to utilize the runway's full length in this direction. This type of "back taxiing" is common at small airports with few operations and minimal jet traffic. It is recommended that the parallel taxiway be extended to the end of Runway 25 to increase safety. It should be noted that the presence of wetland areas near this end of the runway is addressed in a future chapter of this report.

Taxiways should be designed to meet FAA dimensional standards for ARC B-II aircraft to be consistent with other airport design elements. B-II design standards require taxiway widths to be 35 feet. The airport's taxiways are currently 35 feet wide thus meeting FAA standards.

Navigational Aids (NAVAIDs)

As described in Chapter One, Inventory, a navigational aid is a device that provides pilots with relative position information, in relation to a destination or another fixed point. NAVAIDs typically used in aviation are GPS/RNAV, radar, radio communications, or lighted directional equipment. A summary of the different types of landing aids available at ARW are presented in Table 3-3.

Table 3-3: ARW Landing Aid Requirements

Runway	Landing Aids
07	RNAV/GPS, PAPI, REIL
25	RNAV/GPS, Radar 1, PAPI, REIL

Source: FAA 5010 data

The Precision Approach Path Indicator (PAPI) on Runway 7 is currently turned off due to tree obstructions. The Runway End Identifier Lights (REILs) for Runway 7 were installed in 2009.

A Localizer Performance with Vertical Guidance (LPV) approach as part of the RNAV/GPS approach for Runway 25 provides improved vertical and lateral guidance to aircraft, lowering approach minimums to 1-mile visibility and 208 feet ceiling. Lowering visibility minimums for this type of approach would allow the airport to remain open more often and attract aircraft that would help make ARW more financially self-sustaining. As such, it is recommended that airport design criteria for future facilities at ARW should be based on FAA's "Not lower than ¾ mile visibility minimums" criteria.

At present, there are no approach lighting systems at either end of the runway at ARW. The benefit of such a system would allow future instrument approaches to occur at lower than ¾ mile visibility. At this time, there is no justification for such a system at the airport.

FAA Airfield Dimensional Standards

Beaufort County Airport meets most of the FAA's airfield design standards relative to various centerline separations and safety dimensions as this section will demonstrate.

Obstacle Free Zone

The OFZ is a three-dimensional volume of airspace that supports the transition of ground-to-airborne operations (or vice versa). The OFZ clearing standards prohibit taxiing and parked airplanes and other objects, except frangible NAVAIDs or fixed-function objects, from penetrating this zone. The OFZ consists of a volume of

airspace centered on the runway. In addition, precision instrument runways are required to meet standards regarding inner-transitional and precision OFZs.

The OFZ for Runway 07/25 at Beaufort County Airport is 250 feet wide and extends 200 feet beyond each runway end. Existing conditions at ARW comply with the OFZ design standards.

Runway Protection Zones (RPZ)

The RPZ is a two-dimensional area off the runway end 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. Land uses prohibited from the RPZ are residences and places of public assembly. RPZ size is a function of critical aircraft and the visibility minimums established for the approach to the runway. Visual runways have smaller RPZs because the landing minimums are higher and the runway is not used during periods of reduced visibility. Instrumented approaches are required to be protected by larger runway protection zones. In summary, the greater precision of the approach, the lower the visibility minimums for landing, and the larger the RPZ will be.

The RPZ also contains two sub-areas, the runway object free area (OFA) and the controlled activity area. These two sub-areas are discussed as follows:

- *Runway Object Free Area (OFA)* - The runway OFA is a two-dimensional ground area surrounding the entire runway that prohibits parked aircraft and objects, except NAVAIDs and objects with locations fixed by function, from locating there. For the existing runway at Beaufort County Airport, the OFA should extend 300 feet beyond each runway end and have a width of 500 feet along the length of the runway. The runway OFA is clear except for some scrub brush, which are being removed, and portions of the electric wildlife fence on the north side of the runway. Options for addressing the fence will be explored in the alternatives chapter.

- *Controlled Activity Area* - The controlled activity area is the portion of the RPZ beyond and to the sides of the runway OFA. It is recommended that an airport control this area and it should be free of land uses that create glare and smoke. Also, residences, fuel-handling facilities, churches, schools, and offices are not permitted in the RPZ's controlled activity area. Currently, the RPZs are clear of incompatible uses and the current zoning ordinance within the Runway 7 RPZ is designated as light industrial, which is compatible. However, the existing land use designation for a portion of the Runway 7 RPZ is "Neighborhood Mix" and future land use is identified as "Urban Residential", which are both incompatible land uses.

With slightly lower ceiling minimums, Runway 25 is the favored runway during increment weather, based on light wind conditions. Non-precision approaches exist on both runway ends, with visibility minimums not lower than one mile. Although not recommended in this master plan, if the airport were to implement an approach with visibility minimums lower than one mile, but not lower than ¾ mile, the size of the RPZ would increase. This increase in size could create additional incompatible land uses for the Runway 7 RPZ. The current RPZ dimensions for both runway ends are shown in Table 3-4 as well as RPZ dimensions for an approach with visibility minimums not lower than ¾ mile.

Table 3-4: Runway Protection Zones

Runway	Type of Approach	Inner Width	Outer Width	Length
07	Existing RNAV	500’	700’	1,000’
25	Existing RNAV	500’	700’	1,000’
	Not lower than ¾ mile	1,000’	1,510’	1,700’

Source: FAA and Wilbur Smith Associates

Runway Safety Area

The Runway Safety Area (RSA) serves as an area for aircraft overruns and undershoots beyond the paved runway surface. According to the FAA’s definition, the RSA should be cleared and graded and have no potentially hazardous ruts or surface variations. This area should also be drained through proper grading. The requirements for grading the RSA are 0 to –3 degree grade for the first 200 feet from the runway end, with the remaining longitudinal grade ensuring that no part of the RSA penetrate the approach surface or drop below a –5 degree grade.

For ARC B-II runways, the RSA is required to be 150 feet wide and extend 300 feet beyond the runway end. Currently, the RSAs beyond the runway ends at ARW are not to standard, with the Runway 25 RSA providing approximately 130 feet off of the runway end and Runway 07 providing about 125 feet. The main impediment to providing the required safety area length is the presence of the salt marsh. The alternatives chapter of the master plan will discuss these deficiencies and potential options.

Table 3-5 summarizes the required airfield dimensional standards that apply to Beaufort County Airport and the current dimensions provided at the airport. Only the RSA length is deficient.

Table 3-5: Airfield Features and Protection Areas

Facility	Existing Runway 07/25	Design Group B-II Requirements
Width:		
Runway	75’	75’
Taxiway	35’	35’
Runway Safety Area	150’	150’
Runway OFA	500’	500’
Taxiway Safety Area	79’	79’
Taxiway OFA	131’	131’
Length:		
Runway Safety Area	125’/130’	300’
Runway OFA	300’	300’
Runway Centerline to:		
Taxiway Centerline	240’	240’
Aircraft Parking Area	250’	250’

Source: FAA AC 150/5300-13 “Airport Design”, through change 14.

3.2 Landside Requirements

This section will briefly describe the landside requirements needed to accommodate general aviation activity through the planning period. These facilities include hangars, aprons and tie down areas, terminal building, automobile parking, maintenance equipment storage, fuel facilities, security fencing, and access roadways.

Hangars

Based aircraft are routinely stored at airports in a variety of hangar types. The type of hangars needed is determined by aircraft size and type as well as the type of aircraft owner (business or leisure) and the region of the country. Currently, the following types of hangars are offered at ARW:

- **T-hangars** – This hangar type generally consists of a large structure having multiple T-shaped units for lease to individuals. At ARW, there are currently three T-hangar buildings which are fully occupied. Together they are capable of holding 34 aircraft or 60 percent of all the based aircraft at the airport.

- **Conventional Hangars** – This classification includes larger hangars typically capable of holding multiple aircraft, depending on their size. The first conventional hangar at ARW opened in February 2009 and provides storage for the County’s mosquito control helicopter.

- **Corporate Hangars** – These are similar to conventional hangars, but typically have an attached office and are used by one tenant only. These hangars can house just one or multiple aircraft, depending on the owners needs.

Hangars are the preferred method for based aircraft storage at ARW to protect aircraft from the salt water environment, high temperatures and sun exposure. This is confirmed by the based aircraft pilot survey results and the long hangar waiting list. The 60 percent hangar rate is expected to increase throughout the planning period, as more hangars become available to meet the existing demand.

The aircraft type influences the type of storage required for based aircraft. Taking this into consideration, the projected based aircraft fleet mix was used to identify the number of additional hangars by type projected over each period of the planning period. As previously identified in Table 2-14, single-engine aircraft are expected to remain as the largest segment of the fleet at ARW. Seven jet aircraft are anticipated to be present by 2028, whereas multi-engine and rotor aircraft show moderate growth with the addition of eight multi-engine and two new rotor aircraft being based at the airport by the end of the planning period.

The anticipated number of hangars needed over the planning period was estimated by determining the existing percentage of aircraft stored in each facility type. It was assumed that there would be a slight increase in the percentage of aircraft stored in community and corporate hangars. These minor adjustments reflect that single- and multi-engine aircraft make up a smaller percentage of the fleet by the year 2028. These assumed percentages were then multiplied by the projected number of based aircraft to determine how many aircraft would be in that classification of storage facility. The expected mix of based aircraft storage types and hangar requirements are presented in Tables 3-6 and 3-7.

Table 3-6: Mix of Based Aircraft Storage Requirements

Type of Based Aircraft Storage	Single Engine	Multi Engine	Turboprop /Turbojet	Helicopter	Other
Conventional/Corporate Hangar Storage	0%	10%	100%	100%	0%
T-Hangar Storage	75%	80%	0%	0%	0%
Tie-down Storage	25%	10%	0%	0%	100%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Table 3-7
General Aviation Aircraft Hangar Requirements

	2008	2013	2018	2023	2028
Based Aircraft Demand					
Single Engine	38	42	46	50	56
Multi-Engine	14	16	18	20	22
Turboprop/Turbojet	0	1	3	5	7
Helicopter	3	3	4	4	5
Other	1	1	1	2	2
TOTAL	56	63	72	81	92
T-Hangar Spaces					
Single Engine (75%)	29	32	35	38	42
Multi-Engine (80%)	11	13	14	16	17
Turboprop/Turbojet (0%)	0	0	0	0	0
Helicopter (0%)	0	0	0	0	0
TOTAL	**40**	**45**	**49**	**54**	**59**
EXISTING SPACES	34	34	34	34	34
Conventional Hangar Spaces					
Single Engine (0%)	0	0	0	0	0
Multi-Engine (10%)	1	2	2	2	2
Turboprop/Turbojet (100%)	0	1	3	5	7
Helicopter (100%)	3	3	4	4	5
TOTAL	**4**	**6**	**9**	**11**	**14**
Conventional Hangar Area Requirements[1] (SF):					
Single Engine	0	0	0	0	0
Multi-Engine	1,400	2,800	2,800	2,800	2,800
Turboprop/Turbojet	0	3,000	9,000	15,000	21,000
Helicopter	4,500	4,500	6,000	6,000	7,500
TOTAL	**5,900**	**10,300**	**17,800**	**23,800**	**31,300**
EXISTING SPACE	0	0	0	0	0

[1] Multi-engine aircraft require 1,400 square feet, rotorcraft aircraft require 1,500 square feet, and turboprop and jet aircraft require 3,000 square feet of conventional hangar space.
Source: Wilbur Smith Associates

Under present conditions, the three existing T-hangars are capable of holding 34 aircraft and are presently all occupied. There is also a hangar waiting list of 67 willing and able aircraft owners as of November, 2008. Although the hangar demand is assigned with a forecast year, hangar construction should only be undertaken when the demand is imminent, such as airport's current list of waiting aircraft owners.

Depending on demand, conventional hangars could be constructed for storing a single aircraft, such as for a corporate user, or for multiple users, such as a community hangar. The master plan will develop alternatives to accommodate a mix of hangars to meet the based aircraft demand.

Apron and Tiedown Areas

Beaufort County Airport has an area of apron pavement located along the south side of the airfield in front of the terminal building. This apron is used primarily by based aircraft as well as itinerant aircraft stopping briefly in the Beaufort area. Helicopters and small jet aircraft frequently use this apron as a staging/parking area.

The ratio of based aircraft using tiedowns was applied to the forecast to determine future needs. In addition, transient aircraft are also included. Based on activity at similar airports, it is assumed that on average no more that 25 percent of daily transient operations use the ramp at any given time. Table 3-8 summarizes the future ramp requirements for ARW.

Table 3-8: General Aviation Aircraft Parking Apron Requirements

Aircraft Classifications	2008	2013	2018	2023	2028
Daily Transient Aircraft[1]:					
Single Engine	13	15	17	20	22
Multi-Engine	4	4	5	6	7
Turboprop/Turbojet	0	1	1	2	3
Helicopter	1	1	1	2	2
TOTAL	17	20	23	28	32
Based Aircraft:					
Single Engine (25%)	10	11	12	13	14
Multi-Engine (10%)	1	1	1	1	1
Turboprop/Turbojet (0%)	0	0	0	0	0
Helicopter (0%)	0	0	0	0	0
Other (100%)	1	1	1	2	2
TOTAL TIEDOWN	12	13	14	16	17
All Aircraft During Design Day:					
Single Engine	23	26	29	33	36
Multi-Engine	5	5	6	7	8
Turboprop/Turbojet	0	1	1	2	3
Helicopter/Other	2	2	2	4	4
TOTAL TIEDOWN	**30**	**34**	**38**	**46**	**51**
EXISTING SPACES	53	53	53	53	53
Apron Area Requirements (SY):					
Single Engine[2]	6,900	7,800	8,700	9,900	10,800
Multi-Engine[3]	2,500	2,500	3,000	3,500	4,000
Turboprop/Turbojet[4]	0	1,300	1,300	2,600	3,900
Helicopter/Other[5]	800	800	800	1,600	1,600
TOTAL APRON AREA	**10,200**	**12,400**	**13,800**	**17,600**	**20,300**
EXISTING Ramp	21,900	21,900	21,900	21,900	21,900

[1] 25 percent of daily transient operations [2] Single Engine – 300 (SY)/aircraft [3] Multi-Engine – 500 (SY)/aircraft [4] Turboprop and jets – 1,300 (SY)/aircraft [5] Helicopter/Other – 400 (SY)/aircraft
Source: Wilbur Smith Associates

As based aircraft on the waiting list obtain T-hangar positions, additional apron tiedown space will become available, which will accommodate aircraft needing tiedowns. As shown in Table 3-8, no additional apron tiedowns are needed within the planning period.

Terminal Building

The demand for terminal building space at Beaufort County Airport relates to the need for facilities able to accommodate pilots, airport staff and tenants. These facilities should include a waiting area/gathering place, help/supplies counter, business offices, conference room, classroom, briefing room, lounge with vending machines, restrooms, etc.

The results of a planning level analysis for the facility are presented in Table 3-10. This analysis assumes that the following activities would be provided: pilot supply area, pilot/passenger waiting room, flight planning area, flight training, FBO administrative offices, and common areas, such as restrooms and corridors. The size of a general aviation terminal is based upon the anticipated pilots and passengers using the facility which are estimated from the peak hour of general aviation operations. To estimate the peak hour pilots/passengers, the following assumptions were made:

- Itinerant operations are used to calculate terminal space; thus, the peak hour operations were multiplied by the forecasted local-itinerant split.
- Since arriving and departing general aviation pilots/passengers could use the terminal at the same time, the peak hour itinerant operations was used.
- Each itinerant operation (arriving or departing) was estimated to carry an average of 1.5 people (passengers and pilots).

The use of 150 square feet per pilot/passenger was estimated based upon the following breakout per pilot/passenger:

- Public areas (including circulation, structure, and utilities): 80 square feet
- FBO areas (including service counter and office space): 50 square feet
- Pilot areas (including lounge, flight planning, etc.): 20 square feet

The results in Table 3-9 show a need for 5,250 square feet of terminal space by the end of the planning period or an addition of at least 1,750 square feet. This general spatial requirement for terminal expansion is evaluated in the alternatives chapter.

Table 3-9: Terminal Requirements

	2008	2013	2018	2023	2028
Peak Hour Aircraft Operations	21	25	29	33	39
% Itinerant Ops	60%	60%	60%	60%	60%
Peak Hour Itinerant Ops	13	15	17	20	23
No.of Pilots-Passengers	20	23	26	30	35
Terminal Area Required (Sq. Ft.)	**3,000**	**3,450**	**3,900**	**4,500**	**5,250**
Existing Terminal (Sq. Ft.)	3,500	3,500	3,500	3,500	3,500

Source: Wilbur Smith Associates

Automobile Parking

This section discusses the demand for automobile parking for the airport. The demand for automobile parking is determined by the volume of people using the terminal building and the airport. There must be enough space in the parking lot to accommodate based aircraft pilots, passengers, rental cars, terminal building business users, such as police and county personnel and airport staff.

The number of vehicle parking spaces is a function of the aircraft operations level expected for the airport. Typically, levels of aircraft activity during peak periods can be closely correlated to the need for vehicle parking spaces. The methodology used for determining parking needs is related to the peak day pilots and passengers and the spaces needed to accommodate them. In addition, a factor was applied to local peak hour operations to account for other terminal building users. The parking space forecast is based on the following:

- Average day-peak hour (ADPH) pilots and passengers levels are based on an aircraft occupancy level of 1.5 persons per itinerant operation.
- ADPH pilots and passengers levels are based on 2 persons per local operation.
- Assumes 1.5 parking spaces per design hour passenger.

By applying this methodology, Table 3-10 presents estimates of the number of vehicle parking spaces needed to accommodate airport users until the year 2028.

Table 3-10: Vehicle Parking Requirements

	2008	2013	2018	2023	2028
ADPH Itinerant Passengers	8	10	12	13	16
ADPH Local Users	16	20	24	26	32
Total Peak Hour Users	20	23	26	30	35
Required Parking Spaces	**52**	**65**	**75**	**84**	**101**
Existing Parking Spaces	62	62	62	62	62

Source: Wilbur Smith Associates

Currently, there are 62 parking spaces that must be shared between all users of the airport. Based upon the parking requirement calculations, only 52 spaces are needed today. However, overnight/long term pilot parking take up approximately 50 percent of the available spaces. Therefore, on a typical day the number of available parking spaces can become extremely limited. It is recommended that overnight/long term pilot parking be restricted or space provided elsewhere to free up space near the terminal building. It should also be noted that the parking lot surface is in poor condition. By 2028, almost 40 additional parking spaces will be needed at the airport, more if long term parking continues to be allowed.

Airport Maintenance Facilities

Airport maintenance equipment currently used at ARW includes a large tractor, a 4-wheel utility vehicle, a golf cart, and several other vegetation management tools used in maintaining the airport grounds. There are no existing equipment storage facilities at ARW, as a result, the equipment is parked under the terminal building's porch or left outside exposed to the elements, which reduces its useful service life. It is recommended that a storage structure or at a minimum a shade structure be built to store this equipment properly. It should be approximately 800 square feet with a clear span height of 10-12 feet minimum.

Fuel Facilities

Fuel is stored in a centrally located fuel farm and provides self-serve fueling. The fuel farm has a capacity for 12,000 gallons of 100LL AvGas and 12,000 gallons of Jet A. The tanks are reported as being in good condition, although some surface rust is evident. Two fuel trucks are used to support aircraft fueling at the airport.

There is no set industry standard regarding fuel capacity and usage. Normally, as the demand for increased fuel deliveries occurs, the airport will determine if an additional storage tank is needed to maintain an adequate level of service. Airport staff noted that the existing fuel capacity should be sufficient throughout the planning period. The fuel farm will need to be relocated if the terminal building is expanded.

Security

Beaufort County Airport has multiple security features in place. There are various types of fencing surrounding the airport, including an electrified wildlife fence which surrounds most of the property facing the marsh. Standard six-foot chain link security fencing is used around the terminal building and aircraft parking area. Locked gates are also in place to prevent unauthorized access into the T-hangars. The overall perimeter fencing is in good condition except near the gate area at the fire station on the west side of the airport. Fencing at this access road is missing and/or incomplete. This section of fencing should be replaced, and a new gate with a locking mechanism installed.

It should also be noted that the Transportation Security Agency (TSA) is considering implementation of a Large Aircraft Security Plan (LASP), which would require operators of any aircraft larger than 12,500 pounds to establish a security plan which includes third-party audits, background checks, and in-house security coordination. This rule-making effort should be carefully watched to see if any further security procedures will have to be put in place at ARW to accommodate the limited number of aircraft larger than 12,500 pounds expected to operate at the airport in future years.

Access Roadways

U.S. Route 21 is a 54-foot, four-lane roadway adjacent to the airport. In the vicinity of Beaufort, it runs through downtown Beaufort to Hunting Island State Park. Under normal conditions, a four-lane roadway of this type is capable of carrying a flow volume of about 1,300 vehicles per lane, per hour. Direct access to the airport is located off of Airport Circle, a two-lane roadway that intersects U.S 21. This access roadway is capable of carrying about 700 vehicles per lane, per hour. Considering the expected level of aviation activity at ARW, both of these roadways will be adequate to serve the airport in the future. Commercial development zoned across Airport Circle might necessitate a traffic signal in the future, but is not required for airport specific use.

3.3 Summary

A variety of improvements are needed at ARW over the 20-year planning period. For ease of reference, Table 3-11 provides a summary of the development needs identified in previous sections. It includes a brief summary of the justification for the improvement, such as to improve operational safety or maintenance.

Table 3-11: Summary of Facility Requirements

Facility	Future Requirement	Justification
Airfield Facilities		
Runway 07/25 Length	Provide a runway length of 5,000 feet to support future operations	To meet the operational lengths for current and future small jet users.
Runway 07/25 Width	If runway is reconstructed, the runway should also be widened to 100 feet	To accommodate future precision runway requirements
Taxiway	Complete full parallel taxiway	To improve safety on airfield.
Navigation Aids	Preserve future compatible land uses	Airport accessibility during inclement weather conditions
Apron Area	No expansion required	Based on projections and future T-hangar development
Tie Down Areas	No expansion required	Based on projections and future T-hangar development
T-Hangars	Provide at least 25 additional T-Hangars units	To meet current and future demand.
Conventional Hangars	Provide 31,300 SF of storage space through multiple units	To meet the demand expected by increased traffic.
Runway Safety Areas (RSAs)	Lengthen RSAs on both runway ends to 300 feet.	To meet FAA design and safety standards
Landside Facilities		
Terminal Building	Provide at least an additional 1,750 square feet to the existing terminal building	To provide space for expected traffic increases and operational needs.
Vehicle Parking	Provide 39 additional parking spaces	To provide parking for passengers, visitors to the airport and transient pilots.
Support Facilities		
Maintenance equipment storage	Build an 800 square foot storage facility to house maintenance and repair equipment	To increase existing lifespan of maintenance equipment.
Security	Repair existing security fence on west side of airport property	To complete perimeter fencing of the airfield and restrict access to non-airport users.

Source: Wilbur Smith Associates

The facilities outlined in this chapter will undergo further review and evaluation in the following chapters to determine if it is feasible to accommodate the requirements. Alternatives for development will be reviewed and a recommended concept will be presented and illustrated on the Airport Layout Plan.

Chapter

4

Alternative Development Concepts

The airside and landside development alternatives identified for Beaufort County Airport (ARW) in this master plan are based on the analyses completed in Chapter 3, *Capacity Analysis/Facility Requirements*. This chapter examines alternative development concepts and uses evaluation criteria to select a preferred development option to meet identified facility requirements.

The objective of this analysis is to identify a set of feasible development options that allows the Airport to meet projected levels of aviation demand and attain the goals set forth by the Technical Advisory Committee (TAC). Each development option is evaluated to provide recommended improvements that meet demand while providing for future development flexibility.

Based on the Airport's future role and using industry and Federal Aviation Administration (FAA) planning standards, the facility requirements analysis identified the following needs for Beaufort County Airport:

- Extension of Runway 7-25 from 3,434 feet to 5,000 feet
- Extension of the parallel taxiway to Runway 25 end
- Improvements necessary to comply with FAA standards for runway safety areas and runway object free areas
- Development of at least 25 additional T-hangars
- Development of 31,500 SF of conventional/corporate hangars
- Expansion of terminal building by at least 1,750 square feet
- Relocation and expansion of vehicular parking
- Development of maintenance storage facility of 800 square feet

Previous studies conducted at the Airport discussed the inclusion of some of these and other facilities that will be considered. The next section describes these studies and provides recommendations on facilities that should continue to be shown on the Airport Layout Plan (ALP).

4.1 Previous Studies

The findings and recommendations of previous studies are considered for this master plan. The following study was conducted to address key demand and operational/safety requirements for the Airport and continue to be vital aspects of the Airport's future.

- *1978 Airport Master Plan Study* - The master plan recommended the runway to be realigned to the current alignment and lengthened to 3,430 feet in the short term. Then, after Highway 21 was realigned, the runway would be extended to 4,700 feet in the long term (1998). The following facilities from the 1978 master plan continue to be part of the framework for future development of facilities at ARW and will be shown on the updated ALP in this master plan:

    - Extend runway
    - Full parallel taxiway serving Runway 7-25
    - Proposed T-hangars located throughout the terminal area

Most of the major recommendations from the previous master plan study have been carried forward to this master plan because they improve airfield safety or address the demand for facilities within the planning period, as well as illustrate potential ultimate facilities beyond the 20-year planning period.

4.2 Evaluation of Alternative Development Options

To facilitate the selection of a preferred development option, a set of evaluation criteria have been identified for use in this analysis. Through an evaluation that incorporates these criteria, the potential benefits and impacts of alternative development options can be compared, contrasted, and incorporated into the selection process. Separate evaluation criteria have been established for both airside and landside alternatives, although some factors are included in each, described as follows:

Airside Alternative Evaluation Criteria

- Meet the existing and future needs of airport tenant and users
- Meet FAA design standards and Part 77 clearances
- Minimize environmental impacts - such as those related to the salt marsh and Ocean and Coastal Resource Management (OCRM)
- Minimize land acquisition
- Minimize residential and business impacts

- Minimize cemetery impacts
- Minimize Highway 21 impacts
- Preserve present LPV (Localizer Performance with Vertical guidance) GPS approach capabilities
- Prevent impacts to Beaufort MCAS

Landside Development Criteria

- Maximize revenue generating potential
- Meet FAA design standards
- Maximize hangar and apron implementation flexibility to meet demand
- Maximize constructability while minimizing existing tenant impacts
- Minimize environmental impacts

It should be noted that the development options meet FAA design standards. Where appropriate, alternative development options are quantitatively and qualitatively evaluated based on these factors. In addition to the evaluation criteria used above, selected alternatives were presented to TAC, and Beaufort County's Airports Board in order to receive feedback and input for each option. The results of this analysis are used to select preferred development options for overall concepts.

4.3 Airside Alternatives

Chapter 3, *Capacity Analysis/Facility Requirements*, examined the ability of the Airport's existing runway and taxiway system to accommodate projected levels of activity at ARW through the planning period. The findings of that analysis indicate that the existing airfield does not provide sufficient runway length to fully accommodate the existing critical aircraft, the King Air turboprop, nor future small to medium jet aircraft. In addition, certain airside elements require upgrades to ensure that the Airport continues to meet its user's aeronautical utility and safety needs.

Runway System

Chapter 3 described in detail the need for an ARC B-II runway with an ultimate length of 5,000 feet and a width of 75 feet. Given the proliferation of non-precision GPS approaches with vertical guidance (LPV) and the benefits they provide at minimal cost, it is also recommended that ARW continue to maintain non-precision approaches, including the current LPV approach to Runway 25, which requires a runway width of 75 feet. The current runway is 3,434 feet long and surrounded by salt marshland, which presents a challenge for extending the runway.

Part 77 surfaces are to be clear of obstructions per FAA grant assurances. The approach to Runway 25 has been cleared of all obstructions. However, the approach to Runway 7 has 13 powerpoles that currently penetrate Part 77 34:1 slope and are classified as obstructions. Efforts are underway to remove these obstructions. Most of the existing trees obstructions have been removed or will be in the near future.

Taxiway System

Taken from the previous master plan, the existing partial parallel taxiway for Runway 7-25 is proposed to be extended to the end of Runway 25 to improve aircraft safety for departures on Runway 25 and arrivals on Runway 7. In order to achieve the benefit from the LPV approach to Runway 25, a full parallel taxiway is recommended.

To remain consistent with FAA Group II taxiway design standards, taxiways should be 35 feet wide to accommodate the flow of aircraft to and from all runways. Separation standards dictate that the runway centerline to Taxiway "C" separation be 240 feet, as they currently exist.

Airfield Safety Areas

The preceding chapter identified the need for facilities as they relate to the following airfield safety areas:

- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)

Although the Airport's ARC is not changing from its current B-II designation, the existing RSA dimensions do not meet FAA standards. An RSA measuring 300 feet beyond the runway threshold and 150 feet wide along the runway is required.

Based on current and ultimate approach visibility and ceiling minimums, the RPZs for ARW (as described in Chapter 3) will not change within the planning period. If, however, the airport wishes to lower minimums for approaches at the airport, larger RPZs will result, requiring a greater area of airport-controlled land off the end of the runway. Existing avigation easements for RPZs over existing land areas not owned by the Airport will be shown on the ALP. Since the Runway 25 RPZ is located over the salt marsh and "Waters of the State", no avigation easements are necessary.

NAVAIDs and Landing Aids

The airport has runway end identifier lights (REILs) and precision approach path indicators (PAPI) for each runway. The airport should seek recertification of the Runway 7 PAPI as soon as practical. No other NAVIADS or landing aids are recommended throughout the planning period.

Runway Alternative Evaluation Criteria

The types of factors evaluated as part of a runway alternatives analysis are important and were generated by the TAC to ensure each concept is evaluated fairly and critically. The following factors were determined to be significant and necessary to quantify and adequately evaluate each of the three runway alternatives.

- Salt Marsh/OCRM Impacts
- Land Acquisition
- Off Airport Residence Impacts
- Off Airport Business Impacts
- Beaufort Marine Corps Air Station (MCAS) Impacts
- Cemetery Impacts
- Highway 21 Impacts
- Power Substation and Pole Impacts
- Noise Impacts
- Approach Impacts

Each of these factors is reviewed independently for each alternative. Some of these factors are self explanatory and others require their assumptions to be described in more detail.

The Salt Marsh/OCRM impacts can be estimated based on a mitigation ratio established by similar projects in the southeast. Typically, impacts to OCRM areas involve anywhere from 3 to 10 credits per acre disturbed. For the purpose of this analysis, it is assumed that 7 credits would be required. The construction of a mitigation bank would be required, including permits, dirt removal, re-vegetation, and 7 years of monitoring.

Land acquisition is the estimated amount of land to be acquired in order to develop the recommended facilities and any necessary safety areas around them.

The number of residential relocations that may be affected were determined by Beaufort County GIS data.

The number of business relocations and cemeteries that may be affected were determined by Beaufort County GIS data.

Power substation and pole impacts are based on survey data and on SCE&G information.

Beaufort MCAS operations work efficiently and without conflict with the current ARW aircraft operations. The runways of each facility compliment each other and the MCAS air traffic controllers oversee flights at both airports. Since these airfields were established many decades ago, tall structures, such as water towers and cell towers have been constructed in areas around both airports that do not impact either airport. Altering the runway alignment or angle at either airport could create an obstruction problem for these existing towers.

Noise contours were generated for the future aircraft operations predicted at ARW and the 65 DNL noise contour did not go beyond airport property, therefore FAA considers this as having no impact. For each development option, it is assumed that a runway extension and/or realignment would include the purchase of land surrounding the runway and encompass the area that represents the 65 DNL noise contour. This would result in each development option having no noise impacts, but demonstrate a need for land acquisition beyond what is needed for just the runway.

These assumptions were used consistently for each of the three alternatives, along with the "Meeting Standards" option for comparative purposes.

"Meeting Standards" Airfield Alternative

The first concept evaluated involved the status quo, or "no expansion" concept, which maintains the runway as it is today at 3,434 feet in length, but provides a full parallel taxiway. As stated previously, the parallel taxiway is needed to improve safety, especially since ARW does not have a control tower, and meet the recommendations for the LPV approach to Runway 25 with improved approach minimums. The RPZs shown for each runway are based on existing and future approach visibility minimums not going lower than 1 mile. Accordingly, the Part 77 approach surface slopes will remain 34 to 1.

The remaining projects included in this option are those that address current FAA design standards deficiencies, including the RSA, which impacts the OCRM, and addresses the 13 power poles located in the approach to Runway 7. The projects recommended here are intended to enhance the Airport's level of safety and compliance to FAA design standards while maintaining the existing runway length.

Figure 4-1 illustrates this "Meeting Standards" option with the associated projects identified.

Figure 4-1: "Meeting Standards" Airfield Alternative

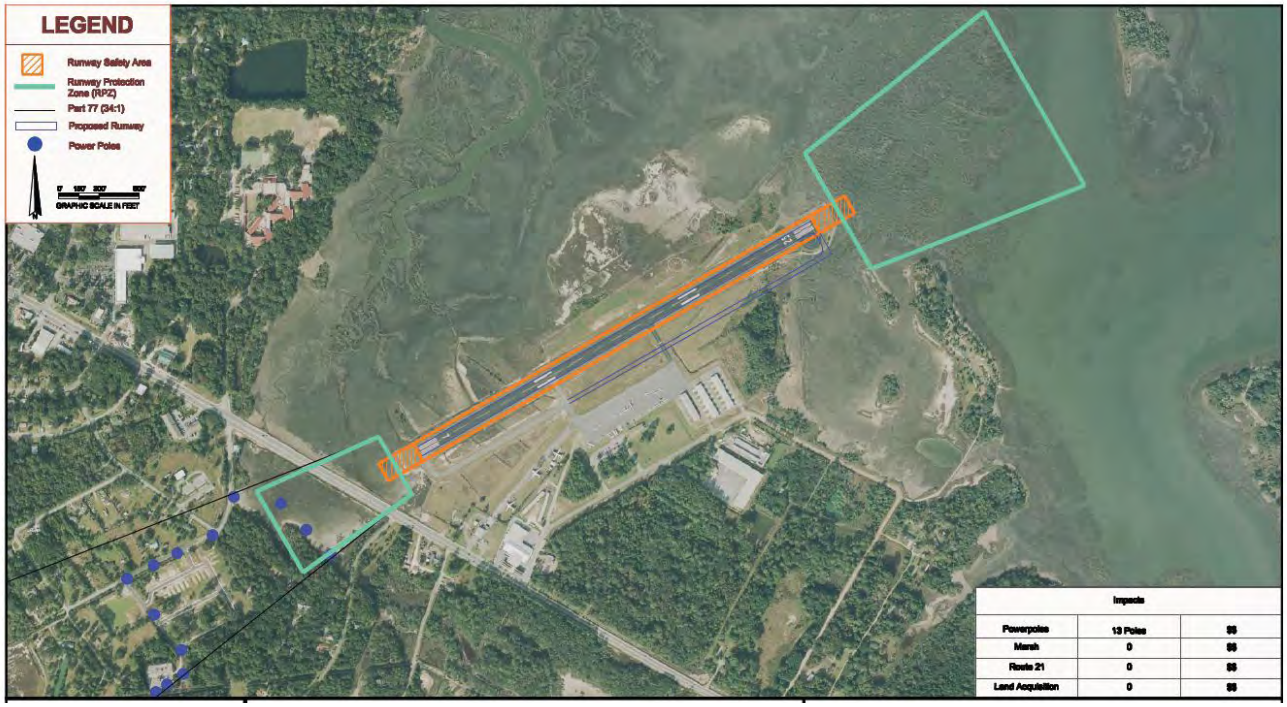


Table 4-1 summarizes and quantifies the impacts of the "Meeting Standards" option. The only major impacts involve the salt marsh, totaling five acres for RSA improvements and taxiway extension to the existing Runway 25 end.

The "Meeting Standards" option did not require any land acquisition, thus did not impact any nearby residences, businesses, or cemeteries. Noise contours were generated for the future aircraft operations predicted at ARW and the 65 DNL noise contour did not go beyond airport property, thus FAA considers this as having no impact. This option did not impact operations at Beaufort MCAS nor Highway 21.

Table 4-1: "Meeting Standards" Option Impact Summary

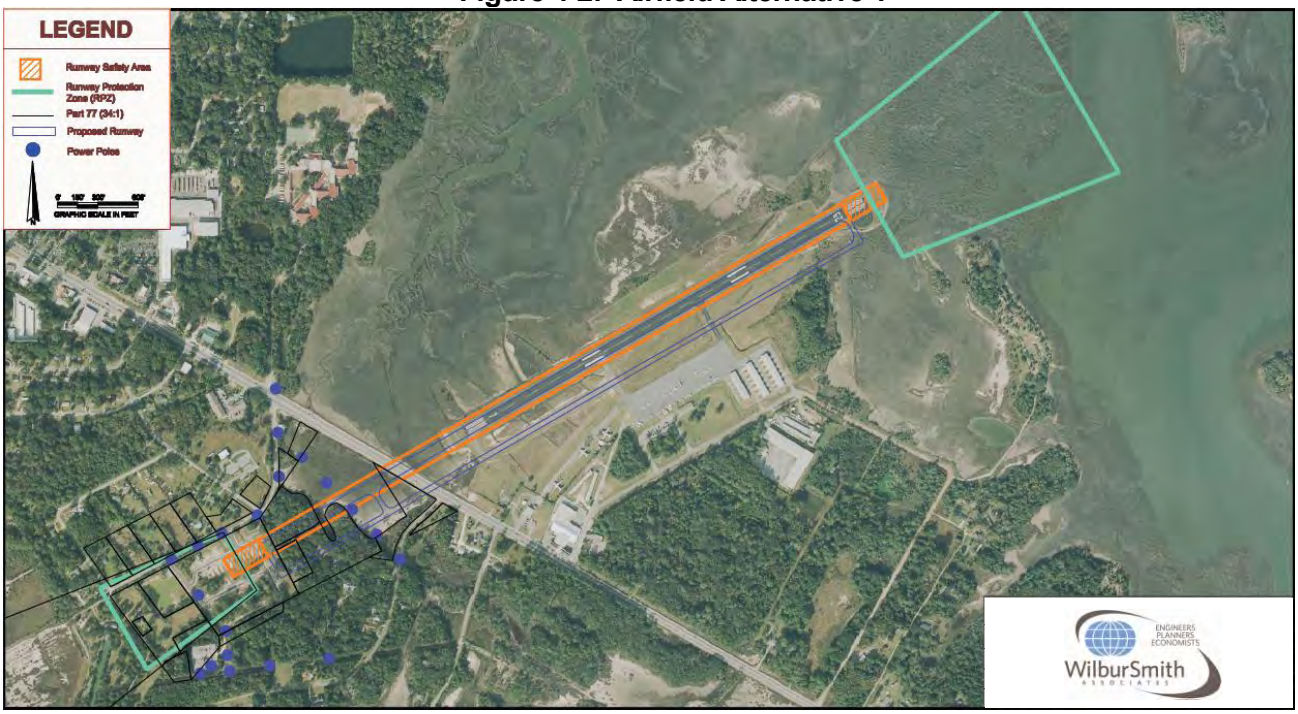
Impact Evaluation Factors	3,434' Runway
Marsh/OCRM (AC)	5
Land Acquisition (AC)	0
Number of Parcels	0
Number of Homes	0
Number of Businesses	0
Beaufort MCAS Impacts	No
Cemetery Impacts	No
Hwy 21 Tunnel/Realignment	No
Power Substation & Pole Impacts	13
Noise	On-Airport
Approach Impacts	No

This alternative is intended to represent a phase of larger, overall airport development to achieve the ultimate runway length of 5,000 feet. Therefore, it stands apart from the other alternatives in the overall alternatives evaluation process. Numbers are assigned to alternatives that provide an ultimate length of 5,000 feet.

Airfield Alternative 1

The goal of the first airfield alternative is to minimize the impacts to the salt marsh while providing the 5,000 feet of runway length required. This was accomplished by starting the runway at the existing Runway 25 approach and extending the runway to 5,000 feet towards the southwest, along the existing runway centerline alignment. Figure 4-2 illustrates Airfield Alternative 1 and its associated impacts.

Figure 4-2: Airfield Alternative 1



As shown in Figure 4-2, Airfield Alternative 1 has significant impact to Highway 21, requiring either tunneling or realignment of the roadway. In addition, there are substantial impacts to residences and a cemetery along the Highway 21 corridor that would require property acquisitions and relocations. Although this alternative seeks to minimize impacts to the salt marsh, 11 acres are impacted due to marsh areas near the end of Runway 7 and along Highway 21. These impacts are quantified in Table 4-2 below.

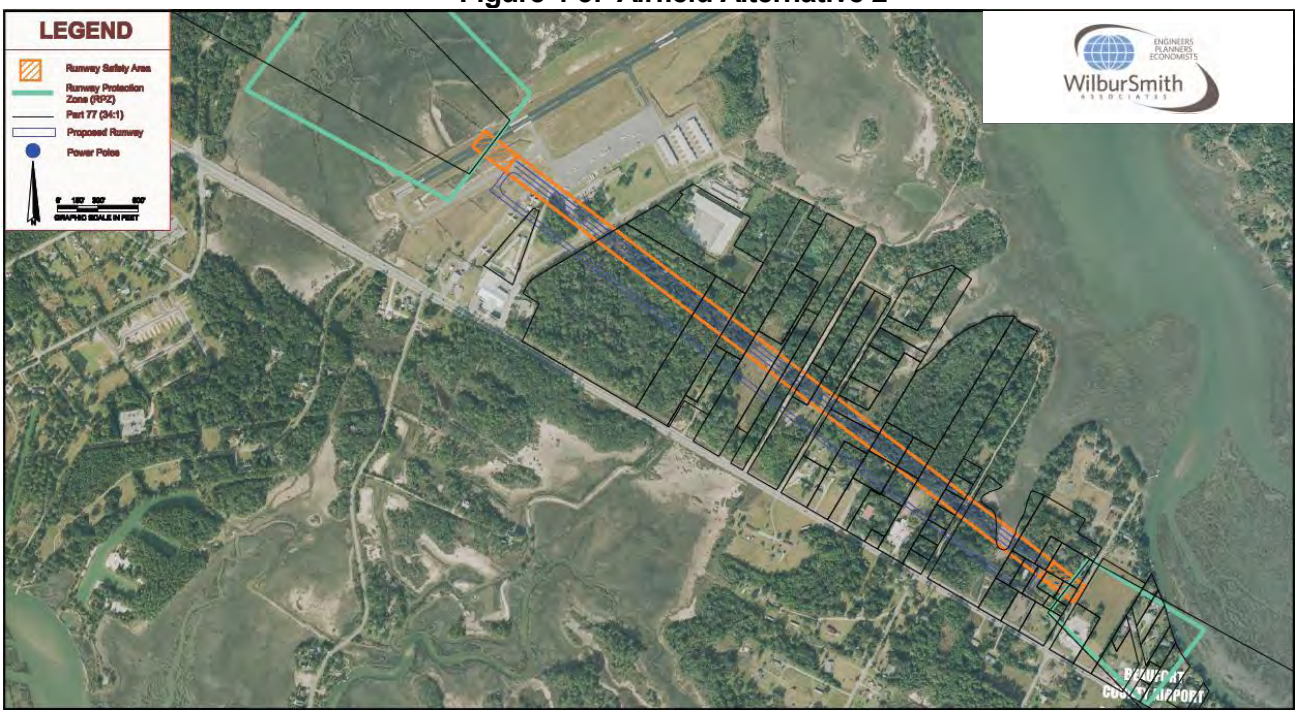
Table 4-2: Alternative 1 Impact Summary

Impact Evaluation Factors	5,000' Runway
Marsh/OCRM (AC)	11
Land Acquisition (AC)	41
Number of Parcels	24
Number of Homes	8
Number of Businesses	0
Beaufort MCAS Impacts	No
Cemetery Impacts	1
Hwy 21 Tunnel/Realignment	Yes
Power Substation & Pole Impacts	20
Noise	On-Airport, Land Acq.
Approach Impacts	No

Airfield Alternative 2

The goal of the second airfield alternative is to minimize the impacts to the salt marsh as well as Highway 21. To accomplish this, the runway is realigned in a northwest-southeast orientation between the salt marsh and Highway 21. Airfield projects and associated impacts are illustrated in Figure 4-3.

Figure 4-3: Airfield Alternative 2



Although it does not impact the marsh areas or Highway 21, Airfield Alternative 2 has impacts to surrounding parcels, homes, and businesses. Most of the land required for this alternative would have to be acquired as most of it is not currently part of the airport property. Table 4-3 summaries the impacts associated with this alternative.

Table 4-3: Alternative 2 Impact Summary

Impact Evaluation Factors	5,000' Runway
Marsh/OCRM (AC)	1
Land Acquisition (AC)	153
Number of Parcels	63
Number of Homes	16
Number of Businesses	7
Beaufort MCAS Impacts	Yes
Cemetery Impacts	No
Hwy 21 Tunnel/Realignment	No
Power Substation & Pole Impacts	Unknown
Noise	On-Airport, Land Acq.
Approach Impacts	Yes

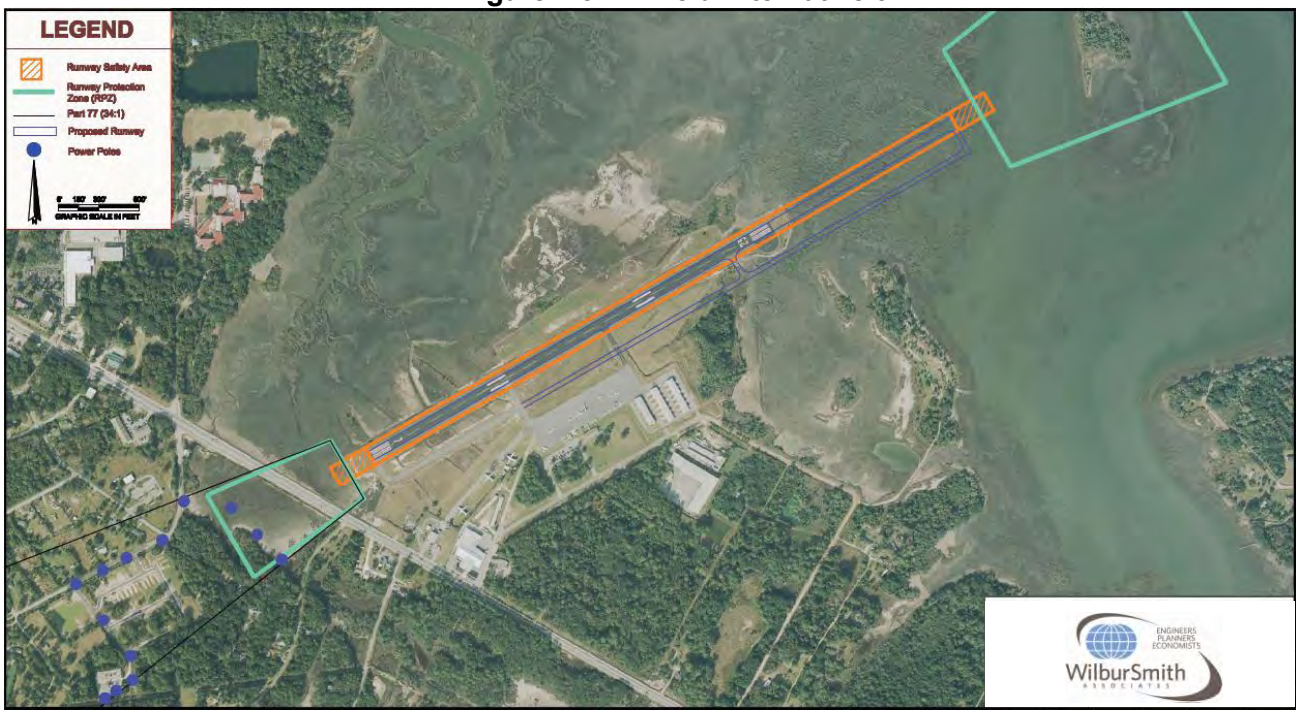
Airfield Alternative 2 has possible impacts to the flight tracks in and out of the nearby Beaufort MCAS. Similarly, flights in and out of Beaufort MCAS as well as surrounding structures could impact the approach to ARW in this option as well. Figure 4-4 illustrates the extended runway centerlines for approaching and departing aircraft at the Beaufort MCAS in orange. The existing extended runway centerline for ARW is shown as a solid red line while the alignment for Airfield Alternative 2 is shown as a dashed red line. It is clear to see that the proposed centerline alignment for Airfield Alternative 2 would conflict with flights in and out of Beaufort MCAS, as the proposed runway centerline is directly aligned with an extended runway centerline at the Beaufort MCAS.

Figure 4-4: Airspace Conflict with Beaufort MCAS

Airfield Alternative 3

The goal of the third airfield alternative is to minimize the impacts to Highway 21 and reduce the need for land acquisition. To do this, the runway is extended into the salt marsh on the Runway 25 end to achieve an ultimate length of 5,000 feet while maintaining the Runway 7 end at its current location. This concept and associated impacts are illustrated in Figure 4-5.

Figure 4-5: Airfield Alternative 3



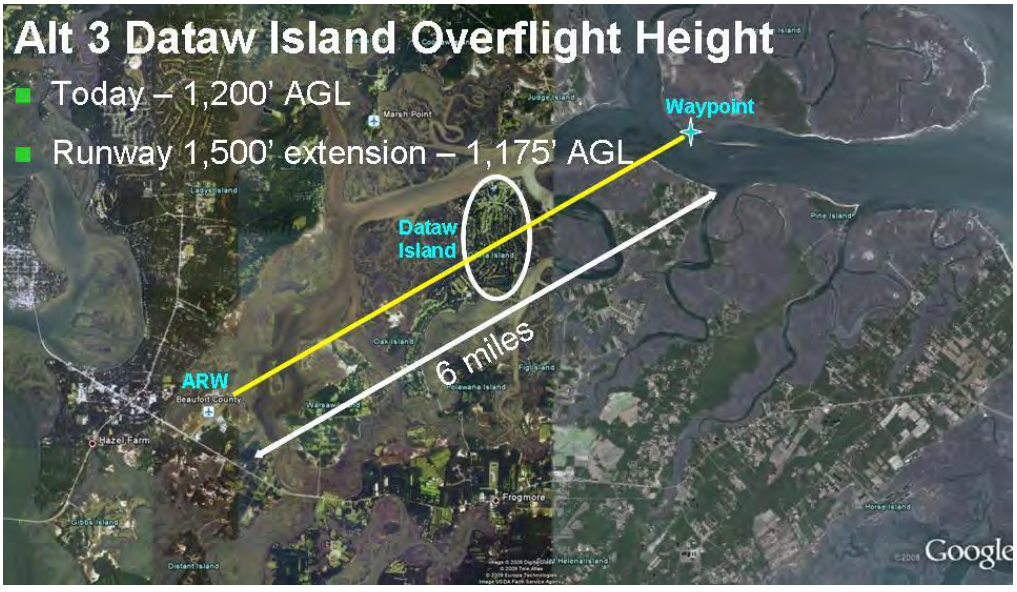
This alternative impacts the salt marsh more than any other alternative. However, there are no impacts to homes or business and there is no need for land acquisition (except through possible environmental mitigation efforts) for development or noise. Table 4-4 summarizes the impacts from Airfield Alternative 3.

Table 4-4: Alternative 3 Impact Summary

Impact Evaluation Factors	5,000' Runway
Marsh/OCRM (AC)	19
Land Acquisition (AC)	0
Number of Parcels	0
Number of Homes	0
Number of Businesses	0
Beaufort MCAS Impacts	No
Cemetery Impacts	No
Hwy 21 Tunnel/Realignment	No
Power Substation & Pole Impacts	13
Noise	On-Airport
Approach Impacts	Yes

Dataw Island is a community across the salt marsh from ARW and along the extended runway centerline. Although the noise exposure from aircraft arriving or departing ARW would be well within federal limits, 65 DNL would remain on airport property, Dataw residences may be disturbed by lower flying aircraft as a result of the runway extension. As shown in Figure 4-6, aircraft flying over the community today are at 1,200 feet above the ground. The elevation of aircraft as a result of the extension at ARW would be 25 feet lower, at an elevation of 1,175 feet above the ground. Although this would be allowed under federal aviation regulations and noise would not be considered impactful under federal guidelines, it is worth mentioning in this report as residents of this community may seek to revise approach procedures into ARW as a result of a 1,500 foot runway extension in this direction.

Figure 4-6: Airfield Alternative 3, Dataw Island Overflights



Airfield Alternative Recommendation

The alternatives developed, as a part of this master plan, are significantly different from one another and their potential impacts vary widely. The chosen airfield alternative will have a dramatic impact on how landside facilities are developed, phased, and constructed. The leading factor in the overall, long-term development of the Airport, however, is centered on the runway length, orientation, and areas of potential impact. Therefore, before evaluating landside facility development, the recommended airfield alternative will be discussed. By doing this, the need for multiple landside alternatives for each airfield concept will be avoided, thus clearing the way for systematic landside development for one chosen airfield alternative.

Table 4-5 summaries the impacts related to each development alternative.

Table 4-5: Impact Summary – All Alternatives

Impact Evaluation Factors	Meeting Standards	Alternative 1	Alternative 2	Alternative 3
Marsh/OCRM (AC)	5	11	1	19
Land Acquisition (AC)	0	41	153	0
Number of Parcels	0	24	63	0
Number of Homes	0	8	16	0
Number of Businesses	0	0	7	0
Beaufort MCAS Impacts	No	No	Yes	No
Cemetery Impacts	No	1	No	No
Hwy 21 Tunnel/Realignment	No	Yes	No	No
Power Substation & Pole Impacts	13	20	Unknown	13
Noise	On-Airport	On-Airport*	On-Airport*	On-Airport
Approach Impacts	No	No	Yes	Yes

*On-airport noise only through land acquisition tied to the runway extension/realignment

Although the "Meeting Standards" option could represent a limit to overall airport development, it is not considered a true development alternative in this analysis because it does not meet the ultimate facility requirement goal of providing a 5,000-foot runway. The Meeting Standards option may represent a stage or phase of airport development within the 20-year planning horizon.

Based on the evaluation criteria discussed earlier in this chapter, Alternative 3 is the recommended development option for ARW. As per FAA planning guidance, this is a needs-based recommendation that meets overall facility requirement goals with the least impact. Some of the key determining factors related to this recommendation include:

- No land acquisition (transfer "Waters of the State")
- No Highway 21 or cemetery impacts
- No residential or business acquisitions or relocations

- No impacts to Beaufort MCAS operations
- Preserves existing LPV approach
- 5,000 feet allows Airport's continued economic viability

As with all the alternatives presented, this recommended development plan does not come without challenges. The following is a list of a few of the potential challenges to developing this airfield alternative:

- Permit to impact salt marsh
- Find a site to mitigate salt marsh impacts
- Secure funding
- Public and governmental support
- Jasper County is pursuing new airport with >5,000 foot runway (4 percent tax)

To successfully develop this recommended airfield alternative and address the challenges mentioned above (as well as others that may be realized) the following steps/studies may be undertaken following this master plan.

- Approval from Beaufort County/SCAC/FAA
- Benefit/Cost Analysis
- Economic Impact Analysis of 5,000 feet at ARW
- New Airport Site Feasibility Study
- Environmental Assessment/EIS
- Secure Funding (local/state/federal)

Phased Approach

The FAA, sponsor, and stakeholders have been consulted throughout the master planning process. The recommended alternative has been met with various levels of acceptance based on the consideration of the following concerns:

- The cost of environmental mitigation and phased construction to extend the runway to 5,000 feet
- FAA support for a runway extension to 5,000 feet
- Increased activity with the runway extension
- A "business-case" for extending the runway to 5,000 feet

In light of these concerns, a phased approach to development provides an ultimate runway length of 5,000 feet beyond the planning horizon with incremental development within the 20-year period. The recommended airfield alternative is broken down into the following phases:

Phase 1 (0-5 years) – Runway safety area improvements to meet FAA design standards and taxiway extension to provide a full length parallel. Projects identified in the "Meets Standards" option.

Phase 2 (6-10 years) – 966-foot runway and taxiway extension to 4,400 feet to support existing based aircraft. FAA supports runway extension to 4,400 feet.

Phase 3 (11-20 years) – No airfield expansion.

Ultimate – 600 foot runway and taxiway extension to achieve 5,000 feet. This will not be illustrated on the ALP or studied further in subsequent chapters of this master plan because it is not within the 20-year planning period.

It is important to recognize that each sequential phase can be reviewed, justified and constructed on its own merit. In other words, each phase represents a stage of expansion for the airport based on demand and may not happen without financial support from the State and FAA, as well as interest from the community and other stakeholders.

4.4 Landside Development

This section focuses on the development, evaluation, and recommendation of landside facilities to accommodate future demands. The recommended landside facilities described in this section are developed with close consideration toward the chosen airfield alternative. Since the chosen airfield alternative effectively maintains the existing landside configuration and terminal area layout, recommended landside development represents an expansion of existing facilities; maintaining the use of existing infrastructure such as taxiways, taxilanes, apron, etc. The following facilities are identified as necessary for inclusion in this master plan:

- Corporate, conventional, and T-hangar development
- Apron and tiedown expansion
- Terminal expansion
- Vehicle parking relocation and expansion

The facilities listed above are discussed in more detail throughout this section.

Hangars

Chapter 3 identified a demand for additional aircraft storage hangars throughout the planning period based on the forecasted number of based aircraft at ARW. Table 4-6 summarizes the anticipated demand for additional T-hangars as well as conventional and corporate hangars throughout the planning period.

Table 4-6: Hangar Demand

Year	T-Hangars	Conventional	Corporate
Existing Hangars	34	1*	0
2008	40	0	0
2013	45	1	1
2018	49	1	3
2023	54	2	5
2028	59	2	7

*Mosquito control hangar not available to airport customers
Source: Wilbur Smith Associates

The Airport needs the addition of T-hangars, conventional and corporate hangars to accommodate the existing and forecasted demand for aircraft storage throughout the planning period. The current T-hangars are in good to very good condition and the conventional hangar used by the Beaufort County Mosquito Control is new as of 2009.

To satisfy the current and future T-hangar, conventional, and corporate hangar deficiency identified above, it is recommended that at least two twelve-unit T-hangars, two conventional hangars, and seven corporate hangars be constructed during the planning period. Actual demand for hangars may differ from the forecast and facility requirements prescribed in previous chapters. Additional hangar development beyond that shown as hangar demand within the planning horizon is illustrated on the ALP. Hangars are positioned to reduce the need for additional pavement and avoid wetland impacts.

Apron Area and Tiedowns

Although Chapter 3 does not identify demand for additional apron and tiedown space, the development of hangars within the terminal area requires aircraft movement area that would effectively allow for additional apron and tiedown space. To avoid conflicts with fixed wing aircraft movement and address the unique needs for helicopter operations, a designated helipad is also shown on the ALP, between the taxiway and apron.

Terminal Expansion

The previous chapter illustrates a need for additional terminal building space within the planning period. The existing terminal building is ideally located within the central terminal area and is convenient to the aircraft apron, tiedown area, and automobile parking. With adequate frontage along the airside for expansion, it is recommended

that the existing terminal building be renovated and expanded in its current location. Additional square footage added to the building will also allow for meeting room spaces as well as convenient access to consolidated operations and airfield maintenance storage facilities within the new terminal.

The development in the terminal area and increasing activity at ARW will call for the relocation of the existing fuel farm. It is ideal to locate the fuel farm and associated self-service fueling facilities on the aircraft apron area in order to provide convenient access for transient and based aircraft. The chosen location and configuration of the terminal building and relocated fuel farm is illustrated on the ALP.

Automobile Parking

Thirty-nine additional vehicle parking spaces are required by the end of the planning period. To make the most use out of valuable airside frontage near the apron, it is recommended that the automobile parking lot be relocated and expanded in front of the terminal building. This space allows for at least the 101 parking spaces recommended in the previous chapter and is convenient to the terminal building and hangar areas that most visitors, users, and tenants will be accessing. With the relocation of the parking lot, roadway access would have to be relocated as well. It is recommended that a single entry/exit access road be built between the airport's primary access road and the new parking lot. The position, size, and alignment of the recommended automobile parking lot and access road are shown on the ALP.

4.5 Summary

The process of selecting development recommendations consisted of identifying and evaluating alternatives that met the Airport's 20-year requirements. The most critical of the requirements identified in the previous chapter are the need to increase compliance with FAA standards, provide for aviation expansion, and preserve flexibility while increasing revenue generation potential. The airfield alternatives were evaluated on their impacts to the surrounding environment and community while providing a 5,000-foot runway to accommodate future demand. This analysis resulted in an airfield recommendation to extend the runway into the salt marsh, a total 1,566-foot from the end of Runway 25 (not including runway safety area). While this alternative avoids impacts to nearby residents, businesses, and Highway 21, it has impacts to the salt marsh. These and other impacts will be evaluated further in the next chapter.

Concerns over the Airport's expansion have been raised and bring into question the public will to undertake such a project. As a result, and in an effort to accommodate demand, a phased approach to airfield development is recommended that will incrementally expand the Airport. Within the 20-year planning period, the first phase of airfield development will be to extend the taxiway to provide a full-length parallel

and to meet FAA design standards by providing a full runway safety area. This will avoid any potential runway shortening that may otherwise be required. The second phase of development would be to extend the runway and taxiway to 4,400 feet, a length that supports existing based aircraft. The last portion of runway/taxiway development would be carried out beyond the planning horizon, based on future demand and public will, and consists of an ultimate runway/taxiway length of 5,000 feet.

Key landside development recommendations have been provided that fit with the chosen airfield development and allow for the expansion of existing facilities. Conventional, corporate, and T-hangar expansion will keep pace with demand and allow for revenue generation growth. Terminal building renovation and expansion will update the existing facility in its current location, while providing for additional space to accommodate increased activity and airfield maintenance storage functions. The automobile parking lot will be relocated and expanded to take advantage of valuable apron space while increasing capacity by at least 38 percent.

The following chapters will continue to examine the environmental impact of the proposed development plan within the planning period, and prepare detailed drawings in the form of Airport Plans. Finally, the cost of constructing the recommended alternatives and financial implications of implementing the proposed capital improvements will be presented.

Chapter

5

Environmental Overview

In addition to identifying airport projects that are financially and technically feasible, an important part of the master planning process is ensuring that future airport developments minimize impacts to the environment. Council on Environmental Quality (CEQ) 1501.2 states, "Agencies shall integrate the NEPA process with other planning at the earliest possible time to insure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts." Accordingly, identifying potential environmental impacts of proposed airport projects has become an integral part of the master planning process. This environmental overview has been prepared to identify potential environmental impacts associated with the proposed airport improvement projects for Beaufort County Airport (Lady's Island Airport – ARW) and to discuss potential mitigation measures that will be considered to minimize these impacts. This environmental overview discusses potential environmental impacts of the following proposed airside improvements, as well as proposed landside developments identified in Chapter 4, "Alternative Development Concepts."

- Phase I (0-5 Years):
  - RSA improvements (both ends)
  - Taxiway improvements, full-length parallel
  - Helipad
  - Hangar development
  - Apron expansion
  - Terminal expansion
  - Roadway access and auto parking improvements
- Phase II (6-10 Years):
  - 966-foot runway extension with associated RSA
  - Taxiway extension to proposed runway extension end
  - Hangar development
- Phase III (11-20 Years):
  - Hangar and T-hangar development
  - Fuel farm relocation

It is important to note that impacts related to projects associated with the ultimate runway length of 5,000 feet identified beyond the planning period are not considered in this Environmental Overview.

This environmental overview was conducted in accordance with FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions,* FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures,* and the FAA's *Environmental Desk Reference for Airport Actions,* which requires the analysis of the following environmental impact categories prior to project implementation:

5.1 Air Quality

5.2 Biotic Resources/ Federally-listed Endangered and Threatened Species

5.3 Coastal Barriers/Coastal Zone Resources

5.4 Compatible Land Use

5.5 Construction Impacts

5.6 Section 4(f)

5.7 Energy Supplies, Natural Resources, and Sustainable Design

5.8 Farmlands

5.9 Floodplains

5.10 Hazardous Materials

5.11 Historical and Archeological Resources

5.12 Light Emissions and Visual Impacts

5.13 Noise

5.14 Social Impacts/Environmental Justice

5.15 Solid Waste

5.16 Water Quality

5.17 Wetlands

5.18 Wild and Scenic Rivers

5.19 Induced Socioeconomic/Cumulative Impacts

Each of these impact areas is discussed in further detail in this chapter. FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures,* outlines types of impacts and thresholds that determine if an impact is considered to be significant. In general, projects fall into one of the following three categories:

Categorical Exclusions – Projects that are categorically excluded include those actions that have been found under normal circumstances to have no potential for significant environmental impact.

Actions Normally Requiring an Environmental Assessment (EA) – Projects that normally require an EA are actions that have been found to sometimes have significant environmental impacts.

Actions Normally Requiring an Environmental Impact Statement (EIS) – If a project is found to have significant impacts during the preparation of an Environmental Assessment, the FAA can determine that an EIS is required to investigate in greater detail a project's potential environmental impacts.

The following sections discuss the preliminary evaluation of the recommended airport development projects for each of the environmental impact categories included in FAA Order 1050.1E. For those proposed airport projects that are not categorically excluded from further environmental review, additional environmental analyses will be conducted and documented in a formal EA or EIS prior to project implementation.

5.1 Air Quality

The National Environmental Policy Act of 1969 (NEPA), the Clean Air Act (CAA), as amended, and Title 49 U.S.C. 47106 (c) (1) (B), as amended (formerly sections 509 B) (5) and (B) (7) of the Airport and Airway Improvement Act of 1982, as amended; and, PL 97-248, are the primary laws that apply to air quality. NEPA requires federal agencies to prepare an environmental document (i.e., EIS or EA for major federal actions that have the potential to affect the quality of the environment, including air quality.

The Clean Air Act (CAA) established National Ambient Air Quality Standards (NAAQS) for six pollutants, termed "criteria pollutants." The six pollutants are: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO2), ozone (O3), particulates (PM10 and PM2.5), and sulfur dioxide (SO2). The CAA requires each state to adopt a plan (State Implementation Plan or SIP) to achieve the NAAQS for each pollutant within timeframes established under CAA. Beaufort County Airport is located in Beaufort County, South Carolina which is currently in attainment for all criteria pollutants[1].

[1] EPA Nonattainment Areas: http://www.epa.gov/air/data/nonat.html?st~SC~South%20Carolina.

In addition to NEPA, the Clean Air Act of 1990 Amendments required the Environmental Protection Agency (EPA) to issue rules that would ensure federal actions conform to the appropriate SIP. The General Conformity rule establishes the procedures and criteria for determining whether certain federal actions conform to state or EPA (federal) air quality implementation plans. To determine whether conformity requirements apply to a proposed federal action, the following must be considered: the non-attainment or maintenance status of the area; type of pollutant or emissions; exemptions from conformity and presumptions to conform; the project's emission levels; and the regional significance of the project's emissions. FAA actions are subject to the General Conformity Rule. The General Conformity Rule only applies in areas that EPA has designated non-attainment or maintenance. Because Beaufort County Airport is located in Beaufort County, which is currently in attainment for all criteria pollutants, the General Conformity Rule does not apply to these projects.

FAA air quality analysis guidelines indicate that, if a proposed federal action is in a state that does not have applicable indirect source review (ISR) requirements, then the projected airport activity levels are examined to determine if a detailed air quality analysis is required. The State of South Carolina does not have ISR requirements; therefore, the determination of whether or not a detailed air quality analysis is required for a proposed project is based on annual aircraft operations. According to FAA guidelines, an air quality analysis is required for general aviation airports with more than 180,000 projected annual operations. Since Beaufort County Airport is located in an area that is in attainment of all criteria pollutants, and because the projected operations at the airport are significantly less than 180,000 annual general aviation operations over the 20-year planning period, a detailed air quality analysis will not be required as part of the NEPA documentation for these projects.

5.2 Biotic Resources/Federally Listed Endangered and Threatened Species

Section 7 of the Endangered Species Act (ESA), as amended, applies to Federal agency actions and requires each agency, generally the lead agency, to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any federally listed endangered or threatened species or result in the destruction or adverse modification of critical habitat. In addition, the Fish and Wildlife Coordination Act requires that agencies consult with the State wildlife agencies and Department of the Interior (USFWS) concerning the conservation of wildlife resources where the water of any stream or other water body is proposed to be controlled or modified by a federal agency or any public or private agency operating under a federal permit.

As shown in Table 5-1, there are 17 federally listed threatened, endangered, proposed or candidate species, which are known to occur in Beaufort County, South Carolina. As part of the NEPA documentation, an on-site biotic survey will be conducted to identify the presence of the species or any habitats necessary to support them within the project area. If potential impacts to these species are identified, Section 7 coordination with the USFWS will be required.

Table 5-1: Identified Endangered Species
Beaufort County

Common Name	Scientific Name	Status
Animals		
West Indian Manatee	*Trichechus manatus*	Endangered
Frosted Flatwoods Salamander	*Ambystoma cingulatum*	Threatened
Green Sea Turtle	*Chelonia mydas*	Endangered
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	Endangered
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered
Loggerhead Sea Turtle	*Caretta caretta*	Threatened
Wood Stork	*Mycteria americana*	Endangered
Shortnose Sturgeon	*Acipenser brevirostrum*	Endangered
Finback Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Right Whale	*Balaena glacialis*	Endangered
Red Cockaded Woodpecker	*Picoides borealis*	Endangered
Red Knot	*Calidris canatus rufa*	Candidate
Plants		
American Chaffseed	*Schwalbea americana*	Endangered
Canby's Dropwort	*Oxypolis canbyi*	Endangered
Pondberry	*Lindera melissifolia*	Endangered

Source: US Fish & Wildlife Endangered Species Program, Wilbur Smith Associates

According to the South Carolina Department of Natural Resources, Heritage Trust Program, there are no known occurrences of any federal or state listed threatened or endangered species within one mile of the project area. Because the organization's database does not represent a comprehensive biological inventory of the state, there may be occurrences of species in the vicinity of the project area that have not been reported. It is noted there is a record for a waterfowl colony (unspecified species) to the northwest of the project area. These birds are afforded legal protection under the Migratory Bird Act and should be considered before any project work begins, however it is not anticipated that the colony would be affected by project work. Fieldwork remains necessary to verify presence/absence of any endangered and threatened species.[2]

5.3 Coastal Barriers/Coastal Zone Resources

The Coastal Barriers Resources Act (CBRA) and the Coastal Zone Management Act (CZMA) govern Federal activities involving or affecting coastal resources. Lady's Island is not included within the Coastal Barrier Resources System, therefore, the Coastal Barrier Resources Act does not apply to this project. Coastal Zone Consistency Certification is required before undertaking any project in Beaufort County. The proposed airport projects must be reviewed by the South Carolina Department of Health and Environmental Control – Office of Ocean and Coastal Resources Management (DHEC-OCRM) to ensure that the project is consistent with the state coastal management policies before any state or federal permit can be issued for a project in the coastal zone.[3]

5.4 Compatible Land Use

FAA Order 5050.4B states that the compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of noise impacts related to that airport. If the noise analysis concludes that there is no significant impact, a similar conclusion usually can be made with regard to compatible land use. Land use impacts also can occur if the proposed projects exceed the threshold of significance of other impact areas that have land use ramifications, including disruption of communities, relocation, and induced socioeconomic impacts (FAA Order 1050.1E).

The 2008 and 2028 noise contours were developed as part of the Noise Analysis discussed in Section 5.13 to evaluate the impact of aircraft noise on sensitive land uses in the airport area. Sensitive land uses include: residential areas, parks, hospitals, churches, amphitheaters, and libraries. FAA Advisory Circular

[2] See Letter from Julie Holling, SCDNR-Heritage Trust Program, dated June 2, 2010 included in Appendix B
[3] See Letter from Shannon Hicks, Office of Ocean and Coastal Resource Management, dated June 4, 2010 included in Appendix B

150/5020-1, *Noise Control and Compatibility Planning for Airports,* has identified land use guidelines that relate types of land uses to airport noise levels. Based on these guidelines, all land uses are considered to be compatible with yearly day-night sound levels below 65 DNL. As shown on Figures 5-1 and 5-2, which are included in Section 5.13, no existing residences or businesses would be exposed to 65 or more DNL noise; therefore, no incompatible land use will occur.

5.5 Construction Impacts

Specific impacts that would occur as a result of construction activities include noise of construction equipment on the site, noise and dust from delivery of materials through local streets, disposal of soil, air pollution from construction equipment exhaust and dust, and water pollution from erosion. To the extent necessary, mitigation of construction impacts would be accomplished by incorporating in the project specifications from the provisions of FAA Advisory Circular 150/5370-10, *Standards for Specifying Construction of Airports,* and FAA Advisory Circular 150/5370-10A, *Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control.* Potential construction-related water quality impacts would be minimized through the implementation of a sediment and erosion control plan.

Construction would require workers and machinery in and about the operations of the Airport. In some cases, runway or taxiway closures may be required for short periods of time. Guidelines as cited in FAA Advisory Circular 150/5370/2C, *Operation Safety on Airports, During Construction,* would be enforced where applicable. Runway or taxiway closure conditions will be kept to a minimum in an effort to minimize inconvenience to Airport users.

5.6 Department of Transportation Act: Section 4(f)

The Department of Transportation Act of 1966, Section 4(f), recodified in 49 USC, Subtitle I, Section 303, prohibits the taking of public parkland, recreation areas, wildlife and waterfowl refuges, or historic sites unless there is "no feasible and prudent alternative." Section 6(f) of the Land and Water Conservation Fund Act (L&WCFA) prohibits the taking of lands purchased with L&WCFA funds. There are no historic or archaeological properties within the Area of Potential Effect of the proposed airport projects.[4] In addition, the project would not impact any parks, recreational areas, or other Section 4(f) resources or lands purchased with L&WCFA funds. Therefore, there will be no direct or indirect impacts to Section 4 (f) or Section 6(f) lands as a result of the proposed Airport development projects.

[4] See Letter from Caroline Dover Wilson, State Historic Preservation Office, dated June 17, 2010 included in Appendix B

5.7 Energy Supplies and Natural Resources

FAA Order 1053.1, *Policies and Procedures for Energy Planning and Conservation,* provides for assessing energy demands related to airport improvement projects. The effects of the airport development on energy supply typically relate to the amount of energy required for the following:

- Stationary facilities (such as terminal building heating and cooling and airfield lighting)
- Movement of air and ground materials

The effects of airport development on natural resources typically relate to basic materials, such as gravel, fill dirt, etc., that are required for construction.

It is anticipated that the local power company will have no difficulty in meeting the energy demands of the proposed airport development.

Aviation activity at the Airport is projected to increase approximately three (3) percent compounded annually. Therefore, energy consumption by aircraft and vehicles is expected to increase due to the proposed airport development. The projected increase in fuel consumption from the proposed airport development would not cause a significant increase in fuel consumption and the increased demand could be met by existing fuel supplies.

5.8 Farmlands

The Farmland Protection Policy Act (FPPA) regulates federal actions with the potential to convert farmland to nonagricultural uses. The proposed airport development projects would occur on what is presently tidal marsh of the Morgan River. Therefore, there will be no impacts to farmlands as a result of the proposed projects.

5.9 Floodplains

Executive Order 11988 directs federal agencies to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains. Agencies are required to make a finding that there is no practicable alternative before taking action that would encroach on a base floodplain based on a 100-year flood (7 CFR Section 650.250).

According to the Flood Insurance Rate Map (FIRM) for Beaufort County, South Carolina dated September 29, 1986 (Panel 100 of 163); the airport lies within a

100-year floodplain, Zone A9. This is an area inundated by 100-year flooding, for which no base flood elevations have been established. Floodplain impacts as a result of the proposed projects are comparable to existing airport floodplain impacts given that the entire airport property is within the 100-year floodplain.

5.10 Hazardous Materials, Pollution Prevention, and Solid Waste

The two statutes of importance in the construction and operation of airport facilities and navigational aids are the Resource Conservation and Recovery Act (RCRA), as amended by the Federal Facilities Compliance Act of 1992, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended (also known as Superfund). RCRA governs the generation, treatment, storage, and disposal of hazardous wastes and CERCLA provides for the cleanup of any releases of a hazardous substance (excluding petroleum) into the environment. FAA actions to fund, approve, or conduct an activity require consideration of hazardous material and solid waste impacts.

To identify the presence of known hazardous waste sites within the Airport property that could be impacted by the construction of the proposed improvement projects, the Environmental Protection Agency (EPA) databases for hazardous waste information were searched. These databases include information on hazardous waste generators, as well as hazardous waste sites.[5] There are two facilities in the vicinity of Beaufort County Airport that are on the RCRA Toxic Releases Inventory, including Beaufort Marine Corps Air Station (MCAS) and Flint Group Pigments. Beaufort MCAS is located approximately 4.8 miles from airport property and Flint Group Pigments is located approximately 8.2 miles from airport property. Due to the distance from these sites there would be no impacts to these facilities as a result of the proposed airport projects.

In addition to hazardous waste sites, solid waste impacts must be evaluated in conjunction with airport development. This includes impacts on solid waste generation. No significant increases in solid waste generation are anticipated as a result of the proposed airport improvements. The only additional waste anticipated is that which will be associated with the construction of the aviation facilities. The existing solid waste disposal facility located in the vicinity of the airport is 3.5 miles east of the airfield. Existing waste collection and disposal facilities will be adequate to handle the waste associated with the construction of the airport facilities.

FAA Order 5200.5, *FAA Guidance Concerning Sanitary Landfills On or Near Airports,* states that “sanitary landfills will be considered as an incompatible use” if located within 1,500 meters (approximately 4,921 feet) of all runways planned to be used by piston type aircraft and within 3,000 meters (approximately 9,843

[5] Right-to-Know Network: http://www.rtknet.org/db/tri/tri.php?citystate=beaufort%2C+sc.

feet) of all runways planned to be used by turbo aircraft. Airports located closer than these distances to sanitary landfills have an increased risk of bird hazards. The nearest municipal landfill licensed by the South Carolina DHEC Bureau of Land and Waste management is located approximately 3.8 miles from Beaufort County Airport, outside the recommended distance of 3,000 meters. Therefore, there would be no potential bird hazards as a result of the proposed runway improvements.

5.11 Historical, Architectural, Archeological, and Cultural Resources

The National Historic Preservation Act of 1966 (NHPA), as amended, provides for the preservation of properties that are eligible for inclusion in the National Register of Historic Places (NRHP). In addition, Section 106 of the NHPA directs the heads of federal agencies, federal departments, or independent agencies that have direct or indirect jurisdiction over a federal or federally assisted undertaking to "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register."

The Archaeological and Historic Preservation Act of 1974 provides for the survey, recovery, and preservation of significant scientific, prehistoric, archaeological, or paleontological data when such data may be destroyed or irreparably lost due to a Federal, federally licensed, or federally funded project.

There are no historic or archaeological properties listed or eligible for listing on the National Register of Historic Places (NRHP) within the Area of Potential Effect (APE) of the recommended airport projects. If archaeological materials are encountered during construction, the procedures codified at 36 CFR 8090.13(b) will apply.[6]

5.12 Light Emissions and Visual Impacts

Light emissions caused by airport-related lighting can create an annoyance to residents in the vicinity of the Airport. In general, however, light emissions created by general aviation airports are minimal. As indicated in FAA Order1050.1E, light emissions are unlikely to have an adverse impact on human activity or the use or characteristics of the protected properties because of the relatively low levels of light intensity compared to background levels associated with most air navigation facilities (NAVAIDS) and other airport development actions.

[6] See Letter from Caroline Dover Wilson, State Historic Preservation Office, dated June 17, 2010 included in Appendix B

The proposed lighting improvements associated with this master plan are related to the recommended runway and taxiway extension. Existing NAVAIDS at the airport include the Runway End Identifier Lights (REILs) and Precision Approach Path Indicator (PAPI) lights to the approach end of each runway as well as the airport's rotating beacon. The REILs are a pair of synchronized flashing lights located laterally on each side of the runway threshold to help identify the end of the runway during times of reduced visibility. The REILs can be omni-directional or unidirectional. Both runway ends also have PAPI lights providing visual glideslope descent guidance. Runway, taxiway, REIL and PAPI lighting systems will be extended to the end of Runway 25 when it is extended. The rotating beacon is mounted on a tower adjacent to the terminal building and omits an alternating white and green light to identify the airport as a civilian-use facility during reduced visibility or evening hours. The beacon will be relocated with planned terminal improvements. Light emission impacts to nearby residences as a result of these improvements are minimal.

5.13 Noise

The standard practice for evaluating the noise impacts at airports involves the use of the FAA-approved Integrated Noise Model (INM). INM version 7.0b was used in this analysis to develop noise contours for Beaufort County Airport based on operational activity in the existing year (2008) and the forecast year (2028).

Methodology

The INM works by defining a network of grid points at ground level around the site. It then selects the shortest distance from each grid point to each flight track and computes the noise exposure generated by each aircraft operation by aircraft type and engine thrust level, and by time of day/night along each flight track. Corrections are applied for atmospheric acoustical attenuation, acoustical shielding of the aircraft engines by the aircraft itself, and aircraft speed variations. The noise exposure levels for each aircraft are then summed at each grid location to provide a day-night level (DNL), which is the 24-hour average sound level expressed in decibels, including an additional 10-decibel penalty for night-time operations (those occurring between the hours of 10 p.m. and 7 a.m.). The cumulative noise exposure levels at all grid points are then used to plot noise exposure contours for selected values (e.g., 65, 70, and 75 DNL).

The decibel scale from zero to 120 includes most of the range of typical daily sound levels, and is shown in Table 5-2.

Table 5-2: Common Sound Levels

Decibels	Common Aircraft Sound Level	Common Daily Sound Level
110	B-747 takeoff at 2 miles	Rock Band
100	DC-10 takeoff at 2 miles	Gas Lawn Mower at 3 feet
90	B-727 takeoff at 2 miles	Garbage Disposal at 3 feet
80	Learjet 25 takeoff at 2 miles	Shouting at 3 feet
70	New generation very light jet takeoff at 2 miles	Normal Speech at 3 feet
60	Beech King Air takeoff at 2 miles	Large business office
50	Piper Twin Comanche takeoff at 2 miles	Dishwasher in next room

Source: FAA, 2010

Noise Contour Mapping

DNL noise levels are indicated by a series of modeled contour lines superimposed on an airport map. These levels are calculated for designated points on the ground from the weighted summation of the effects of all aircraft operations. Some operations are far enough away from a location that their effect is minimal, while other operations may dominate noise exposure at that location. For example, a location just east of the airport may be affected by an aircraft departure to the east but unaffected by an arrival from the west.

Operational Activity

Modeling airport noise in INM requires data from parameters such as aircraft operations, fleet mix, runway utilization, operational profiles, and flight tracks. The following is a summary of the 2008 and 2028 operational data used in the noise modeling analysis.

Aircraft Operations – The annual operations for 2008 were 41,000, approximately 112 operations per day, and the annual operations for the forecast year are estimated to be 74,100, approximately 203 operations per day.

Aircraft Operations Mix – The operations mix consists of various categories of aircraft operating at Beaufort County Airport, as shown in Table 5-3. These estimates were based on the existing and projected fleet mix detailed in the Forecasts of Aviation Demand chapter.

Table 5-3: Aircraft Operations Mix

	Year	Single-Engine	Multi-Engine	Jet	Helicopter
Existing	2008	68.6%	25%	1.0%	5.4%
Forecast	2028	63.0%	23.9%	7.6%	5.4%

Source: Beaufort County Airport records and Wilbur Smith Associates, Inc., 2010

Runway Utilization and Traffic Patterns – Beaufort County Airport's runway is aligned with the prevailing winds of the region, and, with no air traffic control tower, runway use is determined by the pilot in command of each aircraft. In general, pilot's select the runway that permits operations to occur with a headwind. Historic wind data indicates that neither Runway 7 nor Runway 25 is favored by the wind, so runway utilization is split evenly between the two runways. With an assumed 5 percent of operations occurring at night, Table 5-4 shows the allocation of runway use. These utilization rates are not expected to change throughout the forecast period.

Even without an air traffic control tower, there are established traffic patterns at the Airport. Aircraft using Runway 7 fly what is known as a right-hand traffic pattern, a rectangular flight path with all turns to the right that aligns the aircraft with the runway. Pilots flying to Runway 25 use a left-hand traffic pattern. As a result, operations are concentrated to the southeast of the airport and thereby avoid the City of Beaufort to the north and west.

Table 5-4: Runway Utilizations

Runway	Day	Night
07	47.5%	2.5%
25	47.5%	2.5%

Source: Beaufort County Airport, 2010

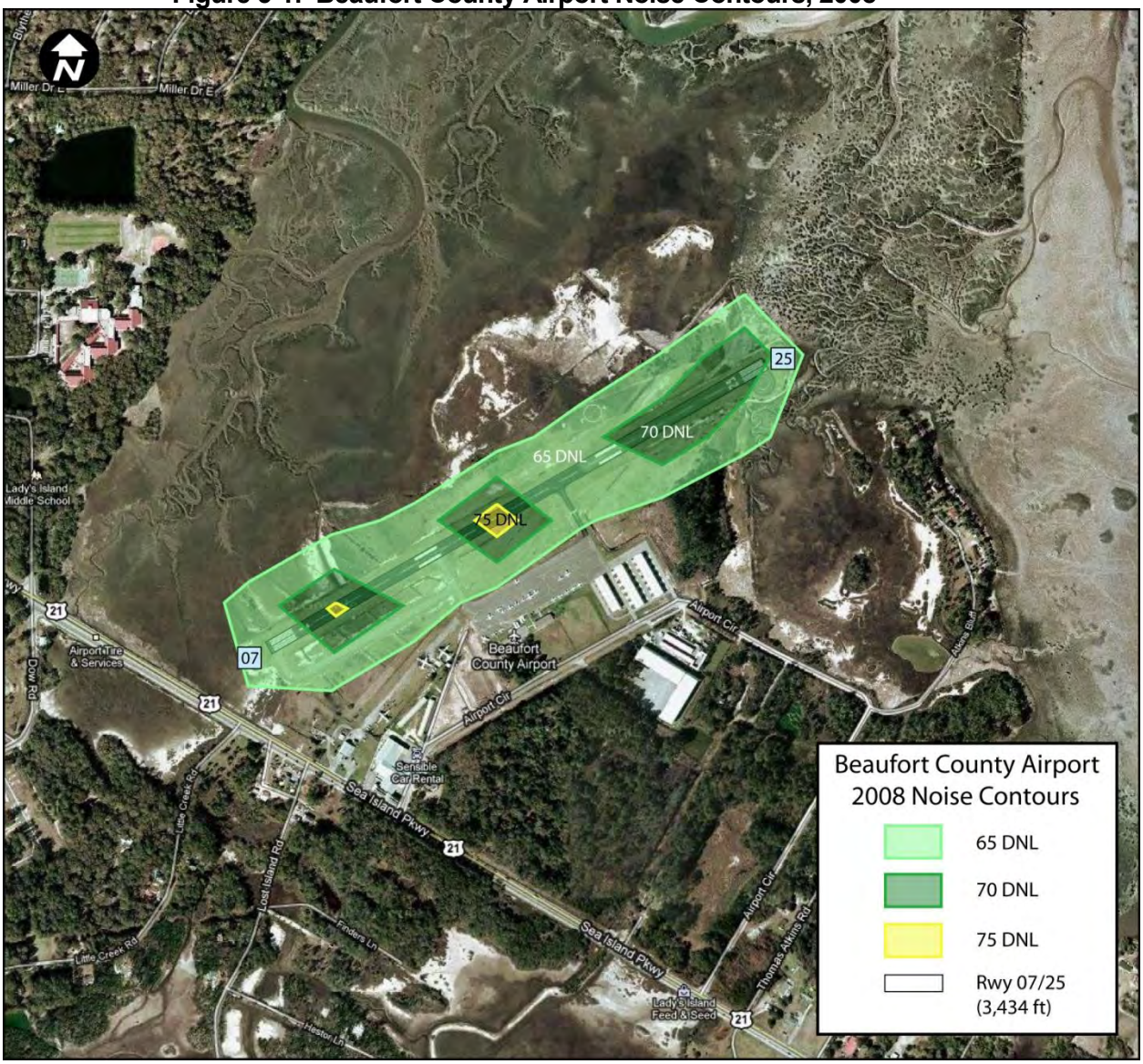
Approach and Departure Profiles – Approach and departure profiles illustrate an aircraft's altitude along its flight path. INM's vast database includes information regarding standard approach and departure profiles for the aircraft in this analysis.

Flight Tracks – Flight tracks project an aircraft's flight path as if shown on the surface. Due to meteorological conditions, aircraft type, stage length, air traffic control instructions, and pilot judgment, flight tracks are unique to each operation. Generalized flight tracks were developed for Beaufort County Airport based on operations and fleet mix data. These flight tracks took into account local traffic patterns, variable entry and exits to the pattern, and arrival and departure paths used by both fixed-wing and helicopter aircraft.

Noise Exposure Impacts

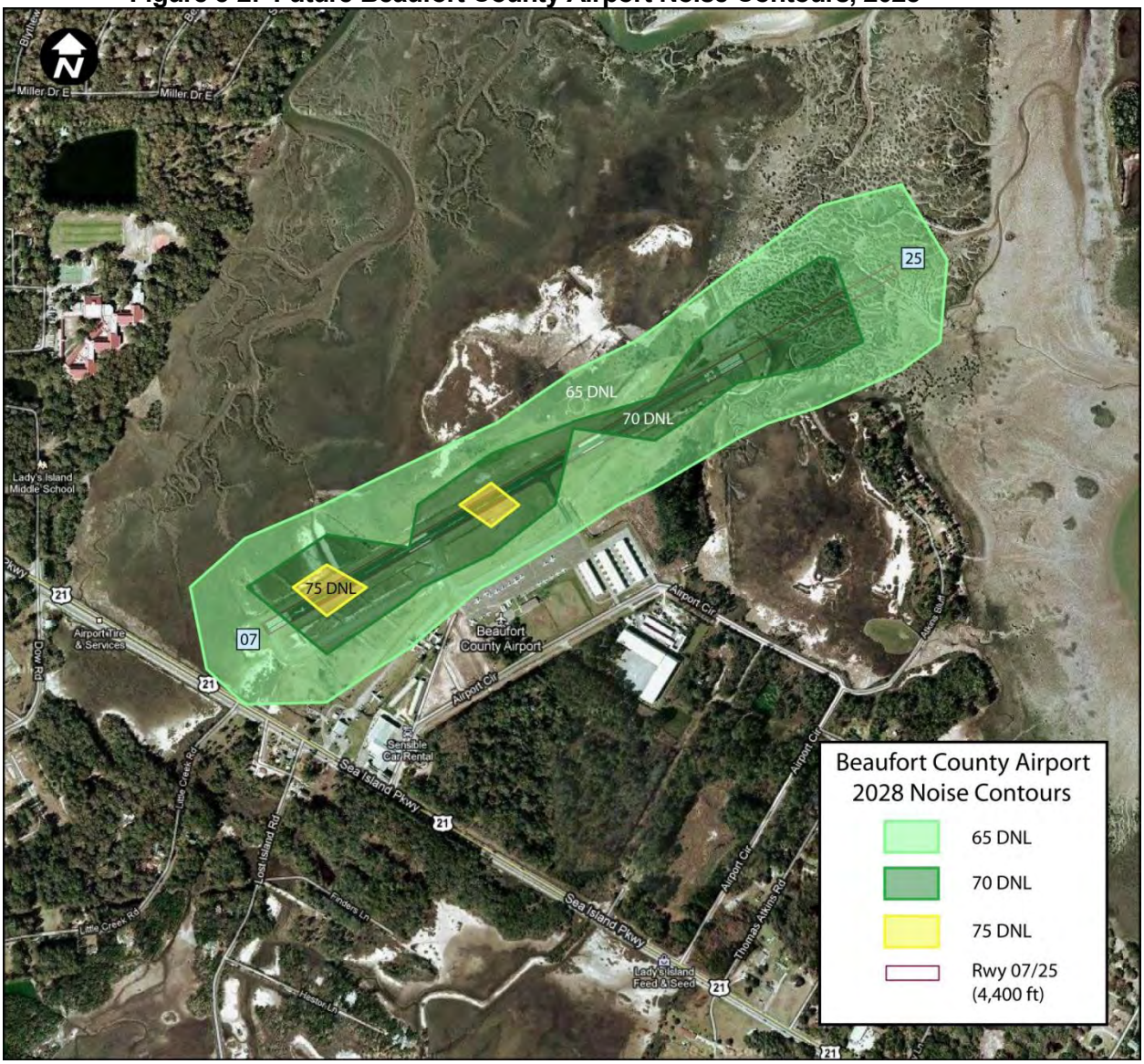
FAA Order 5050.4B requires that the 65, 70, and 75 DNL noise contours be developed for existing and future airport conditions. Noise levels greater than 65 DNL are generally considered unacceptable for noise-sensitive land uses, such as residences, hospitals, and schools. The existing and forecast year noise contours modeled for this analysis are displayed as Figures 5-1 and 5-2, respectively, on the following pages.

Figure 5-1: Beaufort County Airport Noise Contours, 2008



Source: Google Maps, Wilbur Smith Associates, FAA INM

Figure 5-2: Future Beaufort County Airport Noise Contours, 2028



Source: Google Maps, Wilbur Smith Associates, FAA INM

Throughout the forecast period, the 75 DNL area encompasses approximately 2.3 acres, all of it on airport property. The 70 DNL area covers approximately 36.7 acres; and, the 65 DNL covers approximately 107.9 acres. Although an insignificant amount of noise falls beyond the airport property line, the affected areas are small in size and do not appear to be suitable for incompatible land uses. Land acquisition associated with the runway extension will further reduce the amount of noise beyond 65 DNL that extends beyond the airport property line.

5.14 Social Impacts/Environmental Justice/Children's Environmental Health and Safety Risks

Social Impacts

The purpose of a social impact analysis is to determine the effect of airport development on the human environment. The types of social impacts typically evaluated are as follows:

- Relocation of residences and/or businesses
- Alterations in traffic patterns that may permanently or temporarily restrict traditional community access
- Division or disruption of established communities
- Disruption of orderly, planned development
- Creation of appreciable change in employment

Each of these impacts is discussed below:

Relocation of residences and/or businesses: The proposed Airport development projects will not result in the relocation of residences and/or businesses.

Alterations in traffic patterns that may permanently or temporarily restrict traditional community access: The proposed airport improvement projects will not result in changes to local roads or access to the Airport.

Division or disruption of established communities: There will not be any division or disruption of established communities or neighborhoods adjacent to the Airport as a result of the proposed projects.

Creation of appreciable employment: The construction of the Airport development projects will result in the creation of construction-related jobs in Beaufort County. However, the number of jobs that will be created will not result in significant economic changes in Beaufort County.

Environmental Justice

On April 15, 1997, the Department of Transportation (DOT) released DOT Order 5680.1 to comply with the Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations. This Order requires DOT to identify and address disproportionately high and adverse human health or environmental effects of their policies or programs on minorities or low-income populations. Environmental Justice must be considered in all phases of planning. It is essential that any potential impacts

to minority and low-income populations be identified early in the planning process so that they can be considered during the evaluation of project alternatives.

The proposed Airport development projects will not result in any disproportionate adverse impacts to minority and low-income populations because there will be no significant impacts off Airport property to adjacent residential areas.

Children's Environmental Health and Safety Risks

The FAA is encouraged to identify and assess environmental health risks and safety risks that the agency believes could disproportionately affect children, including risks associated with contaminated air, food, drinking water, recreational waters, soil, or products that children might use or be exposed to.

The proposed Airport development projects will not result in any disproportionate health and safety risks to children.

5.15 Water Quality

The Federal Water Pollution Control Act, as amended (commonly referred to as the Clean Water Act), provides the authority to establish water quality standards, control discharges, develop waste treatment management plans and practices, prevent or minimize the loss of wetlands, establish location with regard to an aquifer or sensitive ecological area such as a wetlands area, and regulate other issues concerning water quality.

If the proposed federal action impounds, diverts, drains, controls, or otherwise modifies the waters of any stream or other body of water, the Fish and Wildlife Coordination Act applies unless the project is for the impoundment of water covering an area of less than 10 acres. The Fish and Wildlife Coordination Act requires the responsible federal agency to consult with the Fish and Wildlife Service (FWS) and the applicable state agency to identify means to prevent loss or damage to wildlife resources resulting from the proposal due to its projected 15.2 acres of impact.

If there is the potential for contamination of an aquifer designated by the Environmental Protection Agency (EPA) as a sole or principal drinking water resource for the area, the project needs to be coordinated with the EPA as required by Section 1424 (e) of the Safe Drinking Water Act, as amended.

Beaufort County Airport is located within the Morgan River watershed. Marshes of the Morgan River and multiple smaller creeks are located adjacent to and within the airport property. Potential water quality impacts associated with airport development result from disturbance of large areas of soil during construction; significant alternation of site grading and drainage; creation of large areas of impervious surface; and altered storm water runoff volumes and direction of flow.

As a result, the storm water general permit will need to be amended for changes according to the SCDHEC Bureau of Environmental Services.[7]

A National Pollution Discharge Elimination System (NPDES) permit will be required since more than five acres of existing vegetated land will be disturbed as a result of the proposed airport development projects. Disturbance refers to activities such as clearing, grading, and excavating that leave soil exposed. The general NPDES Construction Permit requires the submittal of a Notice of Intent and an Erosion and Sediment Control Plan to SCDHEC/OCRM and Beaufort County.

Measures identified in FAA Advisory Circular 150/5370-10A, *Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control,* should be incorporated into the design and construction of the proposed Airport development projects to minimize adverse water quality effects, including control of water pollution during construction.

According to the Fish and Wildlife Coordination Act, consultation with the Fish and Wildlife Service is required if the waters of any stream or other body of water are proposed to be impounded, diverted, drained, controlled, or otherwise modified. Therefore, the Fish and Wildlife Coordination Act does apply to these projects for the purpose of preventing loss of and damage to wildlife resources. Since the Beaufort County Airport is not within an area of a Sole Source Aquifer;[8] Section 1424(e) of the Safe Drinking Water Act, as amended, does not apply.

5.16 Wetlands

Executive Order (E.O.) 11990, "Protection of Wetlands," DOT Order 5660.1A, the Rivers and Harbors Act of 1899, and the Clean Water Act, Section 404, address activities in wetlands. E.O. 11990 requires federal agencies to ensure that their actions minimize the destruction, loss, or degradation of wetlands. It also ensures the protection, preservation, and enhancement of the Nation's wetlands to the fullest extent practicable during the planning, construction, funding, and operation of transportation facilities and projects (7CFR Part 650.26, August 6, 1982). DOT Order 5660.1A sets forth DOT policy that transportation facilities should be planned, constructed, and operated to ensure protection and enhancement of wetlands.

The proposed runway extension is located within tidal wetlands and waters of the Morgan River. As illustrated in Table 5-5 below, the proposed development will impact a total of 9.53 acres of wetland area. These wetlands and waters are

[7] See Letter from Russell Berry, SCDHEC-Environmental Quality Control, dated June 25, 2010 included in Appendix B

[8] EPA Region IV Sole Source Aquifer: http://www.epa.gov/safewater/sourcewater/pubs/reg4.pdf.

jurisdictional pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act and are, therefore, regulated by the U.S. Army Corps of Engineers, Charleston District and would require a Section 404 wetlands permit. As part of the NEPA process, a wetland delineation of the runway expansion project area will be conducted and further coordination with the U.S. Army Corps of Engineers will be conducted. Any unavoidable impacts to wetlands will be mitigated in compliance with the Charleston District's Mitigation Standard Operating Procedures (Mitigation SOP) dated 2002. Authorizations from the Office of Ocean and Coastal Resource Management and the South Carolina Department of Health and Environmental Control will also be required.[9]

Table 5-5: Area of Impact (acres)

Development	OCRM Critical Area	Freshwater	Freshwater Isolated	Marsh	Total
Improvements to RSA	0.85	0	0	0.83	1.68
Parallel Taxiway to Existing Runway End	0.68	0	0	0	0.68
Runway Extension to 4,400 feet	0	0	0	3.36	3.36
Parallel Taxiway to 4,400 feet	0	0	0	3.03	3.03
Apron/Taxilanes	0.11	0.67	0	0	0.78
Total	1.64	0.67	0	7.22	**9.53**

Source: Wilbur Smith Associates

5.17 Wild and Scenic Rivers

The Wild and Scenic Rivers Act (P.L. 90-542, as amended) protects rivers that are listed on the National Inventory of Wild and Scenic Rivers. There are no rivers listed on the U.S. Department of Interior's Inventory of National Wild and Scenic Rivers or on the South Carolina list of state scenic rivers in the vicinity of the Airport. Therefore, there will be no impacts to designated wild and scenic rivers as a result of the implementation of the airport projects included in the Master Plan Update.

[9] See Letter from Charles R. Crosby, US Department of the Army, Charleston District, Corps of Engineers, dated June 16, 2010, included in Appendix B

5.18 Induced Socioeconomic/Cumulative Impacts

Induced Socioeconomic Impacts

The potential for airport projects to cause induced or secondary socioeconomic impacts on surrounding communities is evaluated by addressing the following factors: shifts in patterns of population movement and growth; changes in public service demands; and changes in business and economic activity.

The proposed Airport development projects at Beaufort County Airport will not result in shifts in patterns of population movement and growth. With the exception of the runway/taxiway extensions, the proposed projects will occur on Airport-owned land and will not require any re-zoning of adjacent land. The runway/taxiway extension will extend beyond airport property into the river marsh, and therefore may be subject to rezoning after land acquisition approval as determined by Beaufort County Planning Department. However, this re-zoning would not result in shifts in patterns of population growth.

Airport improvement projects will not require an expansion of utilities or public safety services, including fire and police service that are available to the Airport. In addition, it is the SCDHEC Bureau of Environmental Services recommendation that the Airport be connected to the public sewer system.

The proposed Airport development will not result in significant changes in economic activity. There will be some construction-related employment generated by the projects that will have minor short-term economic benefits to Beaufort County. It is not anticipated that there will be any long-term Airport jobs created by the projects. The Airport projects may encourage the location of businesses in Beaufort County. However, these economic impacts, while beneficial to the local economy, are not anticipated to be significant enough to result in shifts in population or changes in local land use.

Cumulative Impacts

According to the Council on Environmental Quality (CEQ), cumulative impacts are defined as:

> "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time."

Cumulative impacts occur if the proposed airport development projects, combined with other local development projects, such as road improvements or

economic development projects, create significant socioeconomic impacts for the surrounding area.

A thorough cumulative impact analysis, while beyond the scope of this Environmental Overview, will be required for the proposed airport projects as part of the NEPA process. This analysis will include consultation and scoping to obtain information from other governmental and non-governmental sources to identify past actions, proposed actions, and any foreseeable actions that would affect resources within the areas of affect.

5.19 Summary

This Environmental Overview identified several environmental issues to be evaluated in greater detail during the NEPA documentation process that will be required prior to the implementation of the airport projects. These include: coastal resource impacts, floodplain impacts, land acquisition/rezoning approval, water quality impacts, storm water impacts, wildlife impacts, and wetland impacts. In addition, further coordination with resource agencies and the public will be required as part of the NEPA process.

Chapter

6

Airport Layout Plans

This chapter presents the airport development program and identifies the airside, landside, and support facilities to be included on the Airport Layout Plan (ALP). The ALP is a graphic presentation to scale of the existing and future airport facilities, their location on the airport, and the pertinent clearance and dimensional information required to show relationships with standard separations. A copy of the ALP drawing set follows in this section and includes the ALP and a series of support drawings used to illustrate other appropriate information. The associated ALP set includes the following sheets:

Sheet 1: Cover Sheet

Sheet 2: Airport Layout Plan

Sheet 3: Airspace Plan – Part 77

Sheet 4: Inner Approach Surface – Runway 7

Sheet 5: Inner Approach Surface – Runway 25

Sheet 6: Terminal Area Plan

Sheet 7: Land Use Map

Sheet 8: Wetlands Layout Plan

Sheet 9: Exhibit “A” – Property Map

Based upon the proposed airport layout, an Exhibit “A” Property Map is included in the ALP set. This map depicts the boundaries of existing airport property, as determined by previous survey efforts not included in this study, as well as property to be acquired for the airport development plan.

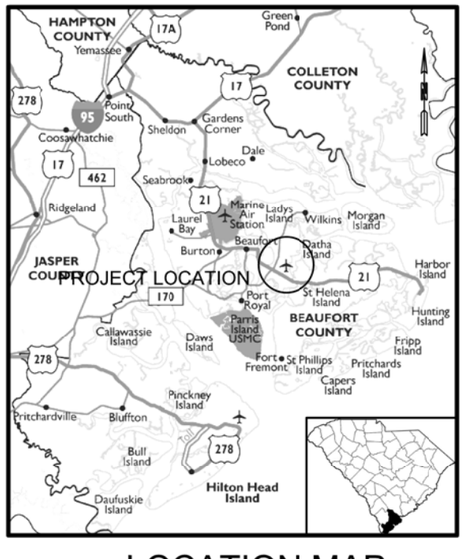
BEAUFORT COUNTY AIRPORT
LADY'S ISLAND, SOUTH CAROLINA

AIRPORT LAYOUT PLAN

PREPARED FOR

BEAUFORT COUNTY

INDEX



LOCATION MAP

NTS

PREPARED BY
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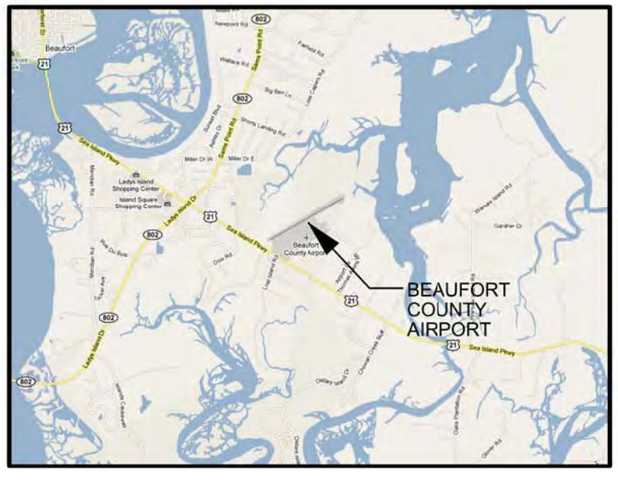

VICINITY MAP

NTS

PROJECT NO. (WSA)	DATE	NO. 1 OF 09
102590	JAN 2011	

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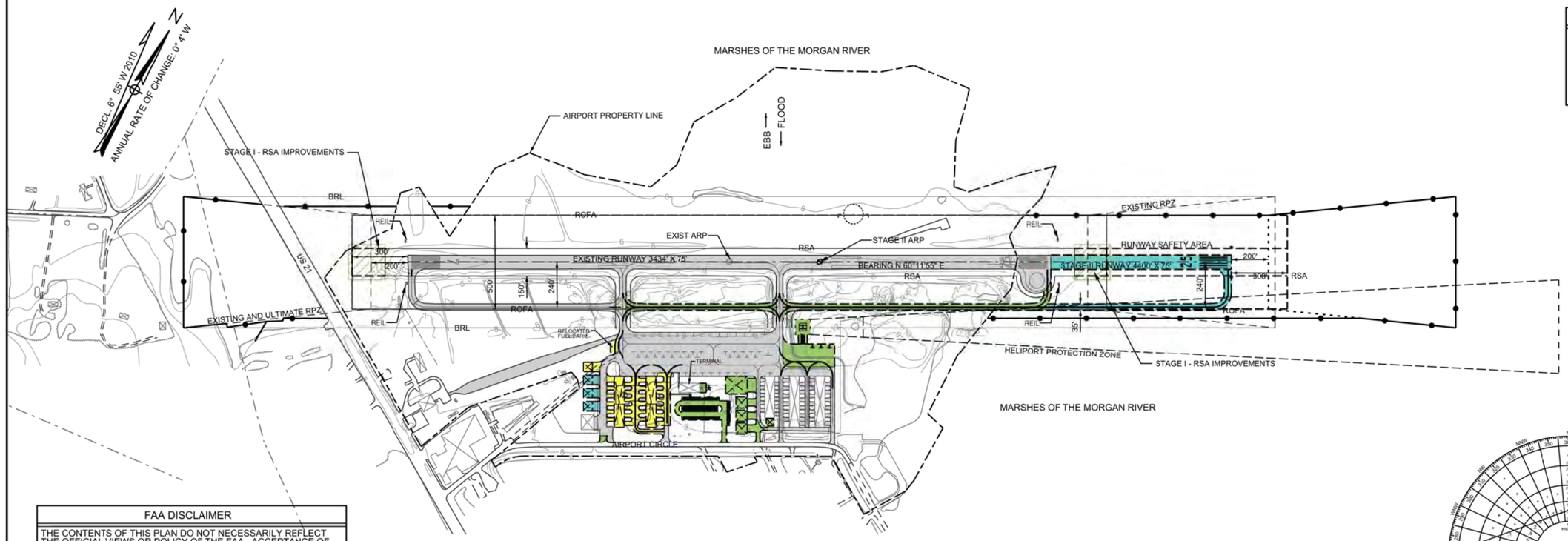


CONSTRUCTION NOTICE REQUIREMENT

To protect operational safety and future development, all proposed construction on the airport must be coordinated by the airport owner with the FAA Airports District Office prior to construction. FAA's review takes approximately 60 days.

FAA DISCLAIMER

THE CONTENTS OF THIS PLAN DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES OR THE STATE OF SOUTH CAROLINA TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

NOTES:

PROPERTY BOUNDARIES OBTAINED FROM R.D. TROGDON SURVEY OF BEAUFORT COUNTY AIRPORT FOR THE BEAUFORT COUNTY COUNCIL. SEE EXHIBIT A.

ALL LEASES OF LAND FOR NON-AERONAUTICAL USES MUST BE COORDINATED WITH THE FEDERAL AVIATION ADMINISTRATION.

TAXIWAY DISTANCES	
	DISTANCE
TO RUNWAY CENTERLINE	240'
TO AIRCRAFT PARKING	135'
TO PARALLEL TAXIWAYS	N/A

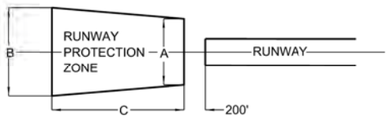
DEVELOPMENT STAGES

EXISTING PAVEMENT	STAGE ONE 0-5 YEARS	STAGE TWO 6-10 YEARS	STAGE THREE 11-20 YEARS

LEGEND

DESCRIPTION	EXISTING	ULTIMATE
GROUND CONTOURS		N/A
AIRPORT PROPERTY LINES		
BUILDINGS (NON-AIRPORT)		SAME
BUILDINGS (AIRPORT)		
RUNWAY PROTECTION ZONE (RPZ)		
RUNWAY END IDENTIFICATION LIGHT (REIL)		
ROTATING BEACON		
TREE LINE		N/A
FENCE LINE		N/A
PAVED ROAD		
AIRPORT REFERENCE POINT (ARP)		
RUNWAY SAFETY AREA AND OBJECT FREE AREA		

RUNWAY ELEVATIONS (MSL)				
	EXISTING ELEVATION DATA		ULTIMATE ELEVATION DATA	
RUNWAY END	R/W 07	R/W 25	R/W 07	R/W 25
DISPLACED THRESHOLD	N/A	N/A	N/A	N/A
R/W INTERSECTION	N/A	N/A	N/A	N/A
R/W HIGH AND LOW POINTS	10.1'/8.0'	9.3'/8.0'	10.1'/8.0'	9.3'/8.9'
TOUCHDOWN ZONE ELEV.	10.1'	9.3	10.1'	9.3'

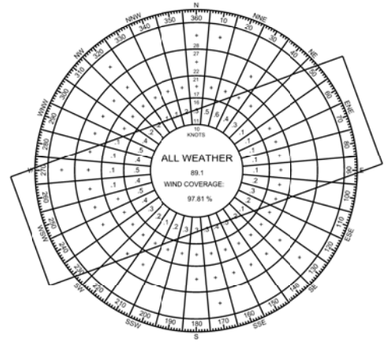


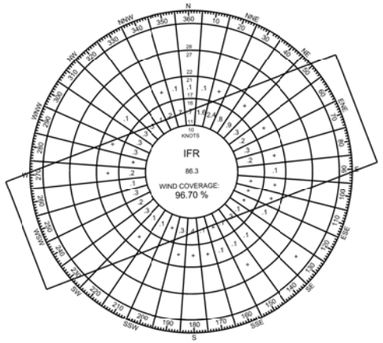
RUNWAY PROTECTION ZONE DATA								
RUNWAY END	APPROACH SLOPE		EXISTING RPZ DIMENSIONS			ULTIMATE RPZ DIMENSIONS		
	EXISTING	ULTIMATE	A	B	C	A	B	C
RUNWAY 7	34:1	34:1	500'	700'	1,000'	SAME	SAME	SAME
RUNWAY 25	34:1	34:1	500'	700'	1,000'	SAME	SAME	SAME

RUNWAY END DATA						
RUNWAY END	EXISTING END DATA			ULTIMATE END DATA		
	ELEVATION	LATITUDE	LONGITUTDE	ELEVATION	LATITUDE	LONGITUTDE
RUNWAY 7	10.1'	32°24'35" N	80°38'21" W	SAME	SAME	SAME
RUNWAY 25	8.3'	32°24'52" N	80°37'46" W	7.77'	32°24'57" N	80°37'37"W

RUNWAY DATA				
	RUNWAY 07-25			
	EXISTING		ULTIMATE	
% EFFECTIVE GRADIENT	0.10%		0.10%	
% WIND COVERAGE - 13 KNOTS (ALL WEATHER)	97.81%		97.81%	
MAXIMUM ELEVATION ABOVE MSL	10'		10'	
RUNWAY LENGTH	3,434'		4,400'	
RUNWAY WIDTH	75'		75'	
RUNWAY SURFACE TYPE	ASPHALT		ASPHALT	
RUNWAY STRENGTH	50,000 LBS DWG		50,000 LBS DWG	
RUNWAY	07	25	07	25
PART 77 APPROACH CATEGORY	NON-PRECISION	NON-PRECISION	NON-PRECISION	NON-PRECISION
APPROACH VISIBILITY MINIMUMS	1 MILE	1 MILE	1 MILE	1 MILE
TYPE INSTRUMENT APPROACH	RNAV/LNAV	RNAV/LNAV/LPV	RNAV/LNAV	RNAV/LNAV/LPV
APPROACH SLOPE	34:1	34:1	34:1	34:1
RUNWAY LIGHTING	MIRL	MIRL	MIRL	MIRL
RUNWAY MARKING	NON-PRECISION	NON-PRECISION	NON-PRECISION	NON-PRECISION
NAVAIDS & VISUAL AIDS	REIL/PAPI	REIL/PAPI	REIL/PAPI	REIL/PAPI
RUNWAY SAFETY AREA	3,689'X150'	3,689'X150'	5,000'X150'	5,000'X150'
RUNWAY OBJECT FREE AREA	4,034'X500'	4,034'X500'	5,000'X500'	5,000'X500'
DECLARED DISTANCES	N/A	N/A	N/A	N/A

AIRPORT DATA		
SPONSOR	BEAUFORT COUNTY	
CITY	CITY OF BEAUFORT	
COUNTY	BEAUFORT	
STATE	SOUTH CAROLINA	
AIRPORT IDENTIFIER	KARW	
GPS AT AIRPORT	RWY 25 / RWY 7	
MEAN MAXIMUM TEMPERATURE	90° F	
	EXISTING	ULTIMATE
AIRPORT REFERNECE POINT (ARP) DATA (NAD 83) LAT.	32°24'43.74" N	32°24'46.12" N
LONG.	80°38'03.76" W	80°37'58.88" W
AIRPORT & TERMINAL NAVAIDS	LPV, BEACON, AWOS III P/T	LPV, BEACON, AWOS III P/T
AIRPORT REFERENCE CODE(ARC)	B-II	B-II
DESIGN AIRCRAFT	BEECH KING AIR	BEECH KING AIR





WIND DATA SOURCE:

BEAUFORT MCAS, SC PERIOD: 1998 - 2008
WEATHER BASED ON 72,867 OBSERVATIONS

WIND COVERAGE (13 KNOTS)			
	RUNWAY 07	RUNWAY 25	TOTAL
ALL WEATHER	59.63%	58.01%	97.81%
IFR	76.08%	29.20%	96.70%

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WilburSmith ASSOCIATES

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BEAUFORT COUNTY
LADY'S ISLAND, SC

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AIRPORT LAYOUT PLAN

02

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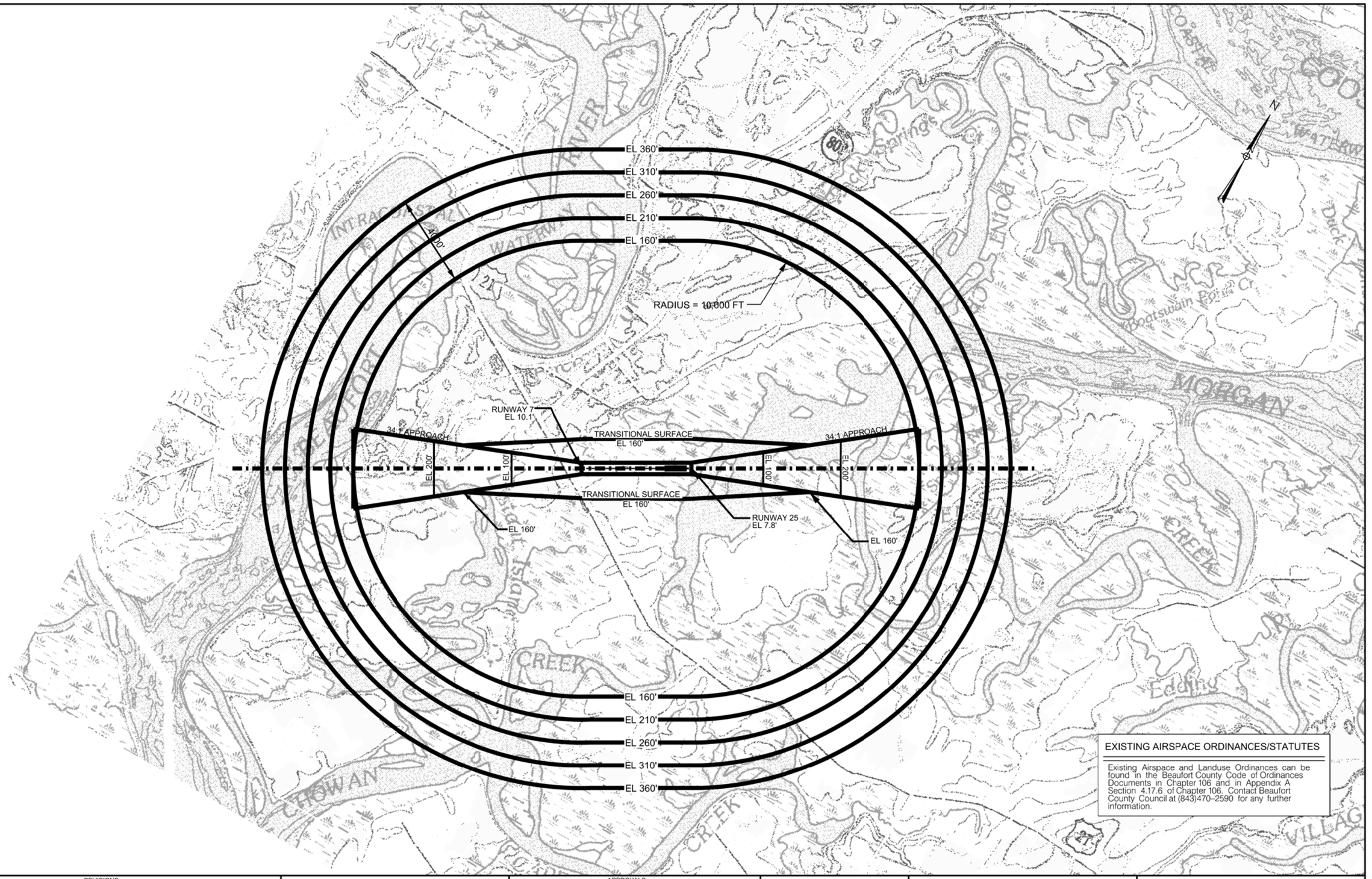

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AIRSPACE PLAN PART 77

03

5/25/2011 3:23:49 PM 03_AIRSPACE.DGN

RUNWAY 7 APPROACH TABLE

TYPE OF APPROACH: NPI — APPROACH SLOPE: 34:1

OBSTRUCTION DATA - SINGLE OBSTRUCTIONS

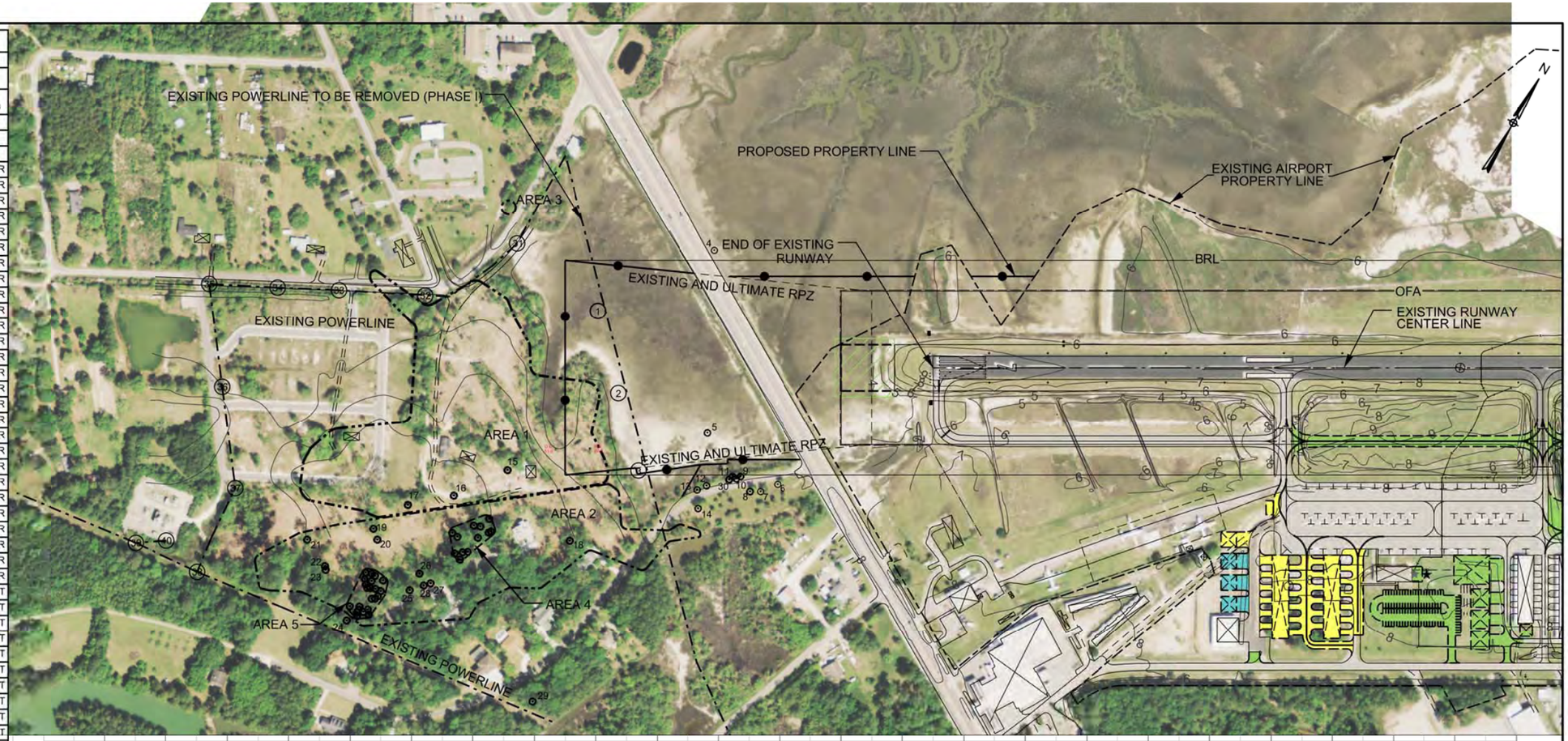
OBST. NO.	DESCRIPTION	ELEV.	PENETRATION (SURFACE*)	PROPOSED DISPOSITION
1	OVERHEAD ELECTRIC LINE	40.8'	5.6' A	BURIAL
2	OVERHEAD ELECTRIC LINE	40.8'	7.6' A	BURIAL
3	OVERHEAD ELECTRIC LINE	41.5'	10.2' A	BURIAL
4	TREE	51.0'	0.5' T	TRIM/CLEAR
5	TREE	51.3'	8.8' A	TRIM/CLEAR
6	TREE	30.2'	0.5' T	TRIM/CLEAR
7	TREE	38.4'	4.6' T	TRIM/CLEAR
8	TREE	44.7'	10.6' T	TRIM/CLEAR
9	TREE	39.7'	12.2' T	TRIM/CLEAR
10	TREE	37.7'	9.0' T	TRIM/CLEAR
11	TREE	46.4'	18.6'	TRIM/CLEAR
12	TREE	41.1'	8.5' T	TRIM/CLEAR
13	TREE	40.7'	5.9' T	TRIM/CLEAR
14	TREE	50.9'	7.4' T	TRIM/CLEAR
15	TREE	63.6'	20.0' A	TRIM/CLEAR
16	TREE	72.0'	23.2' A	TRIM/CLEAR
17	TREE	75.9'	22.8' A	TRIM/CLEAR
18	TREE	81.9'	20.0' T	TRIM/CLEAR
19	TREE	99.7'	38.1' T	TRIM/CLEAR
20	TREE	86.5'	20.8' T	TRIM/CLEAR
21	TREE	90.8'	22.3' T	TRIM/CLEAR
22	TREE	105.3'	25.1' T	TRIM/CLEAR
23	TREE	107.4'	25.3' T	TRIM/CLEAR
24	TREE	135.6'	30.6' T	TRIM/CLEAR
25	TREE	109.4'	20.2' T	TRIM/CLEAR
26	TREE	99.7'	21.8' T	TRIM/CLEAR
27	TREE	104.6'	35.8' T	TRIM/CLEAR
28	TREE	105.3'	24.8' T	TRIM/CLEAR
29	TREE	112.4'	13.7' T	TRIM/CLEAR
30	TREE	50.5'	21.3' T	TRIM/CLEAR
31	OVERHEAD ELECTRIC LINE	77.9'	34.4' A	MARK/LIGHT
32	OVERHEAD ELECTRIC LINE	71.6'	19.8' A	MARK/LIGHT
33	OVERHEAD ELECTRIC LINE	72.3'	11.7' A	MARK/LIGHT
34	OVERHEAD ELECTRIC LINE	72.8'	6.4' A	MARK/LIGHT
35	OVERHEAD ELECTRIC LINE	86.8'	13.9' A	MARK/LIGHT
36	OVERHEAD ELECTRIC LINE	76.7'	5.0' A	MARK/LIGHT
37	OVERHEAD ELECTRIC LINE	79.6'	9.2' A	MARK/LIGHT
38	OVERHEAD ELECTRIC LINE	94.7'	5.6' A	MARK/LIGHT
39	OVERHEAD ELECTRIC LINE	110.4'	30.5' A	MARK/LIGHT
40	OVERHEAD ELECTRIC LINE	88.3'	11.4' A	MARK/LIGHT

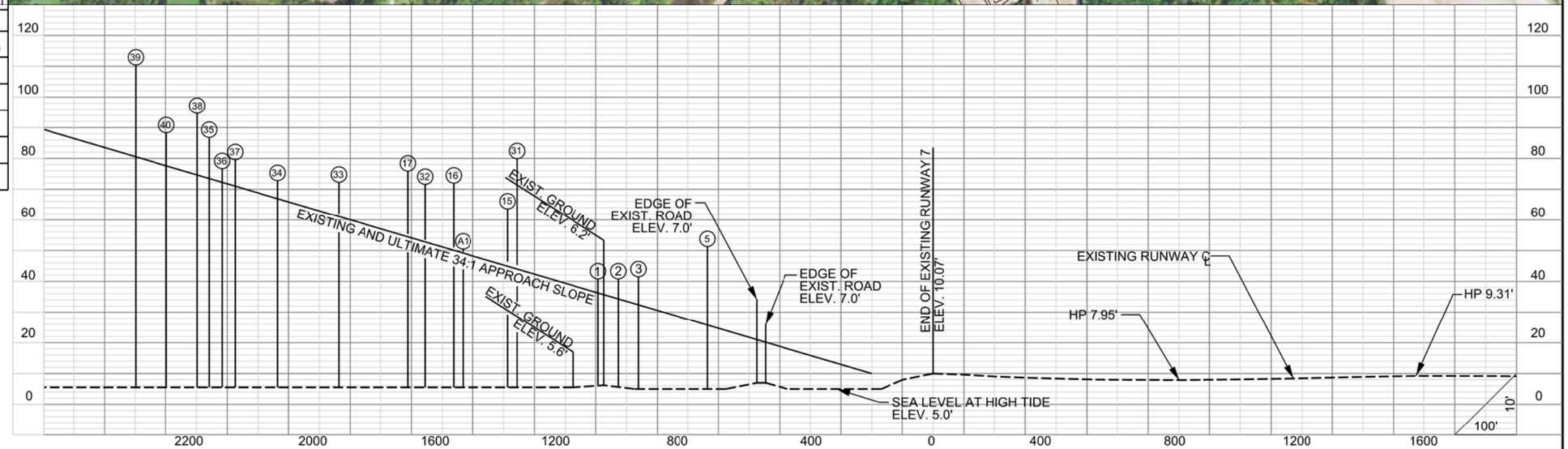
OBSTRUCTION DATA - AREAS OF DENSE OBSTRUCTIONS

AREA NO.	DESCRIPTION	# OF OBSTR.	AVERAGE ELEVATION	AVERAGE PENETRATION	PROPOSED DISPOSITION
1	TREES PENETRATING APPROACH SURFACE BETWEEN 0 FT - 20 FT**	160	50.5'	5.4'	TRIM/ CLEAR
2	TREES PENETRATING TRANSITIONAL SURFACE BETWEEN 0 FT - 20 FT**	170	80.6'	8.0'	TRIM/ CLEAR
3	TREES PENETRATING TRANSITIONAL SURFACE BETWEEN 0 FT - 20 FT**	3	58.4'	0.8'	TRIM/ CLEAR
4	TREES PENETRATING TRANSITIONAL SURFACE OVER 20 FT	12	91.8'	30.1'	TRIM/ CLEAR
5	TREES PENETRATING TRANSITIONAL SURFACE OVER 20 FT	25	119.9'	27.5'	TRIM/ CLEAR

* AN 'A' NEXT TO THE PENETRATION VALUE MEANS OBSTRUCTION IS PENTRATING THE APPROACH SURFACE. THESE PENETRATIONS ARE ILLUSTRATED IN THE PROFILE VIEW. A 'T' NEXT TO THE PENETRATION VALUE MEANS OBSTRUCTION IS PENTRATING THE TRANSITIONAL SURFACE.

** NUMBER OF OBSTRUCTIONS, AVERAGE HEIGHT, AND AVERAGE PENETRATION VALUES DO NOT INCLUDE THE INDIVIDUALLY LABELED OBSTRUCTIONS OR THOSE CONTAINED IN AREAS 4 AND 5.





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BEAUFORT COUNTY
LADY'S ISLAND, SC

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INNER APPROACH SURFACE
RUNWAY 7

NO. 04

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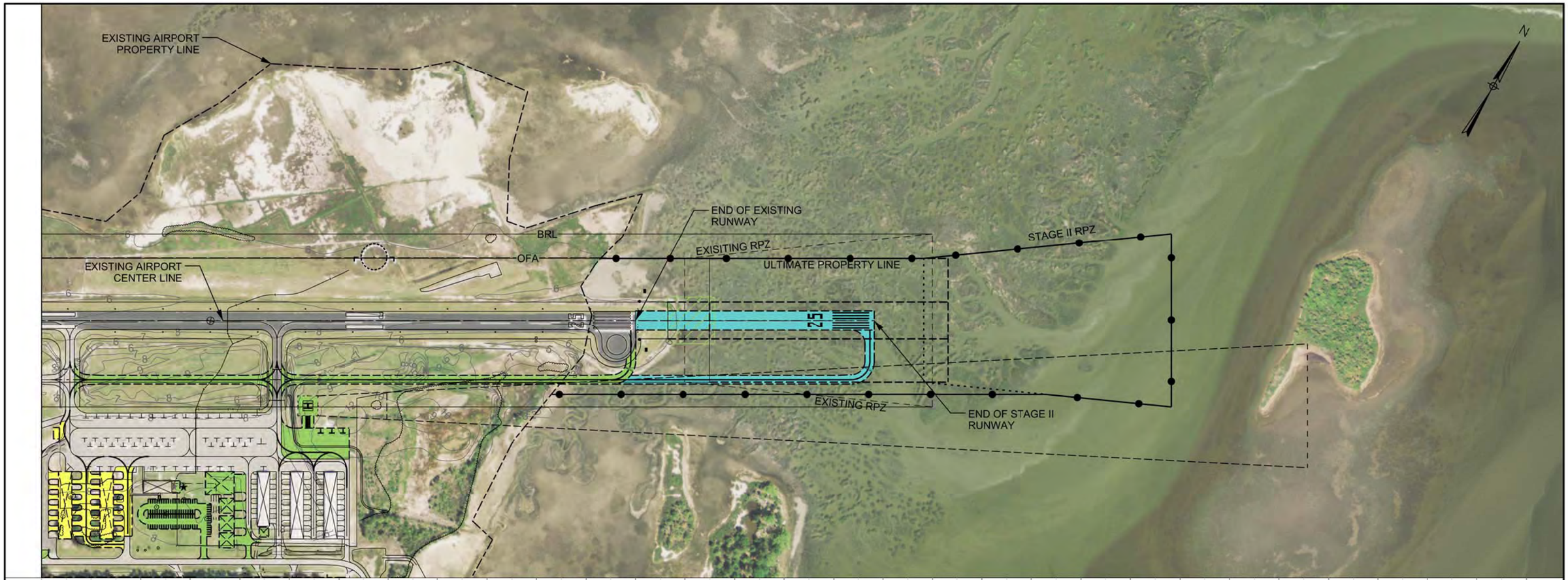
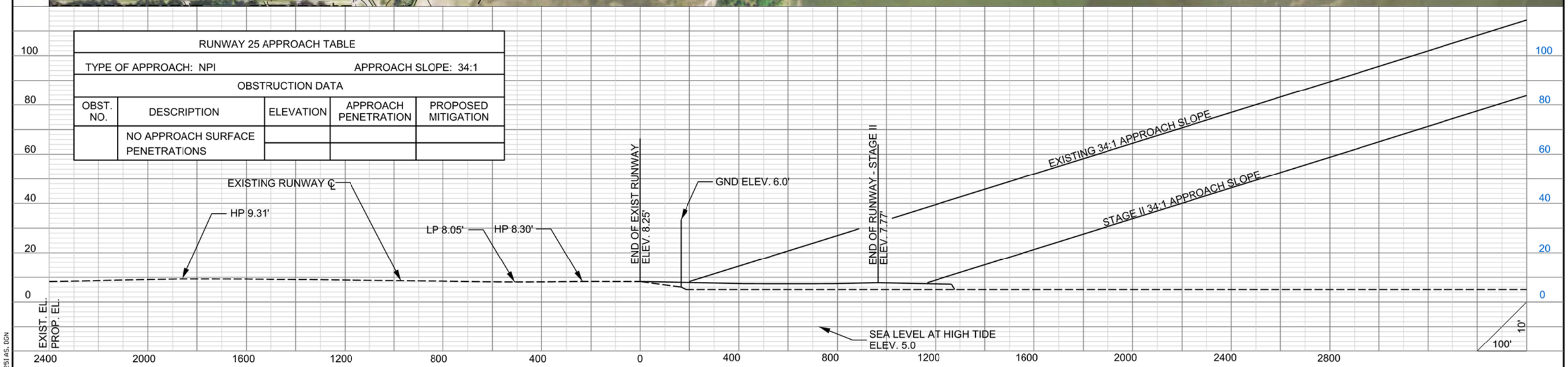


RUNWAY 25 APPROACH TABLE				
TYPE OF APPROACH: NPI			APPROACH SLOPE: 34:1	
OBSTRUCTION DATA				
OBST. NO.	DESCRIPTION	ELEVATION	APPROACH PENETRATION	PROPOSED MITIGATION
	NO APPROACH SURFACE PENETRATIONS			



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INNER APPROACH SURFACE
RUNWAY 25

05

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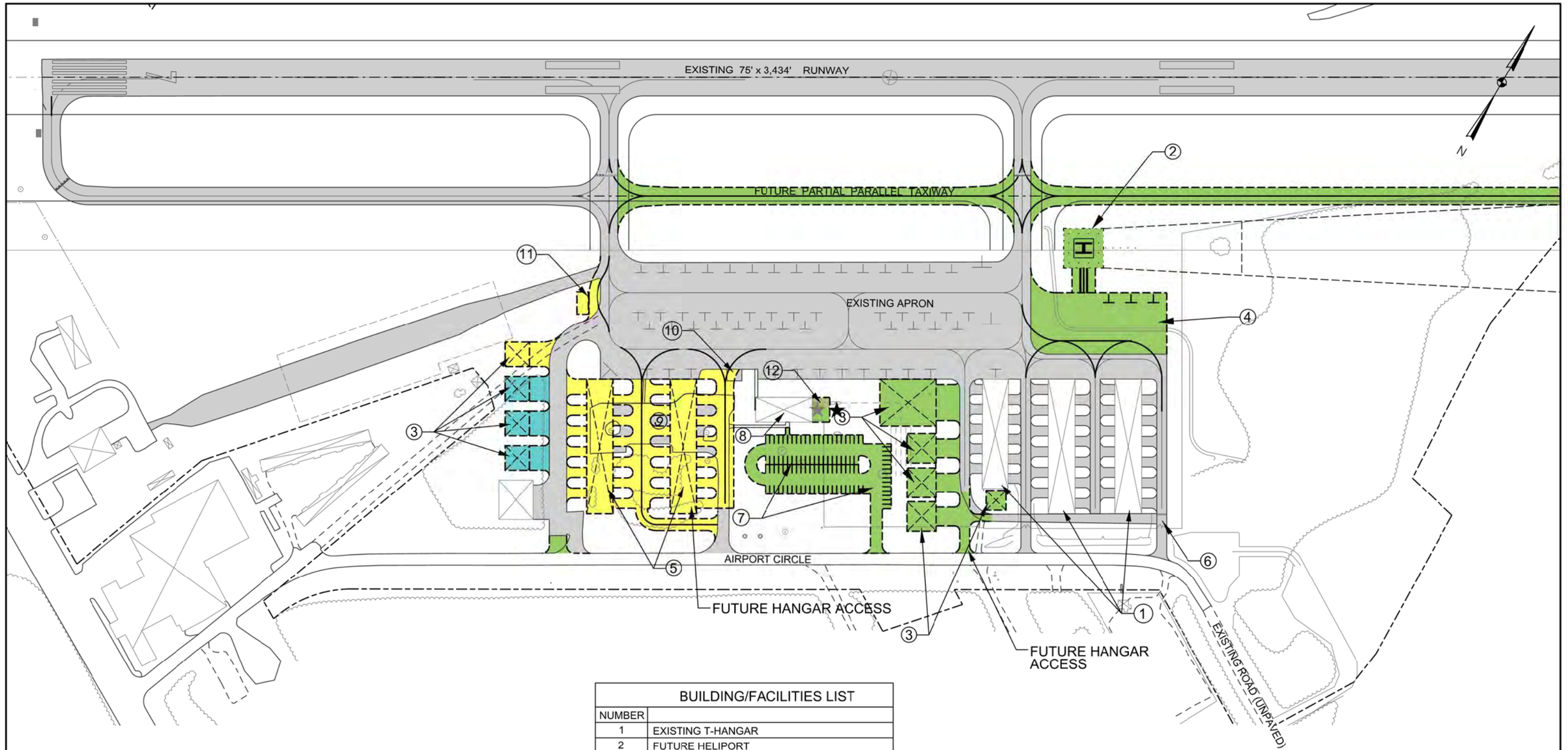

BUILDING/FACILITIES LIST	
NUMBER	
1	EXISTING T-HANGAR
2	FUTURE HELIPORT
3	FUTURE MAINTENANCE/STORAGE HANGARS
4	FUTURE APRON
5	FUTURE 12 UNIT T-HANGARS
6	EXISTING AUTO AND FUEL TRUCK ACCESS
7	FUTURE AUTO PARKING
8	EXISTING TERMINAL BUILDING
9	EXISTING AUTO PARKING
10	EXISTING FUEL FARM
11	RELOCATED FUEL FARM
12	1,750-FT TERMINAL EXPANSION

STAGING LEGEND		
STAGE ONE 0-5 YEARS	STAGE TWO 6-10 YEARS	STAGE THREE 11-20 YEARS

LEGEND	
EXISTING BUILDINGS	ULTIMATE BUILDINGS
EXISTING PAVEMENT	

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TERMINAL AREA DEVELOPMENT

06

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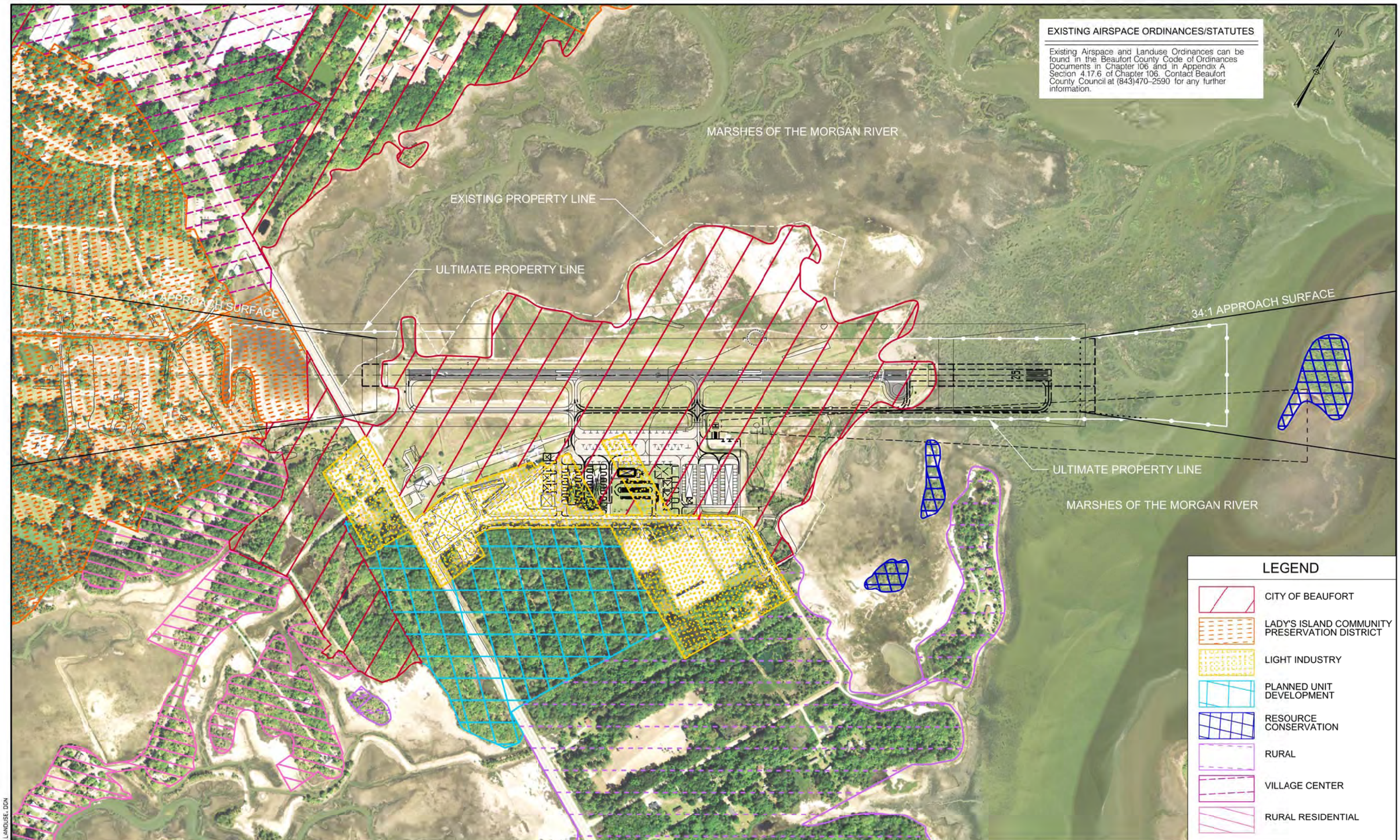

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BEAUFORT COUNTY
LADY'S ISLAND, SC

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102590

LAND USE MAP

07

MARSHES OF THE MORGAN RIVER

APPROXIMATE FLOOD LINE
ZONE AE8 (MIN EL. 12.0')
ZONE AE9 (MIN EL. 12.0')

25

MARSHES OF THE MORGAN RIVER

LEGEND

	PROPOSED HANGAR BUILDING
	INDICATES OCRM CRITICAL AREAS
	INDICATES FRESHWATER WETLAND
	INDICATES ISOLATED FRESHWATER WETLAND AREAS

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BEAUFORT COUNTY
LADY'S ISLAND, SC

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PROJECT NO. (WSA) 102590

WETLANDS LAYOUT PLAN

08

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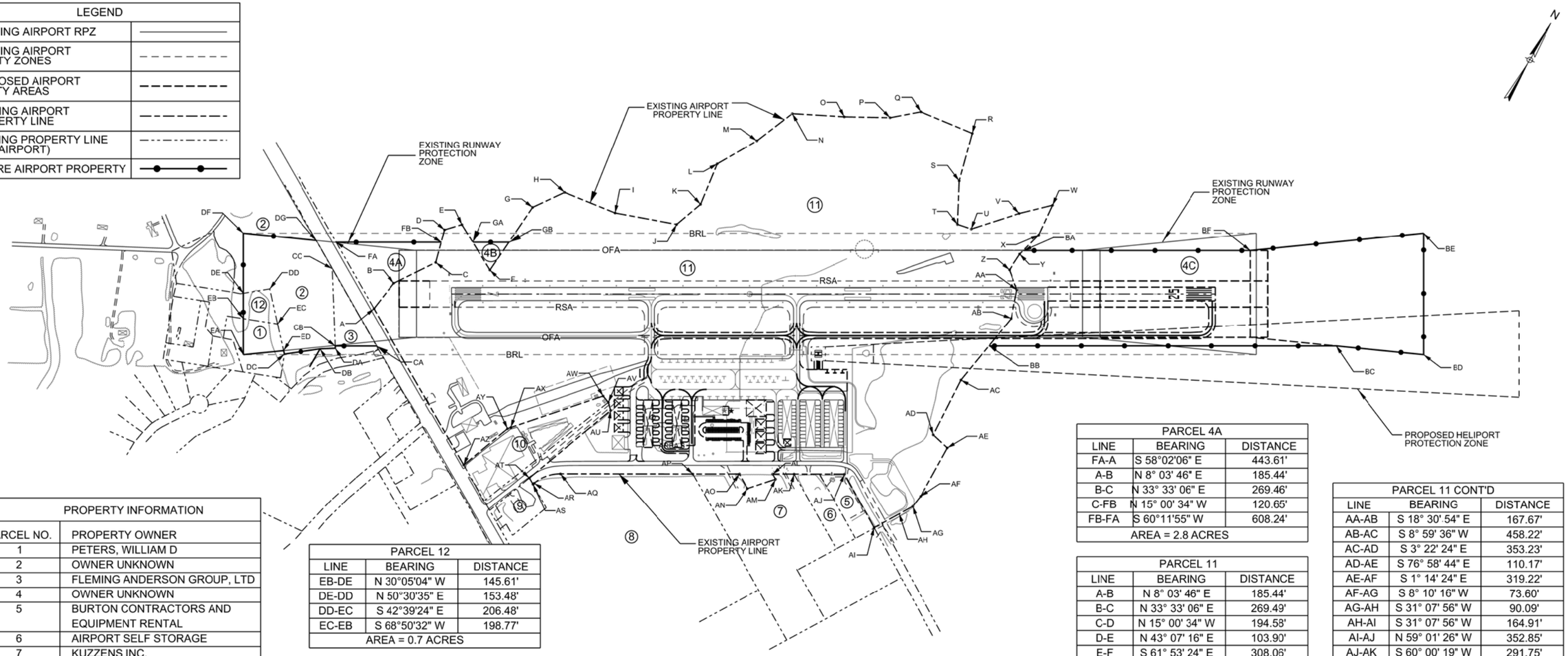
LEGEND	
EXISTING AIRPORT RPZ	
EXISTING AIRPORT SAFETY ZONES	
PROPOSED AIRPORT SAFETY AREAS	
EXISTING AIRPORT PROPERTY LINE	
EXISTING PROPERTY LINE (NON-AIRPORT)	
FUTURE AIRPORT PROPERTY	



PROPERTY INFORMATION	
PARCEL NO.	PROPERTY OWNER
1	PETERS, WILLIAM D
2	OWNER UNKNOWN
3	FLEMING ANDERSON GROUP, LTD
4	OWNER UNKNOWN
5	BURTON CONTRACTORS AND EQUIPMENT RENTAL
6	AIRPORT SELF STORAGE
7	KUZZENS INC.
8	AIRPORT JUNCTION, LLC
9	COUNTY COUNCIL OF BEAUFORT COUNTY
10	KUZZENS INC
11	BEAUFORT COUNTY
12	INLET FARM LLC

PARCEL 12		
LINE	BEARING	DISTANCE
EB-DE	N 30°05'04" W	145.61'
DE-DD	N 50°30'35" E	153.48'
DD-EC	S 42°39'24" E	206.48'
EC-EB	S 68°50'32" W	198.77'
AREA = 0.7 ACRES		

PARCEL 1		
LINE	BEARING	DISTANCE
EA-EB	N 30°05'04" W	208.52'
EB-EC	N 68°50'32" E	198.77'
EC-ED	S 42°39'24" E	158.40'
ED-EA	S 54°12'18" W3	231.99'
AREA = 0.9 ACRES		

ACQUISITION DATA				
TRACT NO.	ACRES	INTEREST	FEDERAL PROJECT NO.	DATE ACQUIRED
1	0.9			FUTURE
2	6.1			FUTURE
3	1.2			FUTURE
4A	2.8			FUTURE
4B	0.4			FUTURE
4C	31.5			FUTURE
11	126.2		EXISTING AIRPORT PROPERTY	
12	0.7			FUTURE

PARCEL 2		
LINE	BEARING	DISTANCE
CC-DA	N 60°11'55" E	459.50'
DA-DB	S 51°32'48" W	87.79'
DB-DC	S 57°58'45" W	210.09'
DC-DD	N 42°39'24" W	385.32'
DD-DE	S 50°30'35" W	153.48'
DE-DF	N 30°05'04" W	345.86'
DF-DG	N 60°11'55" E	422.18'
DG-CC	S 59°53'34" E	186.77'
AREA = 6.1 ACRES		

PARCEL 3		
LINE	BEARING	DISTANCE
CA-CB	S 60°11'55" W	238.04'
CB-CC	N 32°12'11" W	446.26'
CC-CA	S 59°55'14" E	513.92'
AREA = 1.2 ACRES		

PARCEL 4B		
LINE	BEARING	DISTANCE
GA-F	S 61° 53' 24" E	188.74'
F-GB	N 4° 04' 36" E	193.84'
GB-GA	S 60°11'55" W	208.32'
AREA = 0.4 ACRES		

PARCEL 4C		
LINE	BEARING	DISTANCE
BA-Y	S 14° 46' 06" W	28.76'
Y-Z	S 3° 29' 46" W	109.46'
Z-AA	S 51° 09' 54" E	122.82'
AA-AB	S 18° 30' 54" E	167.67'
AB-BB	S 8° 59' 36" W	204.89'
BB-BC	N 60°11'55" E	1999.84'
BC-BD	N 65°37'34" E	507.50'
BD-BE	N 30°05'04" W	700.0'
BE-BF	S 54°12'18" W	1005.0'
BF-BA	S 60°11'55" W	1305.39'
AREA = 31.5 ACRES		

PARCEL 4A		
LINE	BEARING	DISTANCE
FA-A	S 58°02'06" E	443.61'
A-B	N 8° 03' 46" E	185.44'
B-C	N 33° 33' 06" E	269.46'
C-FB	N 15° 00' 34" W	120.65'
FB-FA	S 60°11'55" W	608.24'
AREA = 2.8 ACRES		

PARCEL 11		
LINE	BEARING	DISTANCE
A-B	N 8° 03' 46" E	185.44'
B-C	N 33° 33' 06" E	269.49'
C-D	N 15° 00' 34" W	194.58'
D-E	N 43° 07' 16" E	103.90'
E-F	S 61° 53' 24" E	308.06'
F-G	N 4° 04' 36" E	436.37'
G-H	N 34° 48' 16" E	203.11'
H-I	N 82° 04' 16" E	314.05'
I-J	N 70° 24' 56" E	360.95'
J-K	N 19° 49' 16" E	179.30'
K-L	N 7° 44' 44" W	251.38'
L-M	N 29° 52' 56" E	264.61'
M-N	N 22° 18' 16" E	256.65'
N-O	N 63° 24' 36" E	300.94'
O-P	N 61° 01' 56" E	264.48'
P-Q	N 49° 08' 26" E	180.77'
Q-R	N 82° 33' 56" E	321.41'
R-S	S 14° 40' 54" E	283.58'
S-T	S 27° 52' 24" E	250.04'
T-U	N 78° 39' 16" E	83.51'
U-V	N 42° 01' 06" E	290.62'
V-W	N 45° 59' 36" E	197.42'
W-X	S 5° 16' 34" E	189.02'
X-Y	S 14° 46' 06" W	154.90'
Y-Z	S 3° 29' 46" W	109.46'
Z-AA	S 51° 09' 54" E	122.82'

PARCEL 11 CONT'D		
LINE	BEARING	DISTANCE
AA-AB	S 18° 30' 54" E	167.67'
AB-AC	S 8° 59' 36" W	458.22'
AC-AD	S 3° 22' 24" E	353.23'
AD-AE	S 76° 58' 44" E	110.17'
AE-AF	S 1° 14' 24" E	319.22'
AF-AG	S 8° 10' 16" W	73.60'
AG-AH	S 31° 07' 56" W	90.09'
AH-AI	S 31° 07' 56" W	164.91'
AI-AJ	N 59° 01' 26" W	352.85'
AJ-AK	S 60° 00' 19" W	291.75'
AK-AL	S 60° 02' 57" W	122.86'
AL-AM	S 58° 55' 32" E	34.34'
AM-AN	S 41° 28' 31" W	170.75'
AN-AO	N 59° 00' 43" W	96.42'
AO-AP	S 59° 51' 16" W	267.23'
AP-AQ	S 60° 00' 19" W	763.46'
AQ-AR	Δ = 39°51'51" LT	
	L = 163.50'	
	CH. L = 160.23'	
	CH. B = S 41°56'28" W	
	R = 235.00'	
AR-AS	S 20° 08' 28" W	8.45'
AS-AT	N 59° 55' 28" W	41.17'
AT-AU	N 20° 10' 22" E	608.51'
AU-AV	N 45° 51' 04" W	48.58'
AV-AW	N 69° 33' 34" W	47.04'
AW-AX	S 41° 05' 26" W	561.30'
AX-AY	S 40° 13' 52" W	20.19'
AY-AZ	S 20° 19' 56" W	328.27'
AZ-A	N 59° 53' 34" W	1,038.96'
AREA = 126.2 ACRES		

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BEAUFORT COUNTY
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PROJECT NO. (CLIENT)
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EXHIBIT 'A'
PROPERTY MAP

09

6/1/2011 4:16:53 PM Ø9_EXHIBIT A.DGN

Chapter

7

Capital Improvement Program/Financial Plan

This section details the various projects required for the continued improvement and operation of Beaufort County Airport throughout the Master Plan's 20-year planning period. These projects, by phase (time period), described herein include estimates of probable project costs in constant 2011 dollars. These planning cost estimates are intended to illustrate the relative order of magnitude and will undoubtedly vary somewhat. More detailed project definitions and associated estimates must be developed prior to the implementation of any project identified below.

The 20-year Capital Improvement Program (CIP) is broken down into the following three development phases:

Phase I:	Short–Term (first five years)
Phase II:	Intermediate-Term (second five years)
Phase III:	Long-Term (last 10 years)

7.1 Funding Sources

Defining funding sources and eligibility criteria are crucial to the planning process and the first step in the implementation of a capital improvement program.

FAA Funding

To promote the development of airports to meet the nation's needs, the Federal Government embarked on a Grants-In-Aid Program to units of State and local government after the end of World War II. This early program, the Federal Aid Airport Program (FAAP), was authorized by the Federal Treasury Act of 1946 and provided its funding from the Treasury.

In 1970, a comprehensive program was established with the Airport and Airway Development Act of 1970. This Act provided grants for airport planning under the Planning Grant Program (PGP) and development under the Airport Development Aid Program (ADAP). These programs were funded from a newly established Airport and Airway Trust Fund, which received funds from taxes on airline tickets, air freight, and aviation fuel.

The authority to issue grants under these two programs expired on September 30, 1981. During this 11-year period (1970-1981), a total of 8,809 grants were awarded for a total of $4.5 billion for airport planning and development.

The Airport Improvement Program (AIP) was established by the Airport and Airway Improvement Act of 1982. The initial AIP provided funding legislation through fiscal year 1992. Since then, the AIP has been authorized and appropriated on a yearly basis. Funding for this program is generated from a tax on airline tickets, freight waybills, international departure fees, a tax on general aviation fuel, and a tax on aviation jet fuel.

The FAA issues and administers AIP grants through its regional offices and airport district offices. The AIP provides up to 95 percent funding for AIP eligible project costs, with the State and local sponsors splitting the remaining 5 percent non-federal share.

AIP funding must be spent on FAA eligible projects as defined in FAA Order 5100.38 "Airport Improvement Program (AIP) Handbook." In general, the handbook states that:

- An airport must be in the currently approved National Plan of Integrated Airport Systems (NPIAS),
- AIP provides up to 95 percent federal funding for most eligible public-use airport improvements, and
- General aviation terminal buildings, T-hangars, and corporate hangars and other private-use facilities are not eligible for federal funding.

In addition, revenue-producing items typically are not eligible for federal funding, and all eligible projects must be depicted on an FAA-approved Airport Layout Plan. Other sources of FAA funding include Facilities and Equipment (F&E) funding for facilities such as air traffic control towers and some runway instrumentation. This funding is separate from the AIP program and typically requires no local match. Federal noise funds (Part 150 funds) may also be available for noise mitigation with an 80 percent Federal and a 20 percent State and/or local share.

State Funding

The South Carolina Aeronautics Commission (SCAC) also has a grant program for general aviation airports within the state through its Airport Development Section. The airport development section is responsible for the administration of the state aviation fund and the oversight and development of 60 public-use airports. The staff and leadership of this group work closely with the FAA

Southern Regional Office, and the FAA Atlanta Airports District Office (ADO) to administer millions of dollars of federal grants each year.

The SCAC state aviation fund, which is used to provide grants to local airports for maintenance and capital needs and to be used as matching funds for FAA grants, is funded through tax revenue generated on fuel purchases for aircraft used for pleasure at a rate of 6% of retail sales prices. During fiscal year 2009-2010, SCAC provided almost $600,000 in state grants for airport capital improvement programs.

The SCAC has published its own set of guidelines and applications for sponsors seeking SCAC funding. Since Beaufort County Airport is a federally obligated facility through its past and present acceptance of AIP funding, SCAC funds are utilized for the 2.5 percent state match.

Sponsor Funding

To achieve certain economies of scale and to enhance overall operating efficiencies, the county of Beaufort, SC owns and operates both Beaufort County Airport and Hilton Head Island Airport. An Airport Board is in place to assist the County Council of Beaufort County by providing technical, financial, business, and marketing advice that helps to ensure and promote public aviation facilities and services that are safe, economically self-sufficient, and sensitive to the needs of the community.

This system approach to management and operations provides a consistent subsidy-based revenue stream for Beaufort County Airport that augments its primary revenue sources: rental income from hangar or other tenants, fuel fees and aircraft ramp fees. The subsidies are used for both operating and capital expenses when necessary, part of which goes to pay the sponsor share of federal grant projects as well as those that are not federally funded.

Other Funding

Another potential source of funds for airport improvements is from third-party or private investors. These investors may construct needed facilities as part of a lease agreement with the Airport that will provide for an adequate time frame to amortize their investments. This type of funding is particularly suitable for corporate and T-hangar development as well as other privately owned projects. These types of projects are not typically eligible for the FAA or State funding described above.

7.2 Phasing of Proposed Development

It is essential that an airport's facilities are developed in proportion to the associated volume of aircraft activity. Therefore, a project development schedule in the form of a phasing plan was created for Beaufort County Airport based on correlating predicated based aircraft and aircraft operation levels with facility requirements. It is important that each facility be developed in a timely manner in order to reduce airport congestion, unsafe operating conditions and costly errors.

Phase I: Short-Term Development (first five years)

Projects identified in this phase are intended to improve facilities necessary to meet FAA design standards as well as to meet short-term airport activity needs with consideration given to long-term demand.

A. RSA improvements (both ends)

The Runway Safety Areas must be expanded to achieve a total dimension 150 feet by 300 feet from beyond each runway threshold. This requires a 175-foot extension to the existing RSA located near Runway 7 and a 170-foot extension of the existing RSA located near Runway 25. Meeting RSA standards is identified as a short-term project in order to maintain the existing usable runway length and avoid possible threshold relocations.

B. Improvements to offer full-length parallel taxiway to existing ends

The partial parallel taxiway will be extended approximately 2,225 feet to offer a full-length parallel taxiway to existing runway ends. In addition to pavement necessary to provide a 35-foot wide taxiway, earthwork and grading will also be part of this project to provide a full-length, 79-foot wide Taxiway Safety Area necessary to meet FAA design standards.

C. Helipad

This project consists of an 80-foot by 80-foot helipad and 40-foot long access taxiway from the apron.

D. Hangar Development

Six conventional aircraft storage/maintenance hangars of various sizes will be developed in the terminal area. Although, pavement for roadway and aircraft access to these hangars is included in this project, the hangars are positioned to take advantage of existing taxilanes as much as possible.

E. Apron Expansion

The existing aircraft apron will be expanded with a 280-foot by 120-foot addition to the east. This will allow for additional aircraft tiedowns for based and transient

aircraft, convenient access to the new helipad and additional clearance for aircraft taxiing to and from existing T-hangars.

F. Terminal Expansion

The terminal building will be expanded about 2,000 square feet in the short-term to accommodate demand throughout the 20-year period. This project also includes the refurbishment of the existing terminal building.

G. Roadway Access and Auto Parking Improvements

In support of the hangar and terminal building development described above, an improved automobile parking lot will provide needed capacity for the terminal area. An ancillary access roadway will connect the parking lot with the airport's primary entry road, Airport Circle. The parking lot will encompass about 36,000 square feet. A 100-foot long access road is also included in this project.

Phase II: Intermediate-Term Development (Years 6 – 10)

Projects identified in this phase are intended to provide facilities necessary to accommodate runway length requirements and the demands of based aircraft in the intermediate-term of the planning period.

H. 966-Foot Runway Extension with Associated RSA

The runway will be extended 966 feet at its current width to provide a total usable runway length of 4,400 feet. This project also includes the earthwork and grading necessary to construct a runway safety area to support design aircraft weight around the newly constructed runway extension.

I. Taxiway Extension to Proposed Runway Extension End

At the same time as the runway extension, the parallel taxiway will also be extended to meet the end of the runway extension.

J. Hangar Development

Three 50-foot by 50-foot conventional hangars will be developed to accommodate anticipated demand.

Phase III: Long-Term Development (Years 11 – 20)

Projects identified in this phase are intended to provide facilities necessary to accommodate the demands of based aircraft in the long-term.

K. Hangar and T-hangar Development

Two T-hangar complexes (12-unit buildings) will be constructed to accommodate the growth of based aircraft. T-hangars could be developed in earlier stages,

however, the T-hangar project is shown later to distribute the private development share of funding for projects evenly throughout the planning period as well as to develop the hangars after the runway extension, when demand will likely be greater. Hangar access pavement and taxilanes leading to the aircraft apron will also be included in this project. One 50-foot by 50-foot conventional hangar will also be constructed in this phase.

L. Relocated Fuel Farm

This project will relocate the existing fuel farm away from T-hangar development while still maintaining fueling facilities accessed from the aircraft apron.

7.3 Cost Estimates

Table 7-1 presents a summary of the proposed capital improvements over the 20-year planning period, broken down by phase. Tables 7-2 through 7-4 list each proposed improvement and show estimated rough order of magnitude project costs including environmental study/mitigation costs, professional service fees and contingencies. The estimates contained in these tables were derived from analyzing similar projects, but should be re-evaluated at the time of project initiation.

Overall, this development plan is structured to provide facilities as demand warrants. Therefore, individual projects should not be considered as single improvements, but rather as a series of projects that accrue towards the ultimate development concept. The phasing and priority of the proposed actions have been determined with respect to 1) airport safety requirements, 2) demand levels, 3) compatibility with other airport projects, 4) funding resources, and 5) SCAC/FAA programming schedules. Recommended master plan development projects provide general guidance on meeting anticipated activity levels.

Table 7-1: Summary Table

Phase	FAA Share	State Share	Sponsor Share	Private Funds	Total Cost
Phase I	$6,046,750	$159,125	$159,125	$4,800,000	$11,165,000
Phase II	$8,455,000	$222,500	$222,500	$1,950,000	$10,850,000
Phase III	$285,000	$7,500	$7,500	$1,930,000	$2,230,000
TOTAL	**$14,786,750**	**$389,125**	**$389,125**	**$8,680,000**	**$24,245,000**

Source: Wilbur Smith Associates Team
Note: All values are expressed in 2011 Dollars

The following tables depict anticipated costs for the Short-Term (Phase I), Intermediate-Term (Phase II), and Long-Term (Phase III) developments included in the Airport's CIP.

Phase I, shown in Table 7-2, contains approximately $11 million in capital projects including the RSA improvements to comply with FAA design standards, taxiway extension, apron and helipad development, hangar construction and terminal area improvements. Private sources are anticipated to fund the hangar development since these projects are not AIP or SCAC eligible and the hangars could be privately-owned. It is estimated that the private developer share of Phase I capital costs will be approximately $4.8 million and the state and sponsor shares will each be approximately $160,000. Over half of the costs identified in Phase I are eligible for FAA grant funding.

Table 7-2: Phase I (0 – 5 Years)

Project	FAA Eligible	State Share	Sponsor Share	Private Sources	Total
A. RSA Improvements (both ends)	$3,771,500	$99,250	$99,250		$3,970,000
B. Taxiway Extension (2,225' x 35)	$779,000	$20,500	$20,500		$820,000
C. Helipad	$71,250	$1,875	$1,875		$75,000
D. Hangar Development				$4,800,000	$4,800,000
E. Apron Expansion	$475,000	$12,500	$12,500		$500,000
F. Terminal Expansion	$237,500	$6,250	$6,250		$250,000
G. Road/Parking Improvements	$712,500	$18,750	$18,750		$750,000
TOTAL PHASE I	**$6,046,750**	**$159,125**	**$159,125**	**$4,800,000**	**$11,165,000**

Source: Wilbur Smith Associates
Notes: All Values are expressed in 2011 Dollars

Phase II contains approximately $10.9 million in total capital projects, as shown in Table 7-3. These projects include the runway and the associated taxiway extension as well as conventional hangar development which would be paid for by private funds exclusively. The state and sponsor shares of the proposed runway and taxiway extensions identified in Phase II are equal at $222,500.

Table 7-3: Phase II (6 – 10 Years)

Project	FAA Eligible	State Share	Sponsor Share	Private Sources	Total
H. Runway Extension (966' x 75')	$ 5,343,750	$140,625	$140,625		$5,625,000
I. Taxiway Extension (1,206' x 35')	$3,111,250	$81,875	$81,875		$3,275,000
J. Hangar Development				$1,950,000	$1,950,000
TOTAL PHASE II	**$8,455,000**	**$222,500**	**$222,500**	**$1,950,000**	**$10,850,000**

Source: Wilbur Smith Associates
Notes: All Values are expressed in 2011 Dollars

Table 7-4 lists the Phase III projects that include additional T-hangar and conventional hangar development and relocation of the fuel farm. It is anticipated that all hangar development within this phase will be funded through private sources and leased to prospective tenants. Phase III capital costs are estimated at over $2 million.

Table 7-4: Phase III (11 – 20 Years)

Project	FAA Eligible	State Share	Sponsor Share	Private Sources	Total
K. Hangar Development				$1,930,000	$1,930,000
L. Fuel Farm Relocation	$285,000	$7,500	$7,500		$300,000
TOTAL PHASE III	**$285,000**	**$7,500**	**$7,500**	**$1,930,000**	**$2,230,000**

Source: Wilbur Smith Associates
Notes: All Values are expressed in 2011 Dollars

When combined, the 20-year CIP for projects identified in this master plan represents over $24.2 million in development projects. Approximately 60 percent of the total is eligible for federal participation and the remaining share will be funded through state grants, Airport funds, or private sources.

7.4 Airport Finances

The relationship between Airport operating revenues and operating expenditures at Beaufort County Airport is one representation of the overall financial condition of the Airport. The comparison of operating revenues and expenditures can identify, from a cash-flow perspective, whether the revenues generated at the Airport are sufficient to cover the facility's operating costs. It is important to remember that the revenue and expense comparison provides an important, but narrow, view of the financial and economic implications of the Airport. This financial data must also be evaluated in the context of other economic benefits and tax revenues that are accrued as a result of Airport operations.

In general, where operating revenues are greater than operating expenditures, an airport can be considered profitable, and excess revenues are often used to establish airport reserve funds and/or help fund airport capital development. Where operating revenues are less than operating expenses, an airport experiences a net operating loss and requires some form of subsidy to meet operating requirements. In many cases, the operating loss of a general aviation airport can be maintained at a reasonable level if the public sponsor is willing to subsidize airport operations because of the economic benefits that the facility brings to the area, such as the tax revenues generated by the airport and airport-related businesses, as well as the social and quality-of-life benefits that the airport supports.

Airport Operating Revenues and Expenditures

Airport revenues are typically generated through user fees charged by the airport for the facilities and services that are provided. These user fees are typically established by the airport based on market conditions in the area and vary airport-to-airport. Airport operating revenues are collected at Beaufort County Airport from the following primary sources:

- Leases/Rentals – The majority of Airport tenants lease buildings, land/ground and ramp areas from the Airport on which they house aircraft or run aviation-related businesses. Lease rates at an airport may vary widely by size, location and amenities and are individually negotiated. Leases are based on a, per square foot per year rate. Lease rates should be adjusted in the future and should keep pace with changes in the general price level as reflected in the Consumer Price Index (CPI).

- Fuel Sales – The Airport sells fuel to based and transient aircraft at a reasonable mark-up to deliver revenue to the airport. The price of fuel sold is determined by the price paid and local market conditions.

At most airports, landside facility development and levels of aviation activity are typically the primary factors affecting airport operating revenues. As additional development occurs at Beaufort County Airport and as the number of based aircraft and itinerant aircraft operations increase, it is likely that Airport operating revenues will increase in a corresponding fashion. Projections of future Airport operating revenues are developed later in this section.

Airport operating revenues are offset by operating expenses, often referred to as Maintenance and Operation (M&O) Costs. Airport operating expenses are comprised of the day-to-day costs incurred by the Airport sponsor in the operation of Beaufort County Airport. Included in these costs are consumables for sales and services offered, personnel, services purchased and miscellaneous operating expenses. Depreciation is for FAA assets not paid for by the County and is not a direct expense for the County. Expenses do not include debt or grant related capital development. While personnel expenses stay relatively constant, other expenditures such as services and capital outlays are unpredictable and account for some fluctuation in expenditures as seen in Table 7-5.

An important consideration in examining the feasibility of the recommended development plan is the sponsor's ability to fund the local share of project costs. This analysis examines the financial operating outcome of the Airport for fiscal years 2008 through 2011(budgeted) to identify the potential for funding development through the use of Airport funds. Table 7-5 presents a summary of Beaufort County Airport's revenues, expenses, and operating income over the period fiscal years 2008 through 2011.

Table 7-5: Historic Airport Operating Revenues, Expenses, and Outcome

Category	FY 2008	FY 2009	FY 2010	FY 2011 Budgeted
REVENUES				
Fuel and Oil Sales	$599,504	$415,834	$362,216	$520,000
Concession Sales	$8,362	$6,278	$5,378	$9,000
Ramp Fees	$14,894	$14,554	$13,567	$15,000
Rentals	$106,852	$98,350	$108,146	$111,094
Other Charges	$8		$1,384	$7,800
Total Operating Revenues	$729,620	$535,016	$490,691	$662,894
EXPENSES				
Costs of Sales and Services	$438,114	$278,845	$265,442	$335,950
Personnel	$109,969	$111,540	$108,032	$183,855
Purchased Services	$166,559	$103,803	$82,133	$96,528
Supplies	$13,371	$10,567	$10,517	$12,000
Non-Grant Capital Expense				$1,500
Bad Debt		$4,911		
Total Operating Expenses	$728,013	$509,666	$466,124	$629,833
Net Revenue	**$1,607**	**$25,350**	**$24,567**	**$33,061**
Depreciation	$53,412	$57,302	$53,005	$60,826
Operating Income (loss)	**($51,805)**	**($31,952)**	**($28,438)**	**($27,765)**

Source: Beaufort County
Note: Reflects revised budget for FY2011, effective February 28, 2011

As shown in Table 7-5, the Airport's net revenue has remained positive for the past four years and is trending upward. The annual loss exhibited in operating income is a result of a paper depreciation of FAA assets that the Airport does not pay for. Therefore, it can be reasonably understood that the Airport maintains self-sufficiency when discounting depreciation.

It is important to note that through the majority of these years, the Airport has maintained a relatively consistent ratio between the revenue generated from fuel and oil sales and the expense of sales and services, the primary financial categories for the Airport. As fuel and oil sales increase and the ratio of related costs of sales and services remains consistent, the Airport will likely continue to experience positive financial performance. Through the planning period, incremental growth to keep pace with inflation is projected for both revenues and expenses. Based on incremental growth in revenues and expenses and planned facility development, it is likely that the Airport will maintain self-sufficiency in the near term and become more profitable in later years.

Projected Operating Revenues and Expenses

The continued growth of Beaufort County Airport, in terms of activity, tenants, new leases and facility development, will impact the Airport's operating revenues and expenses over the planning period. Any additional revenue will only act to further strengthen current airport revenues and help ensure that the Airport remains self-sufficient throughout the planning period. Actual future financial outcomes will be determined by a variety of factors, many of which are impossible to identify at the current time. However, the projections developed in this evaluation depict future Airport operating revenues and expenses based on recent financial results, budgeted revenues and expenses for 2011, and activity and tenant growth trends identified in previous chapters.

It is assumed in the projections of future airport revenues that newly constructed hangar facilities will be built by private developers and rented at a market rate which reflects their amenities. Projected airport rental revenue generated from new hangar construction is gained through land leases to private developers consistent with the recommended phased development plan and forecasted growth of based aircraft. Projections of future airport revenues and expenses at Beaufort County Airport through 2030 are presented in Table 7-6.

Table 7-6: Projected On-Airport Operating Revenues and Expenses

		Projected			
	FY 2010	2015	2020	2025	2030
REVENUES					
Fuel and Oil Sales	$362,216	$420,000	$487,000	$565,000	$655,000
Concession Sales	$5,378	$6,300	$7,300	$8,400	$9,700
Ramp Fees	$13,567	$16,000	$18,700	$21,600	$25,100
Rentals (and Land Leases)	$108,146	$140,000	$162,000	$195,000	$230,000
Other Charges	$1,384	$1,000	$1,500	$2,000	$2,500
Total Operating Revenues	$490,691	$583,300	$676,500	$792,000	$922,300
EXPENDITURES					
Costs of Sales and Services	$265,442	$306,000	$355,000	$412,000	$478,000
Personnel	$108,032	$160,000	$186,000	$205,000	$225,000
Purchased Services	$82,133	$70,000	$75,000	$80,000	$85,000
Supplies	$10,517	$12,000	$15,000	$18,000	$21,000
Total Operating Expenses	$466,124	$548,000	$631,000	$715,000	$809,000
Net Revenue	**$24,567**	**$35,300**	**$45,500**	**$77,000**	**$113,300**
Depreciation	$53,005	$55,000	$55,000	$55,000	$55,000
Operating Income (loss)	**($28,438)**	**($19,700)**	**($9,500)**	**$22,000**	**$58,300**

Source: Beaufort County (2010), Wilbur Smith Associates (Projected)

The projections presented in Table 7-6 are based on financial results for 2010 as well as budgeted and actual results achieved to date in 2011. Projections are developed for the years 2015 through 2030 based on anticipated escalations in Airport operating costs, normal revenue increases based on inflation, expected airport activity, and land lease increases directly correlated to the anticipated growth in based aircraft.

Based on projected future revenues, Beaufort County Airport's operating revenues are projected to increase to $922,300 by 2030. Most of the growth in Airport operating revenues is anticipated to be driven by an increased number of facility and land leases as well as increased rental rates. Over the same period, Airport operating expenditures are projected to increase to $809,000 in 2030. Based on these projections, the Airport's total net revenue is projected to improve each year between 2010 and 2030, maintaining operating self-sufficiency, minus depreciation which is held constant throughout the planning period. By 2030, the Airport is projected to have a total net revenue potential of $113,300 for that year.

It is important to note, that projected operating revenues reflect income from capital projects cited in the master plan. The sponsor's (Beaufort County) share of costs related to constructing these projects, however, is not included in the operating revenue and expense calculations, since they are not part of the operating budget. As shown in Table 7-1, the total sponsor share of development costs is $389,125 over the planning period. Analysis of the summary financial information indicates that positive income from Airport operations should go into an airport capital improvement fund to be used to pay the sponsor share of capital project costs.

Appendix A

Supporting materials for Chapter 3 – Facility Requirements

NETJETS

March 30, 2006

Beaufort County Airport
P.O. Box 23739
Hilton Head, SC 29925

Dear Mr. Phillips,

NetJets thanks you for the opportunity to present our viewpoint in the planning process of your runway extension project. Completion of this project would provide Owners in the NetJets Fractional Ownership program a destination airport that would be able to better accommodate the larger cabin sized aircraft in the NetJets fleets.

I am attaching with this letter a performance study based upon temperatures and elevations that are specific to the Beaufort County Airport location. Realizing that the desired runway length is 5000 feet, I also ran numbers for a runway that would be 6000 feet long. NetJets is able to use the 5000 foot length with every aircraft type within our fleet (assuming width and weight bearing are appropriate) but I wanted to show you the benefit the additional 1000 feet would bring. I would like to mention up front, too, that construction up to 5000 feet will allow NetJets to utilize a geographic location that is currently extremely restricted. Today, only the Citation Ultra (71 out of 500 aircraft of the Columbus, Ohio directed fleet) is approved for operations at Beaufort County. I am also attaching the NetJets Fleet Airport Resource document that should give you an idea of the NetJets fleet makeup including wingspan and basic operating weights. This document would be helpful if hangars are being considered as part of the improvement package.

I ran historic traffic counts for the Beaufort County airport and the Hilton Head airport to assess some of the demand for the geographic area. I am confident that the Beaufort County airport would be able to significantly improve traffic counts once the runway was lengthened. NetJets conducts approximately 1000 operations annually at Hilton Head. Due to the runway length of 4300 feet at Hilton Head, NetJets has chosen to operate only our light and light/medium cabin aircraft at this facility. Possession of a 5000 foot (or greater) runway would provide a destination suitable to Owners in the medium and large cabin aircraft programs.

When reviewing the Fleet Airport Resource, you will notice that the runway and taxiway requirements do not fall completely within advisory circular guidelines. The NetJets airport design categories are comprised of BII, CII, CIII, and DII category aircraft. With that in mind, this is how I would summarize the ideal NetJets aircraft movement areas. Runway dimensions would be a minimum of 75 feet wide (unless you one day would like to service the BBJ or comparable aircraft – 100 feet is our minimum), 5000 feet long (a 6000 foot runway would be preferable – mostly due to the effects of temperature on aircraft performance), with a weight bearing geared toward your design aircraft. My guess is that you will be servicing a large number of G-IV and G-V type aircraft and should have a minimum full strength weight bearing capacity of 60,000 pounds dual wheel design configuration. If the airport owners expect to service BBJ type aircraft, roughly 110,000 pounds should be considered as a minimum weight bearing capacity. The surface should be crowned. Grooving should be considered – the feature allows operators to use the dry landing distance numbers for some aircraft types. Runway lighting is suggested and so that a typical Part 91K/135 operator would be able to make use of the FAA's Destination Airport Analysis Program, a PAPI system should be installed with approach angles set between 2.5 and 3.5 degrees. The runway markings should be appropriate to the approach(es) that serve the respective runway ends.

When designing your taxiway surfaces, you would be best suited to abide by the guidance of the advisory circulars under category CIII. The 50 foot wide surface would suit each of our fleets. This surface should be crowned as well and should employ standard taxiway lighting.

Aircraft parking areas should be designed to accommodate the anticipated mix of aircraft that you will be seeing. Piston trainers and light twins should be parked in an area away from jet blast areas. This area should be lighted and possibly provide concrete parking pads for heavier aircraft with the intention of preserving the pavement investment.

One thing that your airport developer should study closely is the application of safety areas that are contained within the advisory circulars. From discussion with the FAA, there is a push from the NTSB to have all runway surfaces comply with this guidance. Personal observation shows numerous airports that are having useable runway consumed by these Declared Distance guidelines that are contained in Appendix 14 of the Airport Design Advisory Circular 150/5300-13.

Highlights of the performance charts include that landing distances don't appear to be an issue as long as the DAAP can be utilized. Takeoff weights are most interesting and could be used as guidelines for determining your weight bearing capacity (inspect the G-IV and G-V weights at both runway lengths and be reminded that our BBJ operates in and out of 5000 foot runways at a weight of about 115,000 pounds.) The last chart in the sequence shows the potential benefit of having the extra 1000 feet. From an operator's viewpoint, number one is the increased safety margins that a longer runway will bring. Following behind, is the utility that the runway will provide for most operating fleets. The chart depicts the additional weight in percentage and fuel weight that can be added to these flights and the ensuing range that the aircraft operator can expect. Please bear in mind that the difference is based on the difference between a 5000 foot runway and a 6000 foot runway. *None* of the performance aircraft on the study are currently eligible to land at Beaufort County because of our minimum runway requirements.

As part of your planning process, NetJets has a website, http://suppliers.netjets.com that will provide you a window into the Fixed Base Operator Standards that many of our suppliers abide by.

I hope all of this information is useful to you. This project will provide a safe operating environment for our Owners and crews and will allow the entire NetJets fleets, sister company Executive Jet Management, vendors for NetJets, and, of course, competitors, and private owners access to a geographic area that has to this point been unreachable. We support your construction efforts. I will be more than happy to answer any questions you might have regarding aircraft operations at your improved facility. The supplier website above will hook you up to the FBO/Fuel department should you have any questions from that side of your operation. NetJets holds info classes on a regular basis that would be open to you and/or your employees that give you yet another means to visit and learn about the NetJets operation and what servicing our aircraft can do for your operation.

Sincerely,

Al Ball
Airport Technologist
Operational Intelligence & Analysis
614 239 4873
ball@netjets.com

NetJets
Fleet Aircraft Resource

AIRCRAFT TYPE	FUEL DELIVERY	PRIST	RUNWAY SPECS: DRY ABSOLUTE MINIMUM	RUNWAY SPECS: MINIMUM RUNWAY WIDTH	RUNWAY SPECS: MINIMUM TAXIWAY WIDTH	AIRCRAFT SPECS: MAIN GEAR SPACING	AIRCRAFT SPECS: AIRCRAFT WING SPAN	AIRCRAFT SPECS: AIRCRAFT TAIL HEIGHT	AIRCRAFT SPECS: ACN	AIRCRAFT SPECS: TIRE PRESSURE	OPERATING WEIGHTS: NJ BASIC OPERATING WEIGHT	OPERATING WEIGHTS: MAX ZERO FUEL WEIGHT	OPERATING WEIGHTS: MINIMUM RELEASE FUEL (LBS)	OPERATING WEIGHTS: MAX LANDING WEIGHT	OPERATING WEIGHTS: MAX TAKEOFF WEIGHT	SPEEDS: APPROACH CATISPD STRAIGHT-IN	SPEEDS: APPROACH CATISPD CIRCLING
CE-525 B						17'	52' 10"	15' 2"	5/6	119		10510		12750	13870		
CE-560	S/O	YES	3500'	50'	35'	17'	52' 6"	15'	7	130	10254	12200	1500	15200	16300	B 97-112	C 107-122
CE-560 E	S/O	YES	3500'	50'	35'	17'	52' 6"	15' 5"	7	156	10865	12600	1500	15200	16630	B 97-112	C 107-122
CE-560 XL	S/O	NO	3800'	50'	30'	15'	56' 7"	17' 2"	9/10	210	13117	15000	1800	18700	20000	B 116-127	C 126-137
CE-560 XLS	S/O	NO	3800'	50'	30'	15'	55'7"	17'2"	9/10	210	13117	15200	1800	18700	20200	B 116-127	C 126-137
CE-650/VII	S/O	NO	4300'	75'	50'	9' 6"	53' 6"	16' 9"	7/8	190	14550	16500	1900	20000	23000	C 145	D 155
CE-680	S/O	NO	4000'	70'	TBD	12'	63' 2"	20' 4"	10/11	160	18440	20300	2500	27100	30000	B 89-115	C 99-125
CE-750	S/O	NO	4600'	75'	50'	11'	63' 5"	18' 4"	8/13	180	22139	24400	2500	31800	35700	C 118-128	D 138
BE-400	O/W	YES	4200	50'	35'	9'4"	43' 6"	13' 11"	7	125	11253	13000	1750	15700	16300	B 102-117	C 139
HS-125/800 XP	S/O	NO	4500'	75'	50'	9' 2"	51' 5"	17' 7"	4/9	135	17305	18450	2400	23350	28000	C 115-120	D 165
BAE-1000	S/O	NO	4600'	75'	50'	9' 2"	51' 5"	17' 1"	4/10	160	18331	20300	2400	25000	31000	C 115-120	D 165
Horizon		NO				11' 9"	61' 9"	19' 9"	5/13	198	22150	25000		33500	37500		
G-200	S/O	NO	4600'	75'	40'	12' 6"	58' 1"	21' 5"	4/11	203	20298	24000	2900	28000	35450	C 120-140	D 140-160
DA-2000	S/O	NO	4500'	75'	50'	14' 6"	63' 5"	22' 9"	5/13	190	23186	28660	3000	33000	36500	C 116	D 140
DA-2EASY	S/O	NO	4500'	75'	50'	14' 7"	63' 5"	23' 2"	5/15	229	24269	29700	3000	39300	42200	C 120	D 140
GIV-SP	S/O	NO	4500'	75'	50'	16'	77' 10"	24' 5"	10/26	189	43656	49000	3-5000	66000	74600	C/D 126-144	C/D 140-150
G-450	S/O	NO	4500'	75'	50'	16'	77' 10"	24' 5"	10/26	189	43656	49000	3-5000	66000	74600	C/D 126-144	C/D 140-150
GV	S/O	NO	4500'	75'	50'	17'	93' 6"	25' 10"	12/33	198	48348	54500	3-5000	75300	90500	C 112-124	C 122-134
G-550	S/O	NO	4500'	75'	50'	17'	93' 6"	25' 10"	12/33	198	48348	54500	3-5000	75300	90500	C 112-124	C 122-134
BBJ	S	NO	5000'	100'	50	23' 2"	117' 5"	41' 3"	26/56	213	102116	126000		134000	171000	C 140-145	D 150

S - Single Point, O/W - Overwing, S/O - Both
GIV-SP - must weigh 61,000 to circle CAT C
ACN = empty wt/max wt; figure toward high end
NetJets pax wts - 221 Smr, 226 Wntr
* This document not valid for flight planning *

12/7/2005

73J Beaufort, South Carolina

		Landing Distance Required									
		33° Dry			33° Wet		41° Dry			41° Wet	
Aircraft Type	Max Landing Wt	Distance	Part 91-K	Factored	Distance	Factored	Distance	Part 91-K	Factored	Distance	Factored
Citation Excel	18700	3363	4204	5606	5037	6446	3427	4284	5713	5144	6569
Citation VII	20000	3074	3843	5123	4134	5891	3142	3928	5236	4237	6021
Citation Sovereign	27100	2803	3504	4672	3398	5373	2852	3565	4753	3473	5466
Citation X	31800	3622	4528	6037	5101	6943	3727	4659	6211	5268	7143
Hawker 400XP	15700	3675	4594	6125	5405	7043	3754	4693	6256	5509	7194
Hawker 800XP	23350	2654	3318	4424	3992	5087	2654	3318	4424	3992	5087
Hawker 1000A	25000	2862	3578	4771	3895	5486	2862	3578	4771	3895	5486
Falcon 2000	33000	3125	3906	5208	3594	5989	3125	3906	5208	3594	5989
Gulfstream 200	28000	3230	4038	5383	3704	6174	3300	4125	5500	3785	6308
G-IV-SP	66000	3180	3975	5301	3657	6096	3180	3975	5301	3657	6096
G-V	75300	2785	3481	4641	3203	5338	2785	3481	4641	3203	5338

Conditons:

Aircraft configured at Max Landing Weight
Airport elevation at 10 feet mean sea level
Assumed landing runway 25 with 5000 feet useable runway
Runway slope computed at downhill 0.06%
Distance is "Part 91" landing distance
Factored landing distance is Part 135 landing distance

Landing distance required exceeds runway length
Temperature/length duplication
NC *Tables do not exist for this configuration*

This information not valid for flight planning

73J Beaufort, South Carolina

Maximum Allowable Takeoff Weight - Existing RWY, 5000 feet

Aircraft Type	Max T/O Weight	33° Dry				33° Wet		41° Dry		41° Wet	
		Std Flaps		Alt Flaps		Std Flaps	Alt Flaps	Std Flaps	Alt Flaps	Std Flaps	Alt Flaps
Citation Excel	20000	15		7	19500		19500	19630	17840	19570	17840
Citation VII	23000	20	21293	7	20466	20085	19122	20071	19246	19167	18170
Citation Sovereign	30000	15		7							
Citation X	35700	15	32865	5	30881	27151	29141	31114	29405	28855	28242
Hawker 400XP	16300	20	15629	10	16257	NC	NC	14750	15511	NC	NC
Hawker 800XP	28000	15	25653	0	24363	NC	NC	24154	22869	NC	NC
Hawker 1000A	31000	15	25882	0	24254	18207	19001	24480	23043	19404	20877
Falcon 2000	36500	20	33017	10	32352	31767	31105	31453	30762	25986	29532
Gulfstream 200	35450	20	29475	12	29143	24238	24369	28470	28027	24238	24348
G-IV-SP	74600	20	67992	10	66260	61855	62180	65278	63485	58625	59586
G-V	90500	20	80798	10	77061	NC	NC	77964	74744	NC	NC

Conditons:

Airport elevation at 10 mean sea level
Departure weights computed for proposed runway length of 6000 feet
Upslope value of 0.06% used in computations
Alternate Flaps settings sometimes allow departures in higher temperatures

	Climb limited
	Maximum takeoff weight allowed this configuration
	Takeoff weight limited by runway length
NC	Tables do not exist for this configuration

This information not valid for flight planning

73J Beaufort, South Carolina

Aircraft Type	Max T/O Weight	Maximum Allowable Takeoff Weight - Proposed RWY, 6000 feet									
		20° Dry				20° Wet		30° Dry		30° Wet	
		Std Flaps		Alt Flaps		Std Flaps	Alt Flaps	Std Flaps	Alt Flaps	Std Flaps	Alt Flaps
Citation Excel	20000	15		7					19180		19180
Citation VII	23000	20		7	22534	22414	21224	21903	21111	21280	19981
Citation Sovereign	30000	15		7							
Citation X	35700	15		5	33123	33899	32529	33821	31322	32195	30944
Hawker 400XP	16300	20	15629	10		NC	NC	14750		NC	NC
Hawker 800XP	28000	15	27990	0	26726	25121	25108	25571	25000	25571	23652
Hawker 1000A	31000	15	28115	0	26401	26657	24668	26611	25118	25004	23442
Falcon 2000	36500	20	36116	10	35311	35463	34219	34178	33711	33891	32762
Gulfstream 200	35450	20	32219	12	31406	32431	30678	30912	30079	29973	28743
G-IV-SP	74600	20	73526	10	72168	68911	68195	70540	69133	66118	65335
G-V	90500	20	86154	10	83288	NC	NC	82906	80885	NC	NC

Conditons:

Airport elevation at 10 mean sea level
Departure weights computed for proposed runway length of 6000 feet
Upslope value of 0.06% used in computations
Alternate Flaps settings sometimes allow departures in higher temperatures

	Climb limited
	Maximum takeoff weight allowed this configuration
	Takeoff weight limited by runway length
NC	*Tables do not exist for this configuration*

This information not valid for flight planning

73J Beaufort, South Carolina

Aircraft Type	Max T/O Weight	Runway Requirements at Max Weight - Elevation 10 feet									
		33° Dry				33° Wet		41° Dry		41° Wet	
		Std Flaps		Alt Flaps		Std Flaps	Alt Flaps	Std Flaps	Alt Flaps	Std Flaps	Alt Flaps
Citation Excel	20000	15	4325	7	5318	4435	5318	5235	6715	5235	6715
Citation VII	23000	20	5694	7	6240	6292	7000	5825	7130	6337	7891
Citation Sovereign	30000	15	3863	7	4175	4570	4456	4156	4547	4486	4763
Citation X	35700	15	5976	5	7372	6687	7471	6489	9109	7248	9230
Hawker 400XP	16300	20	4259	10	5026	NC	NC	4171	5564	NC	NC
Hawker 800XP	28000	15	6004	0	6648	6779	7245	5593	7714	5888	8821
Hawker 1000A	31000	15	7090	0	8800	8270	10590	6670	9680	7770	NC
Falcon 2000	36500	20	6110	10	6420	6360	6820	7370	7180	7030	7530
Gulfstream 200	35450	20	7355	12	8064	7952	8553	6790	8720	7276	9045
G-IV-SP	74600	20	6192	10	6591	7058	7456	6797	7278	7723	8222
G-V	90500	20	6865	10	7489	NC	NC	7687	8111	NC	NC

Conditons:

Max takeoff weight each aircraft type
Takeoff distance based upon unlimited runway
Takeoff distance computed with 0.06% upslope

	Climb limited
	Proposed runway length would be exceeded
NC	Tables do not exist for this configuration

This information not valid for flight planning

73J

Beaufort, South Carolina
Benefit Due to Runway Extension

		Dry Conditions									
	Runway Length	5000 Feet		6000 Feet		% Incr due Rwy Lgth		Wgt/Fuel # Increase		Approx Incr Rng/Hrs	
Aircraft Type	Max T/O Weight	33° Dry	41° Dry	33° Dry	41° Dry	33° Dry	41° Dry	33° Dry	41° Dry	33° Dry	41° Dry
Citation Excel	20000	20000	19630	20000	20000	0.0	1.9	0	370	0	0.29
Citation VII	23000	21293	20071	23000	21903	7.4	8.0	1707	1832	1	1.08
Citation Sovereign	30000	30000	30000	30000	30000	0.0	0.0	0	0	0	0
Citation X	35700	32865	31114	35700	33821	7.9	7.6	2835	2707	1.54	1.47
Hawker 400XP	16300	15629	14750	15629	14750	0.0	0.0	0	0	0	0
Hawker 800XP	28000	25653	24154	27990	25571	8.3	5.1	2337	1417	1.56	0.94
Hawker 1000A	31000	25882	24480	28115	26611	7.2	6.9	2233	2131	1.28	1.22
Falcon 2000	36500	33017	31453	36116	34178	8.5	7.5	3099	2725	1.94	1.7
Gulfstream 200	35450	29475	28470	32219	30912	7.7	6.9	2744	2442	1.32	1.16
G-IV-SP	74600	67992	65278	73525	70540	7.4	7.1	5534	5262	1.98	1.86
G-V	90500	80798	77964	86154	82906	5.9	5.5	5356	4942	1.6	1.48

Climb limited above posted weight

Max Weight, no changes

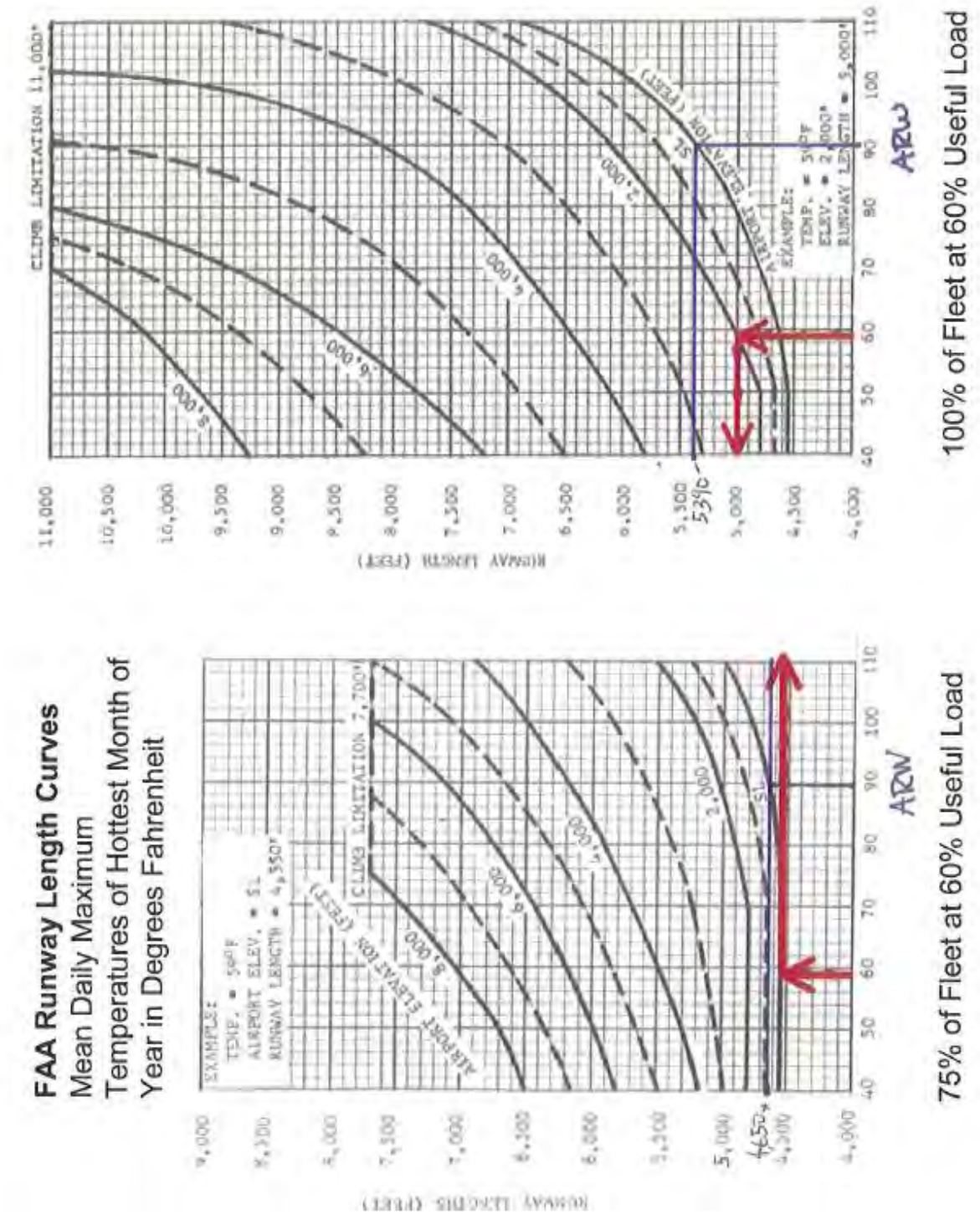
FAA Runway Length Curves
Mean Daily Maximum
Temperatures of Hottest Month of
Year in Degrees Fahrenheit
CLIMB LIMITATION 11,000'
CLIMB LIMITATION 7,700'
AIRPORT ELEVATION (FEET)
RUNWAY LENGTH (FEET)
EXAMPLE:
TEMP. = 90°F
AIRPORT ELEV. = SL
RUNWAY LENGTH = 4,350'
53%
75% of Fleet at 60% Useful Load
100% of Fleet at 60% Useful Load
ARW

Table 3-1. Airplanes that Make Up 75 Percent of the Fleet

Manufacturer	Model
Aerospatiale	Sn-601 Corvette
Bae	125-700
Beech Jet	400A
Beech Jet	Premier I
Beech Jet	2000 Starship
Bombardier	Challenger 300
Cessna	500 Citation/501Citation Sp
Cessna	Citation I/II/III
Cessna	525A Citation II (CJ-2)
Cessna	550 Citation Bravo
Cessna	550 Citation II
Cessna	551 Citation II/Special
Cessna	552 Citation
Cessna	560 Citation Encore
Cessna	560/560 XL Citation Excel
Cessna	560 Citation V Ultra
Cessna	650 Citation VII
Cessna	680 Citation Sovereign

Manufacturer	Model
Dassault	Falcon 10
Dassault	Falcon 20
Dassault	Falcon 50/50 EX
Dassault	Falcon 900/900B
Israel Aircraft Industries (IAI)	Jet Commander 1121
IAI	Westwind 1123/1124
Learjet	20 Series
Learjet	31/31A/31A ER
Learjet	35/35A/36/36A
Learjet	40/45
Mitsubishi	Mu-300 Diamond
Raytheon	390 Premier
Raytheon Hawker	400/400 XP
Raytheon Hawker	600
Sabreliner	40/60
Sabreliner	75A
Sabreliner	80
Sabreliner	T-39

Table 3-2. Remaining 25 Percent of Airplanes that Make Up 100 Percent of Fleet

Manufacturer	Model
Bae	Corporate 800/1000
Bombardier	600 Challenger
Bombardier	601/601-3A/3ER Challenger
Bombardier	604 Challenger
Bombardier	BD-100 Continental
Cessna	S550 Citation S/II
Cessna	650 Citation III/IV
Cessna	750 Citation X
Dassault	Falcon 900C/900EX
Dassault	Falcon 2000/2000EX
Israel Aircraft Industries (IAI)	Astra 1125
IAI	Galaxy 1126
Learjet	45 XR
Learjet	55/55B/55C
Learjet	60
Raytheon/Hawker	Horizon
Raytheon/Hawker	800/800 XP
Raytheon/Hawker	1000
Sabreliner	65/75

Note: Airplanes in tables 3-1 and 3-2 combine to comprise 100% of the fleet.

Appendix B

Supporting materials for Chapter 5 – Environmental Overview

South Carolina Department of
Natural Resources
DNR

John E. Frampton
Director

Ken Rentiers
Deputy Director for
Land, Water and
Conservation Division

June 2, 2010

Marc Cocanougher
Wilbur Smith Associates
6600 Clough Pike
Cincinnati, OH 45244

RE: Master Plan for Beaufort County Airport
Beaufort, SC

Dear Mr. Cocanougher,

Because our database does not represent a comprehensive biological inventory of the state, I can only verify the known occurrences in the vicinity of your project. There may be occurrences of species in the vicinity of your project area that have not been reported to us. Fieldwork remains the responsibility of the investigator.

I have checked our database, and there are no known occurrences of any federal or state listed threatened or endangered species within one mile of the project area. However, there is a record for a waterbird colony (species and use are not specified in our database) northwest of the project area. The birds at this location are afforded some legal protection under the Migratory Bird Act, so you may need to consider them during your work. As further indication of what may occur in the project area, I have also attached the list of rare, threatened, and endangered species and communities for Beaufort County.

As a professional courtesy, we ask that you acknowledge S.C. Heritage Trust as a source of information whenever you use this data in reports. If you need additional assistance, please contact me by phone at 803-734-3917 or by e-mail at HollingJ@dnr.sc.gov.

Sincerely,

Julie Holling

Julie Holling, Data Manager
SC Department of Natural Resources
Heritage Trust Program

Encl.

Rembert C. Dennis Building • 1000 Assembly Street • PO Box 167 • Columbia, SC 29202 • Telephone: 803-734-9100 • Fax: 803-734-9200
EQUAL OPPORTUNITY AGENCY www.dnr.sc.gov PRINTED ON RECYCLED PAPER

3

Cocanougher, Marc

From: Shannon Hicks [hickss@dhec.sc.gov]
Sent: Friday, June 04, 2010 2:29 PM
To: Cocanougher, Marc
Cc: Russell Berry; Penny Cornett; Richard V. Geer; Christine Koczera; Amanda Nodolf; Carl Richardson; Blair N. Williams
Subject: Re: Comments on Beaufort County Airport Master Plan
Attachments: Comments on Beaufort County Airport Master Plan

The above referenced project may need several permits and certifications from SCDHEC-OCRM. NPDES Construction General Permit Coverage and Coastal Zone Consistency Certification are required prior to any land disturbing activity on the site. We are available to review more detailed plans of the project as it progresses.

Shannon

>>> Russell Berry 6/2/2010 12:05 PM >>>
Marc,

I have rcd the Master Plan and have copied SCDHEC representatives who can advise you on the proper permits and regulatory requirements/ comments on the the project as attached below.

SCDHEC OCRM, Blair Williams and the USACOE will need to be contacted for applications for permits to fill wetlands.

SCDHEC OCRM, Shannon Hicks is the contact for a stormwater construction permit in the SC Coastal Zone.

It is recommended that if the airport is not currently served by sewer that it be connected to sewer.
BJWSA is the sewer provider in the area. Please contact Ed Saxxon at BJWSA for more information 843-987-9249.

The stormwater general permit will need to be amended for changes.

Please email if you need additional information.

Thanks
Russell Berry

7

The South Carolina Archives & History Center
History & Heritage For All Generations

June 17, 2010

Marc Cocanougher
Wilbur Smith Associates
6000 Clough Pike
Cincinnati, OH 45244

Re: Beaufort Airport Master Plan, Beaufort, Beaufort, SC
SHPO #: 10CW0340

Dear Mr. Cocanougher:

Thank you for your letter of May 19, which we received on 27, regarding the above referenced project. We also received maps and plans as supporting documentation for this undertaking. The State Historic Preservation Office is providing comments to the Federal Aviation Administration pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR 800.

Based on the description of the Area of Potential Effect (APE) and the identification of historic properties within the APE, our office concurs with the assessment that no properties listed in or eligible for listing in the National Register of Historic Places will be affected by this project.

If archaeological materials are encountered during construction, the procedures codified at 36 CFR 800.13(b) will apply. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal and glass objects, and human skeletal materials. The federal agency or the applicant receiving federal assistance should contact our office immediately.

If you have any questions, please contact me at (803) 896-6169 or cwilson@scdah.state.sc.us.

Sincerely,

Caroline Dover Wilson
Review and Compliance Coordinator
State Historic Preservation Office

S. C. Department of Archives & History • 8301 Parklane Road • Columbia • South Carolina • 29223-4905 • (803) 896-6100 • http://scdah.sc.gov

2

Cocanougher, Marc

From: Russell Berry [BERRYRE@dhec.sc.gov]
Sent: Wednesday, June 02, 2010 12:05 PM
To: Cocanougher, Marc
Cc: Penny Cornett; Mark Giffin; Alison M. Hathcock; Shannon Hicks; Gina Kirkland; Carl Richardson; Roger Stevens; Blair N. Williams
Subject: Comments on Beaufort County Airport Master Plan
Attachments: img007.jpg; img001.jpg; img002.jpg; img003.jpg; img004.jpg; img005.jpg

Marc,

I have rcd the Master Plan and have copied SCDHEC representatives who can advise you on the proper permits and regulatory requirements/ comments on the the project as attached below.

SCDHEC OCRM, Blair Williams and the USACOE will need to be contacted for applications for permits to fill wetlands.

SCDHEC OCRM, Shannon Hicks is the contact for a stormwater construction permit in the SC Coastal Zone.

It is recommended that if the airport is not currently served by sewer that it be connected to sewer.
BJWSA is the sewer provider in the area. Please contact Ed Saxxon at BJWSA for more information 843-987-9249.

The stormwater general permit will need to be amended for changes.

Please email if you need additional information.

Thanks
Russell Berry

DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
69A Hagood Avenue
CHARLESTON, SOUTH CAROLINA 29403-5107

REPLY TO
ATTENTION OF

June 16, 2010

Regulatory Division

Wilbur Smith Associates
Mr. Marc Cocanougher
6600 Clough Pike
Cincinnati, Ohio 45244

Dear Mr. Cocanougher:

This is in response to your letter of May 19, 2010, requesting comments regarding the Master Plan for the Beaufort County Airport on Lady's Island in Beaufort County, South Carolina. The purpose of this letter is to provide you with comments about the project and the permitting process.

The information you provided indicates that the runway expansion project area is located within tidal wetlands and waters of the Morgan River. These wetlands and waters are jurisdictional pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act and are regulated by this office. The placement of fill material and structures into the tidal waters and tidal wetlands of the Morgan River, as well as the excavation of material from the tidal wetlands and tidal waters of the Morgan River, will require a permit from this office.

Prior to submittal of a permit application, we recommend that you conduct a wetland delineation of the runway expansion project area and submit the information to this office for a Jurisdictional Wetland Determination. Please note that you must contact the Office of Ocean and Coastal Resource Management to determine the exact location of the critical line (tidal wetland line) prior to submitting the information to this office. Information regarding Jurisdictional Wetland Determinations can be found on our website at http://www.sac.usace.army.mil/?action=jurisdictional_determination.process_overview.

A search of our records indicates that a previous permit, SAC 92-2A-120, was issued to the Beaufort County Airport on November 2, 1992. This permit authorized the placement of fill into to 3.1 acres of tidal wetlands and the excavation of 4,654 cubic yards of material from tidal wetlands for the construction of a new runway. According to this permit, onsite wetland creation/restoration was proposed as mitigation for the permitted wetland impacts and the mitigation areas were to be preserved by restrictive covenants. The permit, drawings, and mitigation proposal are enclosed with this letter for your information. If the new runway referenced in this permit was constructed, then any future wetland impacts that are to occur at the Beaufort County Airport will be considered cumulative and an Individual Department of the Army Permit will be required, regardless of the amount of wetland impacts a new project will have. In addition, if the wetland mitigation areas were constructed and preserved per the conditions of the above permit, then the wetland mitigation areas may not be used for mitigation for future projects. In addition, no impacts to the mitigation areas will be authorized. Information regarding the Individual Permit (IP) process can be found on

our website at http://www.sac.usace.army.mil/?action=permits.program, or as specified in 33 C.F.R. 325.

For the unavoidable impacts to the wetlands, mitigation will be required. All mitigation must comply with the Mitigation Rule, which can be found on our website at http://www.sac.usace.army.mil/?action=mitigation.home, or found in C.F.R. 332.3 (2) (b). A conceptual mitigation plan must be submitted with the permit application. Please note that as of the date of this letter, there are no Corps approved tidal wetland mitigation banks available in South Carolina. Therefore, all tidal wetland mitigation must be permittee-responsible and consist of onsite or offsite restoration and/or creation. In addition, the mitigation must also comply with the Charleston District's Mitigation Standard Operating Procedures (Mitigation SOP) dated 2002. Please be aware that the 2002 Mitigation SOP is currently being revised and once the revisions are completed, the 2002 Mitigation SOP will be replaced with the new Mitigation SOP. The current and future Charleston District's Mitigation SOPs can also be found on our website at the above link.

In addition to a Corps permit, authorizations from the Office of Ocean and Coastal Resource Management and the South Carolina Department of Health and Environmental Control will also be required for the expansion of the runway into the tidal wetlands and waters.

If during the planning of this project, you wish to meet with the Corps to discuss the project, you may request a Pre-Application Meeting. The Pre-Application Meeting Request Form and process can be found on our website at http://www.sac.usace.army.mil/?action=regulatory.Meetings.

If you have any questions concerning this matter, please contact Tracy Dotolo Sanders at 843-329-8044 or toll free at 1-866-329-8187. In future correspondence concerning this matter, please refer to SAC 2010-0621-1JT.

Respectfully,

Charles R. Crosby
Chief, South Branch

Enclosure

South Carolina Department of
Natural Resources

PO Box 12559
Charleston, SC 29422
843.953.9003 Office
843.953.9399 Fax
Daviss@dnr.sc.gov

John E. Frampton
Director
Robert D. Perry
Director, Office of
Environmental Programs

May 27, 2010

Mr. Marc Cocanougher
Wilber Smith Associates
6600 Clough Pike
Cincinnati, OH 45244

Re: Master Plan for Beaufort County Airport, Environmental Review

Dear Mr. Cocanougher:

Personnel with the South Carolina Department of Natural Resources have reviewed the above referenced project for the presence of threatened and endangered species and offer the following comments.

At the current time we have no records of any endangered or threatened species occurring within your proposed work area. Please keep in mind that this information is derived from our existing database, and we do not assume that it is complete. Areas not yet inventoried by our biologists may contain significant species or communities.

Sincerely,

Susan F. Davis
Coastal Environmental Coordinator

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

June 17, 2010

Mr. Marc Cocanougher
Aviation Planning Analyst
Wilbur Smith Associates
6600 Clough Pike
Cincinnati, OH 45244

Re: Master Plan for Beaufort County Airport
Beaufort, South Carolina
FWS Log No. 2010-TA-0405

Dear Mr. Cocanougher:

The U.S. Fish and Wildlife Service (Service) has reviewed the Master Plan for the Beaufort County Airport. We are providing the following comments in accordance with the Fish and Wildlife Coordination Act, as amended (48 Stat. 401, as amended; 16 U.S.C. § 661-667e); the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531-1543); the Migratory Bird Treaty Act (16 U.S.C. §1536-1538), the National Environmental Policy Act (42 U.S.C. §4321 et seq.); and the Clean Water Act (33 U.S.C. §1251 et seq).

Endangered Species

You should be aware of any existing or potential federally listed threatened or endangered species that may occur within the proposed project area. The following is a list of federally endangered, threatened, and candidate species; designated critical habitat; and Federal species of concern known to occur in Beaufort County, South Carolina. Federal threatened and endangered species are protected under section 7 of the Endangered Species Act (Act). Federal species of concern are not legally protected under the Act and are not subject to any of its provisions, including section 7, unless they are formally proposed or listed as endangered or threatened. However, they could potentially be listed in the future, and therefore, recommend considering these species in the analysis.

TAKE PRIDE IN AMERICA

Section 9 of the Endangered Species Act (Act) of 1973 prohibits the taking of endangered species of fish or wildlife. The definition of "take" is to harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.

All alternatives should be evaluated for their potential affect on rare and federally listed species. The following lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated continually and may be different from the following.

E	Federally endangered
T	Federally threatened
P	Proposed in the Federal Register
CH	Critical Habitat
C	The U.S. Fish and Wildlife Service or the National Marine Fisheries Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species
S/A	Federally protected due to similarity of appearance to a listed species
SC	Federal Species of concern. These species are rare or limited in distribution but are not currently legally protected under the Endangered Species Act.
*	Contact the National Marine Fisheries Service for more information on this species

County	Common Name	Scientific Name	Status
Beaufort	Bald eagle	*Haliaeetus leucocephalus*	BGEPA
	Canby's dropwort	*Oxypolis canbyi*	E
	Finback whale	*Balaenoptera physalus**	E
	Frosted flatwoods salamander	*Ambystoma cingulatum*	T
	Green sea turtle	*Chelonia mydas***	E
	Humpback whale	*Megaptera novaengliae**	E
	Kemp's ridley sea turtle	*Lepidochelys kempii***	E
	Leatherback sea turtle	*Dermochelys coriacea***	E
	Loggerhead sea turtle	*Caretta caretta***	T
	Piping plover	*Charadrius melodus*	T, CH
	Pondberry	*Lindera melissifolia*	E
	Red-cockaded woodpecker	*Picoides borealis*	E
	Red knot	*Calidris canutus rufa*	C
	Right whale	*Balaena glacialis**	E
	Shortnose sturgeon	*Acipenser brevirostrum**	E
	West Indian manatee	*Trichechus manatus*	E
	Wood stork	*Mycteria americana*	E

The proposed project will directly impact tidal marsh. Tidal marsh is vitally important to the southeast ecosystem providing habitat to a variety of species including reptiles, amphibians, invertebrates, fish, mammals, and birds. The federally endangered wood stork uses this habitat to forage for food. Loss of species' nesting and foraging habitats should be analyzed for this project as part of the environmental review process.

We appreciate the opportunity to provide comments for the scoping process of this proposed project. If you have any questions or need additional information, please contact Ms. Morgan Wolf of my staff at 843-727-4707 ext. 219.

Sincerely,

Jay B. Herrington
Field Supervisor

JBH/MKW

Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, South Carolina 29730

Office 803-328-2427
Fax 803-328-5791

June 10, 2010

Attention: Marc Cocanougher
Wilbur Smith Associates
6600 Clough Pike
Cincinnati, Ohio 45244

Re. THPO #	TCNS #	Project Description
2010-471-2		Master Plan for Beaufort Co. Airport, Beaufort, SC

Dear Mr. Cocanougher,

We have received your request for comments regarding the presence of historic properties or traditional cultural, religious, and/or sacred sites of the Catawba Indian Nation that may be impacted by the above referenced undertakings. We will send you our determination as soon as our research process has been completed.

We need the following information for the above project:

- Photographs of the project area, facing north, south, east, and west. We are primarily interested in ground disturbance and do not need detailed information or photographs of historic structures in the project area.
- A copy of any archaeological surveys done within a half mile of the project area.
- A copy of the State Historic Preservation Office's letter of concurrence.

If you have questions please contact Caitlin Totherow at 803-328-2427 ext. 226, or e-mail caitlinh@ccppcrafts.com.

Sincerely,

Caitlin Totherow for
Wenonah G. Haire
Tribal Historic Preservation Officer